

## Technical Report

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# How Software Engineers Deal With Decisions in Scrum

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An Analysis

Mathias Schubanz – M.Schubanz@b-tu.de

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# Abstract

The Agile Manifesto titled “Working software over comprehensive documentation”. Although the stated principle makes an important point, it should not follow that documentation becomes obsolete. On the contrary, agile software development (ASD) is based on frequent decisions focused on customer benefits. Those decisions guide further development, subsequent maintenance, and software evolution and are made during every stage of the software development cycle. Thus, documenting the most important ones is an important foundation fostering product comprehension, software quality, and customer benefit. Besides, preserving decision knowledge supports refactoring and, thus, diminishing software erosion.

However, all these beneficial properties are opposed by a dismissive attitude among software developers. Documentation is very unpopular among software developers, especially in the ASD community. A common interpretation of the agile manifesto at this point is that good and functional code can fully replace documentation. Among other reasons, this attitude is the reason for the sparse application of structured and systematic documentation of decisions and their rationale.

To shed more light on imponderables, developer’s desires regarding decision documentation, and assess the outlined perception of a lack of decision documentation, this paper reports a survey on decision documentation among industry practitioners. The author assesses to what extent the above claims hold by asking industry practitioners about their perceptions and applied practices regarding decision documentation. Therefore, the author conducted a large-scale survey in the German and English speaking Scrum community. A few more than 100 software developers were asked what they document, how they document and how they use/share produced documentation.

The findings of this report reveal that there is a wide range of opinions in the agile community. The responses show that a developer’s experience significantly impacts the documentation frequency and the interest in the available documentation. Similarly, the role in which software developers have operated in Scrum plays a significant role in the frequency of documentation and the timing when developers document.

# 1. Introduction

Design Rationale (DR) plays a vital role in understanding software and its architecture. They are essential for justifying the selection of one decision alternative over another [19, 31, 64]. DR can also explain why a particular alternative was rejected. In some instances, this information is even more valuable. Therefore, whether explicit or implicit, DR constitutes a significant factor influencing the quality of software design decisions. According to Robillard et al. [91], rationale as a part of *developer documentation* is useful in creating and maintaining software. For the latter, it is even considered to be one of the most useful information at all [68]. Successful and valuable applications of DR can be found in open source projects, as shown by Jong et al. [53], respectively, in bug reports (cf. Rogers et al. [92]). However, despite its importance and a growing recognition of the need to manage DR more explicitly, they did not yet arrive in practice on a large scale [7, 20, 108]. Its intangible nature is just one of many driving factors behind this contradiction. Another is the lack of effective process integration and tool support for handling rationale information [64].

Moreover, some research points out other barriers, such as the capture problem [31] or the problem of costs exceeding the benefits [7, 20, 95]. User's needs also need to be addressed [20, 51]. As of today, this only is examined in detail to a limited extent. Tang et al. [109] approached this problem by conducting a survey. They asked software engineers from the Asia-Pacific region for their practice of documenting architecture design rationale (ADR). Although their results do not directly connect to a development methodology, they clearly show that software engineers document ADR and consider them relevant.

Despite the increasing awareness of DR, its documentation is particularly controversial in the context of agile methods. Due to the various interpretations of the agile manifesto (cf. [9]), there are very different opinions on the structured use of DR in agile processes. One of the core values of agile software development (ASD) is: *Value working software over documentation* [9]. Not only that ASD deprioritizes documentation in favour of working software and direct informal face-to-face communication [18], software engineers often understand ASD as the liberation from recording any information at all [102]. It opposes formalized reports and complex documentation. Instead, it promotes knowledge transfer efficiency through face-to-face communication [9, 23, 33, 76]. Some software engineers in ASD also tend to refer to source code as the only documentation artefact [88, 93, 102]. However, code only covers the “*What?*”, not the “*Why?*” and especially not the “*Why not?*”. Other software developers again call documentation *waste* [85]. The perception that software engineers appreciate writing code much more than writing documentation [38] supports this interpretation. ASD's fundamental concept of welcoming and facilitating constant change rather than preventing it [9, 10, 24] and its fast-paced iterative and incremental nature [30] support such a perception. Ambler [4] claims that documentation becomes out of date either way and should only be updated “when it hurts”, at least there is general consent that ASD requires less task-related documentation. ASD needs to focus on the crucial aspects of working code and informal

communication [1, 24, 40, 47, 59]. However, amongst others, Hadar et al. [45], Rubin et al. [93], Rüping [94], Sauer [95], Selic [102], and Stettina et al. [105] point out that ASD does not render decision documentation obsolete. On the contrary, Rubin et al. [93] point out that if documentation is adaptive and supports people’s collaboration rather than replacing it, documentation can align with agile development principles. Accordingly, simple and powerful documentation can be an essential communication tool [39, 68, 120]. Empirical research found evidence that documentation is used in ASD and is perceived as beneficial to the project success [44, 52, 63, 80, 86, 90, 105, 118, 120]. Some software engineers even explicitly stated that face-to-face communication alone is insufficient [52, 63, 105], thus opposing one of ASD’s core values. On top of that, more than half of the agile developers interviewed by Stettina et al. [105] described documentation to be important or very important. They perceived the amount of documentation as too little. Sharp et al. [103] support this by pointing out that agile teams build their intensive face-to-face communication on seemingly simple physical artefacts to support interaction. A lack of documentation, also known as *documentation debt* [77, 114], also increases the risk of architectural errors in ASD, as these are less likely to be discovered through (external) reviews due to lack of documentation (cf. Boehm [14]). Paetsch et al. [82] and Gupta et al. [44] found that documentation debt might cause long-term problems for agile teams. Correspondingly, the software engineers interviewed by Hotomski et al. [52] report postponed deadlines because the requirement specification was not precise enough to write acceptance tests. Similarly serious, documentation repeatedly led to data loss [30], forgotten decisions [30, 94] as well as additional work for the *Product Owner* to explain functionality in place of documentation [30, 52]. Even more worrying is the report of Drury-Grovan et al. [30] on software engineers making decisions based on imprecise, incomplete or completely missing documentation. A case study by Mendes et al. [77] clearly shows to which extent such *documentation debt* can result in severe additional cost. During the investigation case’s maintenance phase, almost half of the maintenance effort (47%) was due to documentation debt. The resulting costs equalled 48% of the total cost of the development phase. McInerney et al. [75] report a similar problem. They elaborate on agile projects in which shortfalls from previous iterations could not be taken care of appropriately because of the undocumented rationale of the design at the time.

Despite all the problem descriptions that call for more research on the subject, one should not lose sight of the fact that documentation in general and in the specific context of ASD should always follow a certain goal, e.g., support communication (cf. [39, 68, 120]). However, it can be hard to determine what defines “useless” documentation and what not [69].

To shed more light on precisely this area of tension, the author reports on a survey in this paper in which he asked software engineers about how to deal with DR for crucial decisions in ASD. Since *Scrum* [84, 101], as one of the most frequently applied representatives of agile methods, is of particular interest to the author, the author tailored the questionnaire to Scrum and adapted the sampling strategy accordingly. According to an international survey [25] with 1492 participants, more than half (56%) of its respondents applied Scrum (hybrids or derivatives not included). These results reinforce our choice to focus on Scrum as a notable representative of agile methods.

Although Scrum does neither explicitly nor implicitly address the topic of decision documentation or DR management, as all agile methods, it promotes the idea of tailoring the development process to the team’s specific needs. Seeing that research in architecture knowledge management, design

documentation, and DR management has received increased attention over recent years, the author wanted to find out about applied practices and the role of DR management perceived by developers. In other words, our research is led by the idea to gather data on the current state of practice and reflect on the opinions of the survey subjects. For this, the author asked developers about their handling of DR for decisions in Scrum. Within the survey, the author distinguished between decision types, types of DR, the process of recording, and the usage of explicitly recorded DR. The results of the study indicate that the motivation and the routine to capture DR is low. However, in contrast to motivation, DR is highly valued for its availability in the event of a problem.

The remainder of the paper is structured as follows. In [Chapter 2](#), the author elaborates on related work. In correspondence to that, [Chapter 3](#) presents the open issues for managing rationale in ASD. Subsequently, [Chapter 4](#) presents the employed research methodology. Next up, the author elaborates on the survey results in [Chapter 5](#). A summary and discussion of the results follow in [Chapter 6](#), together with an elaboration on existing limitations and threats to validity [Chapter 7](#). The report is concluded in [Chapter 8](#). The appendix also contains the complete questionnaire (cf. [Appendix A](#)) and more detailed survey results (cf. [Appendix B](#)).



## 2. Background

Early research in the field of rationale management dates back to the 1970s [60]. While its main area of application was politics in the early days, there was soon a special focus on design aspects. Starting with work on user interface design, the field of rationale management in software engineering gained attention. The most important research approaches to be mentioned are the *Issue-Based Information Systems* (IBIS) by Kunz and Rittel [60], *Questions-Options-Criteria* (QOC) by McLean et al. [71], and the Design Rationale Representation Language (DRL) by Lee and Lai [67]. Building on these approaches, a lot more research subsequently extended the modelling of rationale. For instance, some IBIS derivatives are *itIBIS* [26], *gIBIS* [26], *rIBIS* [89], *PHI* [36], and *DRed* [17]. Some derivatives of QOC are *IVMM* [113], *EvoPL* [99], *DREAM+TEAM* [62], and *RUSE* [122]. A derivative of DRL is *RATspeak* [21]. Some of these approaches already have a precise focus on software engineering. The author discusses more details on the application areas of DR in software engineering in [Section 2.1](#). [Section 2.2](#) supplements the considerations of related work in an agile context. Finally, in [Chapter 3](#), the author presents our four research questions based on open issues. The author then uses these to present and structure the research hypotheses validated within the survey (see [Chapter 5](#)).

### 2.1. Design Rationale in Software Engineering

Among the many research projects on DR, there has been an increasing focus on software engineering over time. The central potential for improvement was seen in the decision-making process. To this end, researchers developed models and methods which should support the documentation of decisions made on the one hand, and on the other hand, pro-actively guide software engineers in exploring the design space, reasoning on decisions and documenting the resulting (architecture) design decisions. For instance, Tang and Han [110] proposed to capture DR with the *Architecture Rationalization Method (ARM)*. Their approach contains fine-grained model elements to capture various information relating to software architecture.

Another approach that enables software architects to evaluate multiple software architectures is the *Architecture Tradeoff Analysis Method (ATAM)* developed by Kazman et al. [54]. The method's central goal is to evaluate a given architecture against a set of defined quality goals. Besides, the method should expose architectural risks should from complex contexts. The results of the method support the decision making deriving by derivable analyses, rationale, and guidelines. The ATAM approach was later extended again by the CBAM approach of Asundi et al. [6]. It additionally links costs and business goals to architecture decision-making.

A completely different approach is that of Bass and Clemens [8]. They capture DR in two graphs, one linking DR with associated architectural elements and the other one with their temporal dimension. This way, the decision history becomes explicit and comprehensible.

## Design Rationale Capture

Many of the above approaches focus on modelling DR or providing tool-support for a given DR model. Even if there are isolated approaches to process integration, these are far from being holistically feasible or a kind of process reference for existing process models. These are, for example, cognitive barriers as mentioned by Horner and Atwood [51] or legal barriers, doubts about process integration and concerns about the effort involved (cf. Burge [20]). The question remains when and how to integrate DR capture into existing processes. Conklin and Yakemovic tried to mitigate this barrier by augmenting the IBIS approach with graphical tool support called *gIBIS* [26]. McCall et al. [74] presented a similar approach called *MIKROPLIS*, and in later versions, *PHIDIAS*. It integrates innovative functionality to support DR capture. During the creation of DR, the tool offers to reuse and modify DR that have previously been entered. VIEWPOINTS and CRACK [37] take a similar approach by extending *MIKROPLIS* and adding graphical capabilities. However, their application domain is kitchen design and not software engineering.

To free designers of the barriers of a given schema Shipman et al. [104] proposed to capture DR information on a 2D space. Afterwards, this has to be structured in a way that makes heavy use of the computer. Besides eliminating the work of structuring DR, it is the primary goal of the approach to reduce the process disruptiveness by avoiding a DR schema. There were similar approaches in other research domains, for instance, in CAD design by Myers et al. [81] and Reeves et al. [87]. They presented approaches for visual annotation of DR.

### Design Rationale Capture in Software Engineering

Although some mentioned tools have already been used in software engineering, they were not explicitly developed for this purpose. The tools presented in the following refer more specifically to aspects of software engineering.

For example, Dutoit and Paech [32] have developed a rationale-based case specification process and provided corresponding tool support. They successfully tested their approach in two case studies with the help of students. Their results showed improved collaboration as well as a reduction in the maintenance effort. Hesse et al. [46] developed a *Decision Documentation Model* supported by the *DecDoc* tool. This tool enables developers to document design decisions collaboratively and incrementally with fine-grained documentation elements. The tool's applicability has only been shown based on a retrospective analysis of decision-making processes retrieved from video recordings of design sessions held at Adobe and Amberpoint. Another tool, named Software Concordance Design Rationale (SCDR), for recording DR was presented by Gill et al. [43]. It allows developers to structure their decision discussions and to attach them to other artefacts of the software. The tool also provides versioning services, which allow developers to always see their decisions in the development stage's context at the time. Burge and Brown propose to capture decision with their tool called *Software Engineering Using RATionale* (SEURAT) [21]. It is a DR management system that provides more features than simply presenting DR, such as inferencing over DR. Moreover, it integrates DR capture and its use into a standard IDE with an Eclipse plugin [50]. Thus, SEURAT can link DR directly to code. Lopez et al. [70] have chosen a much more dedicated focus on the communication aspect when managing DR without specifically addressing agile methods. They have developed the Helaba tool intending to improve the design process and

its outcome. By providing a shared workspace to support communication revolving around design artefacts and activities, Helaba mitigates the probability of the so-called *scattered rationale* pitfall. Alkadhi et al. [3] presented an approach with a similarly dedicated focus on less invasive communication. With *Rationale Annotations in Chat messages* (REACT), they introduced a lightweight concept to labelling chat messages that contain DR. The authors implemented their concept with the help of *Slack*, a real-time messaging platform. They have chosen emojis to represent five conceptual elements of DR modelling (*issues, alternatives, pro-arguments, con-arguments, and decisions*) that developers can use to annotate their chat messages. With roots in another area of software engineering, one approach is Könemann’s [57] approach. The goal of the approach is to seamlessly combine UML models with design decisions that include DR. For this purpose, the author develops a new tool-independent concept and architecture building blocks to merge UML models and design decisions based on existing tools. According to the author, it is possible to implement the concept with IBM Rational Software Modeler and ADkwik. Later the previous approach has been extended [58] not just to describe any ordinary UML model; users should apply it for Model-Driven Development (MDD). Therefore, Könemann presented a two-fold contribution. The author implemented the opportunity for creating and storing model-differences. These are then generalised and made model-independent. Accordingly, the model changes can then be reused and augmented with the underlying design decision. The design decisions are thus reusable as well and directly linked to the corresponding model changes. There are also various tool contributions from the research area of Architecture Knowledge Management (AKM) concerning DR, respectively, Architecture Design Rationale (ADR). The *Process-centric Architecture Knowledge Management Environment* (PAKME) [2], for instance, is a web-based architecture knowledge management tool that aims to support knowledge management for the software architecture process. Ali-Babar and Gorton have designed it to serve as a knowledge source for those who want rapid access to experience-based design decisions. Therefore, they extended the open-source groupware platform *Hipergate*. A competitor to PAKME is ArchiMind which was implemented by de Graaf [27]. By explicitly capturing design knowledge and its rationale, it supports coordination between project stakeholders. However, ArchiMind is not based on groupware software but a Wiki platform. De Graaf implemented it by augmenting the Wiki platform *OntoWiki*. Another approach from the AKM research area is ADkwik [100]. Schuster et al. also implemented a Wiki, which serves as a Web 2.0 collaboration platform for software architects’ cooperative decision-making. The authors claim that the tool is so easy to use that apparent advantages for its users emerge. These include rapid team orientation, regular decision-making advice, and simplification of asset harvesting. ADkwik is an extension of QEDWiki. In addition to the tools presented here from the AKM research area, there are many more tools that address the subject of ADR/DR. Of these tools, the author only mentions a few examples in the following: ADDSS [22], Decision Architect [72], and Architecture Rationale and Elements Linkage (AREL) [111]. For a more detailed overview of the tools available in the AKM research area, please refer to Tang et al. [107].

Bath et al. [12] have opted for a completely different approach. Instead of a concrete tool, they created an AK management framework that allows architects to consolidate project data from disparate sources. Furthermore, their framework supports defining domain-specific rules to address the challenges in inconsistency analysis, context-sensitive recommendations, and tracking of artefacts within projects. Kurtanović and Maalej [61] presented another completely different

approach. They focus on the application users and their rationale for purchasing or replacing software. For this purpose, 32414 publicly accessible Amazon reviews were extracted and analysed using a self-learning algorithm.

## 2.2. Design Rationale in Agile Software Development

According to the discussion so far, there are many research contributions on the topic of agile documentation. However, few have an explicit focus on the topic of DR. Rather, do they address DR implicitly. The strongest overlap in this area is with publications in the area of documentation of design decisions in ASD. Many approaches consider the topic from a conceptual point of view. For instance, Gale [41] suggests using a kind of agile hybrid. At the beginning of a project, there is little or no documentation. As the project progresses and the requirements continue to evolve, so does the documentation. However, their concept lacks a concrete proposal to operationalise it. Another rather fuzzy concept is suggested by Ambler [5]. The author sets up scenarios in which agile documentation is appropriate. Accordingly, this can rather be understood as a kind of best practice. Likewise, Beckers [11] presents experience-based best practices that serve to create product documentation in Scrum.

Hoda et al. [49] take a more structured approach to experience-based patterns in agile documentation. They suggest five concrete patterns, which help developers to create exactly the right amount of documentation. The authors underpin their patterns with a concrete context by providing detailed pattern descriptions and samples for the proposed patterns. Rüping presents a much more comprehensive pattern approach in his book on agile documentation [94]. Based on experiences and concrete cases from previous projects, Rüping introduces different patterns for different problems. For instance, Rüping introduces various patterns for the handling of documentation, selecting the right content, planning documentation, and handling infrastructure and tools.

Bozheva and Gallo [16] combine patterns and rationale in a completely different context. They derive best practices from ASD as process patterns and annotate them with rationale. This way, they want to facilitate the knowledge of how and when to apply those patterns. Accordingly, this approach does not address the rationale capture of design decisions around software to be built. Waagenaar et al. [119] consider the topic of agile documentation somewhat more theoretically. Based on the experience of several case studies and already existing artefact models in ASD, the authors propose a concrete Scrum artefact model as a reference model. This model should allow practitioners to map their ideas and artefacts more easily in Scrum. However, there is no further recommendation for integration into the Scrum process. At a similar level of abstraction, Borrego et al. [15] provide an ontology for modelling aspects of AKM. The ontology focusses on the articulation of AK by unstructured and textual electronic media (UTEM). For creating this ontology, an empirical study was carried out to understand better how AKM is applied in ASD in general and in Global Agile Software Development (GASD) in particular.

Another approach for the structured collection of relevant information presents Wang et al. [121]. They aim to improve safety-related communication with safety-related documentation by introducing *safety epics* and *safety stories* for Scrum. The documentation concept of Rubin et al. [93] is closer to the source code. They propose an architectural design in which domain knowledge is explicitly stored together with the source code while isolating it from other code segments.

Research has also yielded some tools for documenting design decisions in ASD. For instance, Lee et al. [65] presented their tool-driven approach *Echo* for agile requirements gathering, in 2003. Among other things, the tool captures a set of relationships that capture the design rationales. In the same year, Sauer [95] presented an approach for automating the capture of DR in ASD using prototype definitions. The goal was to reduce unnecessary and unjustified costs by using historical data and prototypes based on heuristics and thumb rules. These were linked to events and mapped to the Event-Based Design Rationale Model (ERDM).

More recently, Hadar et al. [45] have introduced the *Abstract Architecture Specification* (AAS). This specification was derived from a study with agile and non-agile practitioners and a survey among architects with agile contexts. The major contribution of AAS is a template for architecture documentation in the elevator speech concept, which is supported by the *Abstract Specification Tool* (AST). Its main purpose is to help architects in organising relevant information regarding the architecture while creating design and architecture blueprints, thus reducing documentation effort. However, the tool has not yet been validated in terms of its usability. Also recently presented was both a concept and the appropriate tool called *sprintDoc* (cf. Voigt et al. [116, 117]). Its unique selling proposition is the integration of developing documentation artefacts (wiki pages) in the agile process and thus trace changes in documents along with changes in issues. The authors enhanced DokuWiki [28] to build *sprintDoc*. It is not supposed to be used standalone. Rather it should be integrated into a specified landscape and respond flexibly to different settings.

Bhat et al. [13] focus their research on the automatic extraction of design decisions. The authors detect design decisions based on a two-phase machine-learning (ML) approach. Subsequently, they classify their results into three categories of architectural design decisions (ADD), namely structural ADDs, behavioural ADDs, and ban ADDs. A similar approach is followed by von der Ven et al. [115]. They developed a conceptual model to reason about the automatic extraction of especially medium complex design decisions from source code versioning systems. They evaluated the model as well as the automatic extraction using open source projects. Accordingly, they claim that this forms a basis for statistical and qualitative reasoning on software architectures and helps software architects make well-informed decisions. It should be noted that the authors have not chosen an explicit focus on agile processes in their work, but this is not an obstacle for the application. On the contrary, here it is listed as related work, as it is ideal for ASD.

Another approach is Garousi's [42], in which the author proposes a practical hybrid method for assessing the benefits and quality of software documentation. The development of the method is based on cooperation with an industrial partner transforming to ASD. Accordingly, the partner is evaluating software documentation to reduce it to what is important. The reduction can play a crucial role in optimising agile processes. The method uses an automated evaluation of the documentation as well as expert opinions.

## 3. Open Issues for Rationale Management in ASD

Despite the friction between agile principles and agile documentation, there are still only a few contributions to integrate documentation into ASD. As described above, many approaches in agile documentation focus on modelling, providing tool support or the agile decision-making process itself. However, there is only a small amount of research on the documentation of design decisions and its DR in ASD (cf. Stettina et al. [105]), especially regarding the process point of view. This survey aims to contribute to this very point.

To better understand how design decisions should be captured in ASD, it is important to consider the peculiarities of decision-making in ASD, as it has a substantial impact on decision-making and the resulting decision quality [29, 30]. Not only does it affect the timing and the way documentation is created, used, and maintained, it also brings up completely new challenges and obstacles in decision-making. For instance, teams in ASD are directly involved in critical decisions that determine a project's success [29, 48, 73, 79, 106]. This involvement and the short development cycles also change the type of decisions that are made. Shifting to ASD means shifting to short-term focussed decisions, i.e., more tactical and less strategical decisions [30]. These and other challenges of ASD make the use of adaptive documentation indispensable. However, the distinction between the two extremes of “useless” and “adaptive” documentation remains blurred.

### 3.1. Research Questions

Given the challenges mentioned above for the documentation of decisions and their rationale, there is a need for research on integrating agile documentation into the development process. To bring more clarity to this area of research, the author sets out four research questions:

#### **Research Question RQ1 – What is the Relevant Information to Be Captured in ASD?**

**Context:** One of the crucial factors to successful documentation is selecting the right and relevant information. There is no point in preparing comprehensive documentation if the likelihood of somebody reading it is low. Those who document need a clear understanding of what information is important and relevant. The author will address this issue from two perspectives. The first perspective is directed at the topic of decision-making. Therefore, the survey will confront its subjects with questions seeking the most important set of decisions. The second perspective is directed on the structural characteristics of decision documentation. Which types of rationale information matter to practitioners, and in which forms should they come along?

**Expected Outcome:** Based on the survey results, the author expects to develop a modest taxonomy of decisions types. These will be augmented by the level of importance which the survey participants attribute to it. Additionally, the survey will ask the participants for situations in which they wished for more rationale information at the time being. The answers will be evaluated to seek additional decision types to be captured. Regarding the second perspective, the author expects to develop a list of rationale information elements ordered by the value attributed to it. Additionally, the author wants to compare applied and desired practices. Therefore, the author will ask the survey participants what types of information they usually capture and consider valuable, respectively, of no value.

#### **Research Question RQ2 – How Should Decisions be Captured in ASD?**

**Context:** Another important issue is the integration of capturing design decisions into the agile development process. Research question *RQ2* seeks the right process elements to augment next to the appropriate means and tools for capturing design decisions and its DR. Correspondingly, the survey will ask for applied practices and particular wishes of the survey subjects. Subsequently, those will be compared.

**Expected Outcome:** With the special focus on Scrum-based software development, the author will report on the current state of practice. Are DR captured in Scrum? When are they captured? Could the capture and use be attributed to a special phase of Scrum? Additionally, the author wants to report on the tools and materials used for capturing design decisions. Personal opinions of software engineers will complement the results for research question *RQ2*.

#### **Research Question RQ3 – How to Use Documented Design Decisions and its Rationale?**

**Context:** One of the most controversial issues discussed concerning rationale is its accessibility and the usage of the captured information. Once the information is captured, there is a considerable potential to benefit from it. Nevertheless, there is also the danger that documentation is no longer up to date or will never be used again. At least, there is no certainty on its usage. Therefore, research questions *RQ3* seeks for best practice of using documented design decisions.

**Expected Outcome:** As a result of *RQ3* the author intends to report on survey participants' experiences on using DR information. In combination with the insights gained from research question *RQ2*, the author wants to deduce guidelines on using rationale within Scrum-based software development.

#### **Research Question RQ4 – How to Maintain Captured Design Decisions?**

**Context:** Rationale information could be seen as a fragile type of information. It reflects ideas and positions from stakeholders at a certain point in time. Most of the research addressing the topic of rationale management does not address the topic of maintaining rationale. There is a considerable danger that captured rationale might get out of date or that it could not be linked to the relevant decision and vice versa. This research question tries to shed light on the current state of practice in this respect.

**Expected Outcome:** At this point, the author intends to report on the current practice of maintaining decision documentation. The focus is on the applied methods for quality

assurance and explicit means to integrate the documentation into the process. These could be manual or automated reviews and the use of explicit responsibilities in the process.

In addition to the outlined research questions, the author intends to determine how other elements influence the survey results. Of special interest to the author in this respect are criteria as, for instance, development experience or the size of the teams in which software engineers are working. Tang et al. [109] already carried out a similar survey in the Asia Pacific region in 2006. They reported on differences in the gender distribution in the IT-sector. Although they did not specifically analyse the influence of gender on their data, this might influence the results. Therefore, the author will review the results from various perspectives.

## 3.2. Research Hypotheses

As part of the survey's planning, the author has put forward several research hypotheses. The hypotheses are listed below based on their affiliation to the research questions *RQ1* to *RQ4*. Their evaluation and correspondingly conducted tests will be elaborated on in [Chapter 5](#).

### **RQ1 – What Is the Relevant Information to Be Captured in ASD?**

**RQ1-H1** – More experienced software engineers capture discarded solution alternatives more frequently.

- An essential and often unrecoverable information of design decisions is which alternatives were rejected for development and why. The assumption underlying this hypothesis is that the more experienced software engineers were often faced with this question and could not answer it. As a consequence, it is reasonable to assume that they write it down themselves more often.

**RQ1-H2** – The more experienced software engineers are, the more valuable design assumptions become to them.

- Like the previous hypothesis, the author expects experienced software engineers to know that assumptions significantly influence decisions' outcome (cf. Lee [66]). Besides, the author assumes that more experience software engineers are also aware that even small changes to assumptions made can have a strong impact on other design objects, even those that are supposedly not directly affected (cf. Tang et al. [111]). Accordingly, the author derives the hypothesis *RQ1-H2* from this.

**RQ1-H3** – The experience of software engineers impacts which types of rationale they consider to be important.

- The author suspects that a software engineer's experience and the influence of agile development methods significantly impact the software engineer's perspective. Especially with a tendency towards more tactical than strategic decisions in ASD, this assumption is reasonable (cf. Drury-Grogan et al. [30]). Accordingly, *RQ1-H3* should examine this assumption concerning the experience aspect.



**RQ1-H4** – The experience of software engineers impacts which rationale information elements they consider important.

- The rationale for creating this hypothesis is analogous to *RQ1-H3*.

## **RQ2 – How Should Decisions Be Captured in ASD?**

**RQ2-H1** – Development experience affects the decisions documentation frequency.

- The underlying assumption is that software engineers with more development experience perceive and embrace the value of key design decisions. Further, the author assumes that experienced software engineers have often faced situations where decision documentation would have been useful. Especially concerning maintenance and further development [94, 99], captured decisions play a central role for them, so they document them.

**RQ2-H2** – Scrum experience affects the decisions documentation frequency.

- Contrary to the previous hypothesis, agile methods repeatedly emphasise the predominant importance of direct informal communication compared to comprehensive documentation [9, 23, 33, 76]. Therefore, the idea should be reflected and lead to software engineers with more Scrum experience documenting decisions less often. With the above hypothesis, it is, therefore, the goal to examine whether an influence through Scrum experience can be identified.

**RQ2-H3** – Experience affects the usage frequency of decision capture guidelines.

- Guidelines provide a basis for making documentation itself and its use much more efficient. They are a key factor in maximising the value of captured decisions so that the associated costs are not significantly exceeded (cf. Tang et al. [109]). Moreover, according to Miksovic et al. [78], decision-makers welcome design guidance during decision identification and decision making. Guidelines also foster increased confidence that a design is adequate and helps ensure industry- or enterprise-wide standards, including architectural principles [123]. Miksovic et al. even argue that such documentation guidance is particularly useful when mentoring less experienced IT service professionals. Research hypothesis *RQ2-H3* is derived from this consideration.

**RQ2-H4** – Experience affects the usage frequency of capture templates.

- Like the previous hypothesis, templates are an effective means to increase efficiency in the design process (cf. Bass et al. [8]). Accordingly, the author assumes that experienced software engineers use them systematically.

**RQ2-H5** – Experience affects the usage frequency of software for documenting decisions.

- In addition to guidelines and templates, capturing software certainly serves as a means of increasing efficiency. While there are already many existing tools that support the design process in software development, capturing software also provides the ability to link captured decisions with other digital artefacts seamlessly. Accordingly, the author assumes that experienced software engineers use software-based tools more often to capture decisions.

**RQ2-H6** – Team size affects the decision documentation frequency.

- An essential driver for using documentation to support communication in development teams is team size. According to Paetsch et al. [82], it makes sense to communicate more efficiently through documentation instead of communicating things repeatedly in large teams. This claim is confirmed by Guptha and Sampath’s observations [44]. Accordingly, the author hypothesises *RQ2-H6*.

**RQ2-H7** – The role of a software engineer in Scrum influences the decision documentation frequency.

- According to observations made by Stettina and Heijstek [105], the role of a software engineer in the project significantly influences the frequency of documentation. The author aims to validate this observation based on the submitted data.

**RQ2-H8** – The role of a software engineer in Scrum influences the point in the process when decisions are usually captured.

- Analogous to the rationale of hypothesis *RQ2-H7*, the author assumes that a software engineer’s role affects the amount of documentation and point of capturing it in the Scrum cycle.

**RQ2-H9** – The domain software engineers work in influences the frequency of decision documentation.

- In addition to the increasing efficiency discussed above, the author assumes that the application domain in which a software engineer works also influences the amount of documentation produced. According to Tang et al. [112], different application domains also require different approaches to extract knowledge. Furthermore, in different application domains, there are also different legal regulations for creating documentation. From this, the author derives research hypothesis *RQ2-H9*.

**RQ2-H10** – Experience affects the amount of rationale software engineers document for a decision.

- According to Falessi et al. [34], experience with design rationales has shown that increased documentation improves communication, design quality, reusability and explicit domain knowledge. Accordingly, it is reasonable to assume that the experience factor influences the documentation frequency of rationale. Possible reasons for this assumption include design quality or code reusability becoming more important with increasing experience.

### **RQ3 – How to Use Documented Design Decisions and Its Rationale?**

**RQ3-H1** – The experience of a software engineer influences the perceived usefulness of documented decisions.

- Analogous to the rationale for the research hypothesis *RQ2-H10*, the author also thinks that the experience factor affects documented decisions’ perceived importance.

**RQ3-H2** – The experience of a software engineer impacts the perceived usefulness of rationale for a decision in questions.

- The rationale for creating this hypothesis is analogous to *RQ3-H1*.

**RQ3-H3** – More experienced software engineers forget reasons justifying decisions less frequently.

- ASD prefers intangible knowledge over detailed documentation and promotes explicit communication instead. According to Stettina and Heijstek [105], verbal communication is susceptible to memory gaps. Accordingly, the author is interested in how far development experience influences the ability to recall previous decisions in ASD

**RQ3-H4** – More experienced software engineers revisit decision documentation to understand previous decisions and assess potential alternatives less frequently.

- The rationale for creating this hypothesis is analogous to *RQ3-H3*.

**RQ3-H5** – For software engineers working in larger teams, the set of involved stakeholders is of greater importance.

- Projects with an increased amount of stakeholders also increase the need for communication, as found by Lagerberg et al. [63]. This phenomenon is due to an increased need for synchronisation among the project participants. Accordingly, the author hypothesises that team size has an impact on the perceived importance of the involved stakeholders.

**RQ3-H6** – For software engineers working in larger teams, stakeholder arguments are of greater importance.

- As already indicated for RQ3-H5, a larger team size requires more intense communication (cf. [63]). Accordingly, the author hypothesises that team size has an impact on the perceived importance of stakeholders' arguments.

**RQ3-H7** – The role of a software engineer in Scrum affects the retrospective desire for decision documentation.

- Based on the different views that stakeholders take on within their role in Scrum, the author assumes that the roles influence the appreciation of decision documentation after the fact. From this, the author derives hypothesis *RQ3-H7*.

**RQ3-H8** – Experience affects the retrospective desire for decision documentation.

- Similar to the previous hypothesis, the author expects the experience of a software engineer to influence in which situations decision documentation is relevant for the person. Stettina and Heijstek's observation that senior technical roles document more [105] supports this expectation.

#### **RQ4 – How to Maintain Captured Design Decisions?**

**RQ4-H1** – Experience affects the application frequency of quality controls for decision documentation.

- Hotomski et al. [52] have found that well-established procedures and habits have the greatest effect on the amount and quality of documentation. Accordingly, the author suspects that these routines are based on the experience of software engineers. Accordingly, the author derives *RQ4-H1*.

**RQ4-H2** – Experience affects the application frequency of dedicated roles or responsibilities for decision documentation.

- The rationale for creating this hypothesis is analogous to *RQ4-H1*.

## 4. Research Methodology

The author structured the survey on the use of DR in Scrum into two parts. First, the author describes a pilot study that has been conducted together with an industry partner. For this purpose, the industry partner arranged contact with 15 randomly selected software engineers, who made themselves available for a survey (cf. [Section 4.1](#)). The findings from the pilot study were subsequently incorporated into the final survey setup. The main survey was conducted with a larger population of 102 software engineers using non-probabilistic sampling. More details on the pilot study can be found in [Section 4.1](#). The main study is described in more detail in [Section 4.2](#).

### 4.1. Pilot Study

While setting up the survey, the author decided to administer a pilot study as proposed by Kitchenham et al. [55]. The aim was to have a preliminary test for our survey. It should identify problems with the questionnaire used in general and with specific questions in particular. It was also crucial for the author to see whether the participants' understanding of the questions corresponds to the intended understanding. Besides, brief feedback sessions were held with the participants to assess and improve the questionnaire's quality.

#### Pilot Study Setup

Building on the research questions outlined in Chapter 2 and previous work (cf. [96]), the author divided the structure of the initial questionnaire of the main study into five parts. These are:

- Decisions in General
- Decisions and Rationale
- Rationale Capture
- Use of Captured Rationale
- Managing Rationale in Scrum

Based on this structure, the author drafted a first version of the questionnaire, in which the first four of the above-listed points were represented in roughly equal parts. The latter topic of rationale management in Scrum had a significantly larger share. The questionnaire also contained questions relating to demographic aspects. This draft was evaluated in several iterations by three domain experts with both industry and research experience. With the experts' feedback, the author optimised the questionnaire until it finally contained around 30 questions in a first regular version.

For the pilot study, the author reduced the number of questions to 19. These were selected according to the following criteria:

**Structural Distribution** The goal was to reduce the questionnaire draft so that the first four of the above-listed points were represented in roughly equal parts. The last of the listed aspects should receive more attention and should thus be disproportionately represented. The questions on demographic aspects were taken over unchanged from the draft.

**Instrument Complexity** Within the draft, the complexity of the individual instruments has been very different. Everything was included in the draft, from simple closed format questions to multiple Likert scales-based questions to open format questions. Accordingly, the pilot study should also offer coverage of all types of questions to draw lessons.

The author decided to carry out the pilot study together with an industry partner. The industry partner is mainly active in the field of consulting and digitisation projects. Accordingly, the questionnaire was forwarded to the company in question. Here 15 of the more than 200 employees were randomly selected by the company without our influence. The result was a well-mixed extract from the workforce. It included a wide range of development experience and work domains. Everything was there, from beginners to software engineers of many years' standing. Nevertheless, the selection's mandatory criterion was always that a study participant is currently practising Scrum or already has experience with Scrum.

For the realisation of the survey, Google Forms has been used. The author later also used Google Forms for the main study. It offers a sufficiently barrier-free and uncomplicated interface for the realisation of such a questionnaire.

## Pilot Study Findings

After all 15 participants of the pilot study had completed the questionnaires, there was a short feedback interview. The following points, in particular, were repeatedly noted:

**Phrasing** Although most of the questions were associated with the desired content, the participants repeatedly pointed to more precise wording alternatives. Furthermore, due to the participants' feedback, the author decided to delete questions that overlapped too much with the questionnaire's other questions.

**Question Complexity** In the draft version, individual questions were phrased in a way that several aspects have been queried simultaneously. As a reaction, such were split up.

**Questionnaire Structure** The finding with the greatest eye-opener for the authors, the feedback was that the separation between the first four outlining points and the point *Managing Rationale in Scrum* is not appropriate. Instead of clarity, this creates ambiguities. Accordingly, the author restructured the questionnaire to merge all aspects of a Scrum process integration with the other outlining points. As already mentioned above, this also led to a reduction of overlapping questions.

Overall, the feedback and the changes associated with it helped to make the questionnaire more concise.

## 4.2. Main Study

As described above, the author used the pilot study's findings to restructure the questionnaire and refine its instruments. The revised questionnaire consists of a total of 31 questions. Of these, 25 questions address the documentation of decisions, their rationale and their use. The other six questions cover demographic aspects, which are essential for analysing the hypotheses put forward.

In [Section 4.2](#), the author explains and justifies the sampling strategy and elaborates on its implementation. In this context, the choice of distribution channels has been addressed as well. [Section 3.2](#) will then present hypotheses to be investigated as a supplement to the research questions presented.

### Sampling Strategy and Its Implementation

The author restricted the target population for this study to all software developers in an industrial context. They need to practice Scrum or at least have some Scrum experience from previous projects. The application domain is not an exclusion criterion for us. On the contrary, the author included it in the questionnaire as a potential classification characteristic.

As a sampling strategy, the author decided against random sampling and opted for a non-probabilistic method. The disadvantage of this is that the survey statements are only valid for a population with the same characteristics. No generalisation can be derived from this. Given the fact that the author conducted an exploratory study, the author believes that this is justifiable. Following Kitchenham et al. [\[55\]](#) the decision was made in favour of a mixture of convenience sampling and snowball sampling. The following aspects influenced the author in deciding on the choice of the sampling method:

- Software developers in the industrial context are usually only available to a limited extent for participation in research studies. Due to their workload, a low response rate is to be expected. The author has to rely on the will to participate. In a study with a comparable target group, even with direct contact persons within the addressed companies, only a response rate of around 50% was achieved (cf. [\[35\]](#)).
- The entire target population of software developers with Scrum experience is unknown. Even with the restriction on the use of Scrum in a professional context, there is no possibility to identify the target population approximately accurately. Since there is no central register for Scrum projects, it is impossible to estimate the target population.
- In the private or open-source context, it is even more challenging to determine which users are using Scrum or have done so before.
- It is almost impossible to identify developers who already have Scrum experience but are not currently practising it. For this purpose, the author would need to address all employees of companies that may not practice Scrum.

To implement the chosen sampling method, the author compiled a contact list as follows:

- The author gathered contacts of alumni and former fellow students. Besides, contacts were gathered from previous research projects that are now working in the industry.

- On relevant job portals, the author searched for job advertisements from companies in Germany that mention Scrum in their job advertisements. These companies have been added to the list.
- On the social networks XING and LinkedIn, the author searched for Meetup-groups in German-speaking countries (including Austria and Switzerland) who have come together for Scrum experience exchange. These have also been added to the list.

The author used cold calling as the means of choice to reach the potential participants. 200 companies and 78 existing industry contacts were contacted. The latter include a wide variety of roles, from software developer to CTO. As a third component, the author cold-called 28 Meetup Groups on social networks with several thousands of members (Please note that many members registered in several of these groups simultaneously. Accordingly, only a fraction are distinct users). The author also explicitly asked them to forward the survey to friends, acquaintances and other known software developers. In this manner, snowball sampling was applied, as well. It is impossible to say how often this was carried out.

### 4.3. Measurement

Discussions with experienced developers and the literature repeatedly raise the question of how far experience influences the type, frequency, and quality of decisions made and their documentation. This question is reflected, both in some of the hypotheses put forward and the reasons for them (cf. [Section 3.2](#)). To shed some light on experience as an influencing factor, the authors examine experience in three different dimensions, as described in the following section.

#### 4.3.1. The Term Experience and Its Dimensions

One of the most obvious manifestations of experience is the time one has already worked as a software engineer. Development experience substantially influences the way decisions are handled in a team, the communication of such decisions, and professional and technical skills. This type of experience is illustrated in [Question Q-26](#) and accordingly results in five possible groups that can be useful for further analysis.

The process experience defines a further dimension of experience for the author and the questionnaire's experts. The degree of skill in dealing with process elements as daily and weekly routines is decisive. Due to the fixed process framework of Scrum, the focus can be on professional challenges and thus also on innovation. The question here is to what extent this influences the type, frequency, and quality of decisions made and their documentation. [Question Q-27](#) allows users to classify themselves in this respect and serves as an independent variable for a more in-depth analysis of this question.

The third dimension of experience relevant to this evaluation is the expertise gathered around the documentation itself. Here the author assumes that an increased capture of decisions leads to an increased experience, improved techniques and better documentation quality. To examine this in more detail, the answers to [Question Q-01](#) will serve as a grouping criterion.



### 4.3.2. Definition and Interpretation of Surveyed Scrum Roles

Within the questionnaire, roles are identified in which the participants gained profound experience. In analogy to the research hypotheses presented in [Section 3.2](#), this information is used to examine the influence of certain role-bound activities on behavioural patterns and needs regarding documentation in Scrum. The relevant data was obtained through [Question Q-28](#). It explicitly asks how far the participants have been able to gain profound experience as a *Scrum Master* or *Product Owner*. The third less specific option is listed as “ordinary team member”. Since the questionnaire’s distribution is specifically aimed at software developers, this role is declared and interpreted as a “*Developer*” in the evaluation’s further course. In this way, a finer and more concise differentiation between the individual role profiles is possible. For example, it allows for distinguishing exactly when survey participants have mainly worked as either *Product Owner*, *Scrum Master* or both, but not as a *Developer*.

Building on these three roles, the individual hypotheses (e.g., [RQ2-H8](#)) are examined to determine the extent to which profound experience in individual roles influences certain habits of documentation. For this purpose, the data are compared based on different groupings. For example, if the influence of the *Scrum Master* is to be investigated, the grouping is chosen so that all possible combinations can be compared with profound experience, either with *Scrum Master* experience or without it. Accordingly, no distinction is made, for example, whether someone has only profound experience as a *Product Owner* or *Developer*. The roles will only be summarised as “another role” and compared to a profound experience as a *Scrum Master*.

Another aspect in this consideration is the quantity of Scrum roles in which a participant has been able to gain profound experience. For the analyses, it will be examined to what extent it makes a difference whether a participant has gained profound experience in one, two, or three roles.

## 5. Data Analysis

The main study itself was conducted between March 2017 and January 2018. This chapter, presents the analysis of the data the author was able to collect during the survey. The focus is on testing and evaluating the hypotheses. The main study itself was carried out between March 2017 and January 2018. For this purpose, a German and an English questionnaire were prepared. The survey was then carried out using the sampling method described in [Section 4.2](#).

The remainder of the chapter is organised as follows. First, in [Section 5.1](#), the author elaborates on the responses received and their origins. Subsequently, in [Section 5.2](#), the validation methods used and the assumptions that led to this selection are briefly discussed and explained. The chapter is rounded off by evaluating the research hypotheses in [Section 5.3.1](#), [Section 5.3.2](#), [Section 5.3.3](#), and [Section 5.3.4](#). These are presented depending on their related research question.

### 5.1. Survey Responses

Based on the explanations in chapter [Section 4.2](#), the author decided to use a mixture of convenience sampling and snowball sampling for this explorative study. Particularly concerning cold-calling, which has been used mainly for companies and social networking groups, it is difficult to estimate the entire amount of people who have received the invitation. For example, from the member count of groups in social networks, it is impossible to deduce who is actively using the network as intended and who is just enrolled for headhunting or advertising purposes. Accordingly, below, the author lists the number of companies, acquaintances, and Meetup Groups contacted. The number of responses is also listed. Further information is available in [Section 4.2](#).

As part of the cold calling, the author contacted:

- 200 Companies ...
  - of which 14 have sent a direct response. 10 out of 14 companies distributed the survey among their software engineers. The other four companies politely rejected the request. All 186 other companies did not respond at all. Accordingly, it is not clear here whether individual developers have received the survey cover letter.
- 78 personal contacts, mostly former fellow students and alumni now ...
  - ... of which 50 replied. Out of those 50 contacts, ten rejected our request, and 40 participated in the survey. Some have also forwarded them to colleagues and acquaintances. These contacts work in a wide variety of roles, including everything from developer to CTO.
- 28 Meetup groups in social networks with a total of several thousand members ...

- ...of which only two sent explicit feedback. The moderators of the respective group sent this feedback. Accordingly, they highlighted our cover letter for the survey in the forum again.
- Please note that many members are registered in several of these groups at the same time. Accordingly, here only a fraction of the users mentioned are distinct users.

In total, 102 survey responses from all invited persons were received. Since the survey was conducted completely anonymously, no conclusions can be drawn from pure participation. Only from individual correspondence with personal contacts, associated telephone calls and associated e-mail correspondence the information emerged that individual participants from abroad participated. Specifically, the author knows that isolated responses come from Austria, South Africa, Australia and India. However, there is no reliable classification in this respect. The distribution of the responses in terms of languages is as follows (see [Table 5.1](#)):

Language	Responses	Percentage
English	11	10.78
German	91	89.22

Table 5.1.: Response distribution.

## 5.2. Applied Validation Methods

The evaluation of the hypotheses depends on the different variables involved. Basically, for each hypothesis, a test was made for differences in the variables involved to find out major trends. Besides, an investigation of the relationships, e.g., in the form of a correlation, is carried out where it is appropriate.

When selecting the validation methods, the author wanted not to assume an underlying distribution for our data set. On the one hand, this decision is based on the number of 102 responses and the fact that grouping those 102 subjects based on the ordinal scales (see provided answer options in [Appendix A](#)) can produce quite small groups. Accordingly, no tests on, e.g., normal distribution were carried out for the following investigations. Based on the above assumptions, only a few methods were considered. Accordingly, the following set distribution-free examination and test methods were used to evaluate the hypotheses:

### Test for difference

- Mann–Whitney U test
- Kruskal–Wallis one-way analysis of variance

### Examination of interrelations

- Pearson’s chi-squared test
- Spearman’s rank correlation
- Kendall’s rank correlation coefficient (Tau-b)

It has to be mentioned that Spearman’s rank correlation was deliberately used together with Kendall’s rank correlation coefficient. The necessity arises from the fact that the significance in the test for Spearman’s rank correlation cannot be reliably calculated once ties exist. Accordingly, for all cases where the calculated p-value deviates less than 0.01 from the threshold for the two possible significance levels, Kendall is used as a basis for discussion. In detail, this concerns all p-values with  $p = 0.04x$ ,  $p = 0.05x$ ,  $p = 0.09x$ , and  $p = 0.10x$ , where  $x$  can be any integer between 1 and 9.

For evaluating the hypothesis tests, the author has chosen to accept a maximum significance level of  $\alpha = 0.10$ . Based on a total population of 102 participants, necessary groupings for individual tests will result in small group sizes. Accordingly, from the author’s point of view, a corresponding decision seems to be appropriate. Results with a significance level of  $\alpha = 0.10$  are nevertheless interpreted as having a lower significance in the evaluation. A significance level of  $\alpha = 0.05$  as a meaningful indicator is preferred.

A uniform colour scale is used throughout the document to visualise correlation strength. It should enable readers to understand the results quickly. The colour scale is defined as shown in the following table.

Highly significant	$p \leq 0.05 \Rightarrow \alpha = 0.05$
Significant	$0.05 < p \leq 0.10 \Rightarrow \alpha = 0.10$
Insignificant	$0.10 < p$

Table 5.2.: Colour scale used to visualise significance throughout the document.

Another aspect is the handling of borderline cases. As displayed in [Table 5.2](#) within the evaluation, they are handled as follows: A value  $p$  with  $p = 0.05$  still counts as significant at the significance level  $\alpha = 0.05$ . Similarly, a value  $p$  with  $p = 0.10$  counts as significant at the significance level  $\alpha = 0.10$ .

### Interpretation of the Correlation Strength

For evaluating the research hypotheses defined in [Section 3.2](#), rank correlations will be calculated repeatedly in the following. To classify the results uniformly, the author has decided to divide the results into three result categories based on a few sample calculations and considerations. These are defined as follows: *weak* correlation, *medium* correlation and *strong* correlation. In detail, they are defined as follows:

- A rank correlation with  $0.0 < \rho \leq 0.1$  is interpreted as a *weak* correlation.
- A rank correlation with  $0.1 < \rho \leq 0.3$  is interpreted as a *moderate* correlation.
- A rank correlation with  $0.3 < \rho$  is interpreted as a *strong* correlation.

### Limitations for Questions Q-14 and Q-15

In the course of the data collection, an error occurred. This error affects [Question Q-14](#) and [Question Q-15](#), which ask about the activities during which the participants usually document or would like to document their decisions. This error manifests itself in the fact that 39 of the

102 participants were missing an answer in the set of given answers. With this knowledge, the author took the following approach when validating the hypotheses: For hypotheses in which the dependent variable is formed by one of the two affected questions, it was analysed in detail whether the error influenced the hypothesis's results. The analyses yielded two different cases, as follows:

1. There are research hypotheses in which the dependent variable is only examined to see whether the different groups of the independent variable gave significantly different answers on the Likert scale of frequency, unrelated to the specific Scrum activity (e.g., research hypotheses [RQ2-H1](#) or [RQ2-H2](#)).
2. The author identified one research hypothesis (cf. [research hypothesis RQ2-H8](#)) in which the independent variable is analysed for any influence on the documentation frequency per Scrum activity.

In the first case, the error does not influence the analysis because the answers are examined for differences independent of the concrete Scrum activity. Accordingly, all 102 data sets were analysed for the affected research hypotheses. However, in the latter case, the 39 data sets mentioned above were excluded from the analysis, as they would effectively distort the results. Accordingly, the validation of [RQ2-H8](#) was only performed based on 63 data sets. Moreover, the data were prepared separately in the appendix containing the data analysis. That means, for questions [Q-14](#) and [Q-15](#), all responses, including the corresponding distortions, can be seen, and the reduced data set with 63 responses.

## 5.3. Hypothesis Evaluation

Several hypotheses were put forward in connection with the study. Further explanations about the individual hypotheses can be found in [Section 3.2](#). These hypotheses are evaluated in detail in [Section 5.3.1](#), [Section 5.3.2](#), [Section 5.3.3](#), and [Section 5.3.4](#) below. The order of the evaluation is oriented along the research questions presented in [Chapter 3](#). For the sake of clarity, only the most important values of the analysis of the individual hypotheses are listed. All detailed values can be found in [Appendix C](#), [Appendix D](#), [Appendix E](#), and [Appendix F](#). Those results that did not represent an added value for the following analyses were not integrated into these appendices.

### 5.3.1. RQ1 – What Is the Relevant Information to Be Captured?

The following section contains explanations of the evaluations research question RQ1. The question here is what kind of information is relevant enough to include in the decision documentation. The author developed and evaluated four hypotheses in which the relationships and differences between variables of interest to the author are analysed.

## RQ1-H1 – More Experienced Software Engineers Capture Discarded Solution Alternatives More Frequently

This hypothesis’s evaluation compares the individual types of experience (independent variable = [Question Q-01](#) / [Question Q-26](#) / [Question Q-27](#)) with the information, how often software engineers document all considered solution alternatives for a documented decision (dependent variable = [Question Q-02](#)).

Accordingly, the following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : There is no relationship between a software engineer’s experience and the capture of discarded solution alternatives.

$H_1$ : More experienced software engineer’s capture discarded solution alternatives more frequently.

The results (cf. [Table 5.3](#)) show a strong monotone and significant relationship between documentation experience and the documentation frequency of discarded solution alternatives for a decision. Furthermore, there is a weak positive but not a significant correlation between development experience and writing down discarded decision alternatives. On the other hand, there is a weak negative but not significant connection between Scrum experience and writing down discarded decision alternatives.

( <i>Dependent Var.</i> ↓)	Documentation Experience	Development Experience	Scrum Experience
Documentation Frequency	Strong monotone positive correlation $H_1$ is to be accepted. $\rho = 0.550, p = 2.515 * 10^{-9}$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.141, p = 0.170$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = -0.141, p = 0.160$
Details	<a href="#">Table C.1 – p. 154</a>	<a href="#">Table C.2 – p. 155</a>	<a href="#">Table C.3 – p. 156</a>

Table 5.3.: Experience influencing the documentation frequency of discarded solution alternatives.

Based on the available data, the null hypothesis  $H_0$  must be rejected, and the alternative hypothesis  $H_1$  is to be accepted for documentation experience. However, it is important to note that a positive correlation has exclusively been found for documentation experience. Thus, data supporting the alternative hypothesis has only been found one type of experience. Based on this data, the author accepts the research hypothesis *RQ1-H1*.

## RQ1-H2 – The More Experienced Software Engineers Are, The More Valuable Design Assumptions Become to Them

On the side of the independent variable, the evaluation of the RQ1-H2 hypothesis is based on the three types of experience already identified (cf. [Section 4.3.1](#)). These are described by questions Q-01, Q-26 and Q-27. Using these independent variables, the evaluation of RQ1-H2 focuses on the perceived value of *design assumptions* to the survey participants. Therefore, three analyses are performed with three different dependent variables based on [Question Q-03 – 2<sup>nd</sup> item](#), [Question Q-07 – 2<sup>nd</sup> item](#), and [Question Q-08 – 2<sup>nd</sup> item](#). The three selected instruments address the perceived importance of underlying assumptions as follows:

- [Question Q-03 – 2<sup>nd</sup> item](#) ⇔ [Design Assumptions Motivating Documentation](#) .....157
- [Question Q-07 – 2<sup>nd</sup> item](#) ⇔ [Documentation Frequency of Design Assumptions](#) .....160
- [Question Q-08 – 2<sup>nd</sup> item](#) ⇔ [Usefulness of Documented Design Assumptions](#) .....163

The analyses mentioned above are carried out according to the described methods in [Section 5.2](#) to identify the influence of the chosen independent variables. In order to do so, the author set up the following hypotheses: The specific analyses apply the Kruskal-Wallis test and Spearman’s rank correlation test to verify the following hypotheses:

- **Question Q-03:**

$H_0$ : Whether design assumptions motivate participants to document decisions or not *is not affected* by the participants’ experience.

$H_1$ : Whether design assumptions motivate participants to document decisions or not *is affected* by the participants’ experience.

- **Question Q-07:**

$H_0$ : The documentation frequency of design assumptions *is not affected by* the participants’ experience.

$H_1$ : The documentation frequency of design assumptions *is affected by* the participants’ experience.

- **Question Q-08:**

$H_0$ : The perceived usefulness of design assumptions fostering comprehensibility *is not affected by* to the participants’ experience.

$H_1$ : The perceived usefulness of design assumptions fostering comprehensibility *is affected by* the participants’ experience.

The emerging results are briefly summarised below. In each case, the independent variable’s different groups are compared, and the result is briefly evaluated. Finally, a summary and conclusion of all experience variables are given.

### Criteria Motivating Decision Documentation

As Table 5.4 shows, there is no correlation for any of the three experience types. However, a positive relationship can be seen in the graphical overview (cf. Figure C.4) and in the computed data for the documentation experience (cf. Table C.4). With  $p = 0.104$  the correlation's significance is just outside the significance level  $\alpha = 0.10$ . The author assumes that a larger survey population would probably have led to significant results here.

(Dep. Var. ↓)	Documentation Experience	Development Experience	Scrum Experience
"Assumptions Made" as Documentation Criterion	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.162, p = 0.104$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.021, p = 0.841$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = -0.008, p = 0.938$
Details	<a href="#">Table C.4 – p. 157</a>	<a href="#">Table C.5 – p. 158</a>	<a href="#">Table C.6 – p. 159</a>

Table 5.4.: Experience influencing “assumptions made” as a criterion for decision documentation.

In summary, no influence of experience on “assumptions made” as a criterion for recording a decision can be proven by the available data.

### Rationale Documentation Frequency

As Table 5.5 shows, there is a strong positive monotone correlation between documentation experience and the documentation frequency of “assumptions made”. It is significant at the level of  $\alpha = 0.05$ . There is also a moderate positive monotone correlation between development experience and the documentation frequency of “assumptions made”. However, the significance level is only  $\alpha = 0.10$  and thus less meaningful. No correlation can be recognised based on Scrum experience. There seems to be a weak negative correlation, but it is not significant. Again, the author assumes that a larger survey population would probably have led to more significant results here.

(Dep. Var. ↓)	Documentation Experience	Development Experience	Scrum Experience
Documentation Frequency of "Assumptions Made"	Strong monotone positive correlation <i><math>H_1</math> is to be accepted.</i> $\rho = 0.414, p = 1.88 * 10^{-5}$	Monotone positive correlation <i><math>H_1</math> is to be accepted.</i> $\rho = 0.191, p = 0.064$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = -0.117, p = 0.248$
Details	<a href="#">Table C.7 – p. 160</a>	<a href="#">Table C.8 – p. 161</a>	<a href="#">Table C.9 – p. 162</a>

Table 5.5.: Experience influencing rationale documentation frequency of “assumptions made”.

In summary, it can be said that experience has a significant influence on the documentation frequency of assumptions made. This influence is not uniformly and equally significant across the different types of experience but is evident.



## Rationale Usefulness Fostering Comprehensibility

As Table 5.6 shows, no significant correlation was found between the Scrum experience factor and the usefulness of documented “assumptions made”. A weak negatively correlated trend between Scrum experience and documented assumptions’ usefulness is apparent both graphically and based on the data (cf. Figure C.12, Table C.12). However, this trend is not significant.

(Dep. Var. ↓)	Documentation Experience	Development Experience	Scrum Experience
Perceived Usefulness of “Assumptions Made“	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.058, p = 0.569$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.067, p = 0.521$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = -0.135, p = 0.181$
Details	<a href="#">Table C.10 – p. 163</a>	<a href="#">Table C.11 – p. 164</a>	<a href="#">Table C.12 – p. 165</a>

Table 5.6.: Experience influencing the perceived usefulness of rationale type: “assumptions made”.

In summary, for the usefulness of “assumptions made” there are no relationships confirmed as significant that would confirm the hypothesis. Accordingly, no statement can be made regarding the usefulness of “assumptions made”.

## Conclusion – RQ1-H2

“Assumptions Made” (as Dependent Var.) ↓	Documentation Experience	Development Experience	Scrum Experience
Documentation Criterion <a href="#">Question Q-03</a>	No apparent relationship.	No apparent relationship.	No apparent relationship.
Documentation Frequency <a href="#">Question Q-07</a>	Strong positive monotone correlation ( $\alpha = 0.05$ )	Moderate positive monotone correlation ( $\alpha = 0.10$ )	No apparent relationship.
Perceived Usefulness <a href="#">Question Q-08</a>	No apparent relationship.	No apparent relationship.	No apparent relationship.

Table 5.7.: Experience influencing the importance of “assumptions made”.

Two of the three questions tested show that no experience influence is evident. In the third question, however, there is a clear influence on the experience factor. There are significant positive correlations in two of three experience categories, and in the third, there is a slight non-significant trend. Based on this data, the author needs to *accept the hypothesis RQ1-H2*.

## RQ1-H3 – Experience Impacts Which Rationale Software Engineers Consider Important

On the side of the independent variable, the evaluation of the RQ1-H3 hypothesis is based on the three types of experience already identified (cf. [Section 4.3.1](#)). These are described by questions [Q-01](#), [Q-26](#) and [Q-27](#). Using these independent variables, the evaluation of RQ1-H3 focuses on whether experience influences which decision-making rationales are perceived as important. Therefore, three analyses are performed with two dependent variables based on [Question Q-07](#) and [Question Q-08](#). The two selected instruments address the perceived importance of types of rationale:

- [Question Q-07](#) ⇔ [Documentation Frequency of Design Assumptions](#) ..... 160
- [Question Q-08](#) ⇔ [Usefulness of Documented Design Assumptions](#) ..... 163

In order to explore the issue outlined above and thus the research hypothesis RQ1-H3, the answers to questions [Q-07](#) and [Q-08](#) were considered by the individual experience groups. The analysis aimed to see whether there were different priorities for the individual types of rationale measured by their corresponding documentation frequencies ([Q-07](#)). For [Question Q-08](#), the analysis examined the extent to which the participants, distributed across the different experience groups, indicated different usefulness for the individual types of decision rationale. Accordingly, the result is a statement about whether the individual experience groups have different priorities for the individual types of rationales or whether the experience factor does not affect this.

The answers to the individual aspects are combined into a data set and examined concerning existing differences caused by the evaluation's development experience.

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-07:**

$H_0$ : Experience *does not affect* the documentation frequency of design assumptions.

$H_1$ : Experience *affects* the documentation frequency of design assumptions.

- **Question Q-08:**

$H_0$ : Experience *does not affect* the perceived usefulness of design assumptions.

$H_1$ : Experience *affects* the perceived usefulness of design assumptions.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated. Finally, a result of the hypothesis evaluation is given.

### Documentation Frequency of Rationale Types

The available data does not allow for any conclusions about the types of experience studied. There are too few significant differences between the individual types of rationale within the respective experience groups. For a more detailed analysis, please refer to [Table 5.8](#).

### The Usefulness of Rationale Types

No clear differences in the usefulness of rationale types can be seen across the experience groups studied. For a more detailed analysis, please refer to [Table 5.9](#).

Experience Influencing Rationale Documentation Frequency	
<i>(Indep. Var. ↓)</i>	
Documentation Experience – Question Q-01	<i>Failed to reject <math>H_0</math>.</i> – Only two of the four groups show any significant results for differences among the different rationale types. No clear picture can be deduced. Accordingly, no statement can be made on the influence of experience.  for details, see: <a href="#">C.13</a> , <a href="#">C.14</a> , <a href="#">C.15</a> , <a href="#">C.16</a> pp. 167 – 170
Development Experience – Question Q-26	<i>Failed to reject <math>H_0</math>.</i> – There are no significant differences in the documentation frequency of the different types of rationale across all five groups. Accordingly, no differences among the individual experience groups can be deduced.  for details, see: <a href="#">C.17</a> , <a href="#">C.18</a> , <a href="#">C.19</a> , <a href="#">C.20</a> , <a href="#">C.21</a> pp. 171 – 175
Scrum Experience – Question Q-27	<i>Failed to reject <math>H_0</math>.</i> – Only for one of three groups are there significant differences among the individual types of rationale. Accordingly, no statement can be made about a difference among the groups of Scrum experience.  for details, see: <a href="#">C.22</a> , <a href="#">C.23</a> , <a href="#">C.24</a> pp. 176 – 178

Table 5.8.: Experience influencing rationale documentation frequency.

Experience Influencing the Perceived Rationale Documentation Frequency	
<i>(Indep. Var. ↓)</i>	
Documentation Experience – Question Q-01	<i>Failed to reject <math>H_0</math>.</i> – For two of the four experience groups, the author found no significant results. For the other two groups, there are only isolated significant results. Thus, there are no clear differences between the experience groups.  for details, see: <a href="#">C.25</a> , <a href="#">C.26</a> , <a href="#">C.27</a> , <a href="#">C.28</a> pp. 180 – 183
Development Experience – Question Q-26	<i>Failed to reject <math>H_0</math>.</i> – For three of the five groups, no significant differences were found. For the remaining groups, there was exactly one significant result in the level $\alpha = 0.05$ and isolated results in the level $\alpha = 0.10$ . From these, no statement about the influence of the experience can be deduced.  for details, see: <a href="#">C.29</a> , <a href="#">C.30</a> , <a href="#">C.31</a> , <a href="#">C.32</a> , <a href="#">C.33</a> pp. 184 – 188
Scrum Experience – Question Q-27	<i>Failed to reject <math>H_0</math>.</i> – For Scrum experience’s influence, no statement can be made either, as only one of three groups shows any significant results for the usefulness of rationale.  for details, see: <a href="#">C.34</a> , <a href="#">C.35</a> , <a href="#">C.36</a> pp. 189 – 191

Table 5.9.: Experience influencing the perceived usefulness of rationale.

### Conclusion – RQ1-H3

None of the tested dependent variables did any of the examined types of experience have an influence. Based on the data available to us, it is accordingly necessary to *reject the hypothesis RQ1-H3*. As one of the central factors influencing this result, the sometimes small group size must be mentioned. In other words, it is reasonable to assume that a repeated investigation with a larger population will produce more significant results and thus new, more specific findings.

## RQ1-H4 – The Experience of Software Engineers Impacts Which Rationale Information Elements They Consider Important

On the side of the independent variable, the evaluation of the RQ1-H4 hypothesis is based on the three types of experience already identified (cf. [Section 4.3.1](#)). These are described by questions [Q-01](#), [Q-26](#) and [Q-27](#). Using these independent variables, the evaluation of RQ1-H4 focuses on whether experience influences which elements of rationale information are perceived as important. Therefore, three analyses are performed each with three different dependent variables based on [Question Q-09](#), [Question Q-11](#), and [Question Q-13](#). The following three selected instruments address the perceived importance of rationale information elements:

The detailed results can be found in the following section of the appendix:

- [Question Q-09](#) ⇔ Usage of rationale information elements .....192
- [Question Q-11](#) ⇔ Documentation frequency of rationale information elements ..... 205
- [Question Q-13](#) ⇔ Usefulness of rationale information elements .....218

To explore the issue outlined above and thus the research hypothesis RQ1-H4, the answers to questions on [Question Q-09](#), [Question Q-11](#), and [Question Q-13](#) were considered by the individual experience groups. The analysis aimed to see whether there were different priorities for the individual rationale information elements measured by their usage frequencies during reasoning ([Q-09](#)). The same approach is applied for the rationale information elements measured by their documentation frequencies ([Question Q-11](#)) and their perceived usefulness for the individual rationale information elements ([Question Q-13](#)). The analysis compares the individual priorities within an experience group against the other experience groups. Accordingly, the result is a statement about whether the individual experience groups have different priorities between the individual rationale information elements or whether the experience factor does not affect this.

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-09:**

$H_0$ : Experience *does not affect* the usage frequency of rationale information elements.

$H_1$ : Experience *affects* the usage frequency of rationale information elements.

- **Question Q-11:**

$H_0$ : Experience *does not affect* the documentation frequency of rationale information elements.

$H_1$ : Experience *affects* the documentation frequency of rationale information elements.

- **Question Q-13:**

$H_0$ : Experience *does not affect* the perceived usefulness of rationale information elements.

$H_1$ : Experience *affects* the perceived usefulness of rationale information elements.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated. Finally, a result of the hypothesis evaluation is given.

## Usage of Rationale Information Elements for Argumentation

Concerning the usage of rationale information elements for reasoning, there is no significant difference based on the available data for the selected groups of experience. More significant results are likely to be obtained with a larger population. Based on these, more concise results would probably have emerged. For more details, please refer to [Table 5.10](#).

Experience Influencing the Usage of Rationale Information Elements for Argumentation	
( <i>Indep. Var.</i> ↓)	
Documentation Experience – <a href="#">Question Q-01</a>	<p><i>Failed to reject <math>H_0</math>.</i> – For two of four groups, it is apparent that they use the “issue in question” significantly more often than any other information. In the other two groups, a similar tendency can be seen but is not clear. Overall, the author does not see any noticeable differences among the analysed experience groups.</p> <p>for details, see: <a href="#">C.38</a>, <a href="#">C.39</a>, <a href="#">C.40</a>, <a href="#">C.41</a> pp. <a href="#">193</a> – <a href="#">196</a></p>
Development Experience – <a href="#">Question Q-26</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The data sorted by development experience yields a similar picture to that of documentation experience. The “issue in question” is confirmed as the most frequently used type of rationale information. However, the author cannot identify any differences due to the different levels of development experience.</p> <p>for details, see: <a href="#">C.42</a>, <a href="#">C.43</a>, <a href="#">C.44</a>, <a href="#">C.45</a>, <a href="#">C.46</a> pp. <a href="#">197</a> – <a href="#">201</a></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results for Scrum experience are similar to the other results. The “issue in question” is confirmed as the most frequently used rationale information element. Apart from that, no influence from Scrum experience can be identified.</p> <p>for details, see: <a href="#">C.47</a>, <a href="#">C.48</a>, <a href="#">C.49</a> pp. <a href="#">202</a> – <a href="#">204</a></p>

Table 5.10.: Experience influencing usage of rationale information elements for argumentation.

## Documentation of Rationale Information Elements

Concerning the documentation frequency of rationale information elements, the author does not see any differences among the selected groups of experience. However, it appears that a larger population would have revealed considerably more significant results. Based on these, more concise results would probably have emerged. For more details, please refer to [Table 5.11](#).

Experience Influencing the Documentation Frequency of Rationale Information Elements	
( <i>Indep. Var.</i> ↓)	
Documentation Experience – Question Q-01	<p><i>Failed to reject <math>H_0</math>.</i> – For two of four groups, it is apparent that they document the “issue in question” significantly more often than any other information. One other group shows a similar tendency, but it is not significant. Overall, the author does not see any noticeable differences among the analysed experience groups.</p> <p>for details, see: <a href="#">C.51</a>, <a href="#">C.52</a>, <a href="#">C.53</a>, <a href="#">C.54</a> pp. 206 – 209</p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – The data sorted by development experience yields a similar picture to that of documentation experience. The “issue in question” is partly the most frequently documented type of rationale information. However, the author cannot identify any differences due to the different levels of development experience.</p> <p>for details, see: <a href="#">C.55</a>, <a href="#">C.56</a>, <a href="#">C.57</a>, <a href="#">C.58</a>, <a href="#">C.59</a> pp. 210 – 214</p>
Scrum Experience – Question Q-27	<p><i>Failed to reject <math>H_0</math>.</i> – The results for Scrum experience are similar. In two of three groups, the “issue in question” tends to be the most frequently documented information. Apart from that, the author cannot identify any influence from Scrum experience.</p> <p>for details, see: <a href="#">C.60</a>, <a href="#">C.61</a>, <a href="#">C.62</a> pp. 215 – 217</p>

Table 5.11.: Experience influencing the documentation frequency of rationale information elements.

### Usefulness of Rationale Information Elements

Concerning the usefulness of rationale information elements, a homogeneous picture emerges. In many experience groups, there are significant differences between individual types. These indicate different groups of information elements sorted by usefulness. The more useful ones are the *issues in question*, the *solution alternatives*, the *decision criteria*, the *assessments* of the solution alternatives and their *consequences*. The information about the *involved stakeholders* and *their arguments* is the group of information that is perceived as less useful.

Occasionally three groups emerge and thus an even more differentiated division according to usefulness. These findings do not contradict the other results. Rather, they seem to reflect more clarity through a larger group size. Overall, the author does not see obvious differences among the selected groups of experience. For more details, please refer to [Table 5.12](#).

Experience Influencing the Perceived Usefulness of Rationale Information Elements	
<i>(Indep. Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><i>Failed to reject <math>H_0</math>.</i> – In three out of four groups, the results show clear differences in the usefulness of rationale information. In the fourth group, there are no significant results, probably due to the group’s size. The apparent structures overlap strongly. Accordingly, the author does not see any influence by documentation experience on the elements of rationale information considered useful.</p> <p>for details, see: <a href="#">C.64</a>, <a href="#">C.65</a>, <a href="#">C.66</a>, <a href="#">C.67</a> pp. <a href="#">219</a> – <a href="#">222</a></p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – The experience groups show either two or three groups of rationale information of different usefulness, some distinguishable, others less so. In the author’s opinion, the results do not contradict each other when viewed across all groups. They differ from each other, only in their clarity. Accordingly, the author does not see any influence by development experience.</p> <p>for details, see: <a href="#">C.68</a>, <a href="#">C.69</a>, <a href="#">C.70</a>, <a href="#">C.71</a>, <a href="#">C.72</a> pp. <a href="#">223</a> – <a href="#">227</a></p>
Scrum Experience – Question Q-27	<p><i>Failed to reject <math>H_0</math>.</i> – The results for Scrum experience are similar. All three experience groups show two or three groups of rationale information of different usefulness, some distinguishable, others less. In the author’s opinion, the results overlap and differ from each other, only in their clarity. Therefore, the author does not see any clear differences among the groups of Scrum experience.</p> <p>for details, see: <a href="#">C.73</a>, <a href="#">C.74</a>, <a href="#">C.75</a> pp. <a href="#">228</a> – <a href="#">230</a></p>

Table 5.12.: Experience influencing the perceived usefulness of rationale information elements.

### Conclusion – RQ1-H4

None of the tested dependent variables did any of the examined types of experience have an influence. Based on the data available to us, it is accordingly necessary to *reject the hypothesis RQ1-H4*. As one of the central factors influencing this result, the sometimes small group size must be mentioned. In other words, it is reasonable to assume that a repeated investigation with a larger population will produce more significant results and thus new, more specific findings.

### 5.3.2. RQ2 – How to Capture Rationale Information?

The following section contains the evaluations around the research question RQ2. The question here is how decision rationales should be recorded. As central aspects, Scrum process elements were the basis for the analyses. It is being investigated how these elements could influence the recording of decision rationales. To this end, the author evaluated ten hypotheses that analyse the relationships and differences between variables of interest to us.

#### RQ2-H1 – Development Experience Affects the Decisions Documentation Frequency

For evaluating research hypothesis RQ2-H1, the author examined the influence of development experience recorded in the questionnaire (independent variable = [Question Q-26](#)) on the decision documentation frequency. The latter's data is based on answers to the three questions [Q-01](#), [Q-04](#) and [Q-14](#). Accordingly, they serve as dependent variables. [Q-01](#) directly asks for the documentation frequency of decisions. [Q-04](#) and [Q-14](#) do this implicitly by asking for the documentation frequency of decisions per decision type, respectively, per Scrum activity. The answers are combined into a data set and examined for existing differences caused by development experience.

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-01:**

$H_0$ : Development experience *does not affect* how frequently software engineers document their decisions made.

$H_1$ : Development experience *affects* how frequently software engineers document their decisions made.

- **Question Q-04:**

$H_0$ : Development experience *does not affect* how frequently software engineers document certain decision types.

$H_1$ : Development experience *affects* how frequently software engineers document certain decision types.

- **Question Q-14:**

$H_0$ : Development experience *does not affect* during which activities software engineers document their decisions made.

$H_1$ : Development experience *affects* during which activities software engineers document their decisions made.

The data show a significant, moderately positive monotone correlation between development experience and the general question's documentation frequency ([Question Q-01](#)). However, no such significance can be found for the data surveyed by the more specific questions ([Q-04](#) and [Q-14](#)). Thus, there is neither an influence of development experience on the frequency of documented decisions grouped by decision type nor by Scrum activity.

Nevertheless, there is a connection. This connection becomes apparent when looking at the various types of decisions. Despite the limited size of the population, three out of eleven decisions



Influence of Development Experience on Decision Documentation	
<p>(<i>Indep. Var.</i> ↓)</p> <p>Documentation frequency (general)</p> <p>–</p> <p>Question Q-01</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – The data shows a moderate monotone positive correlation between development experience and documentation frequency (cf. <a href="#">Section 5.2</a>). It is highly significant (<math>\alpha = 0.05</math>). The more experience software engineers have, the more often they document decisions.</p> <p><b>Spearman:</b> <math>\rho = 0.200, p = 0.051</math>  <b>Kendall:</b> <math>\tau = 0.168, p = 0.049</math></p> <p>for details, see: <a href="#">Table D.1</a> <span style="float: right;">p. 231</span></p>
<p>Documentation frequency across all decision types</p> <p>–</p> <p>Question Q-04</p>	<p><i>Failed to reject H<sub>0</sub>.</i> – A different picture emerges when looking at the documentation frequencies for the different types of decisions. Neither significant differences nor a significant correlation can be found for any type.</p> <p><b>Spearman:</b> <math>\rho = 0.033, p = 0.299</math></p> <p>for details, see: <a href="#">Table D.2</a> <span style="float: right;">p. 232</span></p>
<p>Documentation frequency across all Scrum phases</p> <p>–</p> <p>Question Q-14</p>	<p><i>Failed to reject H<sub>0</sub>.</i> – Looking at the responses to <a href="#">Question Q-14</a>, no influence of development experience can be seen. When aggregated across all phases, neither significant differences nor significant correlation can be identified.</p> <p><b>Spearman:</b> <math>\rho = -0.012, p = 0.776</math></p> <p>for details, see: <a href="#">Table D.3</a> <span style="float: right;">p. 233</span></p>

Table 5.13.: Development experience influencing decision documentation frequency.

types are significantly correlated. In detail, decisions on development tools and user experience are documented significantly more frequently with increasing development experience. In line with general perception, decisions on minor to-do items are documented significantly less with increasing development experience. Detailed results can be found in [Table 5.14](#).

Based on the data available, it is necessary to *accept the hypothesis RQ2-H1*. According to the participants' perception, there is a moderate positive monotone correlation between development experience and the documentation frequency of decisions. However, if the situation is considered in detail, a very differentiated picture emerges. The intensity and direction of the influence depend partly on the context, respectively, the decision's type of decision.

Influence of Development Experience on Decision Documentation	
<p>(<i>Indep. Var.</i> ↓)</p> <p>Decisions on development tools</p> <p>–</p> <p>Question Q-04</p> <p>1<sup>st</sup> item</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – Development experience has a highly significant influence (<math>\alpha = 0.05</math>) on the documentation frequency of decisions on development tools. This monotone correlation is moderately positive, with <math>\rho = 0.221</math>. Given the limited population of 102 participants, this is a strong result.</p> <p><b>Spearman:</b> <math>\rho = 0.221, p = 0.031</math></p> <p>for details, see: <a href="#">Table D.4</a> <span style="float: right;">p. 234</span></p>
<p>Decisions on user experience</p> <p>–</p> <p>Question Q-04</p> <p>7<sup>th</sup> item</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – Development experience also has a significant influence on how often decisions concerning user experience are documented. There is a moderate monotone positive correlation between the two variables. According to the explanations in <a href="#">Section 5.2</a>, the author interprets the result to be significant in the significance level <math>\alpha = 0.10</math>.</p> <p><b>Spearman:</b> <math>\rho = 0.170, p = 0.108</math>  <b>Kendall:</b> <math>\tau = 0.142, p = 0.099</math></p> <p>for details, see: <a href="#">Table D.5</a> <span style="float: right;">p. 234</span></p>
<p>Decisions on To-Do items</p> <p>–</p> <p>Question Q-04</p> <p>11<sup>th</sup> item</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – Another significant influence (<math>\alpha = 0.10</math>) of development experience is found in the documentation frequency of decisions on To-Do items. In contrast to the other two, this is a moderate monotone <i>negative</i> correlation. The more experienced a software engineer is, the fewer To-Do items will he / she document.</p> <p><b>Spearman:</b> <math>\rho = -0.181, p = 0.079</math></p> <p>for details, see: <a href="#">Table D.6</a> <span style="float: right;">p. 235</span></p>

Table 5.14.: Development experience influencing documentation frequency of certain decisions.

## RQ2-H2 – Scrum Experience Affects the Decision Documentation Frequency

For evaluating the research hypothesis RQ2-H2, the author examined the influence of Scrum experience recorded in the questionnaire (independent variable = [Question Q-27](#)) on the decision documentation frequency. For the dependent variable, the author considered different questions, as for the previous hypothesis. In [Question Q-01](#), the participants were asked to indicate in general how often they document decisions. The other two questions ([Q-04 / Q-14](#)) only addressed this implicitly. In these questions, the participants were asked about the frequency with which they document certain types of decisions or how often they document decisions during certain phases of development. The answers are combined into a data set and examined for existing differences caused by Scrum experience.

The following hypotheses were put forward for the detailed hypothesis tests:

- [Question Q-01](#):

$H_0$ : Scrum experience *does not affect* how frequently software engineers document their decisions made.

$H_1$ : Scrum experience *affects* how frequently software engineers document their decisions made.

- [Question Q-04](#):

$H_0$ : Scrum experience *does not affect* how frequently software engineers document certain decision types.

$H_1$ : Scrum experience *affects* how frequently software engineers document certain decision types.

- [Question Q-14](#):

$H_0$ : Scrum experience *does not affect* during which activities software engineers document their decisions made.

$H_1$ : Scrum experience *affects* during which activities software engineers document their decisions made.

None of the data sets showed any influence of Scrum experience on the documentation frequency. The data did not show any significant relationships (cf. [Table 5.15](#)).

Furthermore, the author also examined Scrum's influence on the documentation frequency of individual types of decisions. It turned out that there is a significant correlation ( $\alpha = 0.10$ ) for only one of the eleven explicitly queried decision types (cf. [Table 5.16](#)).

The author also examined a possible correlation between Scrum experience and the documentation frequency during the individual Scrum phases. No significant correlations could be found here.

Influence of Scrum Experience on Decision Documentation Frequency	
<i>(Dependent Var. ↓)</i>	
Documentation frequency (general) – Question Q-01	<p><i>Failed to reject <math>H_0</math>.</i> – According to the participants' answers, no influence of Scrum experience on the documentation frequency of decisions can be found.</p> <p>Spearman: <math>\rho = 0.080, p = 0.427</math></p> <p>for details, see: <a href="#">Table D.7</a> <span style="float: right;">p. 236</span></p>
Documentation frequency across all decision types – Question Q-04	<p><i>Failed to reject <math>H_0</math>.</i> – Likewise, no influence of Scrum experience can be deduced from the number of answers given on the documentation frequency of individual types of decisions.</p> <p>Spearman: <math>\rho = -0.032, p = 0.302</math></p> <p>for details, see: <a href="#">Table D.8</a> <span style="float: right;">p. 237</span></p>
Documentation frequency across all Scrum phases – Question Q-14	<p><i>Failed to reject <math>H_0</math>.</i> – Likewise, no influence of Scrum experience on the documentation frequency of decisions during individual development phases can be deduced from the available data.</p> <p>Spearman: <math>\rho = 0.030, p = 0.444</math></p> <p>for details, see: <a href="#">Table D.9</a> <span style="float: right;">p. 238</span></p>

Table 5.15.: Scrum experience influencing decision documentation frequency in general.

Influence of Scrum Experience on Decision Documentation Frequency	
<i>(Dependent Var. ↓)</i>	
Decisions related to the deployment platform – Question Q-04 3 <sup>rd</sup> item	<p><i><math>H_1</math> is to be accepted.</i> – For the documentation frequency of decisions concerning the deployment platform, a significant influence of Scrum experience can be determined. At the significance level <math>\alpha = 0.10</math>, a moderate monotone negative correlation can be observed.</p> <p>Spearman: <math>\rho = -0.181, p = 0.086</math></p> <p>for details, see: <a href="#">Table D.10</a> <span style="float: right;">p. 239</span></p>

Table 5.16.: Scrum experience influencing documentation frequency by individual decision type.

On the basis of the available data there is no definitive evidence that the Scrum experience has an influence on the documentation frequency of decisions. In the author's view, the one correlation found for the investigated pairings is not sufficient to confirm the general hypothesis. Accordingly, the author concludes that the *RQ2-H2 hypothesis must be rejected*.

## RQ2-H3 – Experience Affects the Usage of Decision Capture Guidelines

To evaluate the research hypothesis RQ2-H3, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = [Question Q-01](#) / [Question Q-26](#) / [Question Q-27](#)) with the question on the usage frequency of capture guidelines (dependent variable = [Question Q-18](#) – 1<sup>st</sup> item).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* how frequently software engineers use decision capture guidelines.

$H_1$ : Experience *affects* how frequently software engineers use decision capture guidelines.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

Experience Affecting the Usage Frequency of Capture Guidelines	
<i>(Indep. Var. ↓)</i>	
Documentation Experience – <a href="#">Question Q-01</a>	<p><math>H_1</math> is to be accepted. – In analogy to the hypothesis, there is a highly significant and strong positive monotone correlation between documentation experience and the usage frequency of capture guidelines. With a factor of <math>\rho = 0.321</math>, it has a moderate intensity.</p> <p><b>Spearman:</b> <math>\rho = 0.321, p = 0.002</math></p> <p>for details, see: <a href="#">Table D.11</a> <span style="float: right;">p. 240</span></p>
Development Experience – <a href="#">Question Q-26</a>	<p>Failed to reject <math>H_0</math>. – The influence of development experience on the use of capture guidelines cannot be proven in our sample. The available data does not allow for the conclusion of a significant correlation.</p> <p><b>Spearman:</b> <math>\rho = 0.060, p = 0.579</math></p> <p>for details, see: <a href="#">Table D.12</a> <span style="float: right;">p. 241</span></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><math>H_1</math> is to be accepted. – As far as the Scrum experience is concerned, a clear significant negative correlation can be seen (<math>\alpha = 0.05</math>, cf. <a href="#">Section 5.2</a>). It states that the more Scrum experience software engineers have, the less likely they are to use decision capture guidelines.</p> <p><b>Spearman:</b> <math>\rho = -0.202, p = 0.052</math>  <b>Kendall:</b> <math>\tau = -0.177, p = 0.049</math></p> <p>for details, see: <a href="#">Table D.13</a> <span style="float: right;">p. 242</span></p>

Table 5.17.: Experience affecting the usage frequency of capture guidelines.

According to the available data, two out of three types of experience significantly influence the usage frequency of capture guidelines. The influence of documentation experience is positively correlated, whereas Scrum experience’s influence is negative (cf. [Table 5.17](#)). Based on the results found, the hypothesis RQ2-H3 is to be accepted.

## RQ2-H4 – Experience Affects the Usage Frequency of Capture Templates

To evaluate the research hypothesis RQ2-H4, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = [Question Q-01](#) / [Question Q-26](#) / [Question Q-27](#)) with the question about the usage frequency of capture templates (dependent variable = [Question Q-18](#) – 2<sup>nd</sup> item).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* how frequently software engineers use capture templates.

$H_1$ : Experience *affects* how frequently software engineers use capture templates.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

Experience Affecting the Usage Frequency of Capture Templates	
( <i>Indep. Var.</i> ↓)	
Documentation Experience – <a href="#">Question Q-01</a>	<p><math>H_1</math> is to be accepted. – In analogy to the hypothesis, there is a highly significant and strong positive correlation between <i>documentation experience</i> and the usage frequency of capture guidelines. With a factor of <math>\rho = 0.543</math>, documentation experience has a strong influence. <b>Spearman:</b> <math>\rho = 0.543, p \ll 0.001</math></p> <p>for details, see: <a href="#">Table D.14</a> <span style="float: right;">p. 243</span></p>
Development Experience – <a href="#">Question Q-26</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The influence of <i>development experience</i> on the use of capture templates cannot be proven in our sample. The available data does not allow for the conclusion of a significant correlation. <b>Spearman:</b> <math>\rho = 0.061, p = 0.579</math></p> <p>for details, see: <a href="#">Table D.15</a> <span style="float: right;">p. 244</span></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><i>Failed to reject <math>H_0</math>.</i> – As far as <i>Scrum experience</i> is concerned, no relationship can be identified either in our sample. <b>Spearman:</b> <math>\rho = -0.059, p = 0.574</math></p> <p>for details, see: <a href="#">Table D.16</a> <span style="float: right;">p. 245</span></p>

Table 5.18.: Experience affecting the usage frequency of capture templates.

The available data indicates that one of the three types of experience studied has a highly significant influence on the usage frequency of capture templates. With a correlation factor of 0.543, this is a strong monotonous positive correlation between documentation experience and usage frequency and capture templates (cf. [Table 5.18](#)). Based on the results found, the hypothesis RQ2-H4 is to be accepted.

## RQ2-H5 – Experience Affects the Usage Frequency of Software for Documenting Decisions

The evaluation of the hypothesis RQ2-H5 is based on two questions. The first one asked the participants in general whether they use software to record their decisions (cf. [Question Q-16 – 3<sup>rd</sup> item](#) and [Table 5.19](#)). The second question asked the how often they use IDE-integrated software to record their decisions (cf. [Question Q-16 – 4<sup>th</sup> item](#) and [Table 5.20](#)). As before, the two previously mentioned values were used as dependent variables and compared to the independent variables of the three surveyed experience values (cf. questions: [Q-01 / Q-26 / Q-27](#)).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* how frequently software engineers use software ([Q-16 – 3<sup>rd</sup> item](#)) / IDE-based software ([Q-16 – 4<sup>th</sup> item](#)) to document decisions.

$H_1$ : Experience *affects* how frequently software engineers use software ([Q-16 – 3<sup>rd</sup> item](#)) / IDE-based software ([Q-16 – 4<sup>th</sup> item](#)) to document decisions.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

(Dep. Var. ↓)	Documentation Experience	Development Experience	Scrum Experience
Usage Frequency of Software for Documentation	Strong monotone positive correlation $H_1$ is to be accepted. $\rho = 0.318, p = 0.001$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.007, p = 0.950$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = -0.141, p = 0.162$
Details	<a href="#">Table D.17 – p. 246</a>	<a href="#">Table D.18 – p. 247</a>	<a href="#">Table D.19 – p. 248</a>

Table 5.19.: Experience affecting the usage frequency of software for documenting.

When analysing the data, it becomes apparent that there is a highly significant positive correlation (although not used, would be  $\alpha = 0.005$ ) between documentation experience and the usage frequency of software for documentation purposes, both for software in general and for IDE-integrated software (cf. [Table 5.19](#), [Table 5.20](#)). With the correlation coefficients being around  $\rho \sim 0.32$ , the author interprets both correlations as strong.

(Dep. Var. ↓)	Documentation Experience	Development Experience	Scrum Experience
Usage Frequency of IDE-integrated Software for Documentation	Strong monotone positive correlation $H_1$ is to be accepted. $\rho = 0.326, p = 0.002$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.154, p = 0.152$	No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.073, p = 0.490$
Details	<a href="#">Table D.20 – p. 249</a>	<a href="#">Table D.21 – p. 250</a>	<a href="#">Table D.22 – p. 251</a>

Table 5.20.: Experience affecting the usage frequency of IDE-based software for documenting.

For the other two types of experience, no corresponding correlation can be identified from the available data. These results give sufficient reason to *accept the RQ2-H5 hypothesis*.

## RQ2-H6 – Team Size Affects the Decision Documentation Frequency

To evaluate the hypothesis RQ2-H6, the author compared the three questions about the documentation frequency of decisions (cf. questions Q-01 / Q-04 / Q-14) with the team size (cf. Question Q-31). In Question Q-01, the participants were asked to indicate in general how often they document decisions. The other two questions (Q-04 / Q-14) only addressed this implicitly. In these questions, the participants were asked about the frequency with which they document certain types of decisions or how often they document decisions during certain phases of development.

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-01:**

$H_0$ : Development experience *does not affect* how frequently software engineers document their decisions made.

$H_1$ : Development experience *affects* how frequently software engineers document their decisions made.

- **Question Q-04:**

$H_0$ : Development experience *does not affect* how frequently software engineers document certain decision types.

$H_1$ : Development experience *affects* how frequently software engineers document certain decision types.

- **Question Q-14:**

$H_0$ : Development experience *does not affect* during which activities software engineers document their decisions made.

$H_1$ : Development experience *affects* during which activities software engineers document their decisions made.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

	(Dep. Var. →) (Indep. Var. ↓)	Documentation Frequency (General)	Documentation Frequency Across all Decision Types	Documentation Frequency Across all Scrum Phases
Team Size		No apparent relationship. <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.081, p = 0.482$	Weak monotone positive relationship. <i><math>H_1</math> is to be accepted.</i> $\rho = 0.088, p = 0.011$	No apparent relationship (just outside $\alpha = 0.10$ ). <i>Failed to reject <math>H_0</math>.</i> $\rho = 0.072, p = 0.107$ $\tau = 0.061, p = 0.103$
Details		<a href="#">Table D.23 – p. 252</a>	<a href="#">Table D.24 – p. 253</a>	<a href="#">Table D.25 – p. 254</a>

Table 5.21.: Team size affecting the decision documentation frequency.

According to the submitted answers, no relationship can be found for the analysis with the rather general Question Q-01. Although the correlation coefficient is similar to the other calculated



coefficients, it is not significant. The author attributes this result to the limited group size. The other two questions, however, show a different picture. Respondents who work in larger teams stated in [Question Q-04](#) that they document decisions more often. Here there is a weak but highly significant monotone positive correlation (cf. [Table 5.21](#)). A similarly strong correlation was found to how often the participants document decisions made per phase (cf. [Question Q-14](#)). However, this was just outside the significance level  $\alpha = 0.10$ .

All in all, the hypothesis RQ2-H6 shows a correlation significant enough to confirm a correlation between team size and documentation frequency. Thus, the research hypothesis has to be accepted.

## RQ2-H7 – The Role of a Software Engineer in Scrum Affects the Decision Documentation Frequency

For evaluating this hypothesis, the data on the experience gained in different roles are evaluated separately according to various grouping variables. This approach is necessary because of the nature of [Question Q-28](#). Here, the participants were able to tick several items at the same time based on their experience. To obtain a more accurate understanding, the author chose to perform several analyses with different groupings. These are oriented around the following roles:

1. *Developer* role / ordinary team member (Dev.),
2. *Scrum Master* role (SM), and
3. *Product Owner* role (PO).

A separate analysis of experiences in several roles at once affecting the documentation frequency was additionally carried out. For more details about the individual Scrum roles and how the corresponding information was surveyed in the questionnaire (cf. [Question Q-28](#)), please refer to [Section 4.3.2](#).

For each of the individual analyses performed, the corresponding independent variable is compared against three instruments. First, the general question of documentation frequency is evaluated (cf. [Question Q-01](#)). Subsequently, the answers regarding individual decision types (cf. [Question Q-04](#)) are analysed together as one combined unit. Afterwards, the same is done for the documentation frequency distributed over the different Scrum phases (cf. [Question Q-14](#)). The groupings are chosen by focussing on one role each, respectively, on the number of the participants' roles in which they gained profound experience.

The following hypotheses were put forward for the detailed hypothesis tests:

- [Question Q-01](#):

$H_0$ : Profound experience gained in one or multiple Scrum roles *does not affect* how frequently software engineers document their decisions.

$H_1$ : Profound experience gained in one or multiple Scrum roles *affects* how frequently software engineers document their decisions.

- [Question Q-04](#):

$H_0$ : Profound experience gained in one or multiple Scrum roles *does not affect* how frequently software engineers document certain decision types.

$H_1$ : Profound experience gained in one or multiple Scrum roles *affects* how frequently software engineers document certain decision types.

- [Question Q-14](#):

$H_0$ : Profound experience gained in one or multiple Scrum roles *does not affect* during which activities software engineers document their decisions.

$H_1$ : Profound experience gained in one or multiple Scrum roles *affects* during which activities software engineers document their decisions.

The results are analysed and presented separately in the following, depending on the individual Scrum roles. In each case, the results of the groups are briefly compared and then evaluated. Finally, all results are evaluated, and a decision is made whether the hypothesis must be rejected or accepted.

## Developer

Role <i>Developer</i> Affecting the Decision Documentation Frequency																																					
(Dependent Var. ↓)																																					
Documentation frequency (general) Question Q-01	<p>According to the answers given, no influence of experience as a <i>Developer</i> on the documentation frequency of decisions can be found.</p> <p>for details, see: <a href="#">Table D.28</a> p. 257</p>																																				
Documentation frequency across all decision types Question Q-04	<p>The available data supports the hypothesis that <i>Developers</i> document less. The data analysis resulted in the following significant differences:</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>Dev</td> <td><b>less than</b></td> <td>PO/SM</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>Dev</td> <td>–</td> <td>PO+SM</td> <td>–</td> </tr> <tr> <td>Dev</td> <td>–</td> <td>Dev + PO/SM</td> <td>–</td> </tr> <tr> <td>Dev</td> <td>–</td> <td>Dev + PO + SM</td> <td>–</td> </tr> <tr> <td>Dev + PO/SM</td> <td><b>less than</b></td> <td>PO/SM</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>Dev + PO/SM</td> <td>–</td> <td>PO + SM</td> <td>–</td> </tr> <tr> <td>Dev + PO + SM</td> <td>–</td> <td>PO/SM</td> <td>–</td> </tr> <tr> <td>Dev + PO + SM</td> <td>–</td> <td>PO + SM</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.33</a> p. 262</p>	Group A	Doc. Frequency	Group B	Significance	Dev	<b>less than</b>	PO/SM	$\alpha = 0.05$	Dev	–	PO+SM	–	Dev	–	Dev + PO/SM	–	Dev	–	Dev + PO + SM	–	Dev + PO/SM	<b>less than</b>	PO/SM	$\alpha = 0.05$	Dev + PO/SM	–	PO + SM	–	Dev + PO + SM	–	PO/SM	–	Dev + PO + SM	–	PO + SM	–
Group A	Doc. Frequency	Group B	Significance																																		
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Dev	–	Dev + PO/SM	–																																		
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Dev + PO/SM	–	PO + SM	–																																		
Dev + PO + SM	–	PO/SM	–																																		
Dev + PO + SM	–	PO + SM	–																																		
Documentation frequency across all Scrum phases Question Q-14	<p>The available data supports the hypothesis that <i>Developers</i> document less. The data analysis resulted in the following significant differences:</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>Dev</td> <td>–</td> <td>PO/SM</td> <td>–</td> </tr> <tr> <td>Dev</td> <td>–</td> <td>PO+SM</td> <td>–</td> </tr> <tr> <td>Dev</td> <td><b>more than</b></td> <td>Dev + PO/SM</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>Dev</td> <td><b>less than</b></td> <td>Dev + PO + SM</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>Dev + PO/SM</td> <td><b>less than</b></td> <td>PO/SM</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>Dev + PO/SM</td> <td><b>less than</b></td> <td>PO + SM</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>Dev + PO + SM</td> <td>–</td> <td>PO/SM</td> <td>–</td> </tr> <tr> <td>Dev + PO + SM</td> <td>–</td> <td>PO + SM</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.38</a> p. 267</p>	Group A	Doc. Frequency	Group B	Significance	Dev	–	PO/SM	–	Dev	–	PO+SM	–	Dev	<b>more than</b>	Dev + PO/SM	$\alpha = 0.10$	Dev	<b>less than</b>	Dev + PO + SM	$\alpha = 0.10$	Dev + PO/SM	<b>less than</b>	PO/SM	$\alpha = 0.05$	Dev + PO/SM	<b>less than</b>	PO + SM	$\alpha = 0.10$	Dev + PO + SM	–	PO/SM	–	Dev + PO + SM	–	PO + SM	–
Group A	Doc. Frequency	Group B	Significance																																		
Dev	–	PO/SM	–																																		
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Dev + PO/SM	<b>less than</b>	PO/SM	$\alpha = 0.05$																																		
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Dev + PO + SM	–	PO/SM	–																																		
Dev + PO + SM	–	PO + SM	–																																		

Table 5.22.: Scrum role *Developer* affecting decision documentation frequency.

The available data suggest a relationship between the documentation frequency of decisions and the *Developer* role. Although the data does not allow this conclusion to be drawn across all data pairs, it can be assumed that a larger population would lead to more significant results. In terms of trend, five of the six pairs found indicate that a more substantial *Developer* role's influence leads to documented decisions less frequently (cf. [Table 5.22](#)). One pairing found indicates the opposite. However, since this contradictory result resides in the  $\alpha = 0.10$  level, the author does not attribute much relevance to it.

## Scrum Master

Role <i>Scrum Master</i> Affecting the Decision Documentation Frequency																																					
<i>(Dependent Var. ↓)</i>																																					
Documentation frequency (general) – Question Q-01	<p>According to the answers given, no influence of experience as SM on the documentation frequency of decisions can be found.</p> <p>for details, see: <a href="#">Table D.29</a> <span style="float: right;">p. 258</span></p>																																				
Documentation frequency across all decision types – Question Q-04	<p>The available data supports the hypothesis that people with profound SM experience document decisions more frequently than their counterparts with additional fields of expertise or no SM experience. For details, see below:</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>SM</td> <td><b>more than</b></td> <td>PO/Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM</td> <td><b>more than</b></td> <td>SM+PO/Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM</td> <td><b>more than</b></td> <td>SM+PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM+PO/Dev</td> <td>–</td> <td>PO/Dev</td> <td>–</td> </tr> <tr> <td>SM+PO/Dev</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM+PO+Dev</td> <td>–</td> <td>PO/Dev</td> <td>–</td> </tr> <tr> <td>SM+PO+Dev</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.34</a> <span style="float: right;">p. 263</span></p>	Group A	Doc. Frequency	Group B	Significance	SM	<b>more than</b>	PO/Dev	$\alpha = 0.05$	SM	<b>more than</b>	PO+Dev	$\alpha = 0.05$	SM	<b>more than</b>	SM+PO/Dev	$\alpha = 0.05$	SM	<b>more than</b>	SM+PO+Dev	$\alpha = 0.05$	SM+PO/Dev	–	PO/Dev	–	SM+PO/Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$	SM+PO+Dev	–	PO/Dev	–	SM+PO+Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$
Group A	Doc. Frequency	Group B	Significance																																		
SM	<b>more than</b>	PO/Dev	$\alpha = 0.05$																																		
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SM	<b>more than</b>	SM+PO/Dev	$\alpha = 0.05$																																		
SM	<b>more than</b>	SM+PO+Dev	$\alpha = 0.05$																																		
SM+PO/Dev	–	PO/Dev	–																																		
SM+PO/Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$																																		
SM+PO+Dev	–	PO/Dev	–																																		
SM+PO+Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$																																		
Documentation frequency across all Scrum phases – Question Q-14	<p>The available data supports the hypothesis that people with profound SM experience document decisions more frequently than their counterparts with additional fields of expertise or no SM experience. For details, see below:</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>SM</td> <td>–</td> <td>PO/Dev</td> <td>–</td> </tr> <tr> <td>SM</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM</td> <td>–</td> <td>SM+PO/Dev</td> <td>–</td> </tr> <tr> <td>SM</td> <td>–</td> <td>SM+PO+Dev</td> <td>–</td> </tr> <tr> <td>SM+PO/Dev</td> <td>–</td> <td>PO/Dev</td> <td>–</td> </tr> <tr> <td>SM+PO/Dev</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>SM+PO+Dev</td> <td><b>more than</b></td> <td>PO/Dev</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>SM+PO+Dev</td> <td><b>more than</b></td> <td>PO+Dev</td> <td><math>\alpha = 0.05</math></td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.39</a> <span style="float: right;">p. 268</span></p>	Group A	Doc. Frequency	Group B	Significance	SM	–	PO/Dev	–	SM	<b>more than</b>	PO+Dev	$\alpha = 0.05$	SM	–	SM+PO/Dev	–	SM	–	SM+PO+Dev	–	SM+PO/Dev	–	PO/Dev	–	SM+PO/Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$	SM+PO+Dev	<b>more than</b>	PO/Dev	$\alpha = 0.10$	SM+PO+Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$
Group A	Doc. Frequency	Group B	Significance																																		
SM	–	PO/Dev	–																																		
SM	<b>more than</b>	PO+Dev	$\alpha = 0.05$																																		
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SM	–	SM+PO+Dev	–																																		
SM+PO/Dev	–	PO/Dev	–																																		
SM+PO/Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$																																		
SM+PO+Dev	<b>more than</b>	PO/Dev	$\alpha = 0.10$																																		
SM+PO+Dev	<b>more than</b>	PO+Dev	$\alpha = 0.05$																																		

Table 5.23.: *Scrum Master* role affecting decision documentation frequency.

The available data show a very strong influence on decisions' documentation frequency, depending on whether one has profound experience as a *Scrum Master*. Several different experience levels show significant differences in the  $\alpha = 0.05$  level for two of three dependent variables examined. They all point in one direction (cf. [Table 5.23](#)) and suggest that software engineers with Scrum Master experience generally document their decisions more frequently.

## Product Owner

Role <i>Product Owner</i> Affecting the Decision Documentation Frequency																																					
<i>(Dependent Var. ↓)</i>																																					
Documentation frequency (general) – Question Q-01	According to the answers given, no influence of experience as PO on the documentation frequency of decisions can be found.  for details, see: <a href="#">Table D.30</a> <span style="float: right;">p. 259</span>																																				
Documentation frequency across all decision types – Question Q-04	Likewise, no influence of profound experience as PO on the documentation frequency across all decision types can be deduced from the available data.  for details, see: <a href="#">Table D.35</a> <span style="float: right;">p. 264</span>																																				
Documentation frequency across all Scrum phases – Question Q-14	<p>There are two significant differences in the documentation frequency of decision across the individual Scrum phases. However, these results do not provide a clear picture and are only at the significance level of <math>\alpha = 0.10</math>.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>PO</td> <td>–</td> <td>SM/Dev</td> <td>–</td> </tr> <tr> <td>PO</td> <td>–</td> <td>SM+Dev</td> <td>–</td> </tr> <tr> <td>PO</td> <td>–</td> <td>PO+SM/Dev</td> <td>–</td> </tr> <tr> <td>PO</td> <td>–</td> <td>PO+SM+Dev</td> <td>–</td> </tr> <tr> <td>PO+SM/Dev</td> <td><b>less than</b></td> <td>SM/Dev</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>PO+SM/Dev</td> <td>–</td> <td>SM+Dev</td> <td>–</td> </tr> <tr> <td>SM+PO+Dev</td> <td>–</td> <td>PO/Dev</td> <td>–</td> </tr> <tr> <td>PO+SM+Dev</td> <td><b>more than</b></td> <td>SM+Dev</td> <td><math>\alpha = 0.10</math></td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.40</a> <span style="float: right;">p. 269</span></p>	Group A	Doc. Frequency	Group B	Significance	PO	–	SM/Dev	–	PO	–	SM+Dev	–	PO	–	PO+SM/Dev	–	PO	–	PO+SM+Dev	–	PO+SM/Dev	<b>less than</b>	SM/Dev	$\alpha = 0.10$	PO+SM/Dev	–	SM+Dev	–	SM+PO+Dev	–	PO/Dev	–	PO+SM+Dev	<b>more than</b>	SM+Dev	$\alpha = 0.10$
Group A	Doc. Frequency	Group B	Significance																																		
PO	–	SM/Dev	–																																		
PO	–	SM+Dev	–																																		
PO	–	PO+SM/Dev	–																																		
PO	–	PO+SM+Dev	–																																		
PO+SM/Dev	<b>less than</b>	SM/Dev	$\alpha = 0.10$																																		
PO+SM/Dev	–	SM+Dev	–																																		
SM+PO+Dev	–	PO/Dev	–																																		
PO+SM+Dev	<b>more than</b>	SM+Dev	$\alpha = 0.10$																																		

Table 5.24.: Scrum role *Product Owner* affecting decision documentation frequency.

The influence of the experience as a *Product Owner* on the documentation frequency of decisions is weak. Two of the three questions show no significant differences among groups with different experiences (cf. [Table D.30](#), [Table D.35](#), [Table D.40](#)). For the third part of the data set examined, two out of eight groups show significant differences in the  $\alpha = 0.10$  level. Accordingly, the data around the PO support the hypothesis only weakly. The interpretation of an existing trend is not apparent.

## Profound Experience in Multiple Roles

Quantity of Scrum Roles Affecting the Decision Documentation Frequency																	
<i>(Dependent Var. ↓)</i>																	
Documentation frequency (general) – Question Q-01	<p>According to the answers given, no influence can be determined by the quantity of roles in which profound experience was gained.</p> <p>for details, see: <a href="#">Table D.27</a> <span style="float: right;">p. 256</span></p>																
Documentation frequency across all decision types – Question Q-04	<p>The data suggest a weak influence from the quantity of roles in which profound experience was gained. Although there is no correlation between the documentation frequency and the quantity of roles in which the participants gained profound experience, the available results confirm the hypothesis.</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>one role</td> <td><b>more than</b></td> <td>two roles</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>one role</td> <td>–</td> <td>three roles</td> <td>–</td> </tr> <tr> <td>two roles</td> <td>–</td> <td>three roles</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.32</a> <span style="float: right;">p. 261</span></p>	Group A	Doc. Frequency	Group B	Significance	one role	<b>more than</b>	two roles	$\alpha = 0.10$	one role	–	three roles	–	two roles	–	three roles	–
Group A	Doc. Frequency	Group B	Significance														
one role	<b>more than</b>	two roles	$\alpha = 0.10$														
one role	–	three roles	–														
two roles	–	three roles	–														
Documentation frequency across all Scrum phases – Question Q-14	<p>The available data confirm that experience in specific Scrum roles influences the documentation frequency of decisions and, thus, the hypothesis.</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>one role</td> <td><b>more than</b></td> <td>two roles</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>one role</td> <td><b>less than</b></td> <td>three roles</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>two roles</td> <td><b>less than</b></td> <td>three roles</td> <td><math>\alpha = 0.05</math></td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.37</a> <span style="float: right;">p. 266</span></p>	Group A	Doc. Frequency	Group B	Significance	one role	<b>more than</b>	two roles	$\alpha = 0.05$	one role	<b>less than</b>	three roles	$\alpha = 0.10$	two roles	<b>less than</b>	three roles	$\alpha = 0.05$
Group A	Doc. Frequency	Group B	Significance														
one role	<b>more than</b>	two roles	$\alpha = 0.05$														
one role	<b>less than</b>	three roles	$\alpha = 0.10$														
two roles	<b>less than</b>	three roles	$\alpha = 0.05$														

Table 5.25.: Quantity of Scrum roles affecting the decision documentation frequency.

According to the available data, an apparent influence can be seen from the quantity of roles in which a participant gained profound experience. There are significant differences among various pairings. However, the differences found do not allow for a straightforward interpretation. In general, participants with experience in one role document more than those with experience in two roles. Those with a profound experience of all three roles document decisions more frequently than the two groups mentioned above. A clear trend cannot be deduced from this. It is more likely that the previously analysed roles' influence is more substantial and influences the present results. Accordingly, there is no significant correlation in any of the examined partial datasets.

## Conclusion – RQ2-H7

Summary: Scrum Roles Affecting Decision Documentation Frequency		
( <i>Indep. Var.</i> ↓)	( <i>Dep. Var.</i> ↓)	
Developer	Question Q-01	No effect was found.
	Question Q-04	A weak effect was found. For two out of eight pairs, participants with <i>Developer</i> experience document decisions less frequently ( $\alpha = 0.05$ ).
	Question Q-14	A moderate effect was found. Participants with <i>Dev</i> experience were less likely to document decisions ( $1 \times \alpha = 0.05$ , $2 \times \alpha = 0.10$ ). The opposite relationship was found for one pair ( $1 \times \alpha = 0.10$ ).
Scrum Master	Question Q-01	No effect was found.
	Question Q-04	The data show a strong influence of the SM role (6 of 8 pairs with $\alpha = 0.05$ ). The identified significant differences indicate that participants with thorough SM experience document decisions more frequently.
	Question Q-14	Likewise, SM experience strongly influences the decision documentation frequency (4 of 8 pairs with $\alpha = 0.05$ ). All these pairs also support the finding that people with profound SM experience document decisions more frequently.
Product Owner	Question Q-01	No effect was found.
	Question Q-04	No effect was found.
	Question Q-14	The data show a very weak influence. A trend cannot be identified.
Number of Scrum Roles	Question Q-01	No effect was found.
	Question Q-04	A weak influence became apparent. However, no trend is apparent.
	Question Q-14	A strong influence became apparent. However, no trend is apparent.

Table 5.26.: Experience influencing the importance of “assumptions made”.

The available data show a strong influence of the roles in which a participant has gained profound experience on the documentation frequency of decisions. However, this influence is not always accompanied by a distinct trend. For example, the quantity of roles in which participants gained experience may influence the documentation frequency. However, there is no apparent trend. It can be assumed that apparent results with a trend, such as those of the roles *Developer* and *Scrum Master*, falsify falsify results for the quantity of roles with profound experience. The most substantial effect can be observed with the roles *Developer* and *Scrum Master*. The least influence can be observed for the role of *Product Owner*.

For each of the tested dependent variables, it can be seen that the mere answer to the question about documentation frequency did not produce significant results (cf. [Question Q-01](#)). On the other hand, considering the aggregated answers determined from questions [Q-04](#) and [Q-14](#) yielded significant results. In summary, the hypothesis *RQ2-H7* has to be accepted.



## RQ2-H8 – The Role of a Software Engineer in Scrum Influences the Point in the Process When Decisions Are Usually Captured

For evaluating research hypothesis RQ2-H8, the data on the experience gained in various Scrum roles are evaluated separately according to various groupings. This approach is necessary because of the nature of [Question Q-28](#). Here, the participants were able to tick several items at the same time based on their experience. To obtain a more accurate understanding, the author chose to perform several analyses with different groupings. These are oriented around the following roles:

1. *Developer* role / ordinary team member (Dev.),
2. *Scrum Master* (SM) role, and
3. *Product Owner* (PO) role.

A separate analysis of experiences in several roles at once affecting the documentation frequency was additionally carried out. For more details about the individual Scrum roles and how the corresponding information was surveyed in the questionnaire (cf. [Question Q-28](#)), please refer to [Section 4.3.2](#).

For each of the analyses carried out, the independent variable is always based on the answers from [Question Q-28](#). Only the grouping of the independent variable differs. The dependent variable always consists of the seven answers to [Question Q-14](#), which are not considered aggregated but individually in contrast to the previous hypothesis.

The analyses aim to examine the dependent variable (7 individual items) for significant differences. This way, the individual habits during which Scrum activities participants preferably document their decisions are uncovered. These habits are not analysed according to the specified documentation frequency (dependent variable, cf. [Q-14](#)). Instead, an order is formed over the Scrum activities, reflecting the priorities of when the respective group prefers to document. This order is derived from the documentation frequency. Subsequently, the orders of the individual groups (cf. [Q-28](#)) are compared with each other. This way, differences in documentation frequency among the groups (cf. [RQ2-H6](#)) do not matter. The comparisons are only made on the order of Scrum activities sorted according to their documentation frequency.

To increase clarity, the author highlighted the individual phases with a consistent colour scheme throughout the analysis. These colours are defined as follows and have no further meaning apart from that:

During the Sprint
Backlog Refinement
Planning Poker
Retrospective
Review
Sprint Planning

During the evaluation, the author noticed a peculiarity. For the “Daily Scrum” phase, most of the participants stated that decisions were rarely documented. During the “Daily Scrum”, the documentation frequency was significantly lower than in all other phases or shared the last place with one or more other phases. Thus, the author has hidden the “Daily Scrum” phase in the

following evaluations for more apparent results. According to the author's view and the textbook definition, documentation is inappropriate in this phase. In Daily Scrum, the focus is on brief, concise communication. However, the hypothesis test results for the "Daily Scrum" can still be found in the data visualisation and tables (see pp. 284 – 296).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Profound experience gained in one or multiple Scrum roles *does not affect* during which activities software engineers document their decisions.

$H_1$ : Profound experience gained in one or multiple Scrum roles *affects* during which activities software engineers document their decisions.

The results are analysed and presented separately in the following, depending on the individual Scrum roles. In each case, the results of the groups are briefly compared and then evaluated. Finally, a conclusion provides a brief evaluation of all results.

## Developer

For the following analysis, the participants' answers to [Question Q-28](#) were grouped according to the role *Developer*, as explained previously. Significant differences were found for the documentation frequency among the individual Scrum phases for three of the groupings. For the group of participants with experience in all three roles (see grouping *Three Roles*, p. 59) and the group with experience as a *Developer* and either *Product Owner* or *Scrum Master*, no differences were found.

Scrum Roles Affecting Documentation Frequency During Scrum Activities			
<i>(Independent Var. ↓)</i>			
Developer	Planning Poker	$\gg \alpha = 0.10$	Retrospective
	Sprint Planning	$\gg \alpha = 0.05$	
PO or SM	Sprint Planning	$\gg \alpha = 0.10$	Planning Poker
		$\gg \alpha = 0.05$	During the Sprint
		$\gg \alpha = 0.05$	Review
	Retrospective	$\gg \alpha = 0.05$	During the Sprint
		$\gg \alpha = 0.05$	Planning Poker
		$\gg \alpha = 0.05$	Review
		$\gg \alpha = 0.10$	Backlog Refinement
Dev + (PO or SM)	No differences found.		
PO + SM	Retrospective	$\gg \alpha = 0.05$	During the Sprint
Dev + PO + SM	No differences found.		
Details	see tables: <a href="#">D.54</a> , <a href="#">D.55</a> , <a href="#">D.56</a> , <a href="#">D.57</a> , <a href="#">D.68</a>		pp. 284 – 287, 298

Table 5.27.: Scrum phases with significantly different documentation frequency, sorted from high (left) to low (right) – grouping criteria: Scrum role *Developer*.

In contrast to the analysis of RQ2-H7, the available results (cf. [Table 5.27](#)) show an apparent influence of the *Developer* role. Participants who have only had a profound experience in the *Developer* role frequently documented in the early phases of a sprint. In detail, those participants documented significantly more often during *Planning Poker* and *Sprint Planning* compared to the *Retrospective*. A look at the data (cf. [Table D.54](#)) also explicitly shows that documentation is seldom carried out in the *Retrospective*. Documentation is done most frequently by *Developers* during *Sprint Planning*.

Interestingly, participants who gained profound experience either exclusively as a *Product Owner* or exclusively as *Scrum Master* show a different picture regarding the *Retrospective*. They document their decisions significantly more often in *Retrospective* than in *Planning Poker*, *Review*, *Backlog Refinement*, and *during the sprint*. Since these participants also document in *Sprint Planning* more frequently than in the other phases, documentation is often done at the beginning and the end of a sprint.

A similar result can be seen when comparing participants with profound experience in the *Developer* role with participants who have profound experience as *Product Owner* and *Scrum Master*. The latter also prefer to document at the beginning and end of a sprint [Table D.57](#). The results also show that this group documents significantly more frequently during the *Retrospective* than *during the sprint*. That also manifests the previously described relationship.

According to the grouping applied to the independent variable, Scrum roles significantly affect the decision documentation frequency. Nevertheless, the small size of the groups should be noted.

## Scrum Master

For the following analysis, the participants' answers to [Question Q-28](#) were grouped according to the *Scrum Master* role, as explained previously. Significant differences in the documentation frequency among the individual Scrum phases were found for the groups with profound experience:

1. Exclusively for the *Scrum Master* role
2. For the *Scrum Master* and either the *Product Owner* or the *Developer* role
3. For the *Developer* and the *Product Owner* role

For the groups where participants had experience in all three roles (see grouping *Three Roles*, p. 59) and the group where participants had experience as a *Developer* and *Product Owner*, no differences were found.

Scrum Roles Affecting Documentation Frequency During Scrum Activities			
<i>(Independent Var. ↓)</i>			
Scrum Master	Retrospective	$\gg_{\alpha = 0.10}$	During the Sprint
		$\gg_{\alpha = 0.05}$	Planning Poker
		$\gg_{\alpha = 0.05}$	Review
	Sprint Planning	$\gg_{\alpha = 0.05}$	During the Sprint
		$\gg_{\alpha = 0.05}$	Review
Dev or PO	Sprint Planning	$\gg_{\alpha = 0.10}$	Retrospective
SM + (Dev or PO)	Retrospective	$\gg_{\alpha = 0.05}$	Backlog Refinement
		$\gg_{\alpha = 0.05}$	During the Sprint
		$\gg_{\alpha = 0.05}$	Planning Poker
Dev + PO		No differences found.	
Dev + PO + SM		No differences found.	
Details	see tables: <a href="#">D.58</a> , <a href="#">D.59</a> , <a href="#">D.60</a> , <a href="#">D.61</a> , <a href="#">D.68</a>		pp. 288 – 291, 298

Table 5.28.: Scrum phases with significantly different documentation frequency, sorted from high (left) to low (right) – grouping criteria: Scrum role *Scrum Master*.

The available data shows similar results as the data grouped around the *Developer* role (cf. p. 55). Participants who have experience either as *Scrum Master* only or those who have experience as *Scrum Master* and either *Developer* or *Product Owner* are most likely to document at the beginning and end of the sprint. In those who only have profound experience as *Scrum Master*, as many as 100% of the participants stated that they *often* or *always* documented decisions during *Sprint Planning* and the *Retrospective* (cf. [Table D.58](#)).

## Product Owner

The participants' answers to [Question Q-28](#) were grouped according to the *Product Owner*'s role for the following analysis. As a result of this analysis, only one of the five groups showed significant differences among the individual phases (cf. [Table 5.29](#)). Significant differences were found in the group where participants gained profound experience as a *Developer* and *Scrum Master*.

Scrum Phases With Significantly Different Documentation Frequencies			
<i>(Independent Var. ↓)</i>			
Product Owner	No differences found.		
Dev or SM	Sprint Planning	$\gg_{\alpha = 0.10}$	During the Sprint
		$\gg_{\alpha = 0.05}$	Review
PO + (Dev or SM)	No differences found.		
Dev + SM	No differences found.		
PO + Dev + SM	No differences found.		
Details	see tables: <a href="#">D.62</a> , <a href="#">D.63</a> , <a href="#">D.64</a> , <a href="#">D.65</a> , <a href="#">D.68</a> pp. 292 – 295, 298		

Table 5.29.: Scrum phases with significantly different documentation frequency, sorted from high (left) to low (right) – grouping criteria: Scrum role *Product Owner*.

Based on the results, no direct influence can be deduced by the *Product Owner* role. Nevertheless, these results confirm those from the previous data grouped by *Scrum Master* and *Developer* (cf. pp. 55 – 57).

## Profound Experience in Multiple Roles

For the following analysis, the participants' answers to [Question Q-28](#) were grouped according to the quantity of roles they gained profound experience. Significant differences among the individual phases were found for the participants with profound experience in *one* and *two* roles. No significant differences among the phases were found for participants with experience in *three* roles: *Developer*, *Product Owner*, and *Scrum Master*.

Scrum Phases With Significantly Different Documentation Frequencies			
(Independent Var. ↓)			
One Role	Sprint Planning	≫ <sub>α = 0.05</sub>	During the Sprint
		≫ <sub>α = 0.05</sub>	Review
Two Roles	Retrospective	≫ <sub>α = 0.10</sub>	Backlog Refinement
Three Roles	No differences found.		
Details	see tables: <a href="#">D.66</a> , <a href="#">D.67</a> , <a href="#">D.68</a>		pp. <a href="#">296</a> – <a href="#">298</a>

Table 5.30.: Scrum phases with significantly different documentation frequency, sorted from high (left) to low (right) – grouping criteria: the amount of Scrum roles.

When comparing the two groups (cf. [Table 5.30](#)), differing results can be found. These are not identical but not contradictory either. All found relations could also occur in the other group with a larger population without contradicting the found results. Accordingly, no decisive influence due to the quantity of Scrum roles in which the participants could gain profound experience can be determined.

## Conclusion – RQ2-H8

Summary: Scrum Roles Affecting the Time of Documentation	
<i>(Indep. Var. ↓)</i>	
Developer	When grouping by the <i>Developer</i> role (cf. p. 53), clear differences become apparent. The participants with only profound experience as <i>Developers</i> have different habits than everyone else. <i>Developers</i> prefer to document mainly in the early phases of the sprint. In comparison, other roles prefer to document at the beginning and end of the sprint. From this, a moderate influence can be deduced.
Scrum Master	The influence of the <i>Scrum Master</i> role is analogous to the results of the <i>Developer</i> role. The results show that <i>Scrum Masters</i> most frequently document their decisions at the beginning and end of the sprint. The comparison groups without <i>Scrum Master</i> experience do this more in the early phases of the sprint. These findings are derived from results for three out of five groups. Accordingly, the author perceives the <i>Scrum Master</i> role to influence the time of documentation within the sprint.
Product Owner	The <i>Product Owner</i> 's influence can only be determined to a limited extent. There are significant differences in the documentation frequency between the individual phases for only one of the five groups. With a higher population, the results would likely be more differentiated. However, the <i>Product Owner</i> role is backed up with too little data to infer conclusions.
Amount of Scrum Roles	Two out of three groups had significantly different documentation frequencies for the individual Scrum phases in the available data. The results of the analysis do not indicate the presence or absence of a corresponding influence. The influence of the specific roles more likely is more substantial, as is probably the case with hypothesis RQ2-H7 (cf. p.51). Accordingly, the quantity of roles in which one has gained experience would be less decisive.

Table 5.31.: Scrum roles affecting the time of documentation *during the sprint*.

The available data shows one thing above all: the influence of the individual roles on the timing of documentation in the sprint is immense. The data evaluated here prove this by analysing the documentation frequency of decisions relative to the role under consideration. The more roles a participant has gained profound experience in, the more he/she adapts. The most apparent differences are evident for those participants who have gained profound experience in only one role. In general, decision documentation timing is strongly influenced by activities of the respective role within a sprint.



## RQ2-H9 – The Domain Software Engineers Work in Influences the Frequency of Decision Documentation

For evaluating this hypothesis, the data on the experience gained in different development domains are evaluated separately according to various grouping variables. This approach is necessary because of the nature of [Question Q-29](#). Here, the participants were able to tick several items at the same time based on their experience. To obtain a more accurate understanding, the author chose to perform several analyses with different groupings. The groupings were chosen so that a possible influence of the five eligible development domains becomes apparent. The development domains examined are as follows:

1. embedded software,
2. mobile applications,
3. desktop applications,
4. web applications, and
5. HPC applications.

A separate analysis of experiences in several development domains affecting the documentation frequency was additionally carried out. A total of 97 of the 102 participants stated that they would work in at least one of the five eligible development domains. The remaining five participants did not indicate a domain and will not be considered in the further analysis.

For each of the individual analyses performed, the respective independent variable is compared against three instruments. First, the documentation frequency is evaluated (cf. [Question Q-01](#)). Subsequently, the specified answers on the documentation frequency regarding individual decision types (cf. [Question Q-04](#)) are compared against the independent variable. In order to do so, all collected answers for [Question Q-04](#) will be aggregated. Afterwards, the same is done for the documentation frequency distributed over the different Scrum activities (cf. [Question Q-14](#)).

Following the hypotheses set out below, the individual groups are compared with each other in terms of the respective documentation frequency (cf. [Q-01](#) / [Q-04](#) / [Q-14](#)). The focus will be on one domain per analysis in order to examine the influence of this domain. Subsequently, the results are analysed across all three dependent variables, and it is specified to what extent a statement on the influence of the corresponding development domain can be found with the help of these results.

The following hypotheses were put forward for the detailed hypothesis tests:

- [Question Q-01](#):

$H_0$ : The development domains in which software engineers are working *do not affect* how frequently they document their decisions.

$H_1$ : The development domains in which software engineers are working *affect* how frequently they document their decisions.

- **Question Q-04:**

$H_0$ : The development domains in which software engineers are working *do not affect* how frequently they document certain decision types.

$H_1$ : The development domains in which software engineers are working *affect* how frequently they document certain decision types.

- **Question Q-14:**

$H_0$ : The development domains in which software engineers are working *do not affect* during which activities they document their decisions.

$H_1$ : The development domains in which software engineers are working *affects* during which activities they document their decisions.

The results are analysed and presented separately in the following, depending on the individual Scrum roles. In each case, the results of the groups are briefly compared and then evaluated. Finally, a conclusion provides a brief evaluation of all results.

## Embedded Software

<i>Embedded Systems</i> Domain Affecting the Decision Documentation Frequency																																																					
<i>(Dependent. Var. ↓)</i>																																																					
Documentation frequency (general) – Question Q-01	Based on the available data, no evidence was found that working in the <i>embedded software</i> domain affects the documentation frequency  for details, see: <a href="#">Table D.70</a> <span style="float: right;">p. 300</span>																																																				
Documentation frequency across all decision types – Question Q-04	<p>The results found are pointing in different directions and show no apparent trend.</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>embedded</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>embedded</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>embedded</td> <td><b>less than</b></td> <td>3–4 other domains</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>embedded</td> <td><b>less than</b></td> <td>embedded + 1 other</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>embedded</td> <td>–</td> <td>embedded + 2–4 other</td> <td>–</td> </tr> <tr> <td>embedded + 1 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>embedded + 1 other</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>embedded + 1 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>embedded + 1 other</td> <td>–</td> <td>embedded + 2–4 other</td> <td>–</td> </tr> <tr> <td>embedded + 2–4 other</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>embedded + 2–4 other</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>embedded + 2–4 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.76</a> <span style="float: right;">p. 306</span></p>	Group A	Doc. Frequency	Group B	Significance	embedded	–	1 other domain	–	embedded	–	2 other domains	–	embedded	<b>less than</b>	3–4 other domains	$\alpha = 0.10$	embedded	<b>less than</b>	embedded + 1 other	$\alpha = 0.10$	embedded	–	embedded + 2–4 other	–	embedded + 1 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	embedded + 1 other	–	2 other domains	–	embedded + 1 other	–	3–4 other domains	–	embedded + 1 other	–	embedded + 2–4 other	–	embedded + 2–4 other	–	1 other domain	–	embedded + 2–4 other	–	2 other domains	–	embedded + 2–4 other	–	3–4 other domains	–
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Documentation frequency across all Scrum phases – Question Q-14	Based on the available data, no evidence was found that working in the <i>embedded software</i> domain affects the documentation frequency.  for details, see: <a href="#">Table D.86</a> <span style="float: right;">p. 316</span>																																																				

Table 5.32.: *Embedded software* domain affecting decision documentation frequency.

The synthesis of all three dependent variables studied does not allow for any apparent conclusion. It can be assumed that the *embedded systems* domain does not influence the decision documentation frequency.

## Mobile Applications

<i>Mobile Applications</i> Domain Affecting the Decision Documentation Frequency																																																					
<i>(Dependent. Var. ↓)</i>																																																					
Documentation frequency (general) – Question Q-01	<p>Based on the available data, no evidence was found that working in the <i>mobile applications</i> domain affects the documentation frequency.</p> <p>for details, see: <a href="#">Table D.71</a> <span style="float: right;">p. 301</span></p>																																																				
Documentation frequency across all decision types – Question Q-04	<p>The available data show a significant difference for two of the twelve groups in question. According to these results, people developing <i>mobile applications</i> are more likely to document decisions than those with experience in exclusively one other domain. Moreover, there are indications that this relationship also applies generally to the other pairs. However, the groups should be larger in order to draw more meaningful conclusions. For example, only one participant has gained experience exclusively in the domain of <i>mobile applications</i> (cf. <a href="#">Table D.77</a>).</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>mobile apps</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>mobile apps</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>mobile apps</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>mobile apps</td> <td>–</td> <td>Mobile + 1 other</td> <td>–</td> </tr> <tr> <td>mobile apps</td> <td>–</td> <td>Mobile + 2–4 other</td> <td>–</td> </tr> <tr> <td>mobile + 1 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>mobile + 1 other</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>mobile + 1 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>mobile + 1 other</td> <td>–</td> <td>mobile + 2–4 other</td> <td>–</td> </tr> <tr> <td>mobile + 2–4 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>mobile + 2–4 other</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>mobile + 2–4 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.77</a> <span style="float: right;">p. 307</span></p>	Group A	Doc. Frequency	Group B	Significance	mobile apps	–	1 other domain	–	mobile apps	–	2 other domains	–	mobile apps	–	3–4 other domains	–	mobile apps	–	Mobile + 1 other	–	mobile apps	–	Mobile + 2–4 other	–	mobile + 1 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	mobile + 1 other	–	2 other domains	–	mobile + 1 other	–	3–4 other domains	–	mobile + 1 other	–	mobile + 2–4 other	–	mobile + 2–4 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	mobile + 2–4 other	–	2 other domains	–	mobile + 2–4 other	–	3–4 other domains	–
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Documentation frequency across all Scrum phases – Question Q-14	<p>Based on the available data, no evidence was found that working in the <i>mobile applications</i> domain affects the documentation frequency.</p> <p>for details, see: <a href="#">Table D.87</a> <span style="float: right;">p. 317</span></p>																																																				

Table 5.33.: *Mobile applications* domain affecting decision documentation frequency.

The data indicate a weak influence of the *mobile applications* domain on the documentation frequency. According to this, people who develop *mobile applications* also document their decisions more frequently. The result is particularly clear for decisions relating to user experience. In line with the results averaged over all types of decisions, it can be seen that participants who develop mobile applications document decisions relating to the user experience significantly more frequently (cf. [Figure D.90](#) and [Table D.87](#)).

## Desktop Applications

<i>Desktop Applications</i> Domain Affecting the Decision Documentation Frequency																																																					
(Dependent. Var. ↓)																																																					
Documentation frequency (general) – Question Q-01	Based on the available data, no evidence was found that working in the <i>desktop applications</i> domain affects the documentation frequency.  for details, see: <a href="#">Table D.72</a> <span style="float: right;">p. 302</span>																																																				
Documentation frequency across all decision types – Question Q-04	The results found are pointing in different directions and show no apparent trend. <table border="1" style="margin: 10px auto;"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>desktop apps</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>desktop apps</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>desktop apps</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>desktop apps</td> <td>–</td> <td>desktop + 1 other</td> <td>–</td> </tr> <tr> <td>desktop apps</td> <td>–</td> <td>desktop + 2–4 other</td> <td>–</td> </tr> <tr> <td>desktop + 1 other</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>desktop + 1 other</td> <td><b>less than</b></td> <td>2 other domains</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>desktop + 1 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>desktop + 1 other</td> <td>–</td> <td>desktop + 2–4 other</td> <td>–</td> </tr> <tr> <td>desktop + 2–4 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>desktop + 2–4 other</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>desktop + 2–4 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> </tbody> </table> for details, see: <a href="#">Table D.78</a> <span style="float: right;">p. 308</span>	Group A	Doc. Frequency	Group B	Significance	desktop apps	–	1 other domain	–	desktop apps	–	2 other domains	–	desktop apps	–	3–4 other domains	–	desktop apps	–	desktop + 1 other	–	desktop apps	–	desktop + 2–4 other	–	desktop + 1 other	–	1 other domain	–	desktop + 1 other	<b>less than</b>	2 other domains	$\alpha = 0.10$	desktop + 1 other	–	3–4 other domains	–	desktop + 1 other	–	desktop + 2–4 other	–	desktop + 2–4 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	desktop + 2–4 other	–	2 other domains	–	desktop + 2–4 other	–	3–4 other domains	–
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Documentation frequency across all Scrum phases – Question Q-14	Based on the available data, no evidence was found that working in the <i>desktop applications</i> domain affects the documentation frequency.  for details, see: <a href="#">Table D.88</a> <span style="float: right;">p. 318</span>																																																				

Table 5.34.: *Desktop applications* domain affecting decision documentation frequency.

The synthesis of all three dependent variables studied does not allow for any apparent conclusion. It can be assumed that the *desktop applications* domain does not influence the decision documentation frequency.

## Web Applications

Web Applications Domain Affecting the Decision Documentation Frequency																																																					
(Dependent. Var. ↓)																																																					
Documentation frequency (general) – Question Q-01	Based on the available data, no evidence was found that working in the <i>web applications</i> domain affects the documentation frequency.  for details, see: <a href="#">Table D.73</a> <span style="float: right;">p. 303</span>																																																				
Documentation frequency across all decision types – Question Q-04	<p>The data suggests that software engineers working in web development domains document their decisions more often. However, there seems to be a limitation to the group of software engineers who gained experience in more than one domain (for more details, see <a href="#">Figure D.81</a> and <a href="#">Table D.79</a>).</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>web apps</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>web apps</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>web apps</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>web apps</td> <td>–</td> <td>Web + 1 other</td> <td>–</td> </tr> <tr> <td>web apps</td> <td>–</td> <td>Web + 2–4 other</td> <td>–</td> </tr> <tr> <td>web + 1 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>web + 1 other</td> <td><b>more than</b></td> <td>2 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>web + 1 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>web + 1 other</td> <td>–</td> <td>web + 2–4 other</td> <td>–</td> </tr> <tr> <td>web + 2–4 other</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>web + 2–4 other</td> <td><b>more than</b></td> <td>2 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>web + 2–4 other</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.79</a> <span style="float: right;">p. 309</span></p>	Group A	Doc. Frequency	Group B	Significance	web apps	–	1 other domain	–	web apps	–	2 other domains	–	web apps	–	3–4 other domains	–	web apps	–	Web + 1 other	–	web apps	–	Web + 2–4 other	–	web + 1 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	web + 1 other	<b>more than</b>	2 other domains	$\alpha = 0.05$	web + 1 other	–	3–4 other domains	–	web + 1 other	–	web + 2–4 other	–	web + 2–4 other	–	1 other domain	–	web + 2–4 other	<b>more than</b>	2 other domains	$\alpha = 0.05$	web + 2–4 other	–	3–4 other domains	–
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Documentation frequency across all Scrum phases – Question Q-14	Based on the available data, no evidence was found that working in the <i>web applications</i> domain affects the documentation frequency.  for details, see: <a href="#">Table D.89</a> <span style="float: right;">p. 319</span>																																																				

Table 5.35.: *Web applications* domain affecting decision documentation frequency.

The data indicate a moderate influence of the *web applications* domain on the documentation frequency. According to this, people who develop *web applications* also document their decisions more frequently.

## High-Performance Computing (HPC)

<i>HPC</i> Domain Affecting the Decision Documentation Frequency																																																					
<i>(Dependent. Var. ↓)</i>																																																					
Documentation frequency (general) – Question Q-01	<p>Based on the available data, no evidence was found that working in the <i>HPC applications</i> domain affects the documentation frequency.</p> <p>for details, see: <a href="#">Table D.74</a> <span style="float: right;">p. 304</span></p>																																																				
Documentation frequency across all decision types – Question Q-04	<p>The results for the <i>HPC</i> domain show a mixed picture. Amongst other things, this is because there were no survey participants who worked or have worked exclusively in the <i>HPC</i> domain. For the two remaining groups with <i>HPC</i> experience, the results are contradictory. The participants who work in the <i>HPC</i> domain and one additional domain document significantly less than the compared groups. In contrast, those who gained experience in the <i>HPC</i> domain and two to four other domains document significantly more than their compared groups.</p> <table border="1"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>HPC applications</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>HPC applications</td> <td>–</td> <td>2 other domains</td> <td>–</td> </tr> <tr> <td>HPC applications</td> <td>–</td> <td>3–4 other domains</td> <td>–</td> </tr> <tr> <td>HPC applications</td> <td>–</td> <td>HPC + 1 other</td> <td>–</td> </tr> <tr> <td>HPC applications</td> <td>–</td> <td>HPC + 2–4 other</td> <td>–</td> </tr> <tr> <td>HPC + 1 other</td> <td>–</td> <td>1 other domain</td> <td>–</td> </tr> <tr> <td>HPC + 1 other</td> <td><b>less than</b></td> <td>2 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>HPC + 1 other</td> <td><b>less than</b></td> <td>3–4 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>HPC + 1 other</td> <td><b>less than</b></td> <td>HPC + 2–4 other</td> <td><math>\alpha = 0.10</math></td> </tr> <tr> <td>HPC + 2–4 other</td> <td><b>more than</b></td> <td>1 other domain</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>HPC + 2–4 other</td> <td><b>more than</b></td> <td>2 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>HPC + 2–4 other</td> <td><b>more than</b></td> <td>3–4 other domains</td> <td><math>\alpha = 0.05</math></td> </tr> </tbody> </table> <p>for details, see: <a href="#">Table D.80</a> <span style="float: right;">p. 310</span></p>	Group A	Doc. Frequency	Group B	Significance	HPC applications	–	1 other domain	–	HPC applications	–	2 other domains	–	HPC applications	–	3–4 other domains	–	HPC applications	–	HPC + 1 other	–	HPC applications	–	HPC + 2–4 other	–	HPC + 1 other	–	1 other domain	–	HPC + 1 other	<b>less than</b>	2 other domains	$\alpha = 0.05$	HPC + 1 other	<b>less than</b>	3–4 other domains	$\alpha = 0.05$	HPC + 1 other	<b>less than</b>	HPC + 2–4 other	$\alpha = 0.10$	HPC + 2–4 other	<b>more than</b>	1 other domain	$\alpha = 0.05$	HPC + 2–4 other	<b>more than</b>	2 other domains	$\alpha = 0.05$	HPC + 2–4 other	<b>more than</b>	3–4 other domains	$\alpha = 0.05$
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HPC + 2–4 other	<b>more than</b>	3–4 other domains	$\alpha = 0.05$																																																		
Documentation frequency across all Scrum phases – Question Q-14	<p>Based on the available data, no evidence was found that working in the <i>HPC applications</i> domain affects the documentation frequency.</p> <p>for details, see: <a href="#">Table D.90</a> <span style="float: right;">p. 320</span></p>																																																				

Table 5.36.: *HPC applications* domain affecting decision documentation frequency.

The synthesis of all three dependent variables studied does not allow for any apparent conclusion. It can be assumed that the domain of *High-Performance Computing (HPC)* does not influence the decision documentation frequency.

## Quantity of Domains Working In

<i>Quantity of Domains Affecting the Decision Documentation Frequency</i>																					
<i>(Dependent. Var. ↓)</i>																					
Documentation frequency (general) – Question Q-01	Based on the available data, no evidence was found that the <i>quantity of domains</i> a participant gained experience in affects the documentation frequency.  for details, see: <a href="#">Table D.69</a> <span style="float: right;">p. 299</span>																				
Documentation frequency across all decision types – Question Q-04	The available data show a significant correlation, as follows: The more domains a software engineer gained experience in, the more frequently he / she will document his decisions. This positive monotone correlation is of moderate strength and highly significant.  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Group A</th> <th>Doc. Frequency</th> <th>Group B</th> <th>Significance</th> </tr> </thead> <tbody> <tr> <td>1 domain</td> <td><b>less than</b></td> <td>2 domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>1 domain</td> <td><b>less than</b></td> <td>3–5 domains</td> <td><math>\alpha = 0.05</math></td> </tr> <tr> <td>2 domains</td> <td>–</td> <td>3–5 domains</td> <td>–</td> </tr> <tr> <td colspan="2">Correlation:</td> <td colspan="2"><math>\rho = 0.118, p = 1.553 * 10^{-4}</math></td> </tr> </tbody> </table> for details, see: <a href="#">Figure D.77</a> <span style="float: right;">p. 305</span>	Group A	Doc. Frequency	Group B	Significance	1 domain	<b>less than</b>	2 domains	$\alpha = 0.05$	1 domain	<b>less than</b>	3–5 domains	$\alpha = 0.05$	2 domains	–	3–5 domains	–	Correlation:		$\rho = 0.118, p = 1.553 * 10^{-4}$	
Group A	Doc. Frequency	Group B	Significance																		
1 domain	<b>less than</b>	2 domains	$\alpha = 0.05$																		
1 domain	<b>less than</b>	3–5 domains	$\alpha = 0.05$																		
2 domains	–	3–5 domains	–																		
Correlation:		$\rho = 0.118, p = 1.553 * 10^{-4}$																			
Documentation frequency across all Scrum phases – Question Q-14	Based on the available data, no evidence was found that the <i>quantity of domains</i> a participant gained experience in affects the documentation frequency.  for details, see: <a href="#">Table D.85</a> <span style="float: right;">p. 315</span>																				

Table 5.37.: The *quantity of domains* working in, affecting the decision documentation frequency.

The available data show a highly significant positive monotonic relationship for one of the three variables studied. It says: The more domains a software engineer gained experience in, the more frequently he / she will document his decisions. This correlation with  $\rho = 0.118$  of moderate strength.

Considering that the dependent variables from [Question Q-01](#) and [Question Q-14](#) did not produce results for the other groupings, this does not seem unusual. The author interprets the results to indicate a weak positive monotone correlation between the quantity of domains in which the participants work or have worked and the decision documentation frequency.



## Conclusion – RQ2-H9

Summary: Development Domains Affecting the Decision Documentation Frequency	
<i>(Indep. Var. ↓)</i>	
Embedded Software	The available data show no clear evidence that working in the <i>embedded systems</i> domain influences the documentation frequency.
Mobile Applications	The data indicate a weak influence of the <i>mobile applications</i> domain on the documentation frequency. According to this, people who develop <i>mobile applications</i> also document their decisions more frequently. It should be noted that the data only show significant results for one of the three dependent variables. While the results are consistent, they prove the influence of only a part of the variable. Therefore, the author has chosen to define the influence as weak, although the results are highly significant.
Desktop Application	The available data show no clear evidence that developing <i>desktop applications</i> influences the documentation frequency.
Web Applications	The data indicate a moderate influence of the <i>web applications</i> domain on the documentation frequency. According to this, people who develop <i>web applications</i> also document their decisions more frequently. In analogy to the situation described above for <i>mobile applications</i> , the author has decided to speak of a weak influence, although the results are highly significant.
HPC	The available data show no clear evidence that working in the <i>High-Performance Computing</i> domain influences the documentation frequency.
Quantity of Domains Working in	The author interprets the results to indicate a weak positive monotone correlation between the quantity of domains in which the participants work or have worked and the decision documentation frequency. The more domains a software engineer gained experience in, the more frequently he / she will document his decisions.

Table 5.38.: Development domains affecting the decision documentation frequency.

The analysis of the different groups for significant differences shows that for none of the groupings examined (cf. Table 5.38), there were results for the answers from Question Q-01 / Question Q-14. All results refer to the investigated answers for Question Q-04. Since this question has the most data points, it can be assumed that a larger population would also lead to results for the other two variables. On the other hand, it should be noted that the results of the dependent variables are not homogeneous. Accordingly, the author only asserts a weak influence by *web applications* and *mobile applications*, although the found differences are highly significant.

Overall, there is an apparent influence from the domains in which software engineers work or have worked. On the one hand, there is a positive monotone correlation between documentation frequency and the quantity of domains in which software engineers work or have worked. On the other hand, software engineers who develop either *mobile applications* or *web applications* document more frequently. Accordingly, hypothesis *RQ2-H9 must be accepted*.

## RQ2-H10 – Experience Affects the Amount of Rationale Software Engineers Document for a Decision

To evaluate the *research hypothesis RQ2-H10*, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) with the documentation frequency of rationale (dependent variable = Question Q-07). Accordingly, the following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* on the rationale documentation frequency.

$H_1$ : Experience *affects* the rationale documentation frequency.

Subsequently, the detailed results are presented regarding the corresponding data around the analyses described above. The chapter is concluded by a summary and a final evaluation of the *research hypothesis RQ2-H10*.

### Rationale Documentation Frequency

Experience Affecting the Usage Frequency of Capture Guidelines	
<i>(Dependent Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><math>H_1</math> is to be accepted. – The data show a strong positive monotone correlation between <i>documentation experience</i> and the rationale documentation frequency being highly significant (<math>\alpha = 0.05</math>). It is so distinct that there is a highly significant difference for each available pairing of two experience groups.</p> <p><b>Spearman:</b> <math>\rho = 0.364</math>, <math>p = 4.0 * 10^{-29}</math></p> <p>for details, see: <a href="#">Table D.91</a> <span style="float: right;">p. 321</span></p>
Development Experience – Question Q-26	<p><math>H_1</math> is to be accepted. – No systematic differences between the individual groups of experience can be identified from the available data. Instead, a moderately positive monotone correlation between <i>development experience</i> and the rationale documentation frequency can be proven (<math>\alpha = 0.05</math>).</p> <p><b>Spearman:</b> <math>\rho = 0.123</math>, <math>p = 3.3 * 10^{-4}</math></p> <p>for details, see: <a href="#">Table D.92</a> <span style="float: right;">p. 322</span></p>
Scrum Experience – Question Q-27	<p><math>H_1</math> is to be accepted. – The available answers show that software engineers with advanced <i>Scrum experience</i> and experts document rationale significantly less frequently (<math>\alpha = 0.05</math>) than Scrum novices. There is a moderate negative monotone correlation between <i>Scrum experience</i> and rationale documentation frequency (<math>\alpha = 0.05</math>).</p> <p><b>Spearman:</b> <math>\rho = -0.132</math>, <math>p = 8.1 * 10^{-5}</math></p> <p>for details, see: <a href="#">Table D.93</a> <span style="float: right;">p. 323</span></p>

Table 5.39.: Experience affecting the usage frequency of capture guidelines.

[Table 5.39](#) above summarises the hypothesis testing results and correlation analysis between the different dimensions of experience and the documentation frequency of rationales. The left-hand

column shows the independent variable that is examined in the respective row. The right-hand column shows the corresponding results.

The available results show highly-significant correlations between the experience factor and the rationale documentation frequency ( $\alpha = 0.05$ , even  $\alpha = 0.005$ ). These correlations are both positive and negative concerning documentation frequency and also have different significances. Firstly, there is a strong positive correlation between documentation experience and the rationale documentation frequency.

Furthermore, there is a moderate positive correlation between development experience and the rationale documentation frequency. The picture is not uniform when looking at the results found for *Scrum experience*. Survey participants with advanced *Scrum experience* and Scrum experts document significantly less than Scrum novices ( $\alpha = 0.05$ ). Following these findings, a moderately negative correlation exists between *Scrum experience* and the documentation frequency of rationales.

## Conclusion – RQ2-H10

The results of the relationships studied between the dependent variable *rationale documentation frequency* (cf. Q-08) and the three independent variables representing the dimensions of experience (cf. Q-01, Q-26, Q-27) show a clear relationship. All three combinations show significant correlations, one strong and two moderate with  $\alpha = 0.005$  (cf. Table 5.40). Among these, two clear trends can be identified. On the one hand, participants who document decisions more frequently (cf. *documentation experience*, Section 4.3.1) also document rationales more frequently. In line with this trend, there is also a positive correlation between development experience and the documentation frequency of rationales.

( <i>Indep. Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Rationale Documentation Frequency	Strong monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.364, p \ll 0.05$	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.123, p \ll 0.05$	Structural differences; moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.132, p \ll 0.05$
Details	Table D.91 – p. 321	Table D.92 – p. 322	Table D.93 – p. 323

Table 5.40.: Experience affecting the rationale documentation frequency.

The second trend is exactly the opposite and is related to Scrum experience. Software engineers with more Scrum experience document reasoning information less frequently. There is a highly significant difference between the more Scrum-experienced practitioners and the Scrum novices (cf. Table D.93 – p. 323). According to this result, novices document rationale information more frequently.

In summary, there is a clear influence of experience on the documentation frequency of rationales for decisions. Accordingly, the *research hypothesis RQ2-H10* is to be *accepted*.

### 5.3.3. RQ3 – How to Use Documented Rationale?

The following section contains the evaluations around research question RQ3. The question here is how decision rationales could be used once documented. As central aspects, experience, the Scrum roles in which the participants gained profound experience in and team size are the elements that are the basis for the analyses. It is being investigated how these elements could influence the use of decision rationales. The author, thus, developed eight hypotheses that analyse the relationships and differences between variables of interest to the author.

#### RQ3-H1 – Experience Affects the Perceived Usefulness of Documented Decisions

To evaluate research hypothesis RQ3-H1, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) with the perceived usefulness of decisions (dependent variable = Question Q-05). From the author's point of view, Question Q-05 reflects exactly this usefulness, as it determines whether certain decisions are worth documenting or not. Accordingly, the following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : A software engineer's experience *does not influence* how far he / she considers it necessary to document a certain decision or not.

$H_1$ : A software engineer's experience *affects* how far he / she considers it necessary to document a certain decision or not.

Subsequently, detailed results are presented regarding the data around the analyses described above. The chapter is concluded by the final evaluation of the research hypothesis RQ3-H1.

#### Documentation Usefulness

Table 5.41 on the next page summarises the results of hypothesis testing and correlation analysis between the different dimensions of experience and the perceived usefulness of documenting decisions. The left-hand column shows the independent variable that is examined in the respective row. The right-hand column shows the corresponding results.

Experience Affecting the Perceived Usefulness of Documented Decisions	
<p>(Independent Var. ↓)</p> <p>Documentation Experience — Question Q-01</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – The present results show a significant moderate positive monotone correlation (<math>\alpha = 0.05</math>) between the documentation experience (cf. <a href="#">Section 4.3.1</a>) and the perceived usefulness of documented decisions (cf. <a href="#">Question Q-05</a>). Furthermore, there is a clear difference between the two most experienced groups (documentation experience) and the two least experienced groups. The latter see a significantly lower benefit in documenting decisions, albeit at a high level.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = 0.154, p = 3.4 * 10^{-7}</math></p>
<p>Development Experience — Question Q-26</p>	<p><i>Failed to reject H<sub>0</sub>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.026, p = 0.398</math></p>
<p>Scrum Experience — Question Q-27</p>	<p><i>H<sub>1</sub> is to be accepted.</i> – The available answers show that software engineers with advanced <i>Scrum experience</i> and experts document rationale significantly less frequently (<math>\alpha = 0.05 / \alpha = 0.10</math>) than Scrum novices. Besides, there is a weak negative monotone correlation (<math>\alpha = 0.05</math>) between <i>Scrum experience</i> and the perceived usefulness of documented decisions (cf. <a href="#">Question Q-05</a>).</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.077, p = 0.011</math></p>
	<p>for details, see: <a href="#">Table E.1</a> <span style="float: right;">p. 324</span></p> <hr/> <p>for details, see: <a href="#">Table E.2</a> <span style="float: right;">p. 326</span></p> <hr/> <p>for details, see: <a href="#">Table E.3</a> <span style="float: right;">p. 327</span></p>

Table 5.41.: Experience affecting the usage frequency of capture guidelines.

The available results show significant correlations between experience and the perceived usefulness of documenting decisions ( $\alpha = 0.05$ , even  $\alpha = 0.005$ ). Firstly, there is a moderately positive correlation between documentation experience and the perceived usefulness of documenting decisions. On the other hand, there is a weak negative correlation between Scrum experience and the perceived usefulness of documenting decisions. These findings are accompanied by the fact that participants with advanced Scrum experience and Scrum experts see significantly less benefit in the availability of rationale than Scrum beginners. Furthermore, there is a clear difference between the two most experienced groups (documentation experience) and the two least experienced groups (cf. [Table E.2](#)). The latter see a significantly lower benefit in documenting decisions, albeit at a high level. Finally, it should be noted that no significant influence can be proven by development experience.

## Conclusion – RQ3-H1

The results of the relationships studied between the dependent variable *usefulness of decision documentation* (cf. [Q-05](#)) and the three independent variables representing the dimensions of experience (cf. [Q-01](#), [Q-26](#), [Q-27](#)) show a clear relationship. The data show significant correlations for two of three combinations, one moderate ( $\alpha = 0.005$ ) and one weak relationship ( $\alpha = 0.05$ ; cf.

Table 5.42 on the next page). Two clear trends can be identified. On the one hand, participants who document decisions more frequently (cf. *documentation experience*, Section 4.3.1) also perceive certain decision types in question to be more useful.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Rationale Usefulness	Structural differences; moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.154, p \ll 0.05$	No apparent relationship <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.026, p = 0.398$	Structural differences; weak monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.077, p = 0.011$
Details	<a href="#">Table E.1 – p. 324</a>	<a href="#">Table E.2 – p. 326</a>	<a href="#">Table E.3 – p. 327</a>

Table 5.42.: Experience affecting the perceived usefulness of rationale.

The second trend is exactly the opposite and is related to Scrum experience. Software engineers with more *Scrum experience* indicate that they value the documentation of certain decision types less. There is a significant difference between the more Scrum-experienced practitioners and the Scrum novices (cf. [Table E.3 – p. 327](#)). According to this difference, documentation of certain decision types appears to be more useful to Scrum novices.

In summary, there is a clear influence of experience on the perceived usefulness documentation of decisions. Accordingly, the *research hypothesis RQ3-H1* is to be *accepted*.

## RQ3-H2 – Experience Affects the Perceived Usefulness of Rationale for a Decision in Question

To evaluate the research hypothesis RQ3-H2, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) with the perceived usefulness of rationales (dependent variable = Question Q-08) for a decision in question. Accordingly, the following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : If a previous decision is challenged, the experience of a software engineer *does not influence* how useful he or she finds certain rationales.

$H_1$ : If a previous decision is challenged, the experience of a software engineer *influences* how useful he or she finds certain rationales.

Subsequently, the detailed results are presented regarding the corresponding data around the analyses described above. The chapter is concluded the final evaluation of research hypothesis RQ3-H2.

### Rationale Usefulness

Experience Affecting the Perceived Usefulness of Rationale	
(Independent Var. ↓)  Documentation Experience – Question Q-01	<p><math>H_1</math> is to be accepted. – No systematic differences between the individual groups of experience can be identified from the available data. Instead, a moderately positive monotone correlation between development experience and the rationale documentation frequency can be proven (<math>\alpha = 0.05</math>).</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = 0.174, p = 1.6 * 10^{-7}</math></p> <p>for details, see: <a href="#">Table E.4</a> <span style="float: right;">p. 328</span></p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = 0.025, p = 0.467</math></p> <p>for details, see: <a href="#">Table E.5</a> <span style="float: right;">p. 329</span></p>
Scrum Experience – Question Q-27	<p><math>H_1</math> is to be accepted. – The available answers show that software engineers with advanced <i>Scrum experience</i> and experts document rationale significantly less frequently (<math>\alpha = 0.05</math>) than Scrum novices. There is a moderate negative monotone correlation between <i>Scrum experience</i> and rationale documentation frequency (<math>\alpha = 0.05</math>).</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.156, p = 3.1 * 10^{-6}</math></p> <p>for details, see: <a href="#">Table E.6</a> <span style="float: right;">p. 330</span></p>

Table 5.43.: Experience affecting the usage frequency of capture guidelines.

Table 5.43 above summarises the results of hypothesis testing and correlation analysis between the different dimensions of experience and the perceived usefulness of rationales. The left-hand

column shows the independent variable examined in the respective row, and the right-hand column shows the individual results.

The available results show significant correlations between experience and the perceived usefulness of rationale ( $\alpha = 0.05$ , even  $\alpha = 0.005$ ). Firstly, there is a moderately positive correlation between documentation experience and the perceived usefulness of rationales. On the other hand, there is a moderately negative correlation between Scrum experience and the perceived usefulness of rationales. These findings are accompanied by the fact that participants with advanced Scrum experience and Scrum experts see significantly less benefit in the availability of rationale than Scrum beginners. Furthermore, no significant influence can be proven by development experience.

## Conclusion – RQ3-H2

The results of the relationships studied between the dependent variable *rationale usefulness* (cf. Q-08) and the three independent variables representing the dimensions of experience (cf. Q-01, Q-26, Q-27) show a clear relationship. The data show significant correlations for two of three combinations, two moderate with  $\alpha = 0.005$  each (cf. Table 5.44). Two clear trends can be identified. On the one hand, participants who document decisions more frequently (cf. *documentation experience*, Section 4.3.1) also perceive the rationale for a decision in question to be more useful.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Rationale Usefulness	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.174, p \ll 0.05$	No apparent relationship <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.025, p = 0.467$	Structural differences; moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.156, p \ll 0.05$
Details	<a href="#">Table E.4 – p. 328</a>	<a href="#">Table E.5 – p. 329</a>	<a href="#">Table E.6 – p. 330</a>

Table 5.44.: Experience affecting the perceived usefulness of rationale.

The second trend is exactly the opposite and is related to Scrum experience. Software engineers with more Scrum experience indicate that they value rationale information less. There is a highly significant difference between the more Scrum-experienced practitioners and the Scrum novices (cf. Table E.6 – p. 330) The latter group value rationale information much more.

In summary, there is a clear influence of experience on the perceived usefulness of rationales for decisions in question. Accordingly, the *research hypothesis RQ3-H2* is to be *accepted*.



### RQ3-H3 – More Experienced Software Engineers Forget Reasons Justifying Decisions Less Frequently

To evaluate the research hypothesis RQ3-H3, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) with the frequency of forgetting reasons behind a decision (dependent variable = Question Q-21).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* how frequently a software engineer forgets decisions from the past.

$H_1$ : Experience *affects* how frequently a software engineer forgets decisions from the past.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

Experience Affecting the Usage Frequency of Capture Guidelines	
<i>(Dependent Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>documentation experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = -0.029</math>, <math>p = 0.774</math></p> <p>for details, see: <a href="#">Table E.7</a> <span style="float: right;">p. 331</span></p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = -0.048</math>, <math>p = 0.647</math></p> <p>for details, see: <a href="#">Table E.8</a> <span style="float: right;">p. 332</span></p>
Scrum Experience – Question Q-27	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>Scrum experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = -0.020</math>, <math>p = 0.843</math></p> <p>for details, see: <a href="#">Table E.9</a> <span style="float: right;">p. 333</span></p>

Table 5.45.: Experience affecting the usage frequency of capture guidelines.

The revealed results do not indicate that there is a connection. There are neither differences between the individual groups based on experience, nor are there correlations. Based on the results found, the hypothesis *RQ3-H3* is to be *rejected*.

## RQ3-H4 – More Experienced Software Engineers Revisit Decision Documentation to Understand Previous Decisions and Assess Potential Alternatives Less Frequently

To evaluate the research hypothesis RQ3-H4, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = [Question Q-01](#) / [Question Q-26](#) / [Question Q-27](#)) with the frequency of revisiting documentation (dependent variable = [Question Q-22](#)).

The following hypotheses were put forward for the detailed hypothesis tests:

$H_0$ : Experience *does not affect* how frequently a software engineer revisits decision documentation.

$H_1$ : Experience *affects* how frequently a software engineer revisits decision documentation.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated.

Experience Affecting the Usage Frequency of Capture Guidelines	
<i>(Independent Var. ↓)</i>	
Documentation Experience – <a href="#">Question Q-01</a>	<p><math>H_1</math> is to be accepted. – The hypothesis tests for difference and correlation show a clear influence of <i>documentation experience</i> on the usage frequency of documentation. There is a strong positive monotone correlation with <math>\rho = 0,355</math> between the two variables. In other words, participants who document a lot also use documentation frequently.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.355, p &lt; 0.001</math></p> <p>for details, see: <a href="#">Table E.10</a> <span style="float: right;">p. <a href="#">334</a></span></p>
Development Experience – <a href="#">Question Q-26</a>	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = 0.054, p = 0.604</math></p> <p>for details, see: <a href="#">Table E.11</a> <span style="float: right;">p. <a href="#">335</a></span></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>Scrum experience</i>. Furthermore, there is no significant correlation.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.037, p = 0.716</math></p> <p>for details, see: <a href="#">Table E.12</a> <span style="float: right;">p. <a href="#">336</a></span></p>

Table 5.46.: Experience affecting the usage frequency of capture guidelines.

The available results clearly show that experience, in general, influences the usage frequency of documentation. However, a clear distinction must be made here between the types of experience. It seems that those who document also use it more frequently. This observed correlation does not apply to the other two types of experience. Based on the results found, the hypothesis *RQ3-H4* has to be *accepted*.

## RQ3-H5 – For Software Engineers Working in Larger Teams, The Set of Involved Stakeholders Is of Greater Importance

For evaluating research hypothesis RQ3-H5, the team size (independent variable) was compared to three questions regarding information about the stakeholders involved. From the author's point of view, these data points represent the perceived importance of this information. One is the relevance of the information during reasoning on a decision (dependent variable = Question Q-09 – 6<sup>th</sup> item). Furthermore, the influence of team size on documentation frequency was investigated (dependent variable = Question Q-11 – 6<sup>th</sup> item). Finally, the usefulness of information about the stakeholders involved was compared with the team size (dependent variable = Question Q-13 – 6<sup>th</sup> item). The team size itself is given by the data from Question Q-31 (independent variable).

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-09:**

$H_0$ : Team size *does not affect* the usage frequency of the rationale information element *involved stakeholders*.

$H_1$ : Team size *affects* the usage frequency of the rationale information element *involved stakeholders*.

- **Question Q-11:**

$H_0$ : Team size *does not affect* the documentation frequency of the rationale information type *involved stakeholders*.

$H_1$ : Team size *affects* the documentation frequency of the rationale information element *involved stakeholders*.

- **Question Q-13:**

$H_0$ : Team size *does not affect* the perceived usefulness of the rationale information element *involved stakeholders*.

$H_1$ : Team size *affects* the perceived usefulness of the rationale information element *involved stakeholders*.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated. Finally, a result for the hypothesis evaluation is given.

Team Size Affecting the Perceived Importance of Involved Stakeholders	
<i>(Dependent Var. ↓)</i>	
Information Used for Reasoning – Question Q-09	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>team size</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.139, p = 0.224</math></p> <p>for details, see: <a href="#">Table E.13</a> <span style="float: right;">p. 337</span></p>
Documentation Frequency of the Information – Question Q-11	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>team size</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.139, p = 0.226</math></p> <p>for details, see: <a href="#">Table E.14</a> <span style="float: right;">p. 338</span></p>
Perceived Usefulness of the Information – Question Q-13	<p><i><math>H_1</math> is to be accepted.</i> – There are no significant differences between the individual groups sorted by <i>team size</i>. However, there is a moderate positive monotone correlation between the groups. It indicates that with increasing <i>team size</i>, the knowledge of the <i>involved stakeholders</i> becomes more and more useful.</p> <p>Spearman: <math>\rho = 0.232, p = 0.044</math> Kendall: <math>\tau = 0.202, p = 0.040</math></p> <p>for details, see: <a href="#">Table E.15</a> <span style="float: right;">p. 339</span></p>

Table 5.47.: Experience affecting the usage frequency of capture guidelines.

The results show that there is no evidence that team size influences the use of the information to reason a decision to be taken. Neither does the team size influence how often the participants document the information about the stakeholders involved. Surprisingly, however, the results show that this information becomes more important for understanding a decision made in the past with increasing team size. Here the data show a moderate positive monotone correlation between the two variables. Based on these results found, the hypothesis *RQ3-H5* has to be *accepted*.

## RQ3-H6 – For Software Engineers Working in Larger Teams, Stakeholder Arguments Are of Greater Importance

For evaluating of the research hypothesis RQ3-H6, the team size (independent variable) was compared to three questions regarding information about the stakeholders' arguments. From the author's point of view, these data points represent the perceived importance of this information. One is the relevance of the information during reasoning on a decision (dependent variable = [Question Q-09 – 7<sup>th</sup> item](#)). Furthermore, the influence of team size on documentation frequency was investigated (dependent variable = [Question Q-11 – 7<sup>th</sup> item](#)). Finally, the usefulness of information about the stakeholders involved was compared with the team size (dependent variable = [Question Q-13 – 7<sup>th</sup> item](#)). The team size itself is given by the data from question [Question Q-31](#) (independent variable).

The following hypotheses were put forward for the detailed hypothesis tests:

- **Question Q-09:**

$H_0$ : Team size *does not affect* the usage frequency of the rationale information element *stakeholder arguments*.

$H_1$ : Team size *affects* the usage frequency of the rationale information element *stakeholder arguments*.

- **Question Q-11:**

$H_0$ : Team size *does not affect* the documentation frequency of the rationale information element *stakeholder arguments*.

$H_1$ : Team size *affects* the documentation frequency of the rationale information element *stakeholder arguments*.

- **Question Q-13:**

$H_0$ : Team size *does not affect* the perceived usefulness of the rationale information element *stakeholder arguments*.

$H_1$ : Team size *affects* the perceived usefulness of the rationale information element *involved stakeholder arguments*.

The results are briefly summarised below. In each case, the results of the groups are briefly compared and then evaluated. Finally, a result for the hypothesis evaluation is given.

Team Size Affecting the Perceived Importance of Stakeholders' Arguments	
<i>(Dependent Var. ↓)</i>	
Information Used for Reasoning – Question Q-09	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>team size</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.109, p = 0.343</math></p> <p>for details, see: <a href="#">Table E.16</a> <span style="float: right;">p. 340</span></p>
Documentation Frequency of Information – Question Q-11	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>team size</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.151, p = 0.187</math></p> <p>for details, see: <a href="#">Table E.17</a> <span style="float: right;">p. 341</span></p>
Perceived Usefulness of Information – Question Q-13	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>team size</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.120, p = 0.301</math></p> <p>for details, see: <a href="#">Table E.18</a> <span style="float: right;">p. 342</span></p>

Table 5.48.: Experience affecting the usage frequency of capture guidelines.

The present results show that team size does not influence the perceived importance of the rationale information element *stakeholder arguments*. Based on these results, the hypothesis  $RQ\beta$ - $H6$  has to be *rejected*.

## RQ3-H7 – The Role of a Software Engineer in Scrum Affects the Retrospective Desire for Decision Documentation

For evaluating this hypothesis, the data on the experience gained in different roles are evaluated separately according to various grouping variables. This approach is necessary because of the nature of [Question Q-28](#). Here, the participants were able to tick several items at the same time based on their experience. To obtain a more accurate understanding, the author chose to perform several analyses with different groupings. These are oriented around the following roles:

1. *Developer* role / ordinary team member (Dev.),
2. *Scrum Master* role (SM), and
3. *Product Owner* role (PO).

A separate analysis of experiences in several roles affecting the retrospective desire for decision documentation was also carried out. For more details about the individual Scrum roles and how the corresponding information was surveyed in the questionnaire (cf. [Question Q-28](#)), please refer to [Section 4.3.2](#).

The evaluation of the research hypothesis is based on situations in which the participants would have liked to have documentation at hand while there was none, or they would consider it valuable, if available. This analysis is done with the help of the answers to questions [Q-23](#) and [Q-24](#), which are, therefore, the dependent variables. The first question, [Q-23](#), identifies situations in which documentation was not available, although it would have been beneficial. The other selected question, [Q-24](#), asked for situations in which decision documentation would be valuable, assuming it is available. Both questions offered the participants predefined answer possibilities and the possibility to record individual situations they had experienced.

In detail, the data is prepared so that the quantity of situations indicated is summed up for [Question Q-23](#) (see p. 87) and [Question Q-24](#) (see p. 88), respectively. The specific analyses apply the Kruskal-Wallis test. Rank correlation is calculated exclusively for the quantity of roles in which the participants have been able to gain profound experience so far.

- **Question Q-23:**

$H_0$ : The quantity of situations in which participants wished for documentation when none was available *does not relate* to the participants' profound experience in certain Scrum roles.

$H_1$ : The quantity of situations in which participants wished for documentation when none was available *is affected by* the participants' profound experience in certain Scrum roles.

- **Question Q-24:**

$H_0$ : The quantity of situations in which decision documentation is considered valuable, if available, *does not relate* to the participants' profound experience in certain Scrum roles.

$H_1$ : The quantity of situations in which decision documentation is considered valuable, if available, *is affected by* the participants' profound experience in certain Scrum roles.

From the author’s point of view, the sum of the given situations seems to be a more expressive measure than an individual analysis of the results for each of the given answer alternatives of the questions. The results should, for example, show how frequently participants with profound experience in certain Scrum roles have been in situations where they wished for documentation not available at the time. On the other hand, the second question can be used to illustrate the extent to which participants with profound experience in certain Scrum roles value documentation more or less frequently. Although the two underlying questions only ask whether such situations occurred and not the respective frequency, the data resulting from the analysis should give a clear impression concerning the research hypothesis. Accordingly, an evaluation of the research hypothesis RQ3-H7 is made from the derived results on the following pages (cf. [Table 5.49](#), [Table 5.50](#)).

## Situations in Which Decision Documentation Was Desired but Not Available At the Time

As introduced above, the sum of situations in which the survey participants would have liked to have documentation when none was available is compared to a level of profound experience gained in certain Scrum roles. [Table 5.49](#) contains the results line by line sorted by groupings according to the analysed Scrum roles.

Scrum Roles Affecting the Desire for Decision Documentation After the Fact When Not Available	
<i>(Independent Var. ↓)</i>	
Quantity of Scrum Roles — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience in <i>multiple Scrum roles</i> and the desire for documentation in situations with a lack of documentation.</p> <p style="text-align: right;">Spearman: <math>\rho = -0.071</math>, <math>p = 0.487</math></p> <p>for details, see: <a href="#">Table E.20</a> <span style="float: right;">p. 344</span></p>
Developer — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as a <i>Developer</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.21</a> <span style="float: right;">p. 345</span></p>
Scrum Master — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as <i>Scrum Master</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.22</a> <span style="float: right;">p. 346</span></p>
Product Owner — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as a <i>Product Owner</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.23</a> <span style="float: right;">p. 347</span></p>

Table 5.49.: Scrum roles affecting the desire for decision documentation after the fact – data computed based on answers to [Question Q-23](#).



## Situations in Which Decision Documentation Is Considered to Be Valuable if Available

In the following, the sum of situations in which documentation valuable to the survey participants is compared to a level of profound experience gained in certain Scrum roles. [Table 5.50](#) contains the results line by line sorted by groupings according to the analysed Scrum roles.

Scrum Roles Affecting the Desire for Decision Documentation After the Fact	
<i>(Independent Var. ↓)</i>	
Quantity of Scrum Roles — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience in <i>multiple Scrum roles</i> and the desire for documentation in situations with a lack of documentation.</p> <p style="text-align: right;">Spearman: <math>\rho = -0.108</math>, <math>p = 0.290</math></p> <p>for details, see: <a href="#">Table E.25</a> <span style="float: right;">p. 349</span></p>
Developer — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as a <i>Developer</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.26</a> <span style="float: right;">p. 350</span></p>
Scrum Master — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as <i>Scrum Master</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.27</a> <span style="float: right;">p. 351</span></p>
Product Owner — <a href="#">Question Q-28</a>	<p><i>Failed to reject <math>H_0</math>.</i> – The results show no connection between profound experience as a <i>Product Owner</i> and the desire for documentation in situations with a lack of documentation.</p> <p>for details, see: <a href="#">Table E.28</a> <span style="float: right;">p. 352</span></p>

Table 5.50.: Scrum roles affecting the desire for decision documentation after the fact – data computed based on answers to [Question Q-24](#).

### Conclusion – RQ3-H7

The results of the relationships studied between the two dependent variables (cf. [Q-23](#), [Q-24](#)) and the independent variable: *profound experience in a Scrum role* (cf. [Q-23](#)) shows no relationship. Even an examination of the individual situations described by questions [Q-23](#) and [Q-24](#) has not revealed any connection. Although there are some significant differences among the groupings ( $\alpha = 0.05$  and  $\alpha = 0.10$ ), the author interprets them as outliers. No clear trend can be detected.

In summary, the results show no influence of profound experience in a certain Scrum role on a retrospective demand for documentation. Accordingly, the research hypothesis RQ3-H7 has to be rejected.

## RQ3-H8 – Experience Affects the Retrospective Desire for Decision Documentation

On the side of the independent variable, the evaluation of the RQ3-H8 hypothesis is based on the three types of experience already identified (cf. [Section 4.3.1](#)). These are described by questions [Q-01](#), [Q-26](#), and [Q-27](#). The evaluation of the research hypothesis is based on situations in which the participants would have liked to have documentation at hand while there was none or consider it valuable, if available. The analysis for a correlation to the dependent variables is done using the answers to questions [Q-23](#) and [Q-24](#). The first question, [Q-23](#), identifies situations in which documentation was not available, although it would have been beneficial. [Question Q-24](#) asked for situations in which decision documentation would be valuable, assuming that it is available. Both questions offered the participants predefined answer possibilities and the possibility to record individual situations they had experienced.

In detail, the data is prepared so that the quantity of situations indicated is summed up for [Question Q-23](#) (see p. 87) and [Question Q-24](#) (see p. 88), respectively. The specific analyses apply the Kruskal-Wallis test and Spearman's rank correlation test to verify the following hypotheses:

- **Question Q-23:**

$H_0$ : The quantity of situations in which participants wished for documentation when none was available *does not relate* to the participants' experience.

$H_1$ : The quantity of situations in which participants wished for documentation when none was available *is affected by* the participants' experience.

- **Question Q-24:**

$H_0$ : The quantity of situations in which decision documentation is considered valuable, if available, *does not relate* to the participants' experience.

$H_1$ : The quantity of situations in which decision documentation is considered valuable, if available, *is affected by* the participants' experience.

From the author's point of view, the sum of the given situations seems to be a more expressive measure than an individual analysis of the results for each of the given answer alternatives of the questions. The results should, for example, show how frequently individual experience groups have been in situations where they wished for documentation not available at the time. On the other hand, the second question can illustrate the extent to which individual groups of experience value documentation more or less frequently. Although the two underlying questions only ask whether such situations occurred and not the respective frequency, the data resulting from the analysis should give a clear impression concerning the research hypothesis. Accordingly, an evaluation of the research hypothesis RQ3-H8 is made from the derived results on the following pages (cf. [Table 5.51](#), [Table 5.52](#)).

## Situations in Which Decision Documentation Was Desired but Not Available At the Time

As introduced above, the cumulative indication of situations in which the survey participants would have liked to have documentation when none was available is compared to the factor experience. [Table 5.51](#) contains the results line by line sorted by experience dimensions.

Experience Affecting the Desire for Decision Documentation After the Fact	
<i>(Independent Var. ↓)</i>	
Documentation Experience – <a href="#">Question Q-01</a>	<p><i>H<sub>1</sub> is to be accepted.</i> – The results show a moderately positive monotone correlation between documentation experience and the frequency of situations in which there was a lack of documentation. In other words, people confronted more frequently with situations where documentation was not available, although desired, document their decisions more frequently.</p> <p>Spearman: <math>\rho = 0.260</math>, <math>p = 0.009</math></p> <p>for details, see: <a href="#">Table E.29</a> <span style="float: right;">p. 353</span></p>
Development Experience – <a href="#">Question Q-26</a>	<p><i>Failed to reject H<sub>0</sub>.</i> – The results show no connection between <i>development experience</i> and the desire for documentation in situations with a lack of documentation.</p> <p>Spearman: <math>\rho = -0.040</math>, <math>p = 0.702</math></p> <p>for details, see: <a href="#">Table E.30</a> <span style="float: right;">p. 354</span></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><i>Failed to reject H<sub>0</sub>.</i> – The results show no connection between <i>Scrum experience</i> and the desire for documentation in situations with a lack of documentation.</p> <p>Spearman: <math>\rho = -0.136</math>, <math>p = 0.175</math></p> <p>for details, see: <a href="#">Table E.31</a> <span style="float: right;">p. 355</span></p>

Table 5.51.: Experience affecting the desire for decision documentation after the fact – data computed based on answers to [Question Q-23](#).

The results show a correlation between documentation experience and the frequency of the desire for documentation when documentation was not available. For the other two types of experience, the results have not shown any connection. An apparent assumption would be that experiencing a lack of documentation made participants increase their documentation frequency. Besides, it could also come with a greater appreciation of documentation.

The individual analysis of the given response alternatives confirms the results found for documentation experience. Four of the nine alternatives (see pp. [359–362](#)) show a positive monotone correlation with documentation experience ( $2 \times \alpha = 0.05$ ,  $2 \times \alpha = 0.10$ ). Interestingly, despite no significant results for *Scrum experience* in general, there is a specific case where a negative monotone correlation can be found in the significance level  $\alpha = 0.10$  (see p. [363](#)), similar to the results with Scrum experience for [Question Q-24](#) on the following page.

## Situations in Which Decision Documentation Is Considered to Be Valuable if Available

In the following, the sum of situations in which the survey participants consider documentation valuable is compared with the three dimensions of experience. [Table 5.52](#) contains the results line by line sorted by experience dimensions.

Experience Affecting the Desire for Decision Documentation After the Fact When Available	
<i>(Independent Var. ↓)</i>	
Documentation Experience – <a href="#">Question Q-01</a>	<p><i>H<sub>1</sub> is to be accepted.</i> – The results show a moderate positive monotone correlation between documentation experience and the situations where existing decision documentation is valuable for software engineers. In other words, software engineers who document more frequently also appreciate the available documentation more frequently.</p> <p><b>Spearman:</b> <math>\rho = 0.232, p = 0.020</math></p> <p>for details, see: <a href="#">Table E.32</a> <span style="float: right;">p. <a href="#">356</a></span></p>
Development Experience – <a href="#">Question Q-26</a>	<p><i>Failed to reject H<sub>0</sub>.</i> – The results show no connection between <i>development experience</i> and the quantity of situations in which existing decision documentation is valuable for software engineers.</p> <p><b>Spearman:</b> <math>\rho = -0.036, p = 0.730</math></p> <p>for details, see: <a href="#">Table E.33</a> <span style="float: right;">p. <a href="#">357</a></span></p>
Scrum Experience – <a href="#">Question Q-27</a>	<p><i>H<sub>1</sub> is to be accepted.</i> – The findings show a moderate negative monotone correlation. The fewer Scrum experience a participant has, the more often he/she considers documentation to be valuable, if available.</p> <p><b>Spearman:</b> <math>\rho = -0.178, p = 0.075</math></p> <p>for details, see: <a href="#">Table E.34</a> <span style="float: right;">p. <a href="#">358</a></span></p>

Table 5.52.: Experience affecting the desire for decision documentation after the fact – data computed based on answers to [Question Q-24](#).

Similar to the previous analysis on page [87](#), there is also a positive correlation between *documentation experience* and the appreciation of available documentation. Additionally, the dependent variable from [Question Q-24](#) produced another negatively correlated relationship. Software engineers with less *Scrum experience* attribute more importance to the availability of documentation.

The analysis of the individual given answer alternatives confirms the results for both documentation experience (see pp. [364–368](#);  $3 \times \alpha = 0.05, 2 \times \alpha = 0.10$ ) and Scrum experience (see pp. [370–371](#);  $1 \times \alpha = 0.05, 1 \times \alpha = 0.10$ ) with significant p-values for the correlations found. Surprisingly, there is also one case where a significant negative monotone correlation was found for development experience (see p. [369](#);  $\alpha = 0.10$ ).

## Conclusion – RQ3-H8

The results of the relationships studied between the two dependent variables (cf. Q-23, Q-24) and the three independent variables (cf. Q-01, Q-26, Q-27) show a clear relationship. There is a highly significant correlation of moderate strength between the documentation experience factor and the two dependent variables studied (cf. Table 5.53, Table 5.54). In line with this finding, software engineers document their decisions more frequently (cf. *documentation experience*, Section 4.3.1) the more types of situations they experienced where documentation was desired but not available. At the same time, it shows that software engineers who document more frequently (cf. *documentation experience*) also appreciate documentation more.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Quantity of Situations in Which Decision Documentation was Desired but not Available	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.260, p = 0.009$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.040, p = 0.702$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = -0.136, p = 0.175$
Details	<a href="#">Table E.29</a> – p. 353	<a href="#">Table E.30</a> – p. 354	<a href="#">Table E.31</a> – p. 355

Table 5.53.: Experience affecting the desire for decision documentation after the fact – data computed based on answers to Question Q-23.

Another finding is a moderate negative monotone correlation among individual situations and development / Scrum experience (cf. p. 363, pp. 369–371). This correlation can also be found between the quantity of mentioned types of situations and Scrum experience. The more Scrum experience a software engineer has, the less likely a software engineer is to value documentation (cf. Table 5.54).

( <i>Independent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Quantity of Situations in Which Decision Documentation is Considered to be Valuable	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.232, p = 0.020$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = -0.036, p = 0.730$	Moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.178, p = 0.075$
Details	<a href="#">Table E.32</a> – p. 356	<a href="#">Table E.33</a> – p. 357	<a href="#">Table E.34</a> – p. 358

Table 5.54.: Experience affecting the desire for decision documentation after the fact – data computed based on answers to Question Q-24.

In summary, the results quite apparently show an influence of experience on a retrospective demand for documentation. Accordingly, the research hypothesis RQ3-H8 is to be accepted.

### 5.3.4. RQ4 – How to Maintain Captured Rationale Information?

The following section contains the evaluations around research question RQ4. The question here is how captured rationale information could be maintained. Experience as a central aspect is the element that is the basis for the analyses. It is being investigated to which extent experience could influence the use of decision rationales. To this end, the author evaluated developed two hypotheses in which the author analyzes the relationships and differences between variables of interest to us.

#### RQ4-H1 – Experience Affects the Application Frequency of Quality Controls for Decision Documentation

To evaluate research hypothesis RQ4-H1, the author examined the influence of the three dimensions of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) on the frequency of application of quality control mechanisms (dependent variable = Question Q-18 – 4<sup>th</sup> item). Furthermore, the participants in the survey were also asked how often they would like to use quality control methods for the documentation of decisions. The author also examined the influence of experience on these answers (dependent variable = Question Q-19 – 4<sup>th</sup> item). Another aspect examined in this context is the difference between the actual application frequency and the desired application frequency specified by the participants.

For the first two sub-aspects mentioned above, the hypotheses to be tested are as follows:

- **Question Q-18 – 6<sup>th</sup> item:**

$H_0$ : Experience does not affect the application frequency of quality control mechanisms.

$H_1$ : Experience affects the application frequency of quality control mechanisms.

- **Question Q-19 – 6<sup>th</sup> item:**

$H_0$ : Experience does not affect the desired application frequency of quality control mechanisms.

$H_1$ : Experience affects the desired application frequency of quality control mechanisms.

Subsequently, the detailed results are presented regarding the corresponding data around the analyses described above. The chapter is concluded by a summary and a final evaluation of the research hypothesis RQ4-H1.

## Application Frequency of Quality Controls Mechanisms for Decision Documentation

The following table shows results of comparing experience and the application frequency of quality control mechanisms. The table is arranged line by line according to the different dimensions of the independent variable. The individual cells on the right-hand side list the extent to which the results indicate a rejection or acceptance of the hypothesis  $H_0$  (cf. p. 90).

Experience Affecting the Application of Quality Control Mechanisms	
<i>(Independent Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><math>H_1</math> is to be accepted. – For the dependent variable studied, systematic differences between groups with different levels of <i>documentation experience</i> can not be deduced from the results. However, there is a moderately positive monotone correlation. With <math>\alpha = 0.05</math>, this is highly significant.</p> <p>Spearman: <math>\rho = 0.285, p = 0.006</math></p> <p>for details, see: <a href="#">Table F.1</a> p. 372</p>
Development Experience – Question Q-26	<p>Failed to reject <math>H_0</math>. – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = -0.126, p = 0.239</math></p> <p>for details, see: <a href="#">Table F.2</a> p. 373</p>
Scrum Experience – Question Q-27	<p>Failed to reject <math>H_0</math>. – For the examined dependent variable, no influence can be determined by <i>Scrum experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.067, p = 0.521</math></p> <p>for details, see: <a href="#">Table F.3</a> p. 374</p>

Table 5.55.: Experience affecting the application frequency of documentation quality control mechanisms.

The results shown in [Table 5.55](#) indicate that software engineers with more documentation experience, i.e., those who document more, also pay considerably more attention to documentation quality. Specifically, the results show that the more software engineers document, the more often they apply quality assurance mechanisms for documentation.

## Desired Application Frequency of Quality Controls Mechanisms for Decision Documentation

The following table shows a comparison of experience and the desired application frequency of quality control mechanisms. The table is arranged line by line according to the different dimensions of the independent variable. The individual cells on the right-hand side list the extent to which the results indicate a rejection or acceptance of the hypothesis  $H_0$  (cf. p. 90).

Experience Affecting the Desired Application of Quality Control Mechanisms	
<i>(Independent Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><i>H<sub>1</sub> is to be accepted.</i> – The available data do not show any distinct structural differences among the individual experience groups. On the other hand, there is a highly significant moderate positive monotone correlation (<math>\alpha = 0.05</math>). The more software engineers document, the more frequently they would like to apply quality assurance mechanisms for capturing decisions and maintaining its documentation.</p> <p><b>Spearman:</b> <math>\rho = 0.257, p = 0.016</math></p> <p>for details, see: <a href="#">Table F.4</a> <span style="float: right;">p. 375</span></p>
Development Experience – Question Q-26	<p><i>H<sub>1</sub> is to be accepted.</i> – The available data do not show any distinct structural differences among the individual experience groups. However, the results reveal a highly significant moderate negative monotone correlation. The longer a software engineer has been developing software, the less often the engineer wishes to apply quality control mechanisms.</p> <p><b>Spearman:</b> <math>\rho = -0.235, p = 0.033</math></p> <p>for details, see: <a href="#">Table F.5</a> <span style="float: right;">p. 376</span></p>
Scrum Experience – Question Q-27	<p><i>Failed to reject H<sub>0</sub>.</i> – For the examined dependent variable, no influence can be determined by <i>Scrum experience</i>. Furthermore, there is no significant correlation.</p> <p><b>Spearman:</b> <math>\rho = 0.006, p = 0.957</math></p> <p>for details, see: <a href="#">Table F.6</a> <span style="float: right;">p. 377</span></p>

Table 5.56.: Experience affecting the desired application frequency of documentation quality control mechanisms.

The results listed in [Table 5.56](#) clearly show a relationship between the dimensions of experience defined in [Section 4.3.1](#) and the desire expressed by participants regarding the application frequency of quality control mechanisms. The results show a moderately positive correlation between documentation experience and the desired application frequency of quality control mechanisms. The more software engineers document, the more often they also strive to use quality control mechanisms for capturing decisions and maintaining their documentation. In contrast, there is a moderately negative correlation between development experience and the desired application frequency of quality control mechanisms. However, it should be emphasised that the responses from all groups reflect a strong interest in the application of quality control measures. The median value on the Likert scale is “often” for all but the most experienced group. For this group, it is “sometimes” (cf. [Figure F.5](#)).



## Difference Between Actual Application and Desired Application of Quality Control Mechanisms

The following tables (cf. [Figure 5.1](#), [Figure 5.2](#), [Figure 5.3](#)) show the differences between the answers to [Question Q-18](#) and [Question Q-19](#). In other words, they show the relative difference between the actual frequency of application and the intended application frequency of quality control mechanisms for the capture of decisions and the maintenance of the associated documentation. The percentages refer to the relative distribution within a group. For instance, if 25% of the group with *more than 15 years of development experience* (see [Figure 5.2](#), first line) said they 'sometimes' use the methods in question, 30.2% of the group said they would like to use them 'sometimes' (+5.2%).

	Never	Infrequently	Sometimes	Often	Always
Always	-4.8%	0.2%	-9.0%	6.9%	6.7%
Often	3.0%	-3.0%	-21.2%	3.0%	18.2%
Sometimes	-2.8%	-5.2%	-4.7%	3.0%	9.7%
Infrequently	2.8%	-6.3%	-6.3%	-9.8%	19.6%
Never	-	-	-	-	-

Figure 5.1.: Relative difference between the application frequency of quality control mechanisms and their desired application frequency (→) grouped by documentation experience (↑).

	Never	Infrequently	Sometimes	Often	Always
> 15 years	-3.7%	4.8%	5.2%	-15.2%	8.8%
12 – 15 years	0.0%	1.1%	-27.5%	10.4%	15.9%
8 – 11 years	-6.2%	-13.3%	-19.0%	30.0%	8.6%
4 – 7 years	5.6%	-17.0%	-11.8%	7.2%	15.9%
0 – 3 years	0.0%	9.1%	-16.7%	-20.5%	28.0%

Figure 5.2.: Relative difference between the application frequency of quality control mechanisms and their desired application frequency (→) grouped by development experience (↑).

	Never	Infrequently	Sometimes	Often	Always
Expert	4.0%	-1.8%	-18.5%	1.5%	14.8%
Advanced	-3.5%	-3.4%	-6.7%	2.0%	11.5%
Novice	-0.5%	-7.6%	-14.8%	3.3%	19.5%

Figure 5.3.: Relative difference between the application frequency of quality control mechanisms and their desired application frequency (→) grouped by Scrum experience (↑).

Looking at the three tables, it becomes apparent that the differences per grouping are quite similar. Especially the participants with more experience (valid for all three types of experience) express that they want to use appropriate quality control mechanisms more frequently than they currently do. Accordingly, no difference caused by the experience factor can be perceived here.

## Conclusion – RQ4-H1

The present results show a clear influence of the factor *experience* on the frequency of application of quality control mechanisms, both actual and intended. This influence is particularly noticeable and is reflected by a highly significant correlation with *documentation experience*. It has a positive monotone correlation with both frequencies, the actual and the intended. A further influence on the intended frequency of application can be seen from the *development experience* (cf. Table 5.58). Although all groups would like to apply appropriate quality control mechanisms at a high frequency, it is apparent that the more experience a software engineer has, the less frequently he/she intends to use quality control mechanisms (for four out of five groups, “often” is the median for the desired frequency of application, cf. Figure F.5).

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Actual Frequency of Application of Quality Control Mechanisms	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.285, p = 0.006$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = -0.126, p = 0.239$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.067, p = 0.521$
Details	<a href="#">Table F.1 – p. 372</a>	<a href="#">Table F.2 – p. 373</a>	<a href="#">Table F.3 – p. 374</a>

Table 5.57.: Experience affecting the actual application frequency of quality control mechanisms.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Intended Frequency of Application of Quality Control Mechanisms	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.257, p = 0.016$	Moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.235, p = 0.033$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.006, p = 0.957$
Details	<a href="#">Table F.4 – p. 375</a>	<a href="#">Table F.5 – p. 376</a>	<a href="#">Table F.6 – p. 377</a>

Table 5.58.: Experience affecting the intended application frequency of quality control mechanisms.

A further aspect compared is the variation between the actual frequency of application and the intended application frequency of quality control measures and how far these differences are influenced by experience (cf. p. 93). No particular influence by the factor experience was identified in this respect.

In summary, it can be said that an influence of the factor experience on the application of quality control mechanisms is present. Accordingly, the research hypothesis *RQ4-H1* has to be accepted.

## RQ4-H2 – Experience Affects the Application Frequency of Dedicated Roles or Responsibilities for Decision Documentation

To evaluate the research hypothesis RQ4-H2, the author compared the influence of the three types of experience recorded in the questionnaire (independent variable = questions Q-01 / Q-26 / Q-27) with the frequency of applying dedicated roles or responsibilities for decision documentation (dependent variable = Question Q-18 – 6<sup>th</sup> item). Furthermore, the participants in the survey were also asked how often they would like to use quality control methods for the documentation of decisions. The author also examined the influence of the factor experience on these answers (dependent variable = Question Q-19 – 6<sup>th</sup> item). Another investigated aspect is the difference between the actual application frequency and the intended application frequency indicated by the participants.

In detail, hypothesis tests are carried out according to the following hypotheses:

- **Question Q-18 – 6<sup>th</sup> item:**

$H_0$ : Experience does not affect the application frequency of dedicated roles and responsibilities to record decisions and maintain their documentation.

$H_1$ : Experience affects the application frequency of dedicated roles and responsibilities to record decisions and maintain their documentation.

- **Question Q-19 – 6<sup>th</sup> item:**

$H_0$ : Experience does not affect the application frequency of dedicated roles and responsibilities to record decisions and maintain their documentation.

$H_1$ : Experience affects the application frequency of dedicated roles and responsibilities to record decisions and maintain their documentation.

Subsequently, the detailed results are presented regarding the corresponding data around the analyses described above. The chapter is concluded by a summary and a final evaluation of the research hypothesis RQ4-H2.

## Actual Application Frequency of Dedicated Roles or Responsibilities for Decision Documentation

The following table shows the results of comparing experience as a factor and the application of dedicated roles or responsibilities. The table is arranged line by line according to the different dimensions of the independent variable. On the right-hand side, the individual cells list the extent to which the results indicate a rejection or acceptance of the hypothesis  $H_0$  for Q-18 (cf. p. 95).

Experience Affecting the Application of Dedicated Roles or Responsibilities	
(Independent Var. ↓)  Documentation Experience – Question Q-01	<p><math>H_1</math> is to be accepted. – The results do not show clear differences between individual groups but a positive moderate monotone correlation. More specifically, survey participants with more <i>documentation experience</i> use dedicated roles and responsibilities more frequently to record decisions and maintain their documentation.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = 0.199, p = 0.064</math></p> <p>for details, see: <a href="#">Table F.7</a> <span style="float: right;">p. 378</span></p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.108, p = 0.333</math></p> <p>for details, see: <a href="#">Table F.8</a> <span style="float: right;">p. 379</span></p>
Scrum Experience – Question Q-27	<p><math>H_1</math> is to be accepted. – The investigated groups show a clear difference from the novices to the users with advanced <i>Scrum experience</i> and the experts. According to these results, novices use dedicated roles and responsibilities to record decisions and maintain their documentation significantly more often. Furthermore, using Kendall's rank correlation, the results show a moderately negative monotone correlation (<math>\alpha = 0.10</math>, cf. <a href="#">Section 5.2</a>).</p> <p style="text-align: right;"><b>Spearman:</b> <math>\rho = -0.176, p = 0.101</math> <b>Kendall:</b> <math>\tau = -0.155, p = 0.093</math></p> <p>for details, see: <a href="#">Table F.9</a> <span style="float: right;">p. 380</span></p>

Table 5.59.: Experience affecting the actual application of dedicated roles or responsibilities.

The results in [Table 5.59](#) show a clear influence of the factor experience on the use of dedicated roles and responsibilities for recording decisions and maintaining the related documentation. On the one hand, participants use dedicated roles and responsibilities more often if they document them more frequently. On the other hand, participants with a higher level of Scrum experience put less emphasis on the roles and responsibilities mentioned.

## Intended Application Frequency of Dedicated Roles or Responsibilities for Decision Documentation

The following table shows the results of comparing experience as a factor and the application of dedicated roles or responsibilities. The table is arranged line by line according to the different dimensions of the independent variable. On the right-hand side, the individual cells list the extent to which the results indicate a rejection or acceptance of the hypothesis  $H_0$  for Q-19 (cf. p. 95).

Experience Affecting the Application of Dedicated Roles or Responsibilities	
<i>(Independent Var. ↓)</i>	
Documentation Experience – Question Q-01	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>documentation experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = 0.086, p = 0.448</math></p> <p>for details, see: <a href="#">Table F.10</a> p. 381</p>
Development Experience – Question Q-26	<p><i>Failed to reject <math>H_0</math>.</i> – For the examined dependent variable, no influence can be determined by <i>development experience</i>. Furthermore, there is no significant correlation.</p> <p>Spearman: <math>\rho = -0.167, p = 0.149</math></p> <p>for details, see: <a href="#">Table F.11</a> p. 382</p>
Scrum Experience – Question Q-27	<p><i><math>H_1</math> is to be accepted.</i> – The investigated groups show a clear difference from the novices to the users with advanced <i>Scrum experience</i> and the experts. According to these results, novices use dedicated roles and responsibilities to record decisions and maintain their documentation significantly more often. Furthermore, the results show a moderately negative monotone correlation (<math>\alpha = 0.10</math>).</p> <p>Spearman: <math>\rho = -0.217, p = 0.052</math> Kendall: <math>\tau = -0.185, p = 0.052</math></p> <p>for details, see: <a href="#">Table F.12</a> p. 383</p>

Table 5.60.: Experience affecting the intended application of dedicated roles or responsibilities.

The results in [Table 5.60](#) show a clear influence of the factor experience on the use of dedicated roles and responsibilities for recording decisions and maintaining the related documentation. In detail, it can be seen that participants with more Scrum experience are less likely to use or intend to use corresponding roles and responsibilities. Moreover, it is even the case that participants with *advanced* Scrum experience or Scrum *experts* place significantly less value on such methods than Scrum *novices* ( $\alpha = 0.05$ ).

## Difference Between Actual Application and Intended Application of Dedicated Roles or Responsibilities for Decision Documentation

The following tables (cf. [Figure 5.4](#), [Figure 5.5](#), [Figure 5.6](#)) show the differences between the answers to [Question Q-18](#) and [Question Q-19](#). In other words, they show the relative difference between the actual and the intended application frequency of dedicated roles and responsibilities for the capture of decisions and the maintenance of the associated documentation. The percentages refer to the relative distribution within a group. For instance, if 25% of the group with *more than 15 years of development experience* (see [Figure 5.5](#), first line) said they '*sometimes*' use the methods in question, 22.4% of the group said they would like to use them '*sometimes*' (-3.6%).

	Never	Infrequently	Sometimes	Often	Always
Always	6.3%	-12.3%	-2.8%	6.3%	2.5%
Often	18.9%	-20.3%	2.6%	-4.0%	2.8%
Sometimes	8.3%	-5.0%	-8.3%	-5.8%	10.8%
Infrequently	-21.7%	-5.0%	3.3%	23.3%	0.0%
Never	-	-	-	-	-

Figure 5.4.: Relative difference between the application frequency dedicated roles or responsibilities and their desired application frequency ( $\rightarrow$ ) grouped by documentation experience ( $\uparrow$ ).

	Never	Infrequently	Sometimes	Often	Always
> 15 years	21.8%	-25.5%	-3.6%	6.4%	0.9%
12 – 15 years	9.3%	-7.1%	2.7%	-5.5%	0.5%
8 – 11 years	-12.6%	1.1%	2.2%	0.0%	9.3%
4 – 7 years	-3.1%	-10.8%	-2.4%	4.3%	12.0%
0 – 3 years	9.1%	0.0%	-9.1%	0.0%	0.0%

Figure 5.5.: Relative difference between the application frequency of dedicated roles or responsibilities and their desired application frequency ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Figure 5.6.: Relative difference between the application frequency of dedicated roles or responsibilities and their desired application frequency ( $\rightarrow$ ) grouped by Scrum experience ( $\uparrow$ ).

Looking at the three tables, it becomes apparent that the differences per grouping are quite similar. For all three types of experience, it appears that the more experienced groups are less likely to use the roles and responsibilities in question, and the less experienced groups are more likely to use them. Accordingly, no difference caused by the experience factor can be perceived here.

## Conclusion – RQ4-H2

The present results show a less clear picture than the research hypothesis RQ4-H1 because the correlations found are less significant ( $\alpha = 0.10$ ). The correlations found are related to *documentation experience* and *Scrum experience*. The more documentation experience participants had, the more often they used dedicated roles and responsibilities to record their decisions and maintain the associated documentation. For Scrum experience, the analysis shows a contrary result. The more Scrum experience a participant had, the less often dedicated roles and responsibilities were used. There was only one case with highly significant results in the study carried out. For the distinction between the Scrum novices, advanced Scrum practitioners, and Scrum experts, there is a difference in the  $\alpha = 0.05$  level (cf. [Table F.12](#)). This highly significant difference simultaneously emphasises the correlation found in the Scrum experience and indicates a special relationship between the different groups of the grouping according to Scrum experience.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Actual Frequency of Application of Quality Control Mechanisms	Moderate monotone positive correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = 0.199, p = 0.064$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = -0.108, p = 0.333$	Moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.176, p = 0.101$ $\tau = -0.155, p = 0.093$
Details	<a href="#">Table F.7 – p. 378</a>	<a href="#">Table F.8 – p. 379</a>	<a href="#">Table F.9 – p. 380</a>

Table 5.61.: Experience affecting the actual application of dedicated roles or responsibilities.

( <i>Dependent Var.</i> ↓)	Documentation Exp.	Development Exp.	Scrum Exp.
Intended Frequency of Application of Quality Control Mechanisms	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = 0.086, p = 0.448$	No apparent relationship. <i>Failed to reject H<sub>0</sub>.</i> $\rho = -0.167, p = 0.149$	Moderate monotone negative correlation <i>H<sub>1</sub> is to be accepted.</i> $\rho = -0.217, p = 0.052$ $\tau = -0.185, p = 0.052$
Details	<a href="#">Table F.10 – p. 381</a>	<a href="#">Table F.11 – p. 382</a>	<a href="#">Table F.12 – p. 383</a>

Table 5.62.: Experience affecting the intended application of dedicated roles or responsibilities.

A further aspect compared is the variation between the actual frequency of application and the intended application frequency of quality control measures and how far these differences are influenced by experience (cf. p. 98). No particular influence by the factor experience was identified in this respect.

In summary, it can be said that an influence of the factor experience on the application of dedicated roles and responsibilities for documenting decisions and maintaining their documentation is present. Accordingly, the research hypothesis *RQ4-H2* is to be accepted.

## 6. Summary of Findings

This chapter summarises the results briefly in [Table 6.1](#). For details on the respective hypotheses, please refer to [Section 5.3](#) on hypothesis evaluation. A detailed discussion on the analysis' results, gained insights and implications will be carried out later in a separate paper.

Research Hypothesis	Hypothesis Summary / Evaluation Outcome
	<i>More experienced software engineers capture discarded solution alternatives more frequently.</i>
RQ1-H1 ✓	The available data supports research hypothesis RQ1-H1. Participants with more documentation experience also document discarded decision alternatives more frequently (strong positive correlation). Besides, no relationships were found for the other two types of experience.
	<i>The more experienced software engineers are, the more valuable design assumptions become to them.</i>
RQ1-H2 ✓	The data analysis neither shows a relationship between experience and perceived importance nor between experience and documentation criteria. However, the analysis revealed positive correlations between documentation experience and the rationale documentation frequency and between development experience and the rationale documentation frequency (for details, see hypothesis evaluation section). Accordingly, the data confirms research hypothesis RQ1-H2.
	<i>The experience of software engineers impacts which types of rationale they consider to be important.</i>
RQ1-H3 ✗	No correlations were found for research hypothesis RQ1-H3.
	<i>The experience of software engineers impacts which rationale information elements they consider important.</i>
RQ1-H4 ✗	No correlations were found for research hypothesis RQ1-H4.
	<i>Development experience affects the decisions documentation frequency.</i>
RQ2-H1 ✓	The available data supports research hypothesis RQ2-H1. Participants with more documentation experience also document decisions more frequently (moderate positive correlation). There is no relationship for the other two types of experience.
	<i>Scrum experience affects the decisions documentation frequency.</i>
RQ2-H2 ✗	No correlations were found for research hypothesis RQ2-H2.



	<i>Experience affects the usage frequency of decision capture guidelines.</i>
RQ2-H3 ✓	The available data supports research hypothesis RQ2-H3. Participants with more documentation experience use capture guidelines more frequently (strong positive correlation). On the other hand, participants with more scrum experience use capture guidelines less frequently (medium negative correlation). Other than that, no correlations were found.
	<i>Experience affects the usage frequency of capture templates.</i>
RQ2-H4 ✓	The available data supports research hypothesis RQ2-H4. Participants with more documentation experience use capture templates more frequently (strong positive correlation). For the other two types of experience, no significant relationship has been found.
	<i>Experience affects the usage frequency of software for documenting decisions.</i>
RQ2-H5 ✓	The available data supports research hypothesis RQ2-H5. Participants who document more frequently (cf. documentation experience, <a href="#">Section 4.3.1</a> ) use software for this purpose significantly more often (strong positive correlation). For the other two types of experience, no significant relationship has been found.
	<i>Team size affects the decision documentation frequency.</i>
RQ2-H6 ✓	The available data supports research hypothesis RQ2-H6. Participants working in larger teams document their decisions more frequently (weak positive relationship).
	<i>The role of a software engineer in Scrum influences the decision documentation frequency.</i>
RQ2-H7 ✓	The available data supports research hypothesis RQ2-H7. The present analysis results show a clear correlation between the Scrum roles in which the participants have been able to gain profound experience and the documentation frequency of their decisions. The most apparent results suggest that software engineers who typically gained experience as <i>Developer</i> document less frequently. According to the available data, those who gained a profound experience as <i>Scrum Master</i> document significantly more often.
	<i>The role of a software engineer in Scrum influences the point in the process when decisions are usually captured.</i>
RQ2-H8 ✓	The available data supports research hypothesis RQ2-H8. The present analysis results show that especially the roles <i>Developer</i> and <i>Scrum Master</i> have a significant influence. According to the results, participants with profound <i>Developer</i> experience tend to document in the earlier phases of the sprint, while Scrum Masters document in both the early and late phases of the sprint.

	<i>The domain software engineers work in influences the frequency of decision documentation.</i>
RQ2-H9 ✓	The available data supports research hypothesis RQ2-H9. The present analysis results show a weak positive correlation between the decision documentation frequency and the development domain for two out of five domains ( $\alpha = 0.10$ ). Besides, a significant positive correlation was found for the quantity of domains in which participants have already gained experience. The more domains a participant has already gained experience in, the more frequently the participant documents his / her decisions (weak positive correlation with $\alpha = 0.05$ ).
	<i>Experience affects the amount of rationale software engineers document for a decision.</i>
RQ2-H10 ✓	The available data supports research hypothesis RQ2-H10. The results show a significant correlation for all three types of experience. A positive correlation has been revealed between the rationale documentation frequency and documentation (strong correlation), respectively, development experience (moderate correlation). For Scrum experience, there is a moderate negative correlation.
	<i>The experience of software engineers influences the perceived usefulness of documented decisions.</i>
RQ3-H1 ✓	The available data supports research hypothesis RQ3-H1. The present analysis results show a highly significant correlation for documentation and Scrum experience. Participants with a higher documentation experience (cf. <a href="#">Section 4.3.1</a> ) consider rationale more useful (moderate positive correlation). On the other hand, participants with more Scrum experience consider rationale less valuable (weak negative correlation). For development experience, no relationship could be identified.
	<i>The experience of software engineers impacts the perceived usefulness of rationale for a decision in questions.</i>
RQ3-H2 ✓	The available data supports research hypothesis RQ3-H2. The present analysis results show a highly significant correlation for documentation and Scrum experience. Participants with a higher documentation experience (cf. <a href="#">Section 4.3.1</a> ) consider the rationale for a decision in question to be more useful (moderate positive correlation). On the other hand, participants with more Scrum experience consider the rationale for a decision in question less valuable (moderate negative correlation). For development experience, no relationship could be identified.
RQ3-H3 ✗	<i>More experienced software engineers forget reasons justifying decisions less frequently.</i> No correlations were found for research hypothesis RQ3-H3.

	<i>More experienced software engineers revisit decision documentation to understand previous decisions and assess potential alternatives less frequently.</i>
RQ3-H4 ✓	The available data supports research hypothesis RQ3-H4. Software engineers with more documentation experience revisit documented decisions more frequently (strong positive correlation). There is no relationship for the other two types of experience.
	<i>For software engineers working in larger teams, the set of involved stakeholders is of greater importance.</i>
RQ3-H5 ✓	The available data supports research hypothesis RQ3-H5. Participants working in larger teams consider the information on involved stakeholders as more useful. However, the data does not disclose any corresponding relationship between the team size and the documentation frequency of that information. Moreover, there is no correlation between the team size and the usage frequency of that information for reasoning purposes either.
	<i>For software engineers working in larger teams, stakeholder arguments are of greater importance.</i>
RQ3-H6 ✗	No correlations were found for research hypothesis RQ3-H6.
	<i>The role of a software engineer in Scrum affects the retrospective desire for decision documentation.</i>
RQ3-H7 ✗	No correlations were found for research hypothesis RQ3-H7.
	<i>Experience affects the retrospective desire for decision documentation.</i>
RQ3-H8 ✓	The available data supports research hypothesis RQ3-H8. Participants with more documentation experience expressed a stronger retrospective desire for decision documentation after the fact (moderate positive correlation). Moreover, there is a less significant correlation for Scrum experience, revealing that participants with more Scrum experience desire available decision documentation after the fact less often. Apart from that, the data did not disclose any correlation with development experience.
	<i>Experience affects the application frequency of quality controls for decision documentation.</i>
RQ4-H1 ✓	The available data supports research hypothesis RQ4-H1. According to the available results, participants with more documentation experience (cf. <a href="#">Section 4.3.1</a> ) employed quality controls for decision documentation more frequently. Apart from that, the data does not show correlations between the actual application frequency of quality control mechanisms and the other two types of experience. However, participants with more development experience express the desire to apply quality control mechanisms more frequently.

*Experience affects the application frequency of dedicated roles or responsibilities for decision documentation.*

RQ4-H2



The available data supports research hypothesis RQ4-H2. According to the available results, participants with more documentation experience (cf. [Section 4.3.1](#)) employed dedicated roles and responsibilities more frequently. On the other hand, participants with increasing Scrum experience indicated that, on the one hand, they used fewer dedicated roles and responsibilities and also want to use them less.

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Table 6.1.: Summary of Research Hypothesis Evaluations.

## 7. Threats to Validity

This chapter lists possible limitations of validity. Following Kitchenham et al. [56] and Perry et al. [83], the author discusses construct validity, internal validity and external validity. Measures to improve the three types of validity included conducting a pilot study with several industry practitioners and obtaining additional feedback from experienced scientists and industry practitioners with domain expertise. This preparation ensures that the questions are unambiguous and to the point. In addition, the research hypotheses are well aligned with the research questions that need to be answered. The author likewise considers the results found to be meaningful and significant. However, a possible bias of the results within the survey cannot be ruled out as maybe only those software engineers being interested in the survey topic might have participated in the survey.

### Construct Validity

Regarding construct validity, the author took care in formulating the hypotheses and their evaluation to use appropriate instruments for the evaluation. For various hypotheses, multiple instruments were used to map the dependent variable (e.g., [research hypothesis RQ1-H4](#)). It turned out that the results of the selected instruments were frequently found to be mutually supportive. In the author's opinion, this confirms an existing construct validity. Furthermore, the author refrained from integrating factors into the questionnaire. Nevertheless, the author is confident that construct validity is sufficiently ensured.

### Internal Validity

In terms of internal validity, the questionnaire design leaves little room for selection bias or confounding variables. Nevertheless, it has to be noted that an error occurred in the data collection for [Question Q-14](#) and [Question Q-15](#). As described in [Section 5.2](#), 39 of 102 participants were missing a choice option. Accordingly, to not compromise internal validity, for evaluating hypotheses related to [Question Q-14](#) and [Question Q-15](#), the used dataset was reduced in each case to the subset of participants for whom all response options were present. In detail, this reduction applies to [research hypothesis RQ2-H8](#). This way, the internal validity of the affected research hypothesis is not threatened by the error.

Further impairment of construct validity is possible for *research hypothesis RQ1-H2*. The peculiarity here is the focus of the research hypothesis on the *assumptions made*. For this purpose, the corresponding item from [Question Q-03](#), [Question Q-07](#), and [Question Q-08](#) is used for the evaluation. The latter two questions explicitly ask for *assumptions made*. In [Question Q-03](#), however, the *assumptions made* are asked for together with “*constraints to consider*”. Accordingly, there may be impairments in construct validity *research hypothesis RQ1-H2*. In the result, however, no correlation can be determined for the item in question. Accordingly, the risk to construct validity seems acceptable here.

## **External Validity**

In terms of external validity, the author believes that the results are fairly generalisable. With a number of over 100 industry practitioners with even international participation from both German and English speaking countries, there is very little chance that, for example, individual company-specific or team specific adjustments will impact the results of the survey. Furthermore, the variables that were mainly used as independent variables also show a balanced distribution. Nevertheless, it cannot be ruled out here that the participants in the survey brought specific cultural influences from the German-speaking and English-speaking regions into the study. A similar study in other areas of the world could make such potential cultural differences obvious. One additional consideration is the implementation of a pilot study. In this, the author had the opportunity to also ask the interviewed participants directly for feedback on the pilot study. Based on this feedback and a comparison of the answers, it can be deduced that the generalizability of the questionnaires' answers to other software engineers is given

## 8. Conclusion and Outlook

The long-term goal of the work on this topic is to improve the understanding of agile documentation in Scrum and its structural characteristics. Besides, the author wants to uncover contradictions between the general perception of documentation and agile principles. Building on the findings and further empirical studies in this context (cf. Schubanz and Lewerentz [98]), the goal is to develop an approach for the systematic and needs-based integration of agile documentation into Scrum. For this purpose, this study provides its readers with important insights into the management of design decisions and its rationales from an industry's perspective. The results show clear correlations in some areas between the influencing factor of experience and aspects of documentation frequency, perceived usefulness, or the point in time within a sprint when participants frequently document. In addition, factors such as the roles in which the software engineers have gained profound experience also show effects on, for example, the time or the Scrum activities in which documentation takes place.

Building on this data, requirements for structured documentation of decisions in Scrum emerge. In detail, the assumptions and rejections of the presented research hypotheses can serve as instruments of control for designing a structured approach to documenting decisions in Scrum. From the author's perspective, the goal of further work is to improve the documentation process. Potential process alterations include

- improved monitoring and control of the documentation quality,
- a reduction of process overhead by employing structured process elements, and
- a reduction of tasks to as little as possible and as much as necessary documentation.

Likewise, a targeted approach includes integrating role-specific mechanisms and methods for controlling documentation in the process. Thus, further work will be directed towards a framework that allows for documentation to be integrated into the Scrum process in a structured way. Adaptability to the individual needs of the team is a key requirement here. The framework is to be rounded off by corresponding tool support. Initial work on this has already been published in Schubanz et al. [97].

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# Appendices

# A. Survey Questionnaire

## An Investigation into Decision Capture in Agile Software Development

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**Q-01** Do you document decisions during your development activities?

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-02** Do you document all considered solution alternatives for a captured decisions?

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-03** Please specify criteria motivating you to document a decision.

- a) – Not Specified –
- b) Auditability / preparation for later audits.
- c) Design assumptions / constraints to consider.
- d) Connected cost / effort.
- e) Compromises to address conflicting objectives.
- f) Complexity of a decision.
- g) Employed technologies (proprietary vs open source; build or buy a technology).
- h) Involved risks.
- i) Longterm influence / strategic value.
- j) Number of stakeholders involved.
- k) Number of (Scrum) teams involved (e.g., Scrum of Scrum).
- l) Protection of potential contract dispute (e.g., “We did not agree on this ...”).
- m) Other: \_\_\_\_\_

**Q-04** How often do you document the following types of decisions?

- Decisions regarding development tools.
- Technology decisions  
(buy or build / make or take → libraries / frameworks).
- Decisions regarding the deployment platform.
- Architecture / Design Decisions.
- Decisions on defining / refining features / requirements.
- Decision regarding software quality measures.
- Decision regarding user experience.
- Decisions regarding the software development process.
- Decisions regarding the team organisation (e.g., change of roles).
- Decisions on the feature / task priorities.
- Decision on small operational to-do items.

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-05** Please rate the following statement: “The following type of decision should be part of a good documentation!”

- Decisions regarding development tools.
- Technology decisions  
(buy or build / make or take → libraries / frameworks).
- Decisions regarding the deployment platform.
- Architecture / Design Decisions.
- Decisions on defining / refining features / requirements.
- Decision regarding software quality measures.
- Decision regarding user experience.
- Decisions regarding the software development process.
- Decisions regarding the team organisation (e.g., change of roles).
- Decisions on the feature / task priorities.
- Decision on small operational to-do items.

The following options to be chosen from were available each:

- a) – Not Specified –
- b) Strongly disagree
- c) Disagree
- d) Neither disagree nor agree
- e) Agree
- f) Strongly agree

**Q-06** Do you consider additional decision types to be worth documenting? If so, please specify.

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**Q-07** How often do you document the following rationale for a decision?

- Constraints
- Assumptions made
- Benefit of a solution alternative
- Weakness of a solution alternative
- Cost of a solution alternative
- Complexity of a solution alternative
- Certainty that the alternative would work
- Certainty that you could implement it
- Tradeoffs between alternatives

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-08** Imagine, a previous decision would be put into question. Please rate the statement accordingly: “The following rationale helps me to understand the decision in question.”

- Constraints
- Assumptions made
- Benefit of a solution alternative
- Weakness of a solution alternative
- Cost of a solution alternative
- Complexity of a solution alternative
- Certainty that the alternative would work
- Certainty that you could implement it
- Tradeoffs between alternatives

The following options to be chosen from were available each:

- a) – Not Specified –
- b) Strongly disagree
- c) Disagree
- d) Neither disagree nor agree
- e) Agree
- f) Strongly agree

**Q-09** Which kind of information do you use to reason about a decision to take?

- Issue
- Solution alternative
- Decision criteria (e.g., cost, risk, tradeoffs, etc.)
- Assessment of the alternatives
- Consequences of the alternatives
- Involved Stakeholders
- Stakeholder arguments

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-10** Do you use additional information not listed previously? If so, please specify.

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**Q-11** Which kind of information do you capture for a decision?

- Issue
- Solution alternative
- Decision criteria (e.g., cost, risk, tradeoffs, etc.)
- Assessment of the alternatives
- Consequences of the alternatives
- Involved Stakeholders
- Stakeholder arguments

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-12** Do you capture additional information not listed previously? If so, please specify.

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**Q-13** Imagine a previous decision would be put into question. Please rate the statement accordingly: “The following information helps me to understand the decision in question.”

- Issue
- Solution alternative
- Decision criteria (e.g., cost, risk, tradeoffs)
- Assessment of the alternatives
- Consequences of the alternatives
- Involved Stakeholders
- Stakeholder arguments

The following options to be chosen from were available each:

- a) – Not Specified –
- b) Strongly disagree
- c) Disagree
- d) Neither disagree nor agree
- e) Agree
- f) Strongly agree

**Q-14** How often do you capture decisions during the following activities?

- Per Backlog Refinement
- Per Planning Poker
- Per Sprint Planning
- Per Daily Scrum
- Per Review
- Per Retrospective
- In the remaining course of the sprint

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-15** According to your experience, during which activities are the following decisions usually made?

- Decisions regarding development tools.
- Technology decisions  
(buy or build / make or take → libraries / frameworks).
- Decisions regarding the deployment platform.
- Architecture / Design Decisions.
- Decisions on defining / refining features / requirements.
- Decision regarding software quality measures.
- Decision regarding user experience.
- Decisions regarding the software development process.
- Decisions regarding the team organisation (e.g., change of roles).
- Decisions on the feature / task priorities.
- Decision on small operational to-do items.

The following options to be chosen from were available each:

- a) – Not Specified –
- b) Backlog refinement
- c) Planning poker
- d) Sprint planning
- e) Daily Scrum
- f) Review
- g) Retrospective
- h) In the remaining course of the sprint

**Q-16** How often do you use the following media types for capturing decisions?

- Paper
- Whiteboard or Scrum Board
- Software (Confluence, Microsoft Office, or similar)
- IDE-integrated software (Eclipse, Visual Studio, or similar)

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-17** How often would you like to use the following media types for capturing decisions?

- Paper
- Whiteboard or Scrum Board
- Software (Confluence, Microsoft Office, or similar)
- IDE-integrated software (Eclipse, Visual Studio, or similar)

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-18** How often do you apply the following means to capture decisions and manage their documentation?

- Guidelines
- Templates / checklists
- Central knowledge management
- Quality control (e.g., reviews)
- Design-Space Exploration (see hint above)
- Dedicated roles + responsibilities

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Provided hint:** Design-Space Exploration comprises a systematic analysis of the solution space. This includes, e.g., requirements to satisfy, consequences, arguments for and against a particular solution alternative.



**Q-19** How often would you like to apply the following means to capture decisions and manage their documentation?

- Guidelines
- Templates / checklists
- Central knowledge management
- Quality control (e.g., reviews)
- Design-Space Exploration (see hint above)
- Dedicated roles + responsibilities

The following options to be chosen from were available each:

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Provided hint:** Design-Space Exploration comprises a systematic analysis of the solution space. This includes, e.g., requirements to satisfy, consequences, arguments for and against a particular solution alternative.

**Q-20** I do not capture decisions because ...

- there are no documentation standards.
- there is no appropriate tool support.
- I did not know how to represent them.
- I fear consequences (e.g., based on political / legal issues or conflicting business philosophy).
- of security issues.
- of time / budget constraints.
- there is no reason. I usually capture decisions if they seem to be worth it.
- Other: \_\_\_\_\_

**Q-21** Do you forget the reasons that justify decisions after some time?

- a) – Not specified –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-22** Do you revisit documentation to understand decisions in question or assess potential alternatives?

- a) – Not specified/Not applicable (no documentation available) –
- b) Never
- c) Infrequently
- d) Sometimes
- e) Often
- f) Always

**Q-23** In which of the following situations did you wish for decision documentation that was not available at the time?

- a) The issue at hand already occurred in a similar fashion.
- b) An existing solution had to be modified because of modified requirements.
- c) You joined an ongoing project.
- d) A colleague asked for your opinion on a decision to make.
- e) The decision at hand was a mistake in your eyes.
- f) You needed to familiarise yourself with a project which has been completed a long time ago.
- g) A software bug had to be resolved.
- h) We conducted a review.
- i) An audit had to be made / auditors put our decisions in question.
- j) No corresponding situation comes to my mind.
- k) Other: \_\_\_\_\_

**Q-24** Imagine in your current project decision documentation is available. In which of the following situations would you consider this documentation to be valuable?

- a) The issue at hand already occurred in a similar fashion.
- b) An existing solution had to be modified because of modified requirements.
- c) You joined an ongoing project.
- d) A colleague asked for your opinion on a decision to make.
- e) The decision at hand was a mistake in your eyes.
- f) You needed to familiarise yourself with a project which has been completed a long time ago.
- g) A software bug had to be resolved.
- h) We conducted a review.
- i) An audit had to be made / auditors put our decisions in question.
- j) No corresponding situation comes to my mind.
- k) Other: \_\_\_\_\_

**Q-25** What are your wishes for managing decisions and their rationale in Scrum?

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**Q-26** Please specify the time of experience you have as a software engineer:

- a) 0 - 3 years
- b) 4 - 7 years
- c) 8 - 11 years
- d) 12 - 15 years
- e) more than 15 years

**Q-27** Please rate your Scrum experience level:

- a) Novice
- b) Advanced
- c) Expert

**Q-28** In which of the following roles did you gain profound experience so far?

- a) Scrum Master
- b) Product Owner
- c) Ordinary team member

**Q-29** Please indicate the domain in which you mainly work (If you are not sure, check those options fitting best).

- a) Embedded software
- b) Mobile applications
- c) Desktop applications
- d) Web applications
- e) High-Performance Computing
- f) Other: \_\_\_\_\_

**Q-30** Please specify the amount of Scrum teams working in your department.

- a) 1 - 3 teams
- b) 4 - 7 teams
- c) 8 - 12 teams
- d) 13 - 20 teams
- e) More than 20 teams

**Q-31** Please specify the average quantity of employees per Scrum team:

- a) less than 4 members
- b) 4 members
- c) 5 members
- d) 6 members
- e) 7 members
- f) more than 7 members

## B. Summary of Survey Results

In this part of the appendix, the results of the questionnaire are presented. Each of the four major thematic complexes will be presented in a separate section. The results for the corresponding questions are then presented and visualised in a related sub-section each. Throughout Appendix B a colour scheme illustrating the relative share of responses for a given question will be used. This color scheme is as follows:

Color										
Relative	0.0 -	10.0 -	20.0 -	30.0 -	40.0 -	50.0 -	60.0 -	70.0 -	80.0 -	90.0 -
Share	9.99	19.99	29.99	39.99	49.99	59.99	69.99	79.99	89.99	100

### B.1. Documenting Decisions in General

The first complex of the questionnaire deals with the recording of decisions in general. To this end, three questions were raised:

- Do developers document decisions in the context of their normal development work?
- How are decisions documented in the context of normal development work?
- Why are decisions documented in the context of normal development work?

The questions and the associated results are presented in the following.

#### Question Q-01 – Do You Document Decisions During Your Development Activities?

The first question of the questionnaire generally asked to which extent the participants document decisions. The distribution of responses can be seen in Figure B.1. It is important to note that the response “Never” has not been chosen by anyone. There were 101 responses and one abstention for this question.

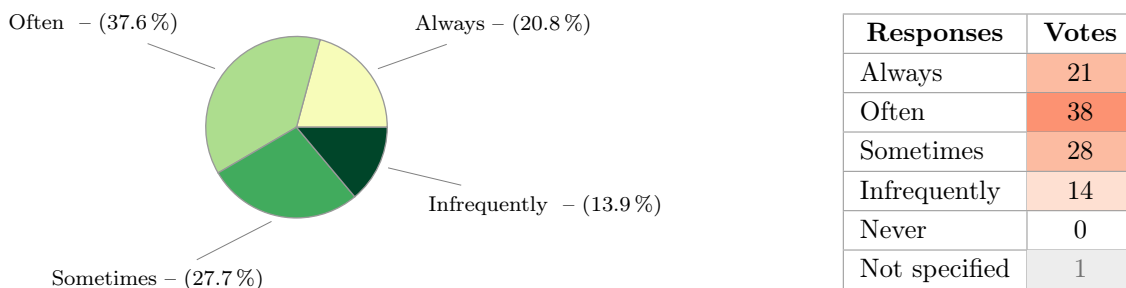


Figure B.1.: Frequency documentation of decisions.

**Question Q-02 – Do You Document All Considered Solution Alternatives for a Captured Decisions?**

In the follow-up question as to whether all possible alternative solutions were recorded for a documented decision, the distribution of responses differed clearly. The distribution of the responses can be found in Figure B.2. For *Question Q-02*, there were 102 responses and no abstentions.

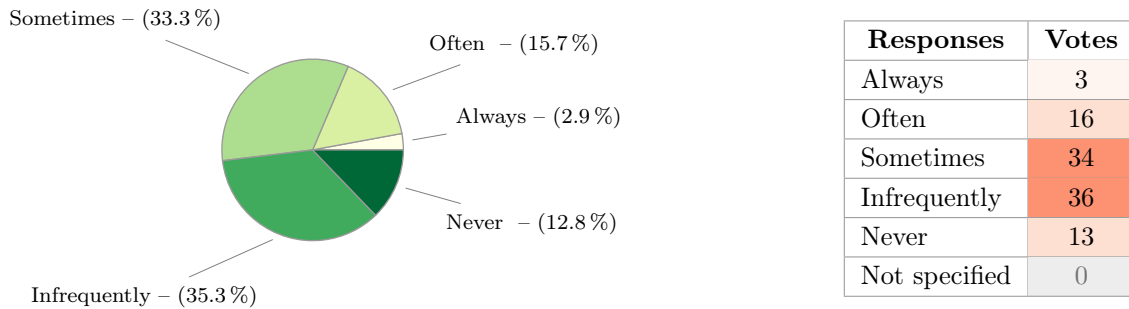


Figure B.2.: Frequency of documentation of discarded solution alternatives.

**Question Q-03 – Please Specify Criteria Motivating You to Document a Decision.**

In the last question of the first complex, the author asked for criteria that motivate participants to record a decision. As shown in Figure B.3, there were multiple defaults from which it was possible to choose. Alternatively, participants had the opportunity to define individual responses. Besides, they had the opportunity to give multiple responses. Figure B.3 shows the relative distribution of the answers given to the predetermined answer alternatives. Table B.1 lists these again, supplemented by the individual answers of the participants and their relative frequency in per cent.

For *Question Q-03*, there were 100 responses and two abstentions.

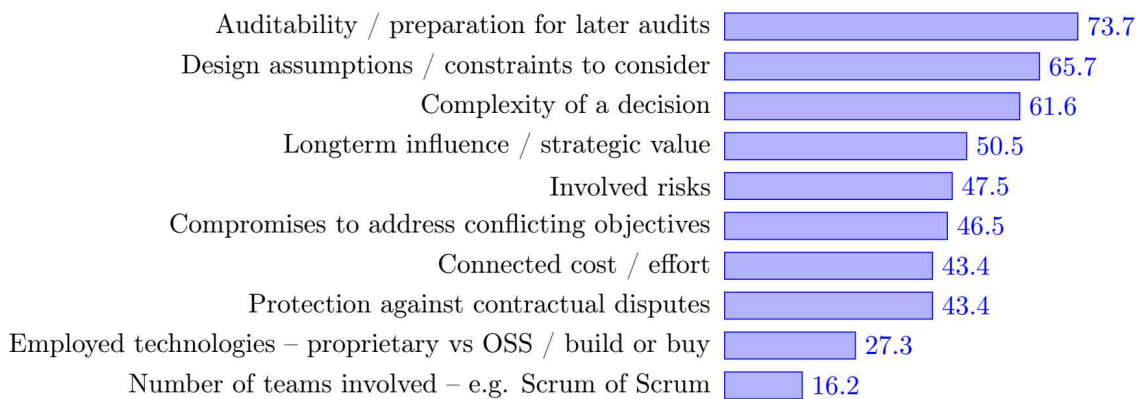


Figure B.3.: Criteria for recording decisions, relative distribution.

Criteria Motivating to Document a Decision	Votes (%)
Auditability / preparation for later audits	73.7
Design assumptions / constraints to consider	65.7
Complexity of a decision	61.6
Longterm influence / strategic value	50.5
Involved risks	47.5
Compromises to address conflicting objectives	46.5
Connected cost / effort	43.4
Protection of potential contract dispute (e.g., “We did not agree on this ...”)	43.4
Employed technologies (proprietary vs open source; build or buy a technology)	27.3
Number of teams involved (e.g., Scrum of Scrum)	16.2
Number of stakeholders involved	16.2
Not specified	2
↑ predefined response options / ↓ individual responses	
Traceability	1
The likelihood of someone reading the documentation	1
Compliance with legal regulations Application documentation for editors	1
Generally all information a) known at the time of the decision b) will probably not be known later without documentation c) cannot be retrieved, and d) is important for future decisions.	1
Software Architecture	1
Cooperation obligations and timelines	1
If it is a significant part of the project process	1
Compatibility with legacy systems	1
A balance of arguments, especially in the case of “tight” decisions	1

Table B.1.: Criteria for recording decisions.

## B.2. Decisions and Rationale

The second complex specifically addresses the research question: “What has to be captured?”. To this end, the author asked questions about the types of decisions and the type of information recorded. Besides, the author asked the participants for reasons for which they document decisions. The questions, as well as the respective responses are as follows:

### Question Q-04 – How Often Do You Document the Following Types of Decisions?

In [Question Q-04](#), participants were asked to specify the frequency of documentation they apply for a predefined list of decision types. The question did not allow for individual responses. [Table B.2](#) shows the predefined types of decisions in the left column for which the participants should indicate the applied documentation frequencies. The right-hand column contains the abbreviations that are

used synonymously for the corresponding in the following illustrations for the sake of conciseness.

Moreover, the participants could specify other types of decisions not listed so far in *Question Q-06*. You can find the relative distribution of the responses on the documentation frequency in *Figure B.4* below and additional specified decision types in *Table B.3*.

Decision Type – Full Description	Abbreviation
Decisions regarding development tools	Dev. Tools
Decisions on defining / refining features / requirements	Refine Feat.
Architecture / design decisions	Arch. / Design
Decisions regarding software quality measures	Quality
Decisions on the feature / task priorities	Feature Prio.
Decisions regarding user experience	UX
Decisions regarding the deployment platform	Deployment
Decisions regarding the software development process	Process
Technology decisions (build or buy / make or take $\Rightarrow$ libraries / frameworks)	Technology
Decisions regarding the team organisation (e.g., change of roles)	Team
Decisions on small operational to-do items	TODOs

Table B.2.: Decisions types with their abbreviations.

The number of submitted votes varies depending on the type of decision. Occasionally there were up to 10 abstentions, but there were also other types of decisions for which all 102 participants answered.

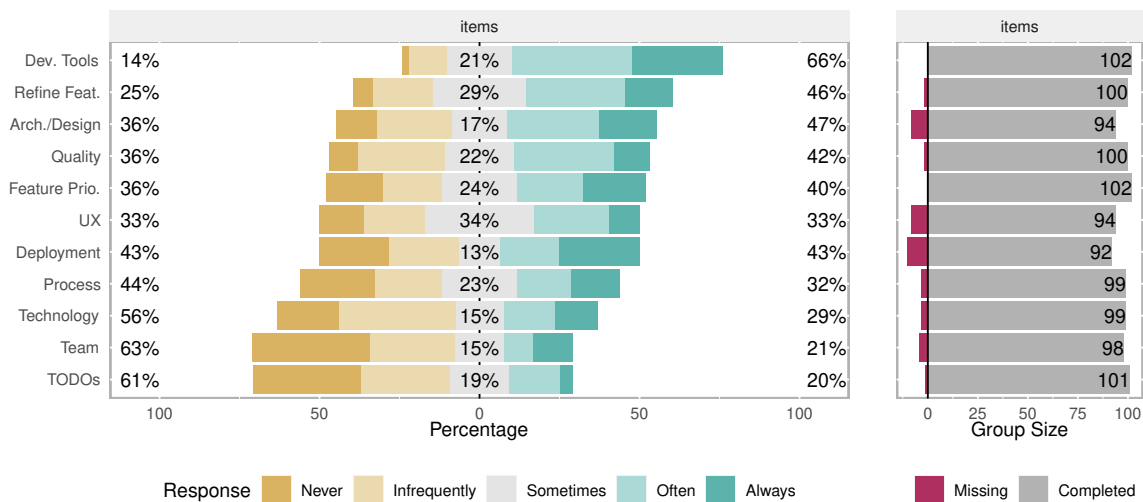


Figure B.4.: Frequency of documentation of decisions types, relative distribution.



### Question Q-05 – Which Types of Decisions Should Be Documented?

*Question Q-05* aimed to find out what types of decisions constitute good documentation. For this purpose, participants should indicate the frequency with which specific types of decisions should be documented. The list of decision types is identical to the one from *Question Q-04* (cf. [Table B.2](#)). The participants could specify other types of decisions not listed so far and which they believe should be recorded in *Question Q-06*. You can find the relative distribution of the responses in [Figure B.5](#) below.

The number of submitted votes varies depending on the type of decision. Occasionally there were up to four abstentions. For the majority of the types of decisions queried, there were only one or two abstentions.

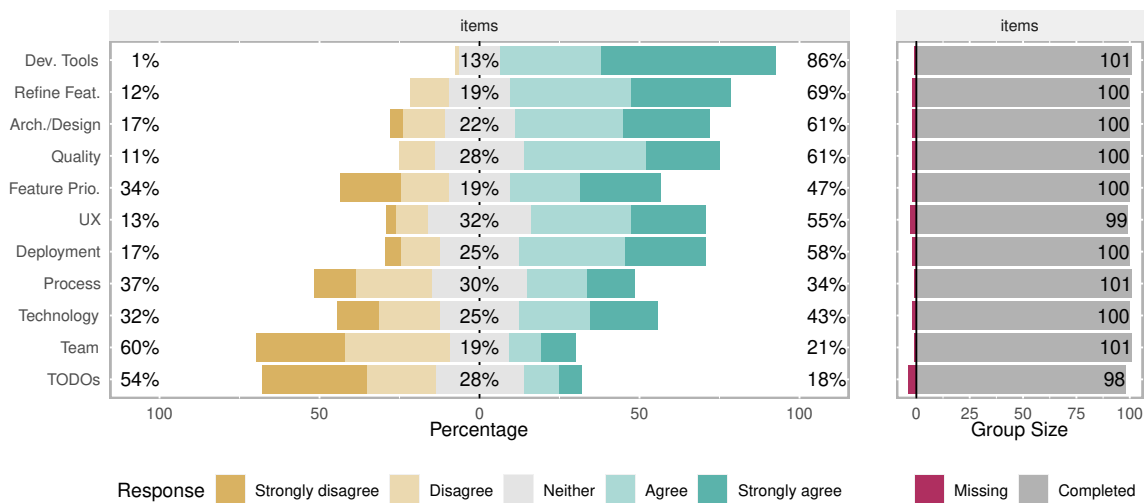


Figure B.5.: Decisions types participants consider worth capturing, relative distribution.

### Question Q-06 – Which Additional Types of Decisions Should Be Documented?

*Question Q-06* supplements the previous questions by asking for types of decisions that were not included in the given list but which the participants consider worthy of documentation. There were no predefined response options to this question. The responses were recorded in free text format. Each response shown in [Table B.3](#) was given exactly once. When reading the responses, one should consider that many of the participant’s responses do not directly refer to abstract decision types but rather to concrete objects or points in time of a possible decision.

<b>Which Additional Types of Decisions Do You Consider Worth Documenting?</b>
1) Important scope changes by stakeholders
2) Visions/guiding principles for milestones such as the MVP
3) Strategy changes, such as migration strategies or roadmap changes in the project each with cause, justification, effects, if applicable
Clarification of quality features as, for instance, scalability, reliability, speed.
Changes in the general parameters (market, customer, organisation) that influence the project.
Any decisions on principal objectives (e.g., OKR [ <i>Objectives and key results</i> ], vision)
Formalised processes (if not automated), test concepts, technical debts
Changes of solution decisions (functional)
It always depends on the goal of the documentation. Therefore, I would rate the questions differently depending on the type of documentation. In system documentation with future developers as readers, design decisions are relevant, but certainly fewer decisions on the development environment. If the team is larger and documentation is created for new team members, decisions on the development process may be relevant.
Decisions where it is not immediately obvious that it is the optimal choice at that time.
Decisions that involve technical debts which have to be repaid at a later date.
More needs to be documented if a customer ↔ provider relationship exists (does not necessarily apply to internal development).
Alternative solutions and their consequences
Comments in source code
Document the business objectives, customer problem that organisation is trying to solve with a change. Define and document the tradeoffs that need to be considered to prioritise the features
Transparency and asynchronous communication (holiday/return from parental leave)
Customer decisions, technical decisions
Only those decisions that cannot be better conveyed in team communication. Further only decisions without interpretation. In the ultimately necessary decisions for new team members to be made to familiarise themselves with the maintenance and further development of software.
Design decisions
(Product)visions
Clear out of scope definition
Post-Mortems
Release dates, roll-out scenarios, risk assessments
Are there “standard processes”; has been deviated from them; if yes, why;
Are there any relevant discrepancies between the estimated effort and the tender submitted?
Decision on fundamental business objectives in terms of software value creation
Decisions about why a particular problem has been solved exactly the same way and why other approaches to the problem do not work or have not worked.
Strategic measures concerning backlog items
Product range, market decisions, vendor decisions

Table B.3.: Additional decisions types participants consider worth capturing.

**Question Q-07 – How Often Do You Document the Following Rationale for a Decision?**

Question Q-07 asked the study participants how often they document certain types of rationale for a decision. The participants had to specify a frequency for the predefined list of rationale types. It was not possible to provide individual responses. Table B.4 shows the predefined types of rationale in the left column for which the participants should indicate the applied documentation frequencies. The right-hand column contains the abbreviations that are used synonymously for the corresponding in the following illustrations for the sake of conciseness.

The relative distribution of the surveyed results for Question Q-07 is listed in Figure B.6 below. For the surveyed documentation frequency, there were between two and four abstentions per rationale type.

Rationale Type – Full Description	Abbreviation
Constraints	Constraints
Assumptions made	Assumptions
Benefit of a solution alternative	Benefits
Tradeoffs between alternatives	Tradeoffs
Weakness of a solution alternative	Weaknesses
Complexity of a solution alternative	Complexity
Certainty that the alternative would work	Functionality
Certainty that you could implement it	Feasibility
Cost of a solution alternative	Costs

Table B.4.: Decisions types with their abbreviations.

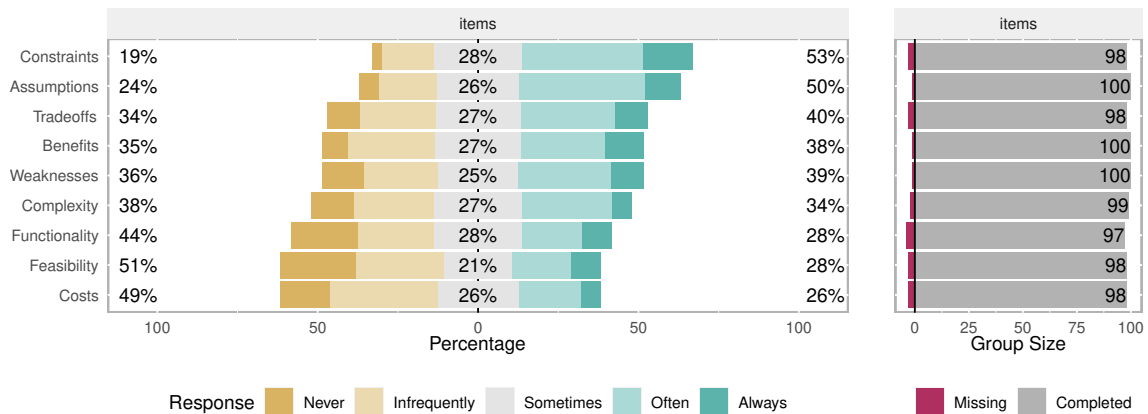


Figure B.6.: Rationale Documentation Frequency (→) Grouped by Rationale Type (↑).

**Question Q-08 – The Following Rationale Helps Me to Understand the Decision in Question.**

*Question Q-08* asked the participants for their level of agreement on the statement that certain types of rationale foster the comprehension of a decision in question. Respondents had to specify their agreement for a set of given types of rationale, also used for *Question Q-07* (cf. [Table B.4](#)). Besides, it was not allowed to provide individual responses. The relative distribution of the results is listed in [Figure B.7](#) below. For the surveyed rationale documentation frequency, there were between two and five abstentions per type.

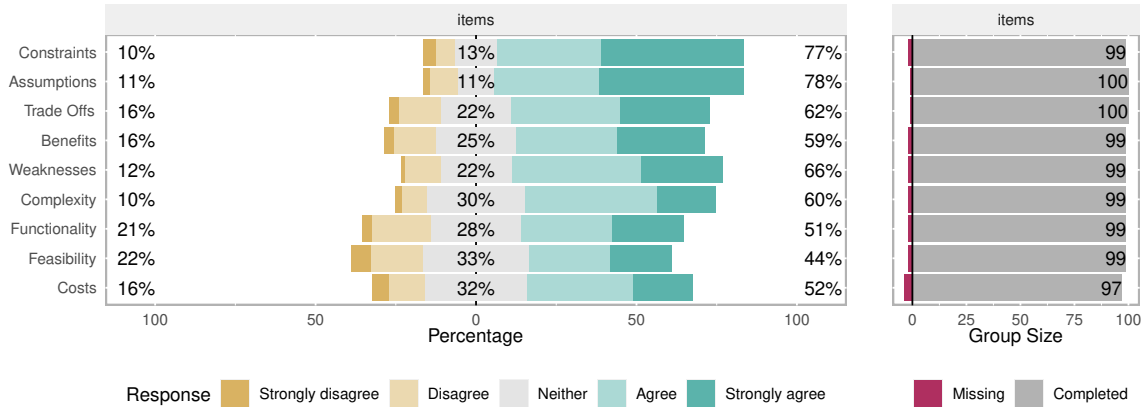


Figure B.7.: Degree of Agreement on a Rationale's Usefulness (→) Grouped by Rationale Type (↑).

**Question Q-09 – Which Kind of Information Do You Use to Reason About a Decision to Take?**

*Question Q-09* asked for types of elements of rationale information that participants use to reason on a decision. The participants had to specify a frequency of usage for each given element type. No individual responses could be given. Those were surveyed in the following *Question Q-10*. The relative distribution of the results for *Question Q-09* is listed in [Figure B.8](#) below. There were occasionally one or two abstentions per type for the given types of elements of rationale information.

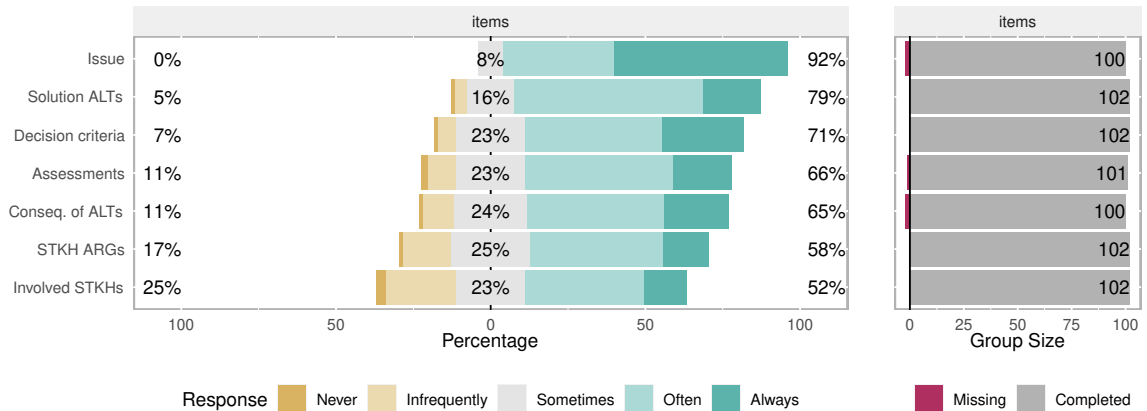


Figure B.8.: Degree of agreement on a rationale's usefulness (→) grouped by element type (↑).

**Question Q-10 – Which Additional Information Do You Use to Reason on a Decision?**

As a follow-up to *Question Q-08* and *Q-09*, *Question Q-10* aimed at collecting additional information that matters to the respondents when they reason on a decision; the responses were collected in free text format. The results are listed in *Table B.5* below.

<b>Which Additional Information Not Listed Previously Do You Use to reason on a decision?</b>
Similarity to decisions in the project environment (a kind of self-similarity in architectures, developments, interfaces and, thus, in decisions when changing teams or transferring know-how).
Decisions already taken
Insights / Learnings since the last decision, when it is necessary to question them.
Time of customer effectiveness
All available information. Usually, decisions are made without a complete information base.
Discussions with colleagues and architects, available external documentation (usually one is not the first)
Business KPI
Inputs from competitor analysis
Gut feeling; life experience
Corporate guidelines
State-of-the-art technology
Expertise in alternative solutions
Urgency. Customer benefit. Recommendation of a standard.
Occasional intuition
Data protection and information security relevance
Costs
Are there know-how carriers who have experienced such an alternative in practice? Bridging the gap between theory and practice.
Ressources - do we have to be qualified to be involved? Which alternative will produce a good quality solution expected to be delivered for the upcoming tasks (prerequisite)? Do we need a spike?
Dependencies to other teams that may cause delays

Table B.5.: Additional information used to reason on a decision.

**Question Q-11 – Which Kind of Information Do You Capture for a Decision?**

*Question Q-11* asked the study participants what types of information they documented when they made a decision. For this purpose, participants had to specify a documentation frequency for a predefined list of elements of rationale information. The relative distribution of the results is listed in *Figure B.9* below. For the given elements of rationale information, there were occasionally one or two abstentions per element type.

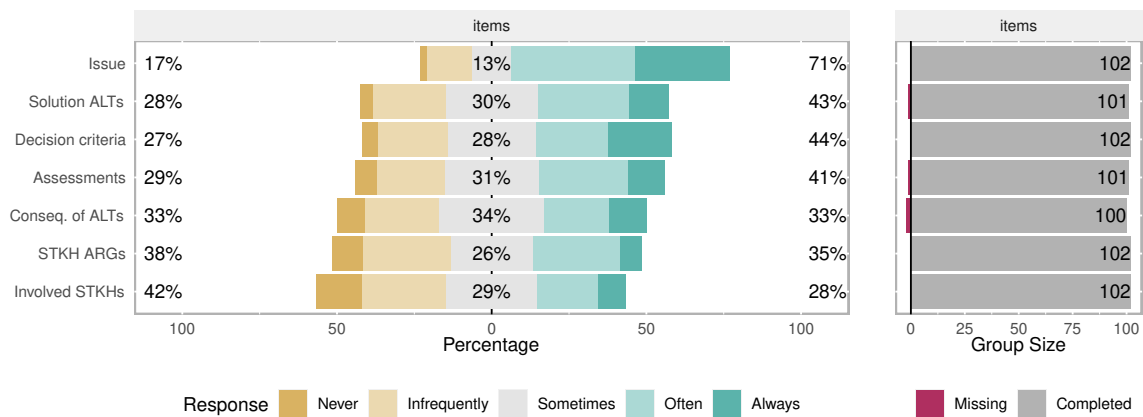


Figure B.9.: Degree of Agreement on a Rationale's Usefulness (→) Grouped by Rationale Type (↑).

### Question Q-12 – Do You Capture Additional Information Not Listed Previously?

*Question Q-12* collected additional types of information not listed in *Question Q-11* that survey participants document for a decision. The responses to these questions had to be entered in free text format. Responding to this question was voluntary. Each of the following responses in [Table B.6](#) was given exactly once.

Which additional information do you capture not listed previously?
Similarity to decisions in the project environment (a kind of self-similarity in architectures, developments, interfaces and, thus, in decisions when changing teams or transferring know-how).
Constraints
Expected impact of the decision
Generally speaking, the environment and the scope of the decision are also important. When a new brake is developed, there are higher requirements for verifiability than when developing a website.
Trends, environment, alignment with IT strategy
Votes against that decision
Operative User Guide
Total content of the retro, i.e., feedback from the team
Internal expertise concerning alternative solutions
System specification - the result of various decisions
Consequences for upcoming sprints and the product's quality

Table B.6.: Additional information documented for a decision.

### Question Q-13 – Which Information Helps You to Understand a Decision in Question?

The section “Decisions and Rationale” is closed by [Question Q-13](#). It asked the participants to specify their level of agreement on the statement that a given element of rationale information fosters the comprehension of a decision in question. The predefined list of elements of rationale information is identical to the one from [Question Q-09](#), respectively, [Q-11](#). The level of agreement was measured with a Likert scale. The relative distribution of the results is listed in [Figure B.10](#) below. For the given elements of rationale information, there were between two and four abstentions per type.

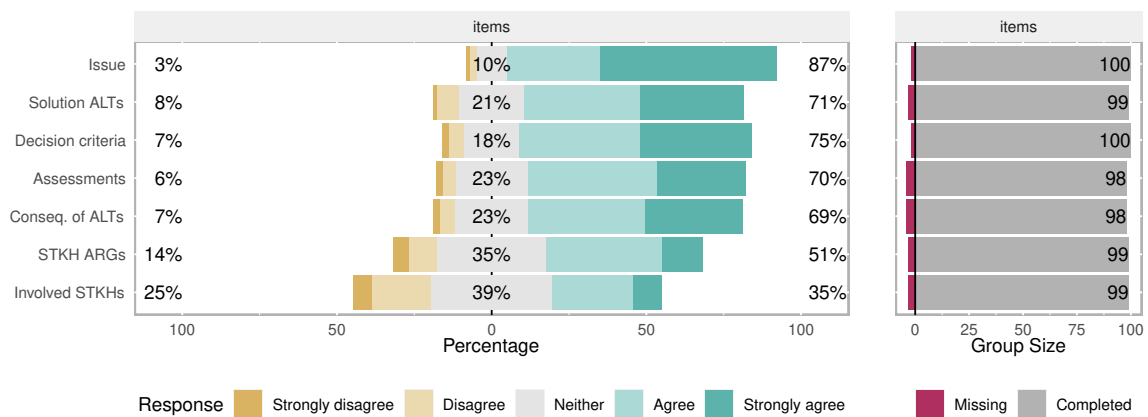


Figure B.10.: Degree of Agreement on a Rationale’s Usefulness (→) Grouped by Rationale Type (↑).

## B.3. Decision Capture

The “*Decision Capture*” section mainly deals with the process of capturing rather than with the question of content. Questions are asked about the materials used, the phases of decision-making and documentation in Scrum, and the methods used.

### Question Q-14 – How Often Do You Capture Decisions During the Following Activities?

[Question Q-14](#) asked the study participants about the frequency of decision making within the individual Scrum phases. The participants had to indicate a documentation frequency of decisions for the usual Scrum phases and the item “In the remaining course of the sprint”. The answers had to be specified based on a Likert scale. Individual responses were not allowed here. The relative result distribution is listed in [Figure B.11](#) below. To improve readability, “*In the remaining course of the sprint*” was replaced by “*during the sprint*”. For the given types of information, there were between one and seven abstentions per type.

Please note, due to an error during the data capture, only 63 of the 102 participants could choose from all the available response alternatives for the Scrum activities (for more information, please refer to [Section 5.2](#)). Accordingly, the results presented in [Figure B.11](#) reflect only those of the

mentioned 63 participants. All results, including the 39 participants who could only choose from an incomplete set of response alternatives, are shown in [Figure B.12](#).

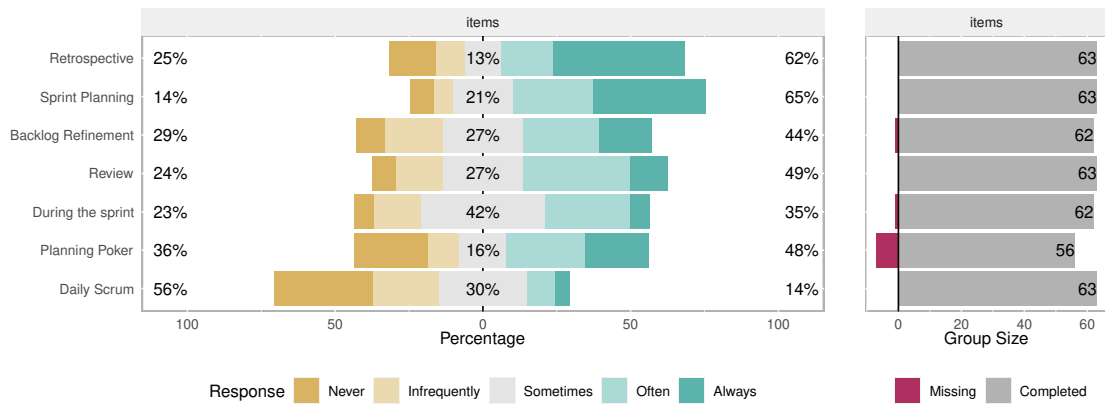


Figure B.11.: Decision documentation frequency per Scrum activity – subset of 63 participants with the full set of answers given (cf. [Section 5.2](#)).

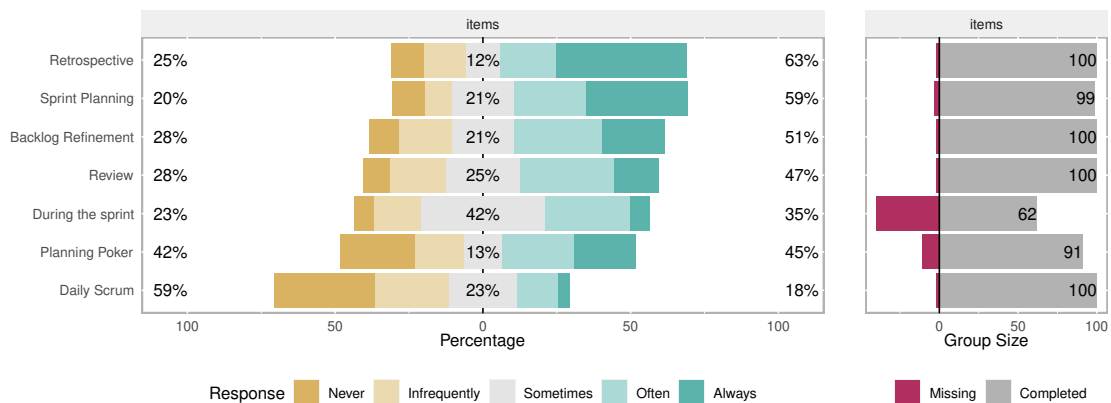


Figure B.12.: Decision documentation frequency per Scrum activity.

### Question Q-15 – According to Your Experience, During Which Activities Are the Following Decisions Usually Made?

*Question Q-15* asked the participants in which of the previously mentioned Scrum phases given decision types are made. The participants had to indicate how often they would make a given type of decision within the relevant phase. It was not possible to define individual scrum phases or to define individual types of decisions. The relative distribution of the results is listed in [Table B.7](#) below.

Please note, due to an error during the data capture, only 63 of the 102 participants were able to choose from all the available response alternatives for the Scrum activities. Accordingly, the results presented in [Table B.7](#) reflect only those of the mentioned 63 participants. All results for which



the participants could only choose from a limited subset of predefined responses are excluded from the evaluation of *Question Q-15* in [Table B.7](#). For a complete picture, all responses, including the 39 participants who could only choose from an incomplete set of response alternatives, are shown in stacked bar charts in [Figure B.14](#) and [Figure B.13](#) relative to the Scrum activities.

	Backlog Refinement	Planning Poker	Sprint Planning	Daily Scrum	Sprint Review	Sprint Retrospective	In the course of the sprint
Decisions regarding the deployment platform	42.8	4.8	11.9	4.8	0	0	35.7
Decisions regarding development tools	55.8	3.8	11.5	1.9	3.8	3.8	19.2
Decisions on defining / refining features / requirements	55.9	8.5	18.6	6.8	3.4	0	6.8
Decision regarding software quality measures	20.8	11.3	28.3	7.6	9.4	9.4	13.2
Architecture / design decisions	42.6	2.1	14.9	4.3	0	2.1	34
Decision regarding user experience	37.2	11.8	15.7	7.8	13.7	2	11.8
Decisions on the feature / task priorities	19.6	3.6	51.8	17.8	3.6	1.8	1.8
Decisions on the software development process	16.7	16.7	23.8	2.4	0	26.2	14.3
Technology decisions (buy or build / make or take → libraries / frameworks)	30.2	4.7	23.3	2.3	0	4.6	34.9
Decisions regarding the team organisation (e.g., change of roles)	4.3	6.4	34	17	0	27.7	10.6
Decision on small operational to do items	7.3	1.8	21.8	54.5	5.5	0	9.1

Table B.7.: Frequency of documentation of decision types per Scrum activity.

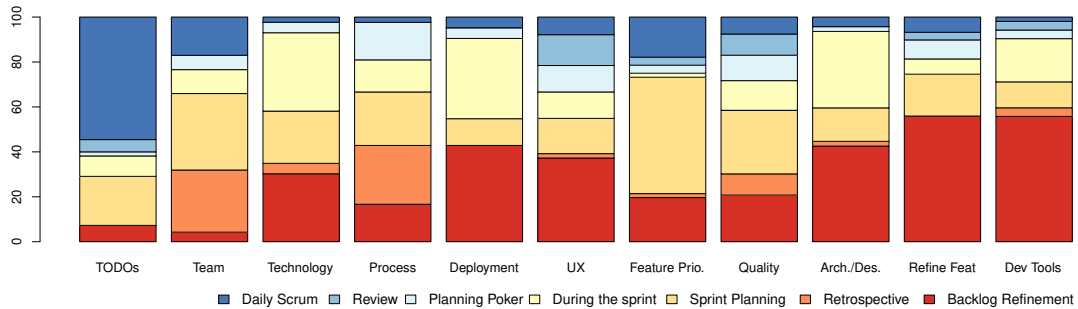


Figure B.13.: Relative documentation frequency of decision types per Scrum activity – subset of 63 participants with the full set of answers given (cf. [Section 5.2](#)).

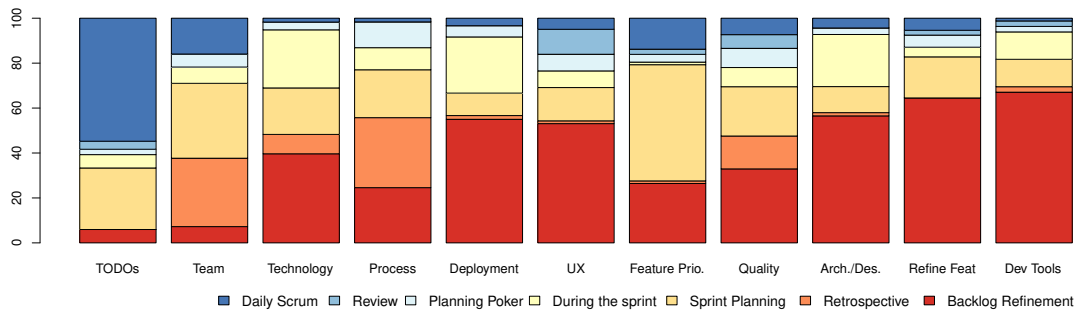


Figure B.14.: Relative documentation frequency of decision types per Scrum activity.

### Question Q-16 – How Often Do You Use the Following Media Types for Capturing Decisions?

*Question Q-16* covers types of media used to capture decisions. For this purpose, four rather general types of media were specified, for which the participants had to specify their frequency of use according to a Likert scale. The participants could not provide individual responses. The relative distribution of the results is listed in [Figure B.15](#) below. In total, between 93 and 101 participants indicated a frequency for each medium surveyed. The remaining participants abstained in the other cases.

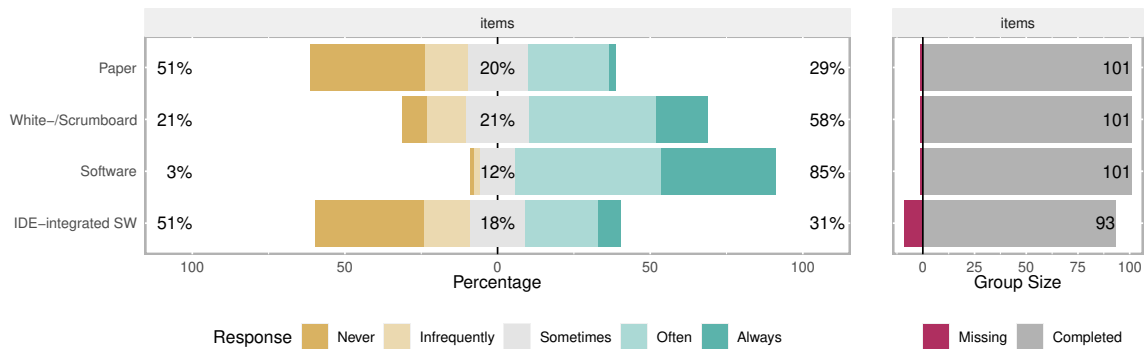


Figure B.15.: Usage frequency of media to document decisions.

### Question Q-17 – How Often Would You Like to Use the Following Media Types for Capturing Decisions?

In line with the previous question, this question asked for types of media that the participants would like to use to document decisions. The predefined list of media types is identical to the one from [Question Q-17](#). In detail, the participants were asked to define the frequency of usage they would prefer for the given types of media on a Likert scale. The relative distribution of the results is listed in [Figure B.16](#) below. In total, between 92 and 100 participants indicated a frequency for each medium surveyed. The remaining participants abstained in the other cases.

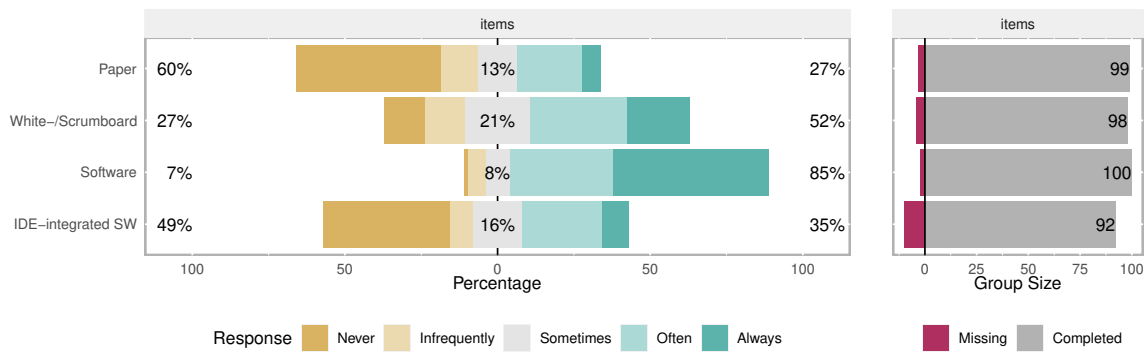


Figure B.16.: Types of media participants would like to use to document decisions.

### Question Q-18 – How Often Do You Apply the Following Means to Capture Decisions and Manage Its Documentation?

*Question Q-18* covered the usage of methods and corresponding tools for dealing with decisions in Scrum. For this purpose, the participants had to record the usage frequency for given methods and tools. In order to avoid misunderstandings, the author provided a brief explanation for the response option “Design Space Exploration” directly in the questionnaire. For every given method / tool, a frequency of usage on a Likert Scale had to be specified. The participants could not specify individual responses. The relative distribution of the results can be found in [Figure B.17](#) below. In total, between 94 and 95 participants indicated a frequency per surveyed mean. The remaining participants abstained in the other cases.

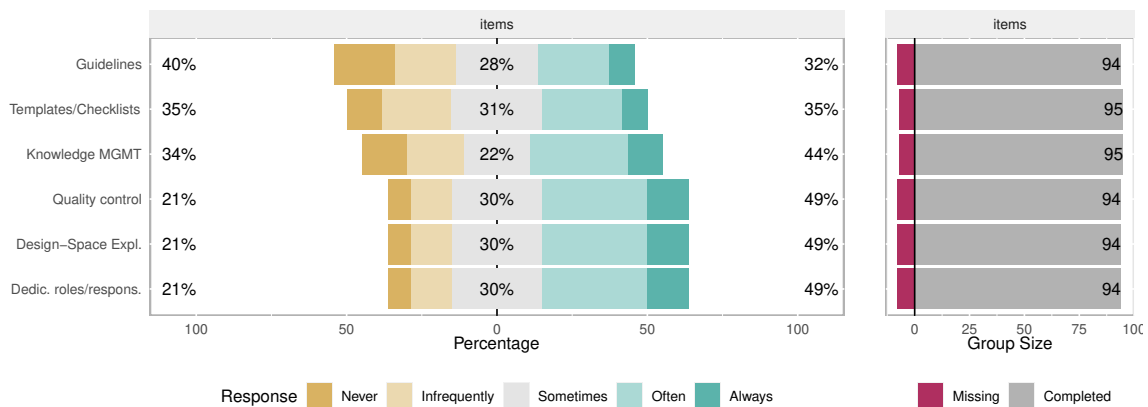


Figure B.17.: Usage frequency of methods/tools to document decisions, relative distribution.

**Question Q-19 – How Often Would You Like to Apply the Following Means to Capture Decisions and Manage its Documentation?**

*Question Q-19*, analogous to *Question Q-18*, asked the participants how often they would like to use the methods and associated tools mentioned so far. These methods and associated tools are identical to the list from the previous *Question Q-18*. In order to avoid misunderstandings, the author provided a brief explanation for the response option “Design Space Exploration” directly in the questionnaire. For every given method / tool, a frequency of usage on a Likert Scale had to be specified. The participants could not specify individual responses. The relative distribution of the results can be found in [Figure B.18](#) below. In total, between 88 and 90 participants indicated a frequency per surveyed mean. The remaining participants abstained in the other cases.

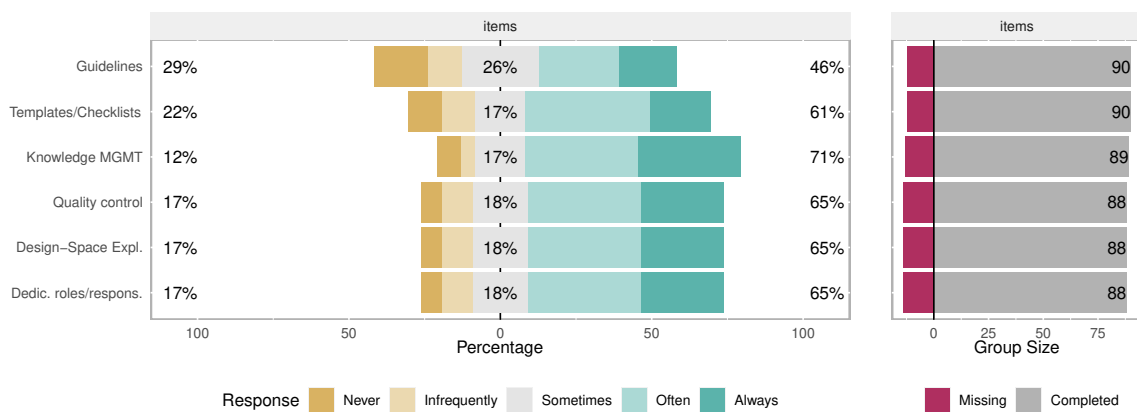


Figure B.18.: Desired usage frequency of methods/tools to document decisions, rel. distribution.

**Question Q-20 – I Do Not Capture Decisions Because ...**

*Question Q-20* asked for reasons to not document decisions. For this purpose, the survey offered predefined response alternatives. The participants were able to select multiple responses or submit individual responses. As a result, some responses are listed exactly once, while others have significantly more votes. The relative distribution of the results can be found in [Table B.8](#) below. Overall, only 83 out of 102 participants gave a reason for documenting decisions. Of the remaining 19, three participants added individual reasons not included in the list of predefined answers. The other 16 abstained completely.

<b>I Do Not Capture Decisions Because ...</b>	<b>Votes (%)</b>
of time / budget constraints.	21.6
There are no documentation standards.	13.7
I did not know how to represent them.	10.8
There is no appropriate tool support.	6.9
I fear consequences (e.g., based on political / legal issues or conflicting business philosophy).	2
of security issues.	1
... there is no reason. I usually capture decisions if they seem to be worth it.	64.7
<b>↑ predefined response options / ↓ individual responses</b>	
Lack of discipline	1
Many decisions in your nature are also temporary, and there is no real added value through documentation. The really important decisions are sometimes documented by themselves (by practices/processes/emails).	1
Sometimes decisions are made intuitively, and there is no analysis of the alternatives. Decisions made unconsciously are also not documented.	1
Sometimes forget it, and it gets lost	1
Because documentation always says the wrong thing.	1
Decisions can change faster than documentation, so small decisions are more likely to be documented directly in the code rather than using wikis.	1
It is unclear what exactly should be documented	1
... there is no reason. Probably because of a lack of consciousness.	1
No added value	1
Fast-moving decisions devalue documentation after a short period	1
You cannot weigh up and write down all the alternatives in every action. Often it is enough to record the result.	1

Table B.8.: Reasons for not capturing decisions.

## B.4. Use of Captured Decisions

This section addresses the handling of documented decisions. Questions were asked about the usage of documented decisions and requirements for decision documentation. The results of the related questions are listed below.

### Question Q-21 – Do You Forget the Reasons That Justify Decisions After a Some Time?

In [Question Q-21](#), the participants were asked how often they generally forget the rationale behind a decision after a while. Respondents had to define a corresponding frequency on a Likert scale. The results are shown in [Figure B.19](#) below. Overall, 100 out of 102 participants specified a corresponding frequency.

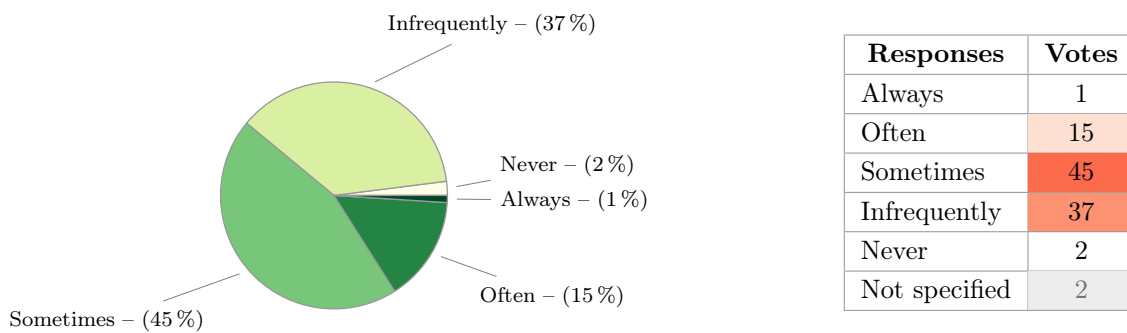


Figure B.19.: Frequency of forgetting rationale for a decision.

### Question Q-22 – Do You Revisit Documentation to Understand Decisions in Question or Asses Potential Alternatives?

[Question Q-22](#) asked the participants how frequently they look at decision documentation to evaluate possible alternatives or generally comprehend a decision in question. To respond to this question, the participants had to specify a frequency on a given Likert scale. The results are shown in [Figure B.20](#) below. Overall, 100 out of 102 participants specified a corresponding frequency.

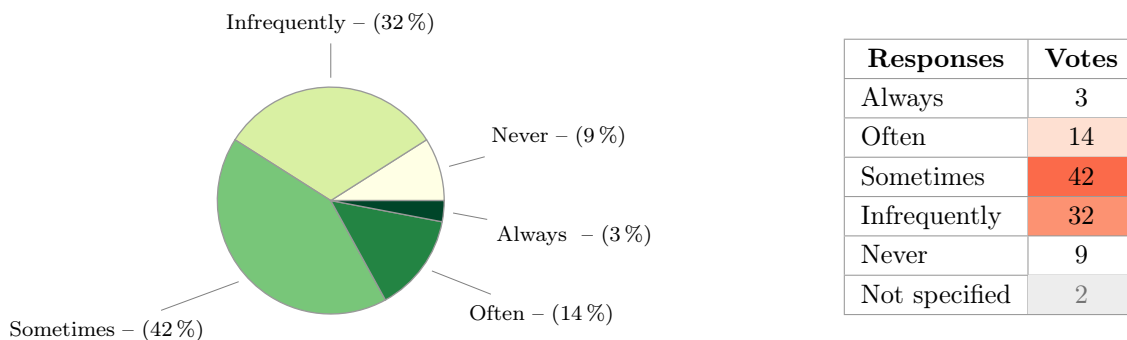


Figure B.20.: Frequency of revisiting decision documentation to foster comprehension.

**Question Q-23 – In Which of the Following Situations Did You Wish for Decision Documentation Which Was Not Available At the Time?**

*Question Q-23* asked the study participants about incidents in which they would have liked documentation on given decisions while none was present. The participants were able to choose from ten predefined response options. They could also provide individual responses. The selection of multiple responses was possible in *Q-23*. As a result, the individually defined responses have been named only once each. The relative distribution of the results is listed in [Table B.9](#) below.

<b>In Which of the Following Situations Did You Wish for Decision Documentation Which Was Not Available At the Time?</b>	<b>Votes (%)</b>
The issue at hand already occurred in a similar fashion.	62.7
An existing solution had to be modified because of modified requirements.	57.8
You joined an ongoing project.	59.8
The decision at hand was a mistake in your eyes.	45.1
You needed to familiarise yourself with a project which has been completed a long time ago.	38.2
A software bug had to be resolved.	39.2
An audit had to be made / auditors put our decisions in question.	31.4
A review was conducted.	26.5
A colleague asked for your opinion on a decision to make.	20.6
No corresponding situations come to your mind.	9.8
<b>↑ predefined response options / ↓ individual responses</b>	
If you have bug discussions with the customer.	1
External consultants made a big mistake, and we had to understand the situation which concluded the disaster	1
Have learnt and need to validate the decision again	1
If there is no one, I can ask.	1
In discussions with customers and external “consultants”,	1
The whole term “documentation of a decision” is somewhat unclear to me in the whole survey. Does this mean weighing up different alternatives and recording them, or is it about capturing the result of a decision?	1

Table B.9.: Situations in which the participants wished for available decision documentation.

**Question Q-24 – Imagine, In Your Current Project Decision Documentation Is Available. In Which of the Following Situations Would You Consider This Documentation to Be Valuable?**

By providing the same response options as the previous question, *Question Q-24* asked in which of the given situations the survey participants would consider documentation on decisions taken to be valuable. The participants could also provide individual responses. The selection of multiple responses was possible in *Q-24* as well. As a result, the individually defined responses have been named only once each. The relative distribution of the results is listed in [Table B.10](#) below.

<b>In Which of the Following Situations Would You Consider Decision Documentation Valuable?</b>	<b>Votes (%)</b>
The issue at hand already occurred in a similar fashion.	65.7
An existing solution has to be modified because of modified requirements.	73.5
You join an ongoing project.	79.4
The decision at hand is a mistake in your eyes.	53.9
You need to familiarise yourself with a project which has been completed a long time ago.	56.9
A software bug has to be resolved.	55.9
An audit has to be made / auditors put our decisions in question.	59.8
A review has to be conducted.	53.9
A colleague asks for your opinion on a decision to make.	41.2
No corresponding situations come to your mind.	8.8
<b>↑ predefined response options / ↓ individual responses</b>	
In discussions with customers and external “consultants”,	1
Whether documentation of the decisions helps when an error is corrected depends on the type of error. If it is an implementation error, it is not documentation, just a look at the code.	1
Have learnt and need to validate the decision again	1
in case of not satisfying delivery	1

Table B.10.: Situations in which participants would consider rationale valuable.

**Question Q-25 – Wishes for Managing Rationale in Scrum**

*Question Q-25* concluded the question complex by asking the participants an open question about their wishes regarding the documentation of decisions. The participants were, therefore, able to respond in a free text format. Each of the responses (cf. [Table B.11](#)) comes from exactly one participant. Accordingly, only some of the participants responded to this question.



<b>What Are Your Wishes for Managing Rationale in Scrum?</b>
Enable teams and do not work with fixed rituals.
All in Jira/Confluence at the appropriate tickets. All artefacts are linked together for better traceability. Contact person.
Scrum should not differ in the documentation level from a classical procedure, e.g., according to the V-model. However, the points in time at which documentation is created can be different.
The iterative approach often makes it difficult for stakeholders to see how far-reaching a decision is.
So far, we only use Scrum rudimentary, and documentation is limited. We want Scrum to support us, what should be documented, for instance, in an environment with little time for documentation.
In our IT department, about 10 Scrum teams work on different topics. It would be helpful if Scrum could provide more support for cross-team decisions, communication and documentation.
The backlog should record all requirements; all information on architecture and configuration belongs in Confluence. That is all you need.
In Scrum, problems and blockers are given much attention. The same should also happen with decisions - so that it remains comprehensible for the whole team (also in consideration of remote team members or holidaymakers)
The rationale for decisions is often seen as additional, unnecessary documentation, the value of which one does not become aware of at the time when it could be recorded.
The impact on budget and desired time must always be made transparent.
As little as possible, as much as necessary.
Wherever possible, work out or at least share decisions with everyone personally. Explicitly do (e.g., close to the Scrum board) and visualise (let it hang in the team room)
Fewer processes imposed by Bosch (e.g., long term OSS scan via India)
Automatic Review of decisions.
Distinguish clearly between interpersonal communication and project documentation. Make it clearer that the manifesto does NOT speak of NO documentation but resists documentation for the sake of documentation only. Quality assurance measures, documentation, planning are also an integral part of any Scrum approach; make people more aware that the existence of (reasonable) documentation is important, not the superfine presentation in the superfine tool.
How can only the most important things be recorded? What are the criteria that can help with lean and yet relevant documentation of decisions?
Decisions should be documented, including reasons, if they are of lasting significance.
Using JIRA (or similar tools) and Confluence for documenting decisions directly

Table B.11.: Wishes for managing rationale in Scrum.

## B.5. Characteristics of Respondents

The last set of questions addresses demographic data. Only general data was requested. Since the survey is anonymous, the author has not asked for any personal data. Rather, the focus is on aspects, e.g., software development experience, Scrum experience and applied Scrum practices.

### Question Q-26 – Please Specify the Time of Experience You Have as a Software Engineer.

*Question Q-26* asked for the level of software development experience. Participants should specify their experience based on a given Likert scale. Of the 102 participants in the study, six participants did not disclose anything about their experience in software development. The relative distribution of the participant’s software development experience is shown in [Figure B.21](#).

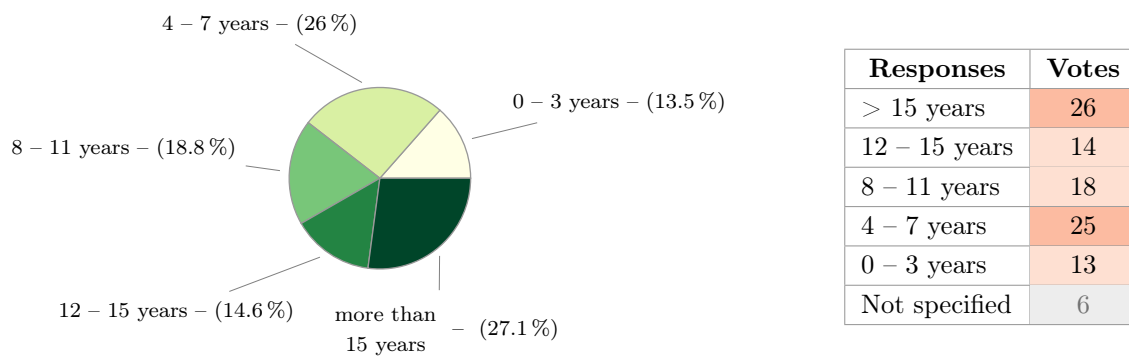


Figure B.21.: Software development experience of the participants, in years.

### Question Q-27 – Please Rate Your Scrum Experience Level.

*Question Q-27* asked for the Scrum experience of the participants. The participants had to determine their level of experience by choosing *novice*, *advanced* and *expert*. When asked, there was only one participant who preferred not to specify the current state of experience (one abstention). The relative distribution of the results is shown in [Figure B.22](#).

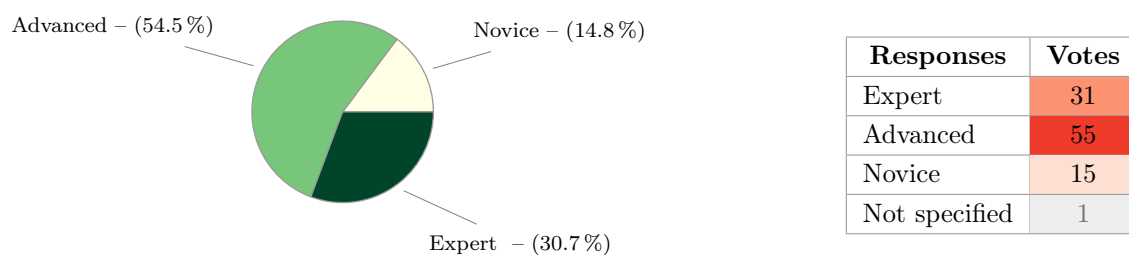


Figure B.22.: Scrum experience level of the participants.

### Question Q-28 – In Which of the Following Roles Did You Gain Profound Experience so Far?

When asked in which of the roles in Scrum the participants were able to gain profound experience, *Scrum Master*, *Product Owner*, and *Developer* were available for selection. The participants were able to select multiple responses. The relative distribution of the results is shown in [Figure B.23](#). It shows those rates in red for which participants selected only one response and those rates in blue for which the participants selected several responses at once. Overall, 98 out of 102 participants indicated having profound experience in one or more of the given roles.

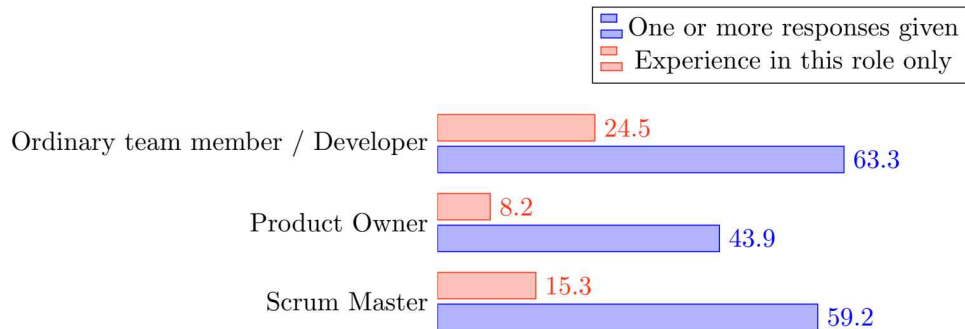


Figure B.23.: Participants' experience in explicit Scrum roles, relative distribution.

### Question Q-29 – Please Indicate the Domain in Which You Mainly Work.

*Question Q-29* asked the participants about the domain in which they work. For this purpose, the participants had several response options at their disposal. The participants did not have to limit themselves to one response but could tick several responses and write an individual response in free text. Each domain is counted individually as a response, even if a single participant has specified several domains. [Figure B.24](#) shows the relative distribution of the responses. Survey participants specified the five domains listed last. In total, 97 out of 102 participants indicated one of the given domains. The remaining five participants abstained and also did not specify an individual domain.

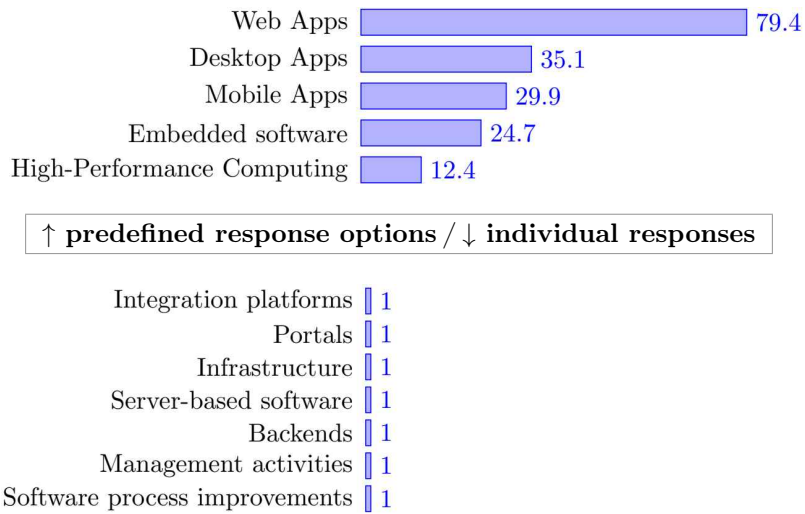


Figure B.24.: Field of work respondents work in, relative distribution.

### Question Q-30 – Please Specify Amount of Scrum Teams Working in Your Department.

As part of the survey, the author asked the respondents for the amount of teams employing Scrum in their department. Therefore, they were able to choose from various intervals. The relative distribution and its corresponding absolute values are shown in Figure B.25. There were 93 responses and nine abstentions for *Question Q-30*.

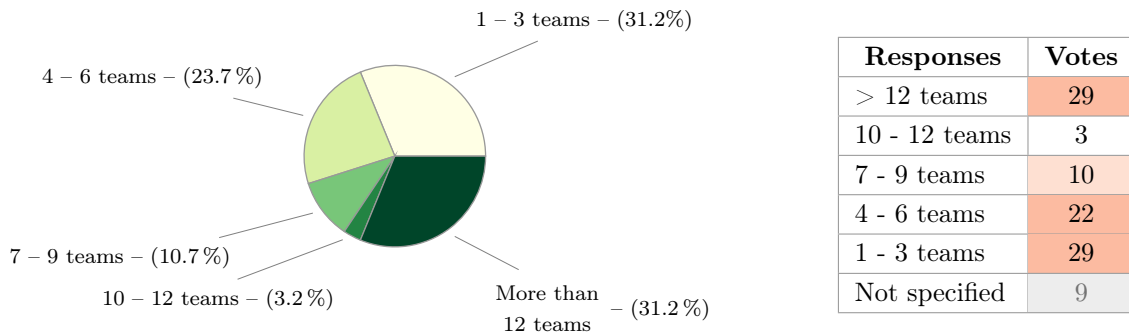


Figure B.25.: Scrum teams per department.

**Question Q-31 – Please Specify the Average Quantity of Employees per Scrum Team.**

The last question in the questionnaire asked the participants for the average team size of the Scrum teams in their department. Therefore, the author offered response options covering all variants from 4 to 7 separately. The extremes of *less than four* (< 4 members) and *more than seven* (> 7 members) were available as well. The results are distributed as shown in [Figure B.26](#). For *Question Q-31*, there were 93 responses and nine abstentions.

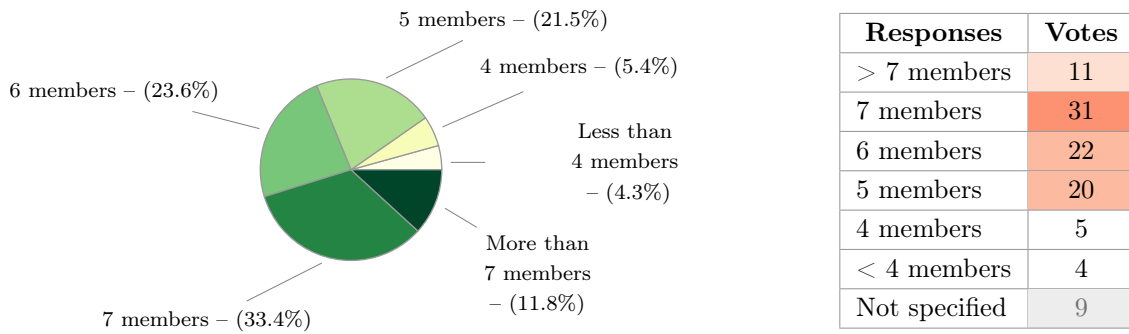


Figure B.26.: Average team size per Scrum team.

## C. Detailed Data for Hypotheses Related to Research Question RQ1

### C.1. Hypothesis RQ1-H1 – Experience $\Leftrightarrow$ Documentation of Discarded Solution Alternatives

#### C.1.1. Documentation Experience $\Leftrightarrow$ Documentation of Discarded Solution Alternatives – (IndepVar: Q-01 – DepVar: Q-02)

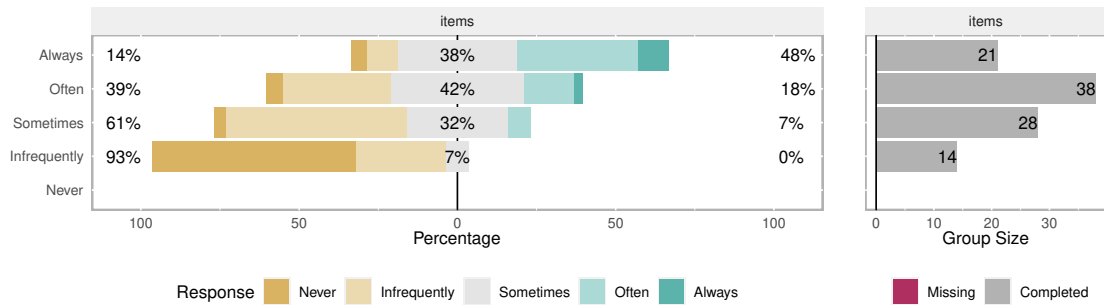


Figure C.1.: Frequency of documenting discarded solution alternatives ( $\rightarrow$ ) grouped by decision experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 33.51$	$p = 2.516 * 10^{-7} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always $\leftrightarrow$ Often	$p = 0.028 < 0.05$	$p = 0.033 < 0.05$	✓
Always $\leftrightarrow$ Sometimes	$p = 9.382 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Always $\leftrightarrow$ Infrequently	$p = 2.053 * 10^{-8} \ll 0.05$	$p = 1.232 * 10^{-7} \ll 0.05$	✓
Often $\leftrightarrow$ Sometimes	$p = 0.152 > 0.10$	$p = 0.152 > 0.10$	✗
Often $\leftrightarrow$ Infrequently	$p = 1.916 * 10^{-5} \ll 0.05$	$p = 5.749 * 10^{-5} \ll 0.05$	✓
Sometimes $\leftrightarrow$ Infrequently	$p = 0.003 \ll 0.05$	$p = 0.004 \ll 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.550$	$p = 2.515 * 10^{-9} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.489$	$p = 7.036 * 10^{-9} \ll 0.05$	✓

Table C.1.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure C.1.

### C.1.2. Development Experience ⇔ Documentation of Discarded Solution Alternatives – (IndepVar: Q-26 – DepVar: Q-02)

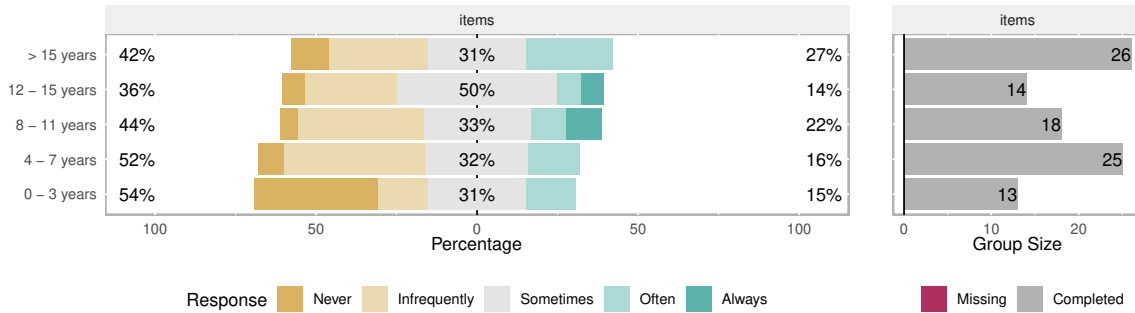


Figure C.2.: Frequency of documenting discarded solution alternatives (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.706$	$p = 0.608 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.938 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.949 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.499 > 0.10$	$p = 0.832 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.167 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.519 > 0.10$	$p = 0.741 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 0.199 > 0.10$	$p = 0.663 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.499 > 0.10$	$p = 0.998 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.179 > 0.10$	$p = 0.897 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.414 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.141$	$p = 0.170 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.119$	$p = 0.158 > 0.10$	X

Table C.2.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure C.2.

### C.1.3. Scrum Experience ⇔ Documentation of Discarded Solution Alternatives – (IndepVar: Q-27 – DepVar: Q-02)

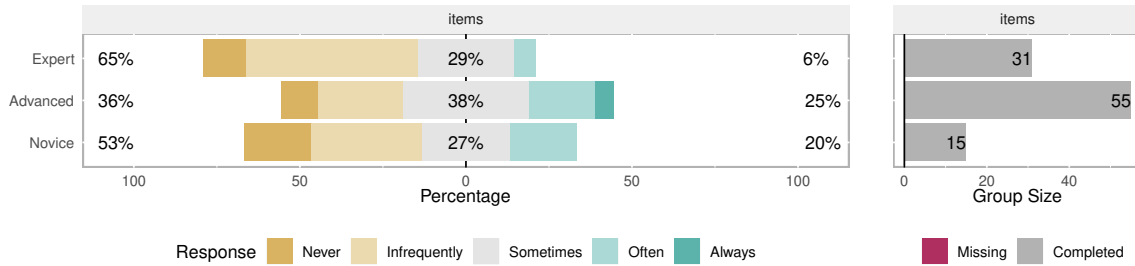


Figure C.3.: Frequency of documenting discarded solution alternatives (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.345$	$p = 0.042 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.014 < 0.05$	$p = 0.042 < 0.05$	✓
Expert ↔ Novice	$p = 0.529 > 0.10$	$p = 0.529 > 0.10$	✗
Advanced ↔ Novice	$p = 0.224 > 0.10$	$p = 0.336 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.141$	$p = 0.160 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.126$	$p = 0.151 > 0.10$	✗

Table C.3.: Results of test for difference and correlation analysis – grouped by Scrum Experience – cf. Figure C.3.



## C.2. Hypothesis RQ1-H2 – Experience ⇔ Design Assumptions Motivating Decision Documentation

### C.2.1. Documentation Experience ⇔ Design Assumptions Motivating Decision Documentation (IndepVar: Q-01 – DepVar: Q-03 – 2<sup>nd</sup> Item)

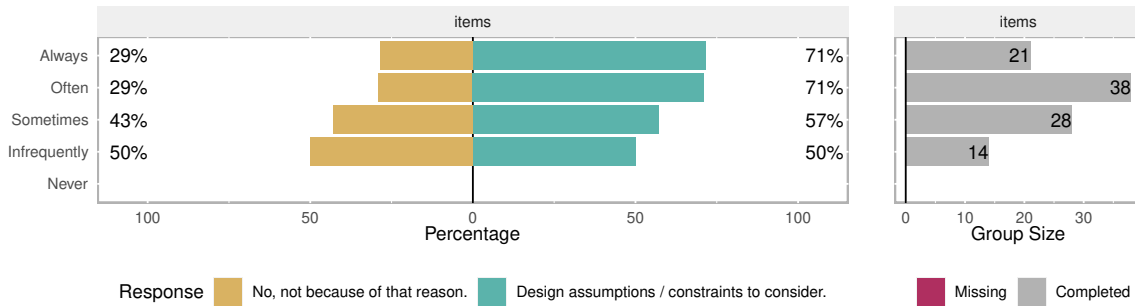


Figure C.4.: Criteria motivating the documentation of a decision: “*design assumptions / constraints to consider*” (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.063$	$p = 0.382 > 0.10$	✗
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.977 > 0.10$	$p = 0.977 > 0.10$	✗
Always ↔ Sometimes	$p = 0.304 > 0.10$	$p = 0.456 > 0.10$	✗
Always ↔ Infrequently	$p = 0.197 > 0.10$	$p = 0.591 > 0.10$	✗
Often ↔ Sometimes	$p = 0.246 > 0.10$	$p = 0.492 > 0.10$	✗
Often ↔ Infrequently	$p = 0.162 > 0.10$	$p = 0.971 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.650 > 0.10$	$p = 0.780 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.162$	$p = 0.105 > 0.10$	✗
Kendall’s Tau (b)	$\tau = 0.150$	$p = 0.104 > 0.10$	✗

Table C.4.: Results of test for difference and correlation analysis – grouped by Documentation Experience – cf. Figure C.4.

**Note:** Since the significance of the rank correlation according to *Spearman* yields a value close to  $p = 0.10$ , the significance of *Kendall’s Tau* was further considered (cf. Section 5.2). Here, however, both yielded a value of  $p > 0.10$ . Thus, there is no rank correlation.

### C.2.2. Development Experience ⇔ Design Assumptions Motivating Decision Documentation (IndepVar: Q-26 – DepVar: Q-03 – 2<sup>nd</sup> Item)

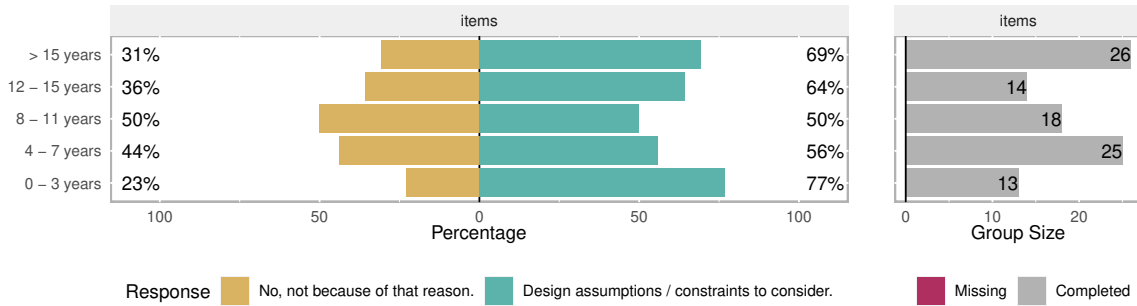


Figure C.5.: Criteria motivating the documentation of a decision: “*design assumptions / constraints to consider*” (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.292$	$p = 0.510 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.759 > 0.10$	$p = 0.759 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 0.197 > 0.10$	$p = 0.987 > 0.10$	✗
> 15 years ↔ 4 – 7 years	$p = 0.332 > 0.10$	$p = 0.829 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.642 > 0.10$	$p = 0.802 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 0.410 > 0.10$	$p = 0.820 > 0.10$	✗
12 – 15 years ↔ 4 – 7 years	$p = 0.610 > 0.10$	$p = 0.871 > 0.10$	✗
12 – 15 years ↔ 0 – 3 years	$p = 0.500 > 0.10$	$p = 0.834 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 0.690 > 0.10$	$p = 0.767 > 0.10$	✗
8 – 11 years ↔ 0 – 3 years	$p = 0.129 > 0.10$	$p = 1.000 > 0.10$	✗
4 – 7 years ↔ 0 – 3 years	$p = 0.209 > 0.10$	$p = 0.695 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.021$	$p = 0.841 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.019$	$p = 0.840 > 0.10$	✗

Table C.5.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure C.5.

### C.2.3. Scrum Experience ⇔ Design Assumptions Motivating Decision Documentation (IndepVar: Q-27 – DepVar: Q-03 – 2<sup>nd</sup> Item)

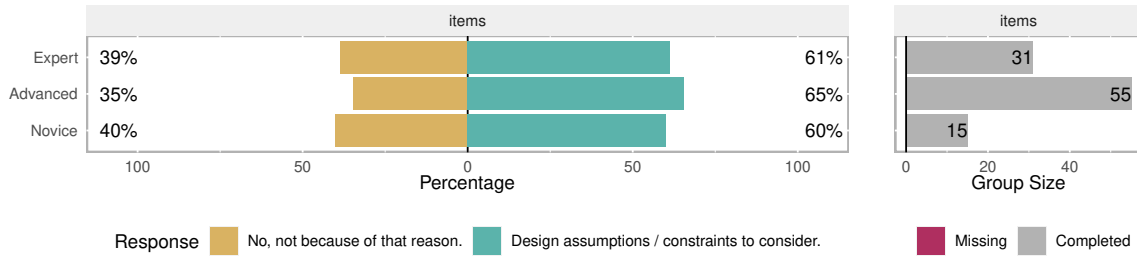


Figure C.6.: Criteria motivating the documentation of a decision: “*design assumptions / constraints to consider*” (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.232$	$p = 0.891 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.702 > 0.10$	$p = 1.000 > 0.10$	X
Expert ↔ Novice	$p = 0.932 > 0.10$	$p = 0.932 > 0.10$	X
Advanced ↔ Novice	$p = 0.699 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = -0.008$	$p = 0.938 > 0.10$	X
Kendall’s Tau (b)	$\tau = -0.008$	$p = 0.937 > 0.10$	X

Table C.6.: Results of test for difference and correlation analysis – grouped by Scrum Experience – cf. [Figure C.6.](#)

### C.3. Research Hypothesis RQ1-H2 – Experience ⇔ Documentation Frequency of Design Assumptions

#### C.3.1. Documentation Experience ⇔ Documentation Frequency of Design Assumptions (IndepVar: Q-01 – DepVar: Q-07 – 2<sup>nd</sup> Item)

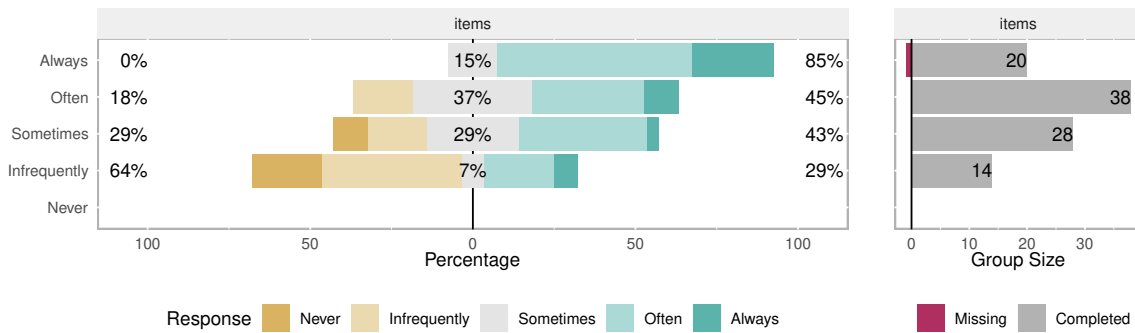


Figure C.7.: Documentation frequency of *design assumptions* (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 18.821$	$p = 2.977 * 10^{-4} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.007 < 0.05$	$p = 0.014 < 0.05$	✓
Always ↔ Sometimes	$p = 0.001 \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Always ↔ Infrequently	$p = 4.414 * 10^{-5} \ll 0.05$	$p = 2.648 * 10^{-4} \ll 0.05$	✓
Often ↔ Sometimes	$p = 0.396 > 0.10$	$p = 0.396 > 0.10$	✗
Often ↔ Infrequently	$p = 0.031 < 0.05$	$p = 0.046 < 0.05$	✓
Sometimes ↔ Infrequently	$p = 0.156 > 0.10$	$p = 0.187 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.414$	$p = 1.881 * 10^{-5} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.358$	$p = 2.297 * 10^{-5} \ll 0.05$	✓

Table C.7.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure C.7.

### C.3.2. Development Experience $\leftrightarrow$ Documentation Frequency of Design Assumptions (IndepVar: Q-26 – DepVar: Q-07 – 2<sup>nd</sup> Item)

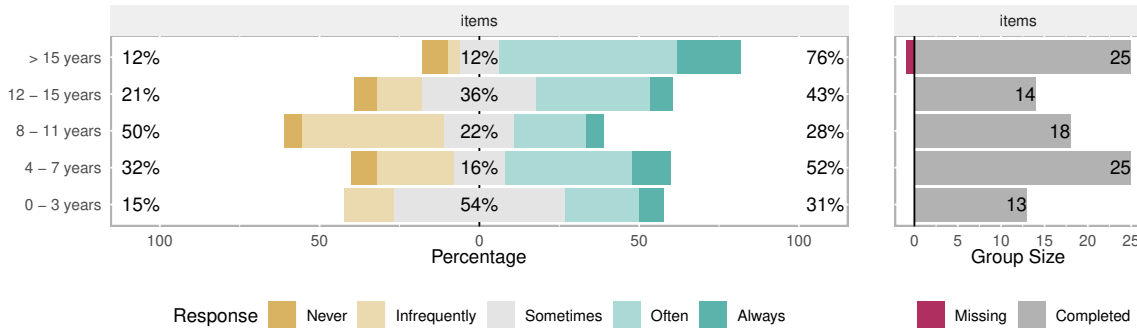


Figure C.8.: Documentation frequency of *design assumptions* ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.112$	$p = 0.039 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.097 < 0.10$	$p = 0.242 > 0.10$	✗
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.002 \ll 0.05$	$p = 0.020 < 0.05$	✓
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.079 < 0.10$	$p = 0.263 > 0.10$	✗
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.078 < 0.10$	$p = 0.390 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.260 > 0.10$	$p = 0.433 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.864 > 0.10$	$p = 0.960 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.900 > 0.10$	$p = 0.900 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.138 > 0.10$	$p = 0.276 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.332 > 0.10$	$p = 0.474 > 0.10$	✗
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.758 > 0.10$	$p = 0.948 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.191$	$p = 0.064 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.156$	$p = 0.065 < 0.10$	✓

Table C.8.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure C.8.

### C.3.3. Scrum Experience ⇔ Documentation Frequency of Design Assumptions (IndepVar: Q-27 – DepVar: Q-07 – 2<sup>nd</sup> Item)

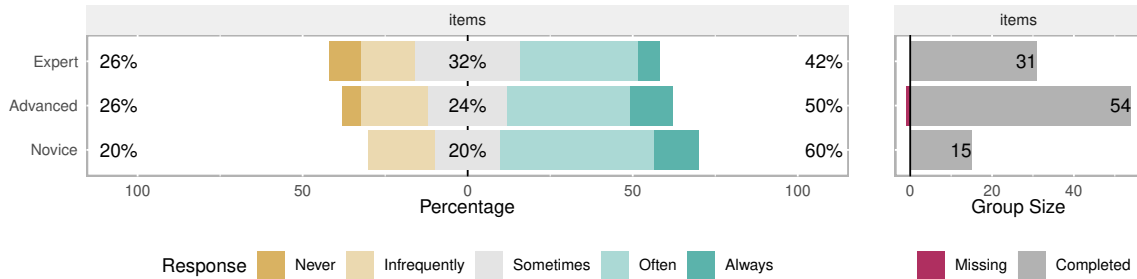


Figure C.9.: Documentation frequency of *design assumptions* (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.366$	$p = 0.505 > 0.10$	x
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.457 > 0.10$	$p = 0.685 > 0.10$	x
Expert ↔ Novice	$p = 0.254 > 0.10$	$p = 0.762 > 0.10$	x
Advanced ↔ Novice	$p = 0.512 > 0.10$	$p = 0.512 > 0.10$	x
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.117$	$p = 0.248 > 0.10$	x
Kendall's Tau (b)	$\tau = -0.101$	$p = 0.249 > 0.10$	x

Table C.9.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. [Figure C.9.](#)

## C.4. Hypothesis RQ1-H2 – Experience ⇔ Rationale Usefulness

### C.4.1. Documentation Experience ⇔ Rationale Usefulness (IndepVar: Q-01 – DepVar: Q-08 – 2<sup>nd</sup> Item)

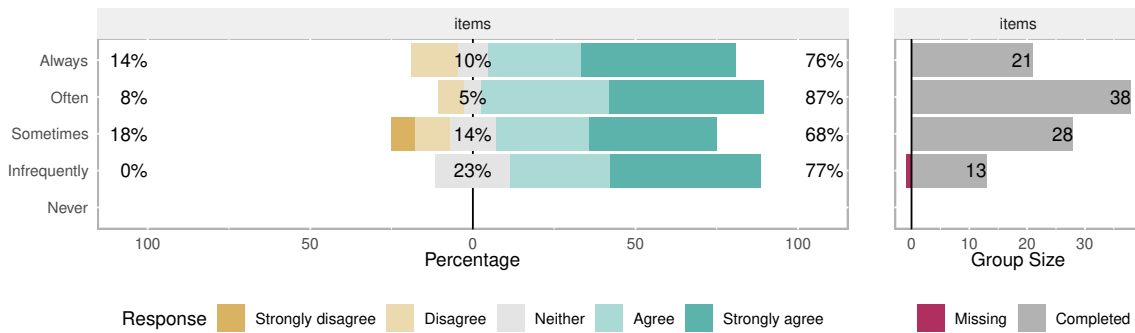


Figure C.10.: Rationale usefulness of *design assumptions* (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.727$	$p = 0.631 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.695 > 0.10$	$p = 1.000 > 0.10$	X
Always ↔ Sometimes	$p = 0.455 > 0.10$	$p = 0.911 > 0.10$	X
Always ↔ Infrequently	$p = 0.915 > 0.10$	$p = 0.915 > 0.10$	X
Often ↔ Sometimes	$p = 0.196 > 0.10$	$p = 1.000 > 0.10$	X
Often ↔ Infrequently	$p = 0.830 > 0.10$	$p = 0.996 > 0.10$	X
Sometimes ↔ Infrequently	$p = 0.451 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.058$	$p = 0.569 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.050$	$p = 0.565 > 0.10$	X

Table C.10.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure C.10.

### C.4.2. Development Experience $\leftrightarrow$ Rationale Usefulness (IndepVar: Q-26 – DepVar: Q-08 – 2<sup>nd</sup> Item)

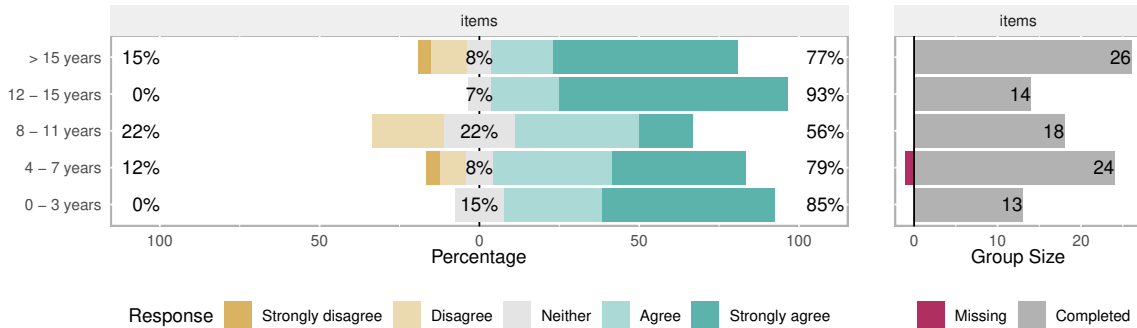


Figure C.11.: Rationale usefulness of *design assumptions* ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 12.048$	$p = 0.017 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.246 > 0.10$	$p = 0.410 > 0.10$	✗
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.013 < 0.05$	$p = 0.063 < 0.10$	✓
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.479 > 0.10$	$p = 0.532 > 0.10$	✗
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.832 > 0.10$	$p = 0.832 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.001 \ll 0.05$	$p = 0.013 < 0.05$	✓
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.082 < 0.10$	$p = 0.164 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.417 > 0.10$	$p = 0.595 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.070 < 0.10$	$p = 0.176 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.022 < 0.05$	$p = 0.072 < 0.10$	✓
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.429 > 0.10$	$p = 0.536 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.067$	$p = 0.521 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.055$	$p = 0.527 > 0.10$	✗

Table C.11.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure C.11.



### C.4.3. Scrum Experience $\leftrightarrow$ Rationale Usefulness (IndepVar: Q-27 – DepVar: Q-08 – 2<sup>nd</sup> Item)

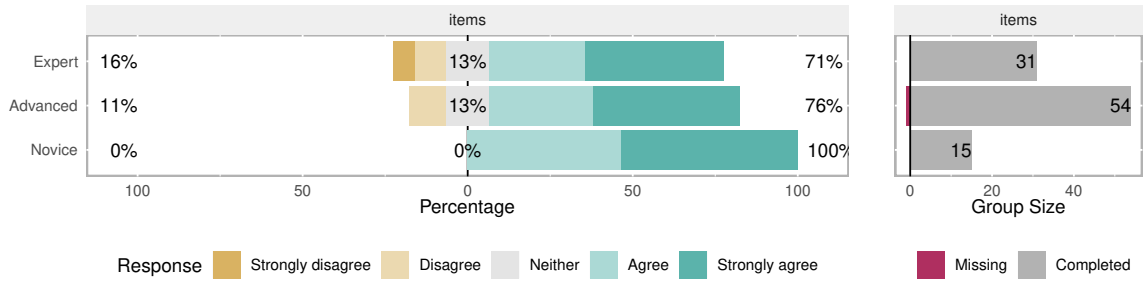


Figure C.12.: Rationale usefulness of *design assumptions* ( $\rightarrow$ ) grouped by Scrum experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.312$	$p = 0.315 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert $\leftrightarrow$ Advanced	$p = 0.632 > 0.10$	$p = 0.632 > 0.10$	X
Expert $\leftrightarrow$ Novice	$p = 0.133 > 0.10$	$p = 0.398 > 0.10$	X
Advanced $\leftrightarrow$ Novice	$p = 0.211 > 0.10$	$p = 0.317 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.135$	$p = 0.181 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.121$	$p = 0.177 > 0.10$	X

Table C.12.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure C.12.

## C.5. Hypothesis RQ1-H3 – Experience ⇔ Documentation Frequency of Rationale Types

### C.5.1. Documentation Experience ⇔ Documentation Frequency of Rationale Types (IndepVar: Q-01 – DepVar: Q-07)

Documentation Experience: “I Always Document Decisions”

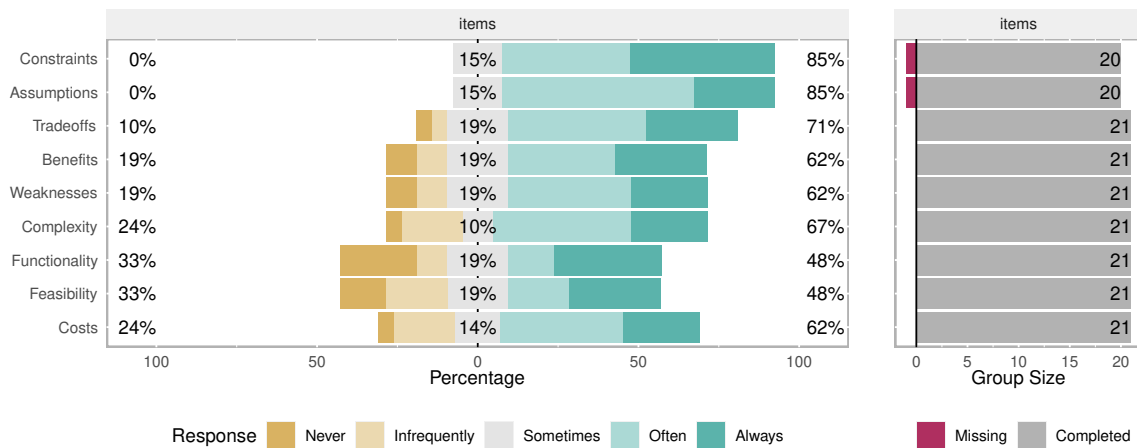


Figure C.13.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – documentation experience “I always document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.645$	$p = 0.291 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.458 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.058 < 0.10$	$p = 0.525 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.076 < 0.10$	$p = 0.551 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.220 > 0.10$	$p = 0.879 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.086 < 0.10$	$p = 0.519 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.055 < 0.10$	$p = 0.663 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.019 < 0.05$	$p = 0.347 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.016 < 0.05$	$p = 0.559 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.254 > 0.10$	$p = 0.761 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.308 > 0.10$	$p = 0.791 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.634 > 0.10$	$p = 0.845 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.336 > 0.10$	$p = 0.805 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.244 > 0.10$	$p = 0.798 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.112 > 0.10$	$p = 0.504 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.095 < 0.10$	$p = 0.490 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.902 > 0.10$	$p = 0.984 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.500 > 0.10$	$p = 0.948 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.856 > 0.10$	$p = 0.994 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.981 > 0.10$	$p = 0.981 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.651 > 0.10$	$p = 0.837 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.594 > 0.10$	$p = 0.891 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.582 > 0.10$	$p = 0.911 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.954 > 0.10$	$p = 0.981 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.883 > 0.10$	$p = 0.994 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.565 > 0.10$	$p = 0.924 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.512 > 0.10$	$p = 0.921 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.622 > 0.10$	$p = 0.861 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.485 > 0.10$	$p = 0.971 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.260 > 0.10$	$p = 0.719 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.227 > 0.10$	$p = 0.819 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.838 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.526 > 0.10$	$p = 0.902 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.475 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.668 > 0.10$	$p = 0.829 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.611 > 0.10$	$p = 0.879 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.936 > 0.10$	$p = 0.991 > 0.10$	X

Table C.13.: Results of test for difference – grouped by rationale types – cf. Figure C.13.

## Documentation Experience: “I Often Document Decisions”

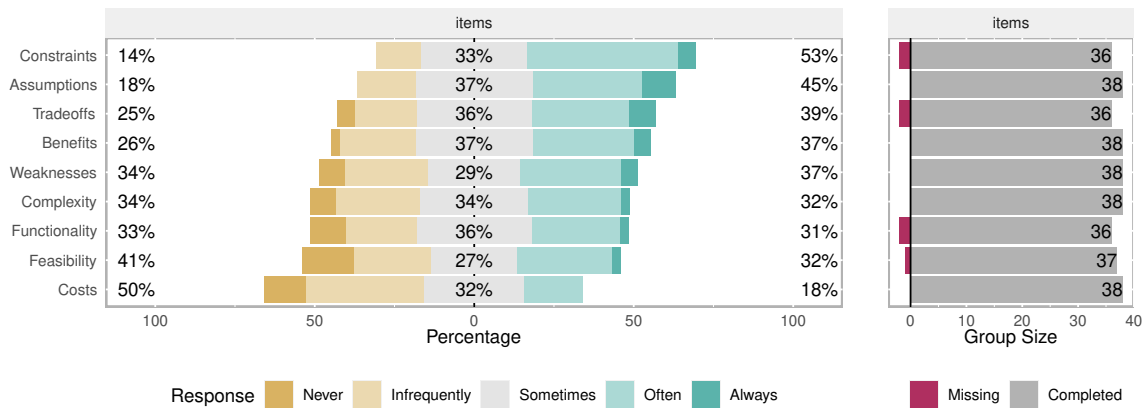


Figure C.14.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – documentation experience “I often document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 21.362$	$p = 0.006 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.642 > 0.10$	$p = 0.771 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.058 > 0.05$	$p = 0.211 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.026 < 0.05$	$p = 0.133 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.221 > 0.10$	$p = 0.418 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.156 > 0.10$	$p = 0.352 > 0.10$	✗
Constraints ↔ an ALT's costs	$p = 1.548 * 10^{-4} \ll 0.05$	$p = 0.006 < 0.05$	✓
Constraints ↔ an ALT's functionality	$p = 0.022 < 0.05$	$p = 0.135 > 0.10$	✗
Constraints ↔ an ALT's feasibility	$p = 0.008 < 0.05$	$p = 0.098 < 0.10$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.148 > 0.10$	$p = 0.355 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.074 > 0.05$	$p = 0.221 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.437 > 0.10$	$p = 0.605 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.334 > 0.10$	$p = 0.523 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 7.666 * 10^{-4} \ll 0.05$	$p = 0.014 < 0.05$	✓
Assumptions made ↔ an ALT's functionality	$p = 0.064 > 0.05$	$p = 0.211 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.027 < 0.05$	$p = 0.121 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.733 > 0.10$	$p = 0.776 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.515 > 0.10$	$p = 0.662 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.630 > 0.10$	$p = 0.783 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.055 > 0.05$	$p = 0.221 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.673 > 0.10$	$p = 0.758 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.438 > 0.10$	$p = 0.584 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.324 > 0.10$	$p = 0.530 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.411 > 0.10$	$p = 0.592 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.115 > 0.10$	$p = 0.318 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.932 > 0.10$	$p = 0.932 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.662 > 0.10$	$p = 0.769 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.860 > 0.10$	$p = 0.885 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.011 < 0.05$	$p = 0.099 < 0.10$	✓
Trade Offs ↔ an ALT's functionality	$p = 0.290 > 0.10$	$p = 0.497 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.158 > 0.10$	$p = 0.335 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.016 < 0.05$	$p = 0.119 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.370 > 0.10$	$p = 0.555 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.210 > 0.10$	$p = 0.420 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.142 > 0.10$	$p = 0.364 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.259 > 0.10$	$p = 0.466 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.729 > 0.10$	$p = 0.795 > 0.10$	✗

Table C.14.: Results of test for difference – grouped by rationale types – cf. Figure C.14.

### Documentation Experience: “I Document Decisions Sometimes”

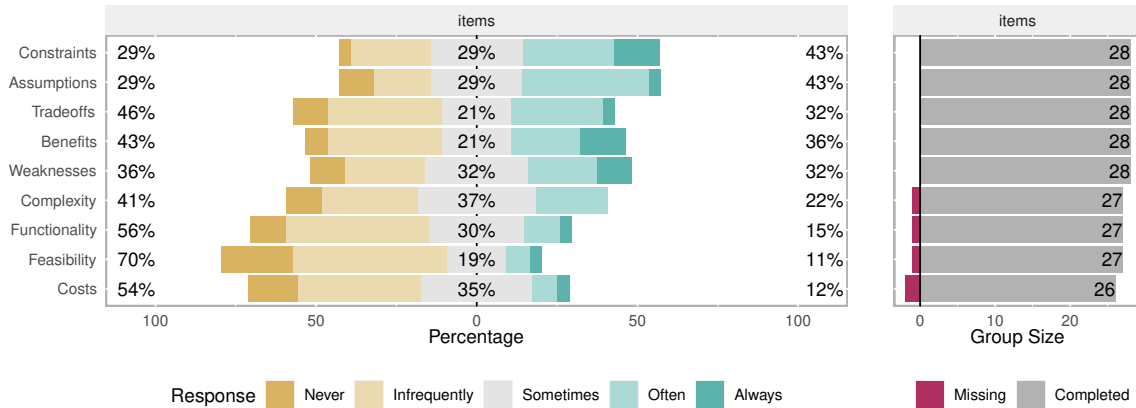


Figure C.15.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – documentation experience “I document decisions sometimes” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 20.022$	$p = 0.010 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.681 > 0.10$	$p = 0.743 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.356 > 0.10$	$p = 0.557 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.099 > 0.05$	$p = 0.274 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.135 > 0.10$	$p = 0.304 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.354 > 0.10$	$p = 0.579 > 0.10$	✗
Constraints ↔ an ALT's costs	$p = 0.010 < 0.05$	$p = 0.125 > 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.015 < 0.05$	$p = 0.092 < 0.10$	✓
Constraints ↔ an ALT's feasibility	$p = 5.088 * 10^{-4} \ll 0.05$	$p = 0.018 < 0.05$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.608 > 0.10$	$p = 0.684 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.214 > 0.10$	$p = 0.453 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.278 > 0.10$	$p = 0.528 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.606 > 0.10$	$p = 0.704 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 0.031 < 0.05$	$p = 0.159 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.044 < 0.05$	$p = 0.196 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.002 \ll 0.05$	$p = 0.039 < 0.05$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.463 > 0.10$	$p = 0.617 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.568 > 0.10$	$p = 0.705 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.998 > 0.10$	$p = 0.998 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.098 > 0.05$	$p = 0.321 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.131 > 0.10$	$p = 0.337 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.010 < 0.05$	$p = 0.094 < 0.10$	✓
an ALT's complexity ↔ Trade Offs	$p = 0.866 > 0.10$	$p = 0.917 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.464 > 0.10$	$p = 0.597 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.358 > 0.10$	$p = 0.537 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.442 > 0.10$	$p = 0.613 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.070 > 0.05$	$p = 0.253 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.570 > 0.10$	$p = 0.684 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.274 > 0.10$	$p = 0.548 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.345 > 0.10$	$p = 0.592 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.046 < 0.05$	$p = 0.184 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.099 > 0.05$	$p = 0.296 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.132 > 0.10$	$p = 0.316 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.011 < 0.05$	$p = 0.076 < 0.10$	✓
an ALT's costs ↔ an ALT's functionality	$p = 0.874 > 0.10$	$p = 0.899 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.382 > 0.10$	$p = 0.551 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.298 > 0.10$	$p = 0.536 > 0.10$	✗

Table C.15.: Results of test for difference – grouped by rationale types – cf. Figure C.15.

### Documentation Experience: “I Infrequently Document Decisions”

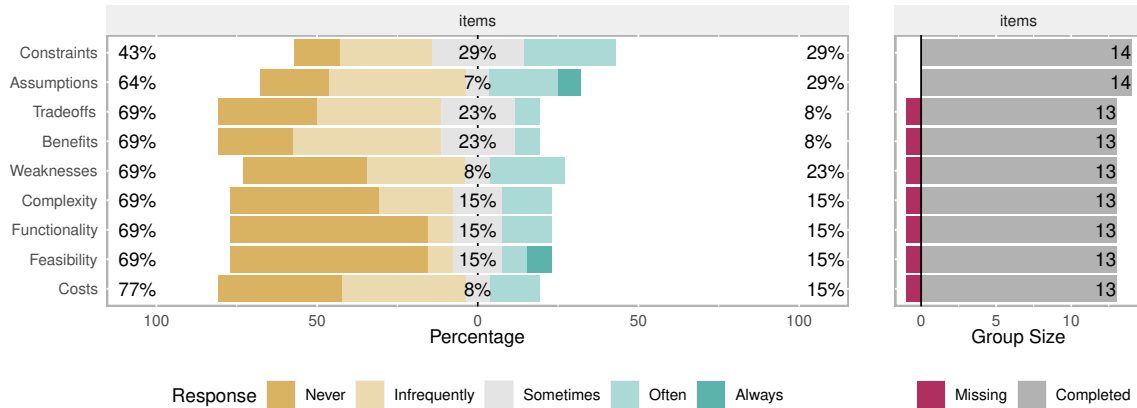


Figure C.16.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑). – documentation experience “I infrequently document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.234$	$p = 0.411 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.529 > 0.10$	$p = 0.952 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.164 > 0.10$	$p = 0.841 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.081 < 0.10$	$p = 0.968 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.166 > 0.10$	$p = 0.749 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.252 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.095 < 0.10$	$p = 0.852 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.026 < 0.05$	$p = 0.939 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.031 < 0.05$	$p = 0.552 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.438 > 0.10$	$p = 0.986 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.259 > 0.10$	$p = 0.932 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.444 > 0.10$	$p = 0.939 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.598 > 0.10$	$p = 0.936 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.292 > 0.10$	$p = 0.876 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.108 > 0.10$	$p = 0.778 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.123 > 0.10$	$p = 0.736 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.728 > 0.10$	$p = 0.904 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.993 > 0.10$	$p = 0.993 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.808 > 0.10$	$p = 0.909 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.785 > 0.10$	$p = 0.911 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.414 > 0.10$	$p = 0.994 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.451 > 0.10$	$p = 0.854 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.722 > 0.10$	$p = 0.928 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.554 > 0.10$	$p = 0.951 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.941 > 0.10$	$p = 0.996 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.639 > 0.10$	$p = 0.885 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.684 > 0.10$	$p = 0.912 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.814 > 0.10$	$p = 0.889 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.778 > 0.10$	$p = 0.933 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.409 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.445 > 0.10$	$p = 0.891 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.605 > 0.10$	$p = 0.908 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.289 > 0.10$	$p = 0.946 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.318 > 0.10$	$p = 0.881 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.587 > 0.10$	$p = 0.960 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.630 > 0.10$	$p = 0.908 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.950 > 0.10$	$p = 0.977 > 0.10$	X

Table C.16.: Results of test for difference – grouped by rationale types – cf. Figure C.16.

## C.5.2. Development Experience ⇔ Documentation Frequency of Rationale Types (IndepVar: Q-26 – DepVar: Q-07)

Development Experience: “More Than 15 Years”

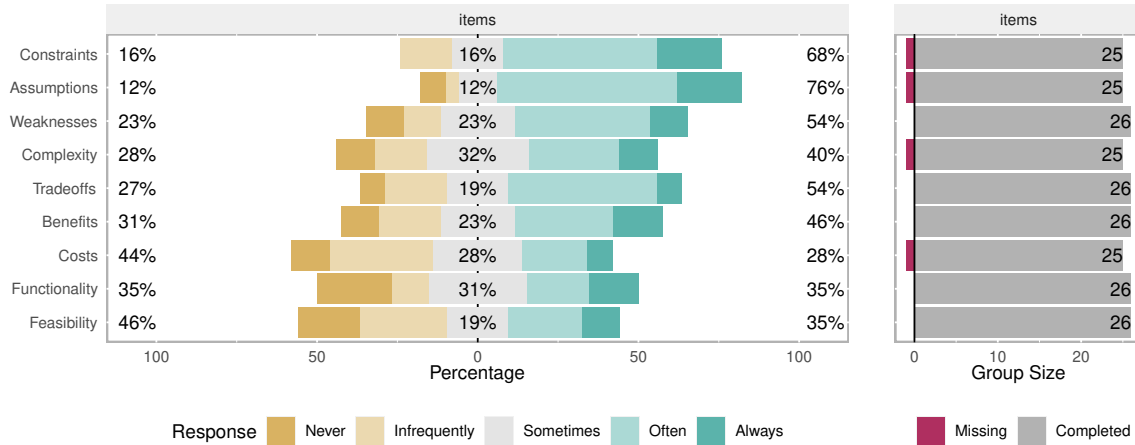


Figure C.17.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – development experience “more than 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.706$	$p = 0.024 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.807 > 0.10$	$p = 0.881 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.241 > 0.10$	$p = 0.456 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.075 < 0.10$	$p = 0.337 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.188 > 0.10$	$p = 0.422 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.126 > 0.10$	$p = 0.377 > 0.10$	✗
Constraints ↔ an ALT's costs	$p = 0.006 < 0.05$	$p = 0.073 < 0.10$	✓
Constraints ↔ an ALT's functionality	$p = 0.023 < 0.05$	$p = 0.141 > 0.10$	✗
Constraints ↔ an ALT's feasibility	$p = 0.009 < 0.05$	$p = 0.082 < 0.10$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.156 > 0.10$	$p = 0.374 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.043 < 0.05$	$p = 0.220 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.118 > 0.10$	$p = 0.386 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.075 < 0.10$	$p = 0.302 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 0.003 < 0.05$	$p = 0.102 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.012 < 0.05$	$p = 0.086 < 0.10$	✓
Assumptions made ↔ an ALT's feasibility	$p = 0.004 < 0.05$	$p = 0.078 < 0.10$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.531 > 0.10$	$p = 0.735 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.884 > 0.10$	$p = 0.884 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.717 > 0.10$	$p = 0.860 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.110 > 0.10$	$p = 0.397 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.269 > 0.10$	$p = 0.485 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.147 > 0.10$	$p = 0.379 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.630 > 0.10$	$p = 0.810 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.789 > 0.10$	$p = 0.888 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.337 > 0.10$	$p = 0.551 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.640 > 0.10$	$p = 0.795 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.419 > 0.10$	$p = 0.628 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.829 > 0.10$	$p = 0.877 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.147 > 0.10$	$p = 0.406 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.338 > 0.10$	$p = 0.529 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.193 > 0.10$	$p = 0.408 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.216 > 0.10$	$p = 0.432 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.458 > 0.10$	$p = 0.660 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.277 > 0.10$	$p = 0.476 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.615 > 0.10$	$p = 0.820 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.872 > 0.10$	$p = 0.896 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.730 > 0.10$	$p = 0.848 > 0.10$	✗

Table C.17.: Results of test for difference – grouped by rationale types – cf. Figure C.17.

### Development Experience: “12 – 15 Years”

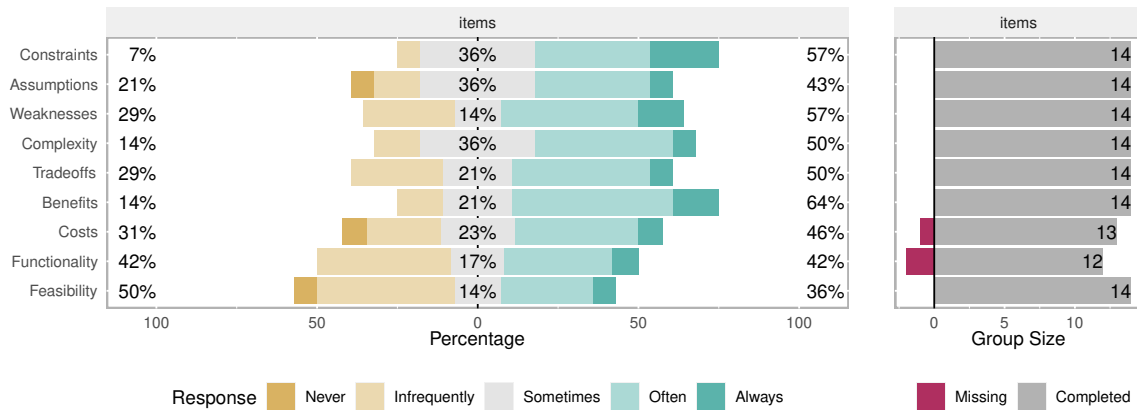


Figure C.18.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – development experience “12 – 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.946$	$p = 0.543 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.235 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.509 > 0.10$	$p = 0.964 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.472 > 0.10$	$p = 0.944 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.295 > 0.10$	$p = 0.967 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.907 > 0.10$	$p = 0.961 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.203 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.131 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.039 < 0.05$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.598 > 0.10$	$p = 0.897 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.639 > 0.10$	$p = 0.852 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.887 > 0.10$	$p = 0.968 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.284 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.916 > 0.10$	$p = 0.942 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.713 > 0.10$	$p = 0.885 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.383 > 0.10$	$p = 0.920 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.954 > 0.10$	$p = 0.954 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.700 > 0.10$	$p = 0.900 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.586 > 0.10$	$p = 0.918 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.533 > 0.10$	$p = 0.959 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.382 > 0.10$	$p = 0.982 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.162 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.743 > 0.10$	$p = 0.892 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.547 > 0.10$	$p = 0.938 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.571 > 0.10$	$p = 0.935 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.413 > 0.10$	$p = 0.929 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.180 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.352 > 0.10$	$p = 0.976 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.807 > 0.10$	$p = 0.907 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.614 > 0.10$	$p = 0.885 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.311 > 0.10$	$p = 0.933 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.247 > 0.10$	$p = 0.988 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.162 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.052 < 0.10$	$p = 0.936 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.795 > 0.10$	$p = 0.923 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.454 > 0.10$	$p = 0.961 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.639 > 0.10$	$p = 0.885 > 0.10$	X

Table C.18.: Results of test for difference – grouped by rationale types – cf. Figure C.18.



### Development Experience: “8 – 11 Years”

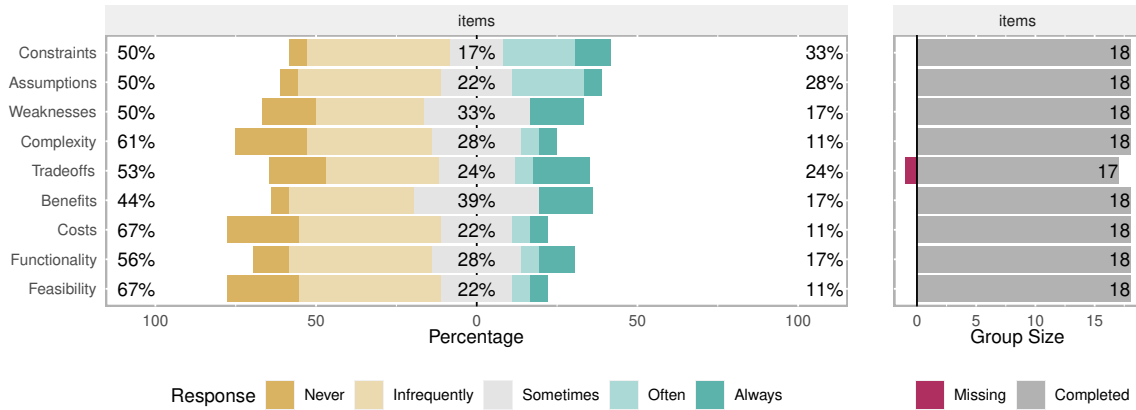


Figure C.19.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – development experience “8 – 11 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.425$	$p = 0.600 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.873 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.557 > 0.10$	$p = 0.955 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.169 > 0.10$	$p = 0.871 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.563 > 0.10$	$p = 0.922 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.960 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.115 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.497 > 0.10$	$p = 0.942 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.115 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.669 > 0.10$	$p = 0.926 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.224 > 0.10$	$p = 0.897 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.674 > 0.10$	$p = 0.899 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.913 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.156 > 0.10$	$p = 0.938 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.603 > 0.10$	$p = 0.869 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.156 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.431 > 0.10$	$p = 0.970 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.999 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.592 > 0.10$	$p = 0.926 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.322 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.927 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.322 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.437 > 0.10$	$p = 0.926 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.186 > 0.10$	$p = 0.835 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.840 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.487 > 0.10$	$p = 0.973 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.840 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.598 > 0.10$	$p = 0.896 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.329 > 0.10$	$p = 0.911 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.927 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.329 > 0.10$	$p = 0.987 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.127 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.530 > 0.10$	$p = 0.954 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.127 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.369 > 0.10$	$p = 0.886 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.369 > 0.10$	$p = 0.949 > 0.10$	X

Table C.19.: Results of test for difference – grouped by rationale types – cf. Figure C.19.

### Development Experience: “4 – 7 Years”

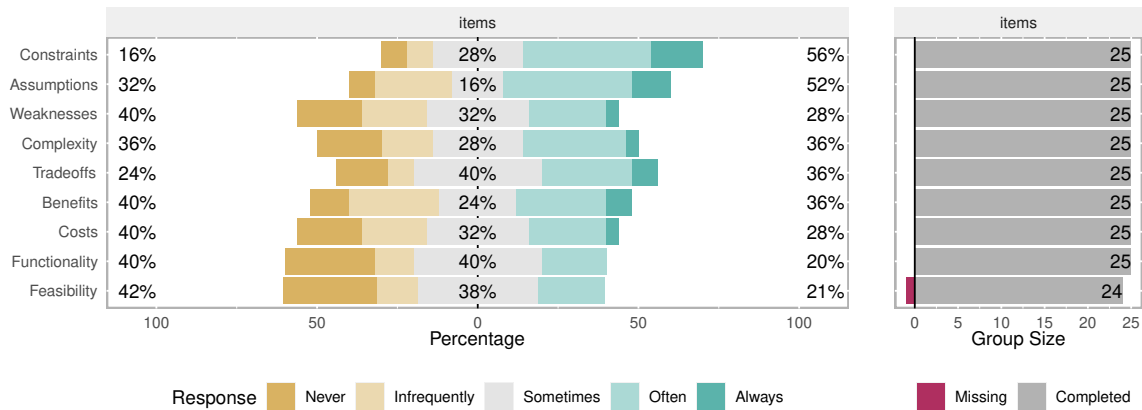


Figure C.20.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – development experience “4 – 7 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 14.742$	$p = 0.064 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.474 > 0.10$	$p = 0.776 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.022 < 0.05$	$p = 0.264 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.061 < 0.10$	$p = 0.315 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.181 > 0.10$	$p = 0.501 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.084 < 0.10$	$p = 0.377 > 0.10$	✗
Constraints ↔ an ALT's costs	$p = 0.022 < 0.05$	$p = 0.198 > 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.004 \ll 0.05$	$p = 0.078 < 0.10$	✓
Constraints ↔ an ALT's feasibility	$p = 0.004 \ll 0.05$	$p = 0.150 > 0.10$	✗
Assumptions made ↔ an ALT's weaknesses	$p = 0.115 > 0.10$	$p = 0.461 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.248 > 0.10$	$p = 0.638 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.534 > 0.10$	$p = 0.836 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.311 > 0.10$	$p = 0.622 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 0.115 > 0.10$	$p = 0.415 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.033 < 0.05$	$p = 0.196 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.031 < 0.05$	$p = 0.223 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.675 > 0.10$	$p = 0.784 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.341 > 0.10$	$p = 0.614 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.575 > 0.10$	$p = 0.739 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.575 > 0.10$	$p = 0.796 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.549 > 0.10$	$p = 0.824 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.594 > 0.10$	$p = 0.713 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.887 > 0.10$	$p = 0.939 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.675 > 0.10$	$p = 0.759 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.327 > 0.10$	$p = 0.619 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.311 > 0.10$	$p = 0.658 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.696 > 0.10$	$p = 0.759 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.341 > 0.10$	$p = 0.584 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.130 > 0.10$	$p = 0.390 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.123 > 0.10$	$p = 0.403 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.575 > 0.10$	$p = 0.713 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.262 > 0.10$	$p = 0.589 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.248 > 0.10$	$p = 0.596 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.575 > 0.10$	$p = 0.766 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.549 > 0.10$	$p = 0.791 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.965 > 0.10$	$p = 0.993 > 0.10$	✗

Table C.20.: Results of test for difference – grouped by rationale types – cf. Figure C.20.

### Development Experience: “0 – 3 Years”

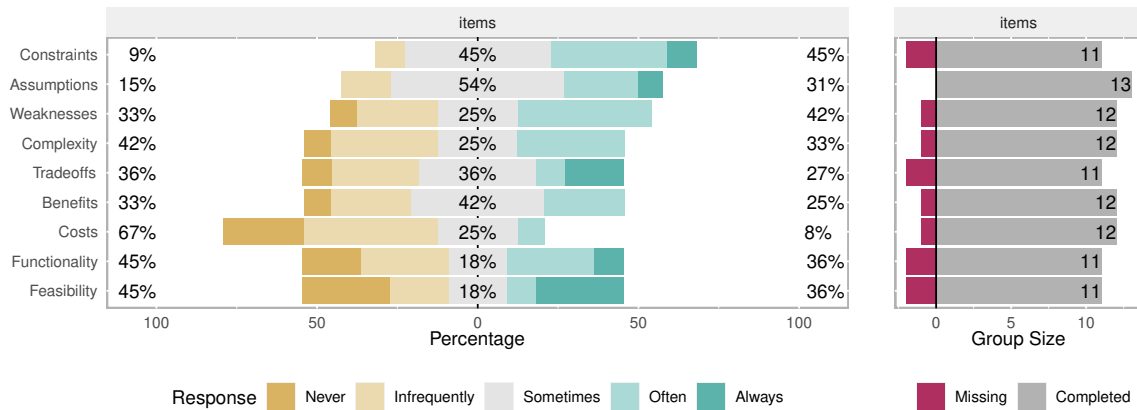


Figure C.21.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – development experience “0 – 3 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.486$	$p = 0.303 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.593 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.351 > 0.10$	$p = 0.902 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.181 > 0.10$	$p = 0.653 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.273 > 0.10$	$p = 0.756 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.183 > 0.10$	$p = 0.597 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.005 < 0.05$	$p = 0.182 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.175 > 0.10$	$p = 0.699 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.209 > 0.10$	$p = 0.628 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.670 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.397 > 0.10$	$p = 0.894 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.544 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.399 > 0.10$	$p = 0.846 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.017 < 0.05$	$p = 0.315 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.380 > 0.10$	$p = 0.912 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.440 > 0.10$	$p = 0.880 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.680 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.852 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.683 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.056 < 0.10$	$p = 0.670 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.650 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.727 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.829 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.997 > 0.10$	$p = 0.997 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.134 > 0.10$	$p = 0.687 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.960 > 0.10$	$p = 0.988 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.957 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.831 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.092 < 0.10$	$p = 0.830 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.794 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.873 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.133 > 0.10$	$p = 0.796 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.957 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.960 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.156 > 0.10$	$p = 0.704 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.128 > 0.10$	$p = 0.924 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.919 > 0.10$	$p = 1.000 > 0.10$	X

Table C.21.: Results of test for difference – grouped by rationale types – cf. Figure C.21.

### C.5.3. Scrum Experience ⇔ Documentation Frequency of Rationale Types (IndepVar: Q-27 – DepVar: Q-07)

#### Scrum Experience: “Expert”

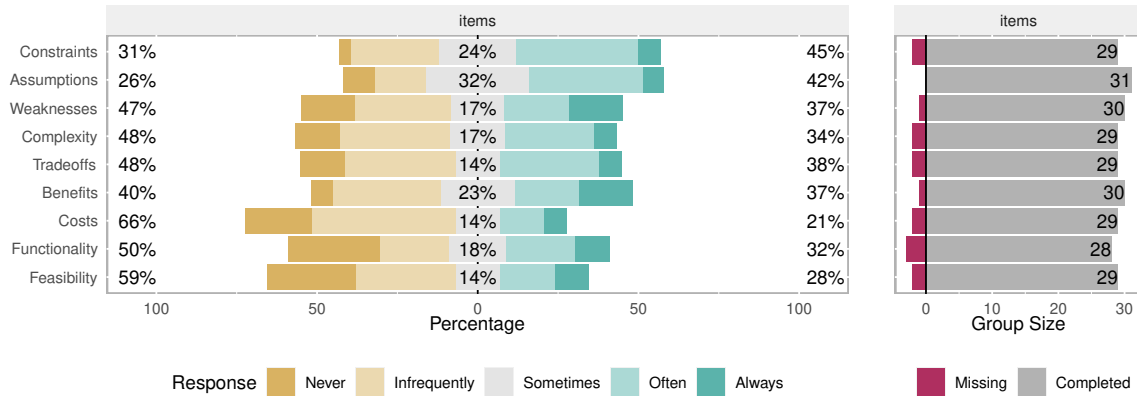


Figure C.22.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – Scrum experience “Expert” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.777$	$p = 0.161 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.907 > 0.10$	$p = 0.933 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.338 > 0.10$	$p = 0.640 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.226 > 0.10$	$p = 0.678 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.268 > 0.10$	$p = 0.603 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.675 > 0.10$	$p = 0.838 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.016 < 0.05$	$p = 0.561 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.090 < 0.10$	$p = 0.465 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.035 < 0.05$	$p = 0.416 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.392 > 0.10$	$p = 0.672 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.265 > 0.10$	$p = 0.636 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.313 > 0.10$	$p = 0.663 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.758 > 0.10$	$p = 0.880 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.019 < 0.05$	$p = 0.345 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.109 > 0.10$	$p = 0.489 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.042 < 0.05$	$p = 0.381 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.792 > 0.10$	$p = 0.864 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.874 > 0.10$	$p = 0.925 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.587 > 0.10$	$p = 0.782 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.139 > 0.10$	$p = 0.554 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.449 > 0.10$	$p = 0.702 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.241 > 0.10$	$p = 0.620 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.918 > 0.10$	$p = 0.918 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.422 > 0.10$	$p = 0.691 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.227 > 0.10$	$p = 0.629 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.622 > 0.10$	$p = 0.800 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.367 > 0.10$	$p = 0.661 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.485 > 0.10$	$p = 0.699 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.190 > 0.10$	$p = 0.683 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.552 > 0.10$	$p = 0.764 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.315 > 0.10$	$p = 0.630 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.043 < 0.05$	$p = 0.312 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.196 > 0.10$	$p = 0.643 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.087 < 0.10$	$p = 0.522 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.481 > 0.10$	$p = 0.722 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.760 > 0.10$	$p = 0.854 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.688 > 0.10$	$p = 0.826 > 0.10$	X

Table C.22.: Results of test for difference – grouped by rationale types – cf. Figure C.22.

### Scrum Experience: “Advanced”

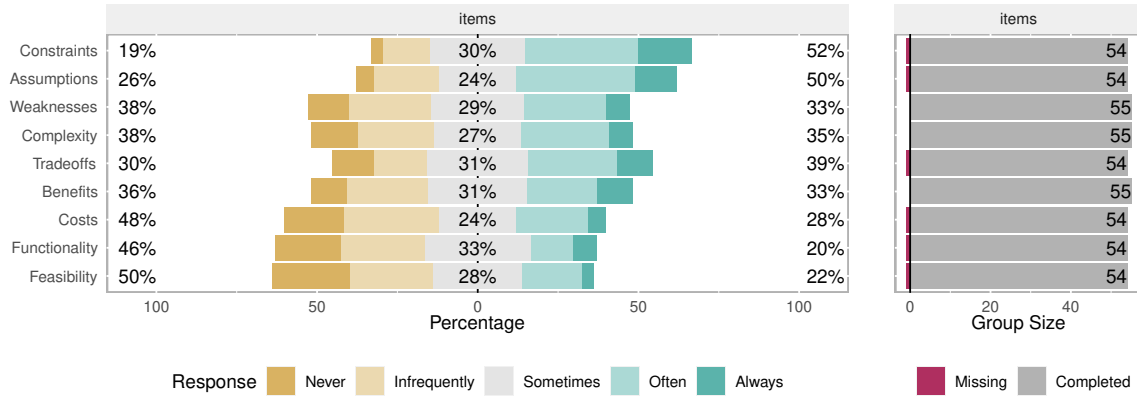


Figure C.23.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – Scrum experience “Advanced” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 30.628$	$p = 1.636 * 10^{-4} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.530 > 0.10$	$p = 0.658 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.012 < 0.05$	$p = 0.061 < 0.10$	✓
Constraints ↔ an ALT's complexity	$p = 0.013 < 0.05$	$p = 0.058 < 0.10$	✓
Constraints ↔ Trade Offs	$p = 0.094 > 0.05$	$p = 0.213 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.025 < 0.05$	$p = 0.088 < 0.10$	✓
Constraints ↔ an ALT's costs	$p = 5.009 * 10^{-4} \ll 0.05$	$p = 0.006 < 0.05$	✓
Constraints ↔ an ALT's functionality	$p = 1.663 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Constraints ↔ an ALT's feasibility	$p = 4.226 * 10^{-5} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.060 > 0.05$	$p = 0.179 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.064 > 0.05$	$p = 0.164 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.297 > 0.10$	$p = 0.445 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.106 > 0.10$	$p = 0.212 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 0.004 \ll 0.05$	$p = 0.026 < 0.05$	✓
Assumptions made ↔ an ALT's functionality	$p = 0.002 \ll 0.05$	$p = 0.012 < 0.05$	✓
Assumptions made ↔ an ALT's feasibility	$p = 5.278 * 10^{-4} \ll 0.05$	$p = 0.005 \ll 0.05$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.977 > 0.10$	$p = 0.977 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.403 > 0.10$	$p = 0.538 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.789 > 0.10$	$p = 0.835 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.327 > 0.10$	$p = 0.452 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.205 > 0.10$	$p = 0.336 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.110 > 0.10$	$p = 0.208 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.420 > 0.10$	$p = 0.540 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.812 > 0.10$	$p = 0.835 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.313 > 0.10$	$p = 0.450 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.195 > 0.10$	$p = 0.334 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.104 > 0.10$	$p = 0.220 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.569 > 0.10$	$p = 0.661 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.071 > 0.05$	$p = 0.169 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.036 < 0.05$	$p = 0.119 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.015 < 0.05$	$p = 0.062 < 0.10$	✓
an ALT's benefits ↔ an ALT's costs	$p = 0.212 > 0.10$	$p = 0.332 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.125 > 0.10$	$p = 0.225 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.062 > 0.05$	$p = 0.172 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.776 > 0.10$	$p = 0.846 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.539 > 0.10$	$p = 0.647 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.742 > 0.10$	$p = 0.835 > 0.10$	✗

Table C.23.: Results of test for difference – grouped by rationale types – cf. Figure C.23.

### Scrum Experience: “Novice”

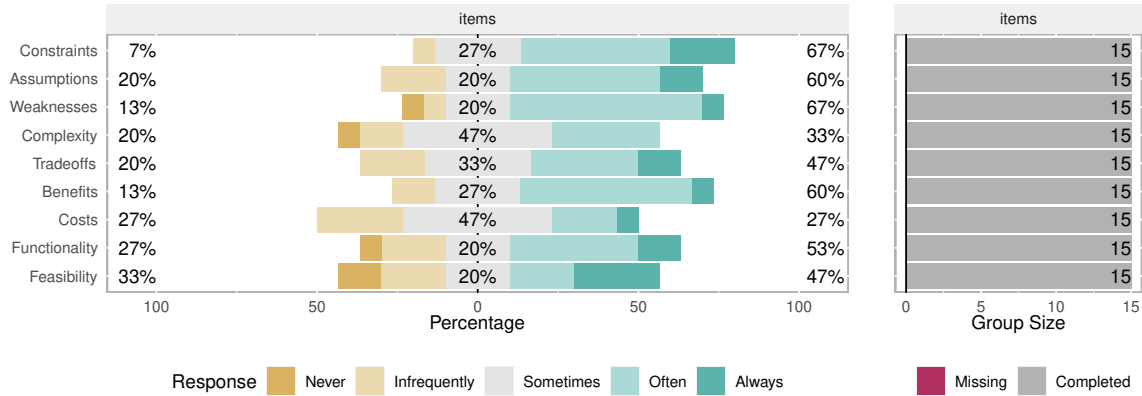


Figure C.24.: Documentation of rationale types for reasoning (→) grouped by rationale types (↑) – Scrum experience “Novice” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.432$	$p = 0.491 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.489 > 0.10$	$p = 0.926 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.580 > 0.10$	$p = 0.908 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.046 < 0.05$	$p = 0.825 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.253 > 0.10$	$p = 0.911 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.476 > 0.10$	$p = 0.953 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.033 < 0.05$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.257 > 0.10$	$p = 0.842 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.216 > 0.10$	$p = 0.866 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.889 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.192 > 0.10$	$p = 0.988 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.652 > 0.10$	$p = 0.903 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.984 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.149 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.660 > 0.10$	$p = 0.879 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.587 > 0.10$	$p = 0.880 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.149 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.555 > 0.10$	$p = 0.952 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.874 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.113 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.562 > 0.10$	$p = 0.919 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.495 > 0.10$	$p = 0.891 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.393 > 0.10$	$p = 0.884 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.199 > 0.10$	$p = 0.895 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.889 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.388 > 0.10$	$p = 0.930 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.447 > 0.10$	$p = 0.946 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.667 > 0.10$	$p = 0.857 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.320 > 0.10$	$p = 0.887 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.992 > 0.10$	$p = 0.992 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.926 > 0.10$	$p = 0.980 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.154 > 0.10$	$p = 0.926 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.674 > 0.10$	$p = 0.836 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.600 > 0.10$	$p = 0.865 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.316 > 0.10$	$p = 0.947 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.368 > 0.10$	$p = 0.946 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.918 > 0.10$	$p = 1.000 > 0.10$	X

Table C.24.: Results of test for difference – grouped by rationale types – cf. Figure C.24.

## C.6. Hypothesis RQ1-H3 – Experience ⇔ Usefulness of Rationale Types

### C.6.1. Documentation Experience ⇔ Usefulness of Rationale Types (IndepVar: Q-01 – DepVar: Q-08)

#### Documentation Experience: “I Always Document Decisions”

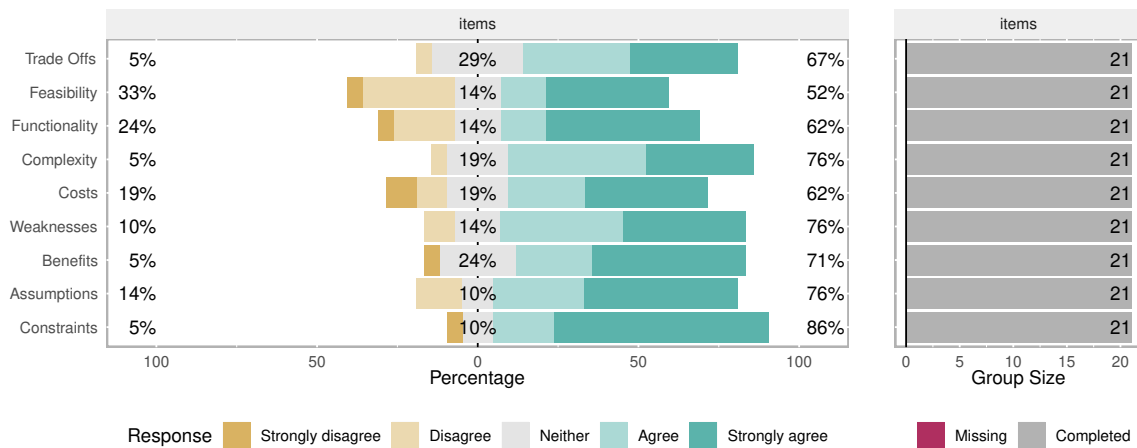


Figure C.25.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – documentation experience “I always document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.905$	$p = 0.443 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.251 > 0.10$	$p = 0.905 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.143 > 0.10$	$p = 0.858 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.113 > 0.10$	$p = 0.812 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.067 < 0.10$	$p = 0.806 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.248 > 0.10$	$p = 0.993 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.040 < 0.05$	$p = 0.712 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.088 < 0.10$	$p = 0.796 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.013 < 0.05$	$p = 0.455 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.751 > 0.10$	$p = 0.965 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.661 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.494 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.994 > 0.10$	$p = 0.994 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.362 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.578 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.178 > 0.10$	$p = 0.915 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.904 > 0.10$	$p = 0.957 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.715 > 0.10$	$p = 0.990 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.756 > 0.10$	$p = 0.939 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.553 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.811 > 0.10$	$p = 0.942 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.303 > 0.10$	$p = 0.993 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.807 > 0.10$	$p = 0.968 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.666 > 0.10$	$p = 0.960 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.636 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.906 > 0.10$	$p = 0.932 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.364 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.499 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.819 > 0.10$	$p = 0.922 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.899 > 0.10$	$p = 0.981 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.507 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.366 > 0.10$	$p = 0.941 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.583 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.180 > 0.10$	$p = 0.812 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.723 > 0.10$	$p = 0.963 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.663 > 0.10$	$p = 0.995 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.429 > 0.10$	$p = 1.000 > 0.10$	X

Table C.25.: Results of test for difference – grouped by rationale types – cf. Figure C.25.



### Documentation Experience: “I Often Document Decisions”

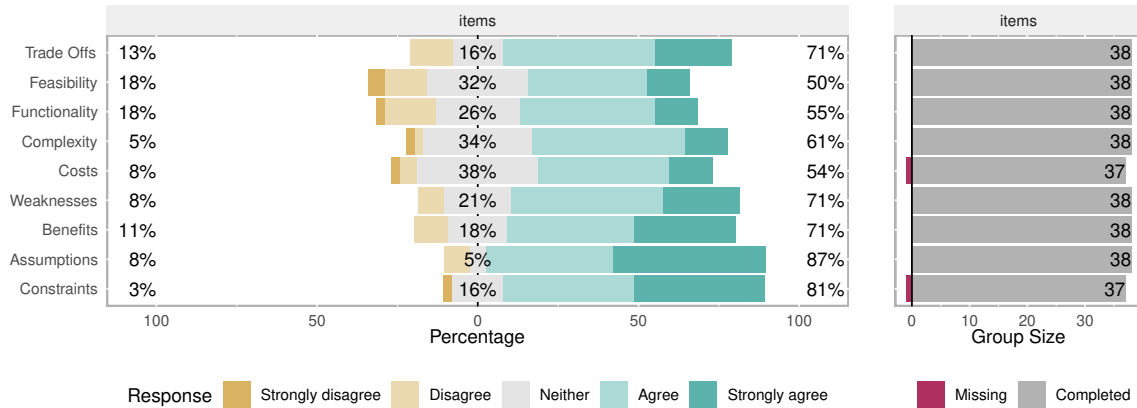


Figure C.26.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – documentation experience “I often document decisions” only.

Kruskal-Wallis – Test for Difference					
Method	Value		Significance		Significant?
Kruskal-Wallis	$\chi^2 = 31.861$		$p = 9.864 * 10^{-5} \ll 0.05$		✓
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance		Significant?
Constraints ↔ Assumptions made	$p = 0.582$	> 0.10	$p = 0.722$	> 0.10	X
Constraints ↔ an ALT's weaknesses	$p = 0.130$	> 0.10	$p = 0.234$	> 0.10	X
Constraints ↔ an ALT's complexity	$p = 0.010$	< 0.05	$p = 0.046$	< 0.05	✓
Constraints ↔ Trade Offs	$p = 0.100$	≤ 0.10	$p = 0.200$	> 0.10	X
Constraints ↔ an ALT's benefits	$p = 0.245$	> 0.10	$p = 0.367$	> 0.10	X
Constraints ↔ an ALT's costs	$p = 0.003$	≤ 0.05	$p = 0.017$	< 0.05	✓
Constraints ↔ an ALT's functionality	$p = 0.002$	≤ 0.05	$p = 0.011$	< 0.05	✓
Constraints ↔ an ALT's feasibility	$p = 5.354 * 10^{-4}$	≤ 0.05	$p = 0.005$	≤ 0.05	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.038$	< 0.05	$p = 0.123$	> 0.10	X
Assumptions made ↔ an ALT's complexity	$p = 0.002$	≤ 0.05	$p = 0.010$	< 0.05	✓
Assumptions made ↔ Trade Offs	$p = 0.027$	< 0.05	$p = 0.097$	< 0.10	✓
Assumptions made ↔ an ALT's benefits	$p = 0.084$	> 0.05	$p = 0.190$	> 0.10	X
Assumptions made ↔ an ALT's costs	$p = 4.523 * 10^{-4}$	≤ 0.05	$p = 0.005$	< 0.05	✓
Assumptions made ↔ an ALT's functionality	$p = 1.804 * 10^{-4}$	≤ 0.05	$p = 0.003$	≤ 0.05	✓
Assumptions made ↔ an ALT's feasibility	$p = 5.342 * 10^{-5}$	≤ 0.05	$p = 0.002$	≤ 0.05	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.288$	> 0.10	$p = 0.415$	> 0.10	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.895$	> 0.10	$p = 0.895$	> 0.10	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.724$	> 0.10	$p = 0.789$	> 0.10	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.149$	> 0.10	$p = 0.256$	> 0.10	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.096$	> 0.05	$p = 0.203$	> 0.10	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.050$	≤ 0.05	$p = 0.138$	> 0.10	X
an ALT's complexity ↔ Trade Offs	$p = 0.352$	> 0.10	$p = 0.488$	> 0.10	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.157$	> 0.10	$p = 0.257$	> 0.10	X
an ALT's complexity ↔ an ALT's costs	$p = 0.699$	> 0.10	$p = 0.786$	> 0.10	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.546$	> 0.10	$p = 0.702$	> 0.10	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.369$	> 0.10	$p = 0.492$	> 0.10	X
Trade Offs ↔ an ALT's benefits	$p = 0.627$	> 0.10	$p = 0.728$	> 0.10	X
Trade Offs ↔ an ALT's costs	$p = 0.190$	> 0.10	$p = 0.297$	> 0.10	X
Trade Offs ↔ an ALT's functionality	$p = 0.125$	> 0.10	$p = 0.237$	> 0.10	X
Trade Offs ↔ an ALT's feasibility	$p = 0.067$	> 0.05	$p = 0.173$	> 0.10	X
an ALT's benefits ↔ an ALT's costs	$p = 0.073$	> 0.05	$p = 0.175$	> 0.10	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.043$	< 0.05	$p = 0.130$	> 0.10	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.021$	< 0.05	$p = 0.083$	< 0.10	✓
an ALT's costs ↔ an ALT's functionality	$p = 0.832$	> 0.10	$p = 0.856$	> 0.10	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.613$	> 0.10	$p = 0.736$	> 0.10	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.768$	> 0.10	$p = 0.813$	> 0.10	X

Table C.26.: Results of test for difference – grouped by rationale types – cf. Figure C.26.

**Documentation Experience: “I Document Decisions Sometimes”**

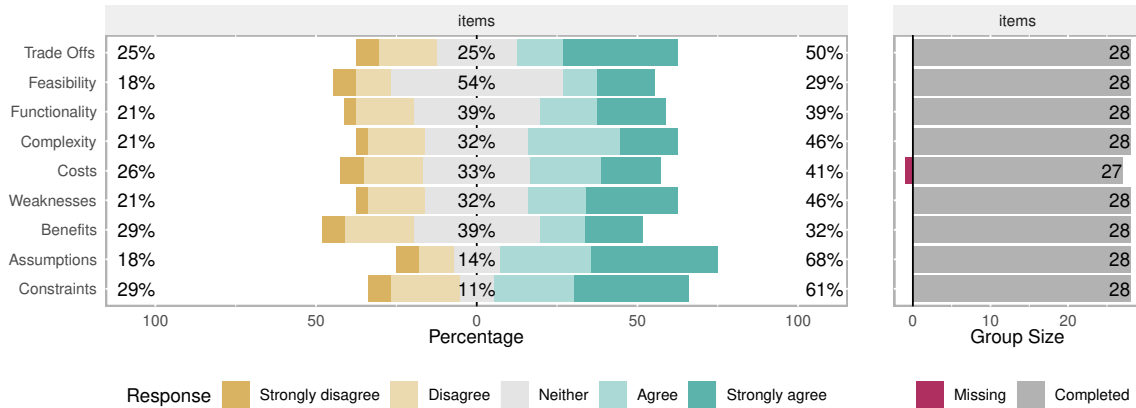


Figure C.27.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – documentation experience “I document decisions sometimes” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.775$	$p = 0.456 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.486 > 0.10$	$p = 0.875 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.675 > 0.10$	$p = 0.934 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.455 > 0.10$	$p = 0.910 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.803 > 0.10$	$p = 0.932 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.129 > 0.10$	$p = 0.929 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.265 > 0.10$	$p = 0.955 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.378 > 0.10$	$p = 0.973 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.195 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.264 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.149 > 0.10$	$p = 0.892 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.344 > 0.10$	$p = 0.952 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.027 < 0.05$	$p = 0.963 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.071 < 0.10$	$p = 0.854 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.115 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.046 < 0.05$	$p = 0.835 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.743 > 0.10$	$p = 0.892 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.865 > 0.10$	$p = 0.916 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.272 > 0.10$	$p = 0.890 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.485 > 0.10$	$p = 0.919 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.644 > 0.10$	$p = 0.928 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.381 > 0.10$	$p = 0.915 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.619 > 0.10$	$p = 0.928 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.441 > 0.10$	$p = 0.933 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.709 > 0.10$	$p = 0.880 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.894 > 0.10$	$p = 0.894 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.584 > 0.10$	$p = 0.914 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.205 > 0.10$	$p = 0.921 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.386 > 0.10$	$p = 0.869 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.528 > 0.10$	$p = 0.864 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.296 > 0.10$	$p = 0.888 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.696 > 0.10$	$p = 0.895 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.524 > 0.10$	$p = 0.898 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.823 > 0.10$	$p = 0.898 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.810 > 0.10$	$p = 0.911 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.866 > 0.10$	$p = 0.890 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.679 > 0.10$	$p = 0.905 > 0.10$	X

Table C.27.: Results of test for difference – grouped by rationale types – cf. Figure C.27.

### Documentation Experience: “I Infrequently Document Decisions”

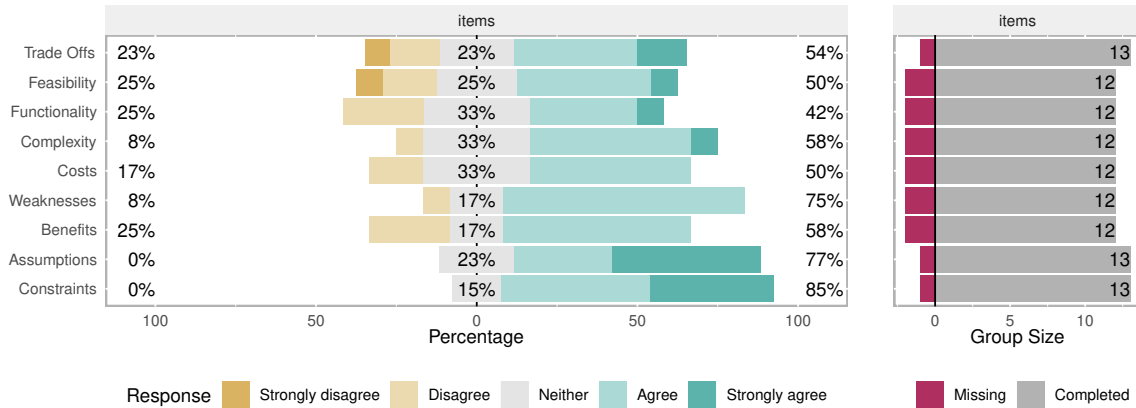


Figure C.28.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – documentation experience “I infrequently document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.259$	$p = 0.028 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.971 > 0.10$	$p = 0.971 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.124 > 0.10$	$p = 0.343 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.064 < 0.10$	$p = 0.211 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.032 < 0.05$	$p = 0.129 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.018 < 0.05$	$p = 0.092 < 0.10$	✓
Constraints ↔ an ALT's costs	$p = 0.012 < 0.05$	$p = 0.150 > 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.007 < 0.05$	$p = 0.266 > 0.10$	✗
Constraints ↔ an ALT's feasibility	$p = 0.014 < 0.05$	$p = 0.100 \leq 0.10$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.133 > 0.10$	$p = 0.341 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.070 < 0.10$	$p = 0.209 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.035 < 0.05$	$p = 0.126 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.020 < 0.05$	$p = 0.089 < 0.10$	✓
Assumptions made ↔ an ALT's costs	$p = 0.014 < 0.05$	$p = 0.124 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.008 < 0.05$	$p = 0.148 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.015 < 0.05$	$p = 0.092 < 0.10$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.761 > 0.10$	$p = 1.000 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.575 > 0.10$	$p = 0.901 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.417 > 0.10$	$p = 0.833 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.347 > 0.10$	$p = 0.780 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.264 > 0.10$	$p = 0.634 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.366 > 0.10$	$p = 0.775 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.803 > 0.10$	$p = 0.964 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.612 > 0.10$	$p = 0.918 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.525 > 0.10$	$p = 0.944 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.417 > 0.10$	$p = 0.789 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.549 > 0.10$	$p = 0.941 > 0.10$	✗
Trade Offs ↔ an ALT's benefits	$p = 0.789 > 0.10$	$p = 0.979 > 0.10$	✗
Trade Offs ↔ an ALT's costs	$p = 0.690 > 0.10$	$p = 0.993 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.563 > 0.10$	$p = 0.921 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.718 > 0.10$	$p = 0.994 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.898 > 0.10$	$p = 0.979 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.761 > 0.10$	$p = 0.978 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.927 > 0.10$	$p = 0.982 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.860 > 0.10$	$p = 0.968 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.970 > 0.10$	$p = 0.998 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.831 > 0.10$	$p = 0.965 > 0.10$	✗

Table C.28.: Results of test for difference – grouped by rationale types – cf. Figure C.28.

## C.6.2. Development Experience ⇔ Documentation of Rationale Types (IndepVar: Q-26 – DepVar: Q-08)

Development Experience: “More Than 15 Years”

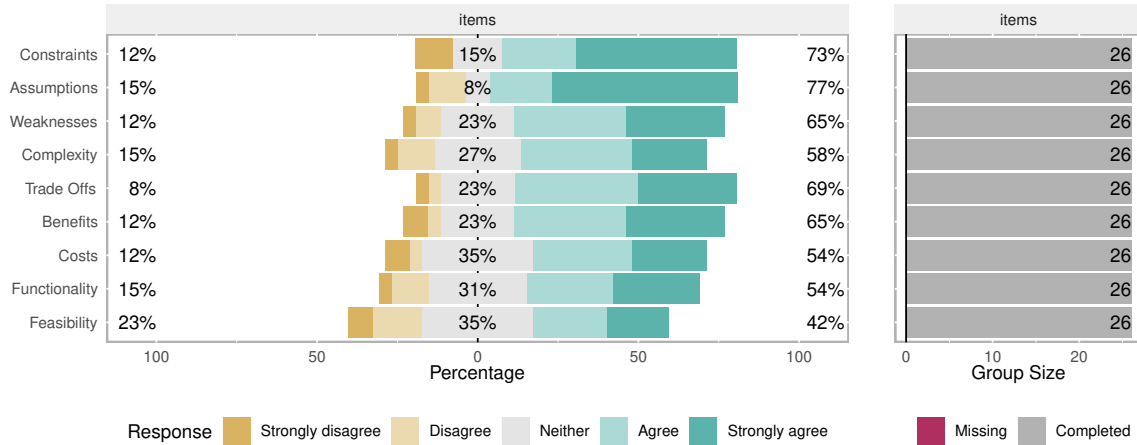


Figure C.29.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – development experience “more than 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 13.234$	$p = 0.104 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.666 > 0.10$	$p = 0.799 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.331 > 0.10$	$p = 0.744 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.103 > 0.10$	$p = 0.464 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.448 > 0.10$	$p = 0.702 > 0.10$	X
Constraints ↔ Benefits of an ALT	$p = 0.314 > 0.10$	$p = 0.754 > 0.10$	X
Constraints ↔ Cost of an ALT	$p = 0.086 < 0.10$	$p = 0.441 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.108 > 0.10$	$p = 0.430 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.012 < 0.05$	$p = 0.215 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.160 > 0.10$	$p = 0.444 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.039 < 0.05$	$p = 0.354 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.234 > 0.10$	$p = 0.602 > 0.10$	X
Assumptions made ↔ Benefits of an ALT	$p = 0.151 > 0.10$	$p = 0.452 > 0.10$	X
Assumptions made ↔ Cost of an ALT	$p = 0.032 < 0.05$	$p = 0.379 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.041 < 0.05$	$p = 0.297 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.003 < 0.05$	$p = 0.116 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.511 > 0.10$	$p = 0.708 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.830 > 0.10$	$p = 0.934 > 0.10$	X
an ALT's weaknesses ↔ Benefits of an ALT	$p = 0.973 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Cost of an ALT	$p = 0.456 > 0.10$	$p = 0.684 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.524 > 0.10$	$p = 0.699 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.123 > 0.10$	$p = 0.443 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.384 > 0.10$	$p = 0.691 > 0.10$	X
an ALT's complexity ↔ Benefits of an ALT	$p = 0.533 > 0.10$	$p = 0.686 > 0.10$	X
an ALT's complexity ↔ Cost of an ALT	$p = 0.930 > 0.10$	$p = 0.984 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.376 > 0.10$	$p = 0.713 > 0.10$	X
Trade Offs ↔ Benefits of an ALT	$p = 0.804 > 0.10$	$p = 0.934 > 0.10$	X
Trade Offs ↔ Cost of an ALT	$p = 0.337 > 0.10$	$p = 0.714 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.395 > 0.10$	$p = 0.677 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.079 < 0.10$	$p = 0.474 > 0.10$	X
Benefits of an ALT ↔ Cost of an ALT	$p = 0.477 > 0.10$	$p = 0.687 > 0.10$	X
Benefits of an ALT ↔ an ALT's functionality	$p = 0.547 > 0.10$	$p = 0.679 > 0.10$	X
Benefits of an ALT ↔ an ALT's feasibility	$p = 0.132 > 0.10$	$p = 0.431 > 0.10$	X
Cost of an ALT ↔ an ALT's functionality	$p = 0.913 > 0.10$	$p = 0.997 > 0.10$	X
Cost of an ALT ↔ an ALT's feasibility	$p = 0.426 > 0.10$	$p = 0.697 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.365 > 0.10$	$p = 0.731 > 0.10$	X

Table C.29.: Results of test for difference – grouped by rationale types – cf. Figure C.29.

### Development Experience: “12 – 15 Years”

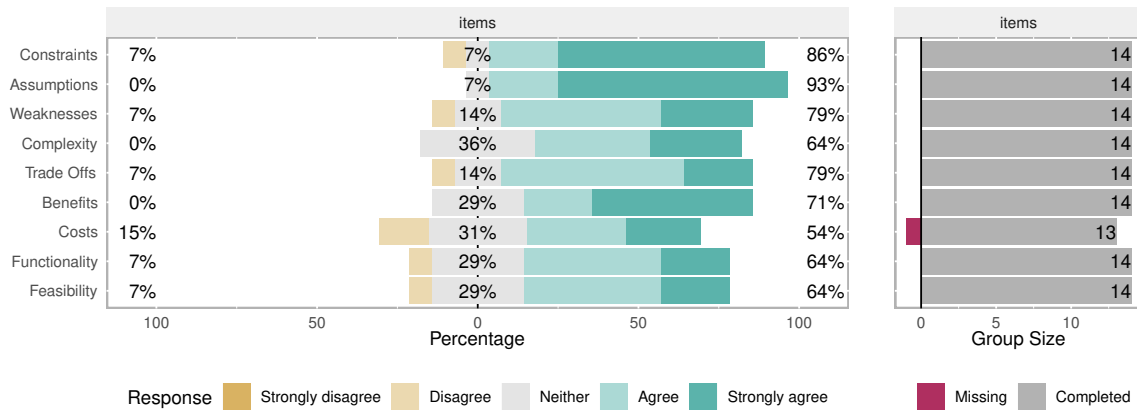


Figure C.30.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – development experience “12 – 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 16.468$	$p = 0.036 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.587 > 0.10$	$p = 0.812 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.146 > 0.10$	$p = 0.404 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.079 < 0.10$	$p = 0.284 > 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.088 < 0.10$	$p = 0.288 > 0.10$	✗
Constraints ↔ Benefits of an ALT	$p = 0.420 > 0.10$	$p = 0.757 > 0.10$	✗
Constraints ↔ Cost of an ALT	$p = 0.016 < 0.05$	$p = 0.148 > 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.035 < 0.05$	$p = 0.182 > 0.10$	✗
Constraints ↔ an ALT's feasibility	$p = 0.035 < 0.05$	$p = 0.160 > 0.10$	✗
Assumptions made ↔ an ALT's weaknesses	$p = 0.046 < 0.05$	$p = 0.183 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.021 < 0.05$	$p = 0.154 > 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.025 < 0.05$	$p = 0.147 > 0.10$	✗
Assumptions made ↔ Benefits of an ALT	$p = 0.177 > 0.10$	$p = 0.456 > 0.10$	✗
Assumptions made ↔ Cost of an ALT	$p = 0.003 \ll 0.05$	$p = 0.122 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.008 < 0.05$	$p = 0.146 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.008 < 0.05$	$p = 0.098 < 0.10$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.761 > 0.10$	$p = 0.831 > 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.802 > 0.10$	$p = 0.849 > 0.10$	✗
an ALT's weaknesses ↔ Benefits of an ALT	$p = 0.517 > 0.10$	$p = 0.744 > 0.10$	✗
an ALT's weaknesses ↔ Cost of an ALT	$p = 0.332 > 0.10$	$p = 0.702 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.517 > 0.10$	$p = 0.809 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.517 > 0.10$	$p = 0.775 > 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.958 > 0.10$	$p = 0.986 > 0.10$	✗
an ALT's complexity ↔ Benefits of an ALT	$p = 0.341 > 0.10$	$p = 0.682 > 0.10$	✗
an ALT's complexity ↔ Cost of an ALT	$p = 0.501 > 0.10$	$p = 0.820 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.730 > 0.10$	$p = 0.906 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.730 > 0.10$	$p = 0.876 > 0.10$	✗
Trade Offs ↔ Benefits of an ALT	$p = 0.368 > 0.10$	$p = 0.698 > 0.10$	✗
Trade Offs ↔ Cost of an ALT	$p = 0.469 > 0.10$	$p = 0.804 > 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.691 > 0.10$	$p = 0.921 > 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.691 > 0.10$	$p = 0.889 > 0.10$	✗
Benefits of an ALT ↔ Cost of an ALT	$p = 0.108 > 0.10$	$p = 0.324 > 0.10$	✗
Benefits of an ALT ↔ an ALT's functionality	$p = 0.195 > 0.10$	$p = 0.467 > 0.10$	✗
Benefits of an ALT ↔ an ALT's feasibility	$p = 0.195 > 0.10$	$p = 0.438 > 0.10$	✗
Cost of an ALT ↔ an ALT's functionality	$p = 0.738 > 0.10$	$p = 0.857 > 0.10$	✗
Cost of an ALT ↔ an ALT's feasibility	$p = 0.738 > 0.10$	$p = 0.830 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	✗

Table C.30.: Results of test for difference – grouped by rationale types – cf. Figure C.30.

**Development Experience: “8 – 11 Years”**

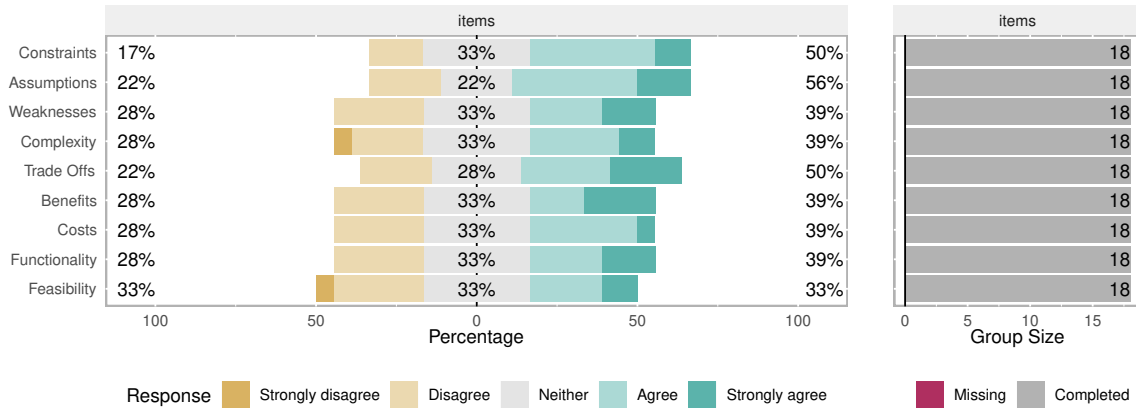


Figure C.31.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – development experience “8 – 11 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.063$	$p = 0.930 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.892 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.574 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.443 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.931 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ Benefits of an ALT	$p = 0.664 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ Cost of an ALT	$p = 0.414 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.574 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.266 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.485 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.366 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.960 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ Benefits of an ALT	$p = 0.568 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ Cost of an ALT	$p = 0.341 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.485 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.212 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.838 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.517 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Benefits of an ALT	$p = 0.899 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Cost of an ALT	$p = 0.799 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.583 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.393 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Benefits of an ALT	$p = 0.740 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ Cost of an ALT	$p = 0.960 > 0.10$	$p = 0.988 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.838 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.730 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ Benefits of an ALT	$p = 0.602 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ Cost of an ALT	$p = 0.366 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.517 > 0.10$	$p = 1.000 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.231 > 0.10$	$p = 1.000 > 0.10$	X
Benefits of an ALT ↔ Cost of an ALT	$p = 0.703 > 0.10$	$p = 1.000 > 0.10$	X
Benefits of an ALT ↔ an ALT's functionality	$p = 0.899 > 0.10$	$p = 1.000 > 0.10$	X
Benefits of an ALT ↔ an ALT's feasibility	$p = 0.499 > 0.10$	$p = 1.000 > 0.10$	X
Cost of an ALT ↔ an ALT's functionality	$p = 0.799 > 0.10$	$p = 1.000 > 0.10$	X
Cost of an ALT ↔ an ALT's feasibility	$p = 0.768 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.583 > 0.10$	$p = 1.000 > 0.10$	X

Table C.31.: Results of test for difference – grouped by rationale types – cf. Figure C.31.

Development Experience: “4 – 7 Years”

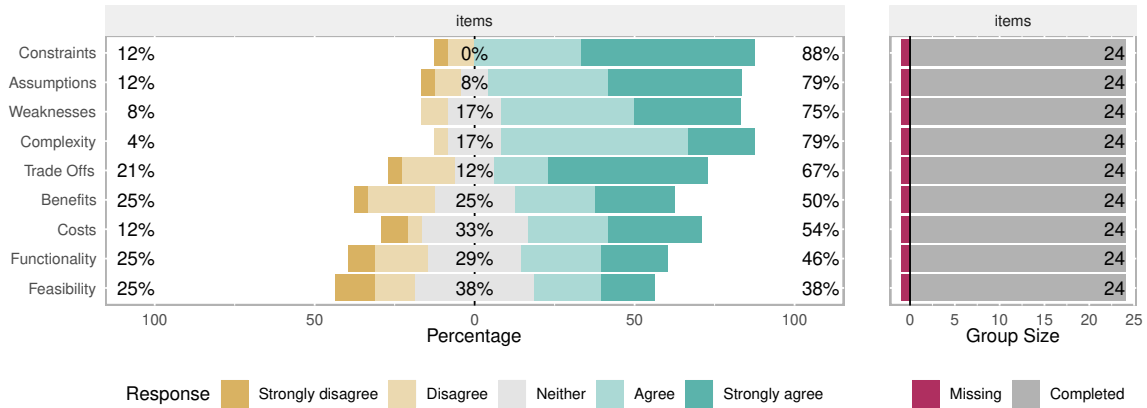


Figure C.32.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – development experience “4 – 7 years” only.

Kruskal-Wallis – Test for Difference					
Method	Value		Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 20.341$		$p = 0.009 < 0.05$	✓	
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance	Significant?	
Constraints ↔ Assumptions made	$p = 0.445$	$> 0.10$	$p = 0.616$	$> 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.269$	$> 0.10$	$p = 0.461$	$> 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.165$	$> 0.10$	$p = 0.371$	$> 0.10$	✗
Constraints ↔ Trade Offs	$p = 0.321$	$> 0.10$	$p = 0.502$	$> 0.10$	✗
Constraints ↔ Benefits of an ALT	$p = 0.009$	$< 0.05$	$p = 0.084$	$< 0.10$	✓
Constraints ↔ Cost of an ALT	$p = 0.036$	$< 0.05$	$p = 0.160$	$> 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.003$	$\ll 0.05$	$p = 0.059$	$< 0.10$	✓
Constraints ↔ an ALT's feasibility	$p = 6.376 * 10^{-4}$	$\ll 0.05$	$p = 0.023$	$< 0.05$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.732$	$> 0.10$	$p = 0.824$	$> 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.532$	$> 0.10$	$p = 0.684$	$> 0.10$	✗
Assumptions made ↔ Trade Offs	$p = 0.819$	$> 0.10$	$p = 0.842$	$> 0.10$	✗
Assumptions made ↔ Benefits of an ALT	$p = 0.066$	$> 0.05$	$p = 0.217$	$> 0.10$	✗
Assumptions made ↔ Cost of an ALT	$p = 0.181$	$> 0.10$	$p = 0.383$	$> 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.029$	$< 0.05$	$p = 0.151$	$> 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.008$	$< 0.05$	$p = 0.096$	$< 0.10$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.777$	$> 0.10$	$p = 0.823$	$> 0.10$	✗
an ALT's weaknesses ↔ Trade Offs	$p = 0.910$	$> 0.10$	$p = 0.910$	$> 0.10$	✗
an ALT's weaknesses ↔ Benefits of an ALT	$p = 0.135$	$> 0.10$	$p = 0.324$	$> 0.10$	✗
an ALT's weaknesses ↔ Cost of an ALT	$p = 0.319$	$> 0.10$	$p = 0.522$	$> 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.066$	$> 0.05$	$p = 0.199$	$> 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.021$	$< 0.05$	$p = 0.125$	$> 0.10$	✗
an ALT's complexity ↔ Trade Offs	$p = 0.692$	$> 0.10$	$p = 0.804$	$> 0.10$	✗
an ALT's complexity ↔ Benefits of an ALT	$p = 0.226$	$> 0.10$	$p = 0.428$	$> 0.10$	✗
an ALT's complexity ↔ Cost of an ALT	$p = 0.476$	$> 0.10$	$p = 0.634$	$> 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.121$	$> 0.10$	$p = 0.310$	$> 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.043$	$< 0.05$	$p = 0.171$	$> 0.10$	✗
Trade Offs ↔ Benefits of an ALT	$p = 0.108$	$> 0.10$	$p = 0.299$	$> 0.10$	✗
Trade Offs ↔ Cost of an ALT	$p = 0.267$	$> 0.10$	$p = 0.481$	$> 0.10$	✗
Trade Offs ↔ an ALT's functionality	$p = 0.051$	$> 0.05$	$p = 0.185$	$> 0.10$	✗
Trade Offs ↔ an ALT's feasibility	$p = 0.015$	$< 0.05$	$p = 0.111$	$> 0.10$	✗
Benefits of an ALT ↔ Cost of an ALT	$p = 0.618$	$> 0.10$	$p = 0.768$	$> 0.10$	✗
Benefits of an ALT ↔ an ALT's functionality	$p = 0.733$	$> 0.10$	$p = 0.800$	$> 0.10$	✗
Benefits of an ALT ↔ an ALT's feasibility	$p = 0.415$	$> 0.10$	$p = 0.598$	$> 0.10$	✗
Cost of an ALT ↔ an ALT's functionality	$p = 0.401$	$> 0.10$	$p = 0.602$	$> 0.10$	✗
Cost of an ALT ↔ an ALT's feasibility	$p = 0.189$	$> 0.10$	$p = 0.378$	$> 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.635$	$> 0.10$	$p = 0.762$	$> 0.10$	✗

Table C.32.: Results of test for difference – grouped by rationale types – cf. Figure C.32.

### Development Experience: “0 – 3 Years”

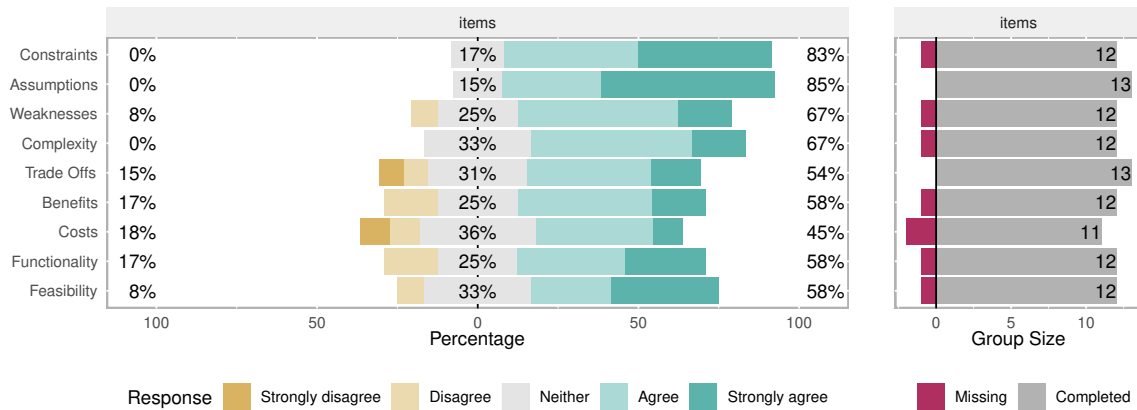


Figure C.33.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – development experience “0 – 3 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 12.231$	$p = 0.141 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.695 > 0.10$	$p = 0.927 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.187 > 0.10$	$p = 0.561 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.233 > 0.10$	$p = 0.598 > 0.10$	X
Constraints ↔ Trade Offs	$p = 0.057 < 0.10$	$p = 0.413 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.092 < 0.10$	$p = 0.414 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.023 < 0.05$	$p = 0.270 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.148 > 0.10$	$p = 0.483 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.278 > 0.10$	$p = 0.625 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.082 < 0.10$	$p = 0.424 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.108 > 0.10$	$p = 0.431 > 0.10$	X
Assumptions made ↔ Trade Offs	$p = 0.019 < 0.05$	$p = 0.348 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.035 < 0.05$	$p = 0.314 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.007 < 0.05$	$p = 0.244 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.062 < 0.10$	$p = 0.370 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.134 > 0.10$	$p = 0.483 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.900 > 0.10$	$p = 0.926 > 0.10$	X
an ALT's weaknesses ↔ Trade Offs	$p = 0.579 > 0.10$	$p = 0.906 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.714 > 0.10$	$p = 0.918 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.321 > 0.10$	$p = 0.681 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.897 > 0.10$	$p = 0.950 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.815 > 0.10$	$p = 0.917 > 0.10$	X
an ALT's complexity ↔ Trade Offs	$p = 0.495 > 0.10$	$p = 0.890 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.623 > 0.10$	$p = 0.934 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.265 > 0.10$	$p = 0.636 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.799 > 0.10$	$p = 0.959 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.914 > 0.10$	$p = 0.914 > 0.10$	X
Trade Offs ↔ an ALT's benefits	$p = 0.856 > 0.10$	$p = 0.934 > 0.10$	X
Trade Offs ↔ an ALT's costs	$p = 0.640 > 0.10$	$p = 0.921 > 0.10$	X
Trade Offs ↔ an ALT's functionality	$p = 0.672 > 0.10$	$p = 0.930 > 0.10$	X
Trade Offs ↔ an ALT's feasibility	$p = 0.427 > 0.10$	$p = 0.810 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.526 > 0.10$	$p = 0.902 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.812 > 0.10$	$p = 0.943 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.548 > 0.10$	$p = 0.897 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.387 > 0.10$	$p = 0.773 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.222 > 0.10$	$p = 0.616 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.717 > 0.10$	$p = 0.890 > 0.10$	X

Table C.33.: Results of test for difference – grouped by rationale types – cf. Figure C.33.



### C.6.3. Scrum Experience ⇔ Usefulness of Rationale Types (IndepVar: Q-27 – DepVar: Q-08)

#### Scrum Experience: “Expert”

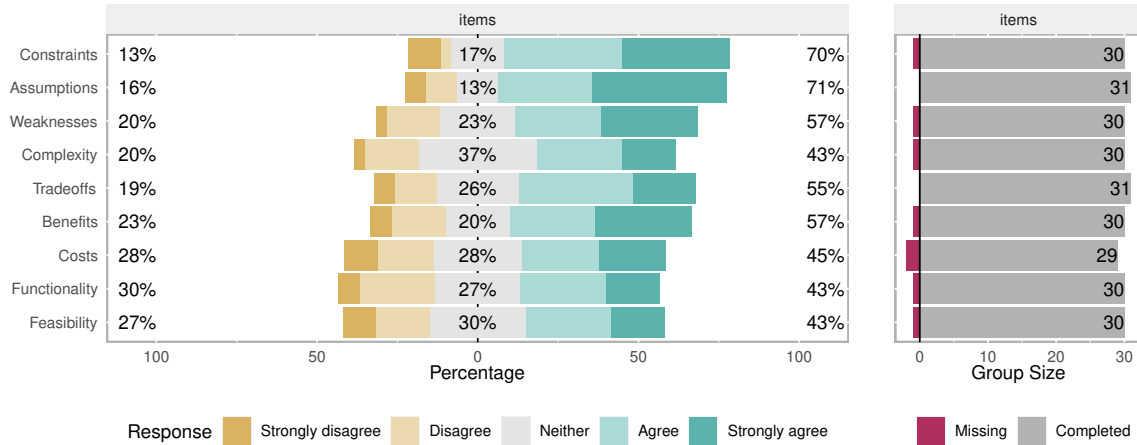


Figure C.34.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – Scrum experience “Expert” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.922$	$p = 0.441 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.710 > 0.10$	$p = 0.881 > 0.10$	$\times$
Constraints ↔ an ALT's weaknesses	$p = 0.790 > 0.10$	$p = 0.918 > 0.10$	$\times$
Constraints ↔ an ALT's complexity	$p = 0.316 > 0.10$	$p = 0.811 > 0.10$	$\times$
Constraints ↔ Tradeoffs	$p = 0.352 > 0.10$	$p = 0.845 > 0.10$	$\times$
Constraints ↔ an ALT's benefits	$p = 0.597 > 0.10$	$p = 0.934 > 0.10$	$\times$
Constraints ↔ an ALT's costs	$p = 0.186 > 0.10$	$p = 0.955 > 0.10$	$\times$
Constraints ↔ an ALT's functionality	$p = 0.108 > 0.10$	$p = 0.972 > 0.10$	$\times$
Constraints ↔ an ALT's feasibility	$p = 0.125 > 0.10$	$p = 0.903 > 0.10$	$\times$
Assumptions made ↔ an ALT's weaknesses	$p = 0.525 > 0.10$	$p = 0.900 > 0.10$	$\times$
Assumptions made ↔ an ALT's complexity	$p = 0.172 > 0.10$	$p = 1.000 > 0.10$	$\times$
Assumptions made ↔ Tradeoffs	$p = 0.190 > 0.10$	$p = 0.758 > 0.10$	$\times$
Assumptions made ↔ an ALT's benefits	$p = 0.364 > 0.10$	$p = 0.819 > 0.10$	$\times$
Assumptions made ↔ an ALT's costs	$p = 0.089 < 0.10$	$p = 1.000 > 0.10$	$\times$
Assumptions made ↔ an ALT's functionality	$p = 0.046 < 0.05$	$p = 1.000 > 0.10$	$\times$
Assumptions made ↔ an ALT's feasibility	$p = 0.056 < 0.10$	$p = 1.000 > 0.10$	$\times$
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.461 > 0.10$	$p = 0.922 > 0.10$	$\times$
an ALT's weaknesses ↔ Tradeoffs	$p = 0.515 > 0.10$	$p = 0.927 > 0.10$	$\times$
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.799 > 0.10$	$p = 0.872 > 0.10$	$\times$
an ALT's weaknesses ↔ an ALT's costs	$p = 0.297 > 0.10$	$p = 0.890 > 0.10$	$\times$
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.188 > 0.10$	$p = 0.844 > 0.10$	$\times$
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.212 > 0.10$	$p = 0.763 > 0.10$	$\times$
an ALT's complexity ↔ Tradeoffs	$p = 0.906 > 0.10$	$p = 0.932 > 0.10$	$\times$
an ALT's complexity ↔ an ALT's benefits	$p = 0.615 > 0.10$	$p = 0.886 > 0.10$	$\times$
an ALT's complexity ↔ an ALT's costs	$p = 0.785 > 0.10$	$p = 0.942 > 0.10$	$\times$
an ALT's complexity ↔ an ALT's functionality	$p = 0.600 > 0.10$	$p = 0.899 > 0.10$	$\times$
an ALT's complexity ↔ an ALT's feasibility	$p = 0.640 > 0.10$	$p = 0.886 > 0.10$	$\times$
Tradeoffs ↔ an ALT's benefits	$p = 0.687 > 0.10$	$p = 0.883 > 0.10$	$\times$
Tradeoffs ↔ an ALT's costs	$p = 0.684 > 0.10$	$p = 0.912 > 0.10$	$\times$
Tradeoffs ↔ an ALT's functionality	$p = 0.500 > 0.10$	$p = 0.948 > 0.10$	$\times$
Tradeoffs ↔ an ALT's feasibility	$p = 0.541 > 0.10$	$p = 0.885 > 0.10$	$\times$
an ALT's benefits ↔ an ALT's costs	$p = 0.421 > 0.10$	$p = 0.891 > 0.10$	$\times$
an ALT's benefits ↔ an ALT's functionality	$p = 0.280 > 0.10$	$p = 0.917 > 0.10$	$\times$
an ALT's benefits ↔ an ALT's feasibility	$p = 0.312 > 0.10$	$p = 0.863 > 0.10$	$\times$
an ALT's costs ↔ an ALT's functionality	$p = 0.798 > 0.10$	$p = 0.898 > 0.10$	$\times$
an ALT's costs ↔ an ALT's feasibility	$p = 0.841 > 0.10$	$p = 0.891 > 0.10$	$\times$
an ALT's functionality ↔ an ALT's feasibility	$p = 0.957 > 0.10$	$p = 0.957 > 0.10$	$\times$

Table C.34.: Results of test for difference – grouped by rationale types – cf. Figure C.34.

Scrum Experience: “Advanced”

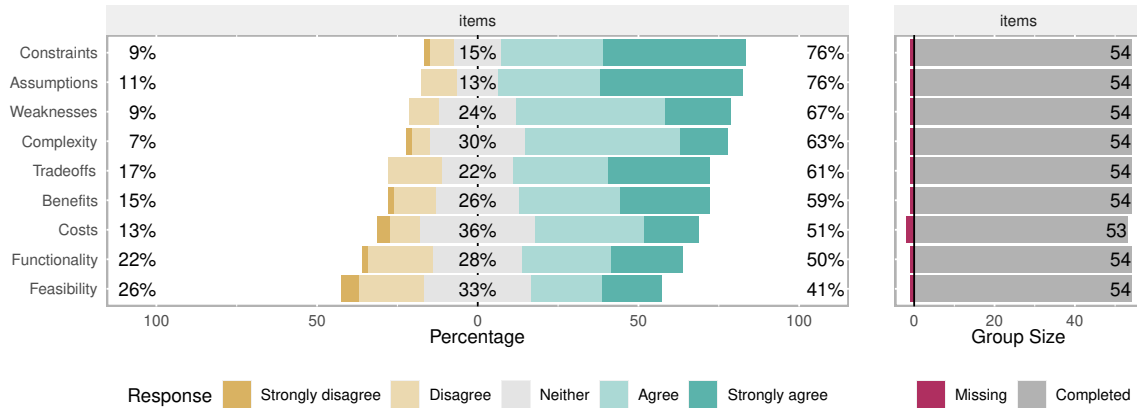


Figure C.35.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – Scrum experience “Advanced” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 18.401$	$p = 0.018 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.882 > 0.10$	$p = 0.882 > 0.10$	✗
Constraints ↔ an ALT's weaknesses	$p = 0.070 < 0.10$	$p = 0.252 > 0.10$	✗
Constraints ↔ an ALT's complexity	$p = 0.033 < 0.05$	$p = 0.171 > 0.10$	✗
Constraints ↔ Tradeoffs	$p = 0.174 > 0.10$	$p = 0.392 > 0.10$	✗
Constraints ↔ an ALT's benefits	$p = 0.130 > 0.10$	$p = 0.360 > 0.10$	✗
Constraints ↔ an ALT's costs	$p = 0.023 < 0.05$	$p = 0.169 > 0.10$	✗
Constraints ↔ an ALT's functionality	$p = 0.011 < 0.05$	$p = 0.133 > 0.10$	✗
Constraints ↔ an ALT's feasibility	$p = 0.001 \ll 0.05$	$p = 0.049 < 0.05$	✓
Assumptions made ↔ an ALT's weaknesses	$p = 0.093 < 0.10$	$p = 0.306 > 0.10$	✗
Assumptions made ↔ an ALT's complexity	$p = 0.046 < 0.05$	$p = 0.206 > 0.10$	✗
Assumptions made ↔ Tradeoffs	$p = 0.222 > 0.10$	$p = 0.470 > 0.10$	✗
Assumptions made ↔ an ALT's benefits	$p = 0.168 > 0.10$	$p = 0.403 > 0.10$	✗
Assumptions made ↔ an ALT's costs	$p = 0.032 < 0.05$	$p = 0.194 > 0.10$	✗
Assumptions made ↔ an ALT's functionality	$p = 0.016 < 0.05$	$p = 0.143 > 0.10$	✗
Assumptions made ↔ an ALT's feasibility	$p = 0.002 \ll 0.05$	$p = 0.038 < 0.05$	✓
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.731 > 0.10$	$p = 0.849 > 0.10$	✗
an ALT's weaknesses ↔ Tradeoffs	$p = 0.651 > 0.10$	$p = 0.808 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.781 > 0.10$	$p = 0.878 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's costs	$p = 0.595 > 0.10$	$p = 0.765 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.464 > 0.10$	$p = 0.668 > 0.10$	✗
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.157 > 0.10$	$p = 0.404 > 0.10$	✗
an ALT's complexity ↔ Tradeoffs	$p = 0.430 > 0.10$	$p = 0.646 > 0.10$	✗
an ALT's complexity ↔ an ALT's benefits	$p = 0.539 > 0.10$	$p = 0.719 > 0.10$	✗
an ALT's complexity ↔ an ALT's costs	$p = 0.846 > 0.10$	$p = 0.922 > 0.10$	✗
an ALT's complexity ↔ an ALT's functionality	$p = 0.704 > 0.10$	$p = 0.845 > 0.10$	✗
an ALT's complexity ↔ an ALT's feasibility	$p = 0.290 > 0.10$	$p = 0.550 > 0.10$	✗
Tradeoffs ↔ an ALT's benefits	$p = 0.866 > 0.10$	$p = 0.890 > 0.10$	✗
Tradeoffs ↔ an ALT's costs	$p = 0.335 > 0.10$	$p = 0.574 > 0.10$	✗
Tradeoffs ↔ an ALT's functionality	$p = 0.237 > 0.10$	$p = 0.474 > 0.10$	✗
Tradeoffs ↔ an ALT's feasibility	$p = 0.063 < 0.10$	$p = 0.252 > 0.10$	✗
an ALT's benefits ↔ an ALT's costs	$p = 0.427 > 0.10$	$p = 0.669 > 0.10$	✗
an ALT's benefits ↔ an ALT's functionality	$p = 0.316 > 0.10$	$p = 0.569 > 0.10$	✗
an ALT's benefits ↔ an ALT's feasibility	$p = 0.094 < 0.10$	$p = 0.281 > 0.10$	✗
an ALT's costs ↔ an ALT's functionality	$p = 0.863 > 0.10$	$p = 0.914 > 0.10$	✗
an ALT's costs ↔ an ALT's feasibility	$p = 0.403 > 0.10$	$p = 0.660 > 0.10$	✗
an ALT's functionality ↔ an ALT's feasibility	$p = 0.491 > 0.10$	$p = 0.679 > 0.10$	✗

Table C.35.: Results of test for difference – grouped by rationale types – cf. Figure C.35.

### Scrum Experience: “Novice”

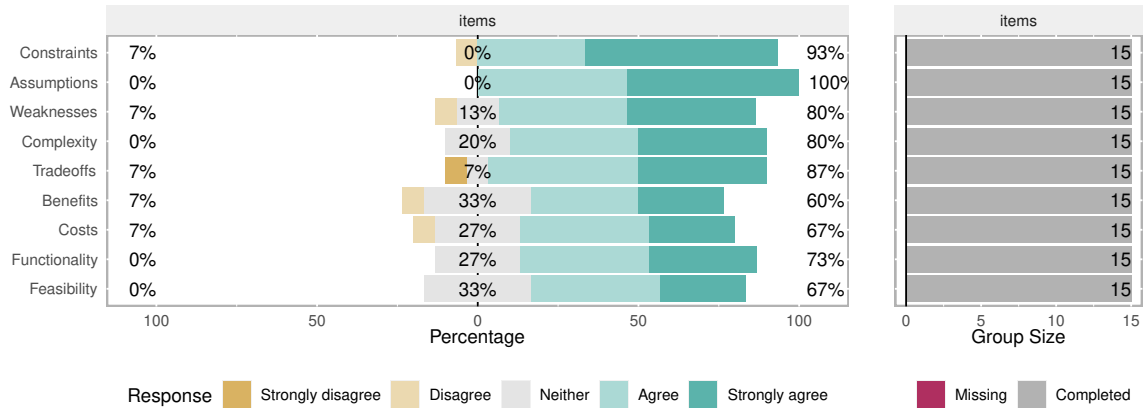


Figure C.36.: Agreement to the usefulness of rationale types (→) grouped by rationale types (↑) – Scrum experience “Novice” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.533$	$p = 0.960 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Constraints ↔ Assumptions made	$p = 0.878 > 0.10$	$p = 0.957 > 0.10$	X
Constraints ↔ an ALT's weaknesses	$p = 0.479 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's complexity	$p = 0.760 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ Tradeoffs	$p = 0.374 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's benefits	$p = 0.320 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's costs	$p = 0.242 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's functionality	$p = 0.609 > 0.10$	$p = 1.000 > 0.10$	X
Constraints ↔ an ALT's feasibility	$p = 0.456 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's weaknesses	$p = 0.576 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's complexity	$p = 0.873 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ Tradeoffs	$p = 0.461 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's benefits	$p = 0.391 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's costs	$p = 0.303 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's functionality	$p = 0.712 > 0.10$	$p = 1.000 > 0.10$	X
Assumptions made ↔ an ALT's feasibility	$p = 0.543 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's complexity	$p = 0.708 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ Tradeoffs	$p = 0.872 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's benefits	$p = 0.743 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's costs	$p = 0.631 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's weaknesses ↔ an ALT's functionality	$p = 0.873 > 0.10$	$p = 0.982 > 0.10$	X
an ALT's weaknesses ↔ an ALT's feasibility	$p = 0.931 > 0.10$	$p = 0.958 > 0.10$	X
an ALT's complexity ↔ Tradeoffs	$p = 0.590 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's benefits	$p = 0.501 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's costs	$p = 0.406 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's functionality	$p = 0.839 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's complexity ↔ an ALT's feasibility	$p = 0.664 > 0.10$	$p = 1.000 > 0.10$	X
Tradeoffs ↔ an ALT's benefits	$p = 0.854 > 0.10$	$p = 1.000 > 0.10$	X
Tradeoffs ↔ an ALT's costs	$p = 0.739 > 0.10$	$p = 1.000 > 0.10$	X
Tradeoffs ↔ an ALT's functionality	$p = 0.752 > 0.10$	$p = 1.000 > 0.10$	X
Tradeoffs ↔ an ALT's feasibility	$p = 0.950 > 0.10$	$p = 0.950 > 0.10$	X
an ALT's benefits ↔ an ALT's costs	$p = 0.894 > 0.10$	$p = 0.946 > 0.10$	X
an ALT's benefits ↔ an ALT's functionality	$p = 0.641 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's benefits ↔ an ALT's feasibility	$p = 0.820 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's costs ↔ an ALT's functionality	$p = 0.539 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's costs ↔ an ALT's feasibility	$p = 0.714 > 0.10$	$p = 1.000 > 0.10$	X
an ALT's functionality ↔ an ALT's feasibility	$p = 0.816 > 0.10$	$p = 1.000 > 0.10$	X

Table C.36.: Results of test for difference – grouped by rationale types – cf. Figure C.36.

## C.7. Hypothesis RQ1-H4 – Experience ⇔ Usage of Rationale Information Elements for Reasoning

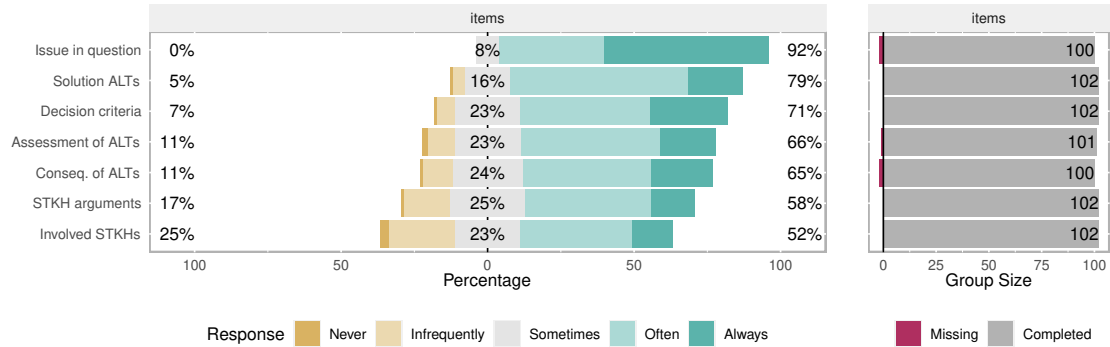


Figure C.37.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 49.036$	$p = 7.333 * 10^{-9} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 2.444 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 0.001 \ll 0.05$	$p = 0.005 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 5.408 * 10^{-5} \ll 0.05$	$p = 2.839 * 10^{-4} \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 9.531 * 10^{-7} \ll 0.05$	$p = 6.672 * 10^{-6} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 4.819 * 10^{-10} \ll 0.05$	$p = 1.012 * 10^{-8} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 6.319 * 10^{-8} \ll 0.05$	$p = 6.634 * 10^{-7} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.617 > 0.10$	$p = 0.682 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.713 > 0.10$	$p = 0.713 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.215 > 0.10$	$p = 0.301 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.029 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.084 > 0.05$	$p = 0.147 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.384 > 0.10$	$p = 0.475 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.082 > 0.05$	$p = 0.156 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.007 < 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.025 < 0.05$	$p = 0.059 < 0.10$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.383 > 0.10$	$p = 0.503 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.030 < 0.05$	$p = 0.063 < 0.10$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.174 > 0.10$	$p = 0.281 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.196 > 0.10$	$p = 0.294 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.630 > 0.10$	$p = 0.662 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.415 > 0.10$	$p = 0.484 > 0.10$	✗

Table C.37.: Results of test for difference – grouped by rationale information elements – cf. Figure C.37.

### C.7.1. Documentation Experience ⇔ Usage of Rationale Information Elements for Reasoning (IndepVar: Q-01 – DepVar: Q-09)

#### Documentation Experience: “I Always Document Decisions”

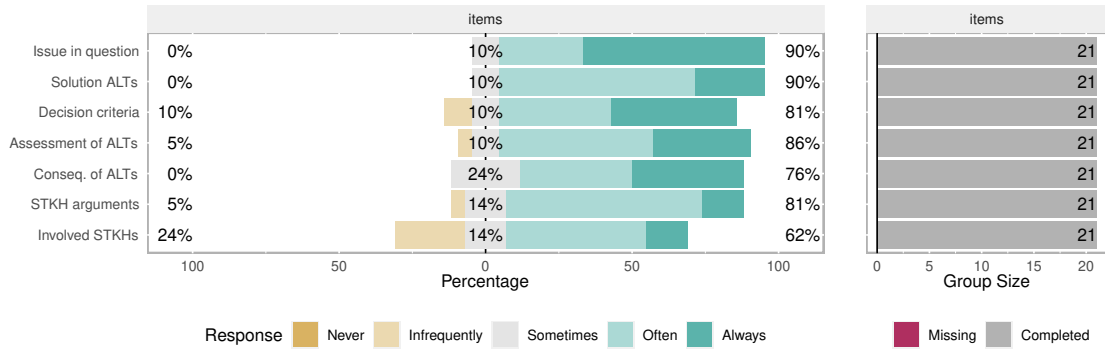


Figure C.38.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I always document decisions” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 15.658$	$p = 0.016 < 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.061 > 0.05$	$p = 0.215 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.162 > 0.10$	$p = 0.340 > 0.10$	✗	
Issue ↔ Assessment of ALTs	$p = 0.102 > 0.10$	$p = 0.238 > 0.10$	✗	
Issue ↔ Consequences of ALTs	$p = 0.089 > 0.05$	$p = 0.234 > 0.10$	✗	
Issue ↔ Involved stakeholders	$p = 2.380 * 10^{-4} \ll 0.05$	$p = 0.005 \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 0.006 < 0.05$	$p = 0.063 < 0.10$	✓	
Solution Alternatives ↔ Decision criteria	$p = 0.637 > 0.10$	$p = 0.836 > 0.10$	✗	
Solution Alternatives ↔ Assessment of ALTs	$p = 0.814 > 0.10$	$p = 0.949 > 0.10$	✗	
Solution Alternatives ↔ Consequences of ALTs	$p = 0.864 > 0.10$	$p = 0.907 > 0.10$	✗	
Solution Alternatives ↔ Involved stakeholders	$p = 0.071 > 0.05$	$p = 0.214 > 0.10$	✗	
Solution Alternatives ↔ Stakeholder ARGs	$p = 0.381 > 0.10$	$p = 0.533 > 0.10$	✗	
Decision criteria ↔ Assessment of ALTs	$p = 0.814 > 0.10$	$p = 0.899 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.764 > 0.10$	$p = 0.943 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 0.023 < 0.05$	$p = 0.160 > 0.10$	✗	
Decision criteria ↔ Stakeholder ARGs	$p = 0.178 > 0.10$	$p = 0.339 > 0.10$	✗	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.948 > 0.10$	$p = 0.948 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.041 < 0.05$	$p = 0.217 > 0.10$	✗	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.266 > 0.10$	$p = 0.466 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 0.048 < 0.05$	$p = 0.203 > 0.10$	✗	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.295 > 0.10$	$p = 0.476 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.354 > 0.10$	$p = 0.530 > 0.10$	✗	

Table C.38.: Results of test for difference – grouped by rationale information elements – cf. Figure C.38.

## Documentation Experience: “I Often Document Decisions”

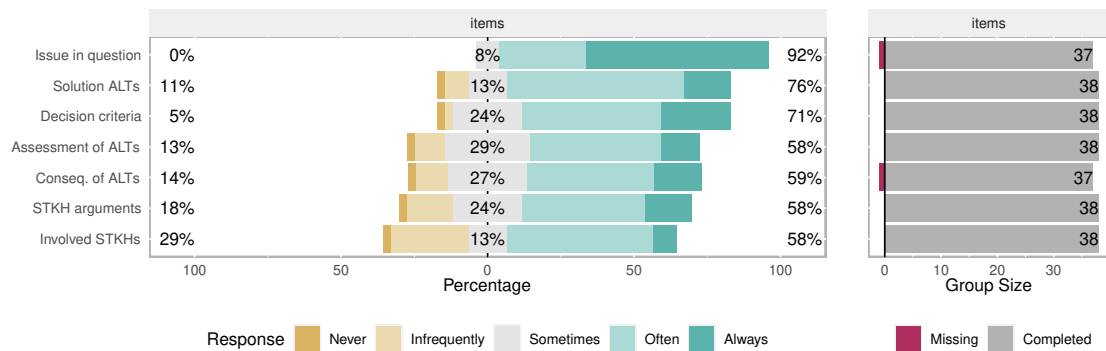


Figure C.39.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I often document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 38.656$	$p = 8.360 * 10^{-7} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 3.534 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 9.831 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 2.233 * 10^{-6} \ll 0.05$	$p = 2.344 * 10^{-5} \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 7.977 * 10^{-6} \ll 0.05$	$p = 4.188 * 10^{-5} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 6.908 * 10^{-8} \ll 0.05$	$p = 1.451 * 10^{-6} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 2.395 * 10^{-6} \ll 0.05$	$p = 1.677 * 10^{-5} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.780 > 0.10$	$p = 0.910 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.244 > 0.10$	$p = 0.426 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.356 > 0.10$	$p = 0.534 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.067 > 0.05$	$p = 0.175 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.249 > 0.10$	$p = 0.403 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.148 > 0.10$	$p = 0.346 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.230 > 0.10$	$p = 0.439 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.035 < 0.05$	$p = 0.104 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.152 > 0.10$	$p = 0.320 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.814 > 0.10$	$p = 0.899 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.505 > 0.10$	$p = 0.624 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.989 > 0.10$	$p = 0.989 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.369 > 0.10$	$p = 0.517 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.825 > 0.10$	$p = 0.866 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.496 > 0.10$	$p = 0.651 > 0.10$	✗

Table C.39.: Results of test for difference – grouped by rationale information elements – cf. Figure C.39.

### Documentation Experience: “I Sometimes Document Decisions”

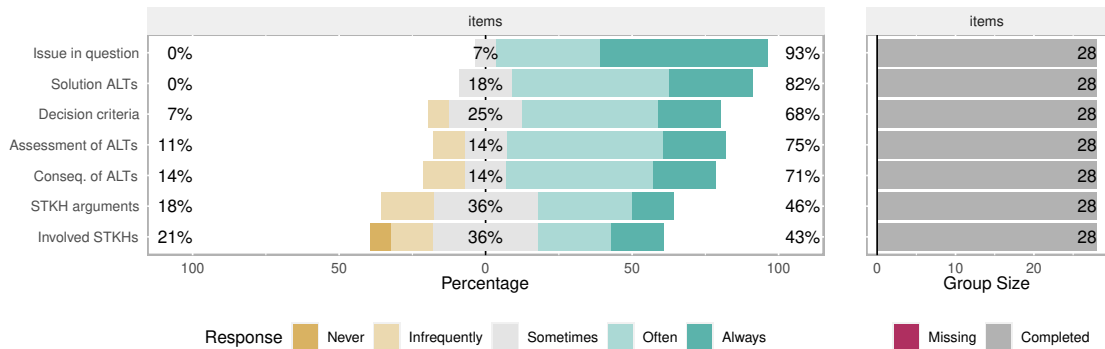


Figure C.40.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I sometimes document decisions” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 28.651$	$p = 7.083 * 10^{-5} \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.072 > 0.05$	$p = 0.167 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.004 \ll 0.05$	$p = 0.026 < 0.05$	✓	
Issue ↔ Assessment of ALTs	$p = 0.008 < 0.05$	$p = 0.027 < 0.05$	✓	
Issue ↔ Consequences of ALTs	$p = 0.004 \ll 0.05$	$p = 0.020 < 0.05$	✓	
Issue ↔ Involved stakeholders	$p = 6.483 * 10^{-6} \ll 0.05$	$p = 1.361 * 10^{-4} \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 1.099 * 10^{-5} \ll 0.05$	$p = 1.154 * 10^{-4} \ll 0.05$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.269 > 0.10$	$p = 0.377 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.385 > 0.10$	$p = 0.476 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.272 > 0.10$	$p = 0.357 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 0.007 < 0.05$	$p = 0.028 < 0.05$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.009 < 0.05$	$p = 0.028 < 0.05$	✓	
Decision criteria ↔ Assessment of ALTs	$p = 0.813 > 0.10$	$p = 0.949 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.995 > 0.10$	$p = 0.995 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 0.109 > 0.10$	$p = 0.190 > 0.10$	✗	
Decision criteria ↔ Stakeholder ARGs	$p = 0.136 > 0.10$	$p = 0.204 > 0.10$	✗	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.818 > 0.10$	$p = 0.904 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.066 > 0.05$	$p = 0.172 > 0.10$	✗	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.084 > 0.05$	$p = 0.177 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 0.107 > 0.10$	$p = 0.205 > 0.10$	✗	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.134 > 0.10$	$p = 0.217 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.910 > 0.10$	$p = 0.955 > 0.10$	✗	

Table C.40.: Results of test for difference – grouped by rationale information elements – cf. Figure C.40.

## Documentation Experience: “I Infrequently Document Decisions”

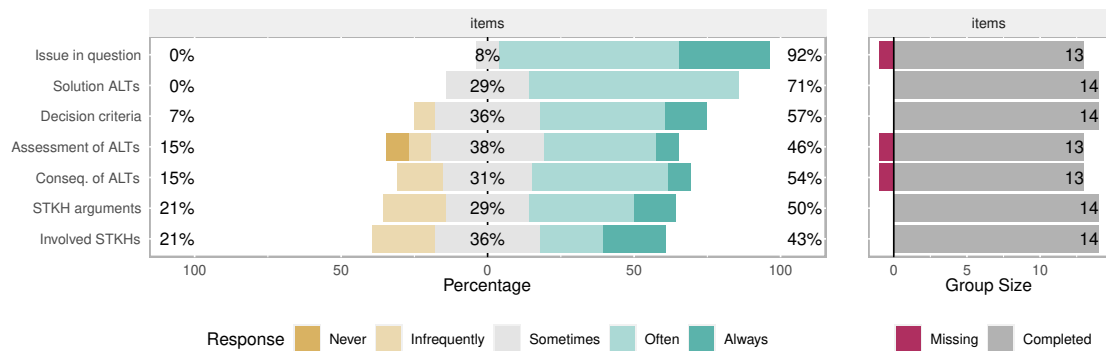


Figure C.41.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I infrequently document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.589$	$p = 0.143 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.107 > 0.10$	$p = 0.375 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.064 < 0.10$	$p = 0.267 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.010 < 0.05$	$p = 0.204 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.023 < 0.05$	$p = 0.121 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.015 < 0.05$	$p = 0.156 > 0.10$	X
Issue ↔ Stakeholder ARGs	$p = 0.017 < 0.05$	$p = 0.120 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.804 > 0.10$	$p = 0.993 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.307 > 0.10$	$p = 0.921 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.481 > 0.10$	$p = 0.918 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.400 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.432 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.437 > 0.10$	$p = 0.917 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.645 > 0.10$	$p = 0.968 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.553 > 0.10$	$p = 0.969 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.591 > 0.10$	$p = 0.954 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.756 > 0.10$	$p = 1.000 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.845 > 0.10$	$p = 0.985 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.803 > 0.10$	$p = 1.000 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.904 > 0.10$	$p = 0.999 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.947 > 0.10$	$p = 0.994 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.956 > 0.10$	$p = 0.956 > 0.10$	X

Table C.41.: Results of test for difference – grouped by rationale information elements – cf. Figure C.41.



## C.7.2. Development Experience ⇔ Usage of Rationale Information Elements for Reasoning (IndepVar: Q-26 – DepVar: Q-09)

### Development Experience: “More Than 15 Years”

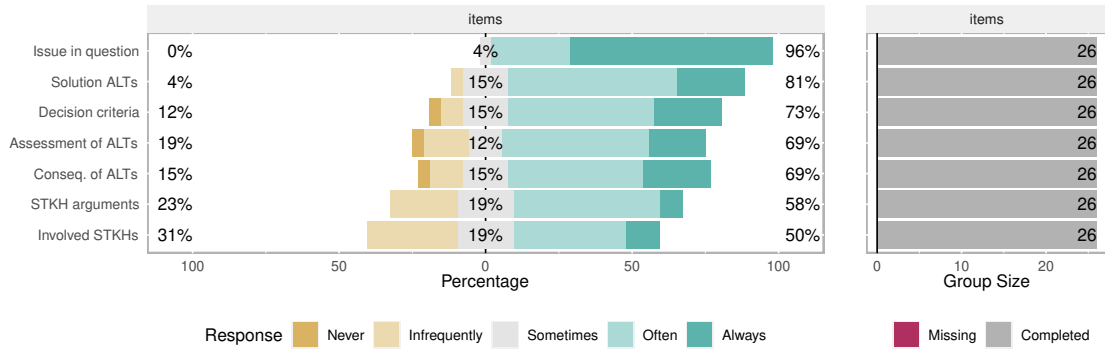


Figure C.42.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “more than 15 years” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 33.983$	$p = 6.777 * 10^{-6} \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.004 \ll 0.05$	$p = 0.015 < 0.05$	✓	
Issue ↔ Decision criteria	$p = 8.669 * 10^{-4} \ll 0.05$	$p = 0.004 \ll 0.05$	✓	
Issue ↔ Assessment of ALTs	$p = 1.426 * 10^{-4} \ll 0.05$	$p = 9.979 * 10^{-4} \ll 0.05$	✓	
Issue ↔ Consequences of ALTs	$p = 3.807 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓	
Issue ↔ Involved stakeholders	$p = 3.396 * 10^{-7} \ll 0.05$	$p = 7.131 * 10^{-6} \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 1.328 * 10^{-6} \ll 0.05$	$p = 1.395 * 10^{-5} \ll 0.05$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.629 > 0.10$	$p = 0.777 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.339 > 0.10$	$p = 0.475 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.480 > 0.10$	$p = 0.631 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 0.024 < 0.05$	$p = 0.073 < 0.10$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.047 < 0.05$	$p = 0.123 > 0.10$	✗	
Decision criteria ↔ Assessment of ALTs	$p = 0.636 > 0.10$	$p = 0.742 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.824 > 0.10$	$p = 0.824 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 0.077 > 0.05$	$p = 0.179 > 0.10$	✗	
Decision criteria ↔ Stakeholder ARGs	$p = 0.132 > 0.10$	$p = 0.253 > 0.10$	✗	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.802 > 0.10$	$p = 0.842 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.195 > 0.10$	$p = 0.341 > 0.10$	✗	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.302 > 0.10$	$p = 0.453 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 0.122 > 0.10$	$p = 0.256 > 0.10$	✗	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.200 > 0.10$	$p = 0.323 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.791 > 0.10$	$p = 0.875 > 0.10$	✗	

Table C.42.: Results of test for difference – grouped by rationale information elements – cf. Figure C.42.

## Development Experience: “12 – 15 Years”

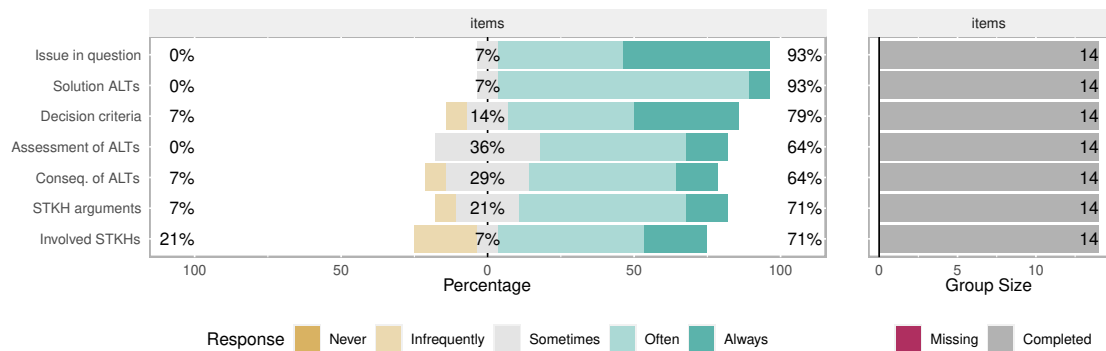


Figure C.43.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “12 – 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.485$	$p = 0.148 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.100 \leq 0.10$	$p = 0.419 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.252 > 0.10$	$p = 0.662 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.017 < 0.05$	$p = 0.174 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.013 < 0.05$	$p = 0.276 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.034 < 0.05$	$p = 0.179 > 0.10$	X
Issue ↔ Stakeholder ARGs	$p = 0.026 < 0.05$	$p = 0.183 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.616 > 0.10$	$p = 0.924 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.453 > 0.10$	$p = 0.793 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.404 > 0.10$	$p = 0.772 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.637 > 0.10$	$p = 0.892 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.563 > 0.10$	$p = 0.910 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.211 > 0.10$	$p = 0.633 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.182 > 0.10$	$p = 0.636 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.330 > 0.10$	$p = 0.694 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.280 > 0.10$	$p = 0.654 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.933 > 0.10$	$p = 0.933 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.781 > 0.10$	$p = 0.965 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.863 > 0.10$	$p = 0.954 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.717 > 0.10$	$p = 0.941 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.798 > 0.10$	$p = 0.931 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.916 > 0.10$	$p = 0.961 > 0.10$	X

Table C.43.: Results of test for difference – grouped by rationale information elements – cf. Figure C.43.

### Development Experience: “8 – 11 Years”

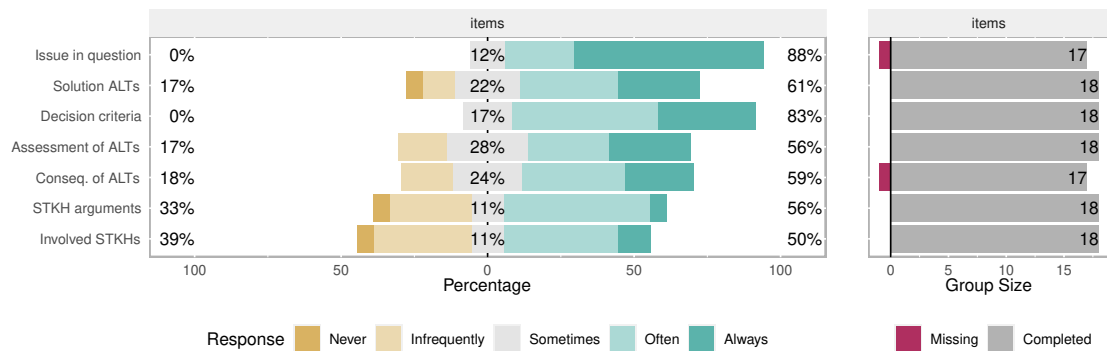


Figure C.44.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “8 – 11 years” only.

Kruskal-Wallis – Test for Difference					
Method	Value		Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 20.548$		$p = 0.002 \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.016$	< 0.05	$p = 0.049$	< 0.05	✓
Issue ↔ Decision criteria	$p = 0.223$	> 0.10	$p = 0.389$	> 0.10	✗
Issue ↔ Assessment of ALTs	$p = 0.012$	< 0.05	$p = 0.063$	< 0.10	✓
Issue ↔ Consequences of ALTs	$p = 0.011$	< 0.05	$p = 0.076$	< 0.10	✓
Issue ↔ Involved stakeholders	$p = 2.227 * 10^{-4}$	$\ll 0.05$	$p = 0.005$	$\ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 2.917 * 10^{-4}$	$\ll 0.05$	$p = 0.003$	$\ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.229$	> 0.10	$p = 0.371$	> 0.10	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.911$	> 0.10	$p = 1.000$	> 0.10	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.859$	> 0.10	$p = 1.000$	> 0.10	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.192$	> 0.10	$p = 0.402$	> 0.10	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.217$	> 0.10	$p = 0.413$	> 0.10	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.189$	> 0.10	$p = 0.441$	> 0.10	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.173$	> 0.10	$p = 0.455$	> 0.10	✗
Decision criteria ↔ Involved stakeholders	$p = 0.012$	< 0.05	$p = 0.051$	< 0.10	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.015$	< 0.05	$p = 0.052$	< 0.10	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.946$	> 0.10	$p = 0.946$	> 0.10	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.232$	> 0.10	$p = 0.348$	> 0.10	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.261$	> 0.10	$p = 0.365$	> 0.10	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.267$	> 0.10	$p = 0.351$	> 0.10	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.298$	> 0.10	$p = 0.368$	> 0.10	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.944$	> 0.10	$p = 0.991$	> 0.10	✗

Table C.44.: Results of test for difference – grouped by rationale information elements – cf. Figure C.44.

### Development Experience: “4 – 7 Years”

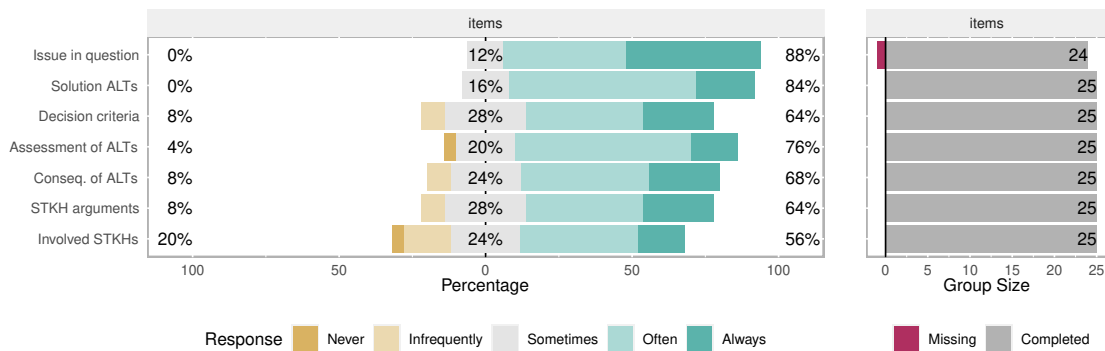


Figure C.45.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “4 – 7 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.316$	$p = 0.079 < 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.177 > 0.10$	$p = 0.532 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.028 < 0.05$	$p = 0.194 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.048 < 0.05$	$p = 0.200 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.043 < 0.05$	$p = 0.227 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.033 < 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.028 < 0.05$	$p = 0.292 > 0.10$	✗
Solution alternatives ↔ Decision criteria	$p = 0.390 > 0.10$	$p = 0.629 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.524 > 0.10$	$p = 0.733 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.497 > 0.10$	$p = 0.745 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.067 < 0.10$	$p = 0.236 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.390 > 0.10$	$p = 0.682 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.824 > 0.10$	$p = 1.000 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.857 > 0.10$	$p = 0.947 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.333 > 0.10$	$p = 0.635 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.966 > 0.10$	$p = 1.000 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.233 > 0.10$	$p = 0.613 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.824 > 0.10$	$p = 1.000 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.250 > 0.10$	$p = 0.584 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.857 > 0.10$	$p = 1.000 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.333 > 0.10$	$p = 0.699 > 0.10$	✗

Table C.45.: Results of test for difference – grouped by rationale information elements – cf. Figure C.45.

### Development Experience: “0 – 3 Years”

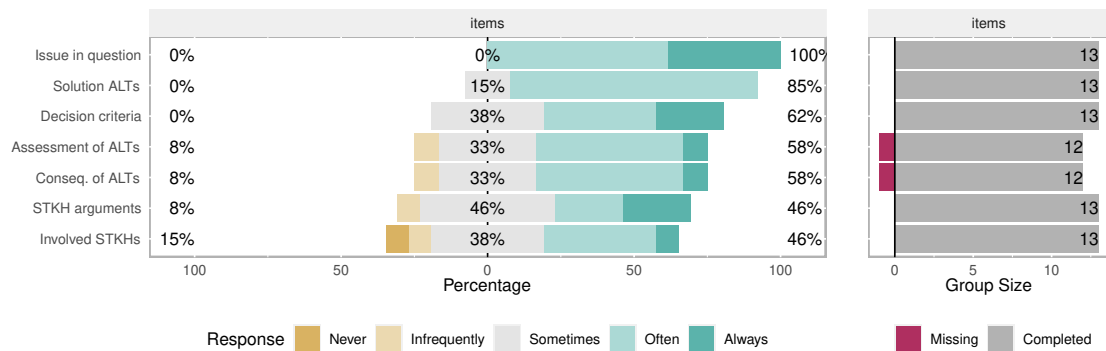


Figure C.46.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “0 – 3 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 13.270$	$p = 0.039 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.077 < 0.10$	$p = 0.269 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.055 < 0.10$	$p = 0.231 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.010 < 0.05$	$p = 0.052 < 0.10$	✓
Issue ↔ Consequences of ALTs	$p = 0.010 < 0.05$	$p = 0.070 < 0.10$	✓
Issue ↔ Involved stakeholders	$p = 0.001 \ll 0.05$	$p = 0.025 < 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.009 < 0.05$	$p = 0.093 < 0.10$	✓
Solution alternatives ↔ Decision criteria	$p = 0.882 > 0.10$	$p = 1.000 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.400 > 0.10$	$p = 0.763 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.400 > 0.10$	$p = 0.839 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.142 > 0.10$	$p = 0.425 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.397 > 0.10$	$p = 0.925 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.486 > 0.10$	$p = 0.729 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.486 > 0.10$	$p = 0.785 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.186 > 0.10$	$p = 0.489 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.484 > 0.10$	$p = 0.847 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.550 > 0.10$	$p = 0.680 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.991 > 0.10$	$p = 1.000 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.550 > 0.10$	$p = 0.722 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.991 > 0.10$	$p = 1.000 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.534 > 0.10$	$p = 0.748 > 0.10$	✗

Table C.46.: Results of test for difference – grouped by rationale information elements – cf. Figure C.46.

### C.7.3. Scrum Experience ⇔ Usage of Rationale Information Elements for Reasoning (IndepVar: Q-27 – DepVar: Q-09)

#### Scrum Experience: “Expert”

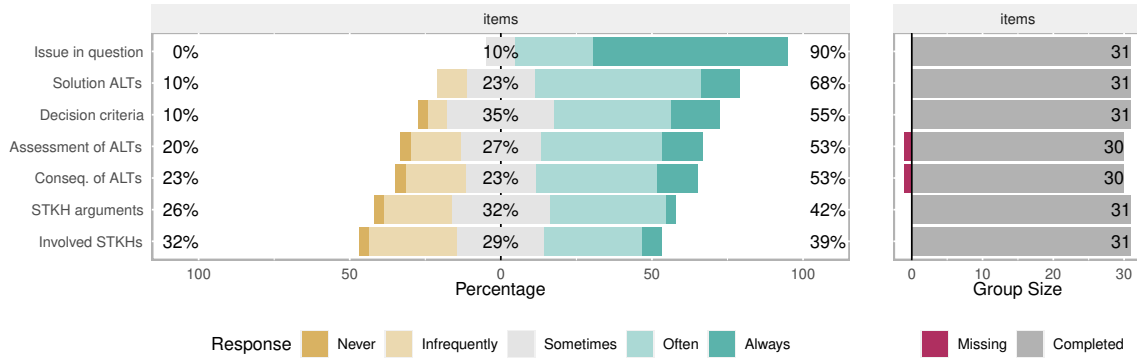


Figure C.47.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Expert” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 43.381$	$p = 9.804 * 10^{-8} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 6.555 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 9.440 * 10^{-5} \ll 0.05$	$p = 3.965 * 10^{-4} \ll 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 1.367 * 10^{-5} \ll 0.05$	$p = 7.177 * 10^{-5} \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 8.823 * 10^{-6} \ll 0.05$	$p = 6.176 * 10^{-5} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 1.319 * 10^{-8} \ll 0.05$	$p = 2.771 * 10^{-7} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 4.207 * 10^{-8} \ll 0.05$	$p = 4.417 * 10^{-7} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.619 > 0.10$	$p = 0.722 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.332 > 0.10$	$p = 0.436 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.287 > 0.10$	$p = 0.431 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.023 < 0.05$	$p = 0.069 < 0.10$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.038 < 0.05$	$p = 0.100 \leq 0.10$	✓
Decision criteria ↔ Assessment of ALTs	$p = 0.634 > 0.10$	$p = 0.700 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.567 > 0.10$	$p = 0.701 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.075 > 0.05$	$p = 0.176 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.115 > 0.10$	$p = 0.241 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.925 > 0.10$	$p = 0.925 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.198 > 0.10$	$p = 0.378 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.277 > 0.10$	$p = 0.447 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.233 > 0.10$	$p = 0.408 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.321 > 0.10$	$p = 0.449 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.840 > 0.10$	$p = 0.882 > 0.10$	✗

Table C.47.: Results of test for difference – grouped by rationale information elements – cf. Figure C.47.

## Scrum Experience: “Advanced”

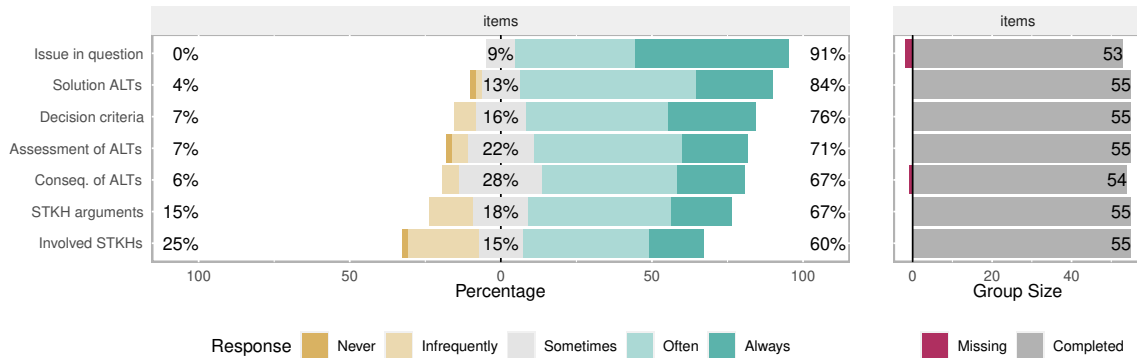


Figure C.48.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Advanced” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 29.124$	$p = 5.763 * 10^{-5} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.019 < 0.05$	$p = 0.058 < 0.10$	✓
Issue ↔ Decision criteria	$p = 0.009 < 0.05$	$p = 0.039 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 5.204 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 2.852 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 1.238 * 10^{-6} \ll 0.05$	$p = 2.600 * 10^{-5} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 6.702 * 10^{-5} \ll 0.05$	$p = 7.037 * 10^{-4} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.789 > 0.10$	$p = 0.828 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.253 > 0.10$	$p = 0.379 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.189 > 0.10$	$p = 0.331 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.039 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.096 > 0.05$	$p = 0.224 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.381 > 0.10$	$p = 0.500 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.295 > 0.10$	$p = 0.413 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.023 < 0.05$	$p = 0.061 < 0.10$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.162 > 0.10$	$p = 0.341 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.861 > 0.10$	$p = 0.861 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.164 > 0.10$	$p = 0.313 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.602 > 0.10$	$p = 0.702 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.226 > 0.10$	$p = 0.365 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.731 > 0.10$	$p = 0.808 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.384 > 0.10$	$p = 0.474 > 0.10$	✗

Table C.48.: Results of test for difference – grouped by rationale information elements – cf. Figure C.48.

## Scrum Experience: “Novice”

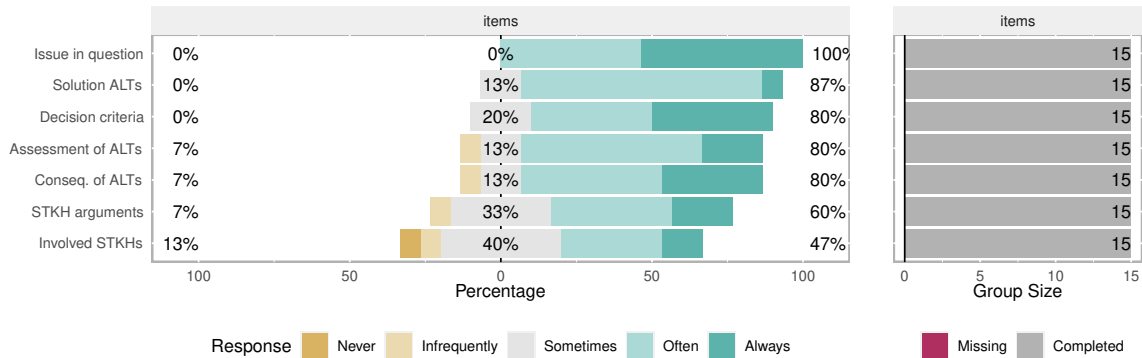


Figure C.49.: Usage of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Novice” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 16.046$	$p = 0.014 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.022 < 0.05$	$p = 0.117 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.222 > 0.10$	$p = 0.389 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.038 < 0.05$	$p = 0.159 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.119 > 0.10$	$p = 0.313 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 3.183 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.005 < 0.05$	$p = 0.057 < 0.10$	✓
Solution alternatives ↔ Decision criteria	$p = 0.287 > 0.10$	$p = 0.464 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.835 > 0.10$	$p = 0.835 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.467 > 0.10$	$p = 0.613 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.189 > 0.10$	$p = 0.396 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.622 > 0.10$	$p = 0.687 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.391 > 0.10$	$p = 0.587 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.736 > 0.10$	$p = 0.772 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.017 < 0.05$	$p = 0.121 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.119 > 0.10$	$p = 0.358 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.604 > 0.10$	$p = 0.704 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.128 > 0.10$	$p = 0.298 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.483 > 0.10$	$p = 0.597 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.041 < 0.05$	$p = 0.144 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.222 > 0.10$	$p = 0.424 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.412 > 0.10$	$p = 0.576 > 0.10$	✗

Table C.49.: Results of test for difference – grouped by rationale information elements – cf. Figure C.49.



## C.8. Hypothesis RQ1-H4 – Experience ⇔ Documentation Frequency of Rationale Information Elements

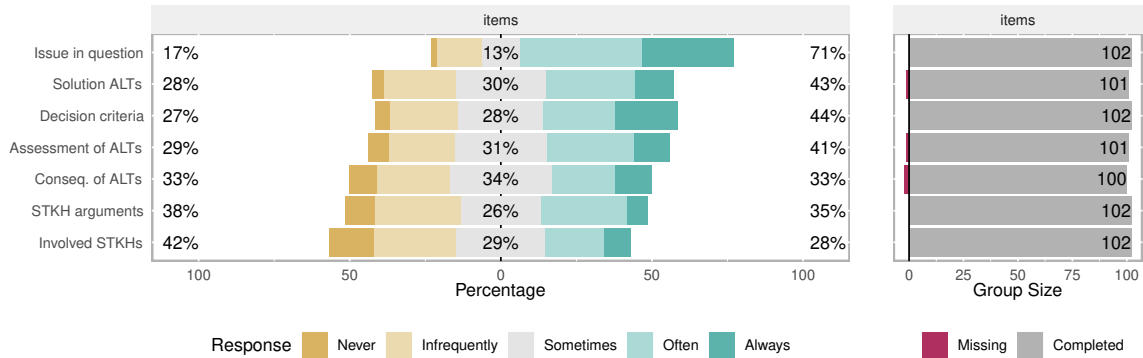


Figure C.50.: Documentation frequency of grouped by rationale information elements for reasoning (→) grouped by rationale information elements (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 49.036$	$p = 7.333 * 10^{-9} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 2.444 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 0.001 \ll 0.05$	$p = 0.005 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 5.408 * 10^{-5} \ll 0.05$	$p = 2.839 * 10^{-4} \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 9.531 * 10^{-7} \ll 0.05$	$p = 6.672 * 10^{-6} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 4.819 * 10^{-10} \ll 0.05$	$p = 1.012 * 10^{-8} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 6.319 * 10^{-8} \ll 0.05$	$p = 6.634 * 10^{-7} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.617 > 0.10$	$p = 0.682 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.713 > 0.10$	$p = 0.713 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.215 > 0.10$	$p = 0.301 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.029 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.084 > 0.05$	$p = 0.147 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.384 > 0.10$	$p = 0.475 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.082 > 0.05$	$p = 0.156 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.007 < 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.025 < 0.05$	$p = 0.059 < 0.10$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.383 > 0.10$	$p = 0.503 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.030 < 0.05$	$p = 0.063 < 0.10$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.174 > 0.10$	$p = 0.281 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.196 > 0.10$	$p = 0.294 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.630 > 0.10$	$p = 0.662 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.415 > 0.10$	$p = 0.484 > 0.10$	✗

Table C.50.: Results of test for difference – grouped by rationale information elements – cf. Figure C.50.

### C.8.1. Documentation Experience ⇔ Documentation Frequency of Rationale Information Elements (IndepVar: Q-01 – DepVar: Q-11)

#### Documentation Experience: “I Always Document Decisions”

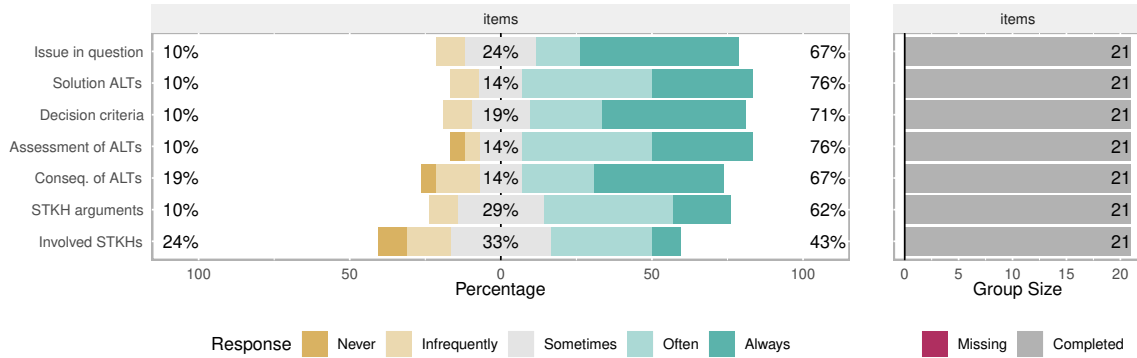


Figure C.51.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I always document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.205$	$p = 0.082 < 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.661 > 0.10$	$p = 0.925 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.971 > 0.10$	$p = 0.971 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.635 > 0.10$	$p = 0.952 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.564 > 0.10$	$p = 0.987 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 0.006 < 0.05$	$p = 0.136 > 0.10$	✗
Issue ↔ Stakeholder ARGs	$p = 0.152 > 0.10$	$p = 0.533 > 0.10$	✗
Solution alternatives ↔ Decision criteria	$p = 0.687 > 0.10$	$p = 0.849 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.971 > 0.10$	$p = 1.000 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.890 > 0.10$	$p = 1.000 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.022 < 0.05$	$p = 0.157 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.321 > 0.10$	$p = 0.748 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.661 > 0.10$	$p = 0.867 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.589 > 0.10$	$p = 0.951 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.007 < 0.05$	$p = 0.076 < 0.10$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.163 > 0.10$	$p = 0.488 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.919 > 0.10$	$p = 1.000 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.025 < 0.05$	$p = 0.129 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.338 > 0.10$	$p = 0.711 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.032 < 0.05$	$p = 0.134 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.393 > 0.10$	$p = 0.749 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.197 > 0.10$	$p = 0.517 > 0.10$	✗

Table C.51.: Results of test for difference – grouped by rationale information elements – cf. Figure C.51.

## Documentation Experience: “I Often Document Decisions”

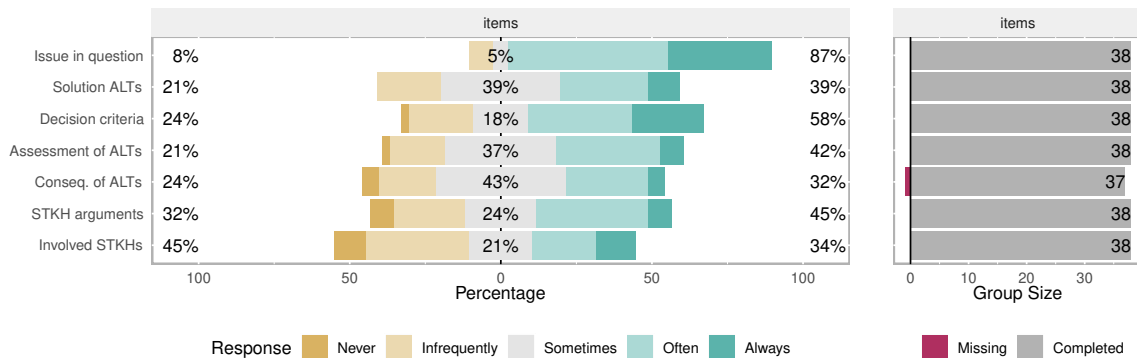


Figure C.52.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I often document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 31.856$	$p = 1.739 * 10^{-5} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 2.989 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 0.016 < 0.05$	$p = 0.049 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 2.699 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 1.431 * 10^{-5} \ll 0.05$	$p = 1.503 * 10^{-4} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 1.237 * 10^{-6} \ll 0.05$	$p = 2.598 * 10^{-5} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 6.025 * 10^{-5} \ll 0.05$	$p = 4.217 * 10^{-4} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.224 > 0.10$	$p = 0.392 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.979 > 0.10$	$p = 0.979 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.455 > 0.10$	$p = 0.637 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.217 > 0.10$	$p = 0.415 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.692 > 0.10$	$p = 0.808 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.214 > 0.10$	$p = 0.449 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.051 > 0.05$	$p = 0.133 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.014 < 0.05$	$p = 0.050 \leq 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.107 > 0.10$	$p = 0.250 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.471 > 0.10$	$p = 0.618 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.227 > 0.10$	$p = 0.367 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.712 > 0.10$	$p = 0.787 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.633 > 0.10$	$p = 0.781 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.723 > 0.10$	$p = 0.760 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.402 > 0.10$	$p = 0.603 > 0.10$	✗

Table C.52.: Results of test for difference – grouped by rationale information elements – cf. Figure C.52.

## Documentation Experience: “I Document Decisions Sometimes”

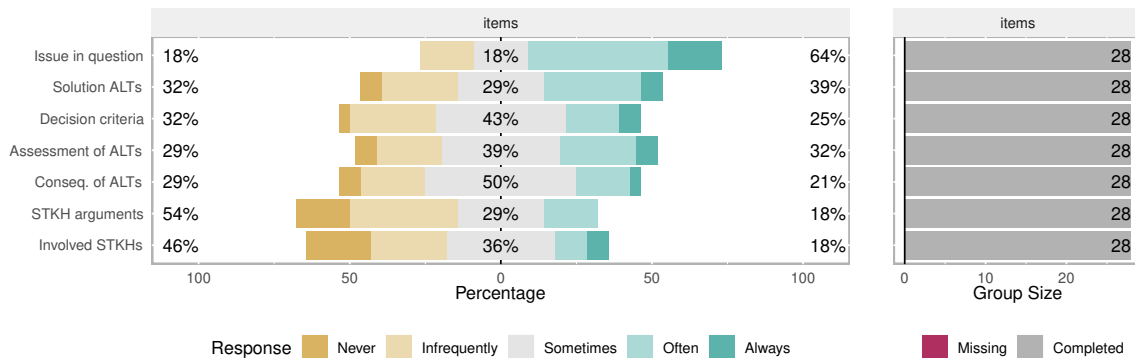


Figure C.53.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I document decisions sometimes” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 20.912$	$p = 0.002 \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.052 > 0.05$	$p = 0.136 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.015 < 0.05$	$p = 0.080 < 0.10$	✓
Issue ↔ Assessment of ALTs	$p = 0.037 < 0.05$	$p = 0.130 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.010 < 0.05$	$p = 0.069 < 0.10$	✓
Issue ↔ Involved stakeholders	$p = 2.257 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 5.305 * 10^{-5} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.631 > 0.10$	$p = 0.779 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.890 > 0.10$	$p = 0.890 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.526 > 0.10$	$p = 0.736 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.081 > 0.05$	$p = 0.189 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.036 < 0.05$	$p = 0.151 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.732 > 0.10$	$p = 0.809 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.878 > 0.10$	$p = 0.921 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.206 > 0.10$	$p = 0.334 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.106 > 0.10$	$p = 0.222 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.620 > 0.10$	$p = 0.813 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.108 > 0.10$	$p = 0.207 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.050 \leq 0.05$	$p = 0.150 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.267 > 0.10$	$p = 0.401 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.144 > 0.10$	$p = 0.251 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.724 > 0.10$	$p = 0.844 > 0.10$	✗

Table C.53.: Results of test for difference – grouped by rationale information elements – cf. Figure C.53.

## Documentation Experience: “I Infrequently Document Decisions”

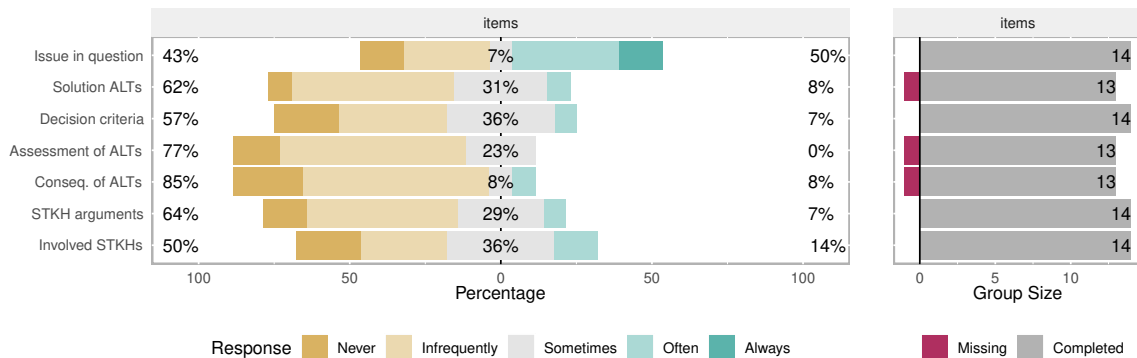


Figure C.54.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – documentation experience “I infrequently document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.382$	$p = 0.287 > 0.10$	$\times$
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.217 > 0.10$	$p = 0.760 > 0.10$	$\times$
Issue ↔ Decision criteria	$p = 0.125 > 0.10$	$p = 0.659 > 0.10$	$\times$
Issue ↔ Assessment of ALTs	$p = 0.036 < 0.05$	$p = 0.376 > 0.10$	$\times$
Issue ↔ Consequences of ALTs	$p = 0.014 < 0.05$	$p = 0.300 > 0.10$	$\times$
Issue ↔ Involved stakeholders	$p = 0.243 > 0.10$	$p = 0.637 > 0.10$	$\times$
Issue ↔ Stakeholder ARGs	$p = 0.119 > 0.10$	$p = 0.835 > 0.10$	$\times$
Solution alternatives ↔ Decision criteria	$p = 0.788 > 0.10$	$p = 0.870 > 0.10$	$\times$
Solution alternatives ↔ Assessment of ALTs	$p = 0.395 > 0.10$	$p = 0.692 > 0.10$	$\times$
Solution alternatives ↔ Consequences of ALTs	$p = 0.233 > 0.10$	$p = 0.698 > 0.10$	$\times$
Solution alternatives ↔ Involved stakeholders	$p = 0.930 > 0.10$	$p = 0.977 > 0.10$	$\times$
Solution alternatives ↔ Stakeholder ARGs	$p = 0.768 > 0.10$	$p = 0.896 > 0.10$	$\times$
Decision criteria ↔ Assessment of ALTs	$p = 0.551 > 0.10$	$p = 0.890 > 0.10$	$\times$
Decision criteria ↔ Consequences of ALTs	$p = 0.344 > 0.10$	$p = 0.723 > 0.10$	$\times$
Decision criteria ↔ Involved stakeholders	$p = 0.716 > 0.10$	$p = 0.940 > 0.10$	$\times$
Decision criteria ↔ Stakeholder ARGs	$p = 0.980 > 0.10$	$p = 0.980 > 0.10$	$\times$
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.731 > 0.10$	$p = 0.903 > 0.10$	$\times$
Assessment of ALTs ↔ Involved stakeholders	$p = 0.341 > 0.10$	$p = 0.795 > 0.10$	$\times$
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.568 > 0.10$	$p = 0.852 > 0.10$	$\times$
Consequences of ALTs ↔ Involved stakeholders	$p = 0.193 > 0.10$	$p = 0.809 > 0.10$	$\times$
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.357 > 0.10$	$p = 0.682 > 0.10$	$\times$
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.697 > 0.10$	$p = 0.976 > 0.10$	$\times$

Table C.54.: Results of test for difference – grouped by rationale information elements – cf. Figure C.54.

## C.8.2. Development Experience ⇔ Documentation Frequency of Rationale Information Elements (IndepVar: Q-26 – DepVar: Q-11)

### Development Experience: “More Than 15 Years”

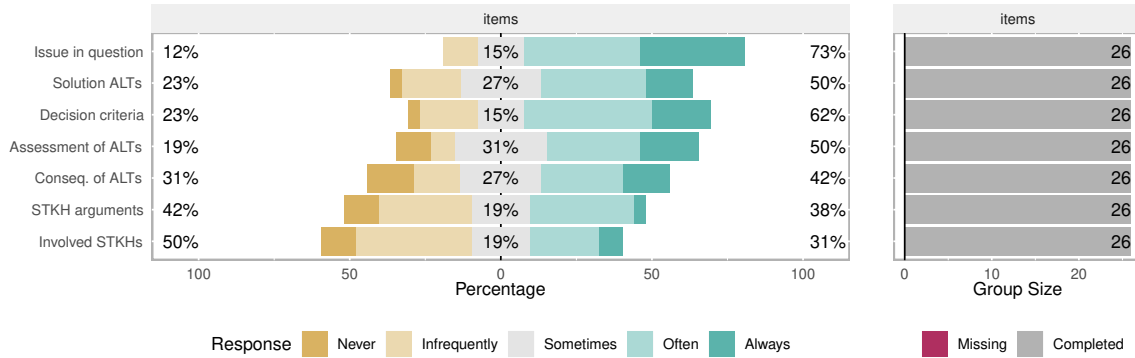


Figure C.55.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “more than 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 18.020$	$p = 0.006 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.070 > 0.05$	$p = 0.211 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.201 > 0.10$	$p = 0.351 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.085 > 0.05$	$p = 0.198 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.012 < 0.05$	$p = 0.087 < 0.10$	✓
Issue ↔ Involved stakeholders	$p = 3.119 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.001 \ll 0.05$	$p = 0.012 < 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.597 > 0.10$	$p = 0.696 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.932 > 0.10$	$p = 0.932 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.489 > 0.10$	$p = 0.604 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.073 > 0.05$	$p = 0.190 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.151 > 0.10$	$p = 0.287 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.657 > 0.10$	$p = 0.726 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.222 > 0.10$	$p = 0.358 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.020 < 0.05$	$p = 0.105 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.049 < 0.05$	$p = 0.207 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.437 > 0.10$	$p = 0.611 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.060 > 0.05$	$p = 0.210 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.128 > 0.10$	$p = 0.268 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.270 > 0.10$	$p = 0.405 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.456 > 0.10$	$p = 0.599 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.720 > 0.10$	$p = 0.756 > 0.10$	✗

Table C.55.: Results of test for difference – grouped by rationale information elements – cf. Figure C.55.

## Development Experience: “12 – 15 Years”

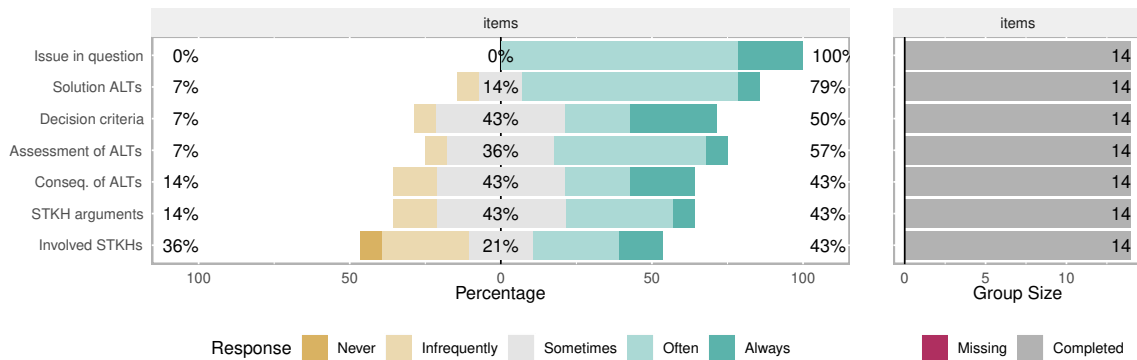


Figure C.56.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “12 – 15 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.731$	$p = 0.068 < 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.194 > 0.10$	$p = 0.510 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.092 < 0.10$	$p = 0.385 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.040 < 0.05$	$p = 0.212 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.023 < 0.05$	$p = 0.159 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 0.003 \ll 0.05$	$p = 0.069 < 0.10$	✓
Issue ↔ Stakeholder ARGs	$p = 0.007 < 0.05$	$p = 0.075 < 0.10$	✓
Solution alternatives ↔ Decision criteria	$p = 0.698 > 0.10$	$p = 0.814 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.452 > 0.10$	$p = 0.731 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.327 > 0.10$	$p = 0.624 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.101 > 0.10$	$p = 0.353 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.165 > 0.10$	$p = 0.494 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.716 > 0.10$	$p = 0.792 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.553 > 0.10$	$p = 0.726 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.210 > 0.10$	$p = 0.491 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.316 > 0.10$	$p = 0.664 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.819 > 0.10$	$p = 0.819 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.374 > 0.10$	$p = 0.654 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.523 > 0.10$	$p = 0.732 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.509 > 0.10$	$p = 0.764 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.682 > 0.10$	$p = 0.843 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.802 > 0.10$	$p = 0.842 > 0.10$	✗

Table C.56.: Results of test for difference – grouped by rationale information elements – cf. Figure C.56.

## Development Experience: “8 – 11 Years”

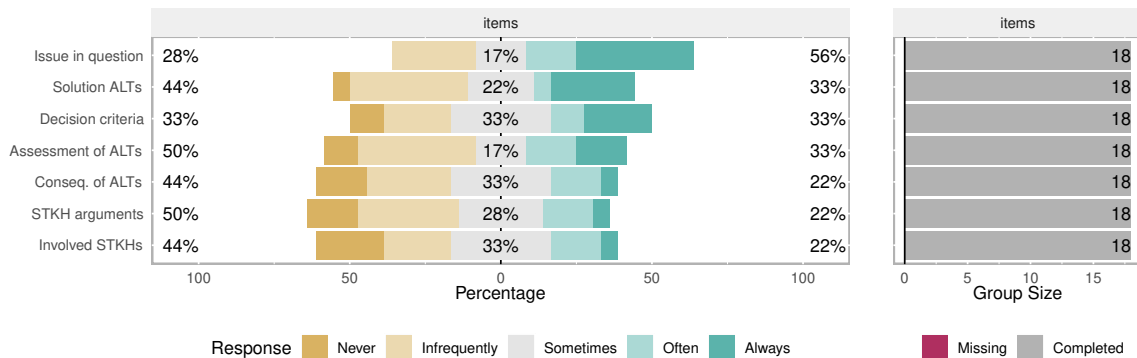


Figure C.57.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “8 – 11 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.299$	$p = 0.217 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.197 > 0.10$	$p = 0.826 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.239 > 0.10$	$p = 0.838 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.077 < 0.10$	$p = 0.403 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.031 < 0.05$	$p = 0.218 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.023 < 0.05$	$p = 0.238 > 0.10$	X
Issue ↔ Stakeholder ARGs	$p = 0.020 < 0.05$	$p = 0.425 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.908 > 0.10$	$p = 0.954 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.632 > 0.10$	$p = 0.829 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.388 > 0.10$	$p = 0.678 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.323 > 0.10$	$p = 0.678 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.303 > 0.10$	$p = 0.706 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.553 > 0.10$	$p = 0.893 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.328 > 0.10$	$p = 0.625 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.270 > 0.10$	$p = 0.708 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.252 > 0.10$	$p = 0.756 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.700 > 0.10$	$p = 0.865 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.610 > 0.10$	$p = 0.855 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.581 > 0.10$	$p = 0.872 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.901 > 0.10$	$p = 0.996 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.868 > 0.10$	$p = 1.000 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.966 > 0.10$	$p = 0.966 > 0.10$	X

Table C.57.: Results of test for difference – grouped by rationale information elements – cf. Figure C.57.



### Development Experience: “4 – 7 Years”

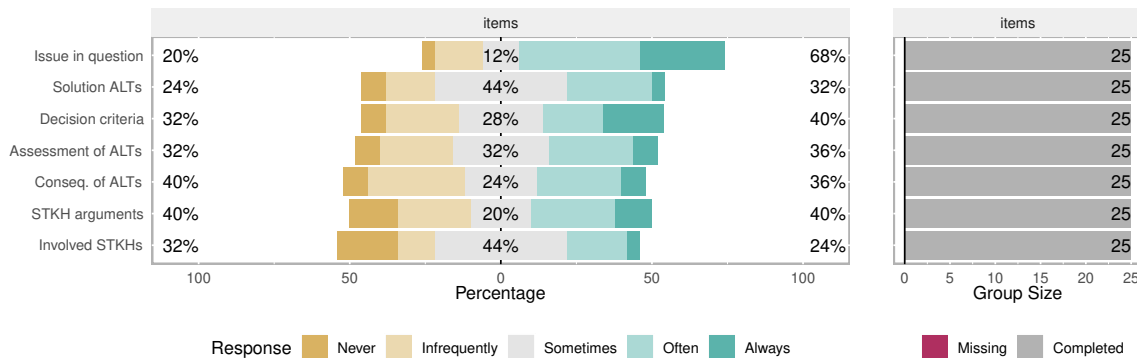


Figure C.58.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “4 – 7 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.976$	$p = 0.126 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.037 < 0.05$	$p = 0.157 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.098 < 0.10$	$p = 0.344 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.036 < 0.05$	$p = 0.191 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.019 < 0.05$	$p = 0.199 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.004 \ll 0.05$	$p = 0.090 < 0.10$	✓
Issue ↔ Stakeholder ARGs	$p = 0.024 < 0.05$	$p = 0.165 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.668 > 0.10$	$p = 0.936 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.991 > 0.10$	$p = 0.991 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.791 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.438 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.856 > 0.10$	$p = 0.999 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.660 > 0.10$	$p = 0.990 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.488 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.229 > 0.10$	$p = 0.686 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.542 > 0.10$	$p = 1.000 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.800 > 0.10$	$p = 0.989 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.445 > 0.10$	$p = 1.000 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.865 > 0.10$	$p = 0.956 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.610 > 0.10$	$p = 0.985 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.934 > 0.10$	$p = 0.980 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.553 > 0.10$	$p = 0.967 > 0.10$	X

Table C.58.: Results of test for difference – grouped by rationale information elements – cf. Figure C.58.

### Development Experience: “0 – 3 Years”

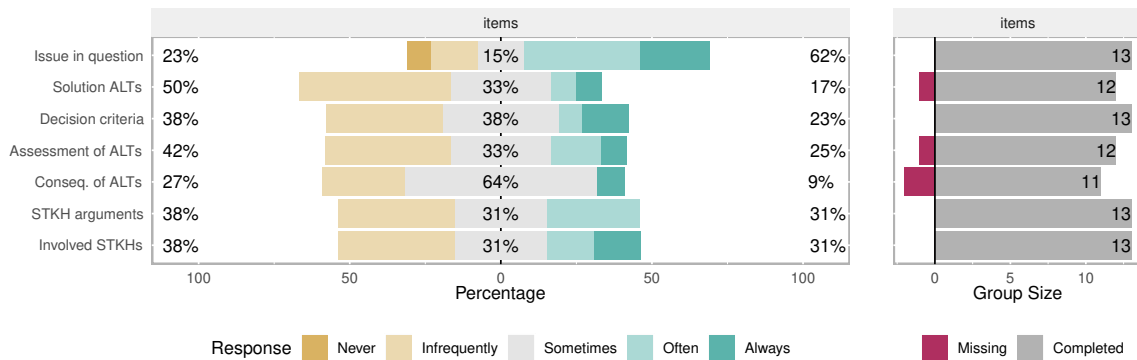


Figure C.59.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – development experience “0 – 3 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.477$	$p = 0.612 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.049 < 0.05$	$p = 1.000 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.166 > 0.10$	$p = 0.871 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.132 > 0.10$	$p = 1.000 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.168 > 0.10$	$p = 0.704 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.229 > 0.10$	$p = 0.802 > 0.10$	X
Issue ↔ Stakeholder ARGs	$p = 0.160 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.544 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.653 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.596 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.432 > 0.10$	$p = 1.000 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.557 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.882 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.958 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.854 > 0.10$	$p = 1.000 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.928 > 0.10$	$p = 1.000 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.743 > 0.10$	$p = 1.000 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.898 > 0.10$	$p = 1.000 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.819 > 0.10$	$p = 1.000 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.973 > 0.10$	$p = 1.000 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.839 > 0.10$	$p = 1.000 > 0.10$	X

Table C.59.: Results of test for difference – grouped by rationale information elements – cf. Figure C.59.

### C.8.3. Scrum Experience ⇔ Documentation Frequency of Rationale Information Elements (IndepVar: Q-27 – DepVar: Q-11)

Scrum Experience: “Expert”

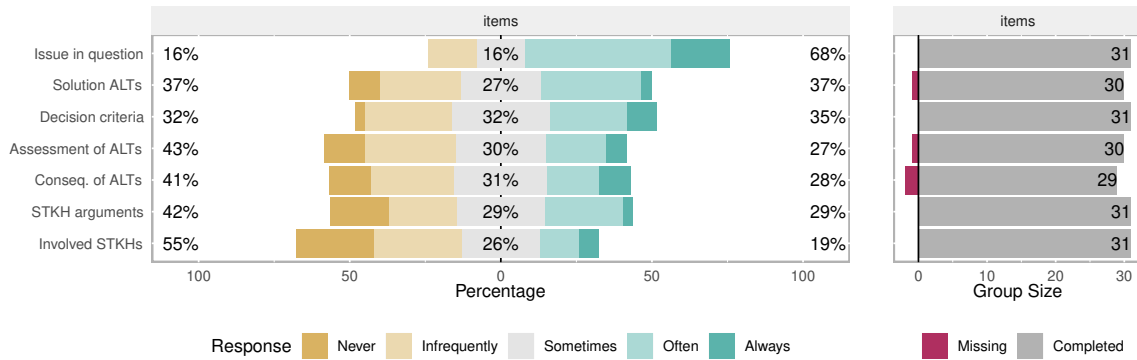


Figure C.60.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Expert” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 21.548$	$p = 0.001 \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.010 < 0.05$	$p = 0.043 < 0.05$	✓
Issue ↔ Decision criteria	$p = 0.033 < 0.05$	$p = 0.116 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.001 \ll 0.05$	$p = 0.010 < 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 0.003 \ll 0.05$	$p = 0.015 < 0.05$	✓
Issue ↔ Involved stakeholders	$p = 2.074 * 10^{-5} \ll 0.05$	$p = 4.355 * 10^{-4} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 8.985 * 10^{-4} \ll 0.05$	$p = 0.009 < 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.652 > 0.10$	$p = 0.806 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.535 > 0.10$	$p = 0.702 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.663 > 0.10$	$p = 0.774 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.098 > 0.05$	$p = 0.256 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.466 > 0.10$	$p = 0.653 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.282 > 0.10$	$p = 0.538 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.376 > 0.10$	$p = 0.564 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.034 < 0.05$	$p = 0.101 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.234 > 0.10$	$p = 0.492 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.857 > 0.10$	$p = 0.900 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.302 > 0.10$	$p = 0.529 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.918 > 0.10$	$p = 0.918 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.229 > 0.10$	$p = 0.534 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.777 > 0.10$	$p = 0.859 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.349 > 0.10$	$p = 0.564 > 0.10$	✗

Table C.60.: Results of test for difference – grouped by rationale information elements – cf. Figure C.60.

## Scrum Experience: “Advanced”

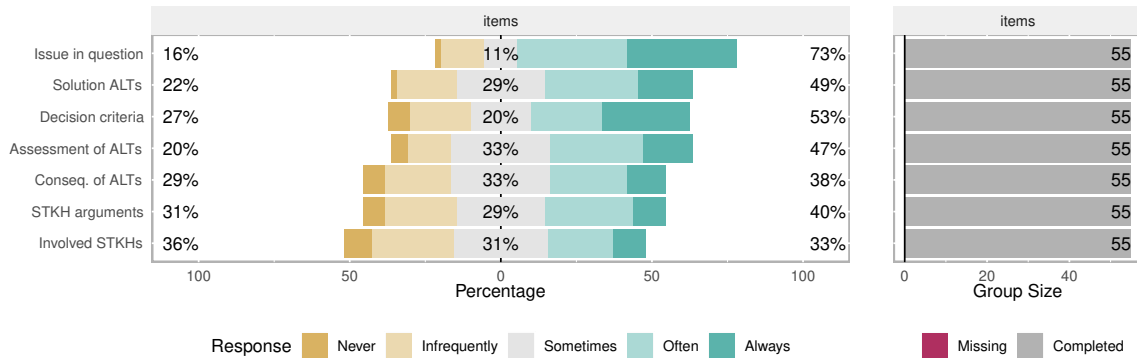


Figure C.61.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Advanced” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 23.458$	$p = 6.567 * 10^{-4} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.024 < 0.05$	$p = 0.084 < 0.10$	✓
Issue ↔ Decision criteria	$p = 0.051 > 0.05$	$p = 0.133 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.015 < 0.05$	$p = 0.078 < 0.10$	✓
Issue ↔ Consequences of ALTs	$p = 4.548 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 2.361 * 10^{-5} \ll 0.05$	$p = 4.958 * 10^{-4} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 3.528 * 10^{-4} \ll 0.05$	$p = 0.004 \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.764 > 0.10$	$p = 0.845 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.855 > 0.10$	$p = 0.898 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.211 > 0.10$	$p = 0.341 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.049 < 0.05$	$p = 0.146 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.188 > 0.10$	$p = 0.328 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.629 > 0.10$	$p = 0.734 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.121 > 0.10$	$p = 0.231 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.023 < 0.05$	$p = 0.097 < 0.10$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.106 > 0.10$	$p = 0.222 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.286 > 0.10$	$p = 0.400 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.074 > 0.05$	$p = 0.172 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.256 > 0.10$	$p = 0.385 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.470 > 0.10$	$p = 0.618 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.947 > 0.10$	$p = 0.947 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.513 > 0.10$	$p = 0.633 > 0.10$	✗

Table C.61.: Results of test for difference – grouped by rationale information elements – cf. Figure C.61.

## Scrum Experience: “Novice”

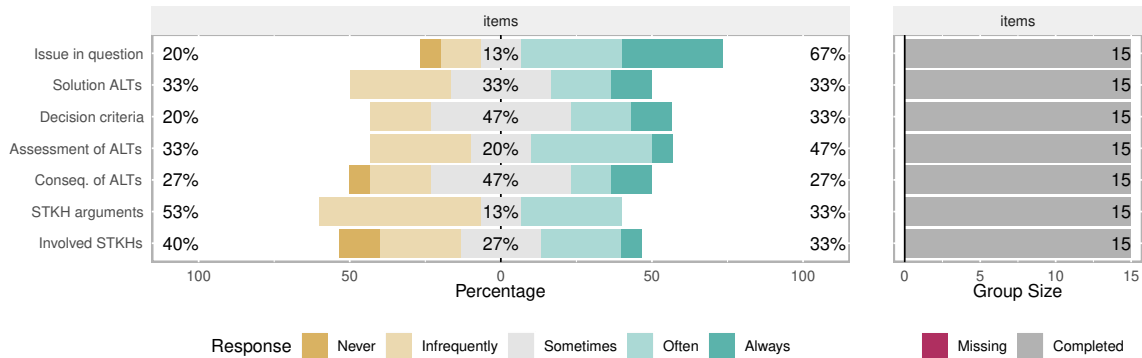


Figure C.62.: Documentation frequency of rationale information elements for reasoning (→) grouped by rationale information elements (↑) – Scrum experience “Novice” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.930$	$p = 0.327 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.121 > 0.10$	$p = 0.637 > 0.10$	X
Issue ↔ Decision criteria	$p = 0.239 > 0.10$	$p = 0.718 > 0.10$	X
Issue ↔ Assessment of ALTs	$p = 0.188 > 0.10$	$p = 0.790 > 0.10$	X
Issue ↔ Consequences of ALTs	$p = 0.099 < 0.10$	$p = 0.695 > 0.10$	X
Issue ↔ Involved stakeholders	$p = 0.038 < 0.05$	$p = 0.400 > 0.10$	X
Issue ↔ Stakeholder ARGs	$p = 0.018 < 0.05$	$p = 0.382 > 0.10$	X
Solution alternatives ↔ Decision criteria	$p = 0.710 > 0.10$	$p = 0.931 > 0.10$	X
Solution alternatives ↔ Assessment of ALTs	$p = 0.816 > 0.10$	$p = 0.902 > 0.10$	X
Solution alternatives ↔ Consequences of ALTs	$p = 0.921 > 0.10$	$p = 0.921 > 0.10$	X
Solution alternatives ↔ Involved stakeholders	$p = 0.600 > 0.10$	$p = 0.969 > 0.10$	X
Solution alternatives ↔ Stakeholder ARGs	$p = 0.416 > 0.10$	$p = 0.874 > 0.10$	X
Decision criteria ↔ Assessment of ALTs	$p = 0.889 > 0.10$	$p = 0.933 > 0.10$	X
Decision criteria ↔ Consequences of ALTs	$p = 0.637 > 0.10$	$p = 0.956 > 0.10$	X
Decision criteria ↔ Involved stakeholders	$p = 0.370 > 0.10$	$p = 0.863 > 0.10$	X
Decision criteria ↔ Stakeholder ARGs	$p = 0.236 > 0.10$	$p = 0.825 > 0.10$	X
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.740 > 0.10$	$p = 0.914 > 0.10$	X
Assessment of ALTs ↔ Involved stakeholders	$p = 0.449 > 0.10$	$p = 0.857 > 0.10$	X
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.296 > 0.10$	$p = 0.776 > 0.10$	X
Consequences of ALTs ↔ Involved stakeholders	$p = 0.671 > 0.10$	$p = 0.939 > 0.10$	X
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.475 > 0.10$	$p = 0.832 > 0.10$	X
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.773 > 0.10$	$p = 0.902 > 0.10$	X

Table C.62.: Results of test for difference – grouped by rationale information elements – cf. Figure C.62.

## C.9. Hypothesis RQ1-H4 – Experience ⇔ Usefulness of Rationale Information Elements

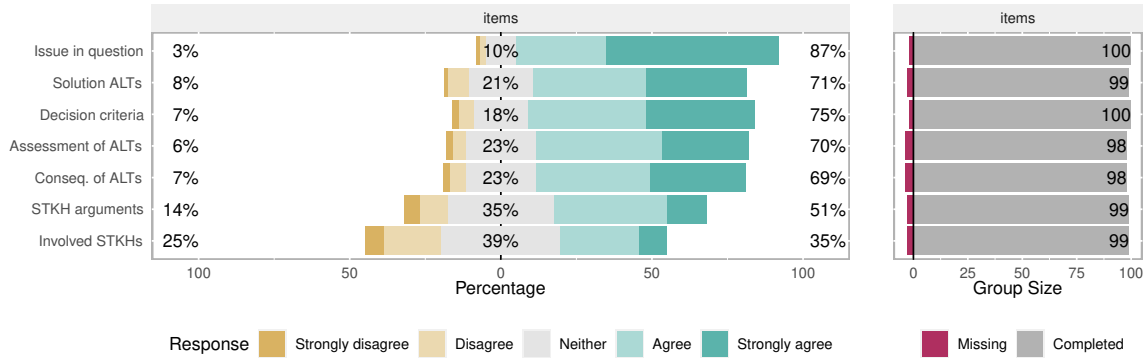


Figure C.63.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 101.160$	$p = 2.200 * 10^{-16} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 5.895 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Issue ↔ Decision criteria	$p = 0.004 \ll 0.05$	$p = 0.006 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 1.555 * 10^{-4} \ll 0.05$	$p = 4.083 * 10^{-4} \ll 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 2.665 * 10^{-4} \ll 0.05$	$p = 6.219 * 10^{-4} \ll 0.05$	✓
Issue ↔ Involved stakeholders	$p = 3.959 * 10^{-19} \ll 0.05$	$p = 8.314 * 10^{-18} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 3.073 * 10^{-12} \ll 0.05$	$p = 3.226 * 10^{-11} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.560 > 0.10$	$p = 0.653 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.724 > 0.10$	$p = 0.800 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.828 > 0.10$	$p = 0.869 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 4.067 * 10^{-8} \ll 0.05$	$p = 2.135 * 10^{-7} \ll 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 4.170 * 10^{-4} \ll 0.05$	$p = 8.756 * 10^{-4} \ll 0.05$	✓
Decision criteria ↔ Assessment of ALTs	$p = 0.349 > 0.10$	$p = 0.458 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.424 > 0.10$	$p = 0.523 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 1.164 * 10^{-9} \ll 0.05$	$p = 8.146 * 10^{-9} \ll 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 3.766 * 10^{-5} \ll 0.05$	$p = 1.130 * 10^{-4} \ll 0.05$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.892 > 0.10$	$p = 0.892 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 3.048 * 10^{-7} \ll 0.05$	$p = 1.067 * 10^{-6} \ll 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.002 \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Consequences of ALTs ↔ Involved stakeholders	$p = 1.470 * 10^{-7} \ll 0.05$	$p = 6.173 * 10^{-7} \ll 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 9.584 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.050 \leq 0.05$	$p = 0.070 < 0.10$	✓

Table C.63.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.63.

## C.9.1. Documentation Experience ⇔ Usefulness of Rationale Information Elements (IndepVar: Q-01 – DepVar: Q-13)

### Documentation Experience: “I Always Document Decisions”

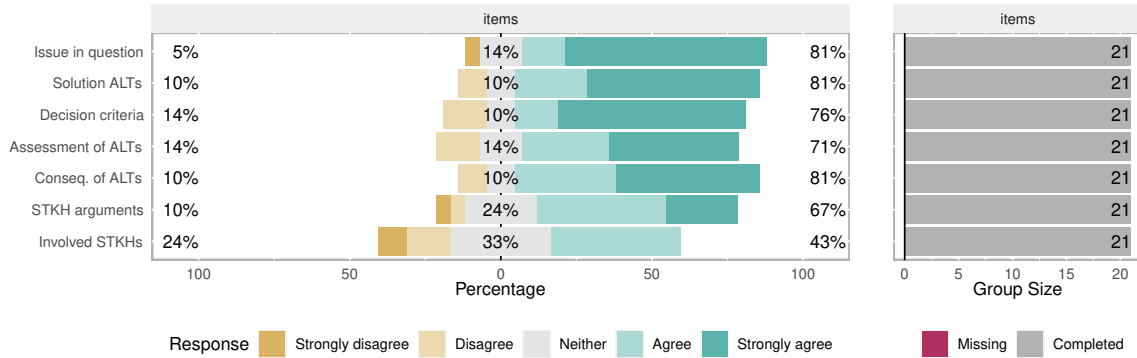


Figure C.64.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – documentation experience “I always document decisions” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 24.907$	$p = 3.553 * 10^{-4} \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.659 > 0.10$	$p = 0.814 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.661 > 0.10$	$p = 0.771 > 0.10$	✗	
Issue ↔ Assessment of ALTs	$p = 0.170 > 0.10$	$p = 0.325 > 0.10$	✗	
Issue ↔ Consequences of ALTs	$p = 0.399 > 0.10$	$p = 0.558 > 0.10$	✗	
Issue ↔ Involved stakeholders	$p = 3.217 * 10^{-5} \ll 0.05$	$p = 6.755 * 10^{-4} \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 0.024 < 0.05$	$p = 0.082 < 0.10$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.998 > 0.10$	$p = 0.998 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.352 > 0.10$	$p = 0.569 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.687 > 0.10$	$p = 0.722 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 2.020 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.068 > 0.05$	$p = 0.159 > 0.10$	✗	
Decision criteria ↔ Assessment of ALTs	$p = 0.351 > 0.10$	$p = 0.615 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.686 > 0.10$	$p = 0.758 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 2.005 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓	
Decision criteria ↔ Stakeholder ARGs	$p = 0.068 > 0.05$	$p = 0.178 > 0.10$	✗	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.598 > 0.10$	$p = 0.785 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.005 < 0.05$	$p = 0.022 < 0.05$	✓	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.372 > 0.10$	$p = 0.557 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 9.205 * 10^{-4} \ll 0.05$	$p = 0.005 \ll 0.05$	✓	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.155 > 0.10$	$p = 0.326 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.058 > 0.05$	$p = 0.175 > 0.10$	✗	

Table C.64.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.64.

## Documentation Experience: “I Often Document Decisions”

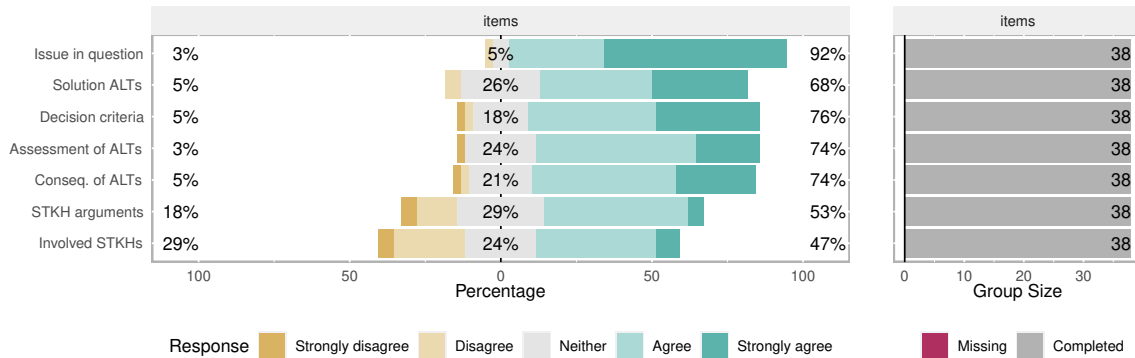


Figure C.65.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – documentation experience “**I often document decisions**” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 45.951$	$p = 3.028 * 10^{-8} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.004 \ll 0.05$	$p = 0.010 < 0.05$	✓
Issue ↔ Decision criteria	$p = 0.020 < 0.05$	$p = 0.032 < 0.05$	✓
Issue ↔ Assessment of ALTs	$p = 0.002 \ll 0.05$	$p = 0.009 < 0.05$	✓
Issue ↔ Consequences of ALTs	$p = 0.004 \ll 0.05$	$p = 0.010 < 0.05$	✓
Issue ↔ Involved stakeholders	$p = 6.742 * 10^{-9} \ll 0.05$	$p = 1.416 * 10^{-7} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 5.346 * 10^{-8} \ll 0.05$	$p = 5.614 * 10^{-7} \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.600 > 0.10$	$p = 0.741 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.783 > 0.10$	$p = 0.866 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.965 > 0.10$	$p = 0.965 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.003 \ll 0.05$	$p = 0.011 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.010 < 0.05$	$p = 0.019 < 0.05$	✓
Decision criteria ↔ Assessment of ALTs	$p = 0.424 > 0.10$	$p = 0.594 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.570 > 0.10$	$p = 0.748 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 5.242 * 10^{-4} \ll 0.05$	$p = 0.004 \ll 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.002 \ll 0.05$	$p = 0.008 < 0.05$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.817 > 0.10$	$p = 0.858 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.008 < 0.05$	$p = 0.016 < 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.021 < 0.05$	$p = 0.031 < 0.05$	✓
Consequences of ALTs ↔ Involved stakeholders	$p = 0.004 \ll 0.05$	$p = 0.011 < 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.011 < 0.05$	$p = 0.019 < 0.05$	✓
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.720 > 0.10$	$p = 0.841 > 0.10$	✗

Table C.65.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.65.



### Documentation Experience: “I Document Decisions Sometimes”

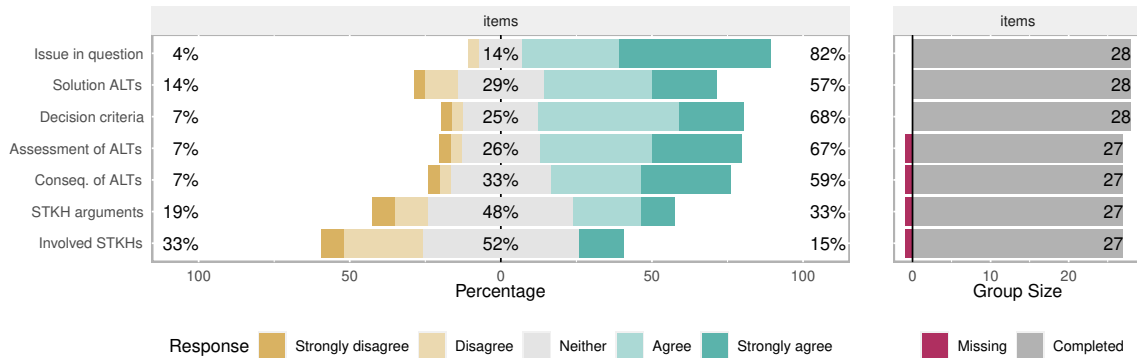


Figure C.66.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – documentation experience “I document decisions sometimes” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 31.508$	$p = 2.027 * 10^{-5} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.016 < 0.05$	$p = 0.048 < 0.05$	✓
Issue ↔ Decision criteria	$p = 0.077 > 0.10$	$p = 0.134 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.130 > 0.10$	$p = 0.210 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.069 > 0.05$	$p = 0.132 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 8.698 * 10^{-7} \ll 0.05$	$p = 1.827 * 10^{-5} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 1.004 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.522 > 0.10$	$p = 0.645 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.381 > 0.10$	$p = 0.500 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.567 > 0.10$	$p = 0.661 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.040 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.134 > 0.10$	$p = 0.200 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.809 > 0.10$	$p = 0.849 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.951 > 0.10$	$p = 0.951 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.008 < 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.033 < 0.05$	$p = 0.077 < 0.10$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.764 > 0.10$	$p = 0.844 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 7.374 * 10^{-4} \ll 0.05$	$p = 0.005 < 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.019 < 0.05$	$p = 0.049 < 0.05$	✓
Consequences of ALTs ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.009 < 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.040 < 0.05$	$p = 0.084 < 0.10$	✓
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.308 > 0.10$	$p = 0.431 > 0.10$	✗

Table C.66.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.66.

## Documentation Experience: “I Infrequently Document Decisions”

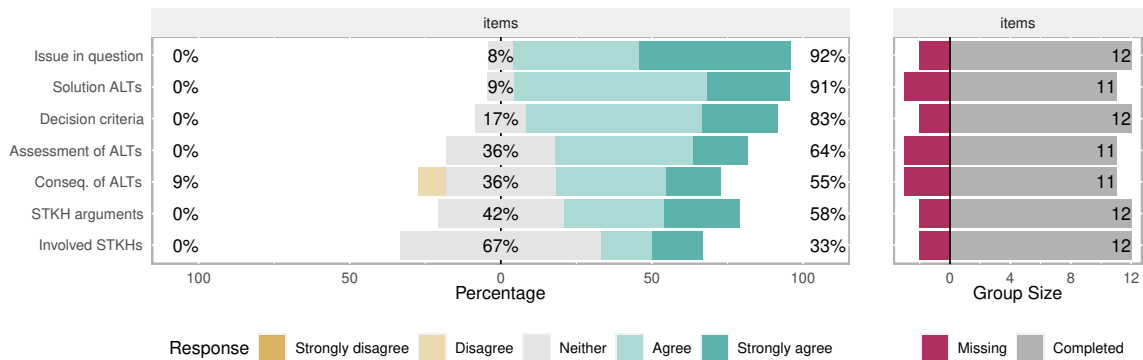


Figure C.67.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – documentation experience “I infrequently document decisions” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.875$	$p = 0.065 < 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.482 > 0.10$	$p = 0.633 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.300 > 0.10$	$p = 0.525 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.065 < 0.10$	$p = 0.226 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.023 < 0.05$	$p = 0.245 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 0.003 \ll 0.05$	$p = 0.072 < 0.10$	✓
Issue ↔ Stakeholder ARGs	$p = 0.064 < 0.10$	$p = 0.267 > 0.10$	✗
Solution alternatives ↔ Decision criteria	$p = 0.756 > 0.10$	$p = 0.794 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.262 > 0.10$	$p = 0.612 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.126 > 0.10$	$p = 0.377 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.031 < 0.05$	$p = 0.215 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.266 > 0.10$	$p = 0.559 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.404 > 0.10$	$p = 0.606 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.210 > 0.10$	$p = 0.551 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.058 < 0.10$	$p = 0.307 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.413 > 0.10$	$p = 0.578 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.681 > 0.10$	$p = 0.753 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.310 > 0.10$	$p = 0.500 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.973 > 0.10$	$p = 0.973 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.551 > 0.10$	$p = 0.681 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.650 > 0.10$	$p = 0.759 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.283 > 0.10$	$p = 0.541 > 0.10$	✗

Table C.67.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.67.

## C.9.2. Development Experience ⇔ Usefulness of Rationale Information Elements (IndepVar: Q-26 – DepVar: Q-13)

### Development Experience: “More Than 15 Years”

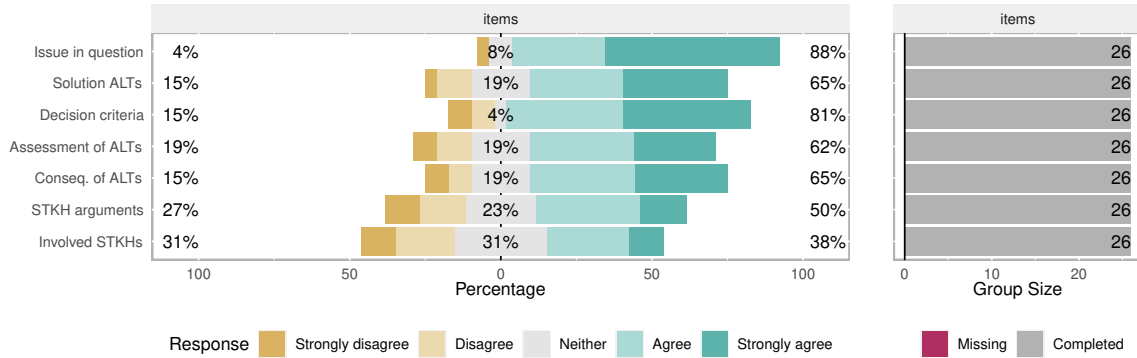


Figure C.68.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – development experience “more than 15 years” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 23.222$	$p = 7.254 * 10^{-4} \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.054 > 0.05$	$p = 0.127 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.252 > 0.10$	$p = 0.378 > 0.10$	✗	
Issue ↔ Assessment of ALTs	$p = 0.013 < 0.05$	$p = 0.068 < 0.10$	✓	
Issue ↔ Consequences of ALTs	$p = 0.033 < 0.05$	$p = 0.100 \leq 0.10$	✓	
Issue ↔ Involved stakeholders	$p = 3.572 * 10^{-5} \ll 0.05$	$p = 7.501 * 10^{-4} \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 4.212 * 10^{-4} \ll 0.05$	$p = 0.004 \ll 0.05$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.437 > 0.10$	$p = 0.539 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.575 > 0.10$	$p = 0.636 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.837 > 0.10$	$p = 0.837 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 0.027 < 0.05$	$p = 0.095 < 0.10$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.109 > 0.10$	$p = 0.208 > 0.10$	✗	
Decision criteria ↔ Assessment of ALTs	$p = 0.181 > 0.10$	$p = 0.292 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.326 > 0.10$	$p = 0.427 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 0.003 \ll 0.05$	$p = 0.020 < 0.05$	✓	
Decision criteria ↔ Stakeholder ARGs	$p = 0.017 < 0.05$	$p = 0.073 < 0.10$	✓	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.722 > 0.10$	$p = 0.758 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.099 > 0.05$	$p = 0.208 > 0.10$	✗	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.297 > 0.10$	$p = 0.416 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 0.045 < 0.05$	$p = 0.118 > 0.10$	✗	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.162 > 0.10$	$p = 0.284 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.544 > 0.10$	$p = 0.634 > 0.10$	✗	

Table C.68.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.68.

### Development Experience: “12 – 15 Years”

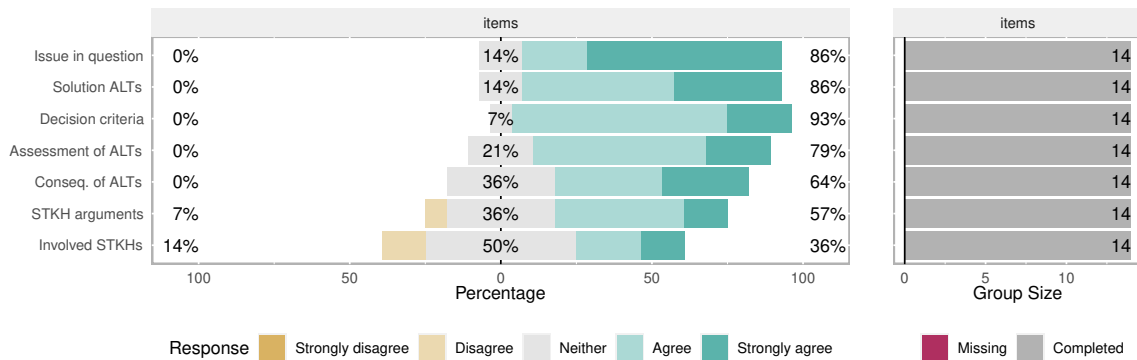


Figure C.69.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – development experience “12 – 15 years” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 16.781$	$p = 0.010 < 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.322 > 0.10$	$p = 0.520 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.211 > 0.10$	$p = 0.404 > 0.10$	✗	
Issue ↔ Assessment of ALTs	$p = 0.085 > 0.05$	$p = 0.222 > 0.10$	✗	
Issue ↔ Consequences of ALTs	$p = 0.051 > 0.05$	$p = 0.215 > 0.10$	✗	
Issue ↔ Involved stakeholders	$p = 3.272 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 0.005 < 0.05$	$p = 0.057 < 0.10$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.796 > 0.10$	$p = 0.836 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.464 > 0.10$	$p = 0.573 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.337 > 0.10$	$p = 0.506 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 0.009 < 0.05$	$p = 0.065 < 0.10$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.073 > 0.05$	$p = 0.220 > 0.10$	✗	
Decision criteria ↔ Assessment of ALTs	$p = 0.635 > 0.10$	$p = 0.702 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.483 > 0.10$	$p = 0.564 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 0.019 < 0.05$	$p = 0.100 \leq 0.10$	✗	
Decision criteria ↔ Stakeholder ARGs	$p = 0.125 > 0.10$	$p = 0.263 > 0.10$	✗	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.821 > 0.10$	$p = 0.821 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.062 > 0.05$	$p = 0.216 > 0.10$	✗	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.290 > 0.10$	$p = 0.507 > 0.10$	✗	
Consequences of ALTs ↔ Involved stakeholders	$p = 0.101 > 0.10$	$p = 0.235 > 0.10$	✗	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.406 > 0.10$	$p = 0.568 > 0.10$	✗	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.418 > 0.10$	$p = 0.548 > 0.10$	✗	

Table C.69.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.69.

### Development Experience: “8 – 11 Years”

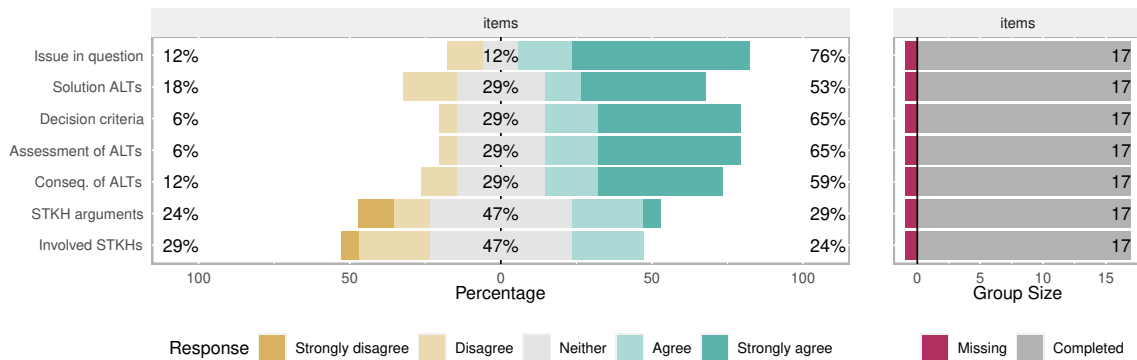


Figure C.70.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – development experience “8 – 11 years” only.

Kruskal-Wallis – Test for Difference					
Method	Value		Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 22.037$		$p = 0.001 \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.211$	$> 0.10$	$p = 0.403$	$> 0.10$	✗
Issue ↔ Decision criteria	$p = 0.617$	$> 0.10$	$p = 0.863$	$> 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.617$	$> 0.10$	$p = 0.809$	$> 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.338$	$> 0.10$	$p = 0.592$	$> 0.10$	✗
Issue ↔ Involved stakeholders	$p = 4.756 * 10^{-4}$	$\ll 0.05$	$p = 0.010$	$< 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.002$	$\ll 0.05$	$p = 0.021$	$< 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.453$	$> 0.10$	$p = 0.733$	$> 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.453$	$> 0.10$	$p = 0.680$	$> 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.769$	$> 0.10$	$p = 0.808$	$> 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.025$	$< 0.05$	$p = 0.065$	$< 0.10$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.067$	$> 0.05$	$p = 0.140$	$> 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 1.000$	$> 0.10$	$p = 1.000$	$> 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.648$	$> 0.10$	$p = 0.800$	$> 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.003$	$\ll 0.05$	$p = 0.019$	$< 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.010$	$< 0.05$	$p = 0.041$	$< 0.05$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.648$	$> 0.10$	$p = 0.756$	$> 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.003$	$\ll 0.05$	$p = 0.014$	$< 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.010$	$< 0.05$	$p = 0.034$	$< 0.05$	✓
Consequences of ALTs ↔ Involved stakeholders	$p = 0.011$	$< 0.05$	$p = 0.034$	$< 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.033$	$< 0.05$	$p = 0.078$	$< 0.10$	✓
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.682$	$> 0.10$	$p = 0.754$	$> 0.10$	✗

Table C.70.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.70.

### Development Experience: “4 – 7 Years”

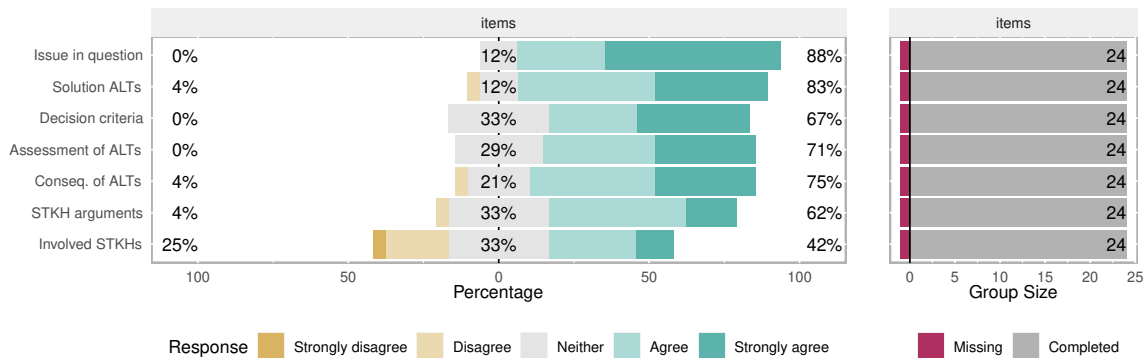


Figure C.71.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – development experience “4 – 7 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 21.876$	$p = 0.001 \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.248 > 0.10$	$p = 0.371 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.084 > 0.05$	$p = 0.195 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.080 > 0.05$	$p = 0.241 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.096 > 0.05$	$p = 0.201 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 1.805 * 10^{-5} \ll 0.05$	$p = 3.791 * 10^{-4} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.004 \ll 0.05$	$p = 0.027 < 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.567 > 0.10$	$p = 0.700 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.553 > 0.10$	$p = 0.726 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.611 > 0.10$	$p = 0.713 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.018 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.084 > 0.05$	$p = 0.220 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.949 > 0.10$	$p = 0.996 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.044 < 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.248 > 0.10$	$p = 0.400 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.933 > 0.10$	$p = 1.000 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.011 < 0.05$	$p = 0.039 < 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.256 > 0.10$	$p = 0.358 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.009 < 0.05$	$p = 0.046 < 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.222 > 0.10$	$p = 0.389 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.161 > 0.10$	$p = 0.307 > 0.10$	✗

Table C.71.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.71.

### Development Experience: “0 – 3 Years”

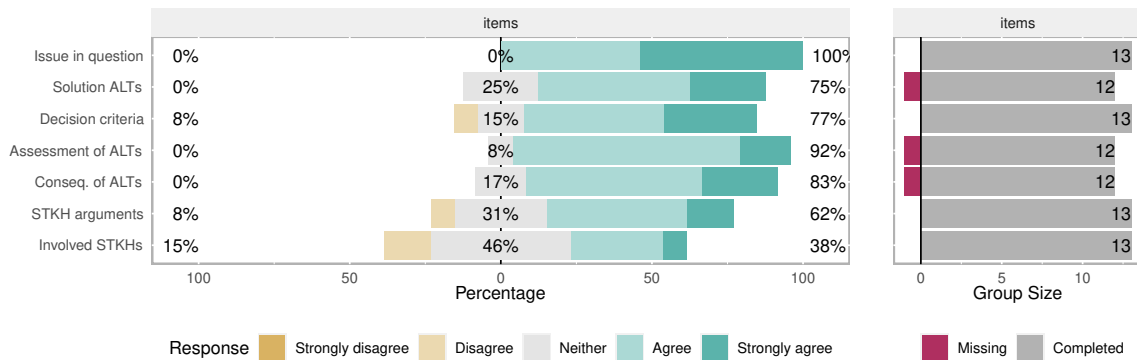


Figure C.72.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – development experience “0 – 3 years” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.061$	$p = 0.009 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.067 > 0.05$	$p = 0.201 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.091 > 0.05$	$p = 0.239 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.115 > 0.10$	$p = 0.269 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.120 > 0.10$	$p = 0.251 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 9.826 * 10^{-5} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 0.006 < 0.05$	$p = 0.062 < 0.10$	✓
Solution alternatives ↔ Decision criteria	$p = 0.861 > 0.10$	$p = 1.000 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.802 > 0.10$	$p = 0.990 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.788 > 0.10$	$p = 1.000 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.047 < 0.05$	$p = 0.165 > 0.10$	✗
Solution alternatives ↔ Stakeholder ARGs	$p = 0.385 > 0.10$	$p = 0.539 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.936 > 0.10$	$p = 0.982 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.922 > 0.10$	$p = 1.000 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 0.027 < 0.05$	$p = 0.115 > 0.10$	✗
Decision criteria ↔ Stakeholder ARGs	$p = 0.287 > 0.10$	$p = 0.430 > 0.10$	✗
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.025 < 0.05$	$p = 0.131 > 0.10$	✗
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.261 > 0.10$	$p = 0.421 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.024 < 0.05$	$p = 0.167 > 0.10$	✗
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.253 > 0.10$	$p = 0.484 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.254 > 0.10$	$p = 0.445 > 0.10$	✗

Table C.72.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.72.

### C.9.3. Scrum Experience ⇔ Usefulness of Rationale Information Elements (IndepVar: Q-27 – DepVar: Q-13)

Scrum Experience: “Expert”

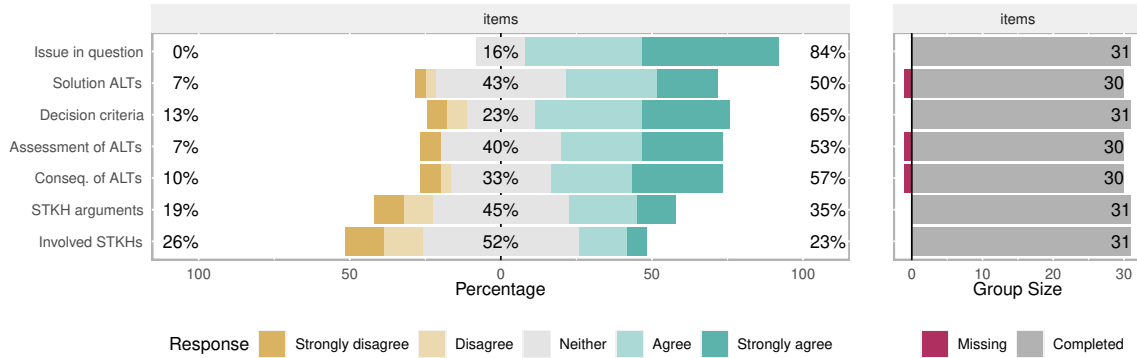


Figure C.73.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – Scrum experience “Expert” only.

Kruskal-Wallis – Test for Difference				
Method	Value		Significance	Significant?
Kruskal-Wallis	$\chi^2 = 31.602$		$p = 1.945 * 10^{-5} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance		Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.007$	< 0.05	$p = 0.026$	< 0.05 ✓
Issue ↔ Decision criteria	$p = 0.056$	> 0.05	$p = 0.107$	> 0.10 ✗
Issue ↔ Assessment of ALTs	$p = 0.021$	< 0.05	$p = 0.055$	< 0.10 ✓
Issue ↔ Consequences of ALTs	$p = 0.033$	< 0.05	$p = 0.069$	< 0.10 ✓
Issue ↔ Involved stakeholders	$p = 3.601 * 10^{-7}$	$\ll 0.05$	$p = 7.562 * 10^{-6}$	$\ll 0.05$ ✓
Issue ↔ Stakeholder ARGs	$p = 5.194 * 10^{-5}$	$\ll 0.05$	$p = 5.454 * 10^{-4}$	$\ll 0.05$ ✓
Solution alternatives ↔ Decision criteria	$p = 0.434$	> 0.10	$p = 0.570$	> 0.10 ✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.714$	> 0.10	$p = 0.790$	> 0.10 ✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.588$	> 0.10	$p = 0.727$	> 0.10 ✗
Solution alternatives ↔ Involved stakeholders	$p = 0.018$	< 0.05	$p = 0.053$	< 0.10 ✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.181$	> 0.10	$p = 0.272$	> 0.10 ✗
Decision criteria ↔ Assessment of ALTs	$p = 0.680$	> 0.10	$p = 0.793$	> 0.10 ✗
Decision criteria ↔ Consequences of ALTs	$p = 0.813$	> 0.10	$p = 0.854$	> 0.10 ✗
Decision criteria ↔ Involved stakeholders	$p = 0.001$	$\ll 0.05$	$p = 0.010$	< 0.05 ✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.033$	< 0.05	$p = 0.076$	< 0.10 ✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.861$	> 0.10	$p = 0.861$	> 0.10 ✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.006$	< 0.05	$p = 0.026$	< 0.05 ✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.088$	> 0.05	$p = 0.142$	> 0.10 ✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.004$	$\ll 0.05$	$p = 0.019$	< 0.05 ✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.060$	> 0.05	$p = 0.105$	> 0.10 ✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.297$	> 0.10	$p = 0.416$	> 0.10 ✗

Table C.73.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.73.



### Scrum Experience: “Advanced”

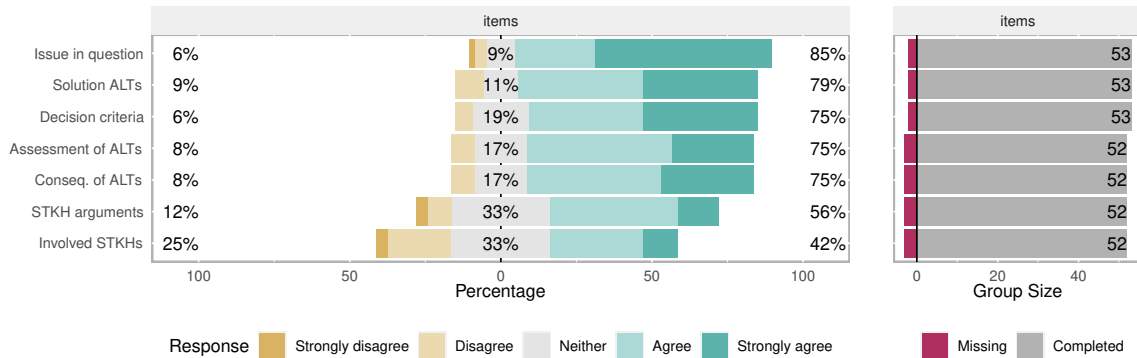


Figure C.74.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – Scrum experience “Advanced” only.

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 46.675$	$p = 2.173 * 10^{-8} \ll 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Issue ↔ Solution alternatives	$p = 0.080 > 0.05$	$p = 0.120 > 0.10$	✗	
Issue ↔ Decision criteria	$p = 0.064 > 0.05$	$p = 0.103 > 0.10$	✗	
Issue ↔ Assessment of ALTs	$p = 0.009 < 0.05$	$p = 0.020 < 0.05$	✓	
Issue ↔ Consequences of ALTs	$p = 0.017 < 0.05$	$p = 0.036 < 0.05$	✓	
Issue ↔ Involved stakeholders	$p = 3.228 * 10^{-9} \ll 0.05$	$p = 6.779 * 10^{-8} \ll 0.05$	✓	
Issue ↔ Stakeholder ARGs	$p = 2.643 * 10^{-6} \ll 0.05$	$p = 2.775 * 10^{-5} \ll 0.05$	✓	
Solution alternatives ↔ Decision criteria	$p = 0.916 > 0.10$	$p = 0.916 > 0.10$	✗	
Solution alternatives ↔ Assessment of ALTs	$p = 0.374 > 0.10$	$p = 0.491 > 0.10$	✗	
Solution alternatives ↔ Consequences of ALTs	$p = 0.523 > 0.10$	$p = 0.611 > 0.10$	✗	
Solution alternatives ↔ Involved stakeholders	$p = 2.950 * 10^{-5} \ll 0.05$	$p = 2.065 * 10^{-4} \ll 0.05$	✓	
Solution alternatives ↔ Stakeholder ARGs	$p = 0.003 \ll 0.05$	$p = 0.009 < 0.05$	✓	
Decision criteria ↔ Assessment of ALTs	$p = 0.433 > 0.10$	$p = 0.535 > 0.10$	✗	
Decision criteria ↔ Consequences of ALTs	$p = 0.594 > 0.10$	$p = 0.656 > 0.10$	✗	
Decision criteria ↔ Involved stakeholders	$p = 4.645 * 10^{-5} \ll 0.05$	$p = 2.438 * 10^{-4} \ll 0.05$	✓	
Decision criteria ↔ Stakeholder ARGs	$p = 0.004 \ll 0.05$	$p = 0.011 < 0.05$	✓	
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.803 > 0.10$	$p = 0.844 > 0.10$	✗	
Assessment of ALTs ↔ Involved stakeholders	$p = 0.001 \ll 0.05$	$p = 0.004 \ll 0.05$	✓	
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.040 < 0.05$	$p = 0.070 < 0.10$	✓	
Consequences of ALTs ↔ Involved stakeholders	$p = 4.274 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓	
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.021 < 0.05$	$p = 0.040 < 0.05$	✓	
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.224 > 0.10$	$p = 0.313 > 0.10$	✗	

Table C.74.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.74.

**Scrum Experience: “Novice”**

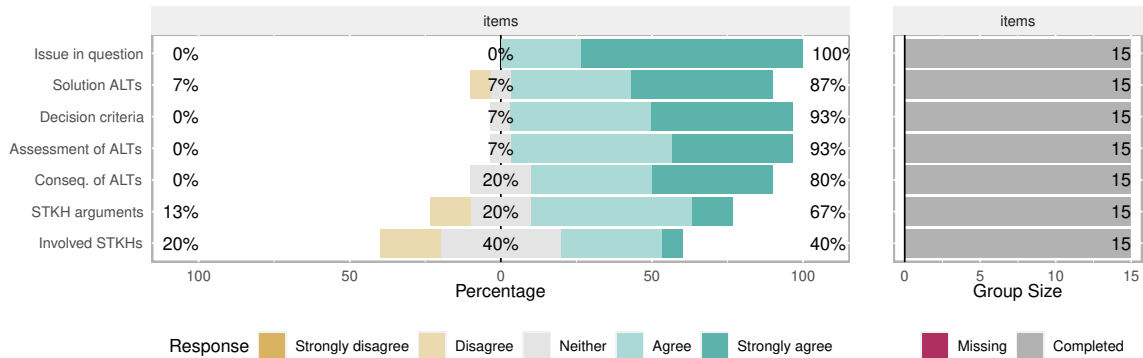


Figure C.75.: Agreement to the usefulness of rationale information elements (→) grouped by rationale information elements (↑) – Scrum experience “Novice” only.

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 28.157$	$p = 8.778 * 10^{-5} \ll 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Issue ↔ Solution alternatives	$p = 0.126 > 0.10$	$p = 0.204 > 0.10$	✗
Issue ↔ Decision criteria	$p = 0.204 > 0.10$	$p = 0.306 > 0.10$	✗
Issue ↔ Assessment of ALTs	$p = 0.123 > 0.10$	$p = 0.216 > 0.10$	✗
Issue ↔ Consequences of ALTs	$p = 0.055 > 0.05$	$p = 0.115 > 0.10$	✗
Issue ↔ Involved stakeholders	$p = 3.963 * 10^{-6} \ll 0.05$	$p = 8.321 * 10^{-5} \ll 0.05$	✓
Issue ↔ Stakeholder ARGs	$p = 4.376 * 10^{-4} \ll 0.05$	$p = 0.005 \ll 0.05$	✓
Solution alternatives ↔ Decision criteria	$p = 0.797 > 0.10$	$p = 0.837 > 0.10$	✗
Solution alternatives ↔ Assessment of ALTs	$p = 0.990 > 0.10$	$p = 0.990 > 0.10$	✗
Solution alternatives ↔ Consequences of ALTs	$p = 0.695 > 0.10$	$p = 0.858 > 0.10$	✗
Solution alternatives ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.011 < 0.05$	✓
Solution alternatives ↔ Stakeholder ARGs	$p = 0.047 < 0.05$	$p = 0.123 > 0.10$	✗
Decision criteria ↔ Assessment of ALTs	$p = 0.787 > 0.10$	$p = 0.870 > 0.10$	✗
Decision criteria ↔ Consequences of ALTs	$p = 0.516 > 0.10$	$p = 0.677 > 0.10$	✗
Decision criteria ↔ Involved stakeholders	$p = 8.300 * 10^{-4} \ll 0.05$	$p = 0.006 < 0.05$	✓
Decision criteria ↔ Stakeholder ARGs	$p = 0.025 < 0.05$	$p = 0.074 < 0.10$	✓
Assessment of ALTs ↔ Consequences of ALTs	$p = 0.704 > 0.10$	$p = 0.822 > 0.10$	✗
Assessment of ALTs ↔ Involved stakeholders	$p = 0.002 \ll 0.05$	$p = 0.009 < 0.05$	✓
Assessment of ALTs ↔ Stakeholder ARGs	$p = 0.048 < 0.05$	$p = 0.113 > 0.10$	✗
Consequences of ALTs ↔ Involved stakeholders	$p = 0.007 < 0.05$	$p = 0.025 < 0.05$	✓
Consequences of ALTs ↔ Stakeholder ARGs	$p = 0.111 > 0.10$	$p = 0.211 > 0.10$	✗
Involved stakeholders ↔ Stakeholder ARGs	$p = 0.273 > 0.10$	$p = 0.382 > 0.10$	✗

Table C.75.: Results of test for difference – grouped by Rationale Information Elements – cf. Figure C.75.

# D. Detailed Data for Hypotheses Related to Research Question RQ2

## D.1. Hypothesis RQ2-H1 – Development Experience ⇔ Decision Documentation Frequency

### D.1.1. Development Experience ⇔ Decision Documentation Frequency (IndepVar: Q-26 – DepVar: Q-01)

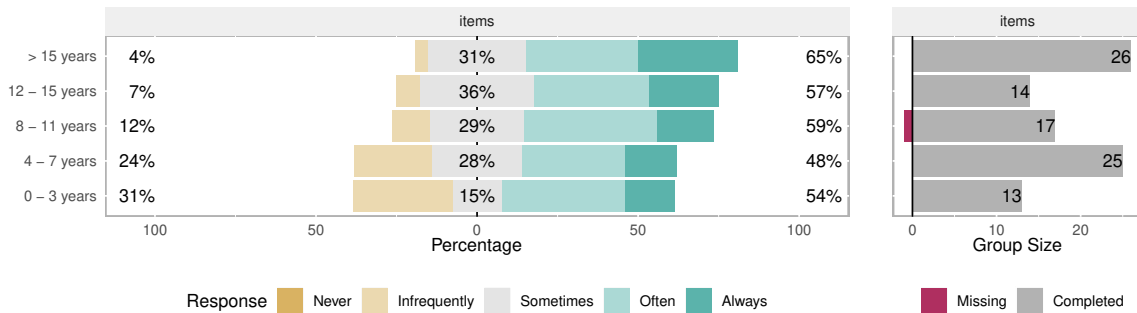


Figure D.1.: Decision documentation frequency (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.020$	$p = 0.403 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.514 > 0.10$	$p = 0.735 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 0.385 > 0.10$	$p = 0.961 > 0.10$	✗
> 15 years ↔ 4 – 7 years	$p = 0.070 < 0.10$	$p = 0.698 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.142 > 0.10$	$p = 0.708 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 0.879 > 0.10$	$p = 0.976 > 0.10$	✗
12 – 15 years ↔ 4 – 7 years	$p = 0.382 > 0.10$	$p = 1.000 > 0.10$	✗
12 – 15 years ↔ 0 – 3 years	$p = 0.462 > 0.10$	$p = 0.771 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 0.452 > 0.10$	$p = 0.903 > 0.10$	✗
8 – 11 years ↔ 0 – 3 years	$p = 0.536 > 0.10$	$p = 0.670 > 0.10$	✗
4 – 7 years ↔ 0 – 3 years	$p = 0.980 > 0.10$	$p = 0.980 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.200$	$p = 0.051 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.168$	$p = 0.049 < 0.05$	✓

Table D.1.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.1.

### D.1.2. Development Experience ↔ Decision Documentation Frequency Across All Decision Types (IndepVar: Q-26 – DepVar: Q-04)

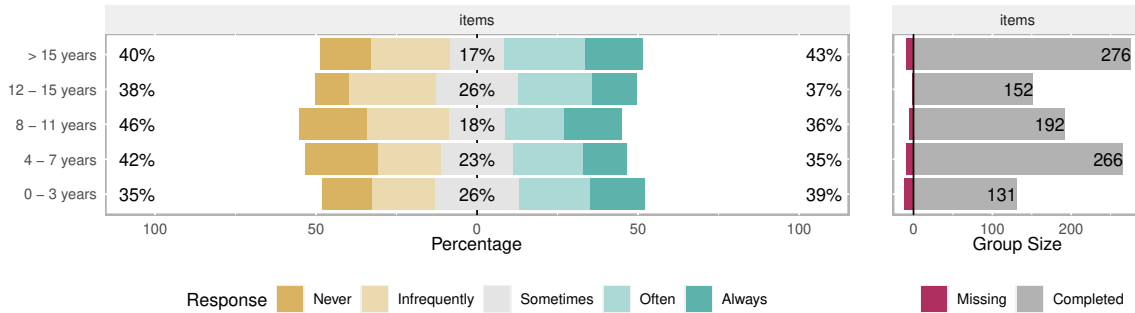


Figure D.2.: Decision documentation frequency across all types of decisions (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.200$	$p = 0.267 > 0.10$	×
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.889 > 0.10$	$p = 1.000 > 0.10$	×
> 15 years ↔ 8 – 11 years	$p = 0.141 > 0.10$	$p = 0.704 > 0.10$	×
> 15 years ↔ 4 – 7 years	$p = 0.080 < 0.10$	$p = 0.801 > 0.10$	×
> 15 years ↔ 0 – 3 years	$p = 0.951 > 0.10$	$p = 0.951 > 0.10$	×
12 – 15 years ↔ 8 – 11 years	$p = 0.252 > 0.10$	$p = 0.420 > 0.10$	×
12 – 15 years ↔ 4 – 7 years	$p = 0.180 > 0.10$	$p = 0.450 > 0.10$	×
12 – 15 years ↔ 0 – 3 years	$p = 0.863 > 0.10$	$p = 1.000 > 0.10$	×
8 – 11 years ↔ 4 – 7 years	$p = 0.900 > 0.10$	$p = 1.000 > 0.10$	×
8 – 11 years ↔ 0 – 3 years	$p = 0.201 > 0.10$	$p = 0.402 > 0.10$	×
4 – 7 years ↔ 0 – 3 years	$p = 0.142 > 0.10$	$p = 0.472 > 0.10$	×
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.033$	$p = 0.299 > 0.10$	×
Kendall's Tau (b)	$\tau = 0.027$	$p = 0.293 > 0.10$	×

Table D.2.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.2.

### D.1.3. Development Experience ↔ Decision Documentation Frequency Across All Scrum Phases (IndepVar: Q-26 – DepVar: Q-14)

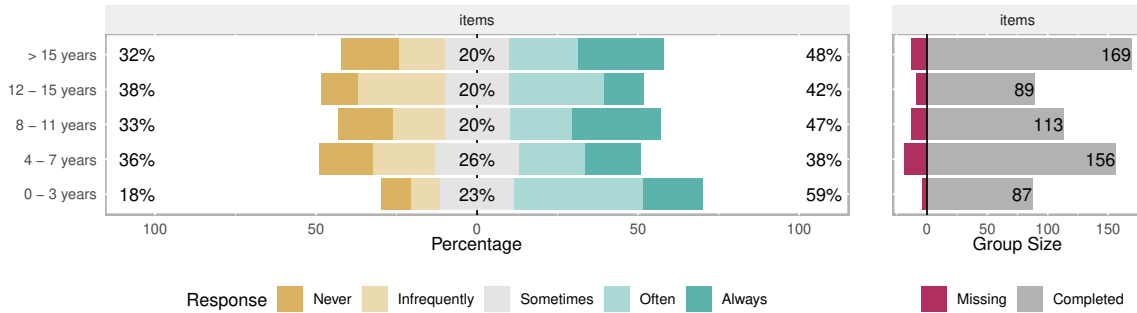


Figure D.3.: Decision documentation frequency across all Scrum phases (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.690$	$p = 0.069 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.183 > 0.10$	$p = 0.366 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	✗
> 15 years ↔ 4 – 7 years	$p = 0.105 > 0.10$	$p = 0.349 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.214 > 0.10$	$p = 0.356 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 0.224 > 0.10$	$p = 0.320 > 0.10$	✗
12 – 15 years ↔ 4 – 7 years	$p = 0.965 > 0.10$	$p = 1.000 > 0.10$	✗
12 – 15 years ↔ 0 – 3 years	$p = 0.025 < 0.05$	$p = 0.124 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 0.149 > 0.10$	$p = 0.373 > 0.10$	✗
8 – 11 years ↔ 0 – 3 years	$p = 0.244 > 0.10$	$p = 0.305 > 0.10$	✗
4 – 7 years ↔ 0 – 3 years	$p = 0.010 < 0.05$	$p = 0.101 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.012$	$p = 0.776 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.011$	$p = 0.743 > 0.10$	✗

Table D.3.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.3.

### D.1.4. Development Experience $\Leftrightarrow$ Decision Documentation Frequency – Specific Types of Decisions (IndepVar: Q-26 – DepVar: Q-04)

#### Decisions on Development Tools – (IndepVar: Q-26 – DepVar: Q-04 (1<sup>st</sup> Item))

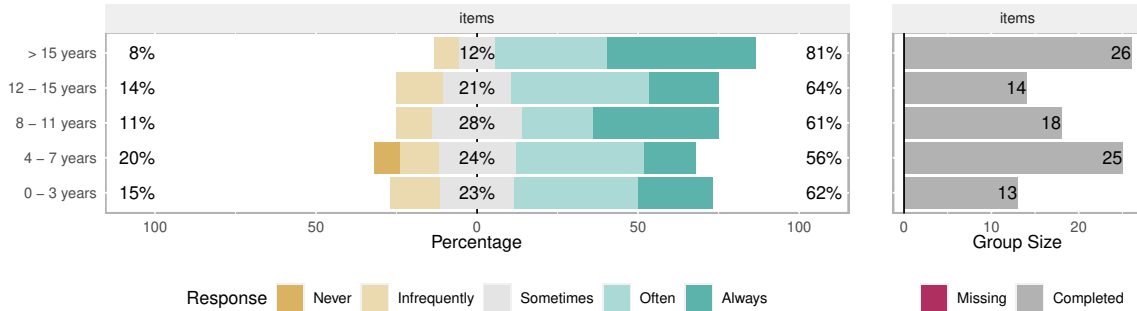


Figure D.4.: Decision documentation frequency on development tools ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.221$	$p = 0.031 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.181$	$p = 0.032 < 0.05$	✓

Table D.4.: Results of correlation analysis – cf. Figure D.4.

#### Decisions on User Experience – (IndepVar: Q-26 – DepVar: Q-04 (7<sup>th</sup> Item))

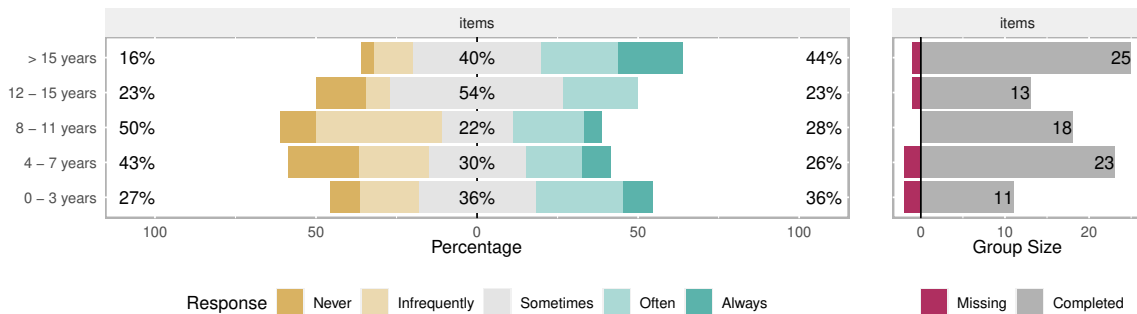


Figure D.5.: Decision documentation frequency on user experience ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.170$	$p = 0.108 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.142$	$p = 0.099 < 0.10$	✓

Table D.5.: Results of correlation analysis – grouped by development experience – cf. Figure D.5.

**Decisions on Operational To-Do Items – (IndepVar: Q-26 – DepVar: Q-04 (11<sup>th</sup> Item))**

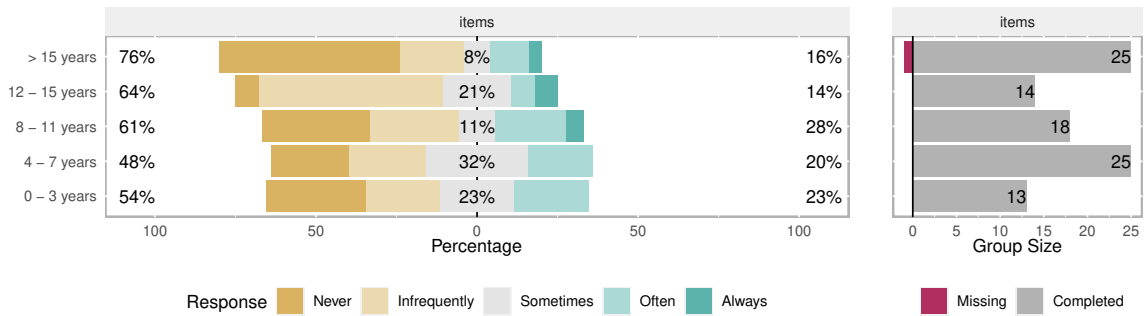


Figure D.6.: Decision documentation frequency on operational to-do items (→) grouped by development experience (↑).

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.181$	$p = 0.079 < 0.10$	✓
Kendall's Tau (b)	$\tau = -0.152$	$p = 0.072 < 0.10$	✓

Table D.6.: Results of correlation analysis – grouped by development experience – cf. [Figure D.6.](#)

## D.2. Hypothesis RQ2-H2 – Scrum Experience ⇔ Decision Documentation Frequency

### D.2.1. Scrum Experience ⇔ Decision Documentation Frequency (IndepVar: Q-27 – DepVar: Q-01)

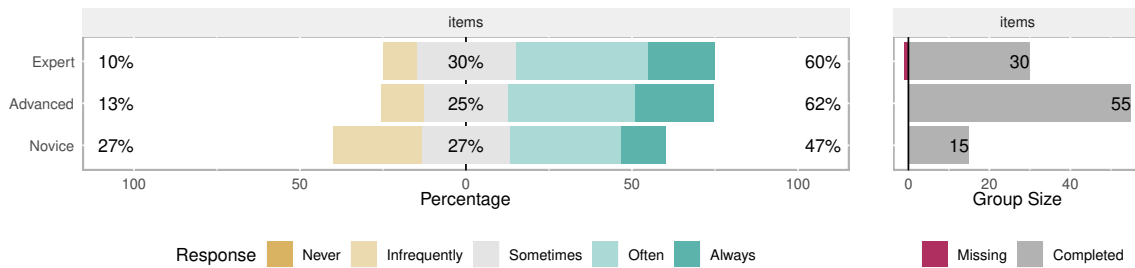


Figure D.7.: Decision documentation frequency (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.835$	$p = 0.400 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.861 > 0.10$	$p = 0.861 > 0.10$	✗
Expert ↔ Novice	$p = 0.268 > 0.10$	$p = 0.402 > 0.10$	✗
Advanced ↔ Novice	$p = 0.180 > 0.10$	$p = 0.541 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.080$	$p = 0.427 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.070$	$p = 0.429 > 0.10$	✗

Table D.7.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.7.



## D.2.2. Scrum Experience ⇔ Decision Documentation Frequency Across All Decision Types (IndepVar: Q-27 – DepVar: Q-04)

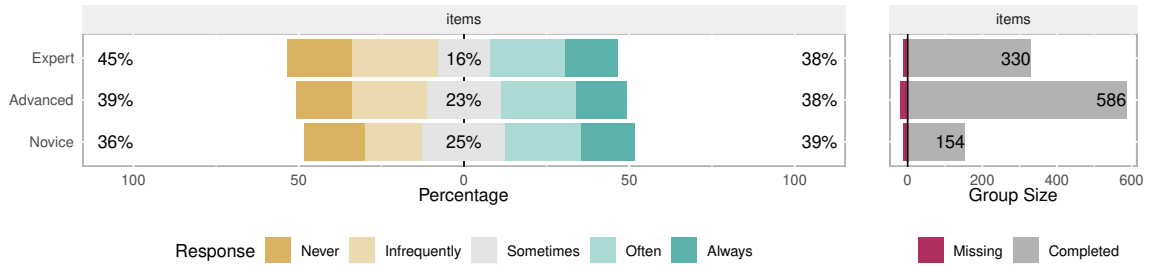


Figure D.8.: Decision documentation frequency across all decision types (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.074$	$p = 0.584 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.412 > 0.10$	$p = 0.619 > 0.10$	✗
Expert ↔ Novice	$p = 0.349 > 0.10$	$p = 1.000 > 0.10$	✗
Advanced ↔ Novice	$p = 0.700 > 0.10$	$p = 0.700 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.032$	$p = 0.302 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.027$	$p = 0.299 > 0.10$	✗

Table D.8.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.8.

### D.2.3. Scrum Experience ⇔ Decision Documentation Frequency Across All Scrum Phases (IndepVar: Q-27 – DepVar: Q-14)

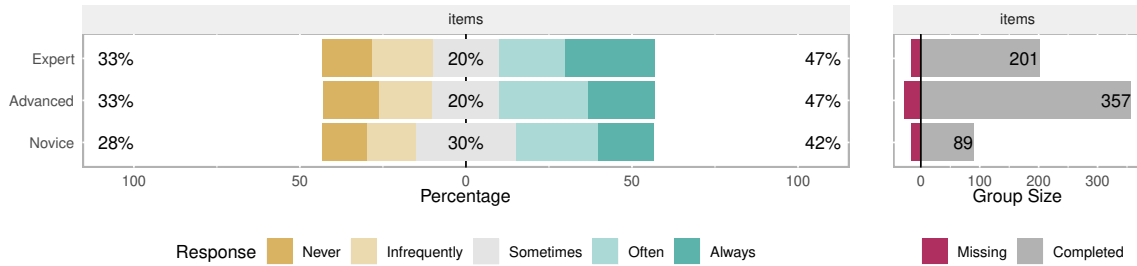


Figure D.9.: Decision documentation frequency across Scrum phases (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.636$	$p = 0.728 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.472 > 0.10$	$p = 1.000 > 0.10$	X
Expert ↔ Novice	$p = 0.530 > 0.10$	$p = 0.795 > 0.10$	X
Advanced ↔ Novice	$p = 0.889 > 0.10$	$p = 0.889 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.030$	$p = 0.444 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.026$	$p = 0.438 > 0.10$	X

Table D.9.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.9.

### D.2.4. Scrum Experience ⇔ Individual Types of Decisions (IndepVar: Q-27 – DepVar: Q-04 – 3<sup>rd</sup> Item)

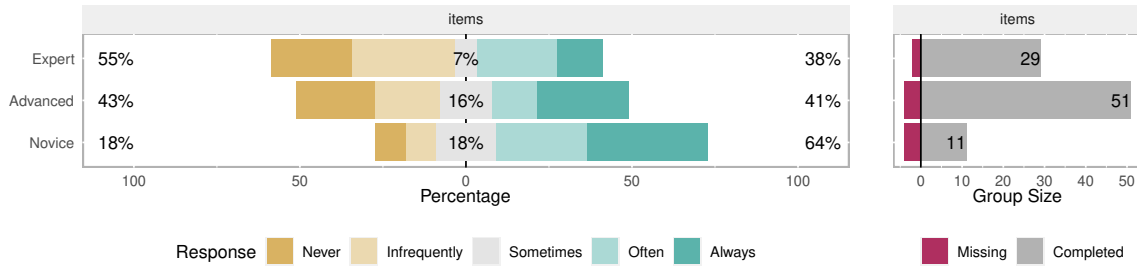


Figure D.10.: Decision documentation frequency of issues related to the deployment platform (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.487$	$p = 0.175 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.388 > 0.10$	$p = 0.388 > 0.10$	✗
Expert ↔ Novice	$p = 0.062 < 0.10$	$p = 0.186 > 0.10$	✗
Advanced ↔ Novice	$p = 0.167 > 0.10$	$p = 0.250 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.181$	$p = 0.086 < 0.10$	✓
Kendall's Tau (b)	$\tau = -0.155$	$p = 0.089 < 0.10$	✓

Table D.10.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. [Figure D.10.](#)

### D.3. Hypothesis RQ2-H3 – Experience ⇔ Usage of Capture Guidelines

#### D.3.1. Documentation Experience ⇔ Usage of Capture Guidelines (IndepVar: Q-01 – DepVar: Q-18 – 1<sup>st</sup> Item)

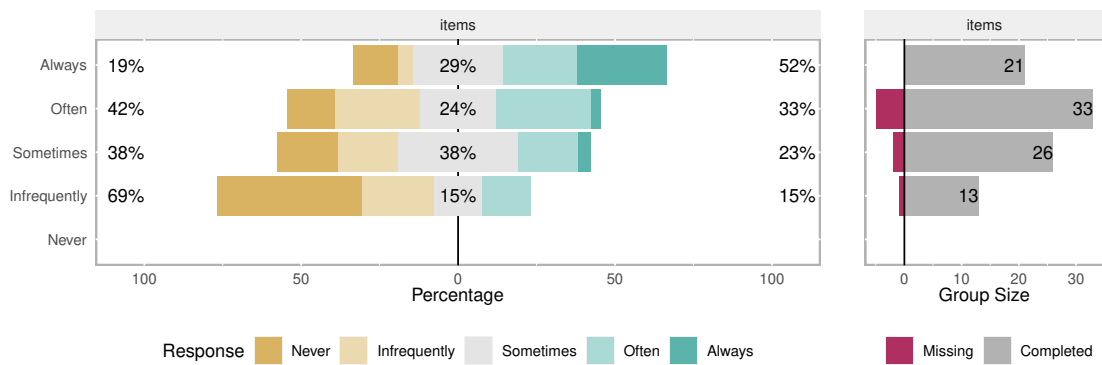


Figure D.11.: Usage of capture guidelines (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.946$	$p = 0.012 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.062 < 0.10$	$p = 0.093 < 0.10$	✓
Always ↔ Sometimes	$p = 0.039 < 0.05$	$p = 0.117 > 0.10$	✗
Always ↔ Infrequently	$p = 0.001 \ll 0.05$	$p = 0.007 < 0.05$	✓
Often ↔ Sometimes	$p = 0.747 > 0.10$	$p = 0.747 > 0.10$	✗
Often ↔ Infrequently	$p = 0.057 < 0.10$	$p = 0.114 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.112 > 0.10$	$p = 0.135 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.321$	$p = 0.002 \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.272$	$p = 0.002 \ll 0.05$	✓

Table D.11.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure D.11.

### D.3.2. Development Experience ⇔ Usage of Capture Guidelines (IndepVar: Q-26 – DepVar: Q-18 – 1<sup>st</sup> Item)

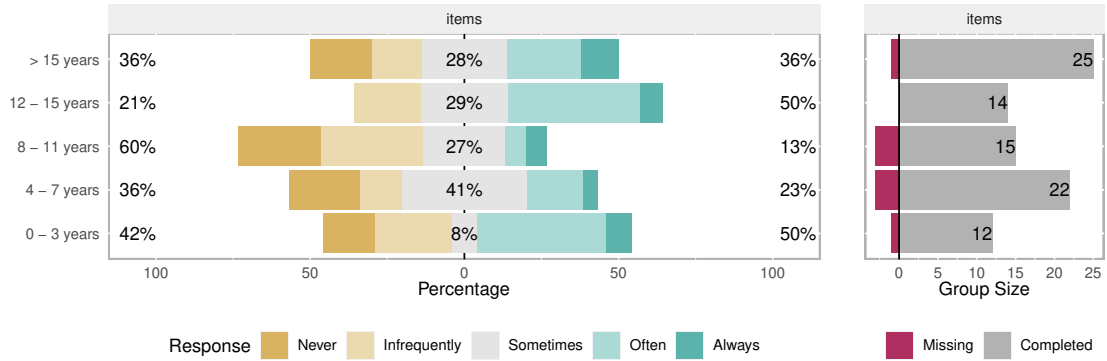


Figure D.12.: Usage of capture guidelines (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.154$	$p = 0.188 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.272 > 0.10$	$p = 0.543 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 0.127 > 0.10$	$p = 0.423 > 0.10$	✗
> 15 years ↔ 4 – 7 years	$p = 0.514 > 0.10$	$p = 0.571 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.809 > 0.10$	$p = 0.809 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 0.020 < 0.05$	$p = 0.199 > 0.10$	✗
12 – 15 years ↔ 4 – 7 years	$p = 0.103 > 0.10$	$p = 0.514 > 0.10$	✗
12 – 15 years ↔ 0 – 3 years	$p = 0.473 > 0.10$	$p = 0.592 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 0.358 > 0.10$	$p = 0.596 > 0.10$	✗
8 – 11 years ↔ 0 – 3 years	$p = 0.132 > 0.10$	$p = 0.330 > 0.10$	✗
4 – 7 years ↔ 0 – 3 years	$p = 0.443 > 0.10$	$p = 0.632 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.060$	$p = 0.579 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.050$	$p = 0.568 > 0.10$	✗

Table D.12.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.12.

### D.3.3. Scrum Experience ⇔ Usage of Capture Guidelines (IndepVar: Q-27 – DepVar: Q-18 – 1<sup>st</sup> Item)

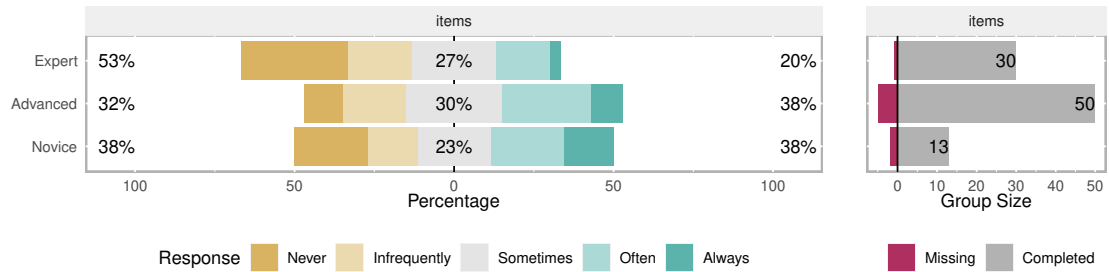


Figure D.13.: Usage of capture guidelines (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.404$	$p = 0.067 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.021 < 0.05$	$p = 0.064 < 0.10$	✓
Expert ↔ Novice	$p = 0.191 > 0.10$	$p = 0.287 > 0.10$	✗
Advanced ↔ Novice	$p = 0.755 > 0.10$	$p = 0.755 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.202$	$p = 0.052 < 0.10$	✓
Kendall's Tau (b)	$\tau = -0.177$	$p = 0.049 < 0.05$	✓

Table D.13.: Results of test for difference and correlation analysis – grouped by Scrum Experience – cf. [Figure D.13](#).

## D.4. Hypothesis RQ2-H4 – Experience ⇔ Usage Frequency of Capture Templates

### D.4.1. Documentation Experience ⇔ Usage of Capture Templates (IndepVar: Q-01 – DepVar: Q-18 – 2<sup>nd</sup> Item)

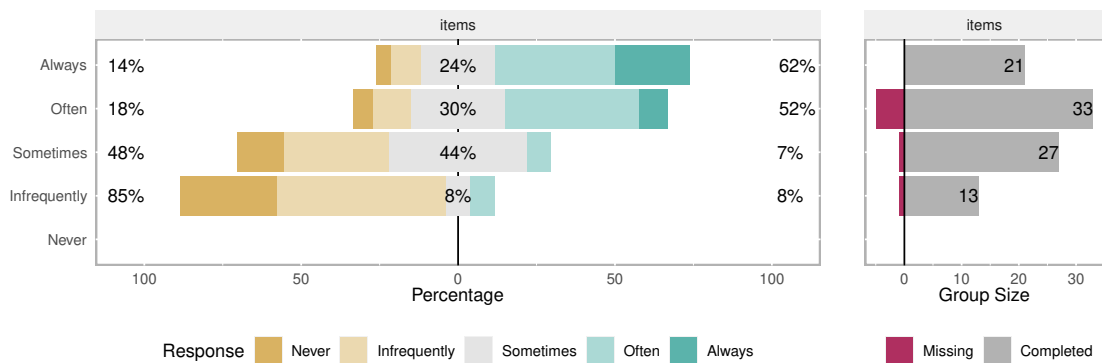


Figure D.14.: Usage of capture templates (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 28.947$	$p = 2.298 * 10^{-6} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.388 > 0.10$	$p = 0.388 > 0.10$	✗
Always ↔ Sometimes	$p = 2.129 * 10^{-4} \ll 0.05$	$p = 4.258 * 10^{-4} \ll 0.05$	✓
Always ↔ Infrequently	$p = 1.678 * 10^{-5} \ll 0.05$	$p = 1.007 * 10^{-4} \ll 0.05$	✓
Often ↔ Sometimes	$p = 0.001 \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Often ↔ Infrequently	$p = 9.505 * 10^{-5} \ll 0.05$	$p = 2.851 * 10^{-4} \ll 0.05$	✓
Sometimes ↔ Infrequently	$p = 0.191 > 0.10$	$p = 0.229 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.543$	$p = 1.579 * 10^{-8} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.471$	$p = 4.911 * 10^{-8} \ll 0.05$	✓

Table D.14.: Results of test for difference and correlation analysis – grouped by Documentation Experience – cf. Figure D.14.

### D.4.2. Development Experience $\leftrightarrow$ Usage of Capture Templates (IndepVar: Q-26 – DepVar: Q-18 – 2<sup>nd</sup> Item)

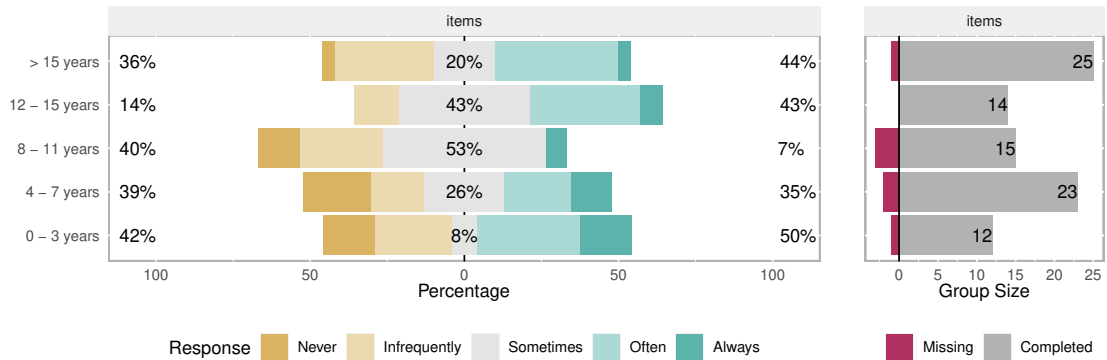


Figure D.15.: Usage of capture templates ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.925$	$p = 0.416 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.478 > 0.10$	$p = 0.796 > 0.10$	X
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.168 > 0.10$	$p = 0.838 > 0.10$	X
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.549 > 0.10$	$p = 0.784 > 0.10$	X
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.979 > 0.10$	$p = 0.979 > 0.10$	X
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.064 < 0.10$	$p = 0.642 > 0.10$	X
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.226 > 0.10$	$p = 0.753 > 0.10$	X
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.562 > 0.10$	$p = 0.703 > 0.10$	X
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.403 > 0.10$	$p = 0.806 > 0.10$	X
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.235 > 0.10$	$p = 0.587 > 0.10$	X
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.608 > 0.10$	$p = 0.676 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.061$	$p = 0.572 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.056$	$p = 0.518 > 0.10$	X

Table D.15.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.15.



### D.4.3. Scrum Experience ⇔ Usage of Capture Templates (IndepVar: Q-27 – DepVar: Q-18 – 2<sup>nd</sup> Item)

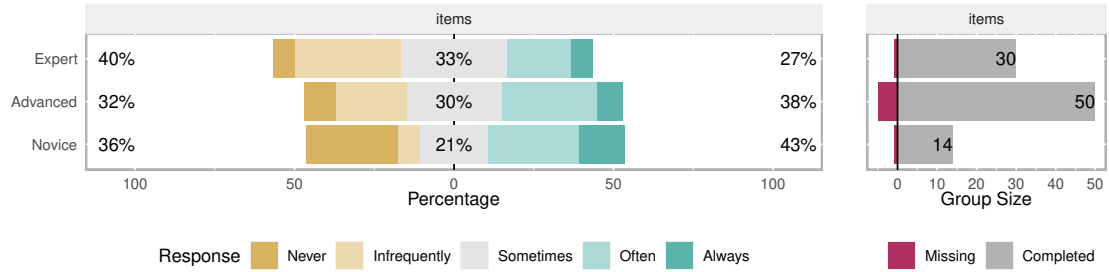


Figure D.16.: Usage of capture templates (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.586$	$p = 0.746 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.444 > 0.10$	$p = 1.000 > 0.10$	X
Expert ↔ Novice	$p = 0.726 > 0.10$	$p = 1.000 > 0.10$	X
Advanced ↔ Novice	$p = 0.835 > 0.10$	$p = 0.835 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.059$	$p = 0.574 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.053$	$p = 0.554 > 0.10$	X

Table D.16.: Results of test for difference and correlation analysis – grouped by Scrum Experience – cf. Figure D.16.

## D.5. Hypothesis RQ2-H5 – Experience ⇔ Usage Frequency of Software for Documenting Decisions

### D.5.1. Documentation Experience ⇔ Usage Frequency of Software for Documenting Decisions (IndepVar: Q-01 – DepVar: Q-16 – 3<sup>rd</sup> Item)

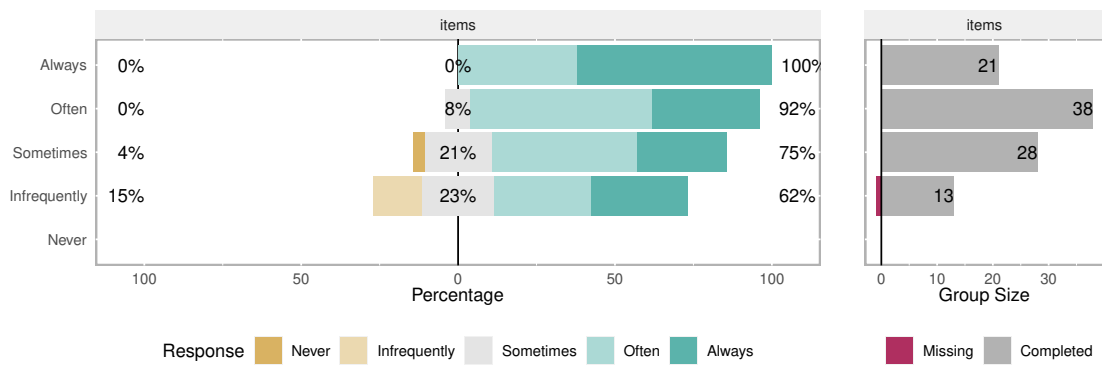


Figure D.17.: Capturing decisions using software (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.670$	$p = 0.014 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.051 < 0.10$	$p = 0.102 > 0.10$	✗
Always ↔ Sometimes	$p = 0.004 \ll 0.05$	$p = 0.027 < 0.05$	✓
Always ↔ Infrequently	$p = 0.006 < 0.05$	$p = 0.019 < 0.05$	✓
Often ↔ Sometimes	$p = 0.242 > 0.10$	$p = 0.290 > 0.10$	✗
Often ↔ Infrequently	$p = 0.176 > 0.10$	$p = 0.264 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.669 > 0.10$	$p = 0.669 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.318$	$p = 0.001 \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.287$	$p = 0.001 \ll 0.05$	✓

Table D.17.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure D.17.

### D.5.2. Development Experience $\leftrightarrow$ Usage Frequency of Software for Documenting Decisions (IndepVar: Q-26 – DepVar: Q-16 – 3<sup>rd</sup> Item)

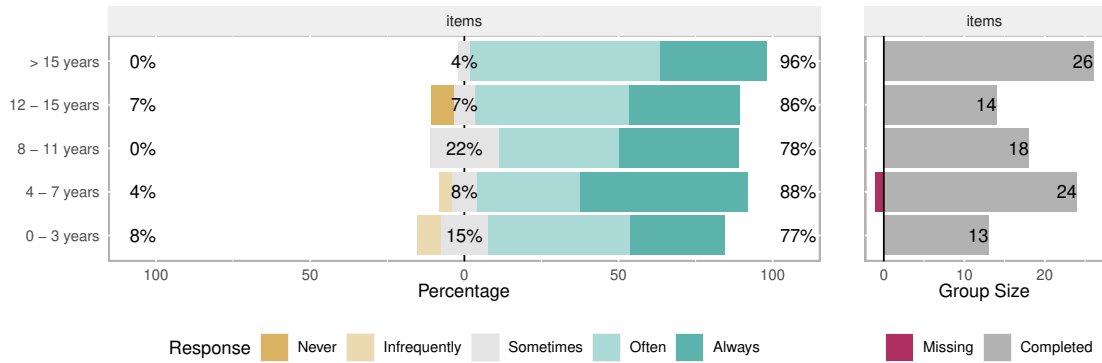


Figure D.18.: Capturing decisions using software ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.598$	$p = 0.627 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.728 > 0.10$	$p = 0.809 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.678 > 0.10$	$p = 0.847 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.447 > 0.10$	$p = 0.893 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.398 > 0.10$	$p = 0.996 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.973 > 0.10$	$p = 0.973 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.325 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.656 > 0.10$	$p = 1.000 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.272 > 0.10$	$p = 1.000 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.661 > 0.10$	$p = 0.944 > 0.10$	$\times$
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.145 > 0.10$	$p = 1.000 > 0.10$	$\times$
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.007$	$p = 0.950 > 0.10$	$\times$
Kendall's Tau (b)	$\tau = 0.006$	$p = 0.945 > 0.10$	$\times$

Table D.18.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.18.

### D.5.3. Scrum Experience ⇔ Usage Frequency of Software for Documenting Decisions (IndepVar: Q-27 – DepVar: Q-16 – 3<sup>rd</sup> Item)

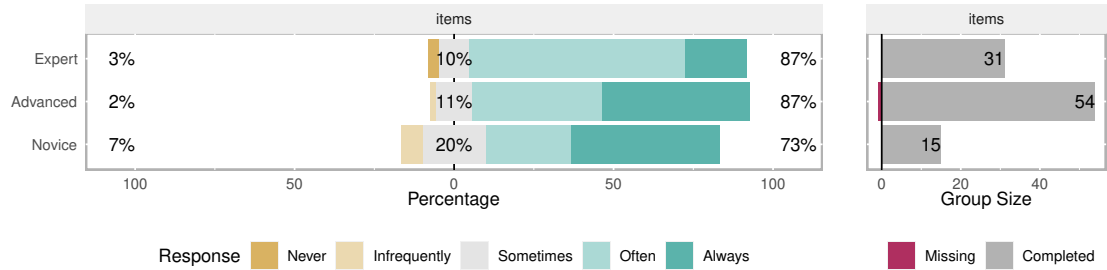


Figure D.19.: Capturing decisions using software (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.735$	$p = 0.155 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.053 < 0.10$	$p = 0.160 > 0.10$	X
Expert ↔ Novice	$p = 0.379 > 0.10$	$p = 0.569 > 0.10$	X
Advanced ↔ Novice	$p = 0.586 > 0.10$	$p = 0.586 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.141$	$p = 0.162 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.131$	$p = 0.152 > 0.10$	X

Table D.19.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.19.

## D.6. Hypothesis RQ2-H5 – Experience $\Leftrightarrow$ Usage Frequency of IDE-Integrated Software for Documenting Decisions

### D.6.1. Documentation Experience $\Leftrightarrow$ Usage Frequency of IDE-Integrated Software for Documenting Decisions (IndepVar: Q-01 – DepVar: Q-16 – 4<sup>th</sup> Item)

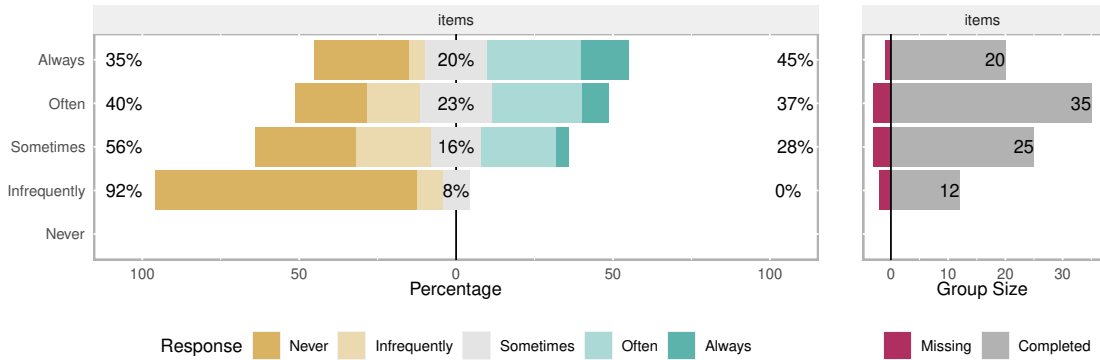


Figure D.20.: Capturing decisions using IDE-integrated software ( $\rightarrow$ ) grouped by documentation experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 14.364$	$p = 0.002 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always $\leftrightarrow$ Often	$p = 0.825 > 0.10$	$p = 0.825 > 0.10$	✗
Always $\leftrightarrow$ Sometimes	$p = 0.265 > 0.10$	$p = 0.398 > 0.10$	✗
Always $\leftrightarrow$ Infrequently	$p = 6.843 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Often $\leftrightarrow$ Sometimes	$p = 0.298 > 0.10$	$p = 0.358 > 0.10$	✗
Often $\leftrightarrow$ Infrequently	$p = 4.286 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Sometimes $\leftrightarrow$ Infrequently	$p = 0.010 < 0.05$	$p = 0.020 < 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.326$	$p = 0.002 \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.281$	$p = 0.001 \ll 0.05$	✓

Table D.20.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure D.20.

### D.6.2. Development Experience $\leftrightarrow$ Usage Frequency of IDE-Integrated Software for Documenting Decisions (IndepVar: Q-26 – DepVar: Q-16 – 4<sup>th</sup> Item)

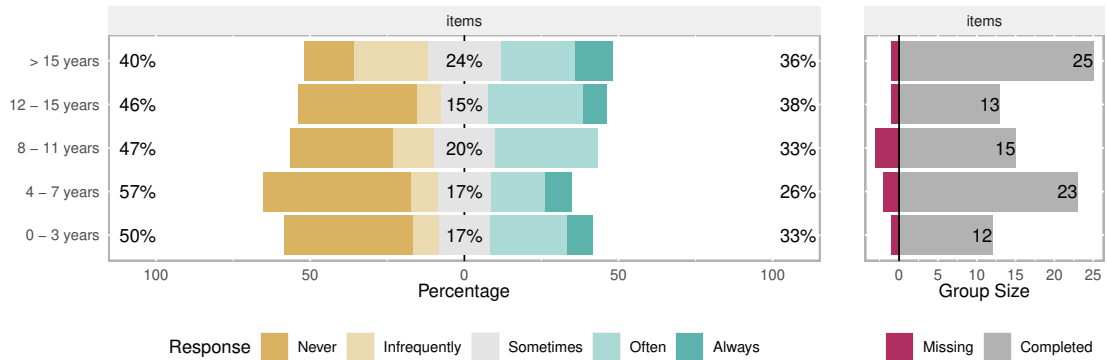


Figure D.21.: Capturing decisions using IDE-integrated software ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.701$	$p = 0.609 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.496 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.395 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.107 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.363 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.905 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.503 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.829 > 0.10$	$p = 1.000 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.573 > 0.10$	$p = 0.954 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.915 > 0.10$	$p = 0.915 > 0.10$	$\times$
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.682 > 0.10$	$p = 0.975 > 0.10$	$\times$
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.154$	$p = 0.152 > 0.10$	$\times$
Kendall's Tau (b)	$\tau = 0.126$	$p = 0.150 > 0.10$	$\times$

Table D.21.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.21.

### D.6.3. Scrum Experience ⇔ Usage Frequency of IDE-Integrated Software for Documenting Decisions (IndepVar: Q-27 – DepVar: Q-16 – 4<sup>th</sup> Item)

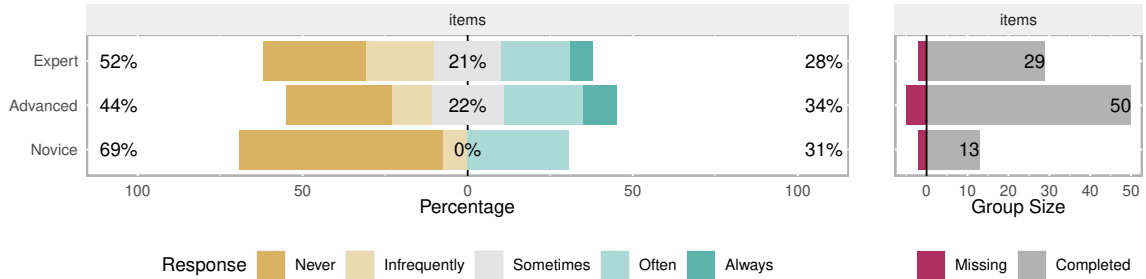


Figure D.22.: Capturing decisions using IDE-integrated software (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.491$	$p = 0.288 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.661 > 0.10$	$p = 0.661 > 0.10$	X
Expert ↔ Novice	$p = 0.244 > 0.10$	$p = 0.366 > 0.10$	X
Advanced ↔ Novice	$p = 0.114 > 0.10$	$p = 0.343 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.073$	$p = 0.490 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.061$	$p = 0.504 > 0.10$	X

Table D.22.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.22.

## D.7. Hypothesis RQ2-H6 – Team Size $\Leftrightarrow$ Decision Documentation Frequency

### D.7.1. Team Size $\Leftrightarrow$ Decision Documentation Frequency (IndepVar: Q-31 – DepVar: Q-01)

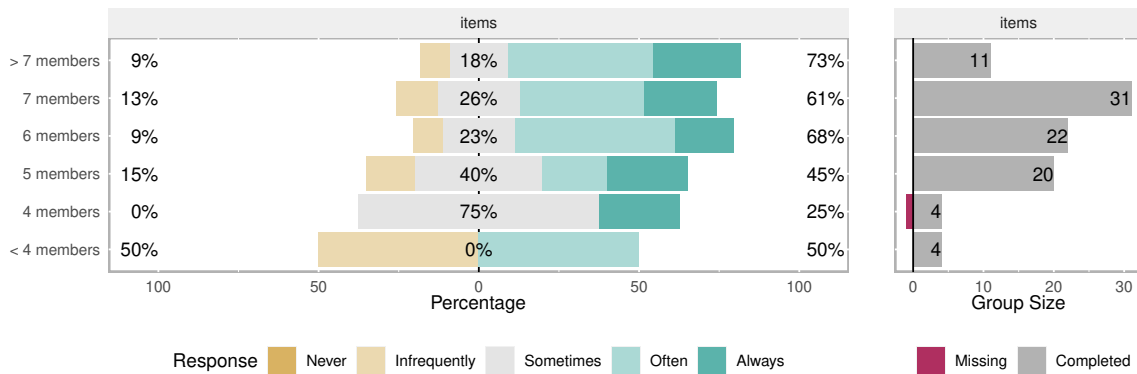


Figure D.23.: Decision documentation frequency ( $\rightarrow$ ) grouped by team size ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.139$	$p = 0.679 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members $\leftrightarrow$ 7 members	$p = 0.545 > 0.10$	$p = 0.818 > 0.10$	X
> 7 members $\leftrightarrow$ 6 members	$p = 0.686 > 0.10$	$p = 0.791 > 0.10$	X
> 7 members $\leftrightarrow$ 5 members	$p = 0.294 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ 4 members	$p = 0.376 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ < 4 members	$p = 0.141 > 0.10$	$p = 1.000 > 0.10$	X
7 members $\leftrightarrow$ 6 members	$p = 0.822 > 0.10$	$p = 0.880 > 0.10$	X
7 members $\leftrightarrow$ 5 members	$p = 0.527 > 0.10$	$p = 0.878 > 0.10$	X
7 members $\leftrightarrow$ 4 members	$p = 0.566 > 0.10$	$p = 0.772 > 0.10$	X
7 members $\leftrightarrow$ < 4 members	$p = 0.223 > 0.10$	$p = 1.000 > 0.10$	X
6 members $\leftrightarrow$ 5 members	$p = 0.429 > 0.10$	$p = 0.920 > 0.10$	X
6 members $\leftrightarrow$ 4 members	$p = 0.499 > 0.10$	$p = 0.935 > 0.10$	X
6 members $\leftrightarrow$ < 4 members	$p = 0.191 > 0.10$	$p = 1.000 > 0.10$	X
5 members $\leftrightarrow$ 4 members	$p = 0.822 > 0.10$	$p = 0.822 > 0.10$	X
5 members $\leftrightarrow$ < 4 members	$p = 0.395 > 0.10$	$p = 0.987 > 0.10$	X
4 members $\leftrightarrow$ < 4 members	$p = 0.628 > 0.10$	$p = 0.785 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.081$	$p = 0.482 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.070$	$p = 0.476 > 0.10$	X

Table D.23.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure D.23.



### D.7.2. Team Size ⇔ Decision Documentation Frequency Across All Decision Types (IndepVar: Q-31 – DepVar: Q-04)

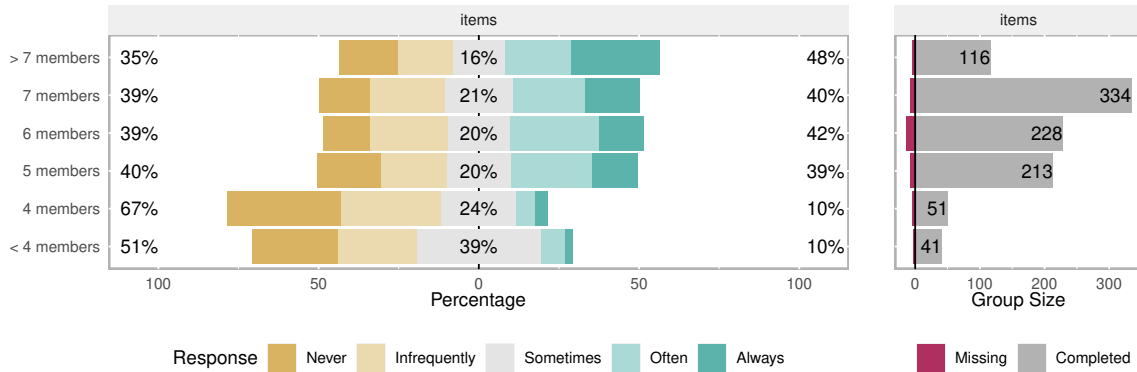


Figure D.24.: Decision documentation frequency across all decision types (→) grouped by team size (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 34.334$	$p = 2.043 * 10^{-6} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members ↔ 7 members	$p = 0.157 > 0.10$	$p = 0.236 > 0.10$	✗
> 7 members ↔ 6 members	$p = 0.215 > 0.10$	$p = 0.293 > 0.10$	✗
> 7 members ↔ 5 members	$p = 0.069 > 0.05$	$p = 0.115 > 0.10$	✗
> 7 members ↔ 4 members	$p = 9.881 * 10^{-7} \ll 0.05$	$p = 1.482 * 10^{-5} \ll 0.05$	✓
> 7 members ↔ < 4 members	$p = 3.302 * 10^{-4} \ll 0.05$	$p = 9.907 * 10^{-4} \ll 0.05$	✓
7 members ↔ 6 members	$p = 0.899 > 0.10$	$p = 0.899 > 0.10$	✗
7 members ↔ 5 members	$p = 0.512 > 0.10$	$p = 0.548 > 0.10$	✗
7 members ↔ 4 members	$p = 8.366 * 10^{-6} \ll 0.05$	$p = 6.275 * 10^{-5} \ll 0.05$	✓
7 members ↔ < 4 members	$p = 0.003 \ll 0.05$	$p = 0.006 < 0.05$	✓
6 members ↔ 5 members	$p = 0.473 > 0.10$	$p = 0.545 > 0.10$	✗
6 members ↔ 4 members	$p = 1.109 * 10^{-5} \ll 0.05$	$p = 5.543 * 10^{-5} \ll 0.05$	✓
6 members ↔ < 4 members	$p = 0.003 \ll 0.05$	$p = 0.006 < 0.05$	✓
5 members ↔ 4 members	$p = 8.568 * 10^{-5} \ll 0.05$	$p = 3.213 * 10^{-4} \ll 0.05$	✓
5 members ↔ < 4 members	$p = 0.009 < 0.05$	$p = 0.018 < 0.05$	✓
4 members ↔ < 4 members	$p = 0.418 > 0.10$	$p = 0.522 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.088$	$p = 0.011 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.074$	$p = 0.011 < 0.05$	✓

Table D.24.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure D.24.

### D.7.3. Team Size ⇔ Decision Documentation Frequency Across All Scrum Phases (IndepVar: Q-31 – DepVar: Q-14)

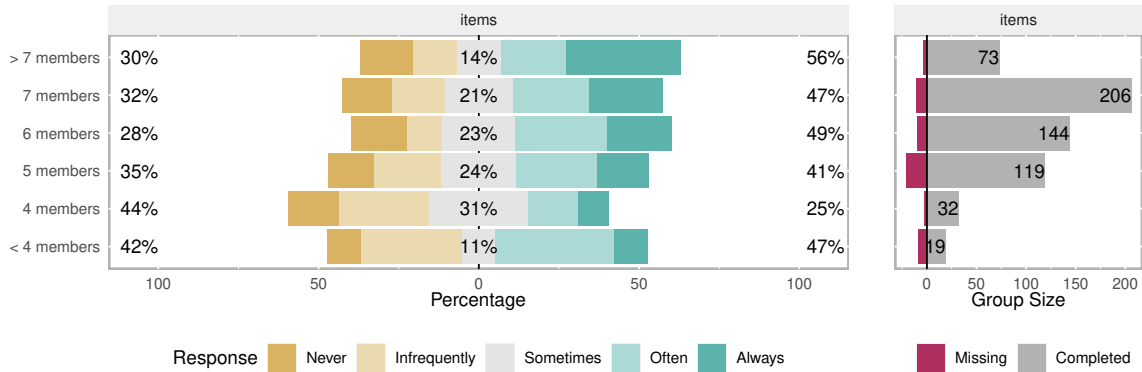


Figure D.25.: Decision documentation frequency across all Scrum phases (→) grouped by team size (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.565$	$p = 0.128 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members ↔ 7 members	$p = 0.163 > 0.10$	$p = 0.488 > 0.10$	X
> 7 members ↔ 6 members	$p = 0.206 > 0.10$	$p = 0.514 > 0.10$	X
> 7 members ↔ 5 members	$p = 0.040 < 0.05$	$p = 0.301 > 0.10$	X
> 7 members ↔ 4 members	$p = 0.009 < 0.05$	$p = 0.131 > 0.10$	X
> 7 members ↔ < 4 members	$p = 0.209 > 0.10$	$p = 0.393 > 0.10$	X
7 members ↔ 6 members	$p = 0.939 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ 5 members	$p = 0.318 > 0.10$	$p = 0.530 > 0.10$	X
7 members ↔ 4 members	$p = 0.054 < 0.10$	$p = 0.271 > 0.10$	X
7 members ↔ < 4 members	$p = 0.579 > 0.10$	$p = 0.668 > 0.10$	X
6 members ↔ 5 members	$p = 0.320 > 0.10$	$p = 0.480 > 0.10$	X
6 members ↔ 4 members	$p = 0.056 < 0.10$	$p = 0.208 > 0.10$	X
6 members ↔ < 4 members	$p = 0.562 > 0.10$	$p = 0.703 > 0.10$	X
5 members ↔ 4 members	$p = 0.208 > 0.10$	$p = 0.445 > 0.10$	X
5 members ↔ < 4 members	$p = 0.941 > 0.10$	$p = 0.941 > 0.10$	X
4 members ↔ < 4 members	$p = 0.422 > 0.10$	$p = 0.575 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.072$	$p = 0.107 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.061$	$p = 0.103 > 0.10$	X

Table D.25.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure D.25.

**Note:** Since the significance of the rank correlation according to *Spearman* yields a value close to  $p = 0.10$ , the significance of *Kendall's Tau* was further considered (cf. Section 5.2). Here, however, both yielded a value of  $p > 0.10$ . Thus, there is no rank correlation.

## D.8. Hypothesis RQ2-H7 – Scrum Role ⇔ Decision Documentation

### D.8.1. Scrum Role ⇔ Decision Documentation Frequency (IndepVar: Q-28 – DepVar: Q-01)

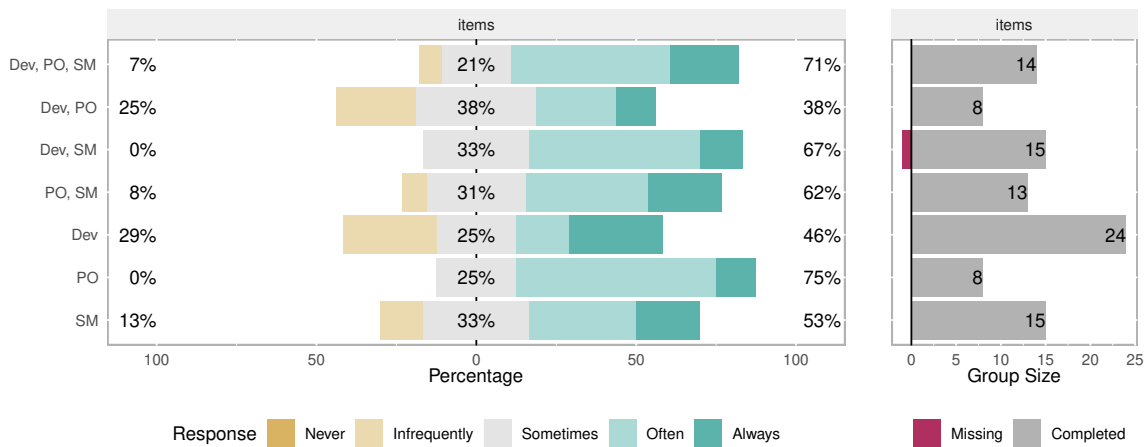


Figure D.26.: Decision documentation frequency (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.638$	$p = 0.726 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.244 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ PO	$p = 0.993 > 0.10$	$p = 0.993 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.456 > 0.10$	$p = 0.957 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.786 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.154 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ Dev, SM	$p = 0.816 > 0.10$	$p = 0.952 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.555 > 0.10$	$p = 0.972 > 0.10$	✗
Dev, PO ↔ PO	$p = 0.203 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ SM	$p = 0.417 > 0.10$	$p = 0.973 > 0.10$	✗
Dev, PO ↔ PO, SM	$p = 0.240 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ Dev, SM	$p = 0.212 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ Dev	$p = 0.354 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.836 > 0.10$	$p = 0.924 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.601 > 0.10$	$p = 0.971 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.962 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ PO	$p = 0.332 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ SM	$p = 0.728 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ PO, SM	$p = 0.405 > 0.10$	$p = 1.000 > 0.10$	✗
PO ↔ SM	$p = 0.521 > 0.10$	$p = 0.994 > 0.10$	✗
PO ↔ PO, SM	$p = 0.809 > 0.10$	$p = 0.999 > 0.10$	✗
SM ↔ PO, SM	$p = 0.649 > 0.10$	$p = 0.973 > 0.10$	✗

Table D.26.: Results of test for difference – grouped by Scrum role – cf. Figure D.26.

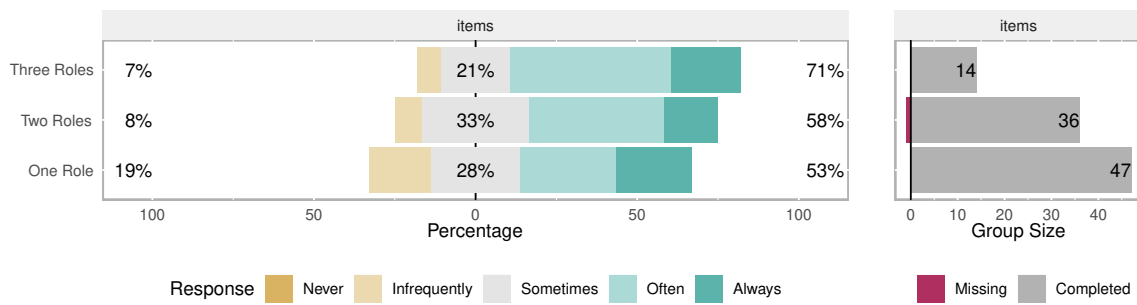


Figure D.27.: Decision documentation frequency (→) grouped by the quantity of Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.895$	$p = 0.639 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.496 > 0.10$	$p = 0.744 > 0.10$	✗
Three Roles ↔ One Role	$p = 0.344 > 0.10$	$p = 1.000 > 0.10$	✗
Two Roles ↔ One Role	$p = 0.740 > 0.10$	$p = 0.740 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.086$	$p = 0.405 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.077$	$p = 0.390 > 0.10$	✗

Table D.27.: Results of test for difference and correlation analysis – grouped by the quantity of Scrum roles – cf. Figure D.27.

**Note:** The correlation here relates the increasing quantity of roles with profound experience to the documentation frequency of decisions.

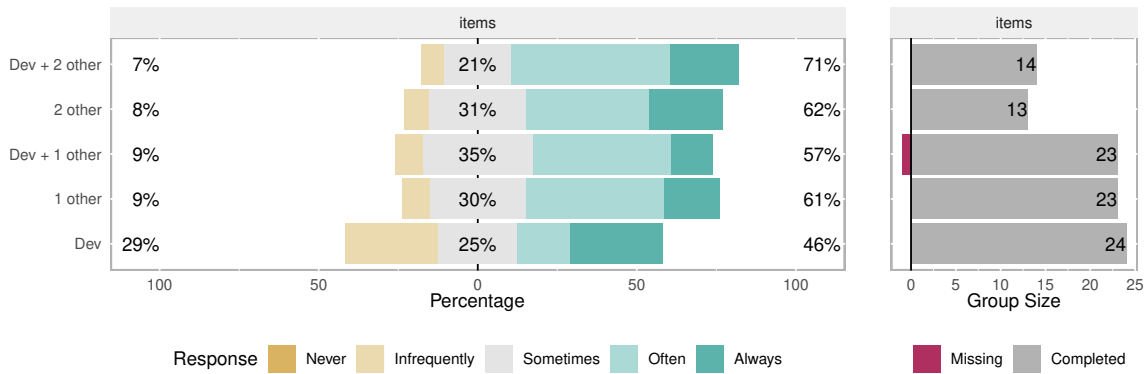


Figure D.28.: Decision documentation frequency (→) grouped by Scrum role *Developer* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.669$	$p = 0.796 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other ↔ 1 other	$p = 0.597 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 2 other ↔ Dev	$p = 0.244 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 2 other ↔ 2 other	$p = 0.786 > 0.10$	$p = 0.873 > 0.10$	X
Dev + 2 other ↔ Dev + 1 other	$p = 0.415 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ 1 other	$p = 0.829 > 0.10$	$p = 0.829 > 0.10$	X
2 other ↔ Dev	$p = 0.405 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Dev + 1 other	$p = 0.621 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 1 other ↔ 1 other	$p = 0.742 > 0.10$	$p = 0.928 > 0.10$	X
Dev + 1 other ↔ Dev	$p = 0.693 > 0.10$	$p = 0.990 > 0.10$	X
1 other ↔ Dev	$p = 0.467 > 0.10$	$p = 1.000 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.112$	$p = 0.275 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.095$	$p = 0.261 > 0.10$	X

Table D.28.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.28.

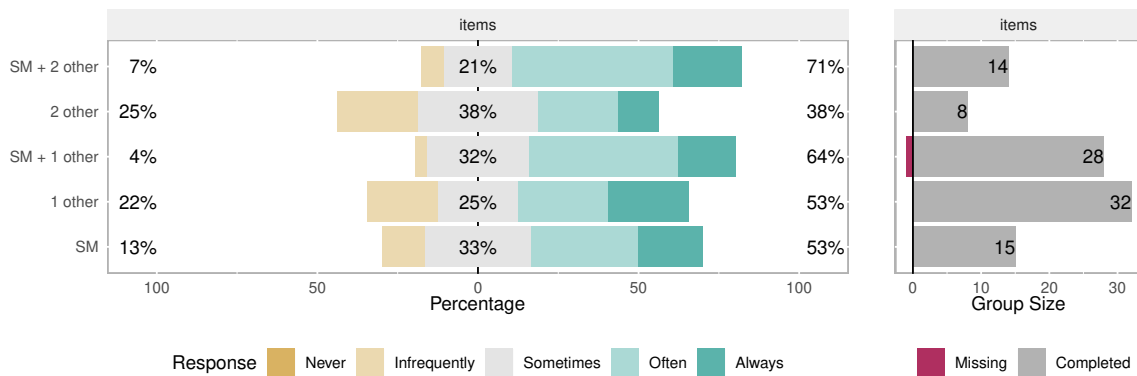


Figure D.29.: Decision documentation frequency (→) grouped by Scrum role *Scrum Master* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.696$	$p = 0.610 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other ↔ 1 other	$p = 0.361 > 0.10$	$p = 1.000 > 0.10$	X
SM + 2 other ↔ SM	$p = 0.456 > 0.10$	$p = 0.651 > 0.10$	X
SM + 2 other ↔ 2 other	$p = 0.154 > 0.10$	$p = 1.000 > 0.10$	X
SM + 2 other ↔ SM + 1 other	$p = 0.772 > 0.10$	$p = 0.858 > 0.10$	X
2 other ↔ 1 other	$p = 0.390 > 0.10$	$p = 0.975 > 0.10$	X
2 other ↔ SM	$p = 0.417 > 0.10$	$p = 0.834 > 0.10$	X
2 other ↔ SM + 1 other	$p = 0.180 > 0.10$	$p = 0.900 > 0.10$	X
SM + 1 other ↔ 1 other	$p = 0.444 > 0.10$	$p = 0.741 > 0.10$	X
SM + 1 other ↔ SM	$p = 0.569 > 0.10$	$p = 0.711 > 0.10$	X
1 other ↔ SM	$p = 0.960 > 0.10$	$p = 0.960 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.042$	$p = 0.760 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.038$	$p = 0.757 > 0.10$	X

Table D.29.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.29.

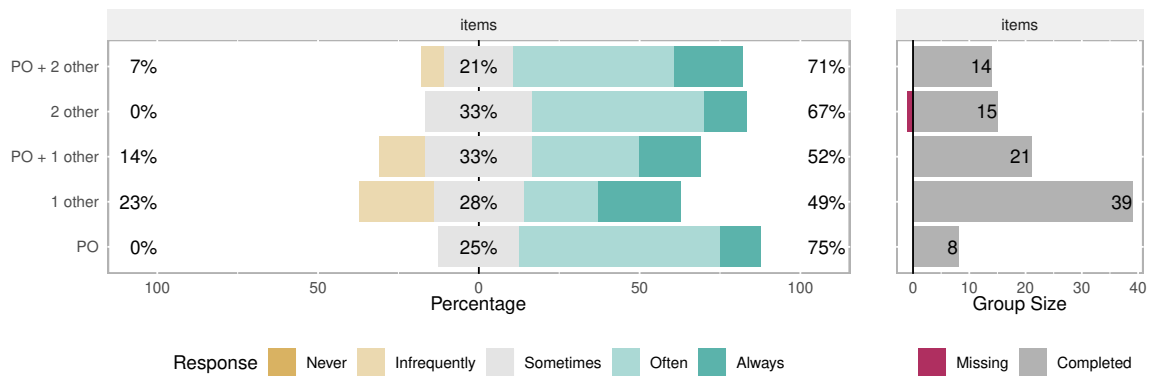


Figure D.30.: Decision documentation frequency ( $\rightarrow$ ) grouped by Scrum role *Product Owner* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.137$	$p = 0.711 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
PO + 2 other $\leftrightarrow$ 1 other	$p = 0.264 > 0.10$	$p = 1.000 > 0.10$	X
PO + 2 other $\leftrightarrow$ PO	$p = 0.993 > 0.10$	$p = 0.993 > 0.10$	X
PO + 2 other $\leftrightarrow$ 2 other	$p = 0.816 > 0.10$	$p = 1.000 > 0.10$	X
PO + 2 other $\leftrightarrow$ PO + 1 other	$p = 0.376 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ 1 other	$p = 0.390 > 0.10$	$p = 0.975 > 0.10$	X
2 other $\leftrightarrow$ PO	$p = 0.836 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ PO + 1 other	$p = 0.517 > 0.10$	$p = 0.861 > 0.10$	X
PO + 1 other $\leftrightarrow$ 1 other	$p = 0.877 > 0.10$	$p = 0.974 > 0.10$	X
PO + 1 other $\leftrightarrow$ PO	$p = 0.456 > 0.10$	$p = 0.912 > 0.10$	X
1 other $\leftrightarrow$ PO	$p = 0.365 > 0.10$	$p = 1.000 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.145$	$p = 0.260 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.130$	$p = 0.250 > 0.10$	X

Table D.30.: Results of test for difference – grouped by Scrum role *Product Owner* – cf. Figure D.30.

## D.8.2. Scrum Role ⇔ Decision Documentation Frequency Across All Decision Types (IndepVar: Q-28 – DepVar: Q-04)

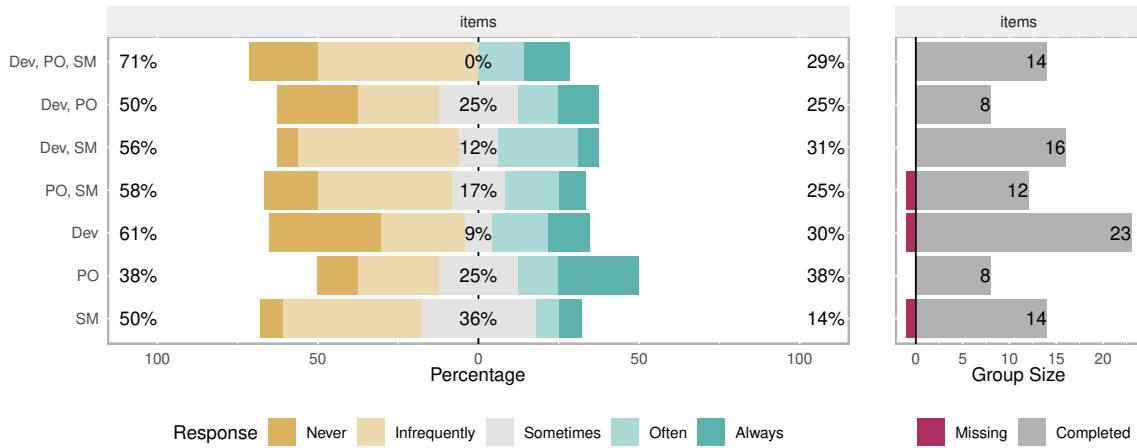


Figure D.31.: Documentation frequency across all decision types (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 22.055$	$p = 0.001 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.469 > 0.10$	$p = 0.580 > 0.10$	✗
Dev, PO, SM ↔ PO	$p = 0.210 > 0.10$	$p = 0.340 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.034 < 0.05$	$p = 0.101 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.722 > 0.10$	$p = 0.758 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.021 < 0.05$	$p = 0.072 < 0.10$	✓
Dev, PO, SM ↔ Dev, SM	$p = 0.578 > 0.10$	$p = 0.674 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.056 > 0.05$	$p = 0.131 > 0.10$	✗
Dev, PO ↔ PO	$p = 0.002 \ll 0.05$	$p = 0.018 < 0.05$	✓
Dev, PO ↔ SM	$p = 4.147 * 10^{-5} \ll 0.05$	$p = 8.708 * 10^{-4} \ll 0.05$	✓
Dev, PO ↔ PO, SM	$p = 0.010 < 0.05$	$p = 0.042 < 0.05$	✓
Dev, PO ↔ Dev, SM	$p = 0.060 > 0.05$	$p = 0.126 > 0.10$	✗
Dev, SM ↔ Dev	$p = 0.909 > 0.10$	$p = 0.909 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.083 > 0.05$	$p = 0.159 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.007 < 0.05$	$p = 0.034 < 0.05$	✓
Dev, SM ↔ PO, SM	$p = 0.366 > 0.10$	$p = 0.480 > 0.10$	✗
Dev ↔ PO	$p = 0.053 > 0.05$	$p = 0.139 > 0.10$	✗
Dev ↔ SM	$p = 0.002 \ll 0.05$	$p = 0.014 < 0.05$	✓
Dev ↔ PO, SM	$p = 0.273 > 0.10$	$p = 0.409 > 0.10$	✗
PO ↔ SM	$p = 0.599 > 0.10$	$p = 0.662 > 0.10$	✗
PO ↔ PO, SM	$p = 0.352 > 0.10$	$p = 0.493 > 0.10$	✗
SM ↔ PO, SM	$p = 0.086 > 0.05$	$p = 0.151 > 0.10$	✗

Table D.31.: Results of test for difference – grouped by Scrum role – cf. Figure D.31.



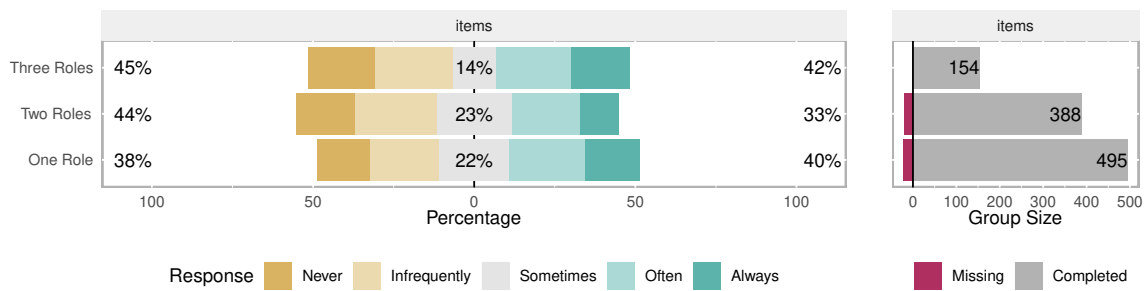


Figure D.32.: Documentation frequency across all decision types ( $\rightarrow$ ) grouped by the quantity of Scrum roles ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.660$	$p = 0.097 < 0.10$	✓

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles $\leftrightarrow$ Two Roles	$p = 0.407 > 0.10$	$p = 0.610 > 0.10$	✗
Three Roles $\leftrightarrow$ One Role	$p = 0.466 > 0.10$	$p = 0.466 > 0.10$	✗
Two Roles $\leftrightarrow$ One Role	$p = 0.031 < 0.05$	$p = 0.093 < 0.10$	✓

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.050$	$p = 0.106 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.044$	$p = 0.101 > 0.10$	✗

Table D.32.: Results of test for difference and correlation analysis – grouped by the quantity of Scrum roles – cf. Figure D.32.

**Note:** The correlation here relates the increasing quantity of roles with profound experience to the documentation frequency of decisions.

Since the significance of the rank correlation according to *Spearman* yields a value close to  $p = 0.10$ , the significance of *Kendall's Tau* was further considered (cf. Section 5.2). Here, however, both yielded a value of  $p > 0.10$ . Thus, there is no rank correlation.

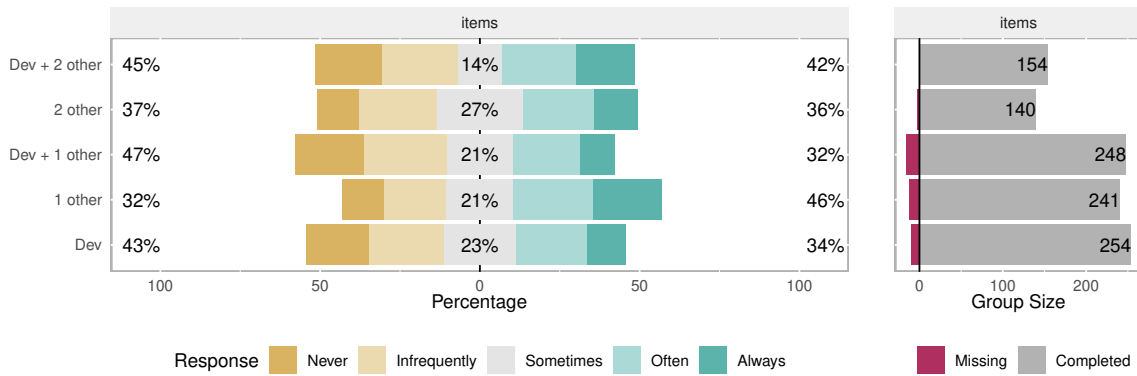


Figure D.33.: Documentation frequency across all decision types (→) grouped by Scrum role *Developer* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 18.244$	$p = 0.001 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other ↔ 1 other	$p = 0.036 < 0.05$	$p = 0.121 > 0.10$	✗
Dev + 2 other ↔ Dev	$p = 0.469 > 0.10$	$p = 0.522 > 0.10$	✗
Dev + 2 other ↔ 2 other	$p = 0.722 > 0.10$	$p = 0.722 > 0.10$	✗
Dev + 2 other ↔ Dev + 1 other	$p = 0.152 > 0.10$	$p = 0.253 > 0.10$	✗
2 other ↔ 1 other	$p = 0.100 \leq 0.10$	$p = 0.201 > 0.10$	✗
2 other ↔ Dev	$p = 0.273 > 0.10$	$p = 0.390 > 0.10$	✗
2 other ↔ Dev + 1 other	$p = 0.074 > 0.05$	$p = 0.186 > 0.10$	✗
Dev + 1 other ↔ 1 other	$p = 5.931 * 10^{-5} \ll 0.05$	$p = 5.931 * 10^{-4} \ll 0.05$	✓
Dev + 1 other ↔ Dev	$p = 0.412 > 0.10$	$p = 0.515 > 0.10$	✗
1 other ↔ Dev	$p = 0.001 \ll 0.05$	$p = 0.006 < 0.05$	✓

Table D.33.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.33.

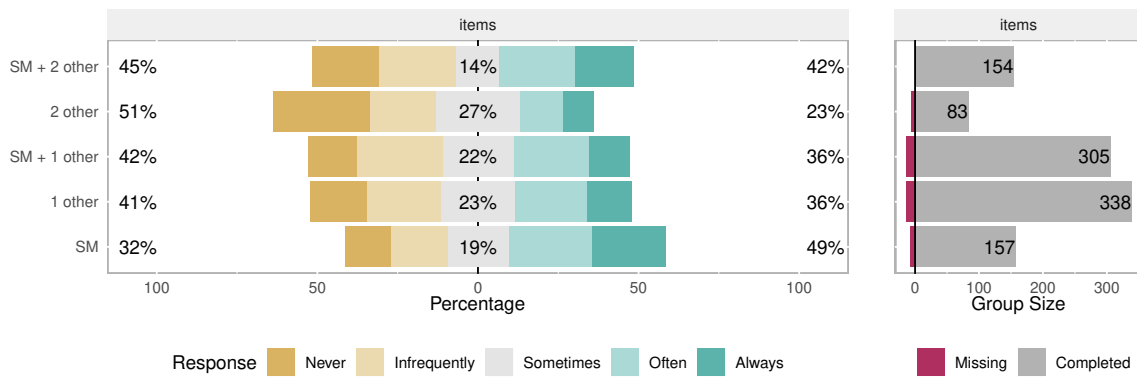


Figure D.34.: Documentation frequency across all decision types (→) grouped by Scrum role *Scrum Master* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.487$	$p = 0.002 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other ↔ 1 other	$p = 0.891 > 0.10$	$p = 0.990 > 0.10$	✗
SM + 2 other ↔ SM	$p = 0.034 < 0.05$	$p = 0.048 < 0.05$	✓
SM + 2 other ↔ 2 other	$p = 0.021 < 0.05$	$p = 0.034 < 0.05$	✓
SM + 2 other ↔ SM + 1 other	$p = 0.882 > 0.10$	$p = 1.000 > 0.10$	✗
2 other ↔ 1 other	$p = 0.014 < 0.05$	$p = 0.034 < 0.05$	✓
2 other ↔ SM	$p = 4.147 * 10^{-5} \ll 0.05$	$p = 4.147 * 10^{-4} \ll 0.05$	✓
2 other ↔ SM + 1 other	$p = 0.015 < 0.05$	$p = 0.030 < 0.05$	✓
SM + 1 other ↔ 1 other	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	✗
SM + 1 other ↔ SM	$p = 0.009 < 0.05$	$p = 0.031 < 0.05$	✓
1 other ↔ SM	$p = 0.008 < 0.05$	$p = 0.042 < 0.05$	✓

Table D.34.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.34.

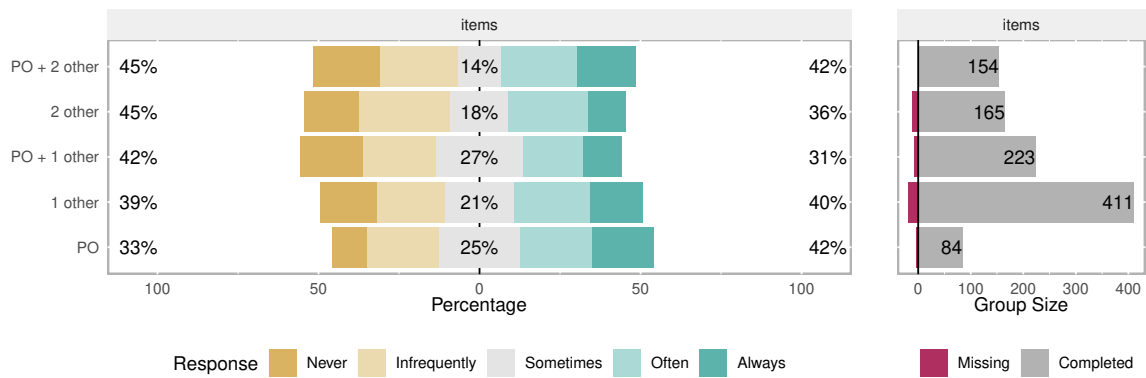


Figure D.35.: Documentation frequency across all decision types ( $\rightarrow$ ) grouped by Scrum role *Product Owner* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.803$	$p = 0.214 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
PO + 2 other $\leftrightarrow$ 1 other	$p = 0.624 > 0.10$	$p = 0.693 > 0.10$	X
PO + 2 other $\leftrightarrow$ PO	$p = 0.210 > 0.10$	$p = 0.526 > 0.10$	X
PO + 2 other $\leftrightarrow$ 2 other	$p = 0.578 > 0.10$	$p = 0.722 > 0.10$	X
PO + 2 other $\leftrightarrow$ PO + 1 other	$p = 0.383 > 0.10$	$p = 0.548 > 0.10$	X
2 other $\leftrightarrow$ 1 other	$p = 0.238 > 0.10$	$p = 0.476 > 0.10$	X
2 other $\leftrightarrow$ PO	$p = 0.083 < 0.10$	$p = 0.416 > 0.10$	X
2 other $\leftrightarrow$ PO + 1 other	$p = 0.778 > 0.10$	$p = 0.778 > 0.10$	X
PO + 1 other $\leftrightarrow$ 1 other	$p = 0.098 < 0.10$	$p = 0.326 > 0.10$	X
PO + 1 other $\leftrightarrow$ PO	$p = 0.041 < 0.05$	$p = 0.413 > 0.10$	X
1 other $\leftrightarrow$ PO	$p = 0.302 > 0.10$	$p = 0.504 > 0.10$	X

Table D.35.: Results of test for difference – grouped by Scrum role *Product Owner* – cf. Figure D.35.

### D.8.3. Scrum Role ⇔ Decision Documentation Frequency Across All Phases (IndepVar: Q-28 – DepVar: Q-14)

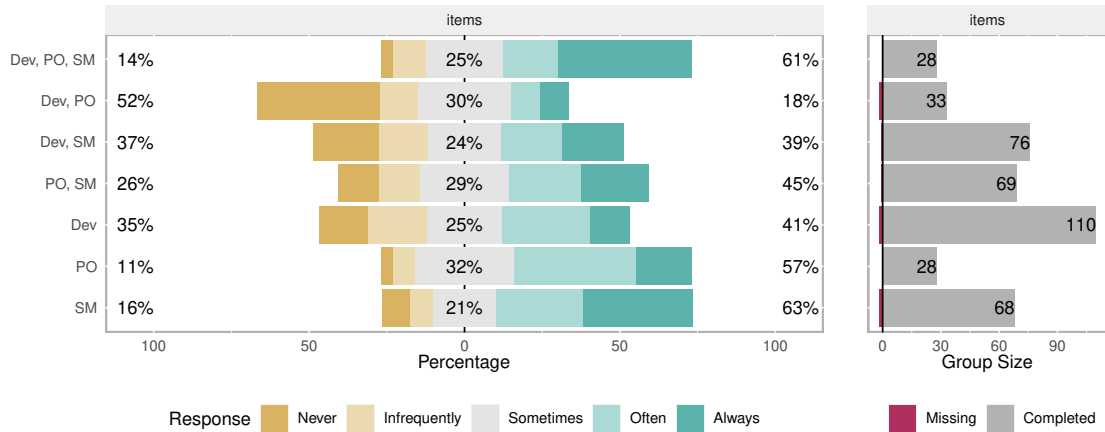


Figure D.36.: Documentation frequency across all Scrum phases (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 30.404$	$p = 3.293 * 10^{-5} \lll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.032 < 0.05$	$p = 0.085 < 0.10$	✓
Dev, PO, SM ↔ PO	$p = 0.295 > 0.10$	$p = 0.516 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.525 > 0.10$	$p = 0.648 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.193 > 0.10$	$p = 0.368 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 3.992 * 10^{-7} \lll 0.05$	$p = 8.384 * 10^{-6} \lll 0.05$	✓
Dev, PO, SM ↔ Dev, SM	$p = 0.018 < 0.05$	$p = 0.054 < 0.10$	✓
Dev, PO ↔ Dev	$p = 1.774 * 10^{-4} \lll 0.05$	$p = 9.312 * 10^{-4} \lll 0.05$	✓
Dev, PO ↔ PO	$p = 3.092 * 10^{-4} \lll 0.05$	$p = 0.001 \lll 0.05$	✓
Dev, PO ↔ SM	$p = 3.685 * 10^{-6} \lll 0.05$	$p = 3.869 * 10^{-5} \lll 0.05$	✓
Dev, PO ↔ PO, SM	$p = 1.008 * 10^{-4} \lll 0.05$	$p = 7.055 * 10^{-4} \lll 0.05$	✓
Dev, PO ↔ Dev, SM	$p = 0.001 \lll 0.05$	$p = 0.004 \lll 0.05$	✓
Dev, SM ↔ Dev	$p = 0.659 > 0.10$	$p = 0.692 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.348 > 0.10$	$p = 0.522 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.077 > 0.05$	$p = 0.179 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.334 > 0.10$	$p = 0.540 > 0.10$	✗
Dev ↔ PO	$p = 0.520 > 0.10$	$p = 0.683 > 0.10$	✗
Dev ↔ SM	$p = 0.136 > 0.10$	$p = 0.286 > 0.10$	✗
Dev ↔ PO, SM	$p = 0.528 > 0.10$	$p = 0.616 > 0.10$	✗
PO ↔ SM	$p = 0.600 > 0.10$	$p = 0.664 > 0.10$	✗
PO ↔ PO, SM	$p = 0.925 > 0.10$	$p = 0.925 > 0.10$	✗
SM ↔ PO, SM	$p = 0.476 > 0.10$	$p = 0.667 > 0.10$	✗

Table D.36.: Results of test for difference – grouped by Scrum role – cf. Figure D.36.

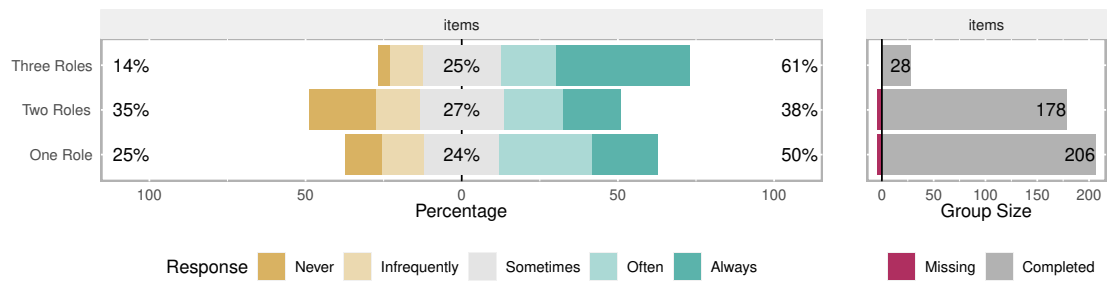


Figure D.37.: Documentation frequency across all Scrum phases (→) grouped by the quantity of Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 12.166$	$p = 0.002 \ll 0.05$	✓

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.001 \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Three Roles ↔ One Role	$p = 0.089 < 0.10$	$p = 0.089 < 0.10$	✓
Two Roles ↔ One Role	$p = 0.019 < 0.05$	$p = 0.028 < 0.05$	✓

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.003$	$p = 0.944 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.004$	$p = 0.897 > 0.10$	✗

Table D.37.: Results of test for difference and correlation analysis – grouped by the quantity of Scrum roles – cf. Figure D.37.

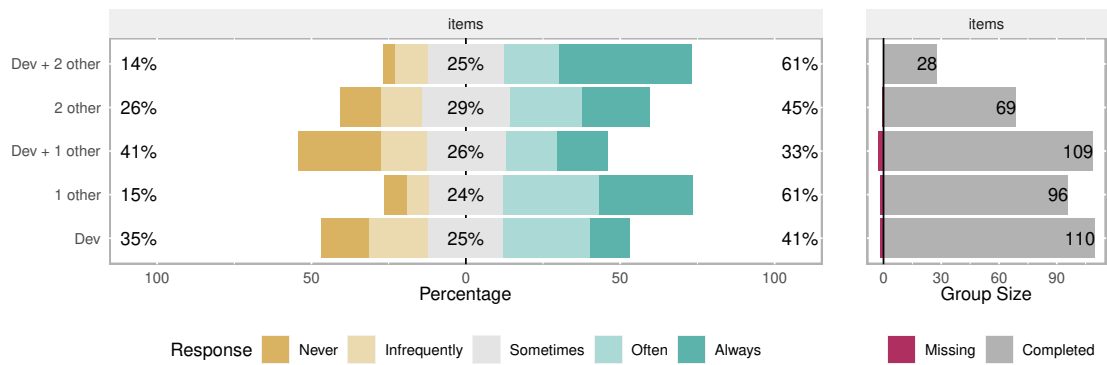


Figure D.38.: Documentation frequency across all Scrum phases ( $\rightarrow$ ) grouped by Scrum role *Developer* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 19.724$	$p = 5.661 * 10^{-4} \ll 0.05$	✓

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other $\leftrightarrow$ 1 other	$p = 0.354 > 0.10$	$p = 0.442 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev	$p = 0.032 < 0.05$	$p = 0.081 < 0.10$	✓
Dev + 2 other $\leftrightarrow$ 2 other	$p = 0.193 > 0.10$	$p = 0.275 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev + 1 other	$p = 9.123 * 10^{-5} \ll 0.05$	$p = 9.123 * 10^{-4} \ll 0.05$	✓
2 other $\leftrightarrow$ 1 other	$p = 0.583 > 0.10$	$p = 0.583 > 0.10$	✗
2 other $\leftrightarrow$ Dev	$p = 0.528 > 0.10$	$p = 0.586 > 0.10$	✗
2 other $\leftrightarrow$ Dev + 1 other	$p = 0.018 < 0.05$	$p = 0.061 < 0.10$	✓
Dev + 1 other $\leftrightarrow$ 1 other	$p = 5.160 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Dev + 1 other $\leftrightarrow$ Dev	$p = 0.039 < 0.05$	$p = 0.077 < 0.10$	✓
1 other $\leftrightarrow$ Dev	$p = 0.159 > 0.10$	$p = 0.265 > 0.10$	✗

Table D.38.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.38.

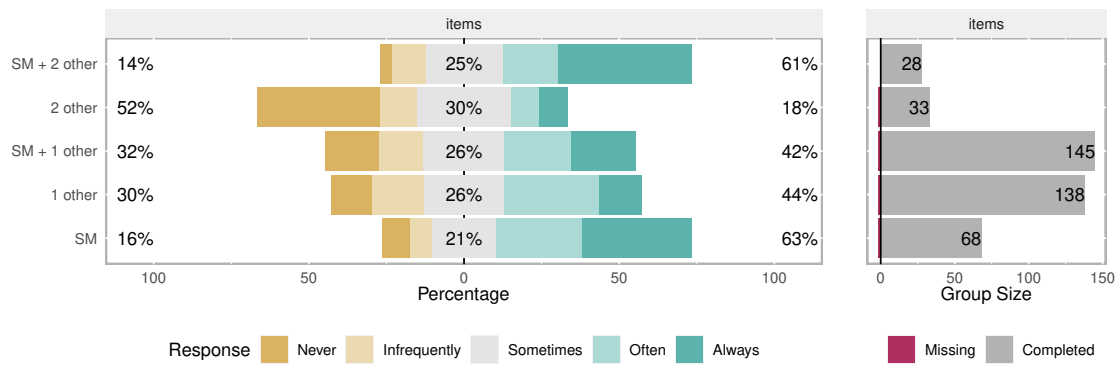


Figure D.39.: Documentation frequency across all Scrum phases ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 29.059$	$p = 7.606 * 10^{-6} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.041 < 0.05$	$p = 0.069 < 0.10$	✓
SM + 2 other $\leftrightarrow$ SM	$p = 0.525 > 0.10$	$p = 0.583 > 0.10$	✗
SM + 2 other $\leftrightarrow$ 2 other	$p = 3.992 * 10^{-7} \ll 0.05$	$p = 3.992 * 10^{-6} \ll 0.05$	✓
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.031 < 0.05$	$p = 0.061 < 0.10$	✓
2 other $\leftrightarrow$ 1 other	$p = 5.339 * 10^{-5} \ll 0.05$	$p = 1.780 * 10^{-4} \ll 0.05$	✓
2 other $\leftrightarrow$ SM	$p = 3.685 * 10^{-6} \ll 0.05$	$p = 1.842 * 10^{-5} \ll 0.05$	✓
2 other $\leftrightarrow$ SM + 1 other	$p = 1.047 * 10^{-4} \ll 0.05$	$p = 2.616 * 10^{-4} \ll 0.05$	✓
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.847 > 0.10$	$p = 0.847 > 0.10$	✗
SM + 1 other $\leftrightarrow$ SM	$p = 0.135 > 0.10$	$p = 0.193 > 0.10$	✗
1 other $\leftrightarrow$ SM	$p = 0.175 > 0.10$	$p = 0.218 > 0.10$	✗

Table D.39.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.39.



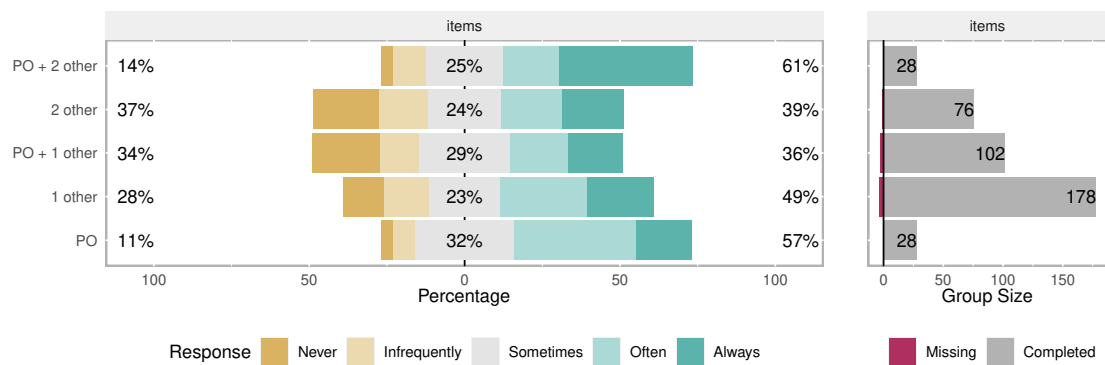


Figure D.40.: Documentation frequency across all Scrum phases ( $\rightarrow$ ) grouped by Scrum role *Product Owner* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 13.060$	$p = 0.011 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
PO + 2 other $\leftrightarrow$ 1 other	$p = 0.089 > 0.05$	$p = 0.178 > 0.10$	✗
PO + 2 other $\leftrightarrow$ PO	$p = 0.295 > 0.10$	$p = 0.421 > 0.10$	✗
PO + 2 other $\leftrightarrow$ 2 other	$p = 0.018 < 0.05$	$p = 0.090 < 0.10$	✓
PO + 2 other $\leftrightarrow$ PO + 1 other	$p = 7.411 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓
2 other $\leftrightarrow$ 1 other	$p = 0.259 > 0.10$	$p = 0.431 > 0.10$	✗
2 other $\leftrightarrow$ PO	$p = 0.348 > 0.10$	$p = 0.435 > 0.10$	✗
2 other $\leftrightarrow$ PO + 1 other	$p = 0.353 > 0.10$	$p = 0.393 > 0.10$	✗
PO + 1 other $\leftrightarrow$ 1 other	$p = 0.018 < 0.05$	$p = 0.062 < 0.10$	✓
PO + 1 other $\leftrightarrow$ PO	$p = 0.086 > 0.05$	$p = 0.215 > 0.10$	✗
1 other $\leftrightarrow$ PO	$p = 0.856 > 0.10$	$p = 0.856 > 0.10$	✗

Table D.40.: Results of test for difference – grouped by Scrum role *Product Owner* – cf. Figure D.40.

### D.8.4. Scrum Role ↔ Decision Documentation Frequency During Individual Scrum Phases (IndepVar: Q-28 – DepVar: Q-14)

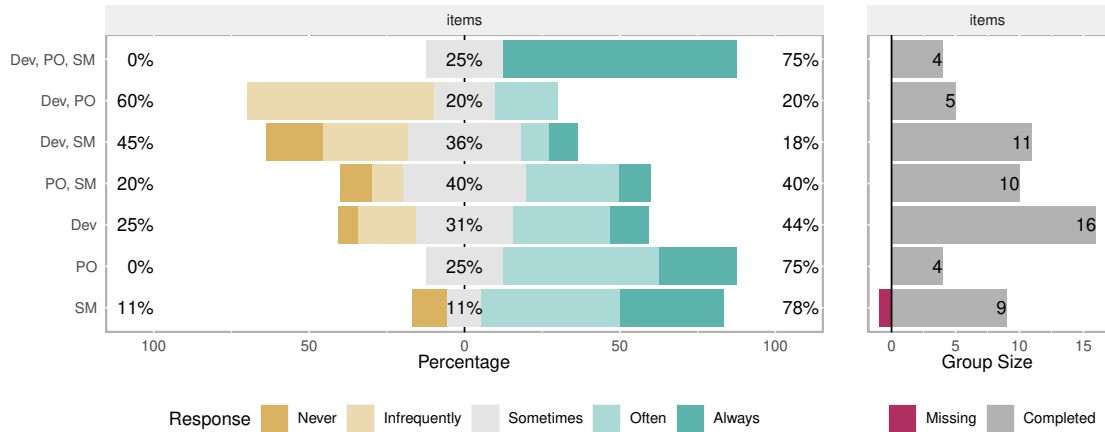


Figure D.41.: Documentation frequency during Backlog Refinement (→) grouped by Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.847$	$p = 0.065 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.376 > 0.10$	$p = 0.526 > 0.10$	✗
Dev, PO, SM ↔ PO	$p = 0.823 > 0.10$	$p = 0.864 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.753 > 0.10$	$p = 0.833 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.109 > 0.10$	$p = 0.328 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.007 < 0.05$	$p = 0.142 > 0.10$	✗
Dev, PO, SM ↔ Dev, SM	$p = 0.044 < 0.05$	$p = 0.186 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.028 < 0.05$	$p = 0.148 > 0.10$	✗
Dev, PO ↔ PO	$p = 0.028 < 0.05$	$p = 0.193 > 0.10$	✗
Dev, PO ↔ SM	$p = 0.015 < 0.05$	$p = 0.154 > 0.10$	✗
Dev, PO ↔ PO, SM	$p = 0.194 > 0.10$	$p = 0.408 > 0.10$	✗
Dev, PO ↔ Dev, SM	$p = 0.284 > 0.10$	$p = 0.458 > 0.10$	✗
Dev, SM ↔ Dev	$p = 0.180 > 0.10$	$p = 0.421 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.141 > 0.10$	$p = 0.370 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.092 < 0.10$	$p = 0.320 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.749 > 0.10$	$p = 0.874 > 0.10$	✗
Dev ↔ PO	$p = 0.624 > 0.10$	$p = 0.771 > 0.10$	✗
Dev ↔ SM	$p = 0.593 > 0.10$	$p = 0.778 > 0.10$	✗
Dev ↔ PO, SM	$p = 0.361 > 0.10$	$p = 0.542 > 0.10$	✗
PO ↔ SM	$p = 0.964 > 0.10$	$p = 0.964 > 0.10$	✗
PO ↔ PO, SM	$p = 0.249 > 0.10$	$p = 0.436 > 0.10$	✗
SM ↔ PO, SM	$p = 0.196 > 0.10$	$p = 0.374 > 0.10$	✗

Table D.41.: Results of test for difference – grouped by Scrum role – cf. Figure D.41.

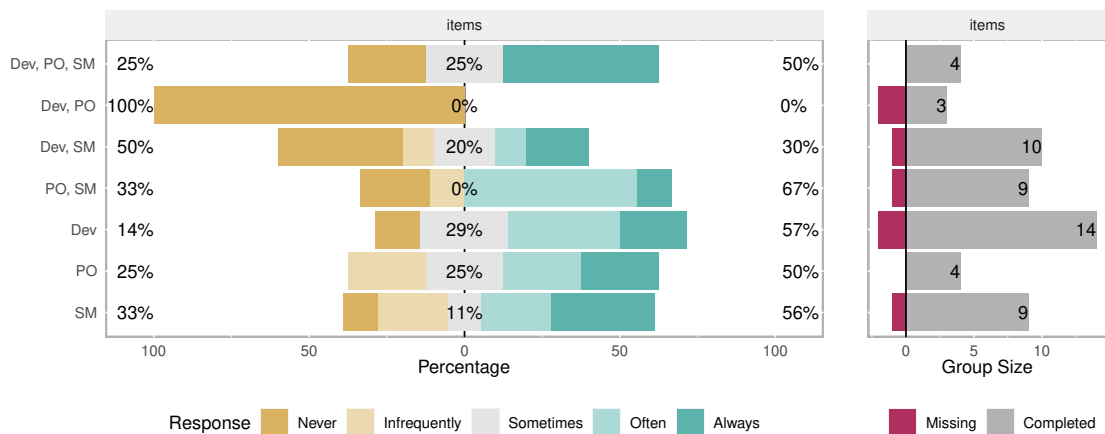


Figure D.42.: Documentation frequency during Planning Poker (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.602$	$p = 0.071 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.272 > 0.10$	$p = 0.635 > 0.10$	✗
Dev, PO, SM ↔ PO	$p = 0.524 > 0.10$	$p = 0.688 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.839 > 0.10$	$p = 0.979 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.870 > 0.10$	$p = 0.962 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.022 < 0.05$	$p = 0.115 > 0.10$	✗
Dev, PO, SM ↔ Dev, SM	$p = 0.550 > 0.10$	$p = 0.680 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.002 \ll 0.05$	$p = 0.033 < 0.05$	✓
Dev, PO ↔ PO	$p = 0.110 > 0.10$	$p = 0.329 > 0.10$	✗
Dev, PO ↔ SM	$p = 0.015 < 0.05$	$p = 0.154 > 0.10$	✗
Dev, PO ↔ PO, SM	$p = 0.019 < 0.05$	$p = 0.136 > 0.10$	✗
Dev, PO ↔ Dev, SM	$p = 0.063 < 0.10$	$p = 0.264 > 0.10$	✗
Dev, SM ↔ Dev	$p = 0.080 < 0.10$	$p = 0.279 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.899 > 0.10$	$p = 0.944 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.423 > 0.10$	$p = 0.684 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.469 > 0.10$	$p = 0.656 > 0.10$	✗
Dev ↔ PO	$p = 0.111 > 0.10$	$p = 0.293 > 0.10$	✗
Dev ↔ SM	$p = 0.381 > 0.10$	$p = 0.800 > 0.10$	✗
Dev ↔ PO, SM	$p = 0.400 > 0.10$	$p = 0.765 > 0.10$	✗
PO ↔ SM	$p = 0.418 > 0.10$	$p = 0.731 > 0.10$	✗
PO ↔ PO, SM	$p = 0.453 > 0.10$	$p = 0.680 > 0.10$	✗
SM ↔ PO, SM	$p = 0.979 > 0.10$	$p = 0.979 > 0.10$	✗

Table D.42.: Results of test for difference – grouped by Scrum role – cf. Figure D.42.

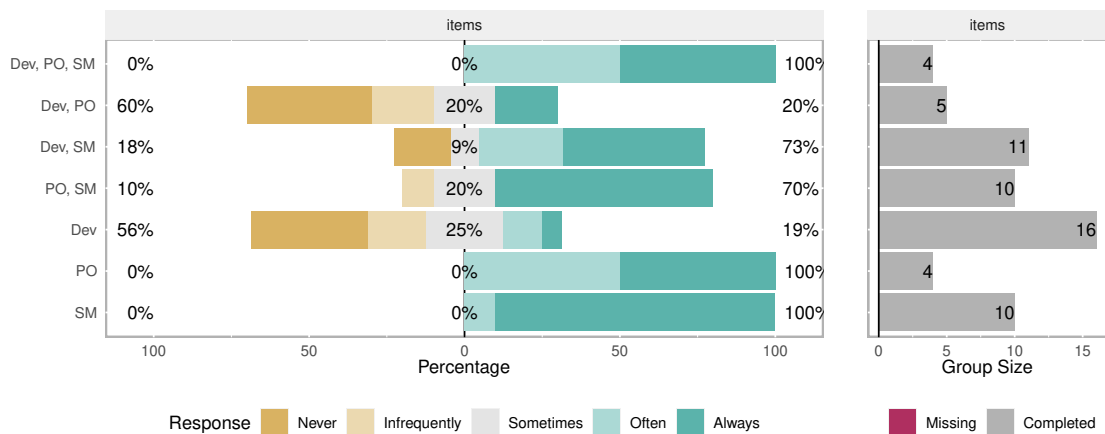


Figure D.43.: Documentation frequency during Retrospective (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 29.319$	$p = 5.294 * 10^{-5} \lll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 5.243 * 10^{-4} \lll 0.05$	$p = 0.006 < 0.05$	✓
Dev, PO, SM ↔ PO	$p = 0.985 > 0.10$	$p = 0.985 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.770 > 0.10$	$p = 0.952 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.845 > 0.10$	$p = 0.934 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.003 \lll 0.05$	$p = 0.012 < 0.05$	✓
Dev, PO, SM ↔ Dev, SM	$p = 0.384 > 0.10$	$p = 0.672 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.721 > 0.10$	$p = 0.946 > 0.10$	✗
Dev, PO ↔ PO	$p = 0.008 < 0.05$	$p = 0.020 < 0.05$	✓
Dev, PO ↔ SM	$p = 0.001 \lll 0.05$	$p = 0.008 < 0.05$	✓
Dev, PO ↔ PO, SM	$p = 0.006 < 0.05$	$p = 0.019 < 0.05$	✓
Dev, PO ↔ Dev, SM	$p = 0.020 < 0.05$	$p = 0.043 < 0.05$	✓
Dev, SM ↔ Dev	$p = 0.008 < 0.05$	$p = 0.020 < 0.05$	✓
Dev, SM ↔ PO	$p = 0.451 > 0.10$	$p = 0.728 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.235 > 0.10$	$p = 0.448 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.527 > 0.10$	$p = 0.791 > 0.10$	✗
Dev ↔ PO	$p = 0.004 \lll 0.05$	$p = 0.014 < 0.05$	✓
Dev ↔ SM	$p = 1.092 * 10^{-4} \lll 0.05$	$p = 0.002 \lll 0.05$	✓
Dev ↔ PO, SM	$p = 0.002 \lll 0.05$	$p = 0.011 < 0.05$	✓
PO ↔ SM	$p = 0.819 > 0.10$	$p = 0.955 > 0.10$	✗
PO ↔ PO, SM	$p = 0.852 > 0.10$	$p = 0.894 > 0.10$	✗
SM ↔ PO, SM	$p = 0.632 > 0.10$	$p = 0.884 > 0.10$	✗

Table D.43.: Results of test for difference – grouped by Scrum role – cf. Figure D.43.

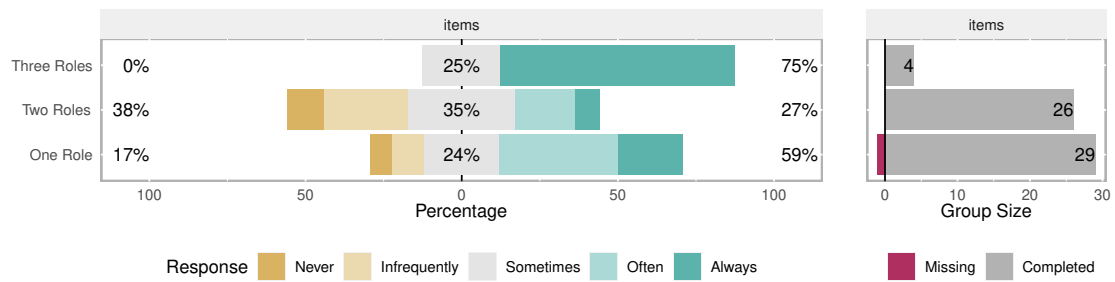


Figure D.44.: Documentation frequency during Backlog Refinement ( $\rightarrow$ ) grouped by the quantity of Scrum roles ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.663$	$p = 0.008 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.011 < 0.05$	$p = 0.017 < 0.05$	✓
Three Roles ↔ One Role	$p = 0.497 > 0.10$	$p = 0.497 > 0.10$	✗
Two Roles ↔ One Role	$p = 0.008 < 0.05$	$p = 0.025 < 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.090$	$p = 0.385 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.083$	$p = 0.346 > 0.10$	✗

Table D.44.: Results of test for difference – grouped by the quantity of Scrum roles – cf. Figure D.44.

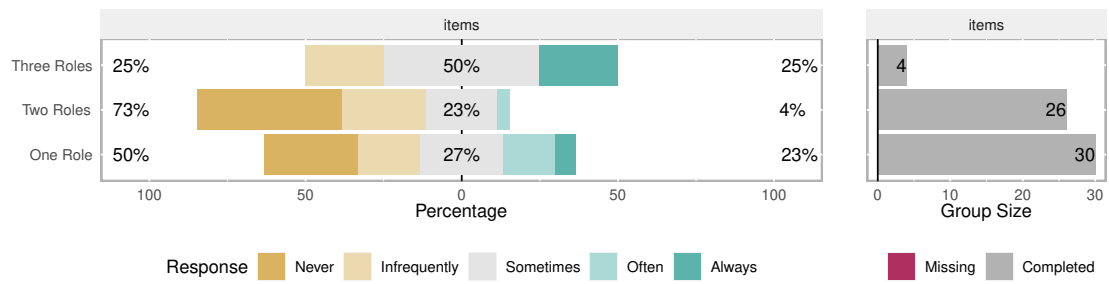


Figure D.45.: Documentation frequency during Daily Scrum (→) grouped by the quantity of Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.165$	$p = 0.028 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.040 < 0.05$	$p = 0.059 < 0.10$	✓
Three Roles ↔ One Role	$p = 0.701 > 0.10$	$p = 0.701 > 0.10$	✗
Two Roles ↔ One Role	$p = 0.017 < 0.05$	$p = 0.051 < 0.10$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.099$	$p = 0.338 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.086$	$p = 0.338 > 0.10$	✗

Table D.45.: Results of test for difference – grouped by the quantity of Scrum roles – cf. Figure D.45.

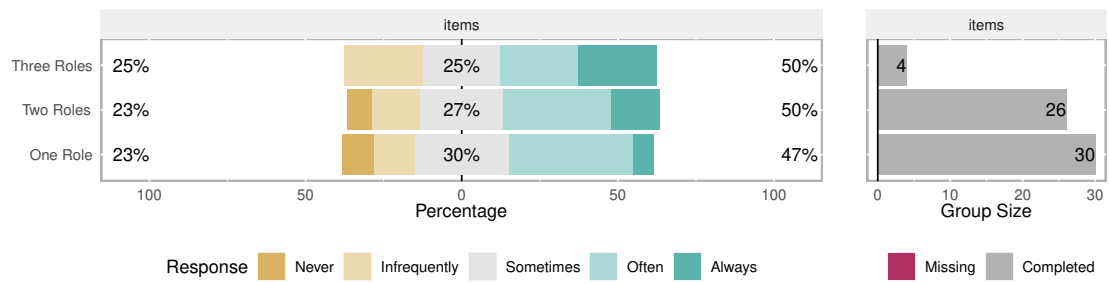


Figure D.46.: Documentation frequency during Review (→) grouped by the quantity of Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.116$	$p = 0.211 > 0.10$	✗

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.471 > 0.10$	$p = 0.471 > 0.10$	✗
Three Roles ↔ One Role	$p = 0.106 > 0.10$	$p = 0.319 > 0.10$	✗
Two Roles ↔ One Role	$p = 0.233 > 0.10$	$p = 0.349 > 0.10$	✗

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.180$	$p = 0.079 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.155$	$p = 0.080 < 0.10$	✓

Table D.46.: Results of test for difference – grouped by the quantity of Scrum roles – cf. Figure D.46.

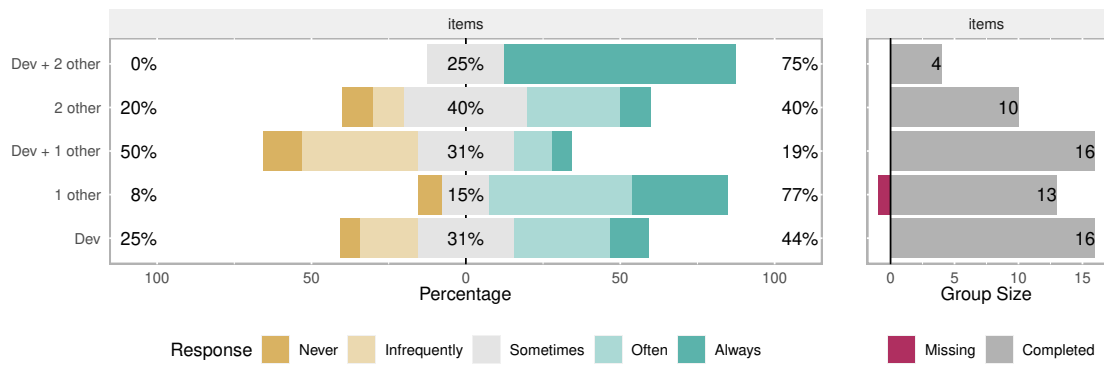


Figure D.47.: Documentation frequency during Backlog Refinement ( $\rightarrow$ ) grouped by Scrum role *Developer* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.696$	$p = 0.030 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other $\leftrightarrow$ 1 other	$p = 0.744 > 0.10$	$p = 0.744 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev	$p = 0.376 > 0.10$	$p = 0.537 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ 2 other	$p = 0.109 > 0.10$	$p = 0.273 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev + 1 other	$p = 0.008 < 0.05$	$p = 0.081 < 0.10$	✓
2 other $\leftrightarrow$ 1 other	$p = 0.149 > 0.10$	$p = 0.297 > 0.10$	✗
2 other $\leftrightarrow$ Dev	$p = 0.361 > 0.10$	$p = 0.602 > 0.10$	✗
2 other $\leftrightarrow$ Dev + 1 other	$p = 0.426 > 0.10$	$p = 0.533 > 0.10$	✗
Dev + 1 other $\leftrightarrow$ 1 other	$p = 0.008 < 0.05$	$p = 0.041 < 0.05$	✓
Dev + 1 other $\leftrightarrow$ Dev	$p = 0.043 < 0.05$	$p = 0.143 > 0.10$	✗
1 other $\leftrightarrow$ Dev	$p = 0.527 > 0.10$	$p = 0.586 > 0.10$	✗

Table D.47.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.47.



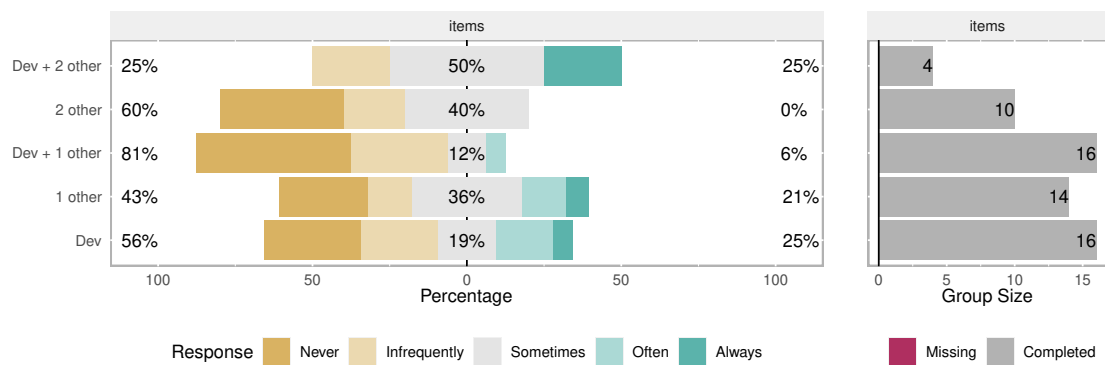


Figure D.48.: Documentation frequency during daily (→) grouped by Scrum role *Developer* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.607$	$p = 0.072 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other ↔ 1 other	$p = 0.526 > 0.10$	$p = 0.657 > 0.10$	✗
Dev + 2 other ↔ Dev	$p = 0.955 > 0.10$	$p = 0.955 > 0.10$	✗
Dev + 2 other ↔ 2 other	$p = 0.294 > 0.10$	$p = 0.589 > 0.10$	✗
Dev + 2 other ↔ Dev + 1 other	$p = 0.023 < 0.05$	$p = 0.114 > 0.10$	✗
2 other ↔ 1 other	$p = 0.579 > 0.10$	$p = 0.644 > 0.10$	✗
2 other ↔ Dev	$p = 0.269 > 0.10$	$p = 0.673 > 0.10$	✗
2 other ↔ Dev + 1 other	$p = 0.317 > 0.10$	$p = 0.529 > 0.10$	✗
Dev + 1 other ↔ 1 other	$p = 0.059 < 0.10$	$p = 0.196 > 0.10$	✗
Dev + 1 other ↔ Dev	$p = 0.010 < 0.05$	$p = 0.105 > 0.10$	✗
1 other ↔ Dev	$p = 0.507 > 0.10$	$p = 0.724 > 0.10$	✗

Table D.48.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.48.

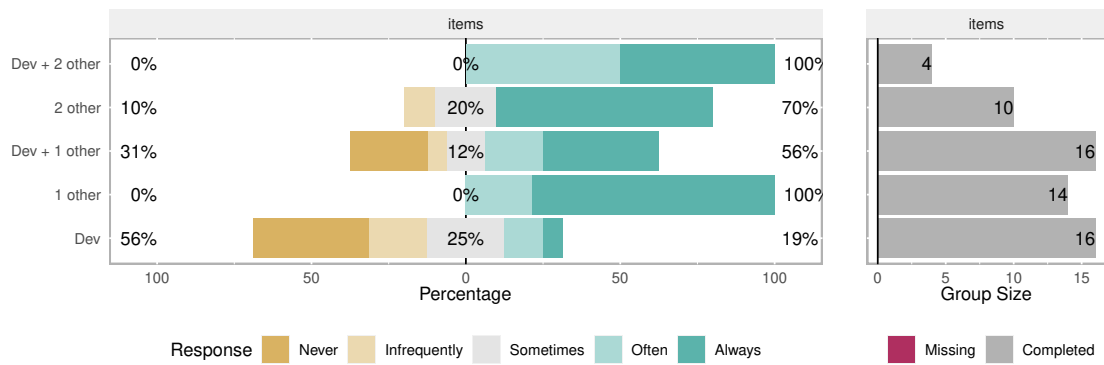


Figure D.49.: Documentation frequency during Retrospective ( $\rightarrow$ ) grouped by Scrum role *Developer* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 23.892$	$p = 8.394 * 10^{-5} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other $\leftrightarrow$ 1 other	$p = 0.828 > 0.10$	$p = 0.920 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev	$p = 5.243 * 10^{-4} \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Dev + 2 other $\leftrightarrow$ 2 other	$p = 0.845 > 0.10$	$p = 0.845 > 0.10$	✗
Dev + 2 other $\leftrightarrow$ Dev + 1 other	$p = 0.052 > 0.05$	$p = 0.104 > 0.10$	✗
2 other $\leftrightarrow$ 1 other	$p = 0.672 > 0.10$	$p = 0.840 > 0.10$	✗
2 other $\leftrightarrow$ Dev	$p = 0.002 \ll 0.05$	$p = 0.007 < 0.05$	✓
2 other $\leftrightarrow$ Dev + 1 other	$p = 0.103 > 0.10$	$p = 0.147 > 0.10$	✗
Dev + 1 other $\leftrightarrow$ 1 other	$p = 0.013 < 0.05$	$p = 0.032 < 0.05$	✓
Dev + 1 other $\leftrightarrow$ Dev	$p = 0.073 > 0.05$	$p = 0.122 > 0.10$	✗
1 other $\leftrightarrow$ Dev	$p = 2.274 * 10^{-5} \ll 0.05$	$p = 2.274 * 10^{-4} \ll 0.05$	✓

Table D.49.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure D.49.

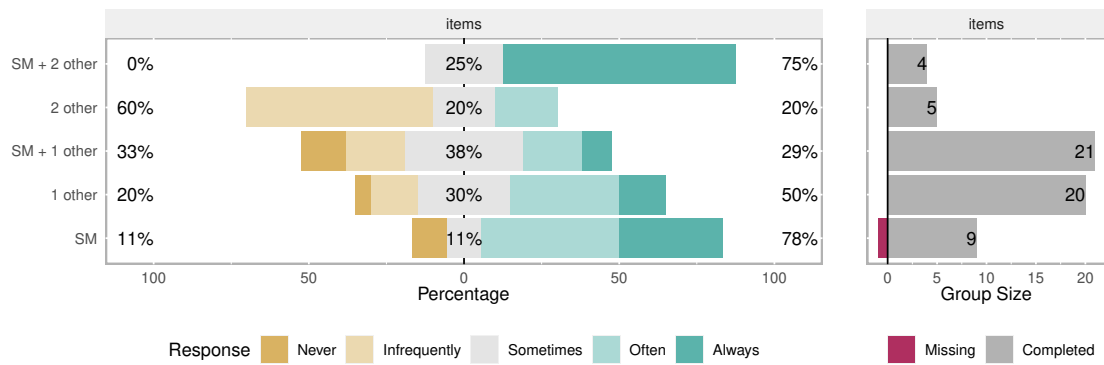


Figure D.50.: Documentation frequency during Backlog Refinement ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.505$	$p = 0.021 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.441 > 0.10$	$p = 0.551 > 0.10$	✗
SM + 2 other $\leftrightarrow$ SM	$p = 0.753 > 0.10$	$p = 0.753 > 0.10$	✗
SM + 2 other $\leftrightarrow$ 2 other	$p = 0.007 < 0.05$	$p = 0.068 < 0.10$	✓
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.036 < 0.05$	$p = 0.090 < 0.10$	✓
2 other $\leftrightarrow$ 1 other	$p = 0.016 < 0.05$	$p = 0.054 < 0.10$	✓
2 other $\leftrightarrow$ SM	$p = 0.015 < 0.05$	$p = 0.073 < 0.10$	✓
2 other $\leftrightarrow$ SM + 1 other	$p = 0.195 > 0.10$	$p = 0.278 > 0.10$	✗
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.093 < 0.10$	$p = 0.154 > 0.10$	✗
SM + 1 other $\leftrightarrow$ SM	$p = 0.083 < 0.10$	$p = 0.166 > 0.10$	✗
1 other $\leftrightarrow$ SM	$p = 0.688 > 0.10$	$p = 0.764 > 0.10$	✗

Table D.50.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.50.

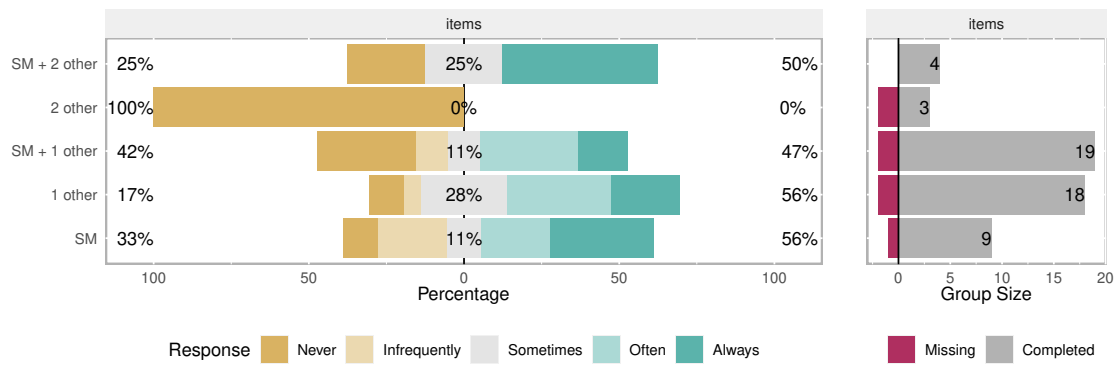


Figure D.51.: Documentation frequency during Planning Poker ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.544$	$p = 0.074 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.546 > 0.10$	$p = 0.910 > 0.10$	✗
SM + 2 other $\leftrightarrow$ SM	$p = 0.839 > 0.10$	$p = 0.839 > 0.10$	✗
SM + 2 other $\leftrightarrow$ 2 other	$p = 0.022 < 0.05$	$p = 0.073 < 0.10$	✓
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.770 > 0.10$	$p = 0.856 > 0.10$	✗
2 other $\leftrightarrow$ 1 other	$p = 0.004 \ll 0.05$	$p = 0.041 < 0.05$	✓
2 other $\leftrightarrow$ SM	$p = 0.015 < 0.05$	$p = 0.073 < 0.10$	✓
2 other $\leftrightarrow$ SM + 1 other	$p = 0.025 < 0.05$	$p = 0.063 < 0.10$	✓
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.281 > 0.10$	$p = 0.563 > 0.10$	✗
SM + 1 other $\leftrightarrow$ SM	$p = 0.602 > 0.10$	$p = 0.860 > 0.10$	✗
1 other $\leftrightarrow$ SM	$p = 0.713 > 0.10$	$p = 0.891 > 0.10$	✗

Table D.51.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.51.

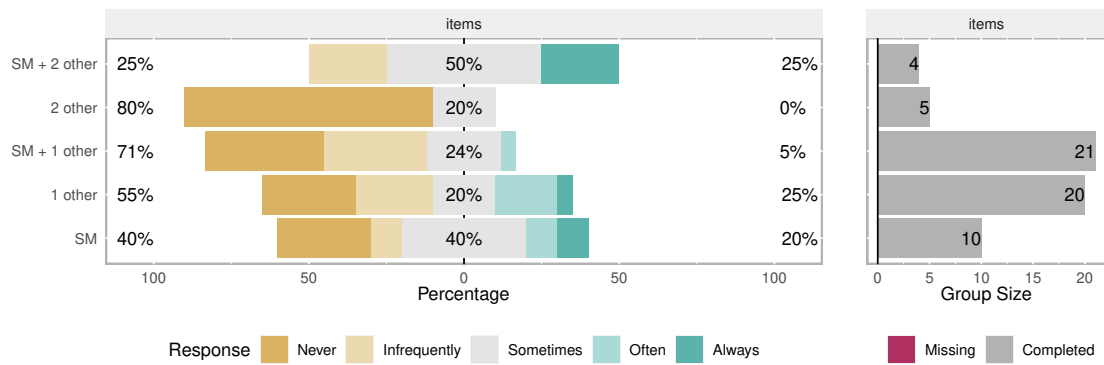


Figure D.52.: Documentation frequency during Daily Scrum ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.587$	$p = 0.072 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.826 > 0.10$	$p = 0.826 > 0.10$	✗
SM + 2 other $\leftrightarrow$ SM	$p = 0.568 > 0.10$	$p = 0.710 > 0.10$	✗
SM + 2 other $\leftrightarrow$ 2 other	$p = 0.025 < 0.05$	$p = 0.126 > 0.10$	✗
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.093 < 0.10$	$p = 0.186 > 0.10$	✗
2 other $\leftrightarrow$ 1 other	$p = 0.020 < 0.05$	$p = 0.201 > 0.10$	✗
2 other $\leftrightarrow$ SM	$p = 0.075 < 0.10$	$p = 0.187 > 0.10$	✗
2 other $\leftrightarrow$ SM + 1 other	$p = 0.269 > 0.10$	$p = 0.449 > 0.10$	✗
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.066 < 0.10$	$p = 0.221 > 0.10$	✗
SM + 1 other $\leftrightarrow$ SM	$p = 0.291 > 0.10$	$p = 0.416 > 0.10$	✗
1 other $\leftrightarrow$ SM	$p = 0.653 > 0.10$	$p = 0.726 > 0.10$	✗

Table D.52.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.52.

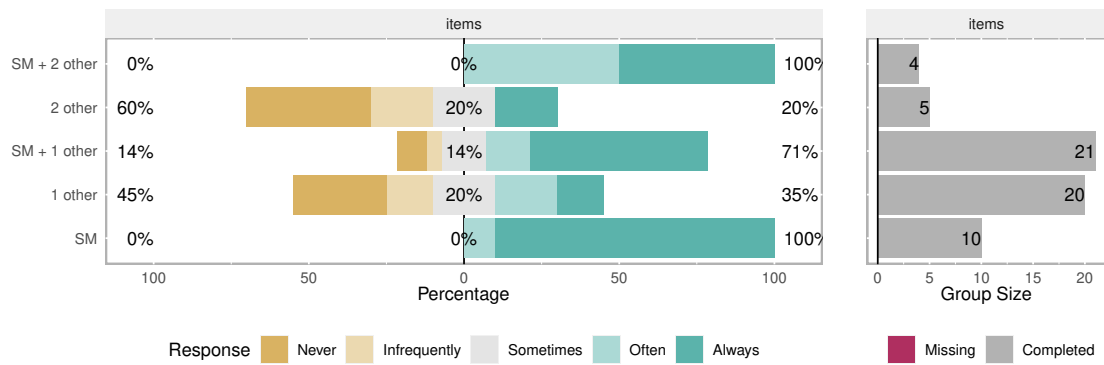


Figure D.53.: Documentation frequency during Retrospective ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 20.602$	$p = 3.797 * 10^{-4} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.007 < 0.05$	$p = 0.014 < 0.05$	✓
SM + 2 other $\leftrightarrow$ SM	$p = 0.770 > 0.10$	$p = 0.770 > 0.10$	✗
SM + 2 other $\leftrightarrow$ 2 other	$p = 0.003 \ll 0.05$	$p = 0.009 < 0.05$	✓
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.511 > 0.10$	$p = 0.568 > 0.10$	✗
2 other $\leftrightarrow$ 1 other	$p = 0.254 > 0.10$	$p = 0.363 > 0.10$	✗
2 other $\leftrightarrow$ SM	$p = 0.001 \ll 0.05$	$p = 0.011 < 0.05$	✓
2 other $\leftrightarrow$ SM + 1 other	$p = 0.006 < 0.05$	$p = 0.014 < 0.05$	✓
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.012 < 0.05$	$p = 0.020 < 0.05$	✓
SM + 1 other $\leftrightarrow$ SM	$p = 0.312 > 0.10$	$p = 0.390 > 0.10$	✗
1 other $\leftrightarrow$ SM	$p = 0.002 \ll 0.05$	$p = 0.009 < 0.05$	✓

Table D.53.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure D.53.

## D.9. Hypothesis RQ2-H8 – Scrum Role $\Leftrightarrow$ Time of Decision Documentation

### D.9.1. Amount of Scrum Roles $\Leftrightarrow$ Decision Documentation per Phase (IndepVar: Q-28 – DepVar: Q-14)

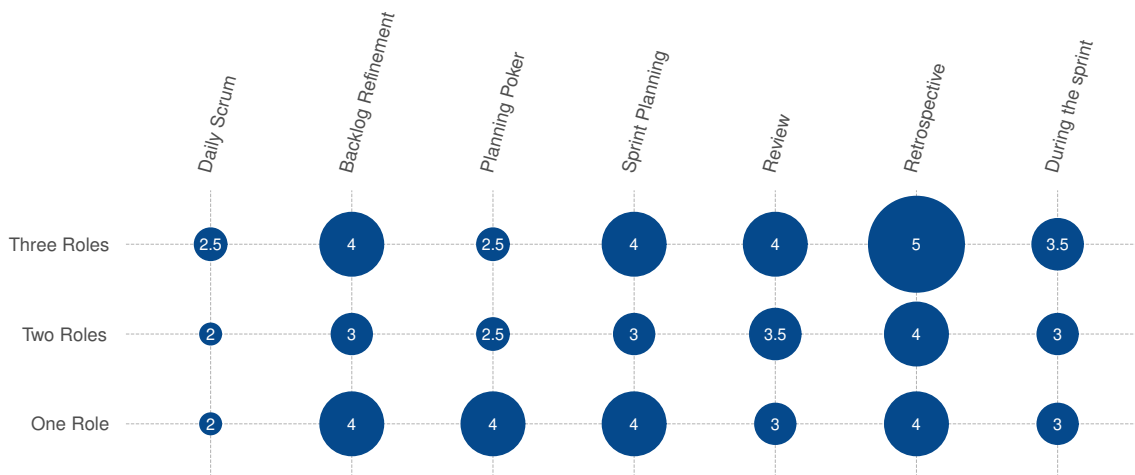


Figure D.54.: Documentation frequency across all Scrum phases ( $\rightarrow$ ) grouped by Scrum role ( $\uparrow$ ).

## Role Developer: Scrum Phase ↔ Decision Documentation Frequency (IndepVar: Q-28 – DepVar: Q-14)

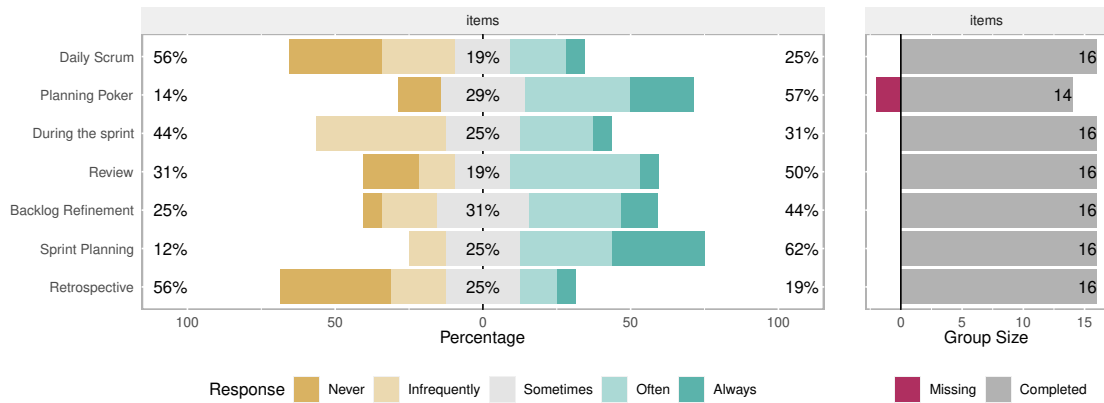


Figure D.55.: Documentation frequency for participants with profound *Developer* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 16.696$	$p = 0.010 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.208 > 0.05$	$p = 0.364 > 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.044 < 0.05$	$p = 0.156 > 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.542 \gg 0.05$	$p = 0.670 \gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.448 > 0.05$	$p = 0.588 \gg 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.752 \gg 0.05$	$p = 0.790 \gg 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.082 > 0.05$	$p = 0.247 > 0.05$	✗
Sprint Planning ↔ Retrospective	$p = 0.001 \ll 0.05$	$p = 0.023 < 0.05$	✓
Sprint Planning ↔ Planning Poker	$p = 0.544 \gg 0.05$	$p = 0.635 \gg 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.044 < 0.05$	$p = 0.183 > 0.05$	✗
Sprint Planning ↔ Review	$p = 0.115 > 0.05$	$p = 0.269 > 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 0.003 \ll 0.05$	$p = 0.029 < 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.011 < 0.05$	$p = 0.075 > 0.05$	✓
Retrospective ↔ During the sprint	$p = 0.211 > 0.05$	$p = 0.341 > 0.05$	✗
Retrospective ↔ Review	$p = 0.090 > 0.05$	$p = 0.237 > 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 0.785 \gg 0.05$	$p = 0.785 \gg 0.05$	✗
Planning Poker ↔ During the sprint	$p = 0.179 > 0.05$	$p = 0.342 > 0.05$	✗
Planning Poker ↔ Review	$p = 0.360 > 0.05$	$p = 0.505 \gg 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.022 < 0.05$	$p = 0.116 > 0.05$	✗
During the sprint ↔ Review	$p = 0.657 \gg 0.05$	$p = 0.727 \gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.328 > 0.05$	$p = 0.492 > 0.05$	✗
Review ↔ Daily Scrum	$p = 0.155 > 0.05$	$p = 0.326 > 0.05$	✗

Table D.54.: Results of test for difference – grouped by Scrum phases – cf. Figure D.55.



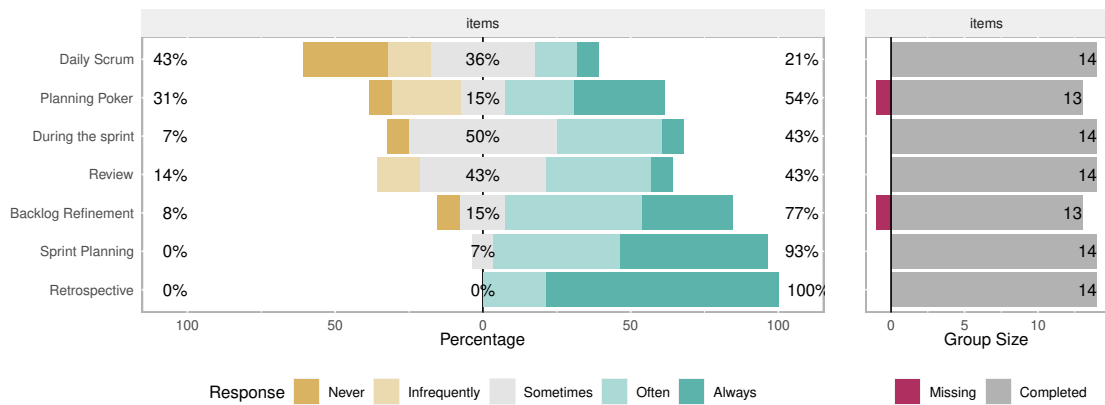


Figure D.56.: Documentation frequency for participants with *PO* or *SM* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance		Significant?
Kruskal-Wallis	$\chi^2 = 35.770$		$p = 3.055 * 10^{-6} \ll 0.05$		✓
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance		Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.262$	$> 0.05$	$p = 0.344$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.034$	$< 0.05$	$p = 0.079$	$> 0.05$	✓
Backlog Refinement ↔ Planning Poker	$p = 0.363$	$> 0.05$	$p = 0.423$	$> 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.124$	$> 0.05$	$p = 0.201$	$> 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.111$	$> 0.05$	$p = 0.195$	$> 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.006$	$< 0.05$	$p = 0.018$	$< 0.05$	✓
Sprint Planning ↔ Retrospective	$p = 0.309$	$> 0.05$	$p = 0.381$	$> 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.041$	$< 0.05$	$p = 0.085$	$> 0.05$	✓
Sprint Planning ↔ During the sprint	$p = 0.007$	$< 0.05$	$p = 0.018$	$< 0.05$	✓
Sprint Planning ↔ Review	$p = 0.006$	$< 0.05$	$p = 0.020$	$< 0.05$	✓
Sprint Planning ↔ Daily Scrum	$p = 7.987 * 10^{-5} \ll 0.05$	$\ll 0.05$	$p = 8.386 * 10^{-4} \ll 0.05$	$\ll 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.002$	$\ll 0.05$	$p = 0.010$	$< 0.05$	✓
Retrospective ↔ During the sprint	$p = 1.942 * 10^{-4} \ll 0.05$	$\ll 0.05$	$p = 0.001$	$\ll 0.05$	✓
Retrospective ↔ Review	$p = 1.551 * 10^{-4} \ll 0.05$	$\ll 0.05$	$p = 0.001$	$\ll 0.05$	✓
Retrospective ↔ Daily Scrum	$p = 6.953 * 10^{-7} \ll 0.05$	$\ll 0.05$	$p = 1.460 * 10^{-5} \ll 0.05$	$\ll 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.542$	$\gg 0.05$	$p = 0.569$	$\gg 0.05$	✗
Planning Poker ↔ Review	$p = 0.506$	$\gg 0.05$	$p = 0.559$	$\gg 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.068$	$> 0.05$	$p = 0.130$	$> 0.05$	✗
During the sprint ↔ Review	$p = 0.955$	$\gg 0.05$	$p = 0.955$	$\gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.216$	$> 0.05$	$p = 0.325$	$> 0.05$	✗
Review ↔ Daily Scrum	$p = 0.238$	$> 0.05$	$p = 0.333$	$> 0.05$	✗

Table D.55.: Results of test for difference – grouped by Scrum phases – cf. Figure D.56.

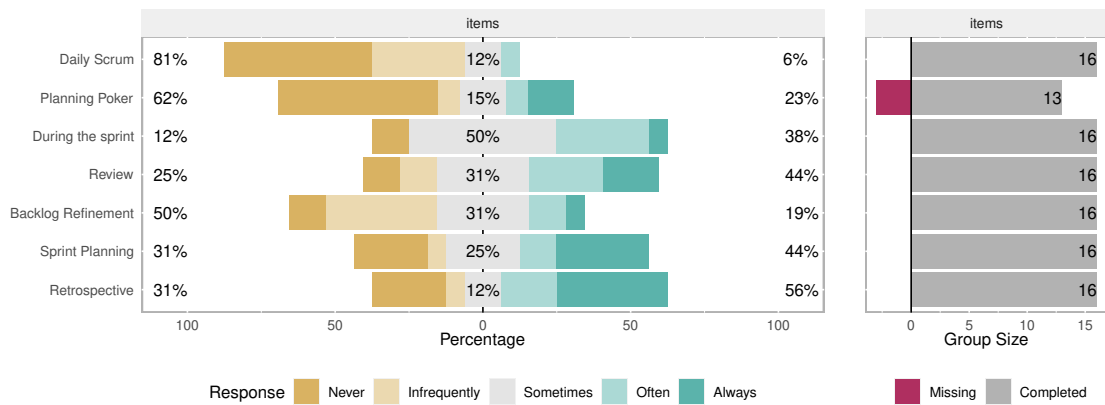


Figure D.57.: Documentation frequency for participants with *Developer* plus (*PO* or *SM*) experience ( $\rightarrow$ ) grouped by Scrum phase ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.751$	$p = 0.007 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.289 > 0.05$	$p = 0.467 > 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.154 > 0.05$	$p = 0.322 > 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.424 > 0.05$	$p = 0.594 \gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.249 > 0.05$	$p = 0.436 > 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.216 > 0.05$	$p = 0.412 > 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.077 > 0.05$	$p = 0.179 > 0.05$	✗
Sprint Planning ↔ Retrospective	$p = 0.714 \gg 0.05$	$p = 0.937 \gg 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.071 > 0.05$	$p = 0.187 > 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.927 \gg 0.05$	$p = 0.973 \gg 0.05$	✗
Sprint Planning ↔ Review	$p = 0.859 \gg 0.05$	$p = 0.949 \gg 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 0.005 \ll 0.05$	$p = 0.024 < 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.032 < 0.05$	$p = 0.132 > 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.783 \gg 0.05$	$p = 0.968 \gg 0.05$	✗
Retrospective ↔ Review	$p = 0.850 \gg 0.05$	$p = 0.992 \gg 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 0.001 \ll 0.05$	$p = 0.029 < 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.059 > 0.05$	$p = 0.176 > 0.05$	✗
Planning Poker ↔ Review	$p = 0.049 < 0.05$	$p = 0.170 > 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.380 > 0.05$	$p = 0.570 \gg 0.05$	✗
During the sprint ↔ Review	$p = 0.931 \gg 0.05$	$p = 0.931 \gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.003 \ll 0.05$	$p = 0.024 < 0.05$	✓
Review ↔ Daily Scrum	$p = 0.003 \ll 0.05$	$p = 0.028 < 0.05$	✓

Table D.56.: Results of test for difference – grouped by Scrum phases – cf. Figure D.57.

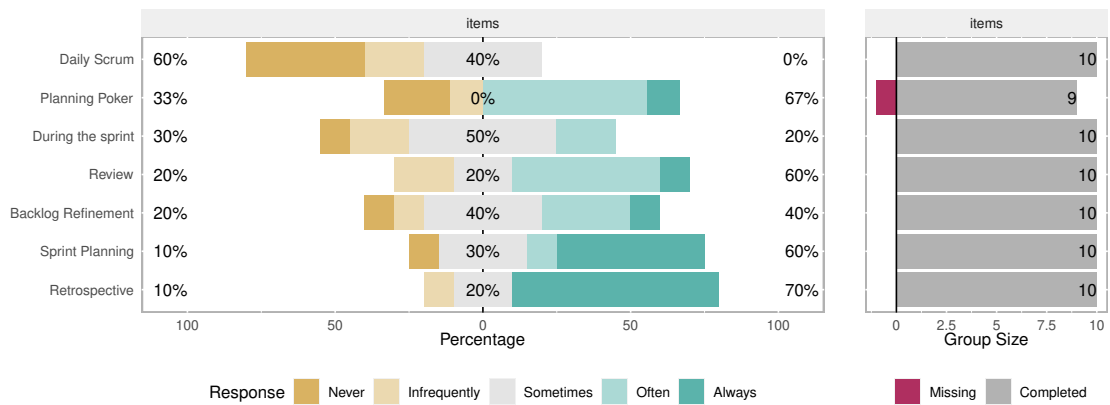


Figure D.58.: Documentation frequency for participants with *PO* and *SM* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 20.046$	$p = 0.003 \ll 0.05$	✓	
Dunn's Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Backlog Refinement ↔ Sprint Planning	$p = 0.198 > 0.05$	$p = 0.378 > 0.05$	✗	
Backlog Refinement ↔ Retrospective	$p = 0.051 > 0.05$	$p = 0.134 > 0.05$	✗	
Backlog Refinement ↔ Planning Poker	$p = 0.829 \gg 0.05$	$p = 0.829 \gg 0.05$	✗	
Backlog Refinement ↔ During the sprint	$p = 0.450 > 0.05$	$p = 0.556 \gg 0.05$	✗	
Backlog Refinement ↔ Review	$p = 0.607 \gg 0.05$	$p = 0.670 \gg 0.05$	✗	
Backlog Refinement ↔ Daily Scrum	$p = 0.048 < 0.05$	$p = 0.145 > 0.05$	✗	
Sprint Planning ↔ Retrospective	$p = 0.507 \gg 0.05$	$p = 0.591 \gg 0.05$	✗	
Sprint Planning ↔ Planning Poker	$p = 0.300 > 0.05$	$p = 0.450 > 0.05$	✗	
Sprint Planning ↔ During the sprint	$p = 0.041 < 0.05$	$p = 0.144 > 0.05$	✗	
Sprint Planning ↔ Review	$p = 0.440 > 0.05$	$p = 0.577 \gg 0.05$	✗	
Sprint Planning ↔ Daily Scrum	$p = 0.001 \ll 0.05$	$p = 0.012 < 0.05$	✓	
Retrospective ↔ Planning Poker	$p = 0.092 > 0.05$	$p = 0.216 > 0.05$	✗	
Retrospective ↔ During the sprint	$p = 0.007 < 0.05$	$p = 0.048 < 0.05$	✓	
Retrospective ↔ Review	$p = 0.151 > 0.05$	$p = 0.317 > 0.05$	✗	
Retrospective ↔ Daily Scrum	$p = 8.673 * 10^{-5} \ll 0.05$	$p = 0.002 \ll 0.05$	✓	
Planning Poker ↔ During the sprint	$p = 0.342 > 0.05$	$p = 0.478 > 0.05$	✗	
Planning Poker ↔ Review	$p = 0.775 \gg 0.05$	$p = 0.814 \gg 0.05$	✗	
Planning Poker ↔ Daily Scrum	$p = 0.033 < 0.05$	$p = 0.137 > 0.05$	✗	
During the sprint ↔ Review	$p = 0.204 > 0.05$	$p = 0.357 > 0.05$	✗	
During the sprint ↔ Daily Scrum	$p = 0.223 > 0.05$	$p = 0.360 > 0.05$	✗	
Review ↔ Daily Scrum	$p = 0.013 < 0.05$	$p = 0.067 > 0.05$	✓	

Table D.57.: Results of test for difference – grouped by Scrum phases – cf. Figure D.58.

## Role Scrum Master: Scrum Phase ↔ Decision Documentation Frequency (IndepVar: Q-28 – DepVar: Q-14)

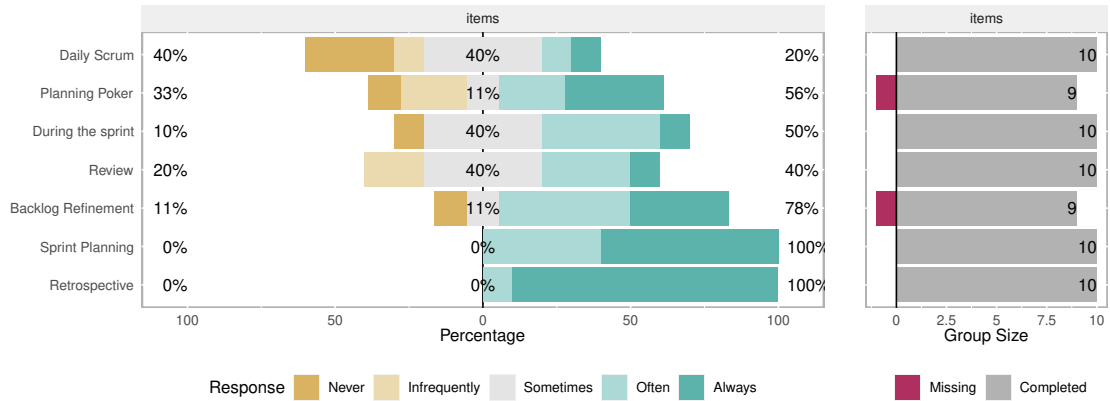


Figure D.59.: Documentation frequency for participants with *SM* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 27.088$	$p = 1.394 * 10^{-4} \ll 0.05$	✓	
Dunn's Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
Backlog Refinement ↔ Sprint Planning	$p = 0.205 > 0.05$	$p = 0.332 > 0.05$	✗	
Backlog Refinement ↔ Retrospective	$p = 0.045 < 0.05$	$p = 0.105 > 0.05$	✗	
Backlog Refinement ↔ Planning Poker	$p = 0.519 \gg 0.05$	$p = 0.574 \gg 0.05$	✗	
Backlog Refinement ↔ During the sprint	$p = 0.280 > 0.05$	$p = 0.420 > 0.05$	✗	
Backlog Refinement ↔ Review	$p = 0.189 > 0.05$	$p = 0.330 > 0.05$	✗	
Backlog Refinement ↔ Daily Scrum	$p = 0.036 < 0.05$	$p = 0.094 > 0.05$	✓	
Sprint Planning ↔ Retrospective	$p = 0.448 > 0.05$	$p = 0.554 \gg 0.05$	✗	
Sprint Planning ↔ Planning Poker	$p = 0.054 > 0.05$	$p = 0.113 > 0.05$	✗	
Sprint Planning ↔ During the sprint	$p = 0.016 < 0.05$	$p = 0.048 < 0.05$	✓	
Sprint Planning ↔ Review	$p = 0.008 < 0.05$	$p = 0.028 < 0.05$	✓	
Sprint Planning ↔ Daily Scrum	$p = 5.452 * 10^{-4} \ll 0.05$	$p = 0.006 < 0.05$	✓	
Retrospective ↔ Planning Poker	$p = 0.008 < 0.05$	$p = 0.032 < 0.05$	✓	
Retrospective ↔ During the sprint	$p = 0.002 \ll 0.05$	$p = 0.008 < 0.05$	✓	
Retrospective ↔ Review	$p = 6.485 * 10^{-4} \ll 0.05$	$p = 0.005 \ll 0.05$	✓	
Retrospective ↔ Daily Scrum	$p = 2.486 * 10^{-5} \ll 0.05$	$p = 5.221 * 10^{-4} \ll 0.05$	✓	
Planning Poker ↔ During the sprint	$p = 0.676 \gg 0.05$	$p = 0.709 \gg 0.05$	✗	
Planning Poker ↔ Review	$p = 0.514 \gg 0.05$	$p = 0.599 \gg 0.05$	✗	
Planning Poker ↔ Daily Scrum	$p = 0.151 > 0.05$	$p = 0.288 > 0.05$	✗	
During the sprint ↔ Review	$p = 0.809 \gg 0.05$	$p = 0.809 \gg 0.05$	✗	
During the sprint ↔ Daily Scrum	$p = 0.295 > 0.05$	$p = 0.413 > 0.05$	✗	
Review ↔ Daily Scrum	$p = 0.420 > 0.05$	$p = 0.552 \gg 0.05$	✗	

Table D.58.: Results of test for difference – grouped by Scrum phases – cf. Figure D.59.

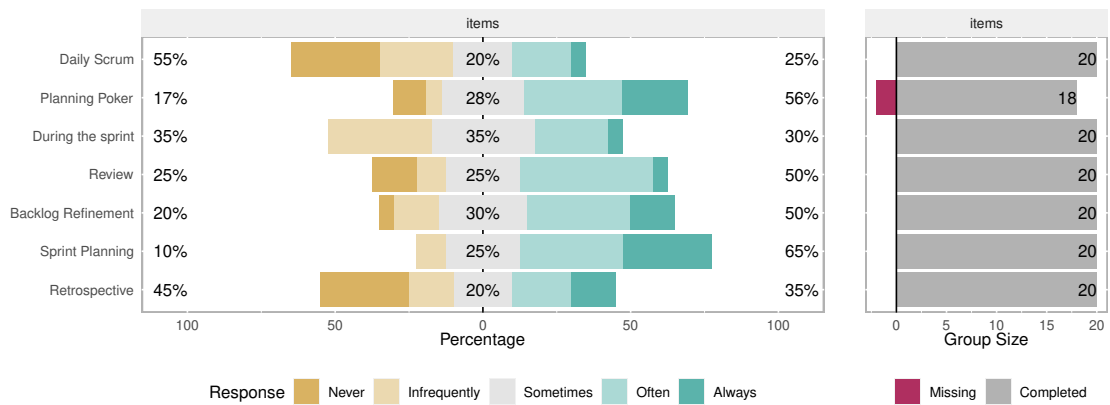


Figure D.60.: Documentation frequency for participants with *Developer* or *PO* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance		Significant?
Kruskal-Wallis	$\chi^2 = 16.567$		$p = 0.011 < 0.05$		✓
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance		Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.241$	$> 0.05$	$p = 0.461$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.135$	$> 0.05$	$p = 0.316$	$> 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.745$	$\gg 0.05$	$p = 0.745$	$\gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.246$	$> 0.05$	$p = 0.431$	$> 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.593$	$\gg 0.05$	$p = 0.655$	$\gg 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.022$	$< 0.05$	$p = 0.090$	$> 0.05$	✓
Sprint Planning ↔ Retrospective	$p = 0.008$	$< 0.05$	$p = 0.081$	$> 0.05$	✓
Sprint Planning ↔ Planning Poker	$p = 0.415$	$> 0.05$	$p = 0.544$	$\gg 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.020$	$< 0.05$	$p = 0.104$	$> 0.05$	✗
Sprint Planning ↔ Review	$p = 0.088$	$> 0.05$	$p = 0.231$	$> 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 5.189 * 10^{-4}$	$\ll 0.05$	$p = 0.011$	$< 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.075$	$> 0.05$	$p = 0.264$	$> 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.739$	$\gg 0.05$	$p = 0.776$	$\gg 0.05$	✗
Retrospective ↔ Review	$p = 0.338$	$> 0.05$	$p = 0.507$	$\gg 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 0.420$	$> 0.05$	$p = 0.519$	$\gg 0.05$	✗
Planning Poker ↔ During the sprint	$p = 0.146$	$> 0.05$	$p = 0.307$	$> 0.05$	✗
Planning Poker ↔ Review	$p = 0.398$	$> 0.05$	$p = 0.557$	$\gg 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.010$	$< 0.05$	$p = 0.073$	$> 0.05$	✓
During the sprint ↔ Review	$p = 0.532$	$\gg 0.05$	$p = 0.621$	$\gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.255$	$> 0.05$	$p = 0.411$	$> 0.05$	✗
Review ↔ Daily Scrum	$p = 0.078$	$> 0.05$	$p = 0.233$	$> 0.05$	✗

Table D.59.: Results of test for difference – grouped by Scrum phases – cf. Figure D.60.

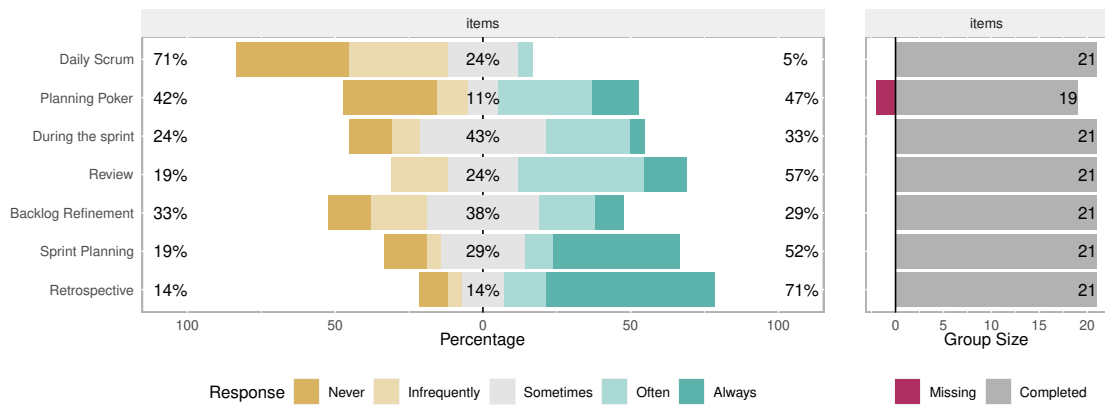


Figure D.61.: Documentation frequency for participants with *SM* plus (*Developer* or *PO*) experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance		Significant?
Kruskal-Wallis	$\chi^2 = 31.434$		$p = 2.095 * 10^{-5} \ll 0.05$		✓
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance		Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.074$	$> 0.05$	$p = 0.156$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.004$	$\ll 0.05$	$p = 0.023$	$< 0.05$	✓
Backlog Refinement ↔ Planning Poker	$p = 0.888$	$\gg 0.05$	$p = 0.932$	$\gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.813$	$\gg 0.05$	$p = 0.898$	$\gg 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.138$	$> 0.05$	$p = 0.222$	$> 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.028$	$< 0.05$	$p = 0.065$	$> 0.05$	✓
Sprint Planning ↔ Retrospective	$p = 0.289$	$> 0.05$	$p = 0.357$	$> 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.110$	$> 0.05$	$p = 0.210$	$> 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.122$	$> 0.05$	$p = 0.213$	$> 0.05$	✗
Sprint Planning ↔ Review	$p = 0.765$	$\gg 0.05$	$p = 0.893$	$\gg 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 6.876 * 10^{-5}$	$\ll 0.05$	$p = 7.220 * 10^{-4}$	$\ll 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.009$	$< 0.05$	$p = 0.036$	$< 0.05$	✓
Retrospective ↔ During the sprint	$p = 0.009$	$< 0.05$	$p = 0.032$	$< 0.05$	✓
Retrospective ↔ Review	$p = 0.174$	$> 0.05$	$p = 0.261$	$> 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 4.643 * 10^{-7}$	$\ll 0.05$	$p = 9.750 * 10^{-6}$	$\ll 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.928$	$\gg 0.05$	$p = 0.928$	$\gg 0.05$	✗
Planning Poker ↔ Review	$p = 0.191$	$> 0.05$	$p = 0.268$	$> 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.022$	$< 0.05$	$p = 0.059$	$> 0.05$	✓
During the sprint ↔ Review	$p = 0.212$	$> 0.05$	$p = 0.278$	$> 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.015$	$< 0.05$	$p = 0.045$	$< 0.05$	✓
Review ↔ Daily Scrum	$p = 2.317 * 10^{-4}$	$\ll 0.05$	$p = 0.002$	$\ll 0.05$	✓

Table D.60.: Results of test for difference – grouped by Scrum phases – cf. Figure D.61.

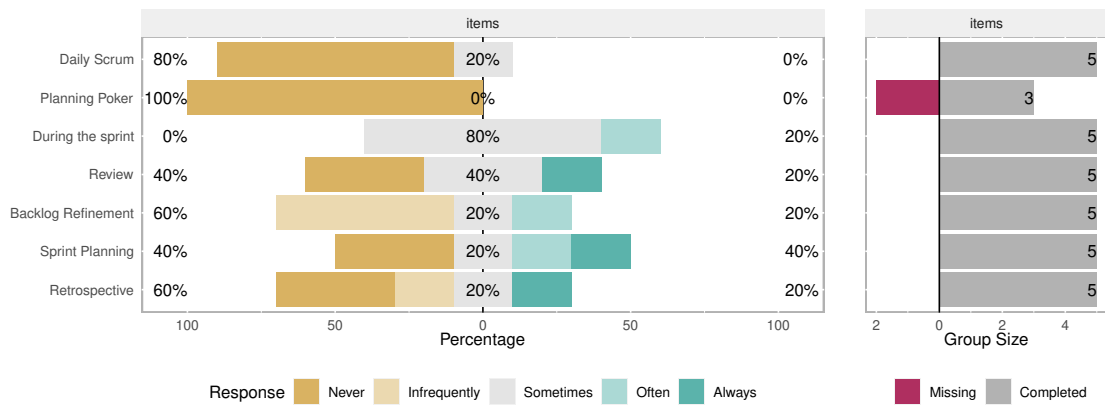


Figure D.62.: Documentation frequency for participants with *Developer* and *PO* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.908$	$p = 0.129 > 0.05$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.986 \gg 0.05$	$p = 0.986 \gg 0.05$	X
Backlog Refinement ↔ Retrospective	$p = 0.631 \gg 0.05$	$p = 0.883 \gg 0.05$	X
Backlog Refinement ↔ Planning Poker	$p = 0.061 > 0.05$	$p = 0.429 > 0.05$	X
Backlog Refinement ↔ During the sprint	$p = 0.471 > 0.05$	$p = 0.707 \gg 0.05$	X
Backlog Refinement ↔ Review	$p = 0.810 \gg 0.05$	$p = 0.945 \gg 0.05$	X
Backlog Refinement ↔ Daily Scrum	$p = 0.103 > 0.05$	$p = 0.361 > 0.05$	X
Sprint Planning ↔ Retrospective	$p = 0.643 \gg 0.05$	$p = 0.844 \gg 0.05$	X
Sprint Planning ↔ Planning Poker	$p = 0.063 > 0.05$	$p = 0.332 > 0.05$	X
Sprint Planning ↔ During the sprint	$p = 0.461 > 0.05$	$p = 0.744 \gg 0.05$	X
Sprint Planning ↔ Review	$p = 0.824 \gg 0.05$	$p = 0.865 \gg 0.05$	X
Sprint Planning ↔ Daily Scrum	$p = 0.107 > 0.05$	$p = 0.321 > 0.05$	X
Retrospective ↔ Planning Poker	$p = 0.145 > 0.05$	$p = 0.382 > 0.05$	X
Retrospective ↔ During the sprint	$p = 0.230 > 0.05$	$p = 0.483 > 0.05$	X
Retrospective ↔ Review	$p = 0.810 \gg 0.05$	$p = 0.895 \gg 0.05$	X
Retrospective ↔ Daily Scrum	$p = 0.250 > 0.05$	$p = 0.478 > 0.05$	X
Planning Poker ↔ During the sprint	$p = 0.013 < 0.05$	$p = 0.264 > 0.05$	X
Planning Poker ↔ Review	$p = 0.096 > 0.05$	$p = 0.404 > 0.05$	X
Planning Poker ↔ Daily Scrum	$p = 0.645 \gg 0.05$	$p = 0.797 \gg 0.05$	X
During the sprint ↔ Review	$p = 0.337 > 0.05$	$p = 0.589 \gg 0.05$	X
During the sprint ↔ Daily Scrum	$p = 0.019 < 0.05$	$p = 0.197 > 0.05$	X
Review ↔ Daily Scrum	$p = 0.165 > 0.05$	$p = 0.384 > 0.05$	X

Table D.61.: Results of test for difference – grouped by Scrum phases – cf. Figure D.62.

Role PO: Scrum Phase ↔ Decision Documentation Frequency (IndepVar: Q-28 – DepVar: Q-14)

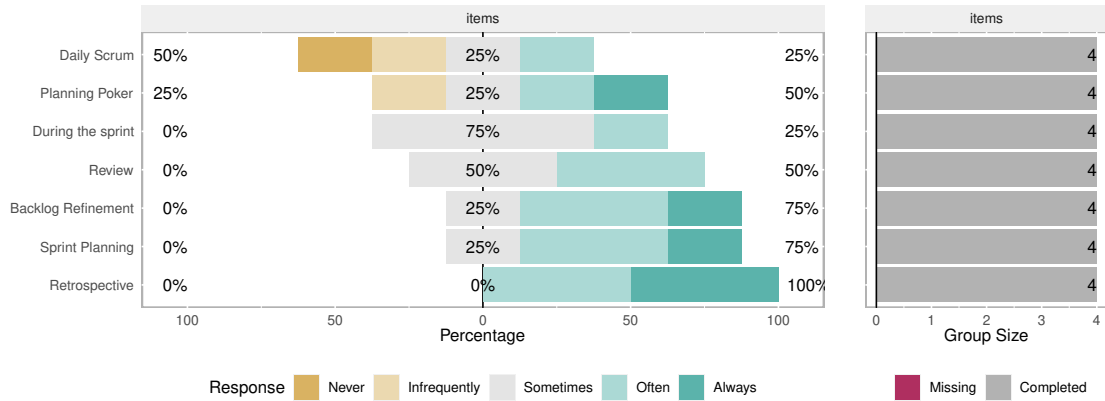


Figure D.63.: Documentation frequency for participants with *PO* experience(→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.448$	$p = 0.150 > 0.05$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 1.000 \gg 0.05$	$p = 1.000 \gg 0.05$	X
Backlog Refinement ↔ Retrospective	$p = 0.415 > 0.05$	$p = 0.623 \gg 0.05$	X
Backlog Refinement ↔ Planning Poker	$p = 0.483 > 0.05$	$p = 0.634 \gg 0.05$	X
Backlog Refinement ↔ During the sprint	$p = 0.205 > 0.05$	$p = 0.538 \gg 0.05$	X
Backlog Refinement ↔ Review	$p = 0.415 > 0.05$	$p = 0.671 \gg 0.05$	X
Backlog Refinement ↔ Daily Scrum	$p = 0.067 > 0.05$	$p = 0.350 > 0.05$	X
Sprint Planning ↔ Retrospective	$p = 0.415 > 0.05$	$p = 0.726 \gg 0.05$	X
Sprint Planning ↔ Planning Poker	$p = 0.483 > 0.05$	$p = 0.676 \gg 0.05$	X
Sprint Planning ↔ During the sprint	$p = 0.205 > 0.05$	$p = 0.615 \gg 0.05$	X
Sprint Planning ↔ Review	$p = 0.415 > 0.05$	$p = 0.792 \gg 0.05$	X
Sprint Planning ↔ Daily Scrum	$p = 0.067 > 0.05$	$p = 0.467 > 0.05$	X
Retrospective ↔ Planning Poker	$p = 0.129 > 0.05$	$p = 0.453 > 0.05$	X
Retrospective ↔ During the sprint	$p = 0.037 < 0.05$	$p = 0.391 > 0.05$	X
Retrospective ↔ Review	$p = 0.103 > 0.05$	$p = 0.433 > 0.05$	X
Retrospective ↔ Daily Scrum	$p = 0.008 < 0.05$	$p = 0.170 > 0.05$	X
Planning Poker ↔ During the sprint	$p = 0.571 \gg 0.05$	$p = 0.706 \gg 0.05$	X
Planning Poker ↔ Review	$p = 0.910 \gg 0.05$	$p = 0.955 \gg 0.05$	X
Planning Poker ↔ Daily Scrum	$p = 0.258 > 0.05$	$p = 0.601 \gg 0.05$	X
During the sprint ↔ Review	$p = 0.651 \gg 0.05$	$p = 0.719 \gg 0.05$	X
During the sprint ↔ Daily Scrum	$p = 0.571 \gg 0.05$	$p = 0.667 \gg 0.05$	X
Review ↔ Daily Scrum	$p = 0.308 > 0.05$	$p = 0.648 \gg 0.05$	X

Table D.62.: Results of test for difference – grouped by Scrum phases – cf. Figure D.63.



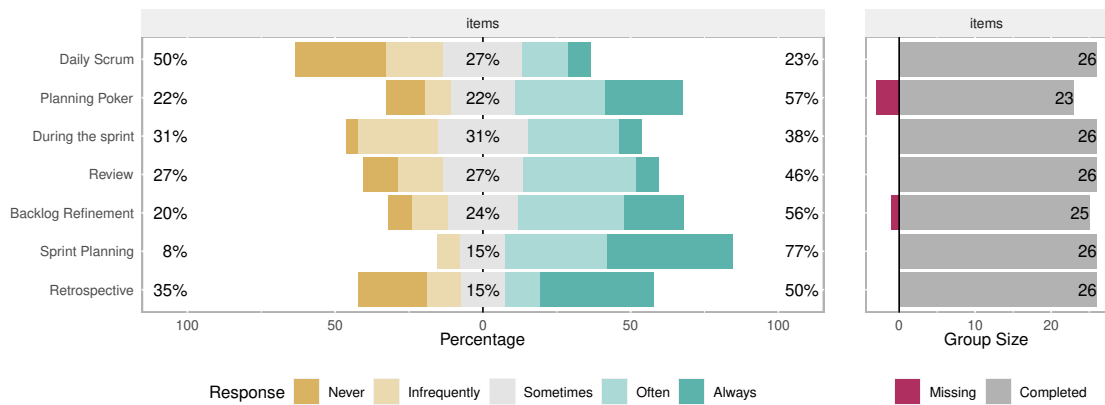


Figure D.64.: Documentation frequency for participants with *Developer* or *SM* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance		Significant?
Kruskal-Wallis	$\chi^2 = 21.892$		$p = 0.001 \ll 0.05$		✓
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance		Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.071$	$> 0.05$	$p = 0.186$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.820$	$\gg 0.05$	$p = 0.907$	$\gg 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.940$	$\gg 0.05$	$p = 0.940$	$\gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.256$	$> 0.05$	$p = 0.414$	$> 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.353$	$> 0.05$	$p = 0.494$	$> 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.010$	$< 0.05$	$p = 0.044$	$< 0.05$	✓
Sprint Planning ↔ Retrospective	$p = 0.040$	$< 0.05$	$p = 0.120$	$> 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.091$	$> 0.05$	$p = 0.212$	$> 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.003$	$\ll 0.05$	$p = 0.031$	$< 0.05$	✓
Sprint Planning ↔ Review	$p = 0.006$	$< 0.05$	$p = 0.040$	$< 0.05$	✓
Sprint Planning ↔ Daily Scrum	$p = 1.036 * 10^{-5}$	$\ll 0.05$	$p = 2.176 * 10^{-4}$	$\ll 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.765$	$\gg 0.05$	$p = 0.893$	$\gg 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.359$	$> 0.05$	$p = 0.471$	$> 0.05$	✗
Retrospective ↔ Review	$p = 0.478$	$> 0.05$	$p = 0.591$	$\gg 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 0.018$	$< 0.05$	$p = 0.065$	$> 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.235$	$> 0.05$	$p = 0.411$	$> 0.05$	✗
Planning Poker ↔ Review	$p = 0.324$	$> 0.05$	$p = 0.486$	$> 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.010$	$< 0.05$	$p = 0.052$	$> 0.05$	✓
During the sprint ↔ Review	$p = 0.835$	$\gg 0.05$	$p = 0.877$	$\gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.150$	$> 0.05$	$p = 0.287$	$> 0.05$	✗
Review ↔ Daily Scrum	$p = 0.100$	$> 0.05$	$p = 0.209$	$> 0.05$	✗

Table D.63.: Results of test for difference – grouped by Scrum phases – cf. Figure D.64.

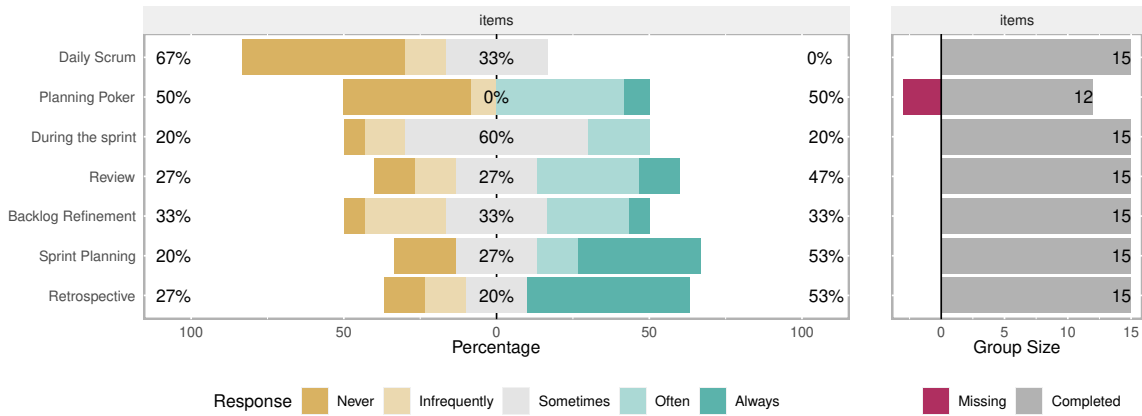


Figure D.65.: Documentation frequency for participants with *PO* plus (*Developer* or *SM*) experience ( $\rightarrow$ ) grouped by Scrum phase ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 17.748$		$p = 0.007 < 0.05$	✓	
Dunn's Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance	Significant?	
Backlog Refinement ↔ Sprint Planning	$p = 0.271$	$> 0.05$	$p = 0.474$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.190$	$> 0.05$	$p = 0.399$	$> 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.634$	$\gg 0.05$	$p = 0.783$	$\gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.877$	$\gg 0.05$	$p = 0.877$	$\gg 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.651$	$\gg 0.05$	$p = 0.759$	$\gg 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.019$	$< 0.05$	$p = 0.099$	$> 0.05$	✓
Sprint Planning ↔ Retrospective	$p = 0.835$	$\gg 0.05$	$p = 0.876$	$\gg 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.130$	$> 0.05$	$p = 0.341$	$> 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.209$	$> 0.05$	$p = 0.399$	$> 0.05$	✗
Sprint Planning ↔ Review	$p = 0.517$	$\gg 0.05$	$p = 0.723$	$\gg 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 5.624 * 10^{-4}$	$\ll 0.05$	$p = 0.006$	$< 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.087$	$> 0.05$	$p = 0.261$	$> 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.143$	$> 0.05$	$p = 0.333$	$> 0.05$	✗
Retrospective ↔ Review	$p = 0.391$	$> 0.05$	$p = 0.587$	$\gg 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 2.542 * 10^{-4}$	$\ll 0.05$	$p = 0.005$	$< 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.742$	$\gg 0.05$	$p = 0.820$	$\gg 0.05$	✗
Planning Poker ↔ Review	$p = 0.367$	$> 0.05$	$p = 0.593$	$\gg 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.082$	$> 0.05$	$p = 0.288$	$> 0.05$	✗
During the sprint ↔ Review	$p = 0.543$	$\gg 0.05$	$p = 0.713$	$\gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.028$	$< 0.05$	$p = 0.119$	$> 0.05$	✗
Review ↔ Daily Scrum	$p = 0.005$	$< 0.05$	$p = 0.036$	$< 0.05$	✓

Table D.64.: Results of test for difference – grouped by Scrum phases – cf. Figure D.65.

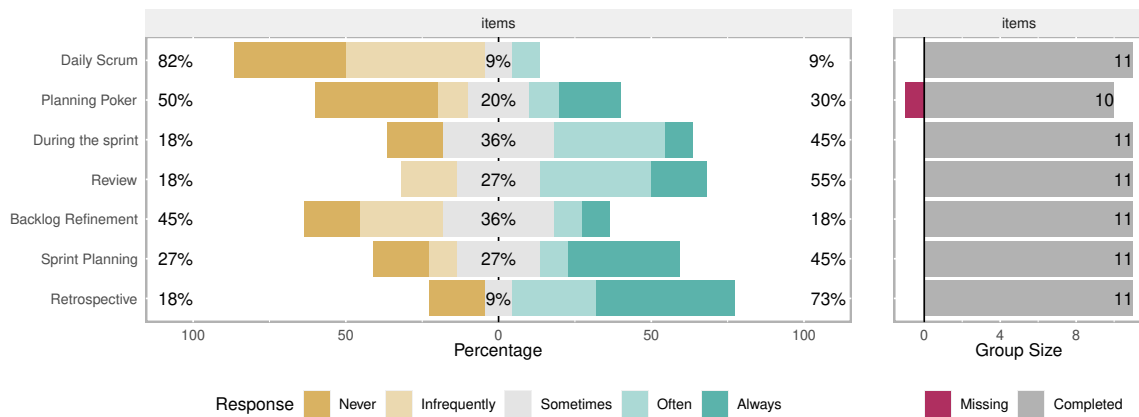


Figure D.66.: Documentation frequency for participants with *Developer* and *SM* experience (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 14.386$	$p = 0.026 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.219 > 0.05$	$p = 0.512 \gg 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.044 < 0.05$	$p = 0.186 > 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.987 \gg 0.05$	$p = 0.987 \gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.351 > 0.05$	$p = 0.527 \gg 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.129 > 0.05$	$p = 0.386 > 0.05$	✗
Backlog Refinement ↔ Daily Scrum	$p = 0.239 > 0.05$	$p = 0.455 > 0.05$	✗
Sprint Planning ↔ Retrospective	$p = 0.433 > 0.05$	$p = 0.568 \gg 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.225 > 0.05$	$p = 0.472 > 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.767 \gg 0.05$	$p = 0.848 \gg 0.05$	✗
Sprint Planning ↔ Review	$p = 0.771 \gg 0.05$	$p = 0.810 \gg 0.05$	✗
Sprint Planning ↔ Daily Scrum	$p = 0.016 < 0.05$	$p = 0.113 > 0.05$	✗
Retrospective ↔ Planning Poker	$p = 0.048 < 0.05$	$p = 0.167 > 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.280 > 0.05$	$p = 0.453 > 0.05$	✗
Retrospective ↔ Review	$p = 0.622 \gg 0.05$	$p = 0.726 \gg 0.05$	✗
Retrospective ↔ Daily Scrum	$p = 0.001 \ll 0.05$	$p = 0.030 < 0.05$	✓
Planning Poker ↔ During the sprint	$p = 0.355 > 0.05$	$p = 0.497 > 0.05$	✗
Planning Poker ↔ Review	$p = 0.134 > 0.05$	$p = 0.352 > 0.05$	✗
Planning Poker ↔ Daily Scrum	$p = 0.257 > 0.05$	$p = 0.449 > 0.05$	✗
During the sprint ↔ Review	$p = 0.557 \gg 0.05$	$p = 0.688 \gg 0.05$	✗
During the sprint ↔ Daily Scrum	$p = 0.035 < 0.05$	$p = 0.183 > 0.05$	✗
Review ↔ Daily Scrum	$p = 0.007 < 0.05$	$p = 0.073 > 0.05$	✓

Table D.65.: Results of test for difference – grouped by Scrum phases – cf. [Figure D.66.](#)

## Amount of Scrum Roles With Experience: Scrum Phase ↔ Decision Documentation Frequency (IndepVar: Q-28 – DepVar: Q-14)

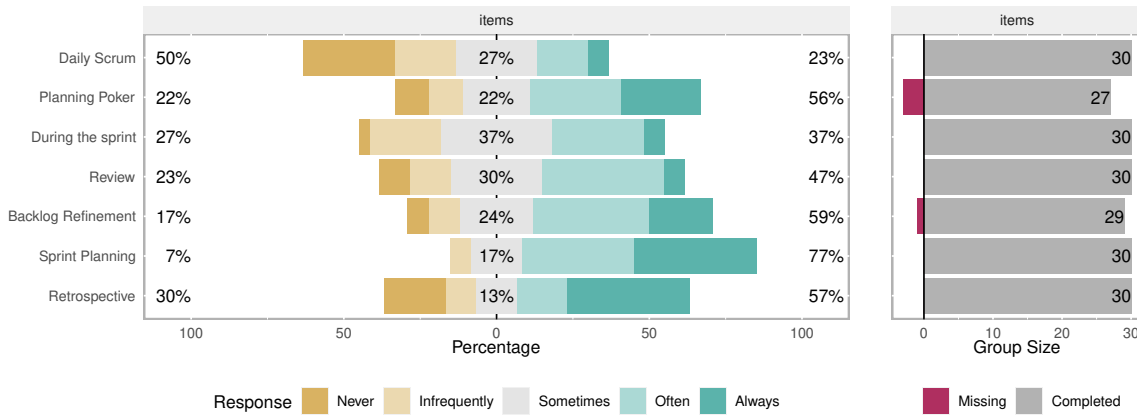


Figure D.67.: Documentation frequency for participants with “One Role” of Scrum grouped by Scrum phase (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference					
Method	Value		Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 13.939$		$p = 0.016 < 0.05$	✓	
Dunn’s Post Hoc Test for Kruskal-Wallis					
Object of Consideration	Significance		Adj. Significance	Significant?	
Backlog Refinement ↔ Sprint Planning	$p = 0.075$	$> 0.05$	$p = 0.282$	$> 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.882$	$\gg 0.05$	$p = 0.945$	$\gg 0.05$	✗
Backlog Refinement ↔ Planning Poker	$p = 0.919$	$\gg 0.05$	$p = 0.919$	$\gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.121$	$> 0.05$	$p = 0.260$	$> 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.238$	$> 0.05$	$p = 0.357$	$> 0.05$	✗
Sprint Planning ↔ Retrospective	$p = 0.100$	$> 0.05$	$p = 0.250$	$> 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.065$	$> 0.05$	$p = 0.323$	$> 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 7.906 * 10^{-4}$	$\ll 0.05$	$p = 0.012$	$< 0.05$	✓
Sprint Planning ↔ Review	$p = 0.003$	$\ll 0.05$	$p = 0.021$	$< 0.05$	✓
Retrospective ↔ Planning Poker	$p = 0.805$	$\gg 0.05$	$p = 0.929$	$\gg 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.087$	$> 0.05$	$p = 0.261$	$> 0.05$	✗
Retrospective ↔ Review	$p = 0.180$	$> 0.05$	$p = 0.300$	$> 0.05$	✗
Planning Poker ↔ During the sprint	$p = 0.156$	$> 0.05$	$p = 0.293$	$> 0.05$	✗
Planning Poker ↔ Review	$p = 0.290$	$> 0.05$	$p = 0.396$	$> 0.05$	✗
During the sprint ↔ Review	$p = 0.710$	$\gg 0.05$	$p = 0.888$	$\gg 0.05$	✗

Table D.66.: Results of test for difference – grouped by Scrum phases – cf. Figure D.67.

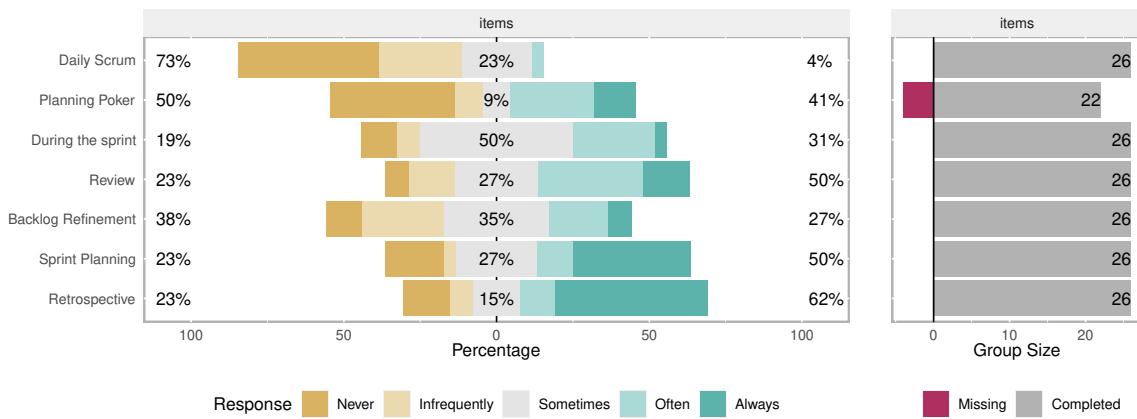


Figure D.68.: Documentation frequency for participants with “Two Roles” of Scrum grouped by Scrum phase (→) grouped by Scrum phase (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.689$	$p = 0.039 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement ↔ Sprint Planning	$p = 0.068 > 0.05$	$p = 0.204 > 0.05$	✗
Backlog Refinement ↔ Retrospective	$p = 0.010 < 0.05$	$p = 0.074 > 0.05$	✓
Backlog Refinement ↔ Planning Poker	$p = 0.827 \gg 0.05$	$p = 0.827 \gg 0.05$	✗
Backlog Refinement ↔ During the sprint	$p = 0.618 \gg 0.05$	$p = 0.713 \gg 0.05$	✗
Backlog Refinement ↔ Review	$p = 0.162 > 0.05$	$p = 0.347 > 0.05$	✗
Sprint Planning ↔ Retrospective	$p = 0.451 > 0.05$	$p = 0.615 \gg 0.05$	✗
Sprint Planning ↔ Planning Poker	$p = 0.049 < 0.05$	$p = 0.185 > 0.05$	✗
Sprint Planning ↔ During the sprint	$p = 0.185 > 0.05$	$p = 0.347 > 0.05$	✗
Sprint Planning ↔ Review	$p = 0.670 \gg 0.05$	$p = 0.718 \gg 0.05$	✗
Retrospective ↔ Planning Poker	$p = 0.007 < 0.05$	$p = 0.108 > 0.05$	✗
Retrospective ↔ During the sprint	$p = 0.038 < 0.05$	$p = 0.188 > 0.05$	✗
Retrospective ↔ Review	$p = 0.238 > 0.05$	$p = 0.397 > 0.05$	✗
Planning Poker ↔ During the sprint	$p = 0.486 > 0.05$	$p = 0.608 \gg 0.05$	✗
Planning Poker ↔ Review	$p = 0.119 > 0.05$	$p = 0.299 > 0.05$	✗
During the sprint ↔ Review	$p = 0.369 > 0.05$	$p = 0.553 \gg 0.05$	✗

Table D.67.: Results of test for difference – grouped by Scrum phases – cf. Figure D.68.

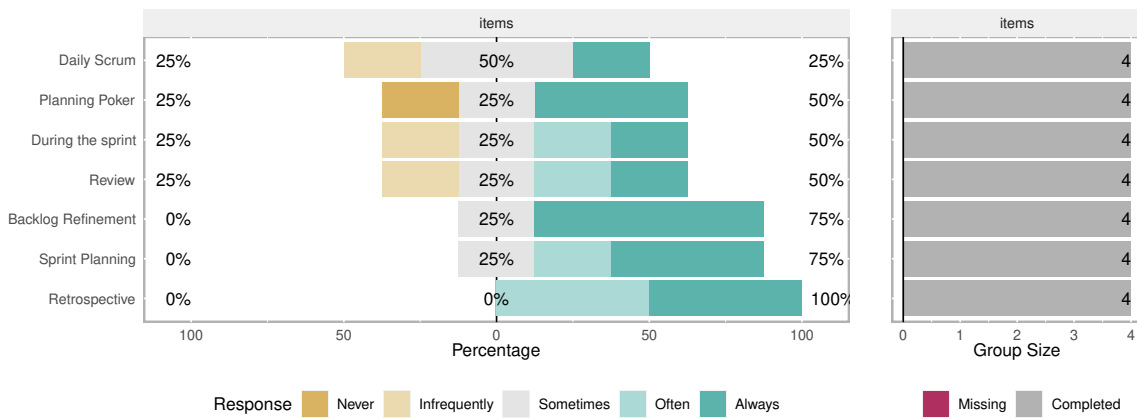


Figure D.69.: Documentation frequency for participants with “Three Roles” of Scrum experience ( $\rightarrow$ ) grouped by Scrum phase ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.291$	$p = 0.655 \gg 0.05$	$\times$
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Backlog Refinement $\leftrightarrow$ Sprint Planning	$p = 0.671 \gg 0.05$	$p = 1.000 \gg 0.05$	$\times$
Backlog Refinement $\leftrightarrow$ Retrospective	$p = 0.873 \gg 0.05$	$p = 0.936 \gg 0.05$	$\times$
Backlog Refinement $\leftrightarrow$ Planning Poker	$p = 0.339 > 0.05$	$p = 1.000 \gg 0.05$	$\times$
Backlog Refinement $\leftrightarrow$ During the sprint	$p = 0.193 > 0.05$	$p = 1.000 \gg 0.05$	$\times$
Backlog Refinement $\leftrightarrow$ Review	$p = 0.193 > 0.05$	$p = 1.000 \gg 0.05$	$\times$
Sprint Planning $\leftrightarrow$ Retrospective	$p = 0.791 \gg 0.05$	$p = 0.912 \gg 0.05$	$\times$
Sprint Planning $\leftrightarrow$ Planning Poker	$p = 0.595 \gg 0.05$	$p = 0.992 \gg 0.05$	$\times$
Sprint Planning $\leftrightarrow$ During the sprint	$p = 0.381 > 0.05$	$p = 0.816 \gg 0.05$	$\times$
Sprint Planning $\leftrightarrow$ Review	$p = 0.381 > 0.05$	$p = 0.952 \gg 0.05$	$\times$
Retrospective $\leftrightarrow$ Planning Poker	$p = 0.426 > 0.05$	$p = 0.798 \gg 0.05$	$\times$
Retrospective $\leftrightarrow$ During the sprint	$p = 0.254 > 0.05$	$p = 0.951 \gg 0.05$	$\times$
Retrospective $\leftrightarrow$ Review	$p = 0.254 > 0.05$	$p = 1.000 \gg 0.05$	$\times$
Planning Poker $\leftrightarrow$ During the sprint	$p = 0.730 \gg 0.05$	$p = 0.912 \gg 0.05$	$\times$
Planning Poker $\leftrightarrow$ Review	$p = 0.730 \gg 0.05$	$p = 0.995 \gg 0.05$	$\times$
During the sprint $\leftrightarrow$ Review	$p = 1.000 \gg 0.05$	$p = 1.000 \gg 0.05$	$\times$

Table D.68.: Results of test for difference – grouped by Scrum phases – cf. Figure D.69.

## D.10. Hypothesis RQ2-H9 – Development Domain ⇔ Decision Documentation Frequency

### D.10.1. Development Domain ⇔ Decision Documentation Frequency (IndepVar: Q-29 – DepVar: Q-01)

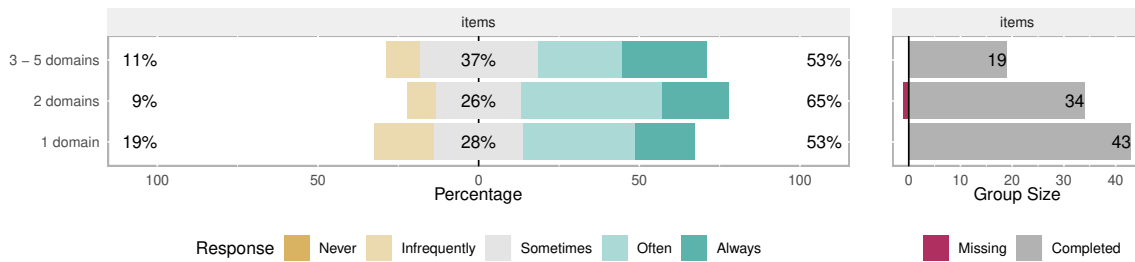


Figure D.70.: Documentation frequency (→) grouped by the quantity of development domains (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.004$	$p = 0.605 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3 – 5 domains ↔ 2 domains	$p = 0.736 > 0.10$	$p = 0.736 > 0.10$	X
3 – 5 domains ↔ 1 domain	$p = 0.633 > 0.10$	$p = 0.949 > 0.10$	X
2 domains ↔ 1 domain	$p = 0.320 > 0.10$	$p = 0.960 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.077$	$p = 0.454 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.067$	$p = 0.452 > 0.10$	X

Table D.69.: Results of test for difference and correlation analysis – grouped by the quantity of development domains – cf. Figure D.70.

**Embedded Software (IndepVar: Q-29 (1<sup>st</sup> Item) – DepVar: Q-01)**

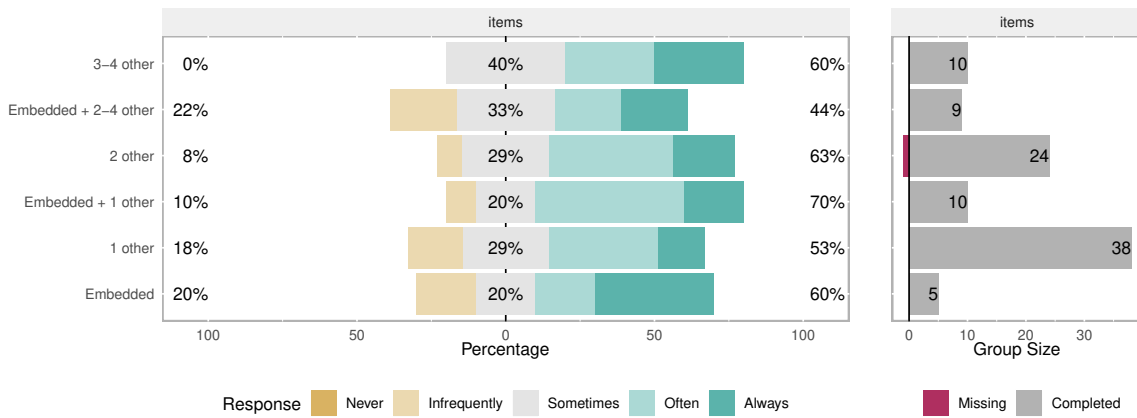


Figure D.71.: Documentation frequency (→) grouped by development domain *Embedded Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.398$	$p = 0.792 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.291 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Embedded	$p = 0.926 > 0.10$	$p = 0.992 > 0.10$	X
3-4 other ↔ Embed. + 2-4 other	$p = 0.344 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.732 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Embedded + 1 other	$p = 0.890 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ 1 other	$p = 0.872 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ Embedded	$p = 0.491 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ 2 other	$p = 0.434 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ Embedded + 1 other	$p = 0.417 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ 1 other	$p = 0.345 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Embedded	$p = 0.873 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Embedded + 1 other	$p = 0.858 > 0.10$	$p = 1.000 > 0.10$	X
Embedded + 1 other ↔ 1 other	$p = 0.378 > 0.10$	$p = 1.000 > 0.10$	X
Embedded + 1 other ↔ Embedded	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	X
1 other ↔ Embedded	$p = 0.495 > 0.10$	$p = 0.928 > 0.10$	X

Table D.70.: Results of test for difference – grouped by development domain *Embedded Apps* – cf. Figure D.71.



**Mobile Applications (IndepVar: Q-29 (2<sup>nd</sup> Item) – DepVar: Q-01)**

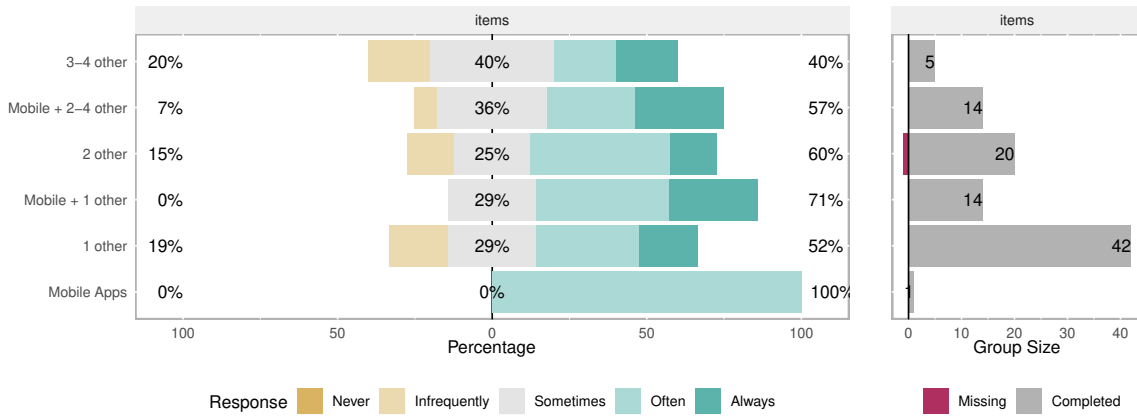


Figure D.72.: Documentation frequency (→) grouped by development domain *Mobile Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.077$	$p = 0.688 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.761 > 0.10$	$p = 0.951 > 0.10$	X
3-4 other ↔ Mobile Apps	$p = 0.549 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Mobile + 2-4 other	$p = 0.454 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.655 > 0.10$	$p = 0.983 > 0.10$	X
3-4 other ↔ Mobile + 1 other	$p = 0.239 > 0.10$	$p = 1.000 > 0.10$	X
Mobile + 2-4 other ↔ 1 other	$p = 0.425 > 0.10$	$p = 1.000 > 0.10$	X
Mobile + 2-4 other ↔ Mobile Apps	$p = 0.797 > 0.10$	$p = 0.854 > 0.10$	X
Mobile + 2-4 other ↔ 2 other	$p = 0.632 > 0.10$	$p = 1.000 > 0.10$	X
Mobile + 2-4 other ↔ Mobile + 1 other	$p = 0.554 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ 1 other	$p = 0.770 > 0.10$	$p = 0.888 > 0.10$	X
2 other ↔ Mobile Apps	$p = 0.672 > 0.10$	$p = 0.917 > 0.10$	X
2 other ↔ Mobile + 1 other	$p = 0.262 > 0.10$	$p = 1.000 > 0.10$	X
Mobile + 1 other ↔ 1 other	$p = 0.128 > 0.10$	$p = 1.000 > 0.10$	X
Mobile + 1 other ↔ Mobile Apps	$p = 0.967 > 0.10$	$p = 0.967 > 0.10$	X
1 other ↔ Mobile Apps	$p = 0.612 > 0.10$	$p = 1.000 > 0.10$	X

Table D.71.: Results of test for difference – grouped by development domain *Mobile Apps* – cf. Figure D.72.

**Desktop Applications (IndepVar: Q-29 (3<sup>rd</sup> Item) – DepVar: Q-01)**

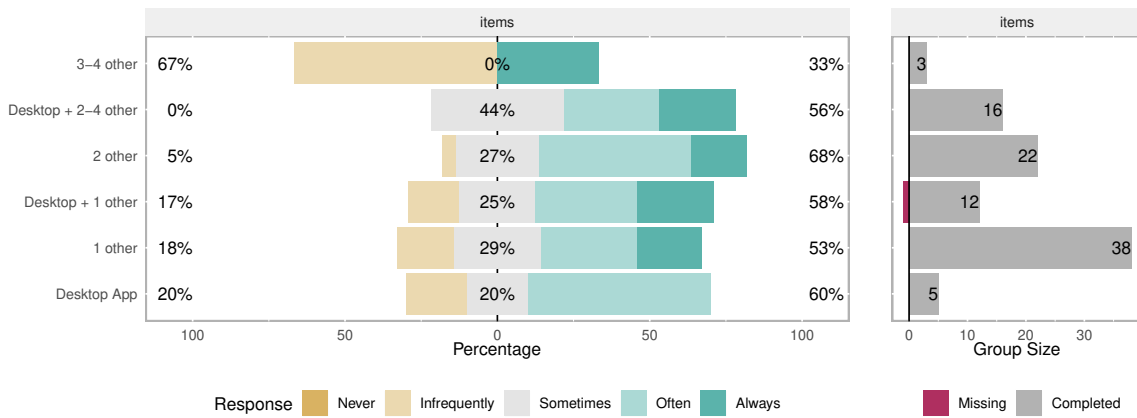


Figure D.73.: Documentation frequency (→) grouped by development domain *Desktop Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.474$	$p = 0.780 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.431 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Desktop App	$p = 0.651 > 0.10$	$p = 0.977 > 0.10$	X
3-4 other ↔ Desktop + 2-4 other	$p = 0.267 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.233 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Desktop + 1 other	$p = 0.357 > 0.10$	$p = 1.000 > 0.10$	X
Desktop + 2-4 other ↔ 1 other	$p = 0.450 > 0.10$	$p = 0.964 > 0.10$	X
Desktop + 2-4 other ↔ Desktop App	$p = 0.473 > 0.10$	$p = 0.887 > 0.10$	X
Desktop + 2-4 other ↔ 2 other	$p = 0.913 > 0.10$	$p = 0.913 > 0.10$	X
Desktop + 2-4 other ↔ Desktop + 1 other	$p = 0.786 > 0.10$	$p = 0.842 > 0.10$	X
2 other ↔ 1 other	$p = 0.330 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Desktop App	$p = 0.416 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Desktop + 1 other	$p = 0.698 > 0.10$	$p = 0.952 > 0.10$	X
Desktop + 1 other ↔ 1 other	$p = 0.713 > 0.10$	$p = 0.892 > 0.10$	X
Desktop + 1 other ↔ Desktop App	$p = 0.620 > 0.10$	$p = 1.000 > 0.10$	X
1 other ↔ Desktop App	$p = 0.765 > 0.10$	$p = 0.883 > 0.10$	X

Table D.72.: Results of test for difference – grouped by development domain *Desktop Apps* – cf. Figure D.73.

Web Applications (IndepVar: Q-29 (4<sup>th</sup> Item) – DepVar: Q-01)

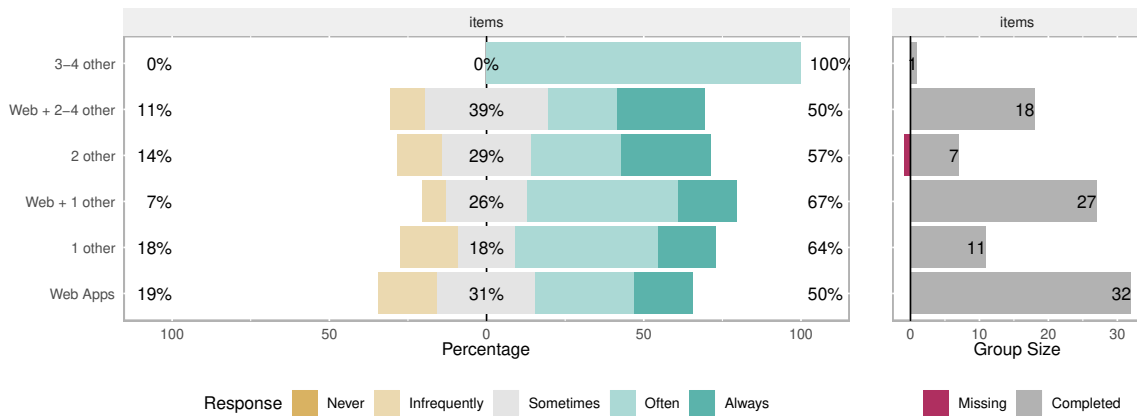


Figure D.74.: Documentation frequency (→) grouped by development domain *Web Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.378$	$p = 0.927 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.715 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Web Apps	$p = 0.594 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Web + 2-4 other	$p = 0.704 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.764 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Web + 1 other	$p = 0.799 > 0.10$	$p = 1.000 > 0.10$	X
Web + 2-4 other ↔ 1 other	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	X
Web + 2-4 other ↔ Web Apps	$p = 0.606 > 0.10$	$p = 1.000 > 0.10$	X
Web + 2-4 other ↔ 2 other	$p = 0.878 > 0.10$	$p = 1.000 > 0.10$	X
Web + 2-4 other ↔ Web + 1 other	$p = 0.669 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ 1 other	$p = 0.901 > 0.10$	$p = 0.965 > 0.10$	X
2 other ↔ Web Apps	$p = 0.598 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Web + 1 other	$p = 0.884 > 0.10$	$p = 1.000 > 0.10$	X
Web + 1 other ↔ 1 other	$p = 0.733 > 0.10$	$p = 1.000 > 0.10$	X
Web + 1 other ↔ Web Apps	$p = 0.281 > 0.10$	$p = 1.000 > 0.10$	X
1 other ↔ Web Apps	$p = 0.648 > 0.10$	$p = 1.000 > 0.10$	X

Table D.73.: Results of test for difference – grouped by development domain *Web Apps* – cf. Figure D.74.

**High-Performance Computing (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-01)**

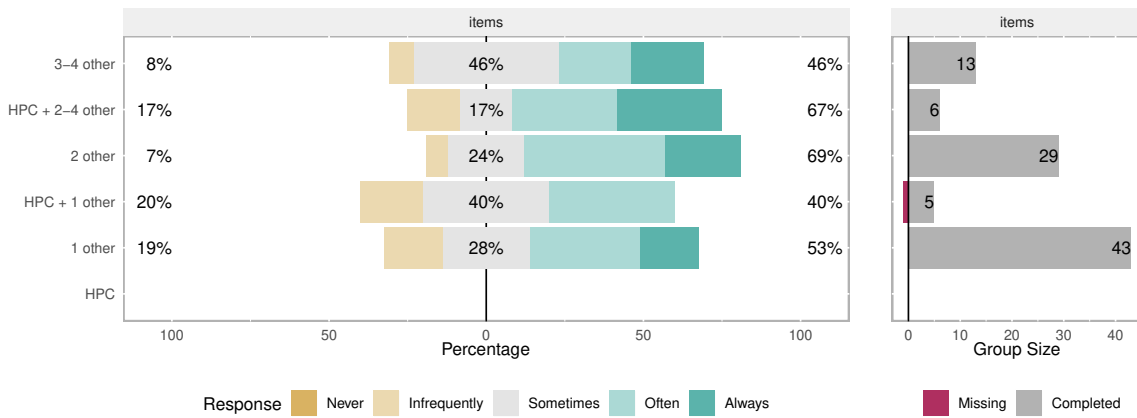


Figure D.75.: Documentation frequency (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.368$	$p = 0.498 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.891 > 0.10$	$p = 0.990 > 0.10$	X
3-4 other ↔ HPC + 2-4 other	$p = 0.572 > 0.10$	$p = 0.714 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.390 > 0.10$	$p = 0.976 > 0.10$	X
3-4 other ↔ HPC + 1 other	$p = 0.441 > 0.10$	$p = 0.882 > 0.10$	X
HPC + 2-4 other ↔ 1 other	$p = 0.459 > 0.10$	$p = 0.656 > 0.10$	X
HPC + 2-4 other ↔ 2 other	$p = 0.987 > 0.10$	$p = 0.987 > 0.10$	X
HPC + 2-4 other ↔ HPC + 1 other	$p = 0.258 > 0.10$	$p = 0.860 > 0.10$	X
2 other ↔ 1 other	$p = 0.170 > 0.10$	$p = 0.848 > 0.10$	X
2 other ↔ HPC + 1 other	$p = 0.153 > 0.10$	$p = 1.000 > 0.10$	X
HPC + 1 other ↔ 1 other	$p = 0.443 > 0.10$	$p = 0.739 > 0.10$	X

Table D.74.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. [Figure D.75](#).

## D.10.2. Development Domain $\leftrightarrow$ Decision Documentation Frequency Across all Decision Types (IndepVar: Q-29 – DepVar: Q-04)

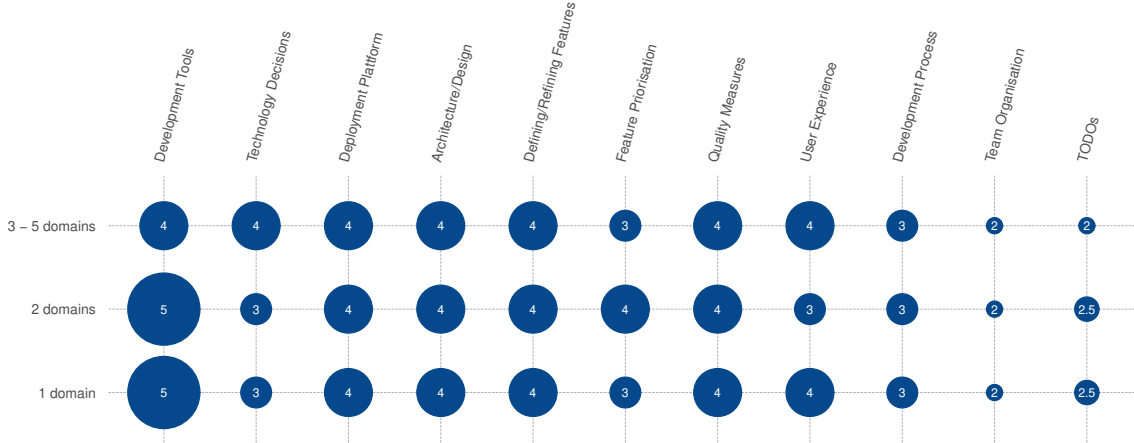


Figure D.76.: Median documentation frequency grouped by decision type ( $\rightarrow$ ) & quantity of development domains ( $\uparrow$ ) – median values range from 1 to 5, representing a Likert frequency scale (never  $\Rightarrow$  always  $\equiv$  1  $\Rightarrow$  5).

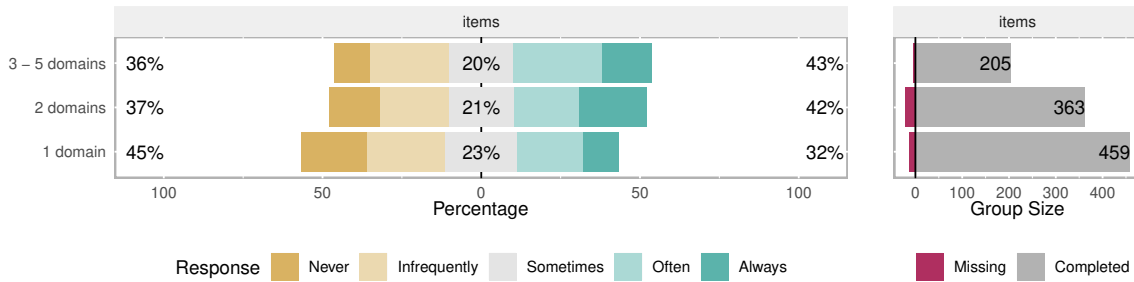


Figure D.77.: Documentation frequency across all decision types ( $\rightarrow$ ) grouped by the quantity of development domains ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 15.803$	$p = 3.701 * 10^{-4} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3 – 5 domains $\leftrightarrow$ 2 domains	$p = 0.821 > 0.10$	$p = 0.821 > 0.10$	✗
3 – 5 domains $\leftrightarrow$ 1 domain	$p = 0.002 \ll 0.05$	$p = 0.003 \ll 0.05$	✓
2 domains $\leftrightarrow$ 1 domain	$p = 5.713 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.118$	$p = 1.553 * 10^{-4} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.099$	$p = 1.862 * 10^{-4} \ll 0.05$	✓

Table D.75.: Results of test for difference and correlation analysis – grouped by the quantity of development domains – cf. Figure D.77.

**Embedded Software (IndepVar: Q-29 (1<sup>st</sup> Item) – DepVar: Q-04)**

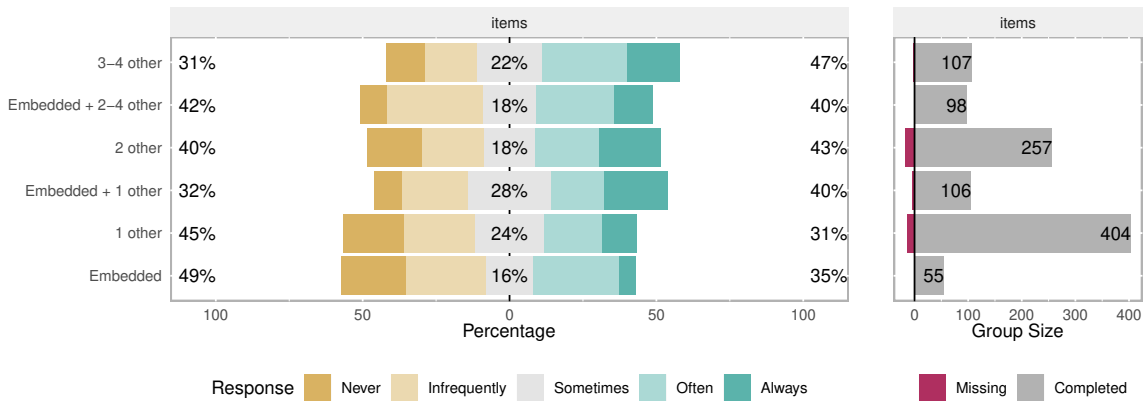


Figure D.78.: Documentation frequency across all decision types (→) grouped by development domain *Embedded Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 17.909$	$p = 0.003 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.003 \ll 0.05$	$p = 0.045 < 0.05$	✓
3-4 other ↔ Embedded	$p = 0.020 < 0.05$	$p = 0.076 < 0.10$	✓
3-4 other ↔ Embed. + 2-4 other	$p = 0.305 > 0.10$	$p = 0.458 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.298 > 0.10$	$p = 0.497 > 0.10$	✗
3-4 other ↔ Embedded + 1 other	$p = 0.929 > 0.10$	$p = 0.929 > 0.10$	✗
Embed. + 2-4 other ↔ 1 other	$p = 0.111 > 0.10$	$p = 0.238 > 0.10$	✗
Embed. + 2-4 other ↔ Embedded	$p = 0.151 > 0.10$	$p = 0.284 > 0.10$	✗
Embed. + 2-4 other ↔ 2 other	$p = 0.842 > 0.10$	$p = 0.902 > 0.10$	✗
Embed. + 2-4 other ↔ Embedded + 1 other	$p = 0.349 > 0.10$	$p = 0.477 > 0.10$	✗
2 other ↔ 1 other	$p = 0.011 < 0.05$	$p = 0.054 < 0.10$	✓
2 other ↔ Embedded	$p = 0.074 < 0.10$	$p = 0.185 > 0.10$	✗
2 other ↔ Embedded + 1 other	$p = 0.352 > 0.10$	$p = 0.440 > 0.10$	✗
Embedded + 1 other ↔ 1 other	$p = 0.004 \ll 0.05$	$p = 0.033 < 0.05$	✓
Embedded + 1 other ↔ Embedded	$p = 0.025 < 0.05$	$p = 0.075 < 0.10$	✓
1 other ↔ Embedded	$p = 0.665 > 0.10$	$p = 0.767 > 0.10$	✗

Table D.76.: Results of test for difference – grouped by development domain *Embedded Apps* – cf. Figure D.78.

**Mobile Applications (IndepVar: Q-29 (2<sup>nd</sup> Item) – DepVar: Q-04)**

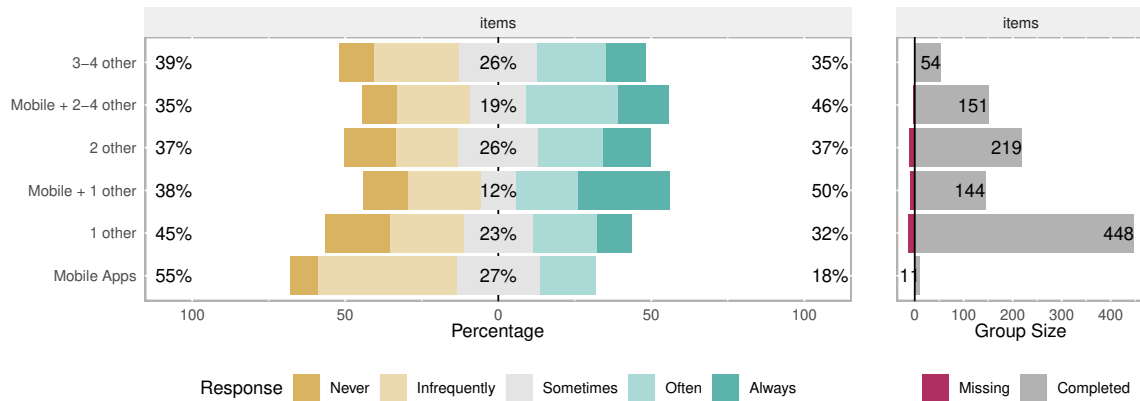


Figure D.79.: Documentation frequency across all decision types (→) grouped by development domain *Mobile Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 20.618$	$p = 9.561 * 10^{-4} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.283 > 0.10$	$p = 0.471 > 0.10$	✗
3-4 other ↔ Mobile Apps	$p = 0.321 > 0.10$	$p = 0.437 > 0.10$	✗
3-4 other ↔ Mobile + 2-4 other	$p = 0.379 > 0.10$	$p = 0.473 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.995 > 0.10$	$p = 0.995 > 0.10$	✗
3-4 other ↔ Mobile + 1 other	$p = 0.193 > 0.10$	$p = 0.361 > 0.10$	✗
Mobile + 2-4 other ↔ 1 other	$p = 0.002 \ll 0.05$	$p = 0.013 < 0.05$	✓
Mobile + 2-4 other ↔ Mobile Apps	$p = 0.134 > 0.10$	$p = 0.335 > 0.10$	✗
Mobile + 2-4 other ↔ 2 other	$p = 0.190 > 0.10$	$p = 0.407 > 0.10$	✗
Mobile + 2-4 other ↔ Mobile + 1 other	$p = 0.558 > 0.10$	$p = 0.644 > 0.10$	✗
2 other ↔ 1 other	$p = 0.059 > 0.05$	$p = 0.221 > 0.10$	✗
2 other ↔ Mobile Apps	$p = 0.286 > 0.10$	$p = 0.429 > 0.10$	✗
2 other ↔ Mobile + 1 other	$p = 0.054 > 0.05$	$p = 0.270 > 0.10$	✗
Mobile + 1 other ↔ 1 other	$p = 1.539 * 10^{-4} \ll 0.05$	$p = 0.002 \ll 0.05$	✓
Mobile + 1 other ↔ Mobile Apps	$p = 0.086 > 0.05$	$p = 0.259 > 0.10$	✗
1 other ↔ Mobile Apps	$p = 0.569 > 0.10$	$p = 0.610 > 0.10$	✗

Table D.77.: Results of test for difference – grouped by development domain *Mobile Apps* – cf. Figure D.79.

**Desktop Applications (IndepVar: Q-29 (3<sup>rd</sup> Item) – DepVar: Q-04)**

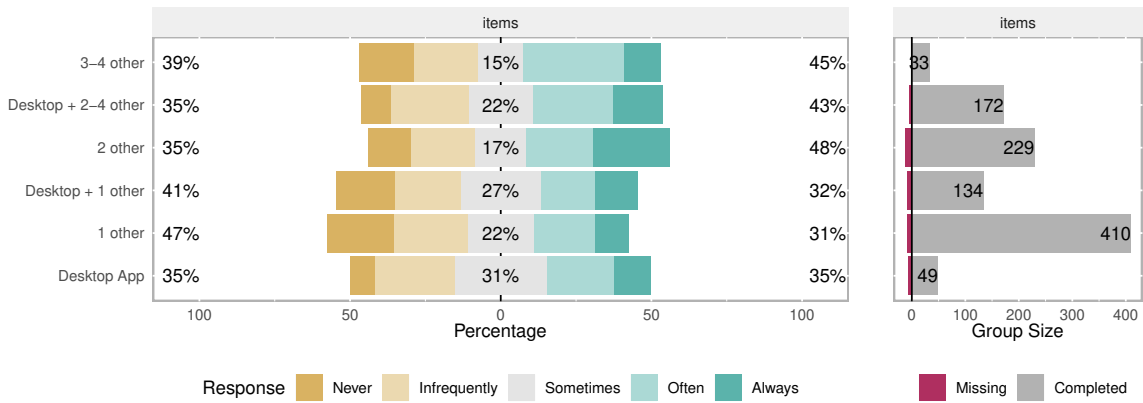


Figure D.80.: Documentation frequency across all decision types (→) grouped by development domain *Desktop Apps* (↑).

Kruskal-Wallis – Test for Difference				
Method	Value	Significance	Significant?	
Kruskal-Wallis	$\chi^2 = 24.957$	$p = 1.420 * 10^{-4} \ll 0.05$	✓	
Dunn's Post Hoc Test for Kruskal-Wallis				
Object of Consideration	Significance	Adj. Significance	Significant?	
3-4 other ↔ 1 other	$p = 0.264 > 0.10$	$p = 0.659 > 0.10$	✗	
3-4 other ↔ Desktop App	$p = 0.903 > 0.10$	$p = 0.903 > 0.10$	✗	
3-4 other ↔ Desktop + 2-4 other	$p = 0.598 > 0.10$	$p = 0.691 > 0.10$	✗	
3-4 other ↔ 2 other	$p = 0.369 > 0.10$	$p = 0.693 > 0.10$	✗	
3-4 other ↔ Desktop + 1 other	$p = 0.566 > 0.10$	$p = 0.707 > 0.10$	✗	
Desktop + 2-4 other ↔ 1 other	$p = 8.739 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓	
Desktop + 2-4 other ↔ Desktop App	$p = 0.653 > 0.10$	$p = 0.700 > 0.10$	✗	
Desktop + 2-4 other ↔ 2 other	$p = 0.507 > 0.10$	$p = 0.691 > 0.10$	✗	
Desktop + 2-4 other ↔ Desktop + 1 other	$p = 0.066 > 0.05$	$p = 0.248 > 0.10$	✗	
2 other ↔ 1 other	$p = 7.553 * 10^{-6} \ll 0.05$	$p = 1.133 * 10^{-4} \ll 0.05$	✓	
2 other ↔ Desktop App	$p = 0.374 > 0.10$	$p = 0.624 > 0.10$	✗	
2 other ↔ Desktop + 1 other	$p = 0.010 < 0.05$	$p = 0.052 < 0.10$	✓	
Desktop + 1 other ↔ 1 other	$p = 0.363 > 0.10$	$p = 0.777 > 0.10$	✗	
Desktop + 1 other ↔ Desktop App	$p = 0.405 > 0.10$	$p = 0.608 > 0.10$	✗	
1 other ↔ Desktop App	$p = 0.129 > 0.10$	$p = 0.386 > 0.10$	✗	

Table D.78.: Results of test for difference – grouped by development domain *Desktop Apps* – cf. Figure D.80.



**Web Applications (IndepVar: Q-29 (4<sup>th</sup> Item) – DepVar: Q-04)**

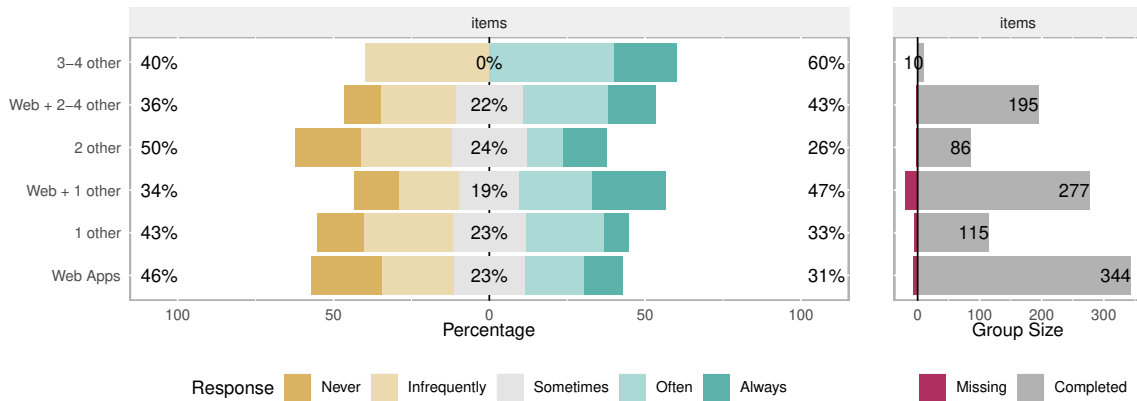


Figure D.81.: Documentation frequency across all decision types (→) grouped by development domain *Web Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 27.417$	$p = 4.731 * 10^{-5} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.198 > 0.10$	$p = 0.331 > 0.10$	✗
3-4 other ↔ Web Apps	$p = 0.131 > 0.10$	$p = 0.246 > 0.10$	✗
3-4 other ↔ Web + 2-4 other	$p = 0.502 > 0.10$	$p = 0.627 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.108 > 0.10$	$p = 0.231 > 0.10$	✗
3-4 other ↔ Web + 1 other	$p = 0.685 > 0.10$	$p = 0.685 > 0.10$	✗
Web + 2-4 other ↔ 1 other	$p = 0.080 > 0.05$	$p = 0.199 > 0.10$	✗
Web + 2-4 other ↔ Web Apps	$p = 0.003 \ll 0.05$	$p = 0.015 < 0.05$	✓
Web + 2-4 other ↔ 2 other	$p = 0.014 < 0.05$	$p = 0.041 < 0.05$	✓
Web + 2-4 other ↔ Web + 1 other	$p = 0.351 > 0.10$	$p = 0.526 > 0.10$	✗
2 other ↔ 1 other	$p = 0.427 > 0.10$	$p = 0.582 > 0.10$	✗
2 other ↔ Web Apps	$p = 0.658 > 0.10$	$p = 0.705 > 0.10$	✗
2 other ↔ Web + 1 other	$p = 9.868 * 10^{-4} \ll 0.05$	$p = 0.007 < 0.05$	✓
Web + 1 other ↔ 1 other	$p = 0.008 < 0.05$	$p = 0.031 < 0.05$	✓
Web + 1 other ↔ Web Apps	$p = 1.205 * 10^{-5} \ll 0.05$	$p = 1.807 * 10^{-4} \ll 0.05$	✓
1 other ↔ Web Apps	$p = 0.578 > 0.10$	$p = 0.667 > 0.10$	✗

Table D.79.: Results of test for difference – grouped by development domain *Web Apps* – cf. Figure D.81.

### High-Performance Computing (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-04)

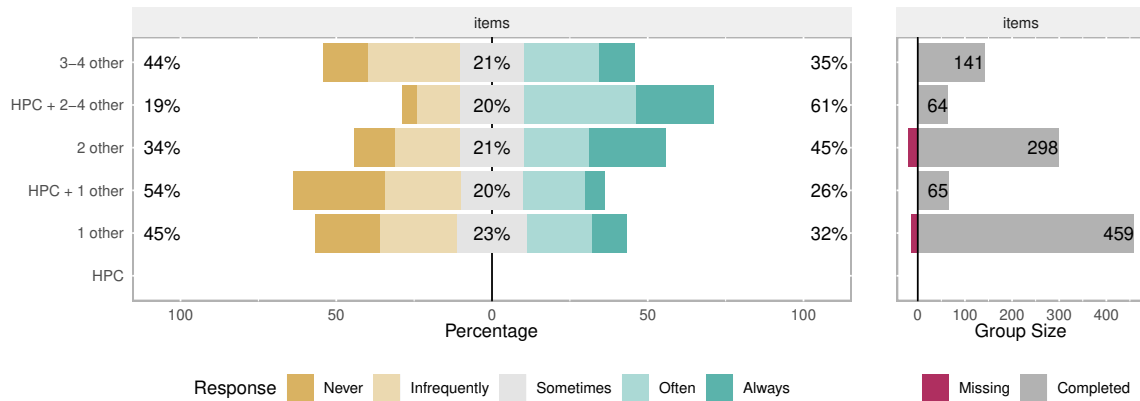


Figure D.82.: Documentation frequency across all decision types (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 45.438$	$p = 3.224 * 10^{-9} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.364 > 0.10$	$p = 0.364 > 0.10$	✗
3-4 other ↔ HPC + 2-4 other	$p = 2.129 * 10^{-4} \ll 0.05$	$p = 4.258 * 10^{-4} \ll 0.05$	✓
3-4 other ↔ 2 other	$p = 0.014 < 0.05$	$p = 0.023 < 0.05$	✓
3-4 other ↔ HPC + 1 other	$p = 0.050 \leq 0.05$	$p = 0.062 < 0.10$	✓
HPC + 2-4 other ↔ 1 other	$p = 1.306 * 10^{-6} \ll 0.05$	$p = 6.532 * 10^{-6} \ll 0.05$	✓
HPC + 2-4 other ↔ 2 other	$p = 0.026 < 0.05$	$p = 0.038 < 0.05$	✓
HPC + 2-4 other ↔ HPC + 1 other	$p = 1.306 * 10^{-6} \ll 0.05$	$p = 1.306 * 10^{-5} \ll 0.05$	✓
2 other ↔ 1 other	$p = 4.941 * 10^{-6} \ll 0.05$	$p = 1.647 * 10^{-5} \ll 0.05$	✓
2 other ↔ HPC + 1 other	$p = 6.605 * 10^{-5} \ll 0.05$	$p = 1.651 * 10^{-4} \ll 0.05$	✓
HPC + 1 other ↔ 1 other	$p = 0.119 > 0.10$	$p = 0.133 > 0.10$	✗

Table D.80.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. Figure D.82.

## Development Domain ⇔ Decision Documentation Frequency for Specific Decision Types (IndepVar: Q-29 – DepVar: Q-04)

Technology Decisions (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-04 (2<sup>nd</sup> Item))

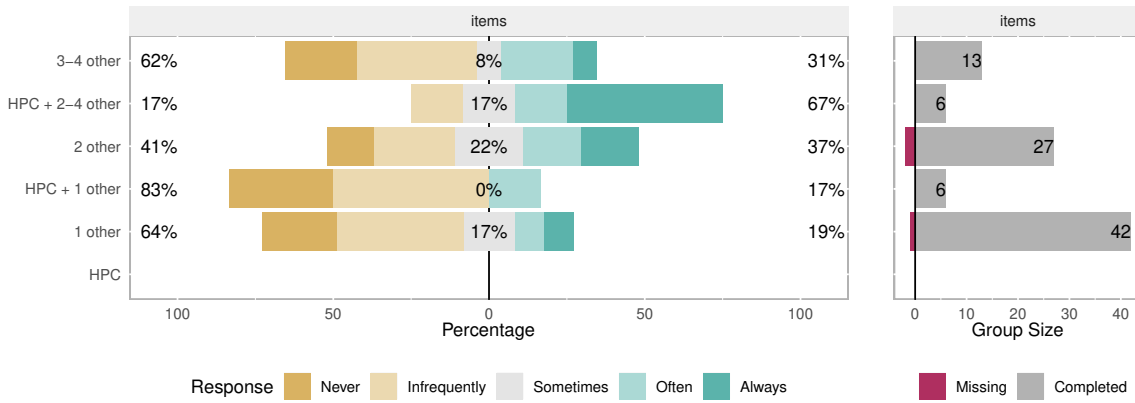


Figure D.83.: Documentation frequency of *Technology Decisions* (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.403$	$p = 0.034 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.784 > 0.10$	$p = 0.784 > 0.10$	✗
3-4 other ↔ HPC + 2-4 other	$p = 0.034 < 0.05$	$p = 0.113 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.286 > 0.10$	$p = 0.409 > 0.10$	✗
3-4 other ↔ HPC + 1 other	$p = 0.400 > 0.10$	$p = 0.500 > 0.10$	✗
HPC + 2-4 other ↔ 1 other	$p = 0.009 < 0.05$	$p = 0.093 < 0.10$	✓
HPC + 2-4 other ↔ 2 other	$p = 0.128 > 0.10$	$p = 0.213 > 0.10$	✗
HPC + 2-4 other ↔ HPC + 1 other	$p = 0.011 < 0.05$	$p = 0.056 < 0.10$	✓
2 other ↔ 1 other	$p = 0.070 < 0.10$	$p = 0.175 > 0.10$	✗
2 other ↔ HPC + 1 other	$p = 0.086 < 0.10$	$p = 0.172 > 0.10$	✗
HPC + 1 other ↔ 1 other	$p = 0.452 > 0.10$	$p = 0.502 > 0.10$	✗

Table D.81.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. [Figure D.83](#).

**Specific Decision Types (IndepVar: Q-29 (2<sup>nd</sup> Item) – DepVar: Q-04 (7<sup>th</sup> Item))**

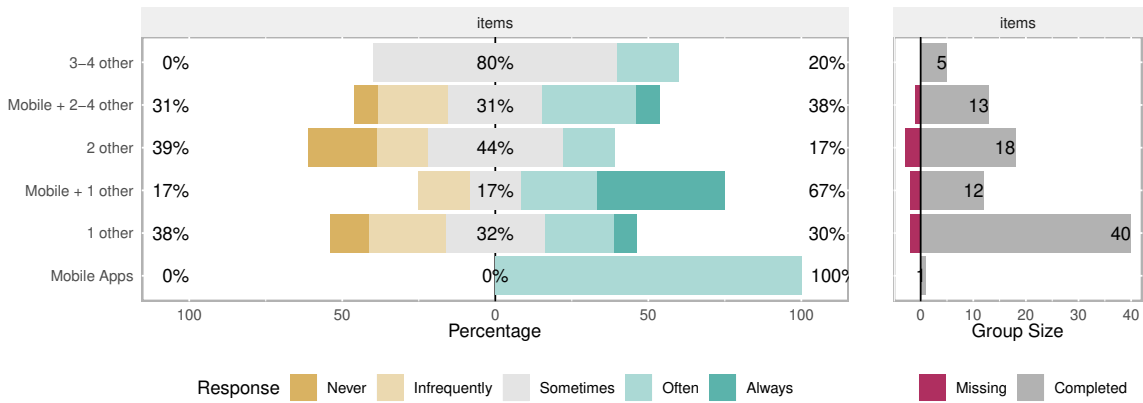


Figure D.84.: Documentation frequency of *User Experience* (→) grouped by development domain *Mobile Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.863$	$p = 0.054 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.543 > 0.10$	$p = 0.678 > 0.10$	✗
3-4 other ↔ Mobile Apps	$p = 0.447 > 0.10$	$p = 0.610 > 0.10$	✗
3-4 other ↔ Mobile + 2-4 other	$p = 0.839 > 0.10$	$p = 0.839 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.285 > 0.10$	$p = 0.534 > 0.10$	✗
3-4 other ↔ Mobile + 1 other	$p = 0.282 > 0.10$	$p = 0.604 > 0.10$	✗
Mobile + 2-4 other ↔ 1 other	$p = 0.568 > 0.10$	$p = 0.655 > 0.10$	✗
Mobile + 2-4 other ↔ Mobile Apps	$p = 0.365 > 0.10$	$p = 0.609 > 0.10$	✗
Mobile + 2-4 other ↔ 2 other	$p = 0.233 > 0.10$	$p = 0.698 > 0.10$	✗
Mobile + 2-4 other ↔ Mobile + 1 other	$p = 0.090 < 0.10$	$p = 0.449 > 0.10$	✗
2 other ↔ 1 other	$p = 0.375 > 0.10$	$p = 0.562 > 0.10$	✗
2 other ↔ Mobile Apps	$p = 0.181 > 0.10$	$p = 0.679 > 0.10$	✗
2 other ↔ Mobile + 1 other	$p = 0.003 \ll 0.05$	$p = 0.042 < 0.05$	✓
Mobile + 1 other ↔ 1 other	$p = 0.009 < 0.05$	$p = 0.066 < 0.10$	✓
Mobile + 1 other ↔ Mobile Apps	$p = 0.803 > 0.10$	$p = 0.860 > 0.10$	✗
1 other ↔ Mobile Apps	$p = 0.268 > 0.10$	$p = 0.670 > 0.10$	✗

Table D.82.: Results of test for difference – grouped by development domain *Mobile Apps* – cf. Figure D.84.

**Specific Decision Types (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-04 (8<sup>th</sup> Item))**

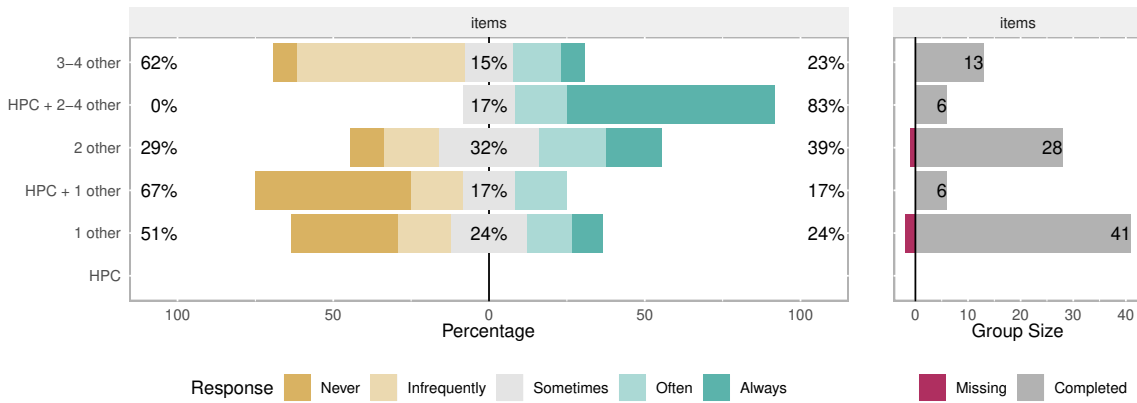


Figure D.85.: Documentation frequency of *development process* (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 15.349$	$p = 0.004 \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.756 > 0.10$	$p = 0.756 > 0.10$	✗
3-4 other ↔ HPC + 2-4 other	$p = 0.007 < 0.05$	$p = 0.024 < 0.05$	✓
3-4 other ↔ 2 other	$p = 0.213 > 0.10$	$p = 0.304 > 0.10$	✗
3-4 other ↔ HPC + 1 other	$p = 0.355 > 0.10$	$p = 0.444 > 0.10$	✗
HPC + 2-4 other ↔ 1 other	$p = 0.001 \ll 0.05$	$p = 0.011 < 0.05$	✓
HPC + 2-4 other ↔ 2 other	$p = 0.043 < 0.05$	$p = 0.087 < 0.10$	✓
HPC + 2-4 other ↔ HPC + 1 other	$p = 0.002 \ll 0.05$	$p = 0.010 < 0.05$	✓
2 other ↔ 1 other	$p = 0.035 < 0.05$	$p = 0.087 < 0.10$	✓
2 other ↔ HPC + 1 other	$p = 0.052 < 0.10$	$p = 0.086 < 0.10$	✓
HPC + 1 other ↔ 1 other	$p = 0.413 > 0.10$	$p = 0.459 > 0.10$	✗

Table D.83.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. Figure D.85.

**Specific Decision Types (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-04 (9<sup>th</sup> Item))**

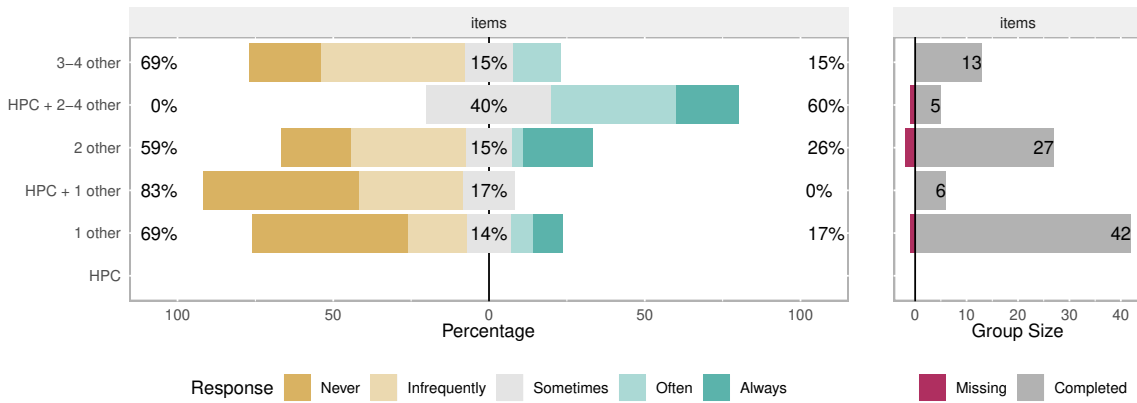


Figure D.86.: Documentation frequency of *team organisation* (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 11.329$	$p = 0.023 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.406 > 0.10$	$p = 0.508 > 0.10$	✗
3-4 other ↔ HPC + 2-4 other	$p = 0.040 < 0.05$	$p = 0.135 > 0.10$	✗
3-4 other ↔ 2 other	$p = 0.522 > 0.10$	$p = 0.580 > 0.10$	✗
3-4 other ↔ HPC + 1 other	$p = 0.326 > 0.10$	$p = 0.465 > 0.10$	✗
HPC + 2-4 other ↔ 1 other	$p = 0.005 \ll 0.05$	$p = 0.045 < 0.05$	✓
HPC + 2-4 other ↔ 2 other	$p = 0.077 < 0.10$	$p = 0.153 > 0.10$	✗
HPC + 2-4 other ↔ HPC + 1 other	$p = 0.010 < 0.05$	$p = 0.049 < 0.05$	✓
2 other ↔ 1 other	$p = 0.052 < 0.10$	$p = 0.129 > 0.10$	✗
2 other ↔ HPC + 1 other	$p = 0.120 > 0.10$	$p = 0.200 > 0.10$	✗
HPC + 1 other ↔ 1 other	$p = 0.612 > 0.10$	$p = 0.612 > 0.10$	✗

Table D.84.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. Figure D.86.

### D.10.1. Development Domain $\leftrightarrow$ Decision Documentation Frequency Across all Scrum Phases (IndepVar: Q-29 – DepVar: Q-14)

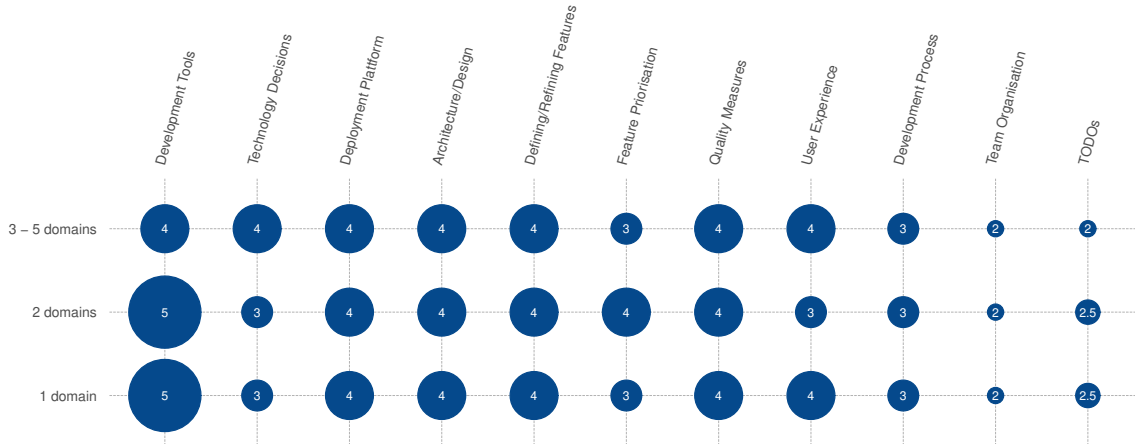


Figure D.87.: Median documentation frequency grouped by decision type ( $\rightarrow$ ) & quantity of development domains ( $\uparrow$ ) – median values range from 1 to 5, representing a Likert frequency scale (never  $\Rightarrow$  always  $\equiv$  1  $\Rightarrow$  5).

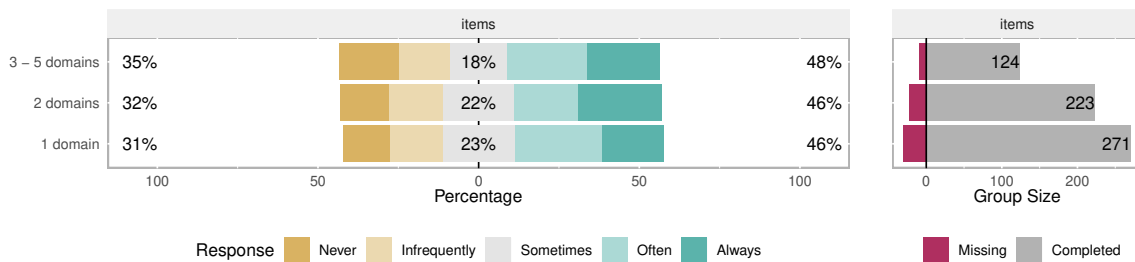


Figure D.88.: Documentation frequency across all Scrum phases ( $\rightarrow$ ) grouped by the quantity of development domains ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.277$	$p = 0.871 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3 – 5 domains $\leftrightarrow$ 2 domains	$p = 0.648 > 0.10$	$p = 1.000 > 0.10$	X
3 – 5 domains $\leftrightarrow$ 1 domain	$p = 0.914 > 0.10$	$p = 0.914 > 0.10$	X
2 domains $\leftrightarrow$ 1 domain	$p = 0.663 > 0.10$	$p = 0.994 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.003$	$p = 0.944 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.002$	$p = 0.947 > 0.10$	X

Table D.85.: Results of test for difference and correlation analysis – grouped by the quantity of development domains – cf. Figure D.88.

**Embedded Software (IndepVar: Q-29 (1<sup>st</sup> Item) – DepVar: Q-14)**

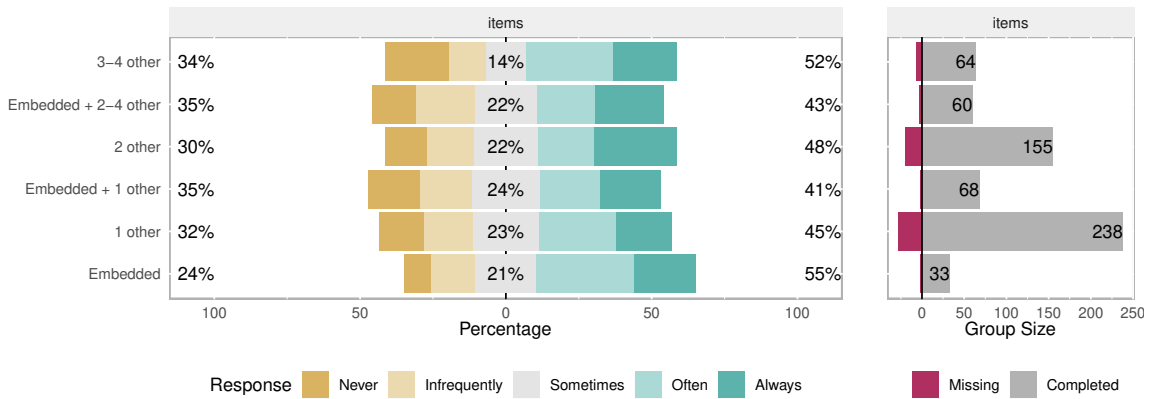


Figure D.89.: Documentation frequency across all decision types (→) grouped by development domain *Embedded Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.584$	$p = 0.764 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.889 > 0.10$	$p = 1.000 > 0.10$	X
3-4 other ↔ Embedded	$p = 0.457 > 0.10$	$p = 0.980 > 0.10$	X
3-4 other ↔ Embed. + 2-4 other	$p = 0.913 > 0.10$	$p = 0.978 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.529 > 0.10$	$p = 0.992 > 0.10$	X
3-4 other ↔ Embedded + 1 other	$p = 0.660 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ 1 other	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ Embedded	$p = 0.409 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ 2 other	$p = 0.457 > 0.10$	$p = 1.000 > 0.10$	X
Embed. + 2-4 other ↔ Embedded + 1 other	$p = 0.748 > 0.10$	$p = 0.935 > 0.10$	X
2 other ↔ 1 other	$p = 0.273 > 0.10$	$p = 1.000 > 0.10$	X
2 other ↔ Embedded	$p = 0.731 > 0.10$	$p = 0.997 > 0.10$	X
2 other ↔ Embedded + 1 other	$p = 0.242 > 0.10$	$p = 1.000 > 0.10$	X
Embedded + 1 other ↔ 1 other	$p = 0.678 > 0.10$	$p = 1.000 > 0.10$	X
Embedded + 1 other ↔ Embedded	$p = 0.266 > 0.10$	$p = 1.000 > 0.10$	X
1 other ↔ Embedded	$p = 0.335 > 0.10$	$p = 1.000 > 0.10$	X

Table D.86.: Results of test for difference – grouped by development domain *Embedded Apps* – cf. Figure D.89.



**Mobile Applications (IndepVar: Q-29 (2<sup>nd</sup> Item) – DepVar: Q-14)**

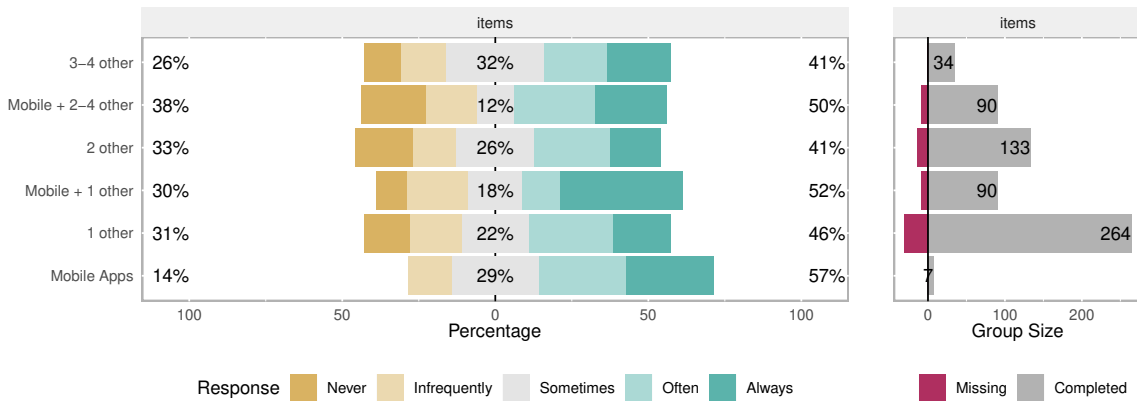


Figure D.90.: Documentation frequency across all decision types (→) grouped by development domain *Mobile Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.842$	$p = 0.165 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.898 > 0.10$	$p = 0.962 > 0.10$	X
3-4 other ↔ Mobile Apps	$p = 0.408 > 0.10$	$p = 0.681 > 0.10$	X
3-4 other ↔ Mobile + 2-4 other	$p = 0.861 > 0.10$	$p = 0.993 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.545 > 0.10$	$p = 0.818 > 0.10$	X
3-4 other ↔ Mobile + 1 other	$p = 0.243 > 0.10$	$p = 0.729 > 0.10$	X
Mobile + 2-4 other ↔ 1 other	$p = 0.922 > 0.10$	$p = 0.922 > 0.10$	X
Mobile + 2-4 other ↔ Mobile Apps	$p = 0.335 > 0.10$	$p = 0.837 > 0.10$	X
Mobile + 2-4 other ↔ 2 other	$p = 0.553 > 0.10$	$p = 0.754 > 0.10$	X
Mobile + 2-4 other ↔ Mobile + 1 other	$p = 0.070 < 0.10$	$p = 0.349 > 0.10$	X
2 other ↔ 1 other	$p = 0.383 > 0.10$	$p = 0.718 > 0.10$	X
2 other ↔ Mobile Apps	$p = 0.236 > 0.10$	$p = 0.886 > 0.10$	X
2 other ↔ Mobile + 1 other	$p = 0.010 < 0.05$	$p = 0.151 > 0.10$	X
Mobile + 1 other ↔ 1 other	$p = 0.034 < 0.05$	$p = 0.257 > 0.10$	X
Mobile + 1 other ↔ Mobile Apps	$p = 0.783 > 0.10$	$p = 0.978 > 0.10$	X
1 other ↔ Mobile Apps	$p = 0.338 > 0.10$	$p = 0.725 > 0.10$	X

Table D.87.: Results of test for difference – grouped by development domain *Mobile Apps* – cf. Figure D.90.

**Desktop Applications (IndepVar: Q-29 (3<sup>rd</sup> Item) – DepVar: Q-14)**

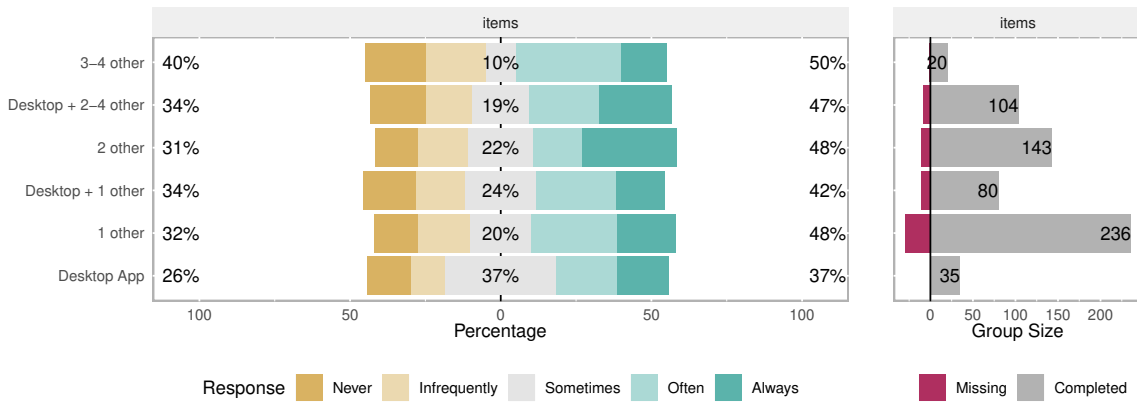


Figure D.91.: Documentation frequency across all decision types (→) grouped by development domain *Desktop Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.756$	$p = 0.738 > 0.10$	<i>X</i>
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.646 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
3-4 other ↔ Desktop App	$p = 0.880 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
3-4 other ↔ Desktop + 2-4 other	$p = 0.672 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
3-4 other ↔ 2 other	$p = 0.375 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
3-4 other ↔ Desktop + 1 other	$p = 0.981 > 0.10$	$p = 0.981 > 0.10$	<i>X</i>
Desktop + 2-4 other ↔ 1 other	$p = 0.977 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
Desktop + 2-4 other ↔ Desktop App	$p = 0.754 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
Desktop + 2-4 other ↔ 2 other	$p = 0.401 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
Desktop + 2-4 other ↔ Desktop + 1 other	$p = 0.512 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
2 other ↔ 1 other	$p = 0.322 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
2 other ↔ Desktop App	$p = 0.369 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
2 other ↔ Desktop + 1 other	$p = 0.140 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
Desktop + 1 other ↔ 1 other	$p = 0.436 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
Desktop + 1 other ↔ Desktop App	$p = 0.858 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>
1 other ↔ Desktop App	$p = 0.722 > 0.10$	$p = 1.000 > 0.10$	<i>X</i>

Table D.88.: Results of test for difference – grouped by development domain *Desktop Apps* – cf. Figure D.91.

**Web Applications (IndepVar: Q-29 (4<sup>th</sup> Item) – DepVar: Q-14)**

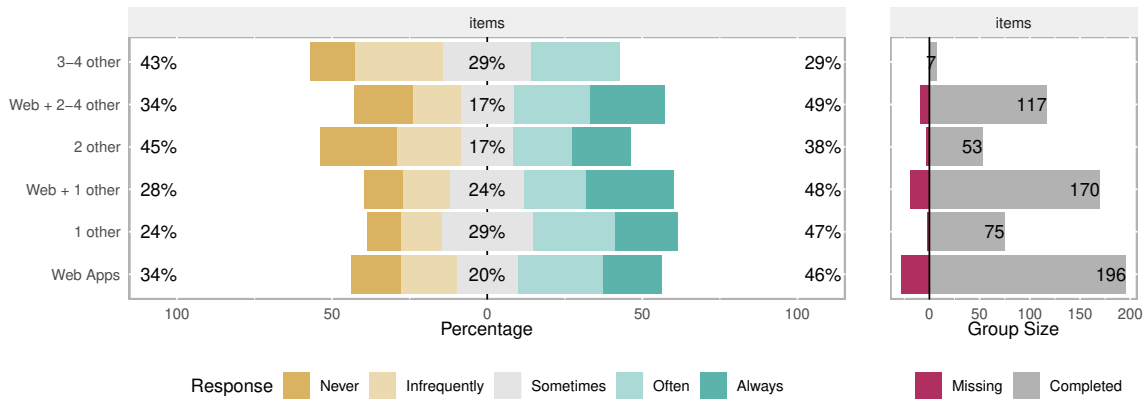


Figure D.92.: Documentation frequency across all decision types (→) grouped by development domain *Web Apps* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.828$	$p = 0.234 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.247 > 0.10$	$p = 0.529 > 0.10$	X
3-4 other ↔ Web Apps	$p = 0.360 > 0.10$	$p = 0.539 > 0.10$	X
3-4 other ↔ Web + 2-4 other	$p = 0.314 > 0.10$	$p = 0.588 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.701 > 0.10$	$p = 0.808 > 0.10$	X
3-4 other ↔ Web + 1 other	$p = 0.191 > 0.10$	$p = 0.574 > 0.10$	X
Web + 2-4 other ↔ 1 other	$p = 0.656 > 0.10$	$p = 0.821 > 0.10$	X
Web + 2-4 other ↔ Web Apps	$p = 0.735 > 0.10$	$p = 0.787 > 0.10$	X
Web + 2-4 other ↔ 2 other	$p = 0.152 > 0.10$	$p = 0.569 > 0.10$	X
Web + 2-4 other ↔ Web + 1 other	$p = 0.351 > 0.10$	$p = 0.585 > 0.10$	X
2 other ↔ 1 other	$p = 0.091 < 0.10$	$p = 0.683 > 0.10$	X
2 other ↔ Web Apps	$p = 0.201 > 0.10$	$p = 0.504 > 0.10$	X
2 other ↔ Web + 1 other	$p = 0.026 < 0.05$	$p = 0.395 > 0.10$	X
Web + 1 other ↔ 1 other	$p = 0.739 > 0.10$	$p = 0.739 > 0.10$	X
Web + 1 other ↔ Web Apps	$p = 0.148 > 0.10$	$p = 0.739 > 0.10$	X
1 other ↔ Web Apps	$p = 0.437 > 0.10$	$p = 0.597 > 0.10$	X

Table D.89.: Results of test for difference – grouped by development domain *Web Apps* – cf. Figure D.92.

**High-Performance Computing (IndepVar: Q-29 (5<sup>th</sup> Item) – DepVar: Q-14)**

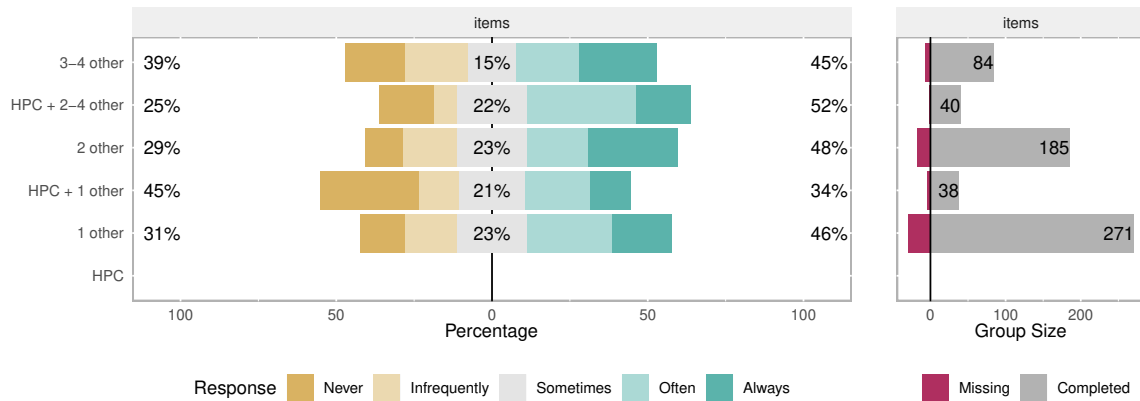


Figure D.93.: Documentation frequency across all decision types (→) grouped by development domain *High-Performance Computing* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.105$	$p = 0.130 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
3-4 other ↔ 1 other	$p = 0.721 > 0.10$	$p = 0.902 > 0.10$	X
3-4 other ↔ HPC + 2-4 other	$p = 0.596 > 0.10$	$p = 0.851 > 0.10$	X
3-4 other ↔ 2 other	$p = 0.219 > 0.10$	$p = 0.438 > 0.10$	X
3-4 other ↔ HPC + 1 other	$p = 0.133 > 0.10$	$p = 0.331 > 0.10$	X
HPC + 2-4 other ↔ 1 other	$p = 0.735 > 0.10$	$p = 0.735 > 0.10$	X
HPC + 2-4 other ↔ 2 other	$p = 0.732 > 0.10$	$p = 0.813 > 0.10$	X
HPC + 2-4 other ↔ HPC + 1 other	$p = 0.080 < 0.10$	$p = 0.268 > 0.10$	X
2 other ↔ 1 other	$p = 0.220 > 0.10$	$p = 0.366 > 0.10$	X
2 other ↔ HPC + 1 other	$p = 0.011 < 0.05$	$p = 0.105 > 0.10$	X
HPC + 1 other ↔ 1 other	$p = 0.051 < 0.10$	$p = 0.253 > 0.10$	X

Table D.90.: Results of test for difference – grouped by development domain *High-Performance Computing* – cf. [Figure D.93](#).

## D.11. Hypothesis RQ2-H10 – Experience ⇔ Rationale Documentation Frequency

### D.11.1. Documentation Experience ⇔ Rationale Documentation Frequency (IndepVar: Q-01 – DepVar: Q-07)

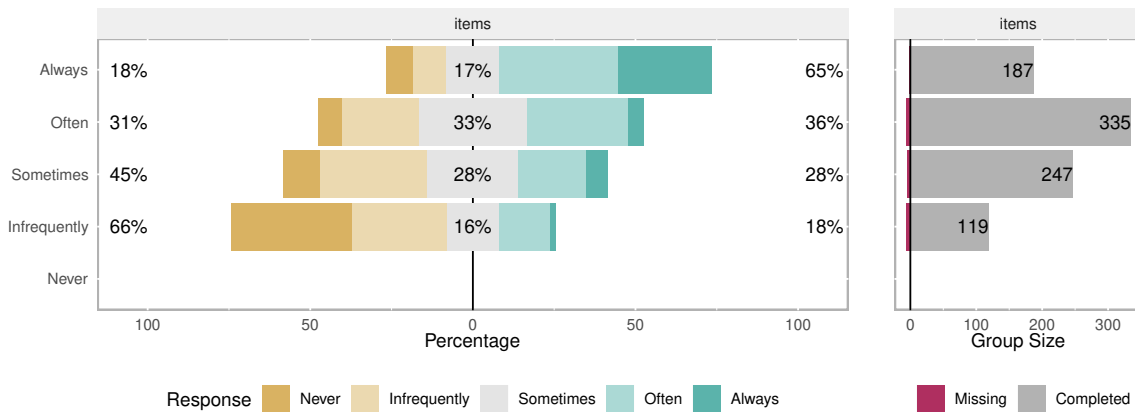


Figure D.94.: Rationale documentation frequency (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 125.630$	$p = 2.200 * 10^{-16} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 2.147 * 10^{-9} \ll 0.05$	$p = 3.220 * 10^{-9} \ll 0.05$	✓
Always ↔ Sometimes	$p = 3.081 * 10^{-15} \ll 0.05$	$p = 9.243 * 10^{-15} \ll 0.05$	✓
Always ↔ Infrequently	$p = 1.143 * 10^{-26} \ll 0.05$	$p = 6.859 * 10^{-26} \ll 0.05$	✓
Often ↔ Sometimes	$p = 0.009 < 0.05$	$p = 0.009 < 0.05$	✓
Often ↔ Infrequently	$p = 3.468 * 10^{-11} \ll 0.05$	$p = 6.936 * 10^{-11} \ll 0.05$	✓
Sometimes ↔ Infrequently	$p = 1.180 * 10^{-5} \ll 0.05$	$p = 1.416 * 10^{-5} \ll 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.364$	$p = 3.964 * 10^{-29} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.314$	$p = 2.518 * 10^{-29} \ll 0.05$	✓

Table D.91.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure D.94.

### D.11.2. Development Experience ⇔ Rationale Documentation Frequency (IndepVar: Q-26 – DepVar: Q-07)

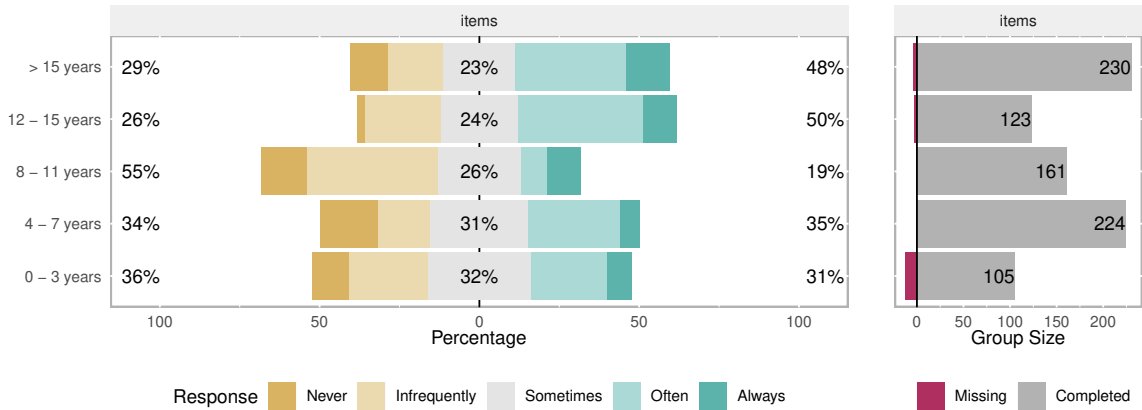


Figure D.95.: Rationale documentation frequency (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 40.710$	$p = 3.087 * 10^{-8} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.468 > 0.10$	$p = 0.520 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 6.089 * 10^{-8} \ll 0.05$	$p = 6.089 * 10^{-7} \ll 0.05$	✓
> 15 years ↔ 4 – 7 years	$p = 0.005 \ll 0.05$	$p = 0.010 < 0.05$	✓
> 15 years ↔ 0 – 3 years	$p = 0.026 < 0.05$	$p = 0.032 < 0.05$	✓
12 – 15 years ↔ 8 – 11 years	$p = 1.010 * 10^{-7} \ll 0.05$	$p = 5.049 * 10^{-7} \ll 0.05$	✓
12 – 15 years ↔ 4 – 7 years	$p = 0.002 \ll 0.05$	$p = 0.007 < 0.05$	✓
12 – 15 years ↔ 0 – 3 years	$p = 0.010 < 0.05$	$p = 0.016 < 0.05$	✓
8 – 11 years ↔ 4 – 7 years	$p = 0.005 \ll 0.05$	$p = 0.012 < 0.05$	✓
8 – 11 years ↔ 0 – 3 years	$p = 0.019 < 0.05$	$p = 0.027 < 0.05$	✓
4 – 7 years ↔ 0 – 3 years	$p = 0.992 > 0.10$	$p = 0.992 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.123$	$p = 3.304 * 10^{-4} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.100$	$p = 3.450 * 10^{-4} \ll 0.05$	✓

Table D.92.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure D.95.

### D.11.3. Scrum Experience ↔ Rationale Documentation Frequency (IndepVar: Q-27 – DepVar: Q-07)

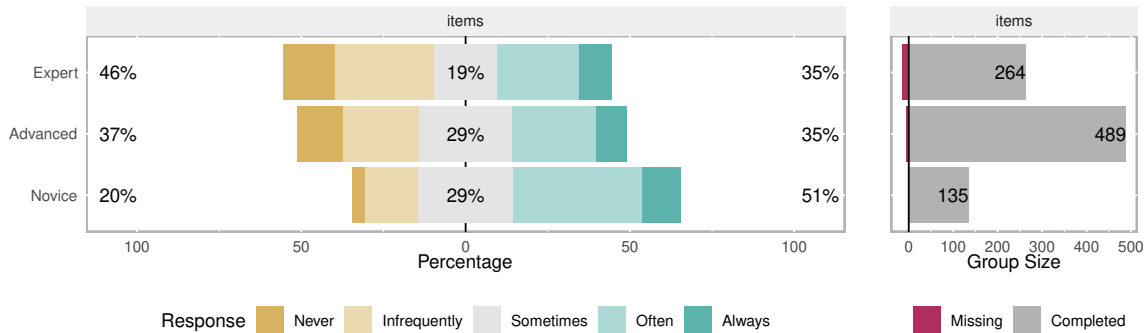


Figure D.96.: Rationale documentation frequency (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 21.476$	$p = 2.170 * 10^{-5} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.263 > 0.10$	$p = 0.263 > 0.10$	✗
Expert ↔ Novice	$p = 6.883 * 10^{-6} \ll 0.05$	$p = 2.065 * 10^{-5} \ll 0.05$	✓
Advanced ↔ Novice	$p = 5.958 * 10^{-5} \ll 0.05$	$p = 8.937 * 10^{-5} \ll 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.132$	$p = 8.120 * 10^{-5} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = -0.115$	$p = 7.700 * 10^{-5} \ll 0.05$	✓

Table D.93.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure D.96.

# E. Detailed Data for Hypotheses Related to Research Question RQ3

## E.1. Hypothesis RQ3-H1 – Experience $\Leftrightarrow$ Perceived Usefulness of Documented Decisions

### E.1.1. Documentation Experience $\Leftrightarrow$ Perceived Usefulness of Documented Decisions (IndepVar: Q-01 – DepVar: Q-05)

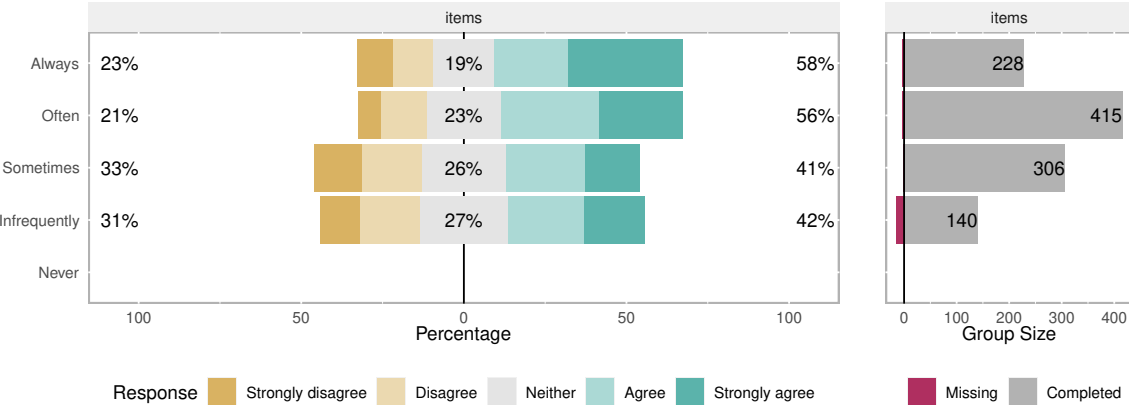


Figure E.1.: Perceived usefulness of documented decisions ( $\rightarrow$ ) grouped by documentation experience ( $\uparrow$ ).



Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 30.584$	$p = 1.040 * 10^{-6} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.393 > 0.10$	$p = 0.471 > 0.10$	✗
Always ↔ Sometimes	$p = 5.572 * 10^{-6} \ll 0.05$	$p = 3.343 * 10^{-5} \ll 0.05$	✓
Always ↔ Infrequently	$p = 0.001 \ll 0.05$	$p = 0.003 \ll 0.05$	✓
Often ↔ Sometimes	$p = 1.433 * 10^{-5} \ll 0.05$	$p = 4.300 * 10^{-5} \ll 0.05$	✓
Often ↔ Infrequently	$p = 0.005 < 0.05$	$p = 0.008 < 0.05$	✓
Sometimes ↔ Infrequently	$p = 0.601 > 0.10$	$p = 0.601 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.154$	$p = 3.378 * 10^{-7} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.129$	$p = 2.753 * 10^{-7} \ll 0.05$	✓

Table E.1.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. [Figure E.1.](#)

### E.1.2. Development Experience ↔ Perceived Usefulness of Documented Decisions (IndepVar: Q-26 – DepVar: Q-05)

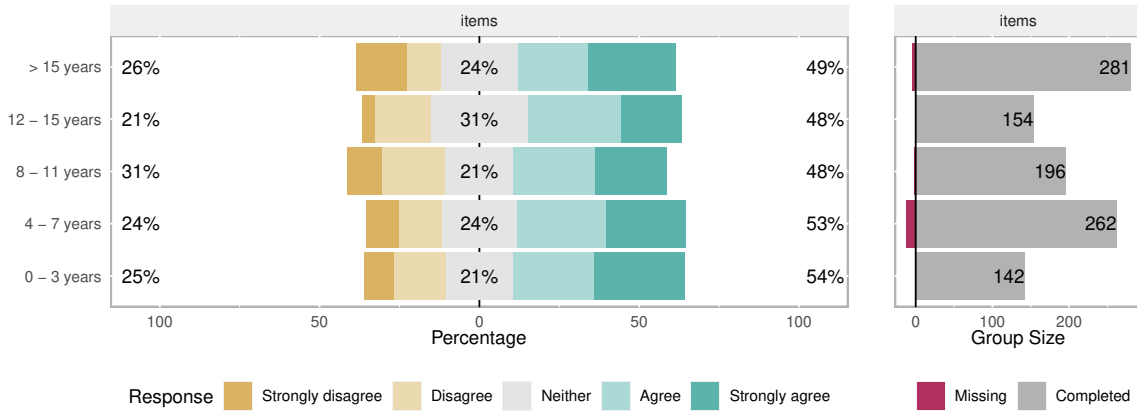


Figure E.2.: Perceived usefulness of documented decisions (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.199$	$p = 0.699 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.487 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.576 > 0.10$	$p = 0.824 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.442 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.558 > 0.10$	$p = 0.931 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.625 > 0.10$	$p = 0.781 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 0.487 > 0.10$	$p = 0.975 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.233 > 0.10$	$p = 1.000 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.192 > 0.10$	$p = 1.000 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.765 > 0.10$	$p = 0.850 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.026$	$p = 0.398 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.021$	$p = 0.397 > 0.10$	X

Table E.2.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.2.

### E.1.3. Scrum Experience $\leftrightarrow$ Perceived Usefulness of Documented Decisions (IndepVar: Q-27 – DepVar: Q-05)

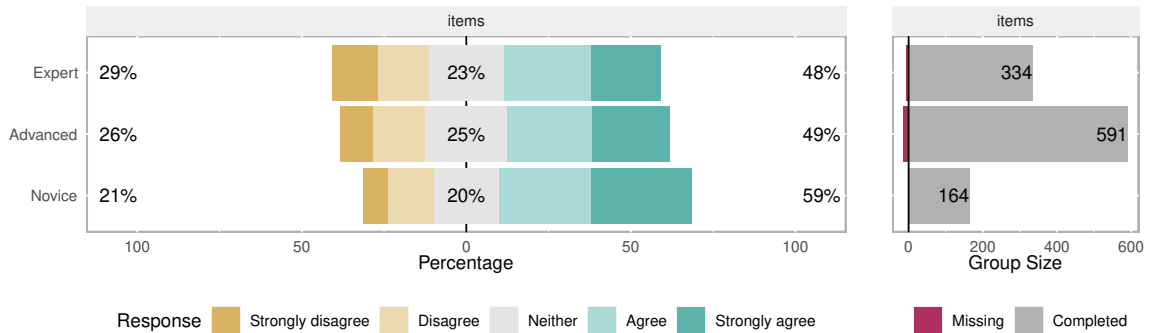


Figure E.3.: Perceived usefulness of documented decisions ( $\rightarrow$ ) grouped by Scrum experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.598$	$p = 0.022 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert $\leftrightarrow$ Advanced	$p = 0.269 > 0.10$	$p = 0.269 > 0.10$	✗
Expert $\leftrightarrow$ Novice	$p = 0.006 < 0.05$	$p = 0.018 < 0.05$	✓
Advanced $\leftrightarrow$ Novice	$p = 0.034 < 0.05$	$p = 0.052 < 0.10$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.077$	$p = 0.011 < 0.05$	✓
Kendall's Tau (b)	$\tau = -0.066$	$p = 0.011 < 0.05$	✓

Table E.3.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure E.3.

## E.2. Hypothesis RQ3-H2 – Experience ⇔ Rationale Usefulness

### E.2.1. Documentation Experience ⇔ Rationale Usefulness (IndepVar: Q-01 – DepVar: Q-08)

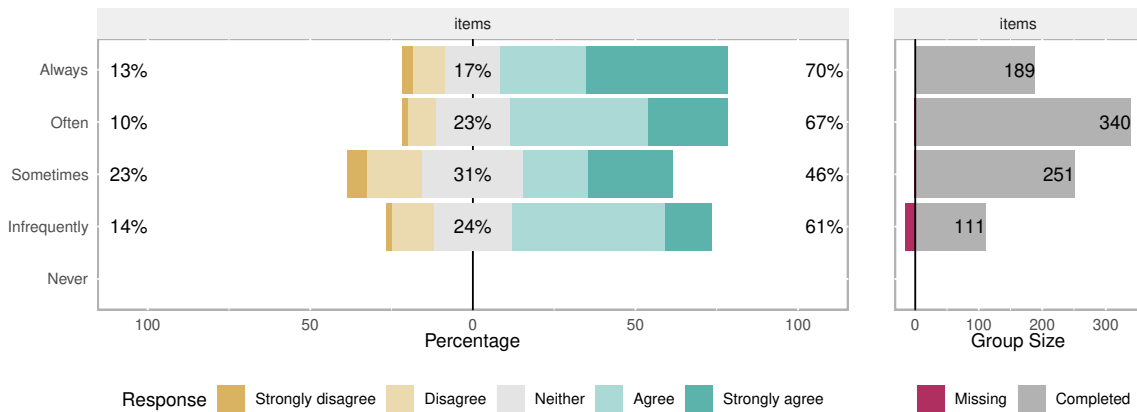


Figure E.4.: Rationale usefulness (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 31.375$	$p = 7.085 * 10^{-7} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.017 < 0.05$	$p = 0.026 < 0.05$	✓
Always ↔ Sometimes	$p = 1.153 * 10^{-7} \ll 0.05$	$p = 6.917 * 10^{-7} \ll 0.05$	✓
Always ↔ Infrequently	$p = 6.183 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Often ↔ Sometimes	$p = 4.117 * 10^{-4} \ll 0.05$	$p = 0.001 \ll 0.05$	✓
Often ↔ Infrequently	$p = 0.078 > 0.05$	$p = 0.093 < 0.10$	✓
Sometimes ↔ Infrequently	$p = 0.375 > 0.10$	$p = 0.375 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.174$	$p = 1.598 * 10^{-7} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.148$	$p = 1.480 * 10^{-7} \ll 0.05$	✓

Table E.4.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure E.4.

## E.2.2. Development Experience ⇔ Rationale Usefulness (IndepVar: Q-26 – DepVar: Q-08)

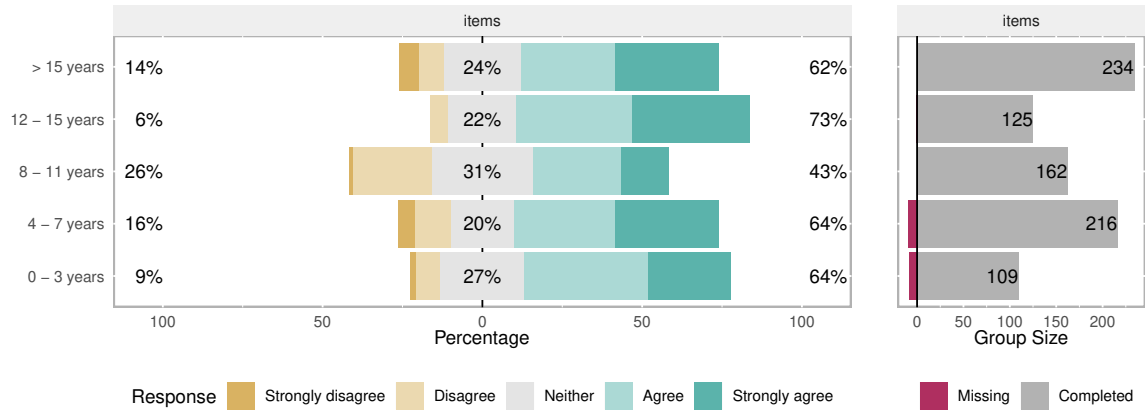


Figure E.5.: Rationale usefulness (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 37.372$	$p = 1.510 * 10^{-7} \ll 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.042 < 0.05$	$p = 0.085 < 0.10$	✓
> 15 years ↔ 8 – 11 years	$p = 8.589 * 10^{-6} \ll 0.05$	$p = 4.295 * 10^{-5} \ll 0.05$	✓
> 15 years ↔ 4 – 7 years	$p = 0.960 > 0.10$	$p = 0.960 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.924 > 0.10$	$p = 1.000 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 1.138 * 10^{-8} \ll 0.05$	$p = 1.138 * 10^{-7} \ll 0.05$	✓
12 – 15 years ↔ 4 – 7 years	$p = 0.050 \leq 0.05$	$p = 0.084 < 0.10$	✓
12 – 15 years ↔ 0 – 3 years	$p = 0.072 > 0.05$	$p = 0.103 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 9.805 * 10^{-6} \ll 0.05$	$p = 3.268 * 10^{-5} \ll 0.05$	✓
8 – 11 years ↔ 0 – 3 years	$p = 3.407 * 10^{-4} \ll 0.05$	$p = 8.517 * 10^{-4} \ll 0.05$	✓
4 – 7 years ↔ 0 – 3 years	$p = 0.893 > 0.10$	$p = 1.000 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.025$	$p = 0.467 > 0.10$	✗
Kendall's Tau (b)	$\tau = 0.022$	$p = 0.444 > 0.10$	✗

Table E.5.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.5.

### E.2.3. Scrum Experience ⇔ Rationale Usefulness (IndepVar: Q-27 – DepVar: Q-08)

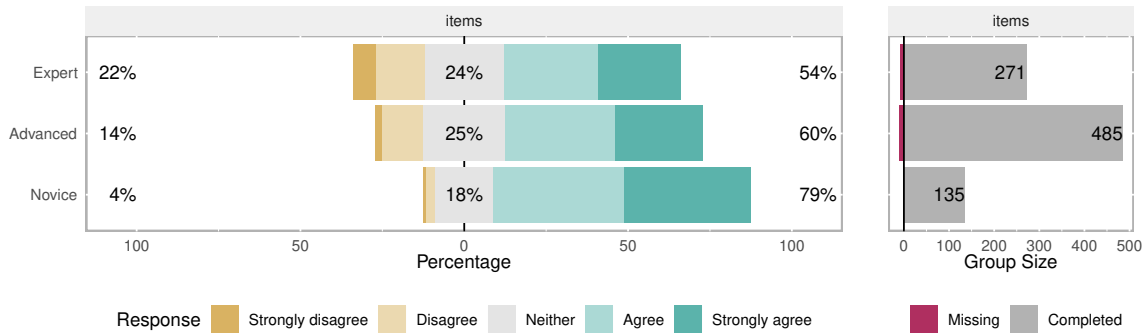


Figure E.6.: Rationale usefulness (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 25.752$	$p = 2.559 * 10^{-6} \ll 0.05$	✓

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.053 > 0.05$	$p = 0.053 < 0.10$	✓
Expert ↔ Novice	$p = 4.316 * 10^{-7} \ll 0.05$	$p = 1.295 * 10^{-6} \ll 0.05$	✓
Advanced ↔ Novice	$p = 7.343 * 10^{-5} \ll 0.05$	$p = 1.101 * 10^{-4} \ll 0.05$	✓

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.156$	$p = 3.086 * 10^{-6} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = -0.137$	$p = 2.859 * 10^{-6} \ll 0.05$	✓

Table E.6.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure E.6.

### E.3. Hypothesis RQ3-H3 – Experience ⇔ Frequency of Forgetting Rationale

#### E.3.1. Documentation Experience ⇔ Frequency of Forgetting Rationale (IndepVar: Q-01 – DepVar: Q-21)

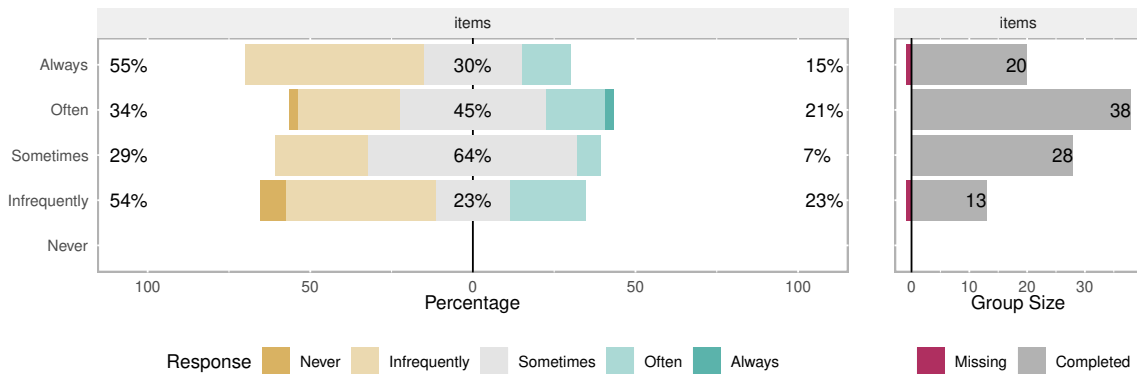


Figure E.7.: Frequency of forgetting rationale (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.444$	$p = 0.486 > 0.10$	×

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.178 > 0.10$	$p = 1.000 > 0.10$	×
Always ↔ Sometimes	$p = 0.281 > 0.10$	$p = 0.844 > 0.10$	×
Always ↔ Infrequently	$p = 0.887 > 0.10$	$p = 0.887 > 0.10$	×
Often ↔ Sometimes	$p = 0.819 > 0.10$	$p = 0.983 > 0.10$	×
Often ↔ Infrequently	$p = 0.317 > 0.10$	$p = 0.633 > 0.10$	×
Sometimes ↔ Infrequently	$p = 0.430 > 0.10$	$p = 0.646 > 0.10$	×

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.029$	$p = 0.774 > 0.10$	×
Kendall's Tau (b)	$\tau = -0.024$	$p = 0.786 > 0.10$	×

Table E.7.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure E.7.

### E.3.2. Development Experience ↔ Frequency of Forgetting Rationale (IndepVar: Q-26 – DepVar: Q-21)

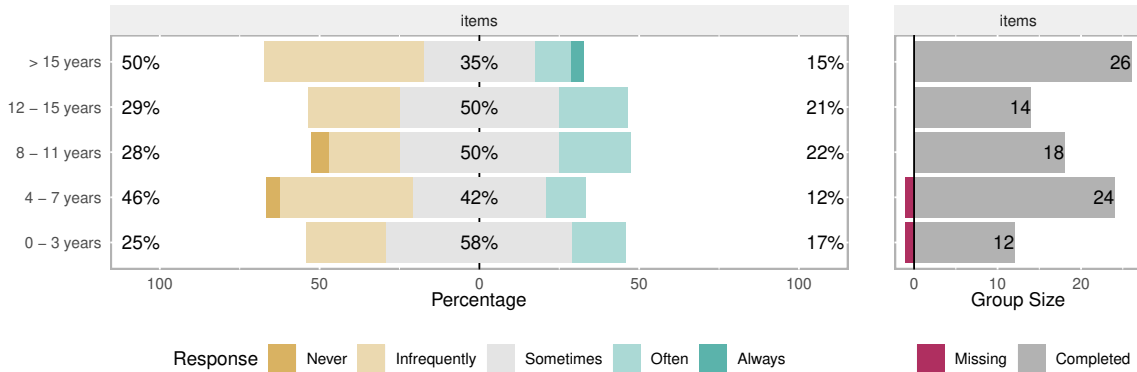


Figure E.8.: Frequency of forgetting rationale (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.313$	$p = 0.507 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.254 > 0.10$	$p = 0.636 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.241 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.967 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.279 > 0.10$	$p = 0.465 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.958 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.247 > 0.10$	$p = 0.822 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 1.000 > 0.10$	$p = 1.000 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.234 > 0.10$	$p = 1.000 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.960 > 0.10$	$p = 1.000 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.270 > 0.10$	$p = 0.541 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.048$	$p = 0.647 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.040$	$p = 0.645 > 0.10$	X

Table E.8.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.8.



### E.3.3. Scrum Experience ⇔ Frequency of Forgetting Rationale (IndepVar: Q-27 – DepVar: Q-21)

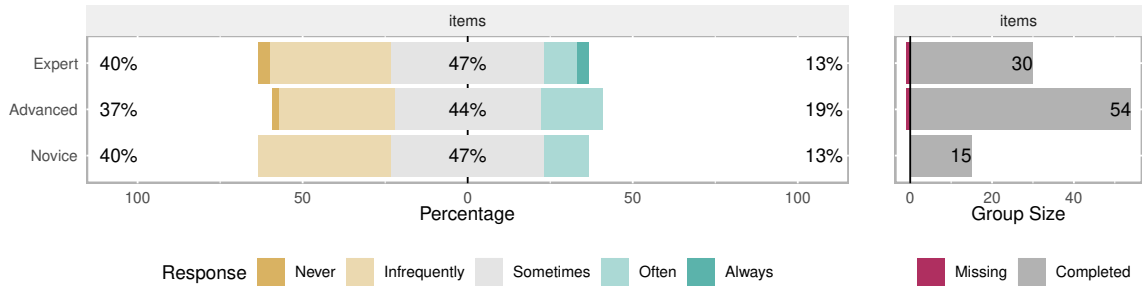


Figure E.9.: Frequency of forgetting rationale (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.246$	$p = 0.884 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.647 > 0.10$	$p = 1.000 > 0.10$	✗
Expert ↔ Novice	$p = 0.965 > 0.10$	$p = 0.965 > 0.10$	✗
Advanced ↔ Novice	$p = 0.756 > 0.10$	$p = 1.000 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.020$	$p = 0.843 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.018$	$p = 0.844 > 0.10$	✗

Table E.9.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure E.9.

## E.4. Hypothesis RQ3-H4 – Experience ⇔ Frequency of Revisiting Documentation

### E.4.1. Documentation Experience ⇔ Frequency of Revisiting Documentation (IndepVar: Q-01 – DepVar: Q-22)

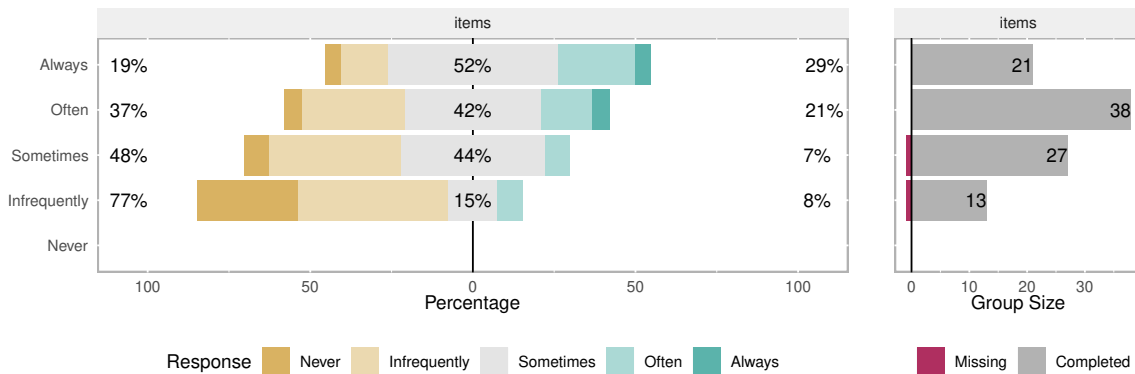


Figure E.10.: Frequency of revisiting documented decisions (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 13.252$	$p = 0.004 \ll 0.05$	✓

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.242 > 0.10$	$p = 0.242 > 0.10$	✗
Always ↔ Sometimes	$p = 0.028 < 0.05$	$p = 0.055 < 0.10$	✓
Always ↔ Infrequently	$p = 6.589 * 10^{-4} \ll 0.05$	$p = 0.004 \ll 0.05$	✓
Often ↔ Sometimes	$p = 0.199 > 0.10$	$p = 0.239 > 0.10$	✗
Often ↔ Infrequently	$p = 0.006 < 0.05$	$p = 0.018 < 0.05$	✓
Sometimes ↔ Infrequently	$p = 0.097 > 0.05$	$p = 0.145 > 0.10$	✗

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.355$	$p = 3.052 * 10^{-4} \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.308$	$p = 3.450 * 10^{-4} \ll 0.05$	✓

Table E.10.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure E.10.

### E.4.2. Development Experience ↔ Frequency of Revisiting Documentation (IndepVar: Q-26 – DepVar: Q-22)

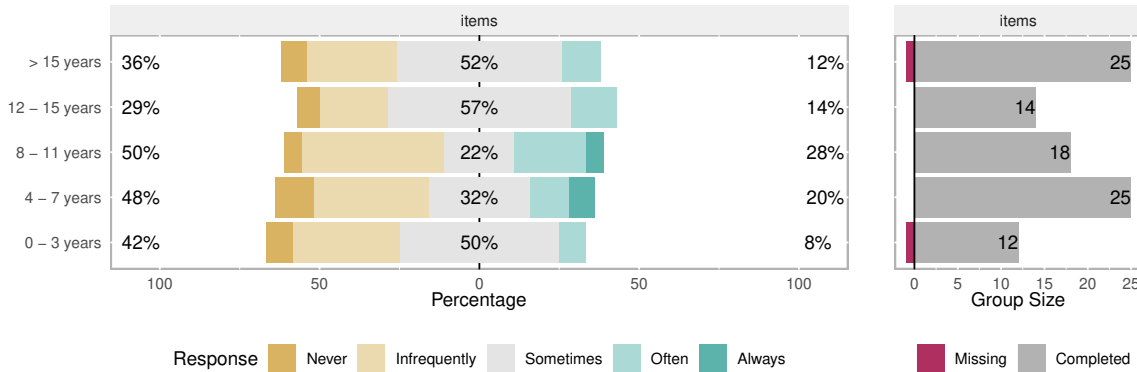


Figure E.11.: Frequency of revisiting documented decisions (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 0.566$	$p = 0.967 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.696 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.988 > 0.10$	$p = 0.988 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.756 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.740 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.724 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.513 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 0.530 > 0.10$	$p = 1.000 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.764 > 0.10$	$p = 0.956 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.744 > 0.10$	$p = 1.000 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.935 > 0.10$	$p = 1.000 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.054$	$p = 0.604 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.043$	$p = 0.621 > 0.10$	X

Table E.11.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.11.

### E.4.3. Scrum Experience ⇔ Frequency of Revisiting Documentation (IndepVar: Q-27 – DepVar: Q-22)

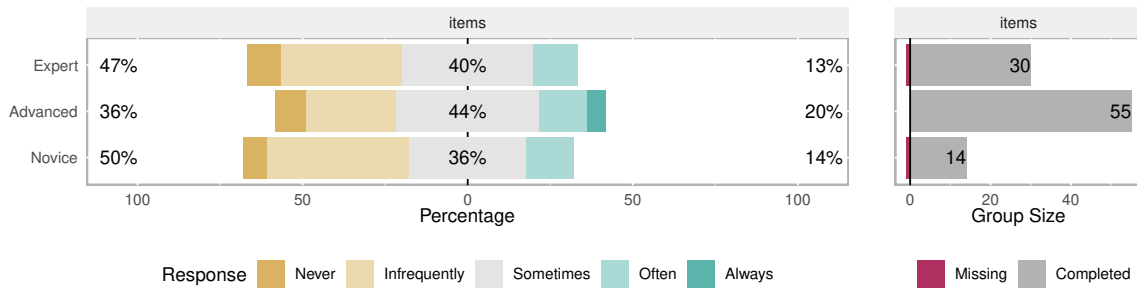


Figure E.12.: Frequency of revisiting documented decisions (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.346$	$p = 0.510 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.310 > 0.10$	$p = 0.931 > 0.10$	✗
Expert ↔ Novice	$p = 0.966 > 0.10$	$p = 0.966 > 0.10$	✗
Advanced ↔ Novice	$p = 0.415 > 0.10$	$p = 0.623 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.037$	$p = 0.716 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.033$	$p = 0.714 > 0.10$	✗

Table E.12.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. [Figure E.12.](#)

## E.5. Hypothesis RQ3-H5 – Team Size $\Leftrightarrow$ Perceived Importance of Involved Stakeholders

### E.5.1. Team Size $\Leftrightarrow$ Information Used For Reasoning: Involved Stakeholders (IndepVar: Q-31 – DepVar: Q-09 – 6<sup>th</sup> Item)

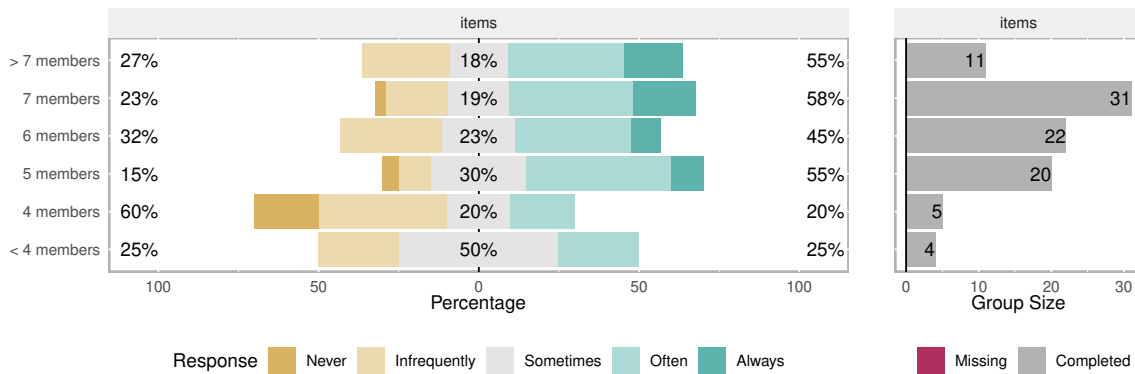


Figure E.13.: Information used for reasoning: *involved stakeholders* (→) grouped by team size (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.430$	$p = 0.366 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members ↔ 7 members	$p = 0.834 > 0.10$	$p = 0.894 > 0.10$	X
> 7 members ↔ 6 members	$p = 0.551 > 0.10$	$p = 0.751 > 0.10$	X
> 7 members ↔ 5 members	$p = 0.980 > 0.10$	$p = 0.980 > 0.10$	X
> 7 members ↔ 4 members	$p = 0.092 < 0.10$	$p = 0.458 > 0.10$	X
> 7 members ↔ < 4 members	$p = 0.419 > 0.10$	$p = 0.786 > 0.10$	X
7 members ↔ 6 members	$p = 0.292 > 0.10$	$p = 0.876 > 0.10$	X
7 members ↔ 5 members	$p = 0.824 > 0.10$	$p = 0.950 > 0.10$	X
7 members ↔ 4 members	$p = 0.041 < 0.05$	$p = 0.620 > 0.10$	X
7 members ↔ < 4 members	$p = 0.305 > 0.10$	$p = 0.763 > 0.10$	X
6 members ↔ 5 members	$p = 0.457 > 0.10$	$p = 0.762 > 0.10$	X
6 members ↔ 4 members	$p = 0.164 > 0.10$	$p = 0.615 > 0.10$	X
6 members ↔ < 4 members	$p = 0.644 > 0.10$	$p = 0.805 > 0.10$	X
5 members ↔ 4 members	$p = 0.066 < 0.10$	$p = 0.495 > 0.10$	X
5 members ↔ < 4 members	$p = 0.380 > 0.10$	$p = 0.814 > 0.10$	X
4 members ↔ < 4 members	$p = 0.513 > 0.10$	$p = 0.770 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.139$	$p = 0.224 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.118$	$p = 0.223 > 0.10$	X

Table E.13.: Results of test for difference and correlation analysis – grouped by team size – cf.

Figure E.13.

### E.5.2. Team Size $\Leftrightarrow$ Documentation Frequency: Involved Stakeholders (IndepVar: Q-31 – DepVar: Q-11 – 6<sup>th</sup> Item)

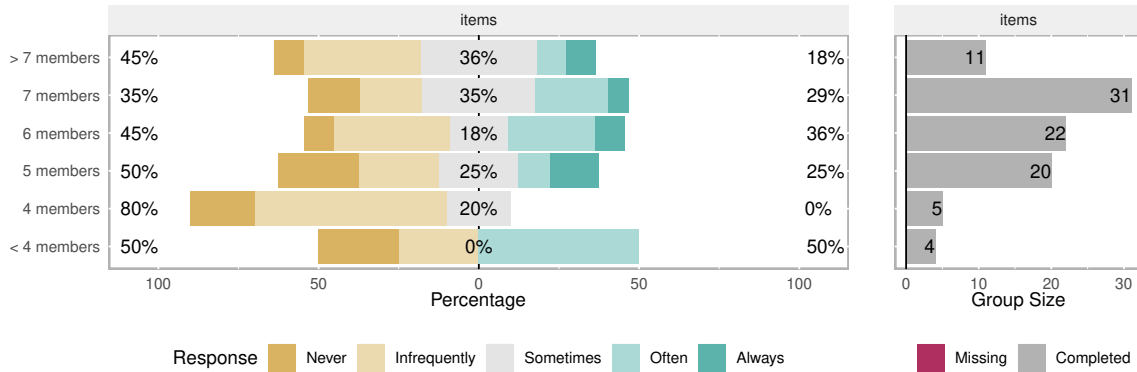


Figure E.14.: Documentation frequency of *involved stakeholders* ( $\rightarrow$ ) grouped by team size ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.975$	$p = 0.704 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members $\leftrightarrow$ 7 members	$p = 0.736 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ 6 members	$p = 0.686 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ 5 members	$p = 0.816 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ 4 members	$p = 0.247 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ < 4 members	$p = 0.941 > 0.10$	$p = 0.941 > 0.10$	X
7 members $\leftrightarrow$ 6 members	$p = 0.912 > 0.10$	$p = 0.977 > 0.10$	X
7 members $\leftrightarrow$ 5 members	$p = 0.473 > 0.10$	$p = 1.000 > 0.10$	X
7 members $\leftrightarrow$ 4 members	$p = 0.123 > 0.10$	$p = 0.926 > 0.10$	X
7 members $\leftrightarrow$ < 4 members	$p = 0.888 > 0.10$	$p = 1.000 > 0.10$	X
6 members $\leftrightarrow$ 5 members	$p = 0.444 > 0.10$	$p = 1.000 > 0.10$	X
6 members $\leftrightarrow$ 4 members	$p = 0.119 > 0.10$	$p = 1.000 > 0.10$	X
6 members $\leftrightarrow$ < 4 members	$p = 0.846 > 0.10$	$p = 1.000 > 0.10$	X
5 members $\leftrightarrow$ 4 members	$p = 0.283 > 0.10$	$p = 1.000 > 0.10$	X
5 members $\leftrightarrow$ < 4 members	$p = 0.812 > 0.10$	$p = 1.000 > 0.10$	X
4 members $\leftrightarrow$ < 4 members	$p = 0.320 > 0.10$	$p = 0.960 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.139$	$p = 0.226 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.113$	$p = 0.237 > 0.10$	X

Table E.14.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure E.14.

### E.5.3. Team Size $\Leftrightarrow$ Documentation Frequency: Involved Stakeholders (IndepVar: Q-31 – DepVar: Q-13 – 6<sup>th</sup> Item)

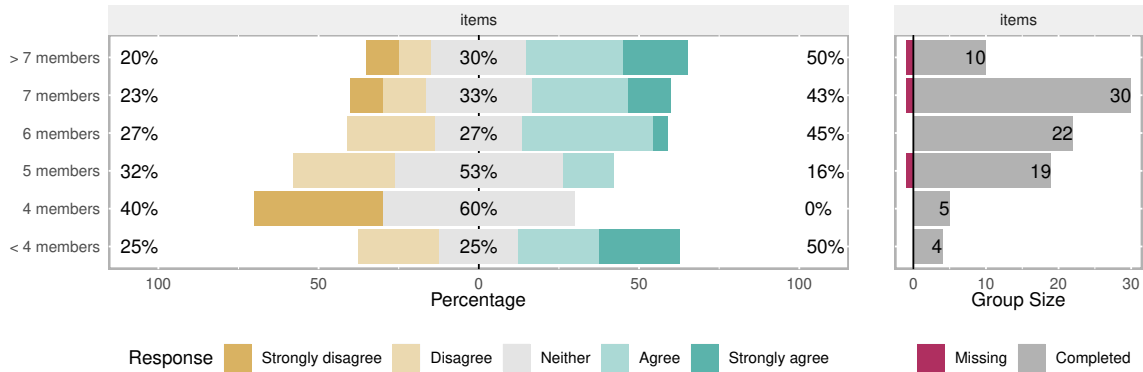


Figure E.15.: Information usefulness *involved stakeholders* ( $\rightarrow$ ) grouped by team size ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.791$	$p = 0.237 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members $\leftrightarrow$ 7 members	$p = 0.671 > 0.10$	$p = 0.915 > 0.10$	X
> 7 members $\leftrightarrow$ 6 members	$p = 0.636 > 0.10$	$p = 0.954 > 0.10$	X
> 7 members $\leftrightarrow$ 5 members	$p = 0.126 > 0.10$	$p = 0.379 > 0.10$	X
> 7 members $\leftrightarrow$ 4 members	$p = 0.054 < 0.10$	$p = 0.803 > 0.10$	X
> 7 members $\leftrightarrow$ < 4 members	$p = 0.960 > 0.10$	$p = 0.960 > 0.10$	X
7 members $\leftrightarrow$ 6 members	$p = 0.928 > 0.10$	$p = 0.994 > 0.10$	X
7 members $\leftrightarrow$ 5 members	$p = 0.131 > 0.10$	$p = 0.328 > 0.10$	X
7 members $\leftrightarrow$ 4 members	$p = 0.062 < 0.10$	$p = 0.463 > 0.10$	X
7 members $\leftrightarrow$ < 4 members	$p = 0.728 > 0.10$	$p = 0.840 > 0.10$	X
6 members $\leftrightarrow$ 5 members	$p = 0.183 > 0.10$	$p = 0.392 > 0.10$	X
6 members $\leftrightarrow$ 4 members	$p = 0.077 < 0.10$	$p = 0.384 > 0.10$	X
6 members $\leftrightarrow$ < 4 members	$p = 0.699 > 0.10$	$p = 0.873 > 0.10$	X
5 members $\leftrightarrow$ 4 members	$p = 0.360 > 0.10$	$p = 0.600 > 0.10$	X
5 members $\leftrightarrow$ < 4 members	$p = 0.254 > 0.10$	$p = 0.476 > 0.10$	X
4 members $\leftrightarrow$ < 4 members	$p = 0.105 > 0.10$	$p = 0.394 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.232$	$p = 0.044 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.202$	$p = 0.040 < 0.05$	✓

Table E.15.: Results of test for difference and correlation analysis – grouped by team size – cf.

Figure E.15.

## E.6. Hypothesis RQ3-H6 – Team Size ⇔ Perceived Importance of Stakeholder Arguments

### E.6.1. Team Size ⇔ Information For Reasoning: Stakeholder Arguments (IndepVar: Q-31 – DepVar: Q-09 – 7<sup>th</sup> Item)

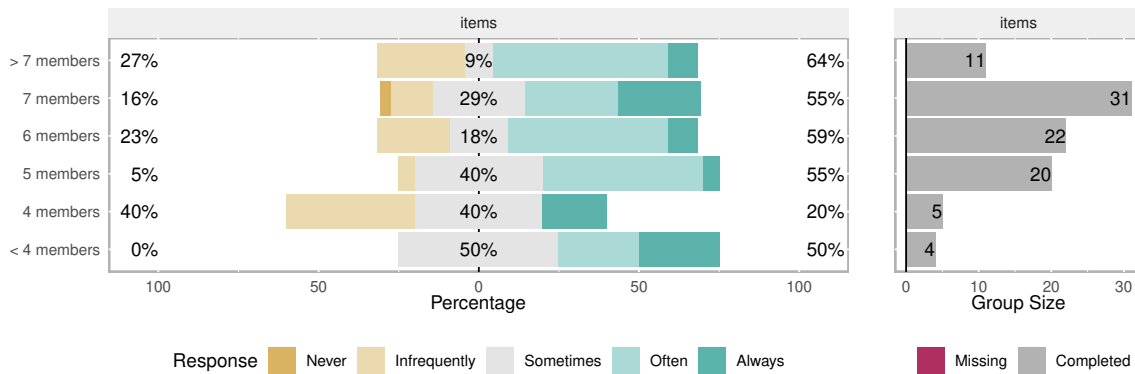


Figure E.16.: Information used for reasoning: *stakeholder arguments* (→) grouped by team size (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.100$	$p = 0.835 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members ↔ 7 members	$p = 0.697 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members ↔ 6 members	$p = 0.958 > 0.10$	$p = 0.958 > 0.10$	X
> 7 members ↔ 5 members	$p = 0.934 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members ↔ 4 members	$p = 0.328 > 0.10$	$p = 0.983 > 0.10$	X
> 7 members ↔ < 4 members	$p = 0.721 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ 6 members	$p = 0.575 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ 5 members	$p = 0.713 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ 4 members	$p = 0.168 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ < 4 members	$p = 0.893 > 0.10$	$p = 1.000 > 0.10$	X
6 members ↔ 5 members	$p = 0.870 > 0.10$	$p = 1.000 > 0.10$	X
6 members ↔ 4 members	$p = 0.305 > 0.10$	$p = 1.000 > 0.10$	X
6 members ↔ < 4 members	$p = 0.675 > 0.10$	$p = 1.000 > 0.10$	X
5 members ↔ 4 members	$p = 0.264 > 0.10$	$p = 1.000 > 0.10$	X
5 members ↔ < 4 members	$p = 0.747 > 0.10$	$p = 1.000 > 0.10$	X
4 members ↔ < 4 members	$p = 0.273 > 0.10$	$p = 1.000 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.109$	$p = 0.343 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.098$	$p = 0.315 > 0.10$	X

Table E.16.: Results of test for difference and correlation analysis – grouped by team size – cf.

Figure E.16.



### E.6.2. Team Size ⇔ Documentation Frequency of: Stakeholder Arguments (IndepVar: Q-31 – DepVar: Q-11 – 7<sup>th</sup> Item)

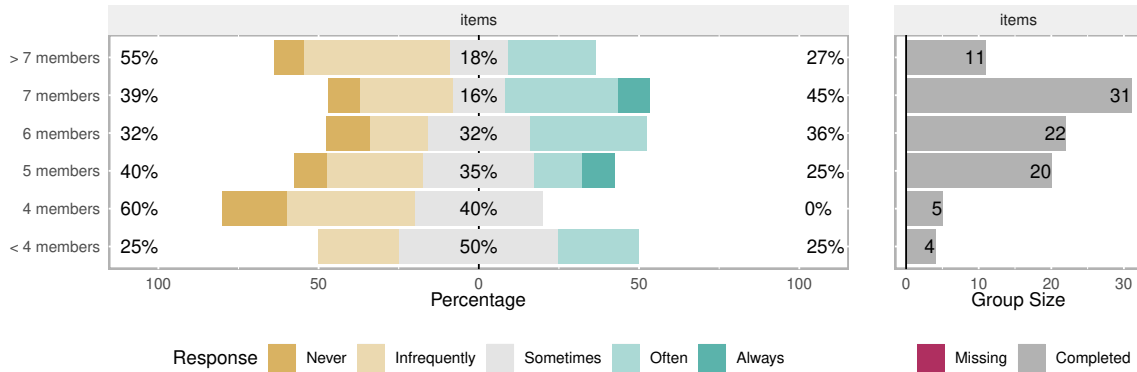


Figure E.17.: Documentation frequency of *stakeholder arguments* (→) grouped by team size (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.481$	$p = 0.626 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members ↔ 7 members	$p = 0.271 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members ↔ 6 members	$p = 0.443 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members ↔ 5 members	$p = 0.639 > 0.10$	$p = 0.959 > 0.10$	X
> 7 members ↔ 4 members	$p = 0.460 > 0.10$	$p = 0.986 > 0.10$	X
> 7 members ↔ < 4 members	$p = 0.564 > 0.10$	$p = 0.940 > 0.10$	X
7 members ↔ 6 members	$p = 0.712 > 0.10$	$p = 0.971 > 0.10$	X
7 members ↔ 5 members	$p = 0.463 > 0.10$	$p = 0.868 > 0.10$	X
7 members ↔ 4 members	$p = 0.103 > 0.10$	$p = 1.000 > 0.10$	X
7 members ↔ < 4 members	$p = 0.926 > 0.10$	$p = 0.926 > 0.10$	X
6 members ↔ 5 members	$p = 0.728 > 0.10$	$p = 0.910 > 0.10$	X
6 members ↔ 4 members	$p = 0.169 > 0.10$	$p = 1.000 > 0.10$	X
6 members ↔ < 4 members	$p = 0.921 > 0.10$	$p = 0.987 > 0.10$	X
5 members ↔ 4 members	$p = 0.251 > 0.10$	$p = 1.000 > 0.10$	X
5 members ↔ < 4 members	$p = 0.769 > 0.10$	$p = 0.887 > 0.10$	X
4 members ↔ < 4 members	$p = 0.273 > 0.10$	$p = 0.819 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.151$	$p = 0.187 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.132$	$p = 0.171 > 0.10$	X

Table E.17.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure E.17.

### E.6.3. Team Size $\Leftrightarrow$ Information Usefulness: Stakeholder Arguments (IndepVar: Q-31 – DepVar: Q-13 – 7<sup>th</sup> Item)

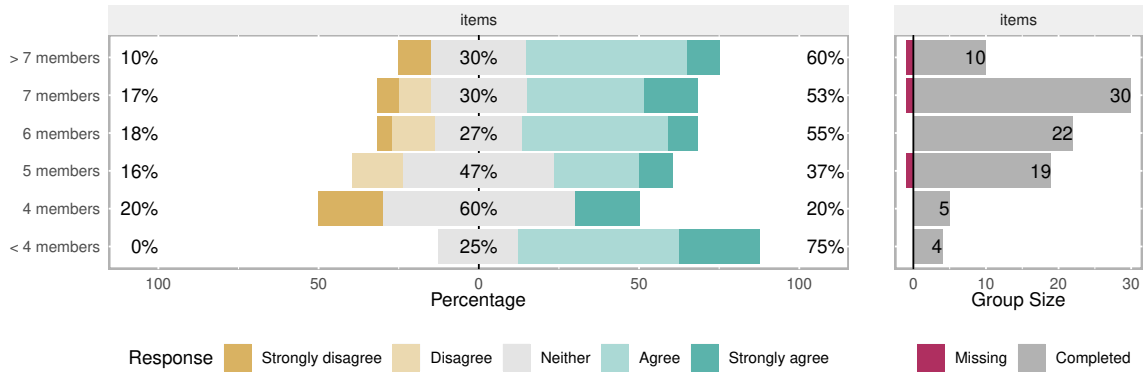


Figure E.18.: Information usefulness of *stakeholder arguments* ( $\rightarrow$ ) grouped by team size ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.003$	$p = 0.700 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 7 members $\leftrightarrow$ 7 members	$p = 0.849 > 0.10$	$p = 0.849 > 0.10$	X
> 7 members $\leftrightarrow$ 6 members	$p = 0.735 > 0.10$	$p = 0.849 > 0.10$	X
> 7 members $\leftrightarrow$ 5 members	$p = 0.425 > 0.10$	$p = 0.709 > 0.10$	X
> 7 members $\leftrightarrow$ 4 members	$p = 0.331 > 0.10$	$p = 1.000 > 0.10$	X
> 7 members $\leftrightarrow$ < 4 members	$p = 0.460 > 0.10$	$p = 0.690 > 0.10$	X
7 members $\leftrightarrow$ 6 members	$p = 0.833 > 0.10$	$p = 0.893 > 0.10$	X
7 members $\leftrightarrow$ 5 members	$p = 0.409 > 0.10$	$p = 0.877 > 0.10$	X
7 members $\leftrightarrow$ 4 members	$p = 0.338 > 0.10$	$p = 1.000 > 0.10$	X
7 members $\leftrightarrow$ < 4 members	$p = 0.341 > 0.10$	$p = 0.852 > 0.10$	X
6 members $\leftrightarrow$ 5 members	$p = 0.560 > 0.10$	$p = 0.763 > 0.10$	X
6 members $\leftrightarrow$ 4 members	$p = 0.415 > 0.10$	$p = 0.778 > 0.10$	X
6 members $\leftrightarrow$ < 4 members	$p = 0.298 > 0.10$	$p = 1.000 > 0.10$	X
5 members $\leftrightarrow$ 4 members	$p = 0.660 > 0.10$	$p = 0.825 > 0.10$	X
5 members $\leftrightarrow$ < 4 members	$p = 0.173 > 0.10$	$p = 1.000 > 0.10$	X
4 members $\leftrightarrow$ < 4 members	$p = 0.148 > 0.10$	$p = 1.000 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.120$	$p = 0.301 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.105$	$p = 0.288 > 0.10$	X

Table E.18.: Results of test for difference and correlation analysis – grouped by team size – cf. Figure E.18.

## E.7. Hypothesis RQ3-H7 – Scrum Role ⇔ Situations Where Rationale Are Desirable / Important

### E.7.1. Scrum Role ⇔ Quantity of Situations Where Rationale Was Desired but Not Available At the Time (IndepVar: Q-28 – DepVar: Q-23)

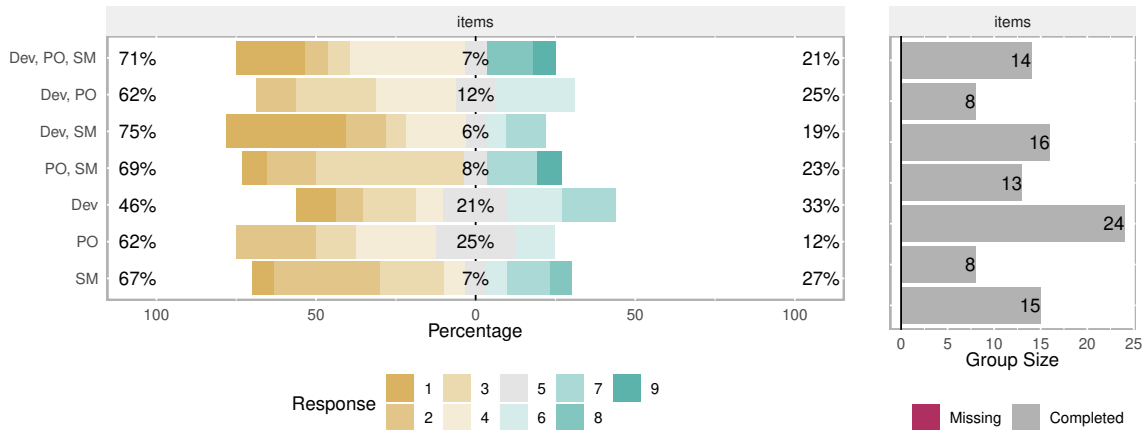


Figure E.19.: Quantity of mentioned situations where rationale was desired but not available at the time (→) grouped by Scrum role (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.124$	$p = 0.660 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM ↔ Dev	$p = 0.600 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ PO	$p = 0.996 > 0.10$	$p = 0.996 > 0.10$	✗
Dev, PO, SM ↔ SM	$p = 0.714 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ PO, SM	$p = 0.790 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ Dev, PO	$p = 0.783 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM ↔ Dev, SM	$p = 0.227 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ Dev	$p = 0.895 > 0.10$	$p = 0.989 > 0.10$	✗
Dev, PO ↔ PO	$p = 0.810 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ SM	$p = 0.555 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ PO, SM	$p = 0.617 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO ↔ Dev, SM	$p = 0.193 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ Dev	$p = 0.056 < 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ PO	$p = 0.305 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ SM	$p = 0.395 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM ↔ PO, SM	$p = 0.363 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ PO	$p = 0.670 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ SM	$p = 0.343 > 0.10$	$p = 1.000 > 0.10$	✗
Dev ↔ PO, SM	$p = 0.418 > 0.10$	$p = 1.000 > 0.10$	✗
PO ↔ SM	$p = 0.752 > 0.10$	$p = 1.000 > 0.10$	✗
PO ↔ PO, SM	$p = 0.816 > 0.10$	$p = 0.952 > 0.10$	✗
SM ↔ PO, SM	$p = 0.929 > 0.10$	$p = 0.976 > 0.10$	✗

Table E.19.: Results of test for difference – grouped by Scrum role – cf. Figure E.19.

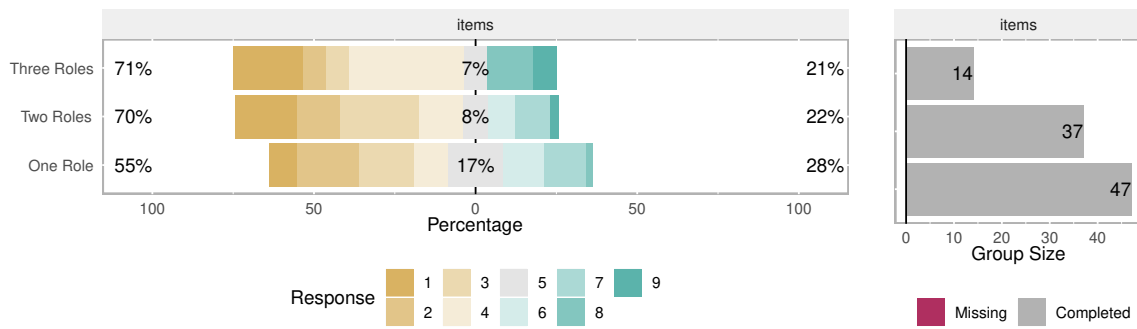


Figure E.20.: Quantity of mentioned situations where rationale was desired but not available at the time (→) grouped by the quantity of Scrum roles (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.315$	$p = 0.518 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles ↔ Two Roles	$p = 0.522 > 0.10$	$p = 0.784 > 0.10$	X
Three Roles ↔ One Role	$p = 0.878 > 0.10$	$p = 0.878 > 0.10$	X
Two Roles ↔ One Role	$p = 0.260 > 0.10$	$p = 0.780 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.071$	$p = 0.487 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.058$	$p = 0.490 > 0.10$	X

Table E.20.: Results of test for difference and correlation analysis – grouped by the quantity of Scrum roles – cf. [Figure E.20](#).

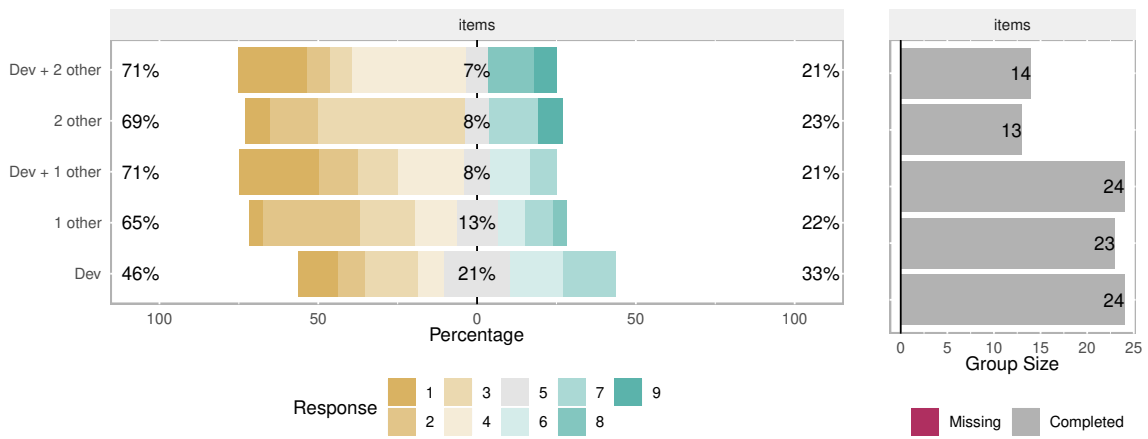


Figure E.21.: Quantity of mentioned criteria for decision documentation ( $\rightarrow$ ) grouped by Scrum role *Developer* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.328$	$p = 0.676 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other $\leftrightarrow$ 1 other	$p = 0.795 > 0.10$	$p = 0.883 > 0.10$	X
Dev + 2 other $\leftrightarrow$ Dev	$p = 0.600 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 2 other $\leftrightarrow$ 2 other	$p = 0.790 > 0.10$	$p = 0.988 > 0.10$	X
Dev + 2 other $\leftrightarrow$ Dev + 1 other	$p = 0.450 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ 1 other	$p = 0.967 > 0.10$	$p = 0.967 > 0.10$	X
2 other $\leftrightarrow$ Dev	$p = 0.418 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ Dev + 1 other	$p = 0.660 > 0.10$	$p = 0.943 > 0.10$	X
Dev + 1 other $\leftrightarrow$ 1 other	$p = 0.570 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 1 other $\leftrightarrow$ Dev	$p = 0.136 > 0.10$	$p = 1.000 > 0.10$	X
1 other $\leftrightarrow$ Dev	$p = 0.365 > 0.10$	$p = 1.000 > 0.10$	X

Table E.21.: Results of test for difference – grouped by Scrum role *Developer* – cf. Figure E.21.

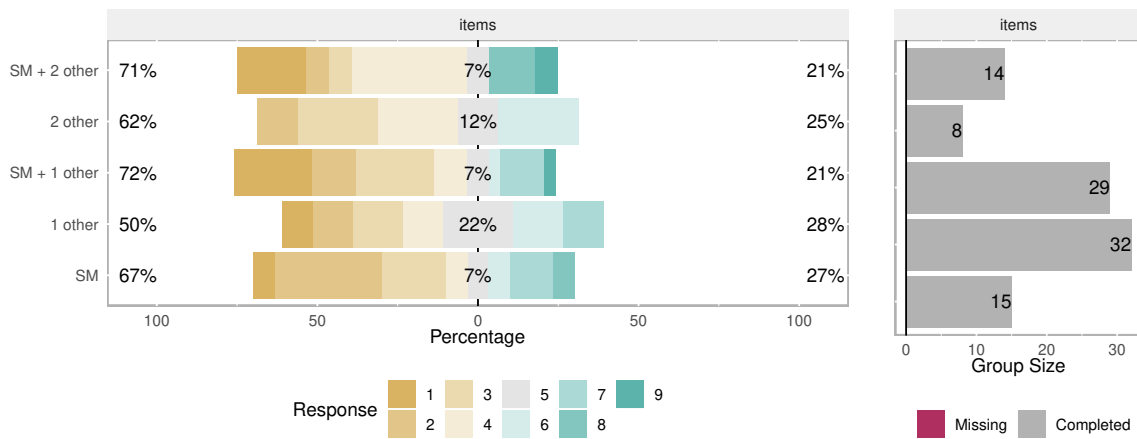


Figure E.22.: Quantity of mentioned criteria for decision documentation (→) by Scrum role *Scrum Master* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.116$	$p = 0.539 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other ↔ 1 other	$p = 0.679 > 0.10$	$p = 0.970 > 0.10$	✗
SM + 2 other ↔ SM	$p = 0.714 > 0.10$	$p = 0.893 > 0.10$	✗
SM + 2 other ↔ 2 other	$p = 0.783 > 0.10$	$p = 0.870 > 0.10$	✗
SM + 2 other ↔ SM + 1 other	$p = 0.373 > 0.10$	$p = 1.000 > 0.10$	✗
2 other ↔ 1 other	$p = 0.979 > 0.10$	$p = 0.979 > 0.10$	✗
2 other ↔ SM	$p = 0.555 > 0.10$	$p = 1.000 > 0.10$	✗
2 other ↔ SM + 1 other	$p = 0.302 > 0.10$	$p = 1.000 > 0.10$	✗
SM + 1 other ↔ 1 other	$p = 0.099 < 0.10$	$p = 0.995 > 0.10$	✗
SM + 1 other ↔ SM	$p = 0.629 > 0.10$	$p = 1.000 > 0.10$	✗
1 other ↔ SM	$p = 0.390 > 0.10$	$p = 0.976 > 0.10$	✗

Table E.22.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. Figure E.22.

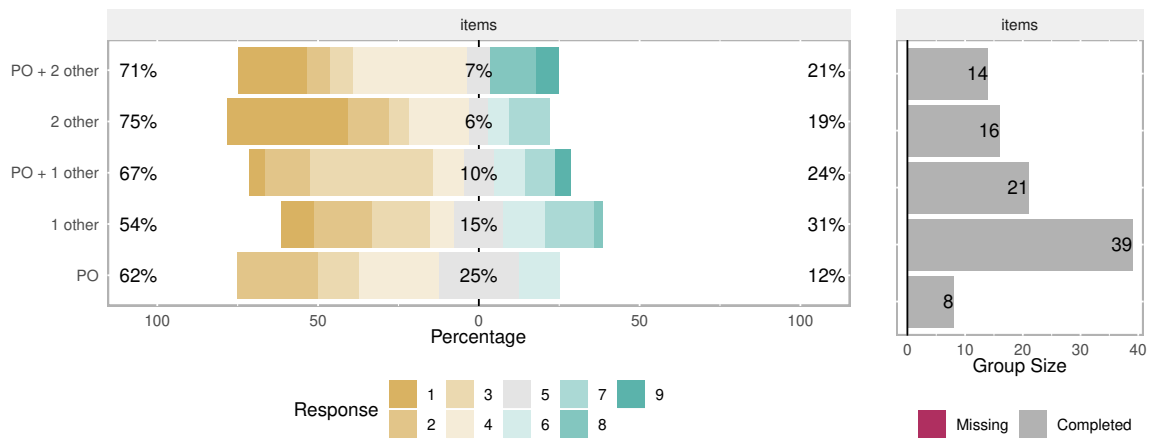


Figure E.23.: Quantity of mentioned criteria for decision documentation ( $\rightarrow$ ) grouped by Scrum role *Product Owner* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.974$	$p = 0.562 > 0.10$	$\times$

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
PO + 2 other $\leftrightarrow$ 1 other	$p = 0.857 > 0.10$	$p = 1.000 > 0.10$	$\times$
PO + 2 other $\leftrightarrow$ PO	$p = 0.996 > 0.10$	$p = 0.996 > 0.10$	$\times$
PO + 2 other $\leftrightarrow$ 2 other	$p = 0.227 > 0.10$	$p = 0.758 > 0.10$	$\times$
PO + 2 other $\leftrightarrow$ PO + 1 other	$p = 0.961 > 0.10$	$p = 1.000 > 0.10$	$\times$
2 other $\leftrightarrow$ 1 other	$p = 0.094 < 0.10$	$p = 0.936 > 0.10$	$\times$
2 other $\leftrightarrow$ PO	$p = 0.305 > 0.10$	$p = 0.763 > 0.10$	$\times$
2 other $\leftrightarrow$ PO + 1 other	$p = 0.200 > 0.10$	$p = 1.000 > 0.10$	$\times$
PO + 1 other $\leftrightarrow$ 1 other	$p = 0.788 > 0.10$	$p = 1.000 > 0.10$	$\times$
PO + 1 other $\leftrightarrow$ PO	$p = 0.963 > 0.10$	$p = 1.000 > 0.10$	$\times$
1 other $\leftrightarrow$ PO	$p = 0.890 > 0.10$	$p = 1.000 > 0.10$	$\times$

Table E.23.: Results of test for difference – grouped by Scrum role *Product Owner* – cf. Figure E.23.

### E.7.2. Scrum Role $\leftrightarrow$ Quantity of Situations Where Rationale Are Considered Valuable if Documentation Is Available (IndepVar: Q-28 – DepVar: Q-24)

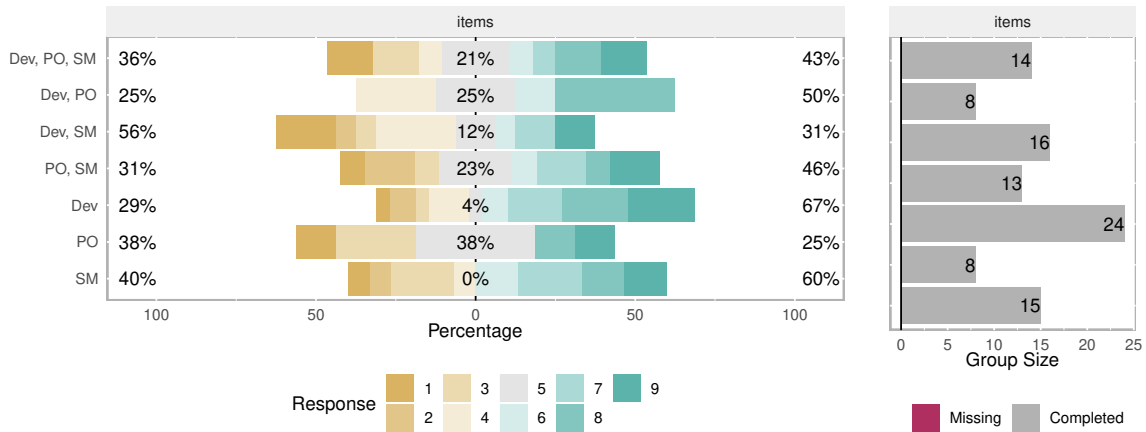


Figure E.24.: Quantity of mentioned situations where the rationale is considered valuable if documentation is available ( $\rightarrow$ ) grouped by Scrum role ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.242$	$p = 0.513 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev, PO, SM $\leftrightarrow$ Dev	$p = 0.270 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM $\leftrightarrow$ PO	$p = 0.711 > 0.10$	$p = 0.996 > 0.10$	✗
Dev, PO, SM $\leftrightarrow$ SM	$p = 0.833 > 0.10$	$p = 0.921 > 0.10$	✗
Dev, PO, SM $\leftrightarrow$ PO, SM	$p = 0.981 > 0.10$	$p = 0.981 > 0.10$	✗
Dev, PO, SM $\leftrightarrow$ Dev, PO	$p = 0.593 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, PO, SM $\leftrightarrow$ Dev, SM	$p = 0.398 > 0.10$	$p = 0.929 > 0.10$	✗
Dev, PO $\leftrightarrow$ Dev	$p = 0.742 > 0.10$	$p = 0.866 > 0.10$	✗
Dev, PO $\leftrightarrow$ PO	$p = 0.423 > 0.10$	$p = 0.888 > 0.10$	✗
Dev, PO $\leftrightarrow$ SM	$p = 0.718 > 0.10$	$p = 0.942 > 0.10$	✗
Dev, PO $\leftrightarrow$ PO, SM	$p = 0.613 > 0.10$	$p = 0.990 > 0.10$	✗
Dev, PO $\leftrightarrow$ Dev, SM	$p = 0.208 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM $\leftrightarrow$ Dev	$p = 0.035 < 0.05$	$p = 0.737 > 0.10$	✗
Dev, SM $\leftrightarrow$ PO	$p = 0.738 > 0.10$	$p = 0.911 > 0.10$	✗
Dev, SM $\leftrightarrow$ SM	$p = 0.281 > 0.10$	$p = 1.000 > 0.10$	✗
Dev, SM $\leftrightarrow$ PO, SM	$p = 0.394 > 0.10$	$p = 1.000 > 0.10$	✗
Dev $\leftrightarrow$ PO	$p = 0.190 > 0.10$	$p = 1.000 > 0.10$	✗
Dev $\leftrightarrow$ SM	$p = 0.374 > 0.10$	$p = 1.000 > 0.10$	✗
Dev $\leftrightarrow$ PO, SM	$p = 0.293 > 0.10$	$p = 1.000 > 0.10$	✗
PO $\leftrightarrow$ SM	$p = 0.580 > 0.10$	$p = 1.000 > 0.10$	✗
PO $\leftrightarrow$ PO, SM	$p = 0.700 > 0.10$	$p = 1.000 > 0.10$	✗
SM $\leftrightarrow$ PO, SM	$p = 0.855 > 0.10$	$p = 0.898 > 0.10$	✗

Table E.24.: Results of test for difference – grouped by Scrum role – cf. Figure E.24.



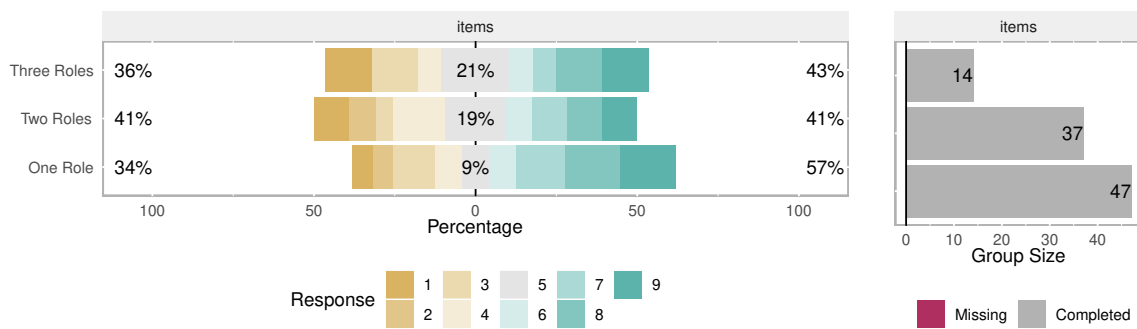


Figure E.25.: Quantity of mentioned situations where the rationale is considered valuable if documentation is available ( $\rightarrow$ ) grouped by the quantity of Scrum roles ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.521$	$p = 0.468 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Three Roles $\leftrightarrow$ Two Roles	$p = 0.800 > 0.10$	$p = 0.800 > 0.10$	$\times$
Three Roles $\leftrightarrow$ One Role	$p = 0.540 > 0.10$	$p = 0.810 > 0.10$	$\times$
Two Roles $\leftrightarrow$ One Role	$p = 0.226 > 0.10$	$p = 0.679 > 0.10$	$\times$
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.108$	$p = 0.290 > 0.10$	$\times$
Kendall's Tau (b)	$\tau = -0.090$	$p = 0.285 > 0.10$	$\times$

Table E.25.: Results of test for difference and correlation analysis – grouped by the quantity of Scrum roles – cf. [Figure E.25](#).

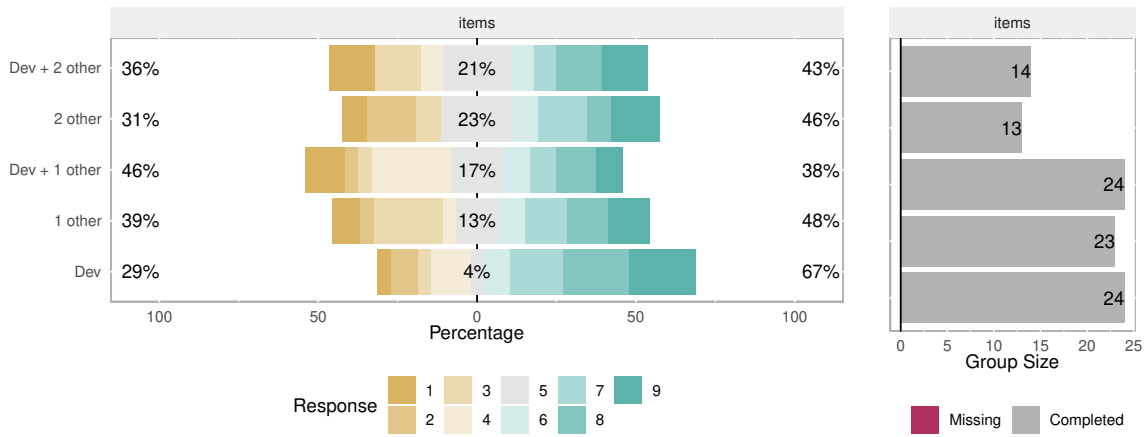


Figure E.26.: Quantity of mentioned situations where the rationale is considered valuable if documentation is available ( $\rightarrow$ ) grouped by role *Developer* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.346$	$p = 0.502 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Dev + 2 other $\leftrightarrow$ 1 other	$p = 0.986 > 0.10$	$p = 0.986 > 0.10$	X
Dev + 2 other $\leftrightarrow$ Dev	$p = 0.270 > 0.10$	$p = 0.900 > 0.10$	X
Dev + 2 other $\leftrightarrow$ 2 other	$p = 0.981 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 2 other $\leftrightarrow$ Dev + 1 other	$p = 0.705 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ 1 other	$p = 0.965 > 0.10$	$p = 1.000 > 0.10$	X
2 other $\leftrightarrow$ Dev	$p = 0.293 > 0.10$	$p = 0.733 > 0.10$	X
2 other $\leftrightarrow$ Dev + 1 other	$p = 0.692 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 1 other $\leftrightarrow$ 1 other	$p = 0.678 > 0.10$	$p = 1.000 > 0.10$	X
Dev + 1 other $\leftrightarrow$ Dev	$p = 0.084 < 0.10$	$p = 0.844 > 0.10$	X
1 other $\leftrightarrow$ Dev	$p = 0.196 > 0.10$	$p = 0.982 > 0.10$	X

Table E.26.: Results of test for difference – grouped by role *Developer* – cf. Figure E.26.

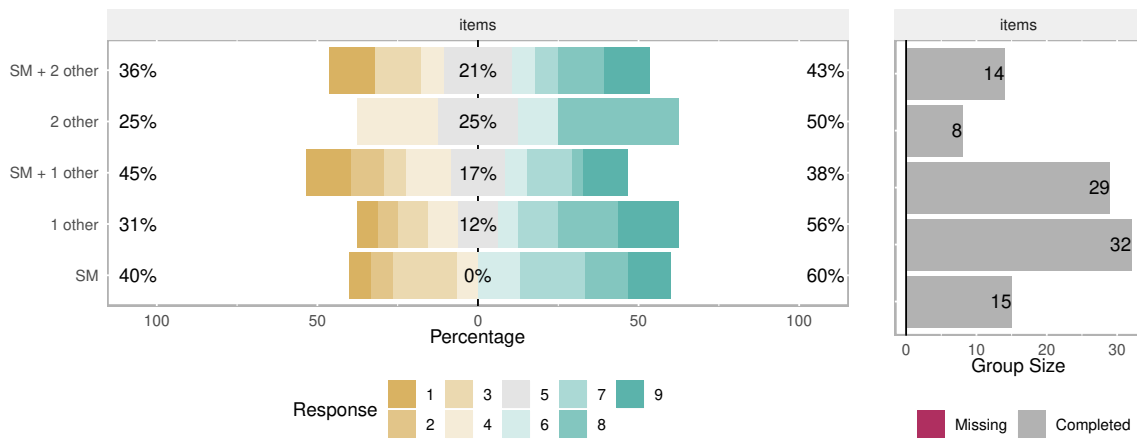


Figure E.27.: Quantity of mentioned situations where the rationale is considered valuable if documentation is available ( $\rightarrow$ ) grouped by Scrum role *Scrum Master* ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.797$	$p = 0.592 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
SM + 2 other $\leftrightarrow$ 1 other	$p = 0.459 > 0.10$	$p = 1.000 > 0.10$	$\times$
SM + 2 other $\leftrightarrow$ SM	$p = 0.833 > 0.10$	$p = 0.926 > 0.10$	$\times$
SM + 2 other $\leftrightarrow$ 2 other	$p = 0.593 > 0.10$	$p = 1.000 > 0.10$	$\times$
SM + 2 other $\leftrightarrow$ SM + 1 other	$p = 0.609 > 0.10$	$p = 1.000 > 0.10$	$\times$
2 other $\leftrightarrow$ 1 other	$p = 0.999 > 0.10$	$p = 0.999 > 0.10$	$\times$
2 other $\leftrightarrow$ SM	$p = 0.718 > 0.10$	$p = 0.897 > 0.10$	$\times$
2 other $\leftrightarrow$ SM + 1 other	$p = 0.313 > 0.10$	$p = 1.000 > 0.10$	$\times$
SM + 1 other $\leftrightarrow$ 1 other	$p = 0.115 > 0.10$	$p = 1.000 > 0.10$	$\times$
SM + 1 other $\leftrightarrow$ SM	$p = 0.441 > 0.10$	$p = 1.000 > 0.10$	$\times$
1 other $\leftrightarrow$ SM	$p = 0.612 > 0.10$	$p = 0.874 > 0.10$	$\times$

Table E.27.: Results of test for difference – grouped by Scrum role *Scrum Master* – cf. [Figure E.27](#).

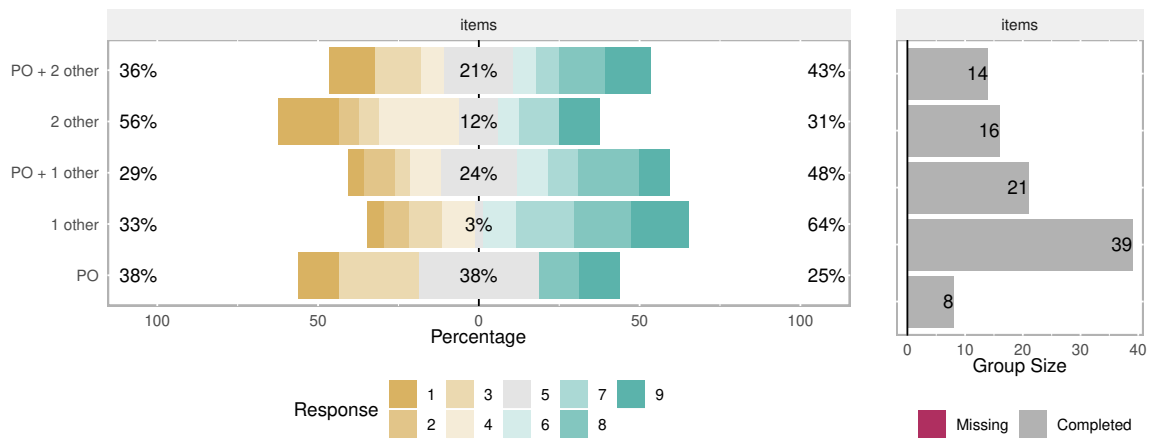


Figure E.28.: Quantity of mentioned situations where the rationale is considered valuable if documentation is available (→) grouped by Scrum role *Product Owner* (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.195$	$p = 0.380 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
PO + 2 other ↔ 1 other	$p = 0.407 > 0.10$	$p = 0.814 > 0.10$	✗
PO + 2 other ↔ PO	$p = 0.711 > 0.10$	$p = 0.889 > 0.10$	✗
PO + 2 other ↔ 2 other	$p = 0.398 > 0.10$	$p = 0.995 > 0.10$	✗
PO + 2 other ↔ PO + 1 other	$p = 0.781 > 0.10$	$p = 0.781 > 0.10$	✗
2 other ↔ 1 other	$p = 0.056 < 0.10$	$p = 0.559 > 0.10$	✗
2 other ↔ PO	$p = 0.738 > 0.10$	$p = 0.820 > 0.10$	✗
2 other ↔ PO + 1 other	$p = 0.222 > 0.10$	$p = 1.000 > 0.10$	✗
PO + 1 other ↔ 1 other	$p = 0.548 > 0.10$	$p = 0.783 > 0.10$	✗
PO + 1 other ↔ PO	$p = 0.532 > 0.10$	$p = 0.886 > 0.10$	✗
1 other ↔ PO	$p = 0.276 > 0.10$	$p = 0.921 > 0.10$	✗

Table E.28.: Results of test for difference – grouped by Scrum role *Product Owner* – cf. [Figure E.28.](#)

## E.8. Hypothesis RQ3-H8 – Experience ⇔ Situations Where Rationale Are Desirable / Important

### E.8.1. Documentation Experience ⇔ Quantity of Specific Situations in Which Rationale Was Desired but Not Available At the Time (IndepVar: Q-01 – DepVar: Q-23)

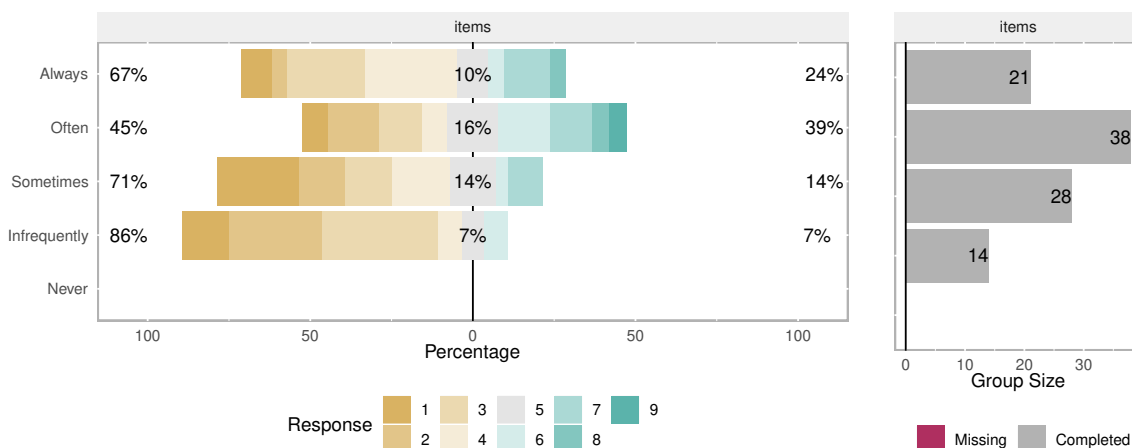


Figure E.29.: Quantity of mentioned situations where rationale was desired but not available at the time (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.727$	$p = 0.021 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.556 > 0.10$	$p = 0.556 > 0.10$	✗
Always ↔ Sometimes	$p = 0.152 > 0.10$	$p = 0.227 > 0.10$	✗
Always ↔ Infrequently	$p = 0.055 < 0.10$	$p = 0.111 > 0.10$	✗
Often ↔ Sometimes	$p = 0.021 < 0.05$	$p = 0.064 < 0.10$	✓
Often ↔ Infrequently	$p = 0.009 < 0.05$	$p = 0.052 < 0.10$	✓
Sometimes ↔ Infrequently	$p = 0.451 > 0.10$	$p = 0.541 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.260$	$p = 0.009 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.202$	$p = 0.012 < 0.05$	✓

Table E.29.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure E.29.

### E.8.2. Development Experience ↔ Quantity of Specific Situations in Which Rationale Was Desired but Not Available At the Time (IndepVar: Q-26 – DepVar: Q-23)

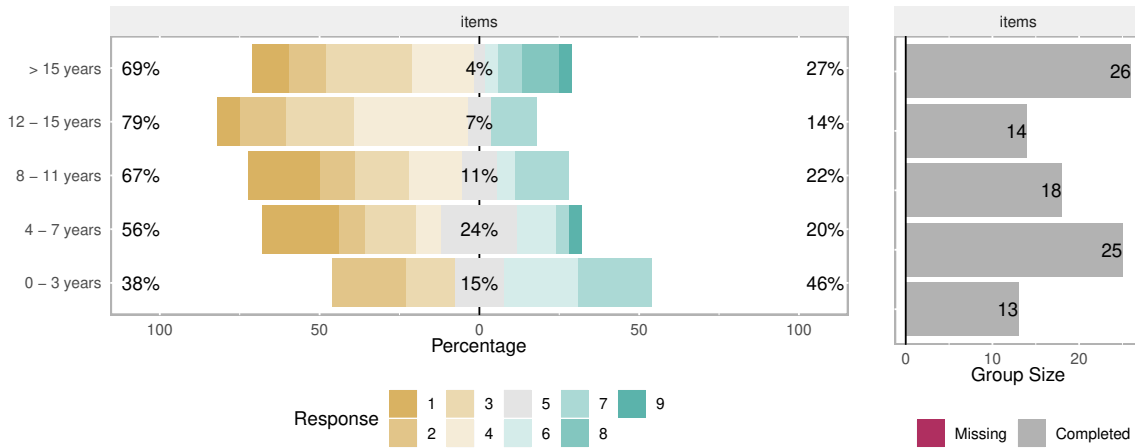


Figure E.30.: Quantity of mentioned situations where rationale was desired but not available at the time (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.188$	$p = 0.701 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12-15 years	$p = 0.785 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 8-11 years	$p = 0.563 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 4-7 years	$p = 0.623 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 0-3 years	$p = 0.372 > 0.10$	$p = 0.929 > 0.10$	X
12-15 years ↔ 8-11 years	$p = 0.808 > 0.10$	$p = 1.000 > 0.10$	X
12-15 years ↔ 4-7 years	$p = 0.887 > 0.10$	$p = 0.986 > 0.10$	X
12-15 years ↔ 0-3 years	$p = 0.307 > 0.10$	$p = 1.000 > 0.10$	X
8-11 years ↔ 4-7 years	$p = 0.898 > 0.10$	$p = 0.898 > 0.10$	X
8-11 years ↔ 0-3 years	$p = 0.187 > 0.10$	$p = 1.000 > 0.10$	X
4-7 years ↔ 0-3 years	$p = 0.197 > 0.10$	$p = 0.985 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.040$	$p = 0.702 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.036$	$p = 0.655 > 0.10$	X

Table E.30.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.30.

### E.8.3. Scrum Experience ⇔ Quantity of Specific Situations in Which Rationale Was Desired but Not Available At the Time (IndepVar: Q-27 – DepVar: Q-23)

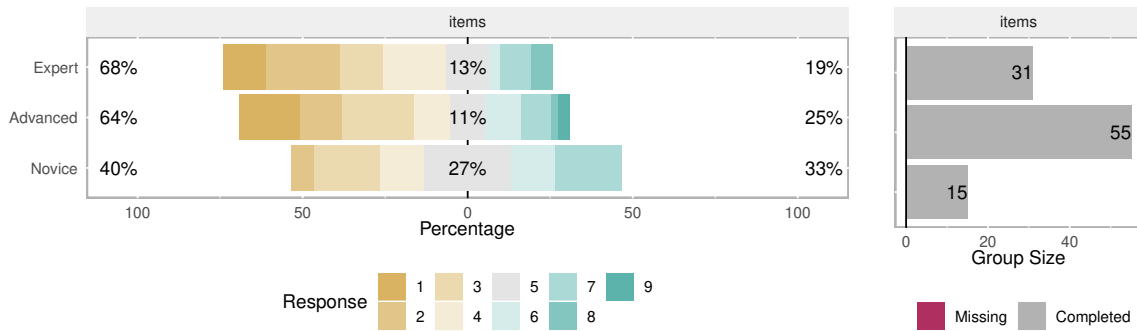


Figure E.31.: Quantity of mentioned situations where rationale was desired but not available at the time (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.652$	$p = 0.161 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.947 > 0.10$	$p = 0.947 > 0.10$	X
Expert ↔ Novice	$p = 0.084 < 0.10$	$p = 0.126 > 0.10$	X
Advanced ↔ Novice	$p = 0.069 < 0.10$	$p = 0.208 > 0.10$	X

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.136$	$p = 0.175 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.111$	$p = 0.180 > 0.10$	X

Table E.31.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure E.31.

### E.8.4. Documentation Experience $\Leftrightarrow$ Quantity of Specific Situations in Which Rationale Are Considered Valuable if Documented (IndepVar: Q-01 – DepVar: Q-24)

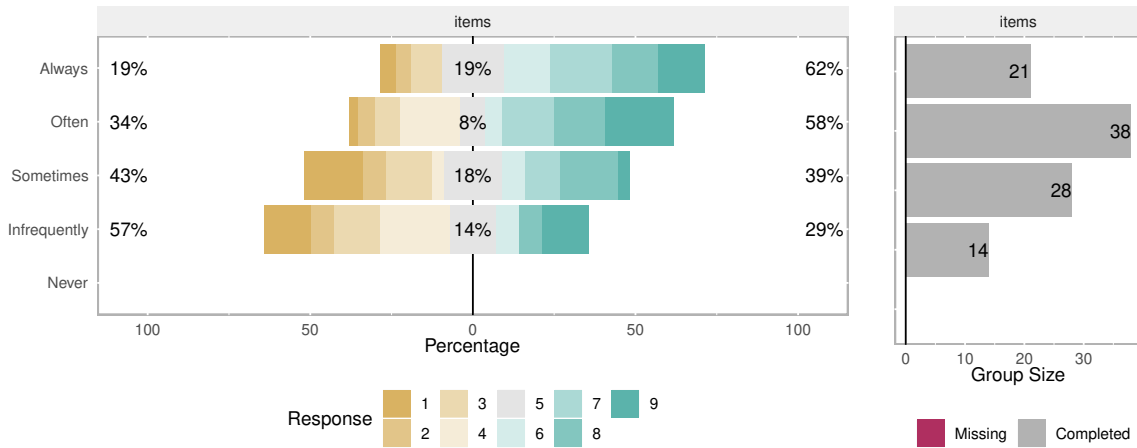


Figure E.32.: Quantity of specific situations in which rationale are considered valuable if documentation is available ( $\rightarrow$ ) grouped by documentation experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.855$	$p = 0.077 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always $\leftrightarrow$ Often	$p = 0.901 > 0.10$	$p = 0.901 > 0.10$	✗
Always $\leftrightarrow$ Sometimes	$p = 0.092 < 0.10$	$p = 0.183 > 0.10$	✗
Always $\leftrightarrow$ Infrequently	$p = 0.117 > 0.10$	$p = 0.175 > 0.10$	✗
Often $\leftrightarrow$ Sometimes	$p = 0.036 < 0.05$	$p = 0.219 > 0.10$	✗
Often $\leftrightarrow$ Infrequently	$p = 0.066 < 0.10$	$p = 0.198 > 0.10$	✗
Sometimes $\leftrightarrow$ Infrequently	$p = 0.869 > 0.10$	$p = 1.000 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.232$	$p = 0.020 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.182$	$p = 0.022 < 0.05$	✓

Table E.32.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure E.32.



### E.8.5. Development Experience ↔ Quantity of Specific Situations in Which Rationale Are Considered Valuable if Documented (IndepVar: Q-26 – DepVar: Q-24)

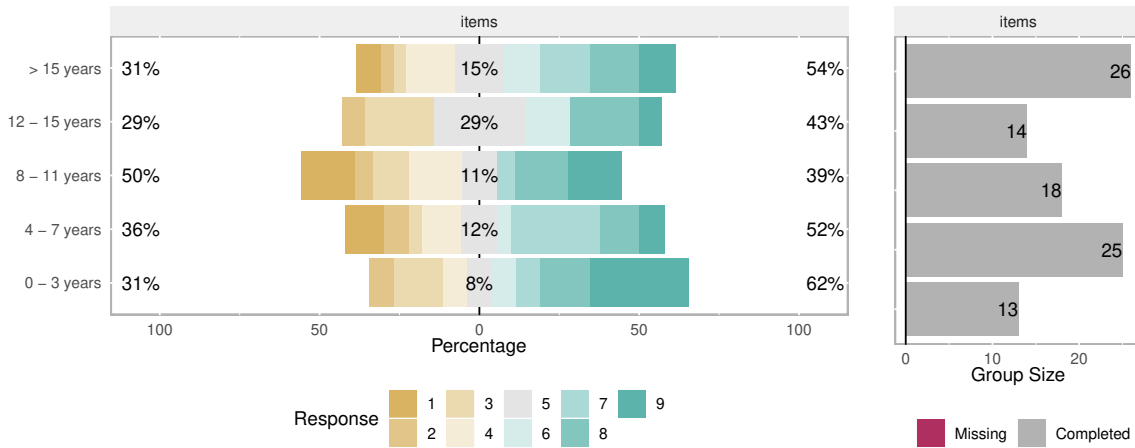


Figure E.33.: Quantity of specific situations in which rationale are considered valuable if documentation is available (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.069$	$p = 0.723 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.736 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.485 > 0.10$	$p = 0.969 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.647 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.430 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.773 > 0.10$	$p = 0.967 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.961 > 0.10$	$p = 0.961 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 0.324 > 0.10$	$p = 1.000 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.780 > 0.10$	$p = 0.867 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.185 > 0.10$	$p = 1.000 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.247 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.036$	$p = 0.730 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.024$	$p = 0.761 > 0.10$	X

Table E.33.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure E.33.

**E.8.6. Scrum Experience ⇔ Quantity of Specific Situations in Which Rationale Are Considered Valuable if Documented (IndepVar: Q-27 – DepVar: Q-24)**

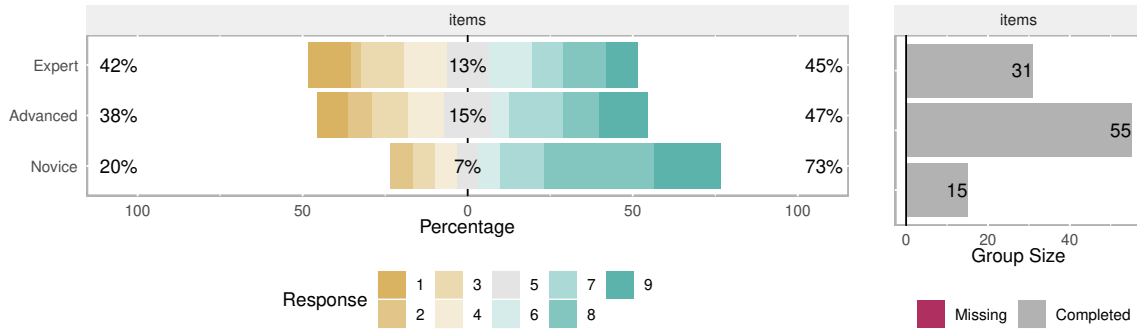


Figure E.34.: Quantity of specific situations in which rationale are considered valuable if documentation is available (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.475$	$p = 0.107 > 0.10$	X

Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.613 > 0.10$	$p = 0.613 > 0.10$	X
Expert ↔ Novice	$p = 0.040 < 0.05$	$p = 0.119 > 0.10$	X
Advanced ↔ Novice	$p = 0.067 < 0.10$	$p = 0.100 \leq 0.10$	✓

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.178$	$p = 0.075 < 0.10$	✓
Kendall's Tau (b)	$\tau = -0.146$	$p = 0.077 < 0.10$	✓

Table E.34.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure E.34.

**E.8.7. Experience ⇔ Specific Situations in Which Rationale Were Desired but Not Available At the Time**  
**(IndepVar: Q-01 / Q-26 / Q-27 – DepVar: Q-23)**

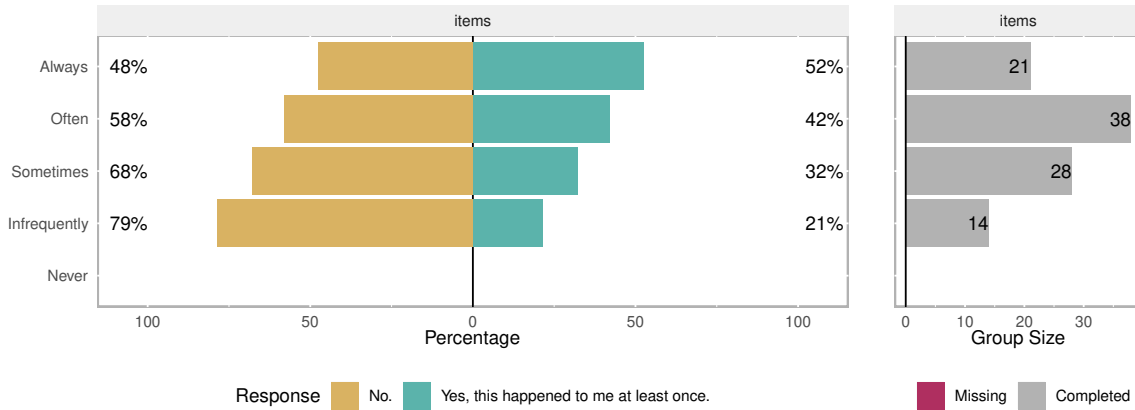


Figure E.35.: *Did you wish for decision documentation in the following situation, which was not available at the time? – “You needed to familiarise yourself with a project which has been completed a long time ago.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.073$	$p = 0.254 > 0.10$	✗
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.440 > 0.10$	$p = 0.528 > 0.10$	✗
Always ↔ Sometimes	$p = 0.152 > 0.10$	$p = 0.456 > 0.10$	✗
Always ↔ Infrequently	$p = 0.067 < 0.10$	$p = 0.400 > 0.10$	✗
Often ↔ Sometimes	$p = 0.414 > 0.10$	$p = 0.620 > 0.10$	✗
Often ↔ Infrequently	$p = 0.176 > 0.10$	$p = 0.353 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.504 > 0.10$	$p = 0.504 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.201$	$p = 0.044 < 0.05$	✓
Kendall’s Tau (b)	$\tau = 0.185$	$p = 0.045 < 0.05$	✓

Table E.35.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.35.

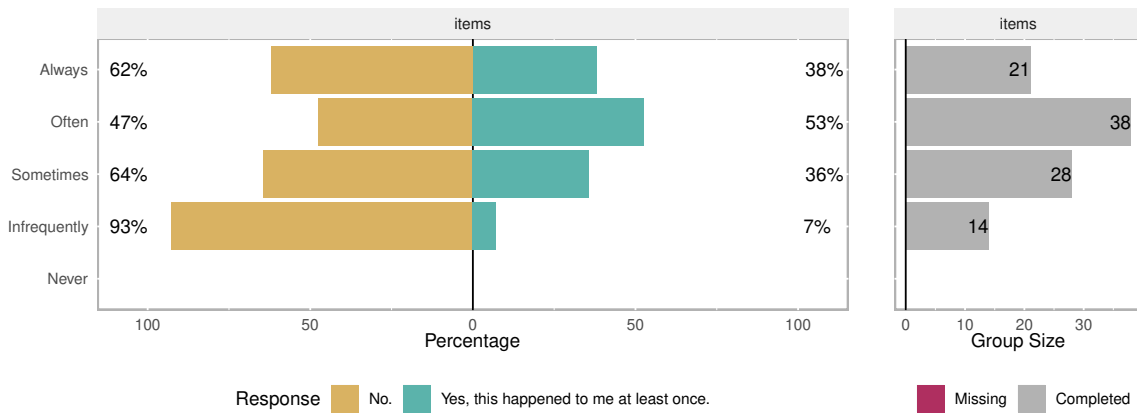


Figure E.36.: *Did you wish for decision documentation in the following situation, which was not available at the time? – “A software bug had to be resolved.”*(→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.011$	$p = 0.029 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.275 > 0.10$	$p = 0.329 > 0.10$	✗
Always ↔ Sometimes	$p = 0.866 > 0.10$	$p = 0.866 > 0.10$	✗
Always ↔ Infrequently	$p = 0.067 < 0.10$	$p = 0.200 > 0.10$	✗
Often ↔ Sometimes	$p = 0.165 > 0.10$	$p = 0.248 > 0.10$	✗
Often ↔ Infrequently	$p = 0.003 \ll 0.05$	$p = 0.018 < 0.05$	✓
Sometimes ↔ Infrequently	$p = 0.074 < 0.10$	$p = 0.149 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.191$	$p = 0.056 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.176$	$p = 0.056 < 0.10$	✓

Table E.36.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.36.

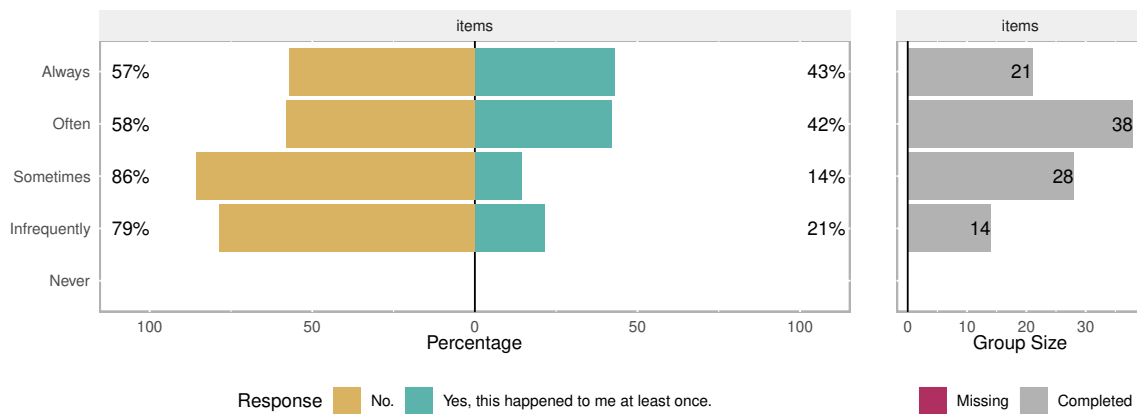


Figure E.37.: Did you wish for decision documentation in the following situation, which was not available at the time? – “An audit had to be made / auditors put our decisions in question.”(→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.638$	$p = 0.054 < 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.953 > 0.10$	$p = 0.953 > 0.10$	✗
Always ↔ Sometimes	$p = 0.034 < 0.05$	$p = 0.103 > 0.10$	✗
Always ↔ Infrequently	$p = 0.184 > 0.10$	$p = 0.276 > 0.10$	✗
Often ↔ Sometimes	$p = 0.017 < 0.05$	$p = 0.101 > 0.10$	✗
Often ↔ Infrequently	$p = 0.157 > 0.10$	$p = 0.314 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.641 > 0.10$	$p = 0.769 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.235$	$p = 0.018 < 0.05$	✓
Kendall’s Tau (b)	$\tau = 0.216$	$p = 0.019 < 0.05$	✓

Table E.37.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.37.

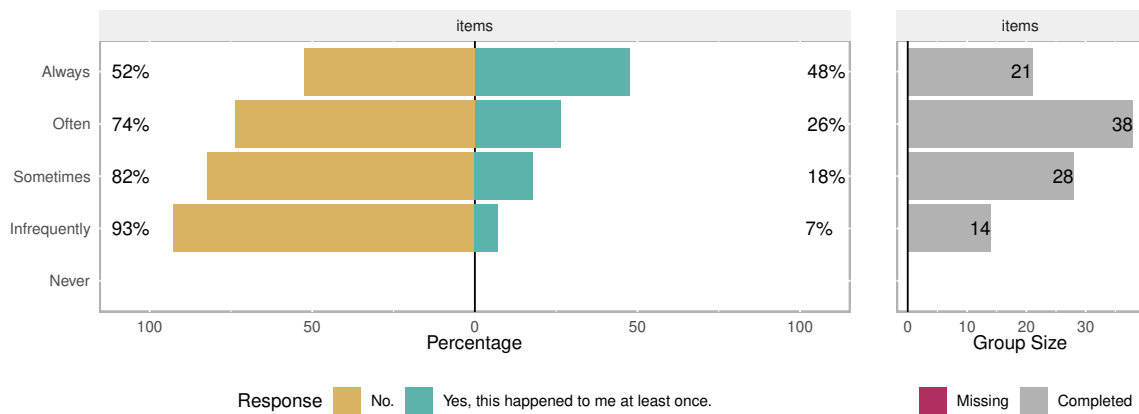


Figure E.38.: *Did you wish for decision documentation in the following situation, which was not available at the time? – “A review was conducted.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 8.622$	$p = 0.035 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.075 < 0.10$	$p = 0.149 > 0.10$	✗
Always ↔ Sometimes	$p = 0.019 < 0.05$	$p = 0.057 < 0.10$	✓
Always ↔ Infrequently	$p = 0.008 < 0.05$	$p = 0.046 < 0.05$	✓
Often ↔ Sometimes	$p = 0.440 > 0.10$	$p = 0.527 > 0.10$	✗
Often ↔ Infrequently	$p = 0.163 > 0.10$	$p = 0.244 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.456 > 0.10$	$p = 0.456 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.284$	$p = 0.004 \ll 0.05$	✓
Kendall's Tau (b)	$\tau = 0.261$	$p = 0.005 \ll 0.05$	✓

Table E.38.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.38.

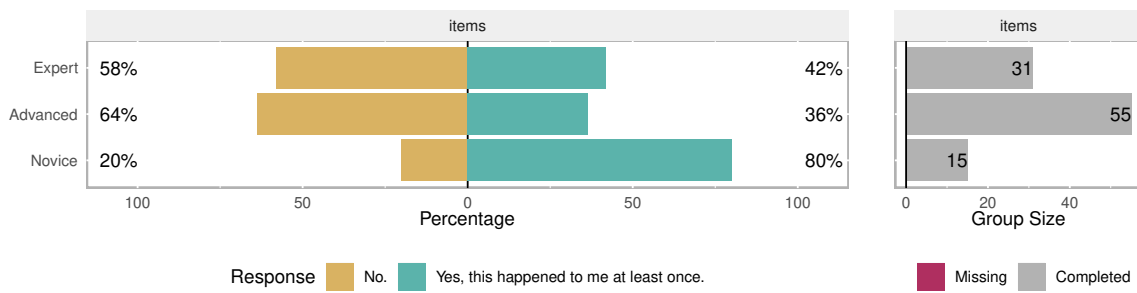


Figure E.39.: *Did you wish for decision documentation in the following situation, which was not available at the time? – “The decision at hand was a mistake in your eyes!”* (→) grouped by Scrum experience (↑) (DepVar: Q-27).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 9.117$	$p = 0.010 < 0.05$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.619 > 0.10$	$p = 0.619 > 0.10$	✗
Expert ↔ Novice	$p = 0.015 < 0.05$	$p = 0.023 < 0.05$	✓
Advanced ↔ Novice	$p = 0.003 \ll 0.05$	$p = 0.008 < 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = -0.168$	$p = 0.093 < 0.10$	✓
Kendall’s Tau (b)	$\tau = -0.161$	$p = 0.093 < 0.10$	✓

Table E.39.: Results of test for difference and correlation analysis – grouped by Scrum experience (DepVar: Q-27) – cf. Figure E.39.

**E.8.8. Experience ⇔ Specific Situations in Which Rationale Are Considered Valuable if Documentation Is Available**  
(IndepVar: Q-01 / Q-26 / Q-27 – DepVar: Q-24)

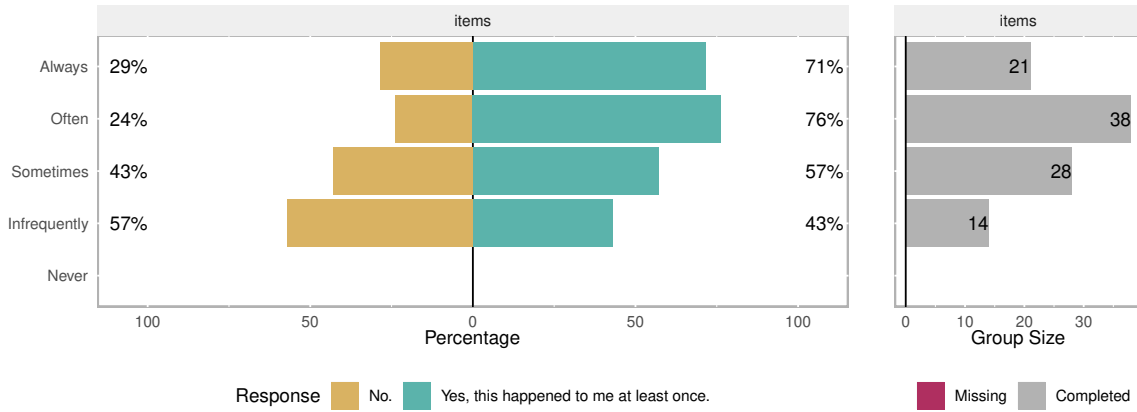


Figure E.40.: *Would you consider rationale valuable, if available in the following situation? – “The issue at hand already occurred in a similar fashion.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 6.259$	$p = 0.100 \leq 0.10$	✓
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.707 > 0.10$	$p = 0.707 > 0.10$	✗
Always ↔ Sometimes	$p = 0.301 > 0.10$	$p = 0.451 > 0.10$	✗
Always ↔ Infrequently	$p = 0.083 < 0.10$	$p = 0.250 > 0.10$	✗
Often ↔ Sometimes	$p = 0.107 > 0.10$	$p = 0.215 > 0.10$	✗
Often ↔ Infrequently	$p = 0.025 < 0.05$	$p = 0.151 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.361 > 0.10$	$p = 0.434 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.212$	$p = 0.034 < 0.05$	✓
Kendall’s Tau (b)	$\tau = 0.195$	$p = 0.034 < 0.05$	✓

Table E.40.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.40.



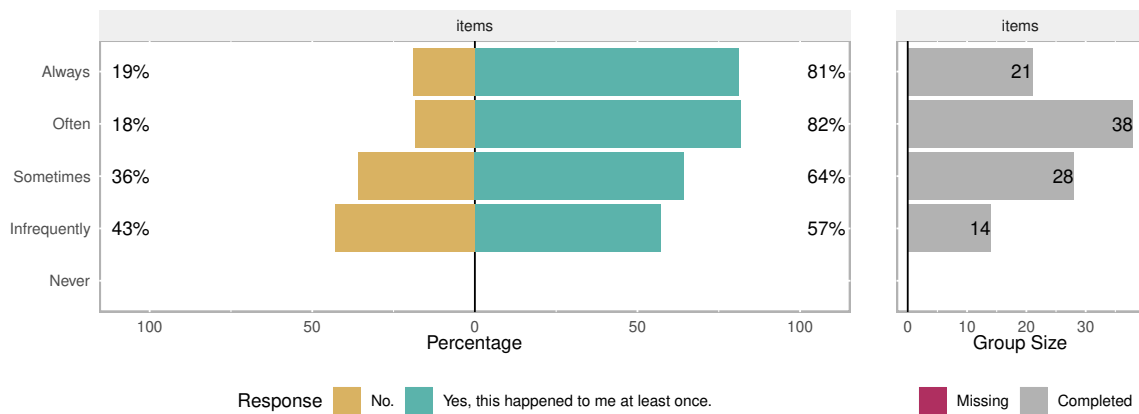


Figure E.41.: *Would you consider rationale valuable, if available in the following situation? – “An existing solution has to be modified because of modified requirements.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.936$	$p = 0.177 > 0.10$	✗
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.959 > 0.10$	$p = 0.959 > 0.10$	✗
Always ↔ Sometimes	$p = 0.194 > 0.10$	$p = 0.291 > 0.10$	✗
Always ↔ Infrequently	$p = 0.121 > 0.10$	$p = 0.242 > 0.10$	✗
Often ↔ Sometimes	$p = 0.118 > 0.10$	$p = 0.355 > 0.10$	✗
Often ↔ Infrequently	$p = 0.079 < 0.10$	$p = 0.473 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.624 > 0.10$	$p = 0.748 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.203$	$p = 0.042 < 0.05$	✓
Kendall’s Tau (b)	$\tau = 0.187$	$p = 0.043 < 0.05$	✓

Table E.41.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.41.

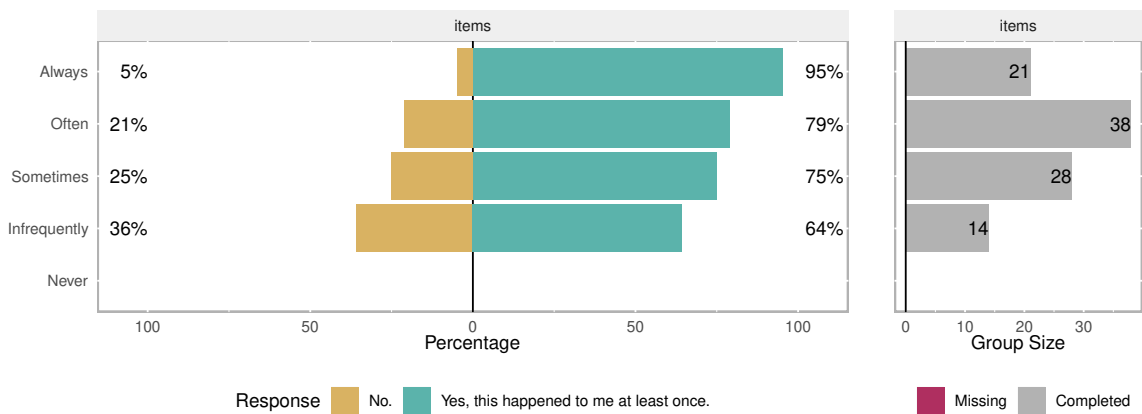


Figure E.42.: *Would you consider rationale valuable, if available in the following situation? – “You join an ongoing project.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.418$	$p = 0.144 > 0.10$	✗
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.142 > 0.10$	$p = 0.284 > 0.10$	✗
Always ↔ Sometimes	$p = 0.086 < 0.10$	$p = 0.257 > 0.10$	✗
Always ↔ Infrequently	$p = 0.028 < 0.05$	$p = 0.167 > 0.10$	✗
Often ↔ Sometimes	$p = 0.698 > 0.10$	$p = 0.698 > 0.10$	✗
Often ↔ Infrequently	$p = 0.250 > 0.10$	$p = 0.375 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.422 > 0.10$	$p = 0.507 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.220$	$p = 0.027 < 0.05$	✓
Kendall’s Tau (b)	$\tau = 0.202$	$p = 0.028 < 0.05$	✓

Table E.42.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. [Figure E.42.](#)

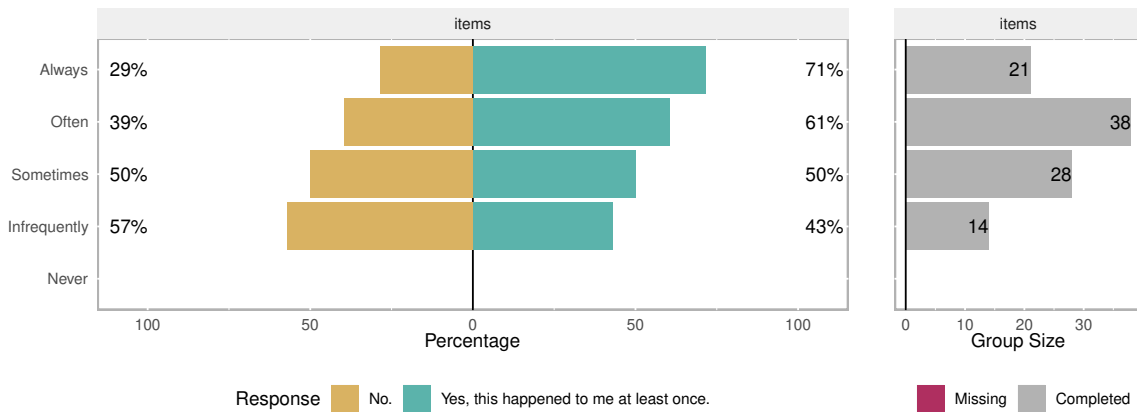


Figure E.43.: *Would you consider rationale valuable, if available in the following situation? – “You need to familiarise yourself with a project which has been completed a long time ago.”* (→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.644$	$p = 0.303 > 0.10$	✗
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.420 > 0.10$	$p = 0.504 > 0.10$	✗
Always ↔ Sometimes	$p = 0.135 > 0.10$	$p = 0.406 > 0.10$	✗
Always ↔ Infrequently	$p = 0.096 < 0.10$	$p = 0.574 > 0.10$	✗
Often ↔ Sometimes	$p = 0.395 > 0.10$	$p = 0.593 > 0.10$	✗
Often ↔ Infrequently	$p = 0.255 > 0.10$	$p = 0.511 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.661 > 0.10$	$p = 0.661 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = 0.191$	$p = 0.056 < 0.10$	✓
Kendall’s Tau (b)	$\tau = 0.176$	$p = 0.056 < 0.10$	✓

Table E.43.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. Figure E.43.

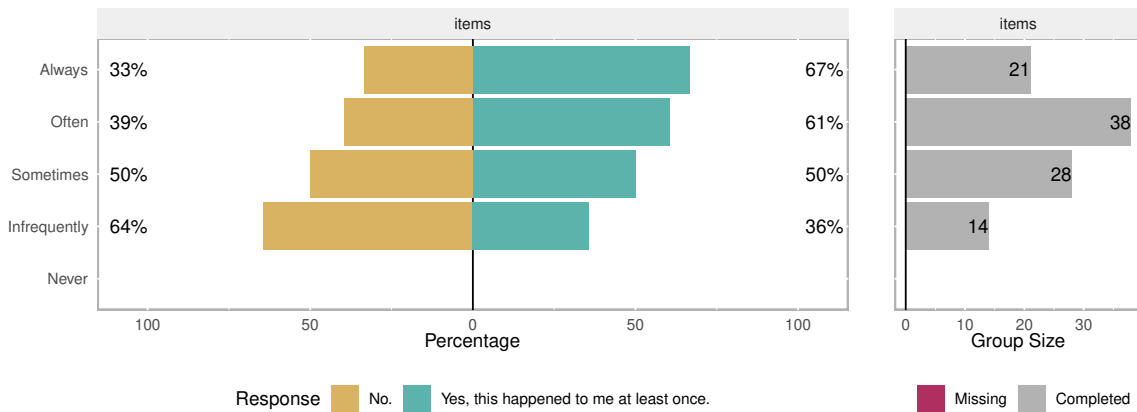


Figure E.44.: *Would you consider rationale valuable, if available in the following situation? – “A software bug has to be resolved.”*(→) grouped by documentation experience (↑) (DepVar: Q-01).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.970$	$p = 0.265 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.651 > 0.10$	$p = 0.651 > 0.10$	✗
Always ↔ Sometimes	$p = 0.248 > 0.10$	$p = 0.495 > 0.10$	✗
Always ↔ Infrequently	$p = 0.073 < 0.10$	$p = 0.435 > 0.10$	✗
Often ↔ Sometimes	$p = 0.397 > 0.10$	$p = 0.477 > 0.10$	✗
Often ↔ Infrequently	$p = 0.112 > 0.10$	$p = 0.336 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.382 > 0.10$	$p = 0.573 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.192$	$p = 0.054 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.177$	$p = 0.055 < 0.10$	✓

Table E.44.: Results of test for difference and correlation analysis – grouped by documentation experience (DepVar: Q-01) – cf. [Figure E.44.](#)

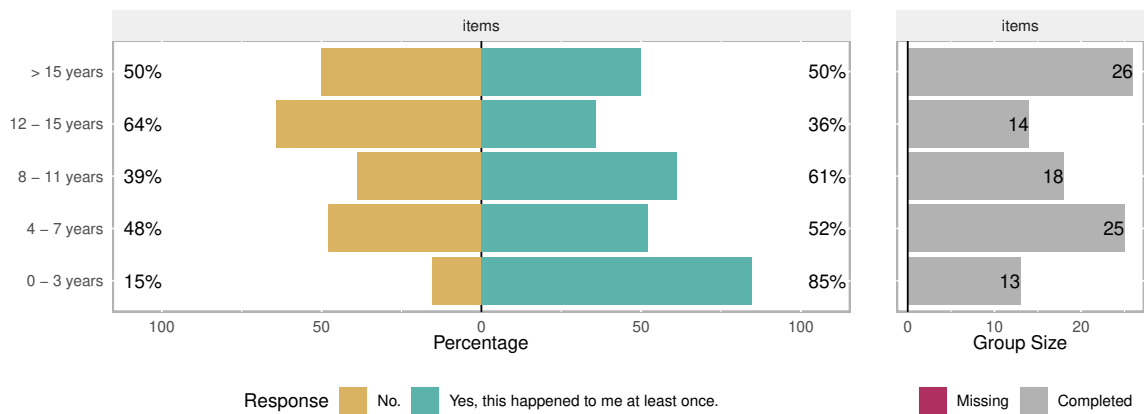


Figure E.45.: *Would you consider rationale valuable, if available in the following situation? – “A review has to be conducted.”*(→) grouped by development experience (↑) (DepVar: Q-26).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.264$	$p = 0.123 > 0.10$	X
Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.389 > 0.10$	$p = 0.555 > 0.10$	X
> 15 years ↔ 8 – 11 years	$p = 0.469 > 0.10$	$p = 0.586 > 0.10$	X
> 15 years ↔ 4 – 7 years	$p = 0.886 > 0.10$	$p = 0.886 > 0.10$	X
> 15 years ↔ 0 – 3 years	$p = 0.041 < 0.05$	$p = 0.207 > 0.10$	X
12 – 15 years ↔ 8 – 11 years	$p = 0.154 > 0.10$	$p = 0.385 > 0.10$	X
12 – 15 years ↔ 4 – 7 years	$p = 0.329 > 0.10$	$p = 0.548 > 0.10$	X
12 – 15 years ↔ 0 – 3 years	$p = 0.011 < 0.05$	$p = 0.111 > 0.10$	X
8 – 11 years ↔ 4 – 7 years	$p = 0.555 > 0.10$	$p = 0.617 > 0.10$	X
8 – 11 years ↔ 0 – 3 years	$p = 0.196 > 0.10$	$p = 0.393 > 0.10$	X
4 – 7 years ↔ 0 – 3 years	$p = 0.056 < 0.10$	$p = 0.188 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = -0.178$	$p = 0.082 < 0.10$	✓
Kendall’s Tau (b)	$\tau = -0.160$	$p = 0.082 < 0.10$	✓

Table E.45.: Results of test for difference and correlation analysis – grouped by development experience (DepVar: Q-26) – cf. Figure E.45.

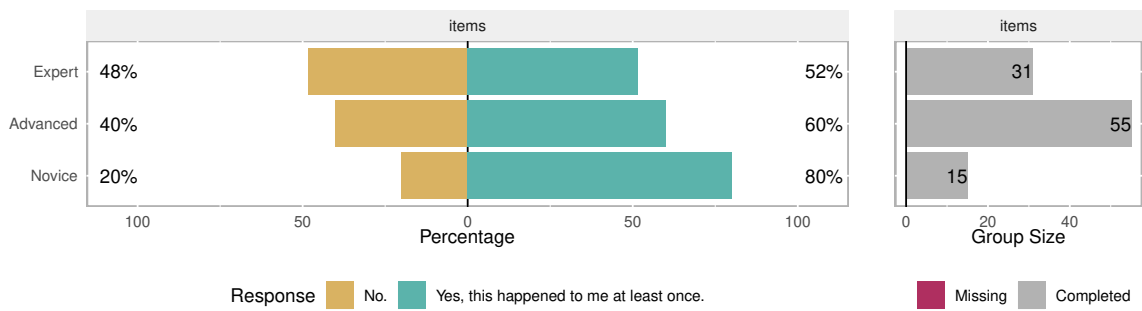


Figure E.46.: *Would you consider rationale valuable, if available in the following situation? – “An audit has to be made / auditors put our decisions in question.”*(→) grouped by Scrum experience (↑) (DepVar: Q-27).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 3.380$	$p = 0.185 > 0.10$	✗

Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.447 > 0.10$	$p = 0.447 > 0.10$	✗
Expert ↔ Novice	$p = 0.066 < 0.10$	$p = 0.199 > 0.10$	✗
Advanced ↔ Novice	$p = 0.162 > 0.10$	$p = 0.244 > 0.10$	✗

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = -0.170$	$p = 0.089 < 0.10$	✓
Kendall’s Tau (b)	$\tau = -0.163$	$p = 0.089 < 0.10$	✓

Table E.46.: Results of test for difference and correlation analysis – grouped by Scrum experience (DepVar: Q-27) – cf. [Figure E.46](#).

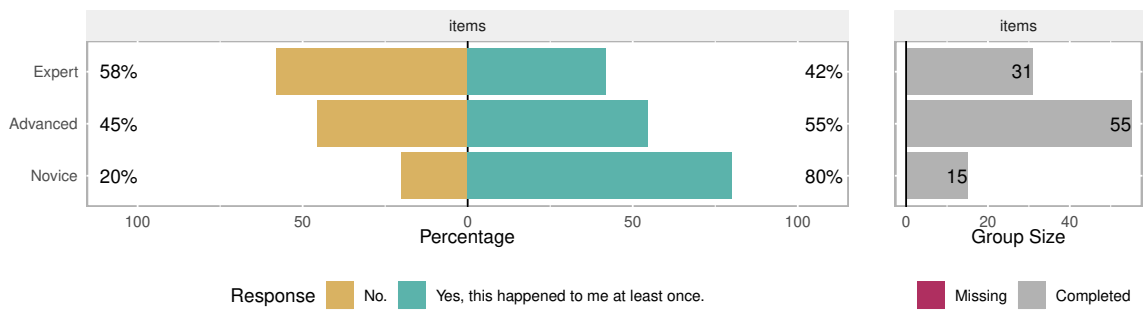


Figure E.47.: *Would you consider rationale valuable, if available in the following situation? – “A review has to be conducted.”* (→) grouped by Scrum experience (↑) (DepVar: Q-27).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.847$	$p = 0.054 < 0.10$	✓

Dunn’s Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.262 > 0.10$	$p = 0.262 > 0.10$	✗
Expert ↔ Novice	$p = 0.016 < 0.05$	$p = 0.047 < 0.05$	✓
Advanced ↔ Novice	$p = 0.081 < 0.10$	$p = 0.121 > 0.10$	✗

Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman’s Rank Correlation	$\rho = -0.229$	$p = 0.022 < 0.05$	✓
Kendall’s Tau (b)	$\tau = -0.219$	$p = 0.022 < 0.05$	✓

Table E.47.: Results of test for difference and correlation analysis – grouped by Scrum experience (DepVar: Q-27) – cf. [Figure E.47](#).

# F. Detailed Data for Hypotheses Related to Research Question RQ4

## F.1. Hypothesis RQ4-H1 – Experience ⇔ Application Frequency of Quality Control Mechanisms

### F.1.1. Documentation Experience ⇔ Application Frequency of Quality Control Mechanisms (IndepVar: Q-01 – DepVar: Q-18 – 4<sup>th</sup> Item)

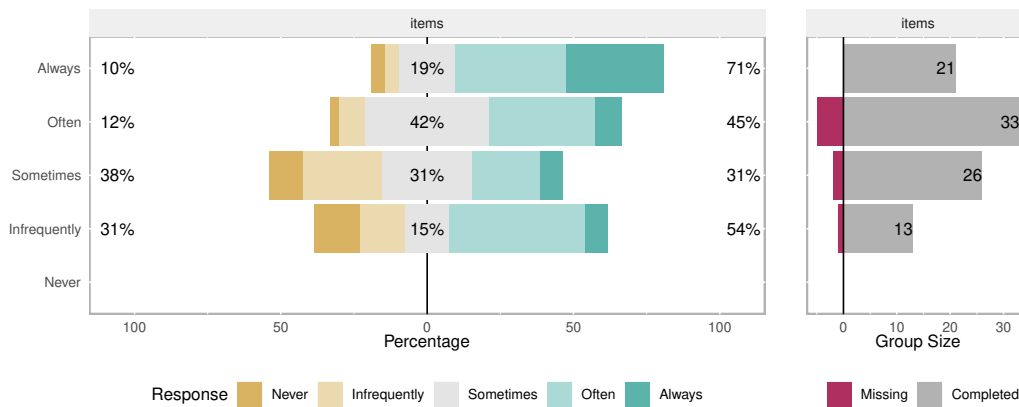


Figure F.1.: Application frequency of quality control mechanisms (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 10.535$	$p = 0.015 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.061 < 0.10$	$p = 0.182 > 0.10$	✗
Always ↔ Sometimes	$p = 0.001 \ll 0.05$	$p = 0.008 < 0.05$	✓
Always ↔ Infrequently	$p = 0.073 < 0.10$	$p = 0.145 > 0.10$	✗
Often ↔ Sometimes	$p = 0.107 > 0.10$	$p = 0.161 > 0.10$	✗
Often ↔ Infrequently	$p = 0.737 > 0.10$	$p = 0.737 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.358 > 0.10$	$p = 0.429 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.285$	$p = 0.006 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.248$	$p = 0.005 \ll 0.05$	✓

Table F.1.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure F.1.



### F.1.2. Development Experience $\leftrightarrow$ Application Frequency of Quality Control Mechanisms (IndepVar: Q-26 – DepVar: Q-18 – 4<sup>th</sup> Item)

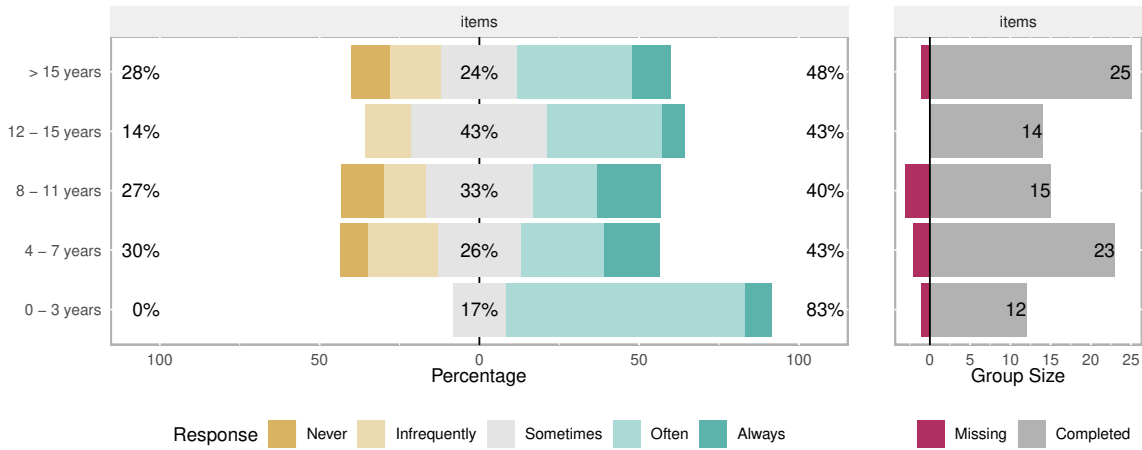


Figure F.2.: Application frequency of quality control mechanisms ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.185$	$p = 0.382 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.878 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.961 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.974 > 0.10$	$p = 1.000 > 0.10$	X
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.071 < 0.10$	$p = 0.353 > 0.10$	X
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.856 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.858 > 0.10$	$p = 1.000 > 0.10$	X
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.138 > 0.10$	$p = 0.344 > 0.10$	X
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.984 > 0.10$	$p = 0.984 > 0.10$	X
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.093 < 0.10$	$p = 0.309 > 0.10$	X
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.070 < 0.10$	$p = 0.703 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.126$	$p = 0.239 > 0.10$	X
Kendall's Tau (b)	$\tau = -0.101$	$p = 0.248 > 0.10$	X

Table F.2.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure F.2.

### F.1.3. Scrum Experience ⇔ Application Frequency of Quality Control Mechanisms (IndepVar: Q-27 – DepVar: Q-18 – 4<sup>th</sup> Item)

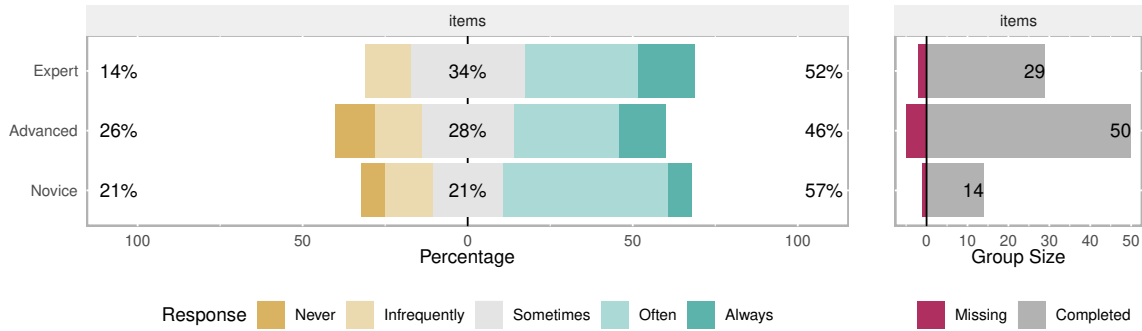


Figure F.3.: Application frequency of quality control mechanisms (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.030$	$p = 0.598 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.314 > 0.10$	$p = 0.941 > 0.10$	X
Expert ↔ Novice	$p = 0.728 > 0.10$	$p = 0.728 > 0.10$	X
Advanced ↔ Novice	$p = 0.687 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.067$	$p = 0.521 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.059$	$p = 0.516 > 0.10$	X

Table F.3.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure F.3.

### F.1.4. Documentation Experience $\Leftrightarrow$ Desired Application Frequency of Quality Control Mechanisms (IndepVar: Q-01 – DepVar: Q-19 – 4<sup>th</sup> Item)

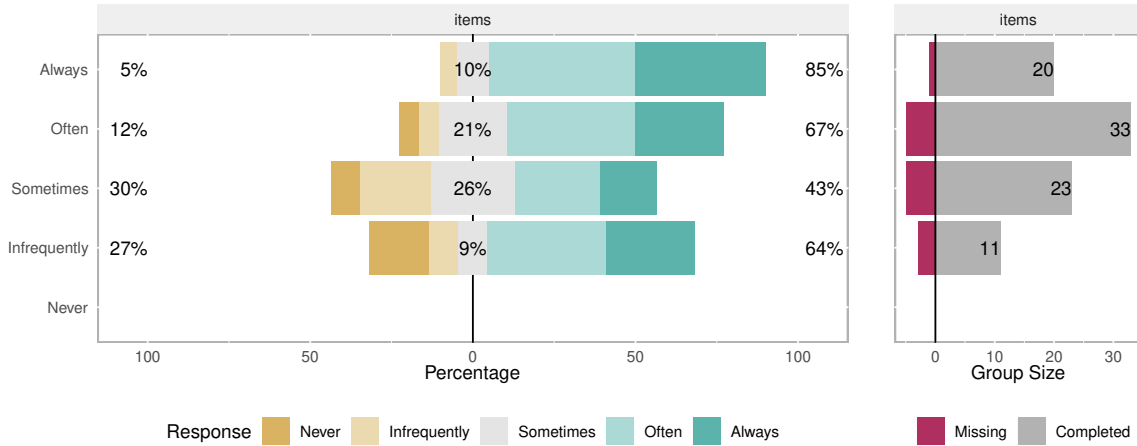


Figure F.4.: Desired application frequency of quality control mechanisms ( $\rightarrow$ ) grouped by documentation experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.557$	$p = 0.056 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always $\leftrightarrow$ Often	$p = 0.176 > 0.10$	$p = 0.263 > 0.10$	✗
Always $\leftrightarrow$ Sometimes	$p = 0.007 < 0.05$	$p = 0.040 < 0.05$	✓
Always $\leftrightarrow$ Infrequently	$p = 0.158 > 0.10$	$p = 0.317 > 0.10$	✗
Often $\leftrightarrow$ Sometimes	$p = 0.100 \leq 0.10$	$p = 0.301 > 0.10$	✗
Often $\leftrightarrow$ Infrequently	$p = 0.676 > 0.10$	$p = 0.676 > 0.10$	✗
Sometimes $\leftrightarrow$ Infrequently	$p = 0.412 > 0.10$	$p = 0.495 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.257$	$p = 0.016 < 0.05$	✓
Kendall's Tau (b)	$\tau = 0.221$	$p = 0.015 < 0.05$	✓

Table F.4.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure F.4.

### F.1.5. Development Experience $\leftrightarrow$ Application Frequency of Quality Control Mechanisms (IndepVar: Q-26 – DepVar: Q-19 – 4<sup>th</sup> Item)

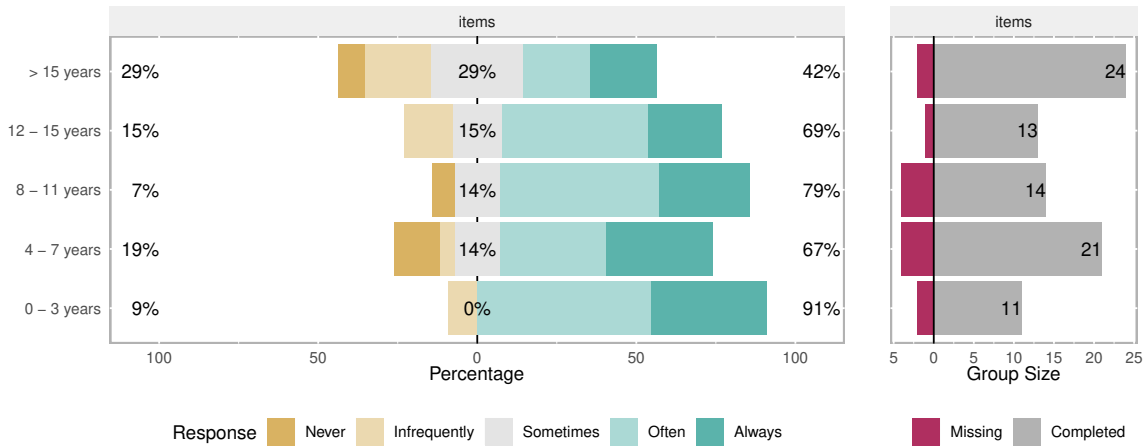


Figure F.5.: Desired application frequency of quality control mechanisms ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.780$	$p = 0.216 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.257 > 0.10$	$p = 0.644 > 0.10$	✗
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.094 < 0.10$	$p = 0.471 > 0.10$	✗
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.160 > 0.10$	$p = 0.532 > 0.10$	✗
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.031 < 0.05$	$p = 0.306 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.654 > 0.10$	$p = 0.817 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.932 > 0.10$	$p = 0.932 > 0.10$	✗
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.332 > 0.10$	$p = 0.553 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.679 > 0.10$	$p = 0.755 > 0.10$	✗
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.577 > 0.10$	$p = 0.825 > 0.10$	✗
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.324 > 0.10$	$p = 0.648 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.235$	$p = 0.033 < 0.05$	✓
Kendall's Tau (b)	$\tau = -0.196$	$p = 0.030 < 0.05$	✓

Table F.5.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure F.5.

### F.1.6. Scrum Experience ⇔ Application Frequency of Quality Control Mechanisms (IndepVar: Q-27 – DepVar: Q-18 – 4<sup>th</sup> Item)

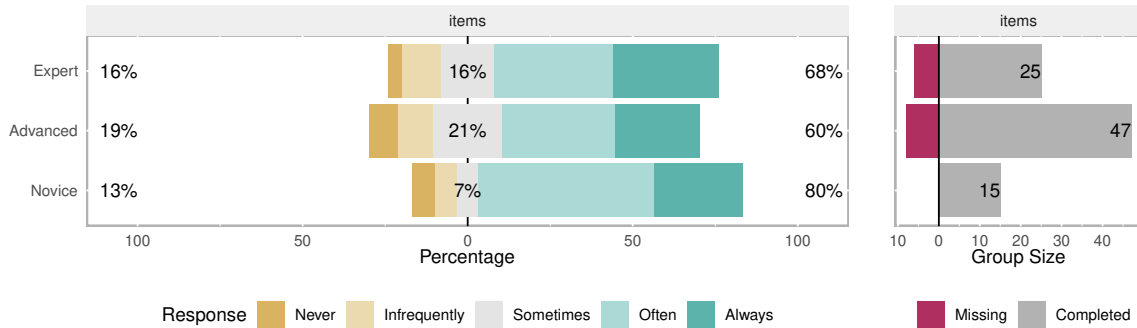


Figure F.6.: Desired application frequency of quality control mechanisms (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.009$	$p = 0.604 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.444 > 0.10$	$p = 0.667 > 0.10$	X
Expert ↔ Novice	$p = 0.851 > 0.10$	$p = 0.851 > 0.10$	X
Advanced ↔ Novice	$p = 0.398 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.006$	$p = 0.957 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.004$	$p = 0.963 > 0.10$	X

Table F.6.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure F.6.

## F.2. Hypothesis RQ4-H2 – Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities

### F.2.1. Documentation Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-01 – DepVar: Q-18 – 6<sup>th</sup> Item)

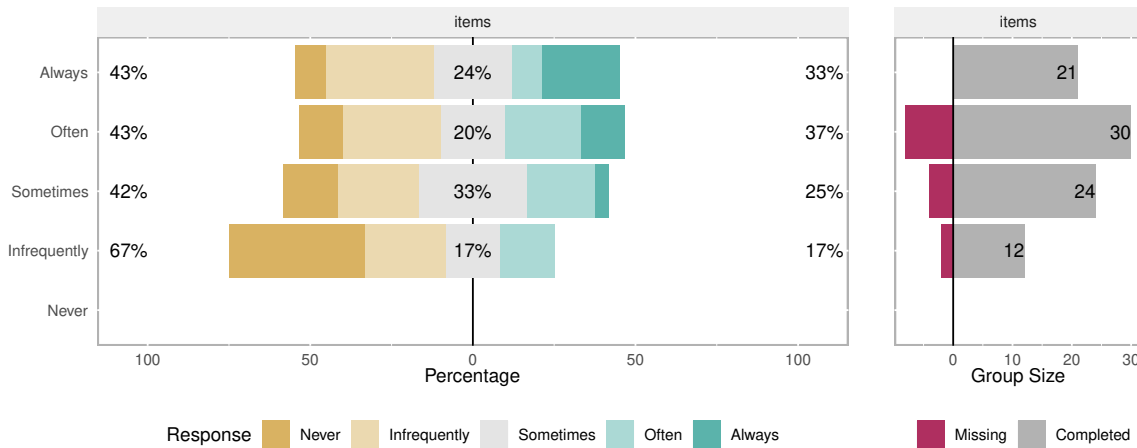


Figure F.7.: Application frequency of dedicated roles and responsibilities (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.791$	$p = 0.188 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.817 > 0.10$	$p = 0.817 > 0.10$	✗
Always ↔ Sometimes	$p = 0.475 > 0.10$	$p = 0.713 > 0.10$	✗
Always ↔ Infrequently	$p = 0.042 < 0.05$	$p = 0.254 > 0.10$	✗
Often ↔ Sometimes	$p = 0.590 > 0.10$	$p = 0.708 > 0.10$	✗
Often ↔ Infrequently	$p = 0.050 \leq 0.05$	$p = 0.150 > 0.10$	✗
Sometimes ↔ Infrequently	$p = 0.140 > 0.10$	$p = 0.281 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.199$	$p = 0.064 < 0.10$	✓
Kendall's Tau (b)	$\tau = 0.167$	$p = 0.061 < 0.10$	✓

Table F.7.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure F.7.

### F.2.2. Development Experience $\leftrightarrow$ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-26 – DepVar: Q-18 – 6<sup>th</sup> Item)

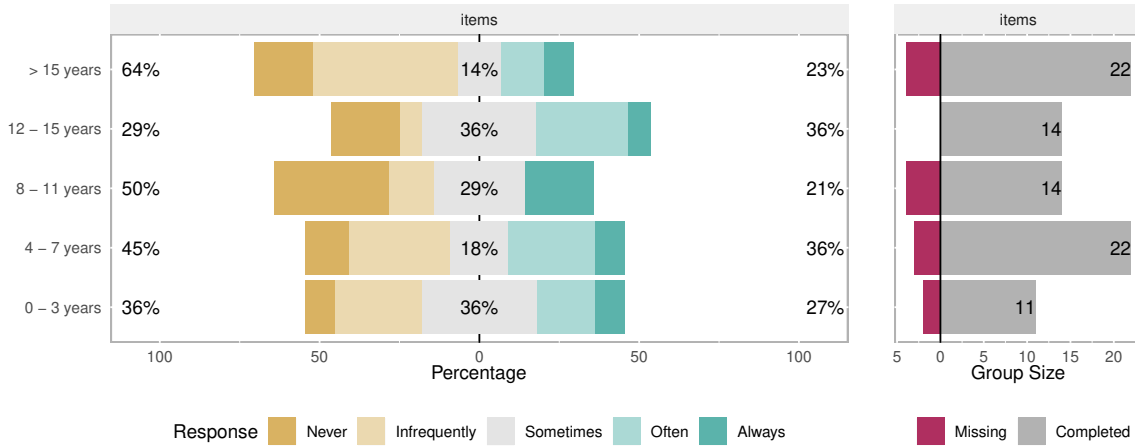


Figure F.8.: Application frequency of dedicated roles and responsibilities ( $\rightarrow$ ) grouped by development experience ( $\uparrow$ ).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 2.252$	$p = 0.690 > 0.10$	$\times$
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years $\leftrightarrow$ 12 – 15 years	$p = 0.266 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.924 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.311 > 0.10$	$p = 1.000 > 0.10$	$\times$
> 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.331 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 8 – 11 years	$p = 0.357 > 0.10$	$p = 0.893 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 4 – 7 years	$p = 0.826 > 0.10$	$p = 1.000 > 0.10$	$\times$
12 – 15 years $\leftrightarrow$ 0 – 3 years	$p = 0.957 > 0.10$	$p = 0.957 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 4 – 7 years	$p = 0.425 > 0.10$	$p = 0.708 > 0.10$	$\times$
8 – 11 years $\leftrightarrow$ 0 – 3 years	$p = 0.418 > 0.10$	$p = 0.836 > 0.10$	$\times$
4 – 7 years $\leftrightarrow$ 0 – 3 years	$p = 0.885 > 0.10$	$p = 1.000 > 0.10$	$\times$
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.108$	$p = 0.333 > 0.10$	$\times$
Kendall's Tau (b)	$\tau = -0.086$	$p = 0.338 > 0.10$	$\times$

Table F.8.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure F.8.

### F.2.3. Scrum Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-27 – DepVar: Q-18 – 6<sup>th</sup> Item)

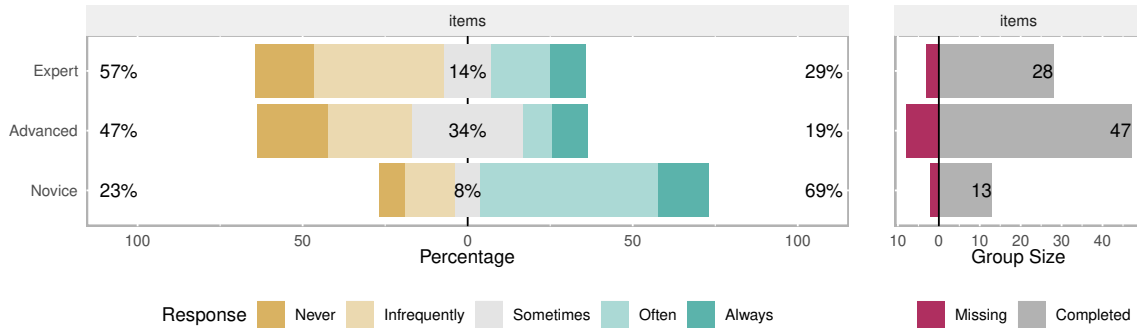


Figure F.9.: Application frequency of dedicated roles and responsibilities (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 5.851$	$p = 0.054 < 0.10$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.990 > 0.10$	$p = 0.990 > 0.10$	✗
Expert ↔ Novice	$p = 0.031 < 0.05$	$p = 0.046 < 0.05$	✓
Advanced ↔ Novice	$p = 0.020 < 0.05$	$p = 0.061 < 0.10$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.176$	$p = 0.101 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.155$	$p = 0.093 < 0.10$	✓

Table F.9.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure F.9.



### F.2.4. Documentation Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-01 – DepVar: Q-19 – 6<sup>th</sup> Item)

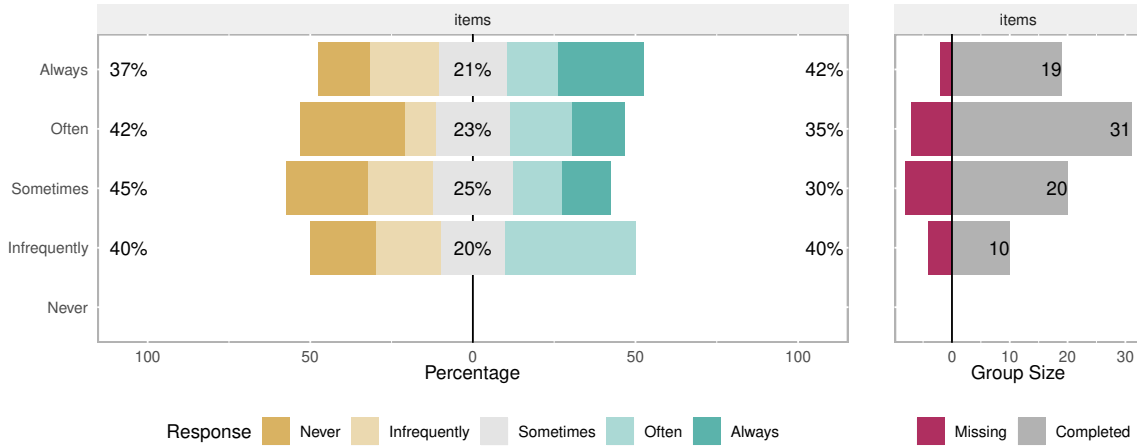


Figure F.10.: Intended application frequency of dedicated roles and responsibilities (→) grouped by documentation experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 1.063$	$p = 0.786 > 0.10$	X
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Always ↔ Often	$p = 0.356 > 0.10$	$p = 1.000 > 0.10$	X
Always ↔ Sometimes	$p = 0.373 > 0.10$	$p = 1.000 > 0.10$	X
Always ↔ Infrequently	$p = 0.546 > 0.10$	$p = 1.000 > 0.10$	X
Often ↔ Sometimes	$p = 0.954 > 0.10$	$p = 0.954 > 0.10$	X
Often ↔ Infrequently	$p = 0.928 > 0.10$	$p = 1.000 > 0.10$	X
Sometimes ↔ Infrequently	$p = 0.898 > 0.10$	$p = 1.000 > 0.10$	X
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = 0.086$	$p = 0.448 > 0.10$	X
Kendall's Tau (b)	$\tau = 0.069$	$p = 0.456 > 0.10$	X

Table F.10.: Results of test for difference and correlation analysis – grouped by documentation experience – cf. Figure F.10.

### F.2.5. Development Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-26 – DepVar: Q-19 – 6<sup>th</sup> Item)

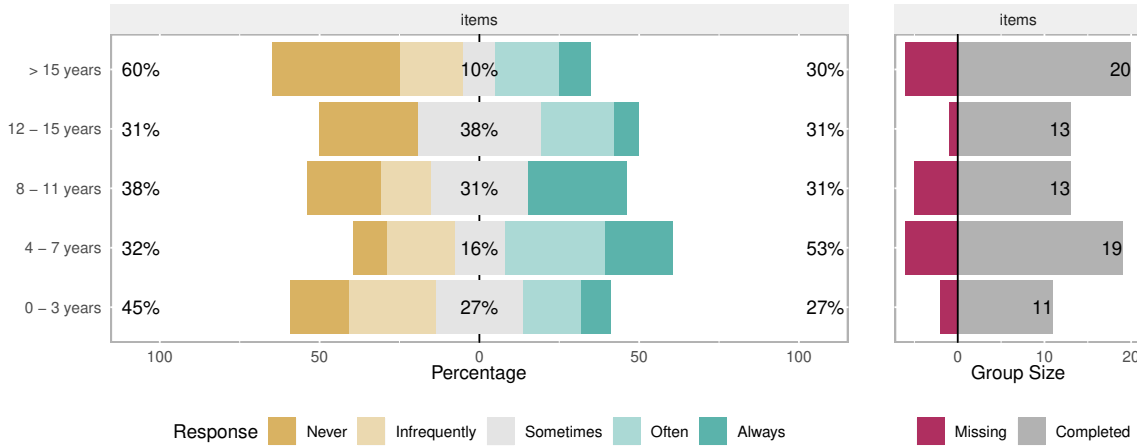


Figure F.11.: Intended application frequency of dedicated roles and responsibilities (→) grouped by development experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 4.369$	$p = 0.358 > 0.10$	✗
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
> 15 years ↔ 12 – 15 years	$p = 0.461 > 0.10$	$p = 0.922 > 0.10$	✗
> 15 years ↔ 8 – 11 years	$p = 0.249 > 0.10$	$p = 1.000 > 0.10$	✗
> 15 years ↔ 4 – 7 years	$p = 0.042 < 0.05$	$p = 0.417 > 0.10$	✗
> 15 years ↔ 0 – 3 years	$p = 0.528 > 0.10$	$p = 0.755 > 0.10$	✗
12 – 15 years ↔ 8 – 11 years	$p = 0.706 > 0.10$	$p = 0.785 > 0.10$	✗
12 – 15 years ↔ 4 – 7 years	$p = 0.279 > 0.10$	$p = 0.697 > 0.10$	✗
12 – 15 years ↔ 0 – 3 years	$p = 0.950 > 0.10$	$p = 0.950 > 0.10$	✗
8 – 11 years ↔ 4 – 7 years	$p = 0.501 > 0.10$	$p = 0.836 > 0.10$	✗
8 – 11 years ↔ 0 – 3 years	$p = 0.672 > 0.10$	$p = 0.839 > 0.10$	✗
4 – 7 years ↔ 0 – 3 years	$p = 0.273 > 0.10$	$p = 0.909 > 0.10$	✗
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.167$	$p = 0.149 > 0.10$	✗
Kendall's Tau (b)	$\tau = -0.129$	$p = 0.164 > 0.10$	✗

Table F.11.: Results of test for difference and correlation analysis – grouped by development experience – cf. Figure F.11.

### F.2.6. Scrum Experience ⇔ Application Frequency of Dedicated Roles and Responsibilities (IndepVar: Q-27 – DepVar: Q-19 – 6<sup>th</sup> Item)

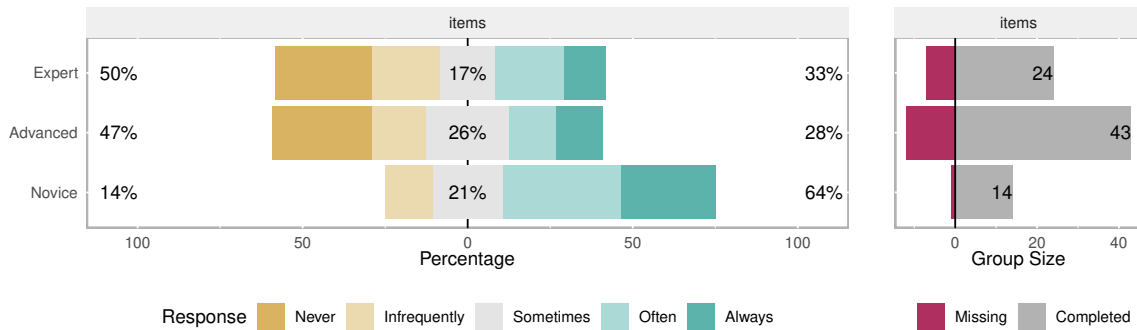


Figure F.12.: Intended application frequency of dedicated roles and responsibilities (→) grouped by Scrum experience (↑).

Kruskal-Wallis – Test for Difference			
Method	Value	Significance	Significant?
Kruskal-Wallis	$\chi^2 = 7.468$	$p = 0.024 < 0.05$	✓
Dunn's Post Hoc Test for Kruskal-Wallis			
Object of Consideration	Significance	Adj. Significance	Significant?
Expert ↔ Advanced	$p = 0.954 > 0.10$	$p = 0.954 > 0.10$	✗
Expert ↔ Novice	$p = 0.018 < 0.05$	$p = 0.027 < 0.05$	✓
Advanced ↔ Novice	$p = 0.009 < 0.05$	$p = 0.026 < 0.05$	✓
Examination of Interrelation			
Method	Value	Significance	Significant?
Spearman's Rank Correlation	$\rho = -0.217$	$p = 0.052 < 0.10$	✓
Kendall's Tau (b)	$\tau = -0.185$	$p = 0.052 < 0.10$	✓

Table F.12.: Results of test for difference and correlation analysis – grouped by Scrum experience – cf. Figure F.12.