

2022

Digitalization in Conformity Assessment in Spain

A QI-FoKuS study

The digital transformation of the economy as well as increasingly networked and complex products and applications are bringing digitalization into the focus of conformity assessment bodies (CABs). Innovations, new technologies and processes rely on corresponding conformity assessment services. This poses new challenges for testing and calibration laboratories, inspection and certification bodies, and other CABs. At the same time, however, new digital technologies and applications also offer new opportunities. This study is the first to comprehensively explore "Digitalization in Conformity Assessment" building on data from an online survey of accredited CABs in Spain.

Major topic areas covered

Digital Maturity Level

- Assessment of the digital maturity of the CABs in Spain based on a tailored digital maturity model

Drivers, Benefits and Barriers

- What motivates CABs to transform digitally, what impact do they experience, and what hurdles must be overcome?

Technology Trends



- Assessment of the digital technologies and applications currently in use (now and in a 5-year perspective)

A Study conducted within the framework of the QI-FoKuS initiative



Basic statistical population for the survey	1315 accredited conformity assessment bodies (CABs) in Spain
Data collection method	Online survey
Survey period	January 21, 2021 February 28, 2022
Sample	106 fully completed questionnaires (= 8% response rate)

Digitalization in Conformity Assessment
Online Survey



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The Sample

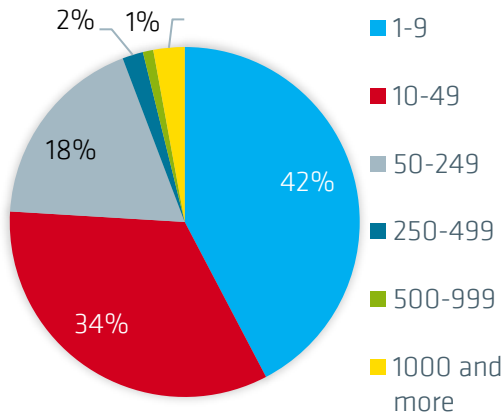
General information about the participating Conformity Assessment Bodies

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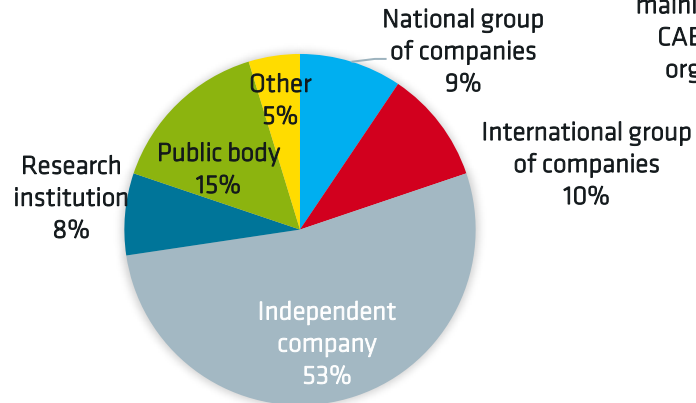
106 conformity assessment bodies (CABs) in Spain participated in the survey

- 76% of participating CABs are **small businesses** with less than 50 employees
- 53% are **independent companies**, 10% belong to an **international group** and 15% are **public bodies**
- For 43%, Conformity Assessment (CA) is the main economic **focus of activity**, 14% are an **internal CAB** of a higher-level organization

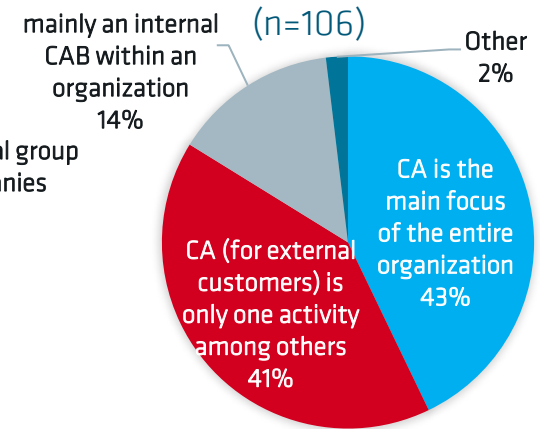
Number of employees (n=106)



Type of organization (n=106)

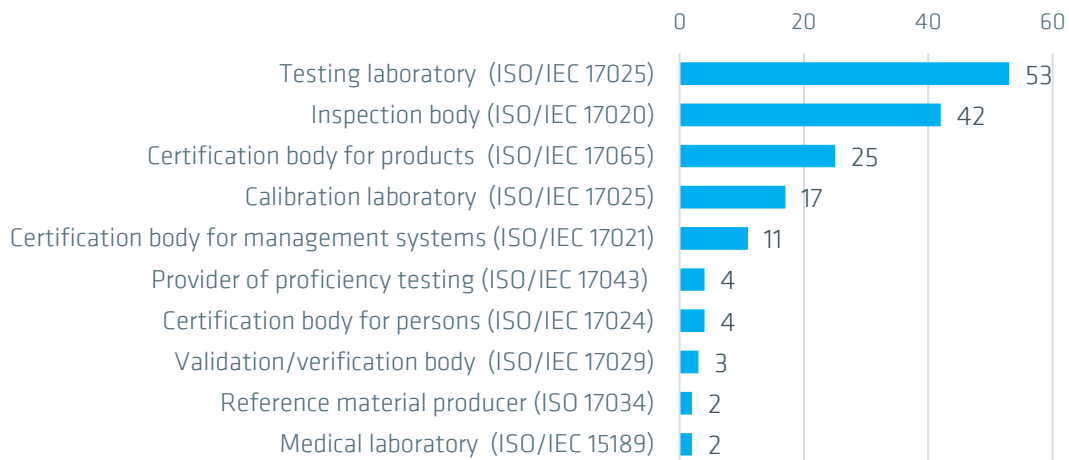


Role of CA for the organization (n=106)

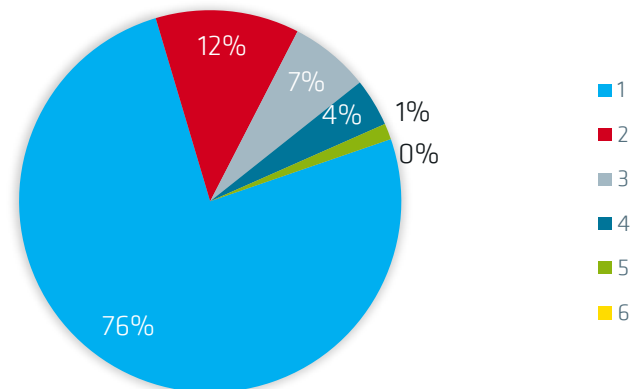


The 106 participating CABs are active in (almost) all fields of conformity assessment

Field of activity



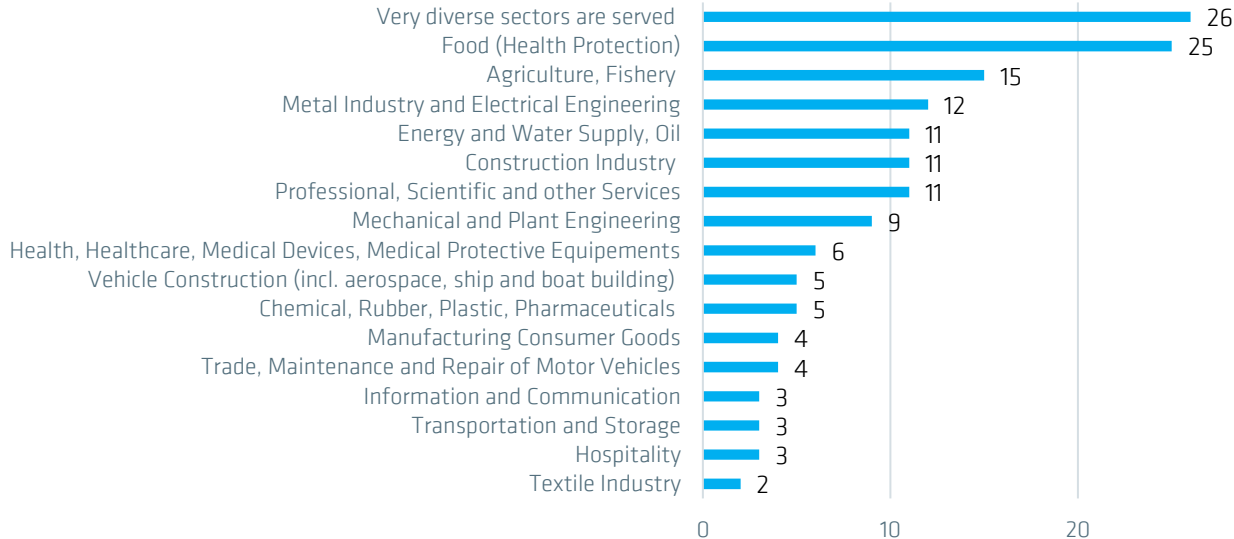
Number of fields of CA activities per CAB



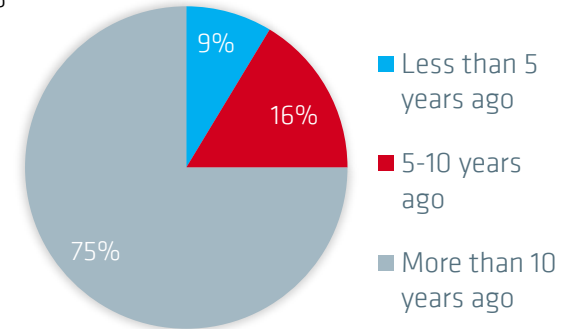
- Testing laboratories represent the **largest group of participants**, followed by inspection bodies and certification bodies for products
- 76% of CABs **specialize** in a single field of activity in conformity assessment; only a few cover a broad range of fields of activity (up to 5)

The CABs serve a wide range of industries // mostly established on the market for a long time

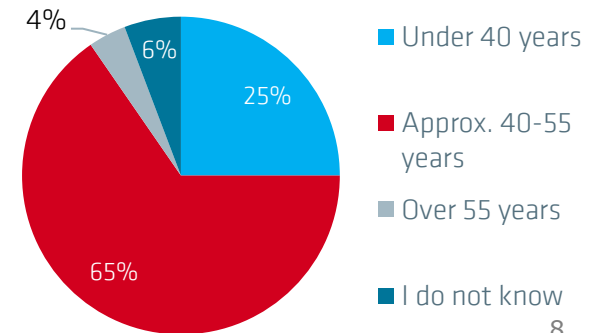
Main sectors served by the CABs



Establishment of the CAB (n=110)



Age of employees (n=104)



- The **main industries** served by the CABs are very diverse, also the food sector is important
- 75% of CABs were **established** more than 10 years ago
- While the **average age of the employees** is between 40 and 55 years in 65% of the CABs, it is below 40 years in 25% of the CABs

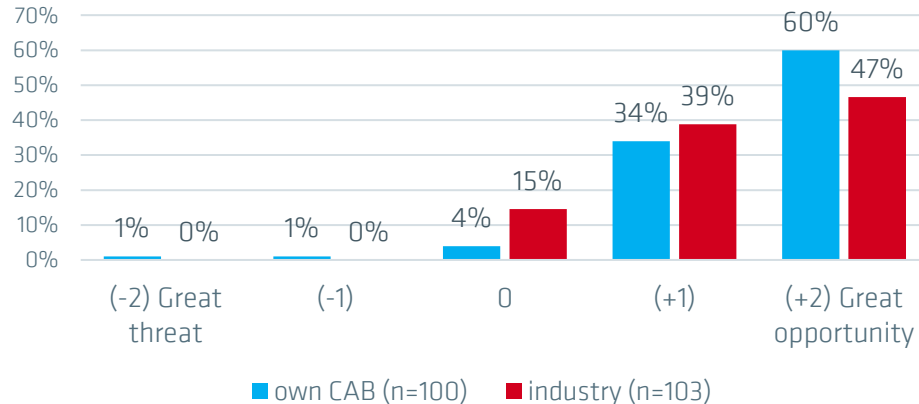
Digitalization in Spanish CABs A General Overview

This section covers how the participating CABs perceive digitalization for their organization (now and in perspective) and how they self-evaluate their current state of digital transformation.

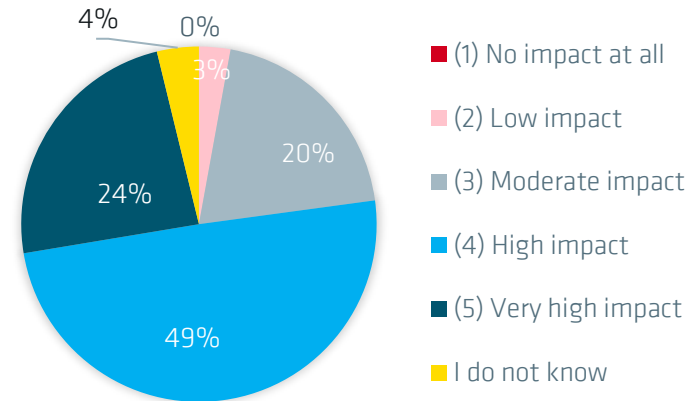
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Digitalization more of an opportunity rather than a threat // Major influence expected

For the CAB itself and the whole industry, digitalization is viewed rather as...



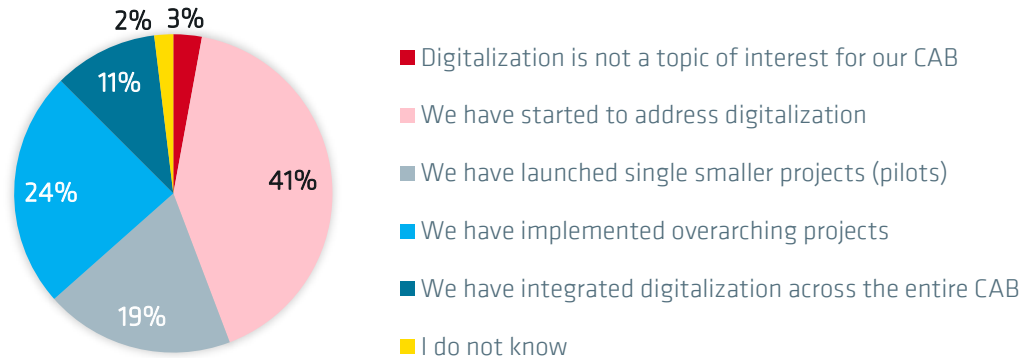
Expected impact of digitalization in the next 5-10 years (n=105)



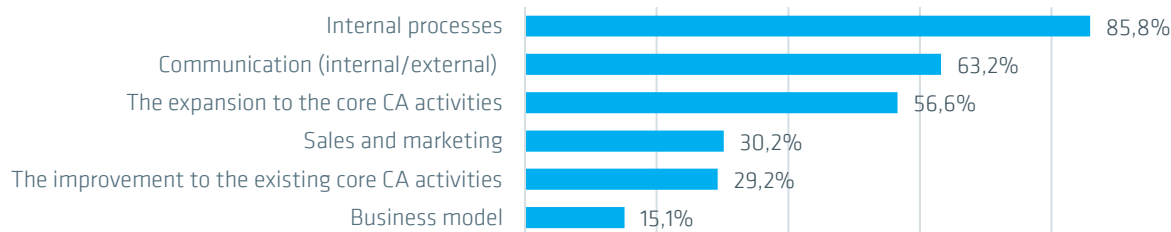
- In general, CABs have a **positive perception** of digitalization: 94% of the surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat for their own organization, and 85% with regard to the whole CA industry
- 69% of the participants expect digitalization to have a **great or even very great impact on CA activities** in the next 5-10 years, however every fifth CAB expects only a moderate impact

State of digitalization varies greatly // Focus mainly on internal processes

Status and extent of digitalization in the CABs (n=104)



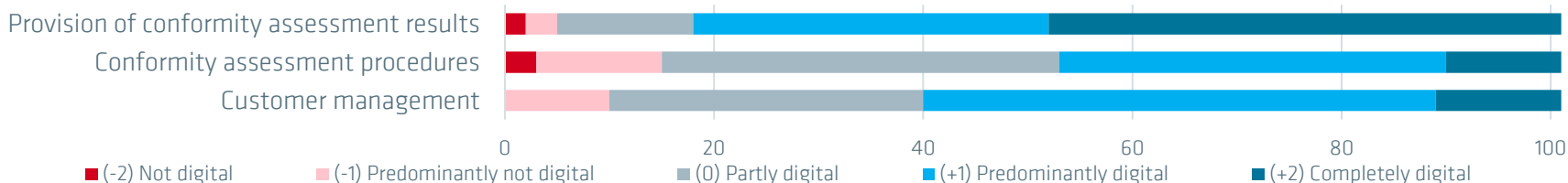
Areas targeted by digitalization (multiple answers possible, n=106)



- **The status of digitalization is quite divers** among the CABs in Spain: While 41% of the CABs have just started to address this topic, 19% have launched single smaller projects and 24% have already implemented overarching projects. 11% state that they have integrated digitalization throughout the whole organization.
- Most **digitalization activities concern internal processes**. Yet communication and expansion to the core CA activities are also relevant areas. However, digitalization is currently rarely used to improve CA services or even less to adopt new business models.

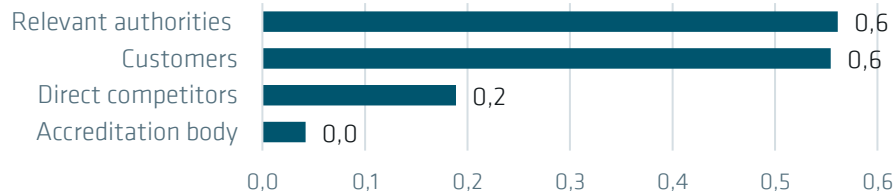
Positive self-assessment on digitalization in core areas - and in comparison with stakeholders

Self-evaluation of the CABs' status of digitalization in different areas (n=102)

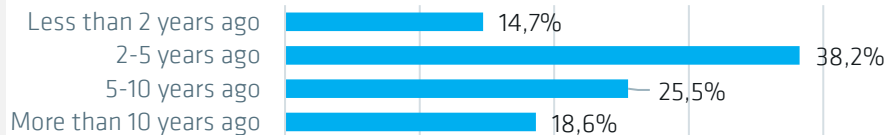


- The CA results are provided predominantly or completely digitally by the majority of CABs. The CA processes themselves are less frequently digitalized.
- Compared to **other organizations** that are direct stakeholders, CABs rate their digital status on average as at least as good or slightly better, especially with regard to the relevant authorities and customers.
- Digitalization has not been a topic for long: every second CAB **has only started to deal with it** during the last 5 years. Only 19% have already done so at least 10 years ago.

Own status of digitalization compare to (n=100)
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=102)

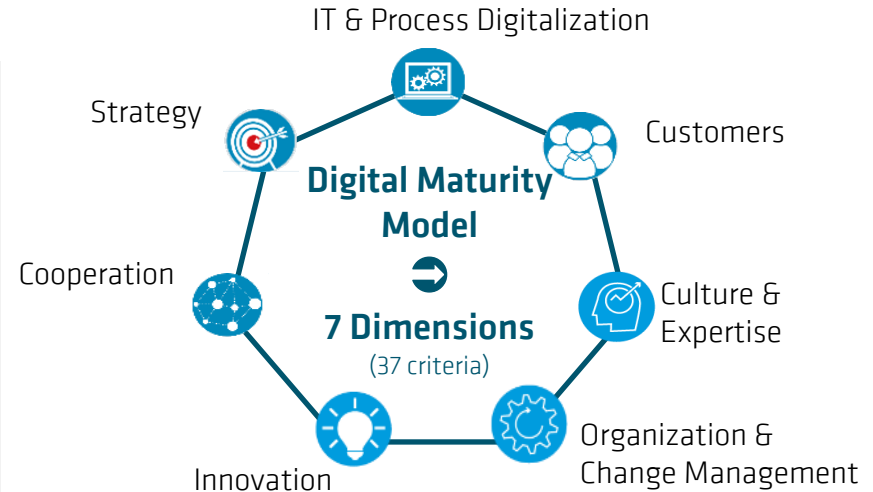


Digital Maturity of CABs

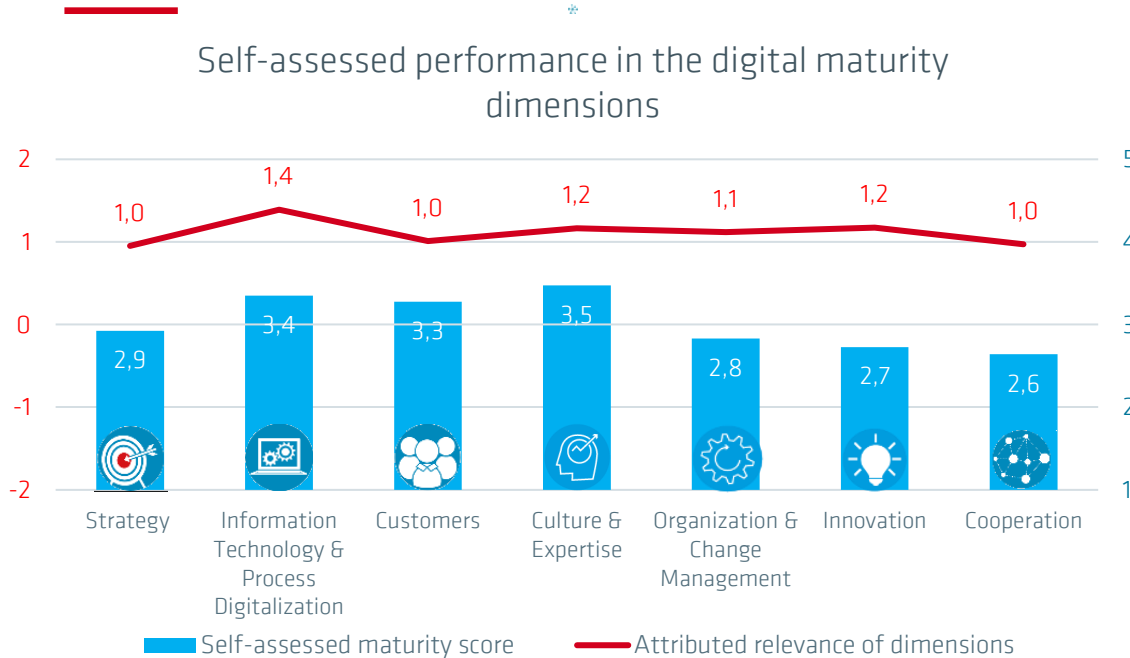
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in Spain based on a model developed specifically for this study.

The digital maturity model for the conformity assessment industry

- The digital maturity level reflects the status of digital transformation of an organization and includes technical as well as organizational and strategic aspects.
- Becoming a digitally mature organization requires efforts, **capabilities** and **resources** across many areas.
- These are mapped in a maturity model using various **dimensions** and **criteria**:
 - Our specially developed model takes into account 7 dimensions that are essential for the digital transformation of CABs: from technological to strategic and organizational to cultural aspects.
 - Each dimension is operationalized by 4 to 6 criteria describing basic success factors in terms of capabilities, capacities, and resources.
- By means of a self-assessment of the participating CABs along these criteria, an individual digital maturity level is calculated - from level 1 ("beginner") to level 5 ("expert").



Maturity very different in the dimensions: Technology advanced, organization not yet



* The CABs were asked to self-evaluate their maturity/performance along statements in 7 topic areas (dimensions) on a scale from 1 (I do not agree at all) to 5 (I fully agree). These statements and dimensions are displayed in detail in the annex.

The participants were then asked to rate the importance of each dimension with regard to a successful digital transformation on a scale from -2 (not important at all) to +2 (very important).

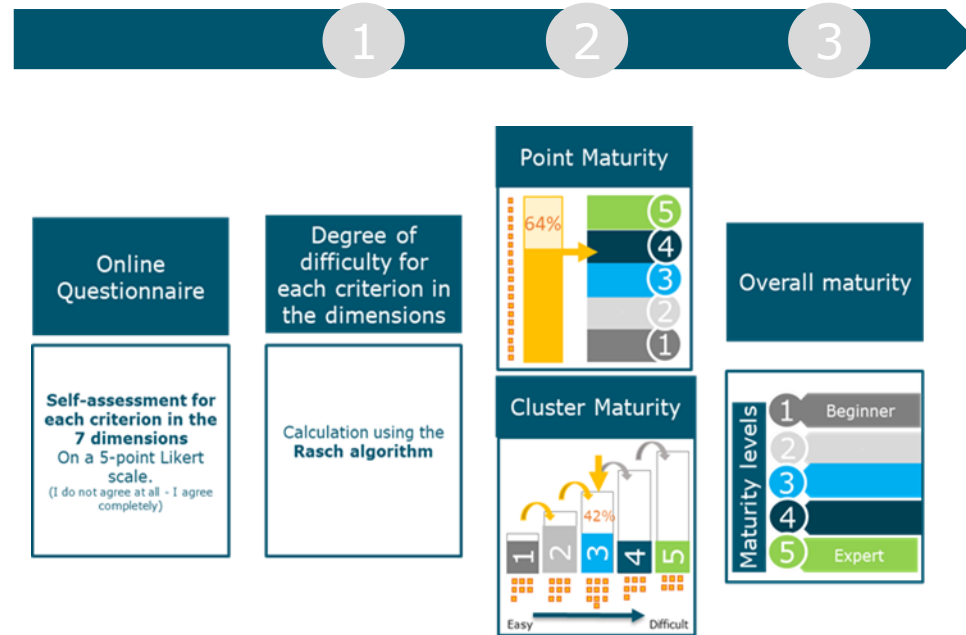
- The results of the maturity model show that the status of the CAB slightly differs in the various dimensions:
 - The CABs consider themselves to be **most advanced** in the area of "Culture and Expertise" and "IT & Process Digitization" followed by "Customers"
 - The **greatest need** to catch up is in the areas of "Organization", "Innovation" and "Cooperation" - although the respondents are actually aware of their high relevance
- This **pattern is typical**: Digital transformation in organizations starts with the introduction of technologies and develops into an implicit holistic organizational transformation

➔ *Details on the composition and partial results in the individual dimensions can be found in the appendix.*

Background information: Calculation of the digital maturity level

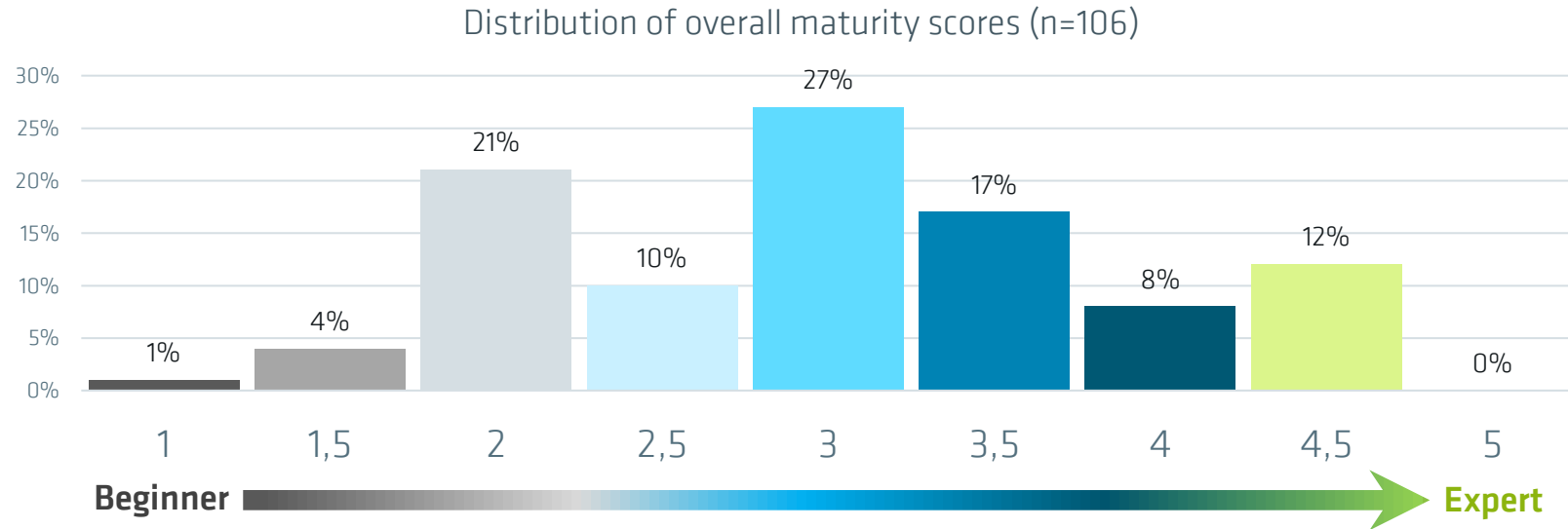
In the questionnaire, participants indicate the extent to which each of the criteria of the 7 dimensions applies to their CAB. In a **multi-stage process**, digital maturity is determined on the basis of these assessments:

1. For each criterion, the Rasch algorithm is first used to calculate how difficult it is to achieve a good result for it (**degree of difficulty**). If, on average, a large number of participants state that they can meet this criterion, it is classified as easy to achieve.
2. Based on this, 2 types of maturity levels are determined: **Cluster analysis** is used to divide the indicators into 5 sequential maturity clusters (1 = easiest indicators; 5 = most difficult). To reach a higher maturity, the thresholds of the lower maturity levels have to be met first. In addition, the **point maturity** is calculated: Here, the points achieved count in comparison to the possible total points.
3. The **overall digital maturity score** is the average of the cluster and point maturity scores.



The calculation is based on the method of the St. Gallen Maturity Model. See Back & Berghaus (2016). Digital Maturity & Transformation Study; Berghaus & Back (2016). Stages in Digital Business Transformation; and Friedel & Back (2012). Determination of enterprise 2.0 development levels with a maturity model.

Overall Digital Maturity Scores of the Spanish CA industry



Statistically, the **digital maturity levels** achieved by the 106 participating CABs in Spain follow a *normal distribution*:

- 27% of the CABs have reached medium level 3, and 37% have already reached a higher level of maturity. However, about the same number of CABs (36%) are still in the earlier stages of transformation (though only 1% is at the absolute beginner level). No CAB has yet reached expert level 5.

The 5 Digital Maturity stages in Spanish CABs

Beginner

1



- ✓ Openness to change



- ✓ Digitalization as a new source of value creation



- ✓ Digitalization has central role in strategy



- ✓ Automated routine processes
- ✓ Investment in digital technologies
- ✓ IT security: awareness and compliance
- ✓ IT department



- ✓ Digitalized customer interactions
- ✓ Digitalized customer care



- ✓ Digital transformation is important
- ✓ Suitable personnel and know-how for digital transformation
- ✓ Risk of failure accepted



- ✓ Digital activities integrated into core processes



- ✓ Work across departments

2

Intermediate

3



- ✓ Evaluation of digital technologies with regard to innovation potential
- ✓ Documented digital strategy



- ✓ Networked processes



- ✓ Analysis of customer data



- ✓ Digital innovations are driven forward systematically and purposefully
- ✓ Competitive advantages generated



- ✓ External experts
- ✓ Collaboration supported

4



- ✓ Clear responsibilities for strategic goals



- ✓ Most important technologies are known



- ✓ Digital solutions based on customer needs



- ✓ Targeted training of our employees



- ✓ Digitalization goals defined and measurable
- ✓ Sufficient resources to drive innovation
- ✓ Quick reaction to change
- ✓ Defined roles, responsibilities & decision-making processes



- ✓ Customers involved in development of digital innovations



- ✓ Collaboration with stakeholders

Expert

5



- ✓ Key indicators for measuring the implementation of the digital strategy
- ✓ Digital Roadmap



- ✓ Early warning system to identify relevant digital technologies and business models

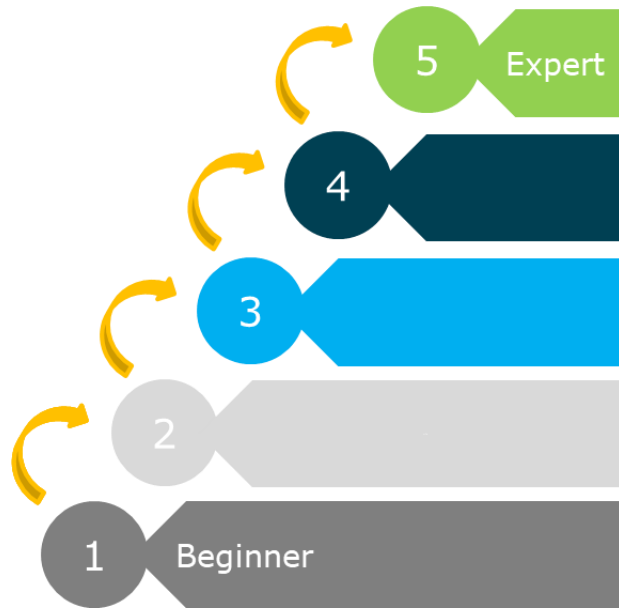


- ✓ Clearly defined innovation process



- ✓ Partner network

The Digital Maturity of CABs in Spain // Summary of the observed patterns



- Even on the **first maturity level**, CABs are open to change. Digitalization is recognized as a source for value creation.
- Organizations at the **second maturity level** give digitalization a central role in their strategy. They further put a strong focus on Culture & Expertise as well as IT and process digitalization. The necessary personnel skills/competences are available and there is cross-functional and cross-departmental collaboration on this topic. In addition, customer care and interactions are more and more digitalized.
- On **stage three**, customer data are increasingly analyzed and collaboration is strengthened, also with external stakeholders. Innovation is shifting into focus, both, on a strategic and systematic level to generate competitive advantages.
- In the **fourth maturity stage**, capabilities, resources, and capacities are activated further in all dimensions. Special emphasis is now given to organizational adaptation i.a. with defined responsibilities, measurable digitalization goals and allocation of sufficient resources.
- CABs in the final **fifth stage** have a digital roadmap and clear innovation process. A partner network for digital transformation is established.

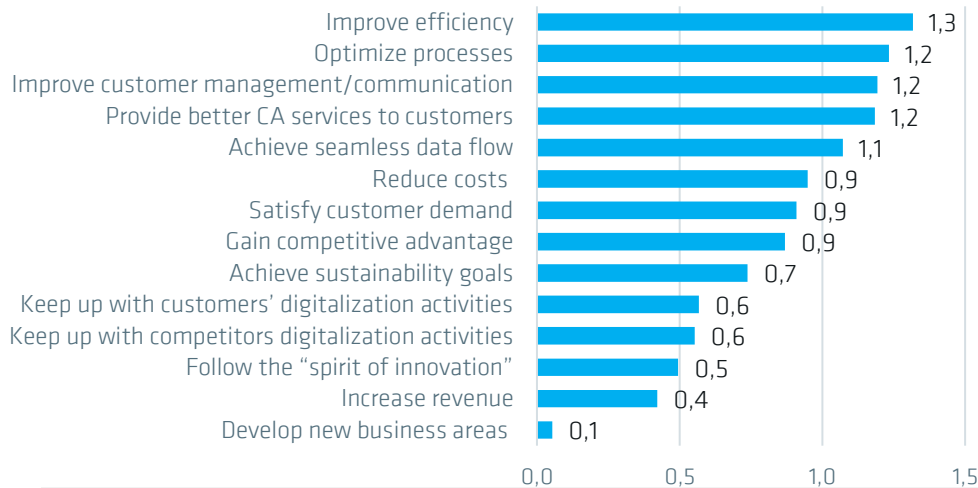
Motives, Impacts, and Hurdles of Digitalization

What is driving digitalization in the CABs? What effects can be achieved for the organizations? Are expectations being met? And what are the biggest hurdles to be overcome in the digital transformation?

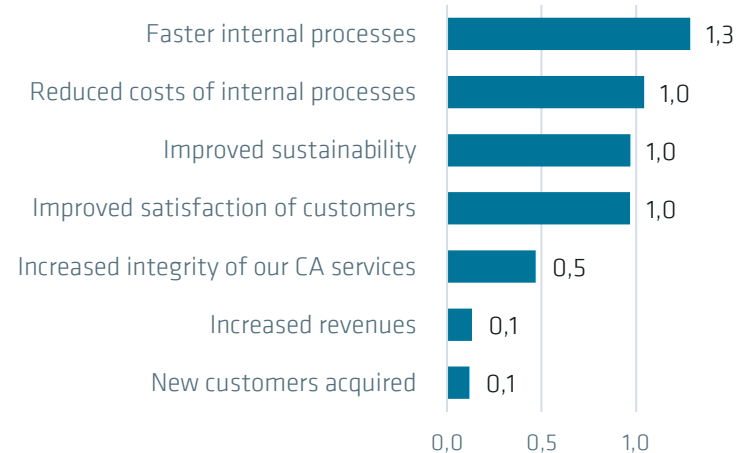
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Focus on process optimization and efficiency enhancement – and customer relations

Goals behind the digitalization efforts (n=100)
(on a scale from (-2) does not apply at all to (+2) fully applies)



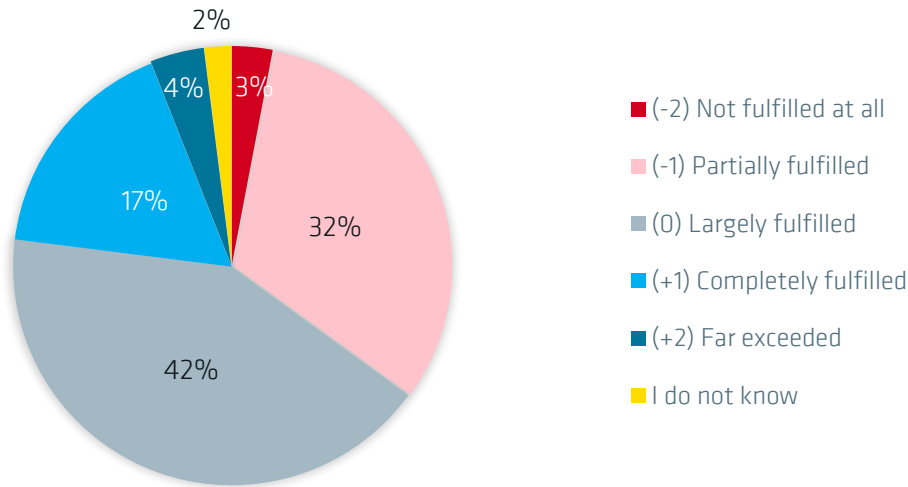
Benefits realized from digitalization (n=102)
(on a scale from (-2) not agree at all to (+2) fully agree)



- Increased efficiency and process optimization are the **main goals** behind the digitization efforts of CABs in Spain. In fact, faster and more cost-effective internal processes are considered as greatest realized benefits.
- Market objectives such as increased revenues or the development of new business areas are no big drivers - and the effects achieved on sales and new customer acquisition are correspondingly low. However, many respondents see the satisfaction of existing customers as well as the CAB's sustainability improved.

CABs' expectations in connection with digitalization are (at least partially) met

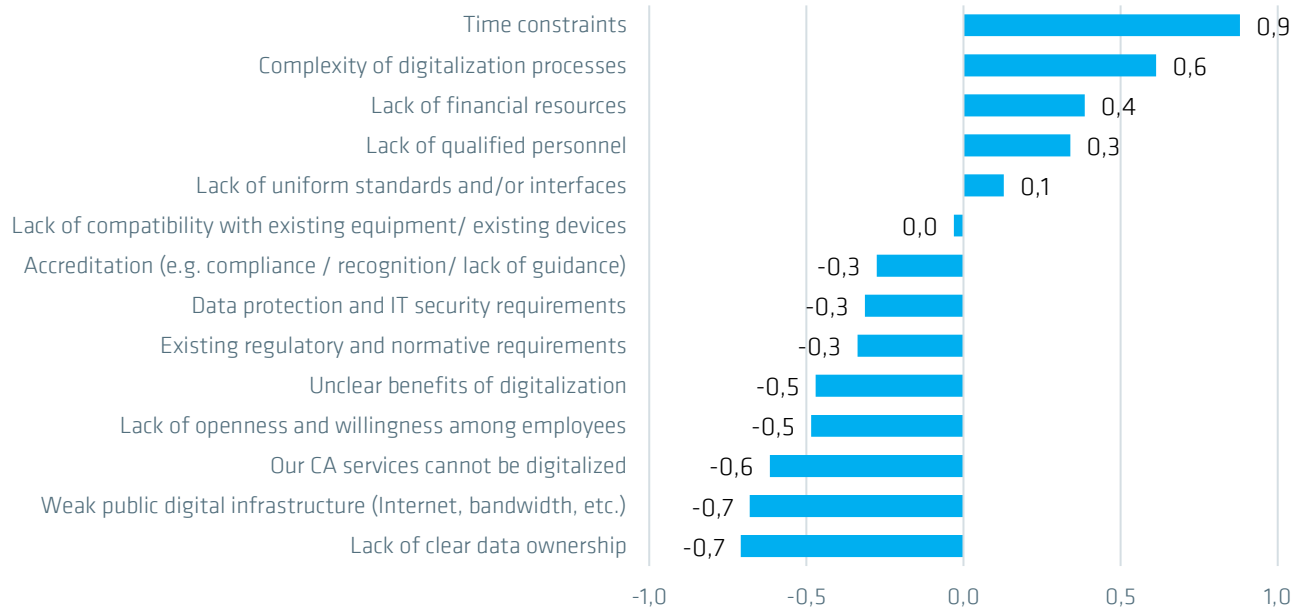
Whether expectations behind the introduction of digital processes/technologies have been fulfilled overall so far (n=100)



- 59% of the CABs consider their expectations behind the introduction of digital technologies to have been largely or completely fulfilled. Another 32% find them at least partially fulfilled.
- Only for 3% of the CABs the expectations are not fulfilled at all. They, however, are confident to still meet the expectations in the medium or long run.

Lack of time and complexity of the topic are the biggest hurdles to digital transformation

Hurdles to digital transformation (n=103)
(Scale from (-2) not at all to (+2) very much)



- Time constraints in managing the digital transformation are the biggest hurdles for CABs, followed by the general complexity of this topic.
- While the lack of financial resources and qualified personnel is an obstacle, a lack of openness/ readiness on the part of employees is not.
- Technical issues such as lack of standards and/or interfaces and lack of compatibility are also an issue for many CABs.

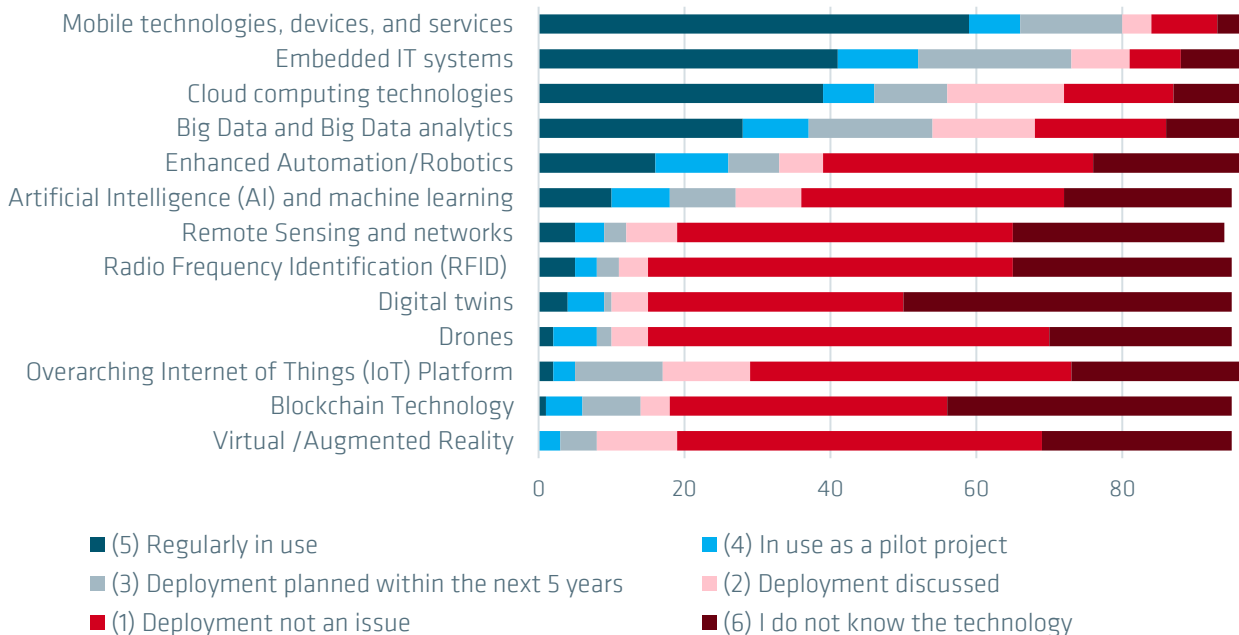
Digital Technologies and Trends

This section highlights the actual (or planned) use of concrete digital technologies and applications in the CABs. In addition, the use of remote procedures and technologies is presented.

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Latest digital technologies are not yet widely used in CABs

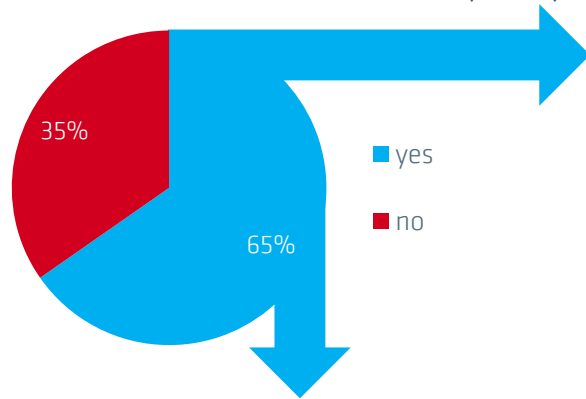
Technologies that are used or planned to be used (n=97)



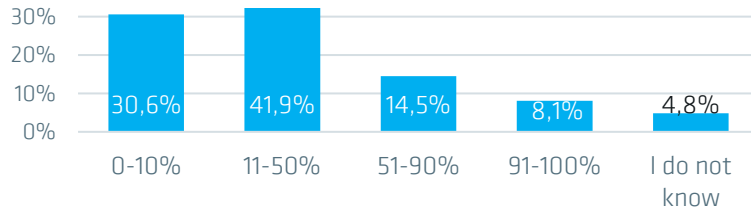
- Everyone is talking about the latest digital technologies such as big data, artificial intelligence, blockchain and virtual reality. However, with the exception of big data analytics, they are not yet in widespread use by CABs in Spain. In some cases, they are not even known (blockchain technologies, for example, mean nothing to 41% of the respondents, digital twins to 46%).
- Among CABs, mobile technologies are the most widely used ones.
- Embedded IT systems and cloud computing technologies are also in use in many CABs.

Remote methods and technologies are used by most CABs

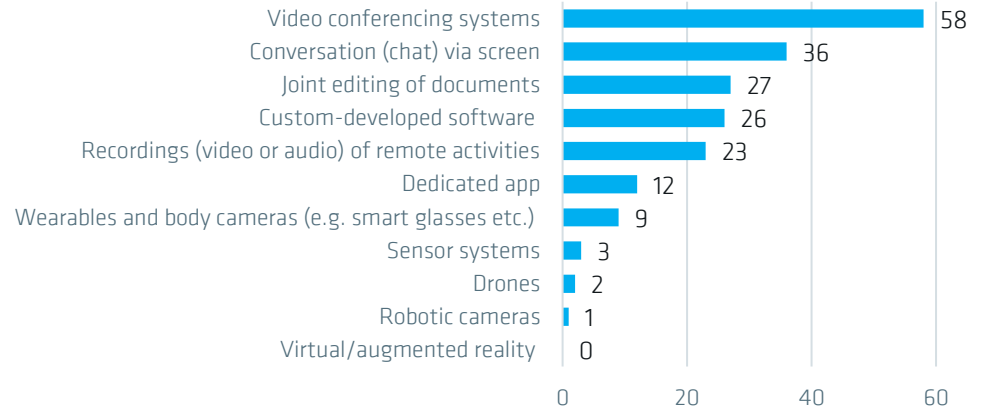
CABs that use remote methods in CA (n=98)



Share of CA services taking place remotely (n=62)



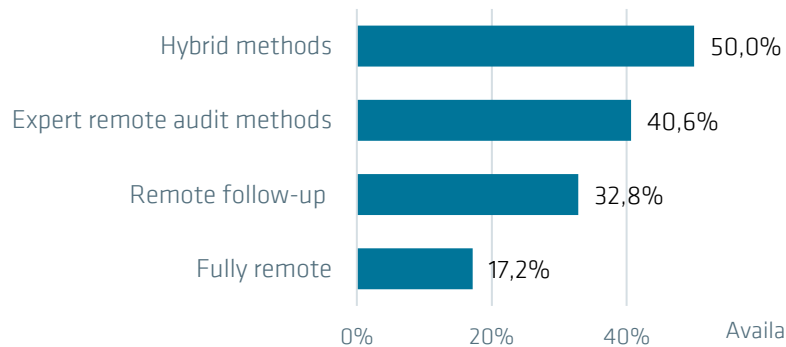
Technologies used for remote procedures (n=64)



- 2 out of 3 CABs use **remote methods** in their CA activities.
- Of these, however, 31% perform max. 10% of their activities remotely. Only a few (8%) have switched completely.
- Video conferencing is the most common used **tool for remote working**, while drones or virtual reality are rarely or not used at all.

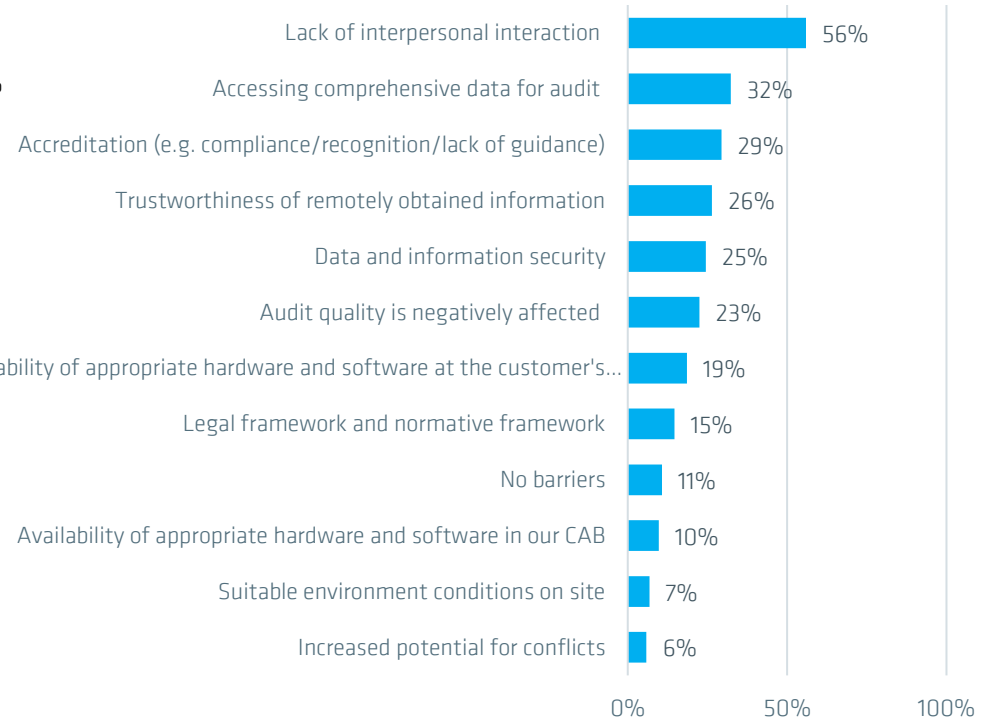
Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=64)



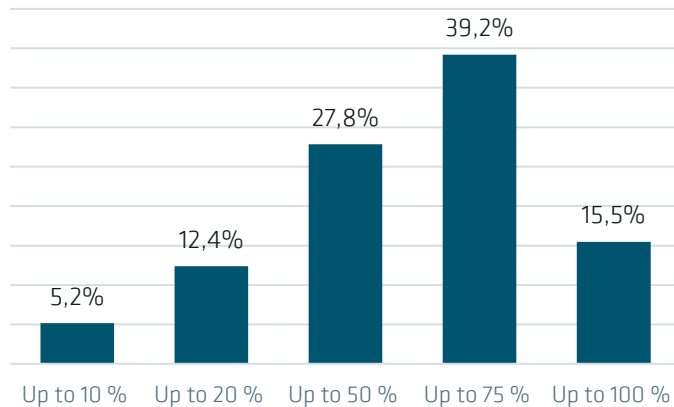
- **Hybrid methods** are the predominant type among remote methods used by CABs.
- Lack of interpersonal interaction is seen as the biggest **hurdle** to using remote procedures, followed by practical issues such as access to comprehensive data for the audit.

Barriers (n=102)

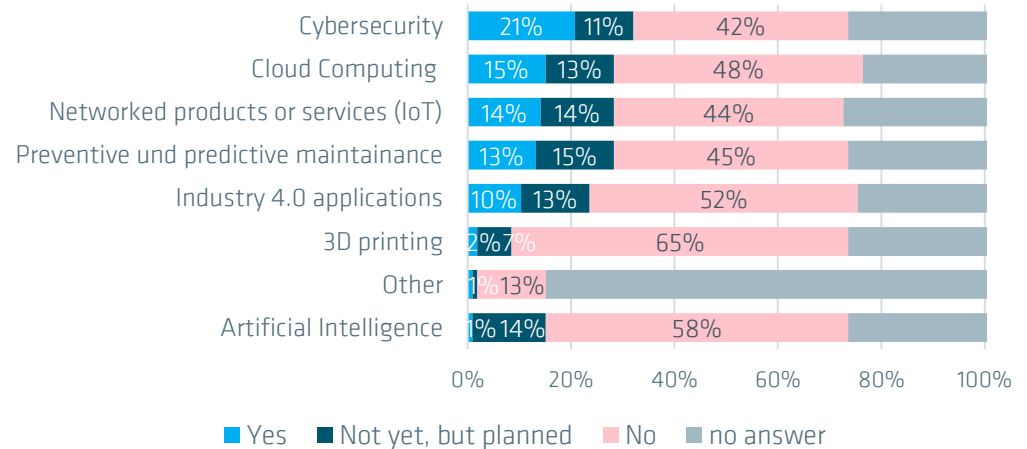


CA for advanced digital technologies is only performed by a minority of CABs so far

Share of routine processes that are digital (n=97)



Digital products and applications for which CA is conducted (n=106)



- 55% of the CABs have digitalized more than half of their **routine processes**. Only 5% of the CABs have not even digitally converted 10% of their processes.
- 36% of the surveyed CABs conduct **conformity assessments for modern digital technologies and applications**. In focus: cybersecurity (21%) and cloud computing (15%).

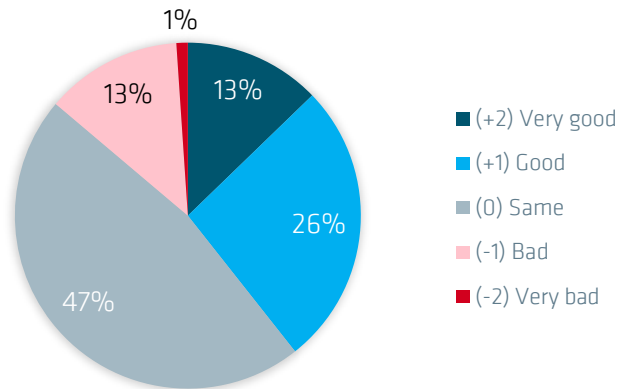
The COVID-19 Pandemic and Digitalization

The COVID-19 pandemic has accelerated digitalization in many organizations. At the same time, previous studies show that digital organizations are more resilient. This section looks at the interaction of pandemic response and digitalization in CABs.

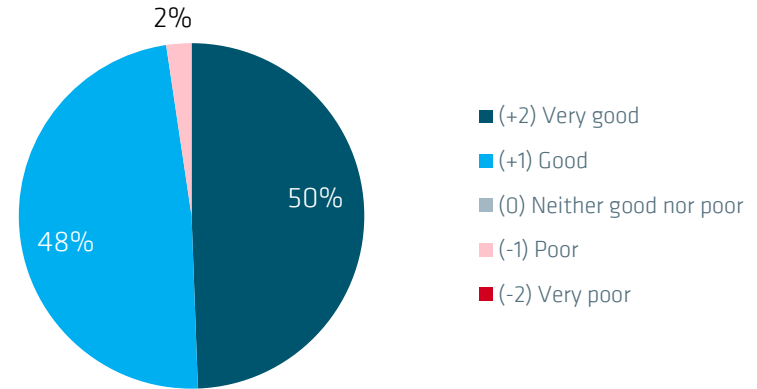
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Most CABs have coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=95)

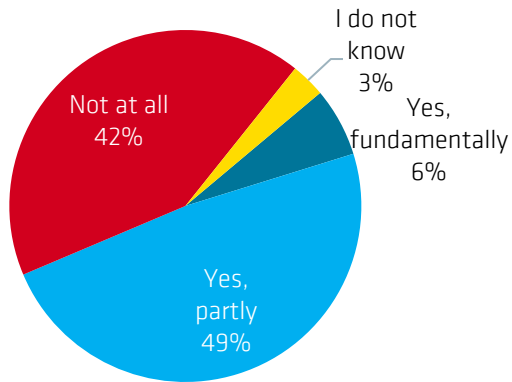


Response to the challenges of the COVID-19 pandemic (n=86)

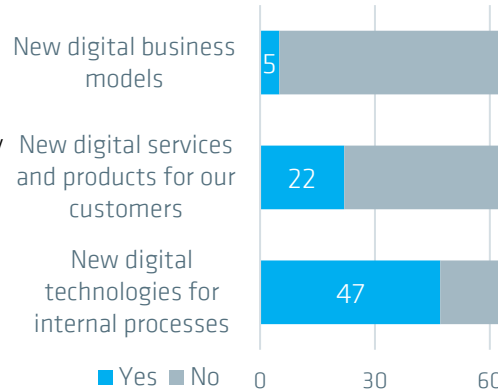


- For 47% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 14% of the CABs stated that their orders have declined, and 39% of CABs have actually seen their order situation improve.
- 98% of the CABs claim to have responded well or very well to the challenges related to the COVID-19 pandemic.

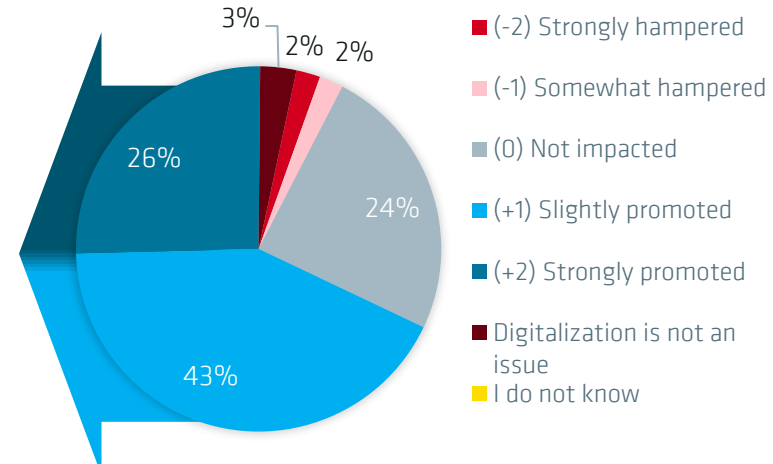
Digital technologies have helped coping with challenges of the COVID-19 (n=95)



Digital adaptation in course of the COVID-19 pandemic (n=64)



Impact of the Covid-19 pandemic on the digitalization of CABs (n=94)



- For 55% of CABs, digital technologies have helped in coping with the challenges of the COVID-19 pandemic.
- Yet, in 4% of CABs the pandemic has hampered digitalization while 69% of CABs report that digital transformation has been slightly or even strongly encouraged and has led to adaptations:
 - 73% of CABs have introduced new digital technologies for internal processes, 34% new digital services and products for their customers, 8% even new digital business models.

- CABs in Spain clearly see digital transformation as an opportunity. The **level of digitalization** varies greatly.
- Even though digital transformation is an individual project for each organization, **typical patterns of digital maturity** in Spanish CABs are nevertheless confirmed: An initial strong technological focus is followed by holistic organizational transformation, including change management and strong innovation networks.
- It is striking that many of the **cutting-edge digital technologies** that are on everyone's lips as buzzwords have not yet found their way into application in CABs. Blockchain, Artificial Intelligence, or Virtual Reality are only used by a few, many are not yet aware of the technologies and their potentials.
- With their digitalization efforts, the CABs are primarily **aiming** at internal process improvements. Routine processes are increasingly being digitalized and there is a switch to - mostly hybrid - remote processes.

Spain in international comparison

How do Spanish conformity assessment bodies compare internationally? We have conducted the survey on digitalization in conformity assessment in around 20 other countries. The individual country reports and a final comparative study will be published step by step on our website. Furthermore articles and an extensive report with further detailed analyses are planned.

➔ www.qi-fokus.de



This study was developed in the context of the QI-Digital initiative. Its goal is to develop solutions for a modern digital quality infrastructure (QI) - together with stakeholders from business, politics, science, and QI.

More information on the initiative and the opportunities for participation can be found at

➔ www.qi-digital.de

The project

Project partners



Supported by



Scientific execution / authors

Dr. Claudia Koch, Dr. Luana Ladu, Parsa Asna Ashari (BAM)

Prof. Dr. Knut Blind (TU Berlin, Fraunhofer ISI)

Prof. Dr. Pavel Castka (University of Canterbury, NZL)

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QI-FoKuS stands for *Qualitätsinfrastruktur - Forschung für Konformitätsbewertung und Sicherheit* ("Quality Infrastructure - Research for Conformity Assessment and Safety").

The initiative was launched jointly by BAM and TU Berlin in 2019 and is supported by the Federal Ministry of Economic Affairs and Climate Action.

We conduct studies on current and fundamental topics of conformity assessment and accreditation. The studies are based on our comprehensive surveys of companies and in particular conformity assessment bodies in Germany and abroad. By publishing the results, we contribute to an improved database, scientifically sound findings and the identification of trends in quality infrastructure.

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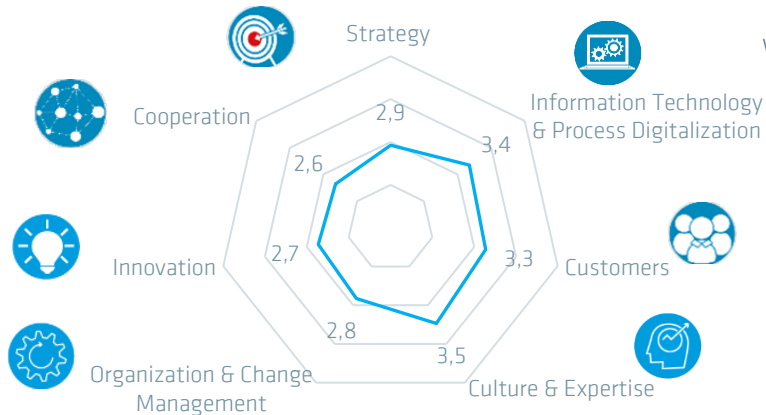
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Annexes

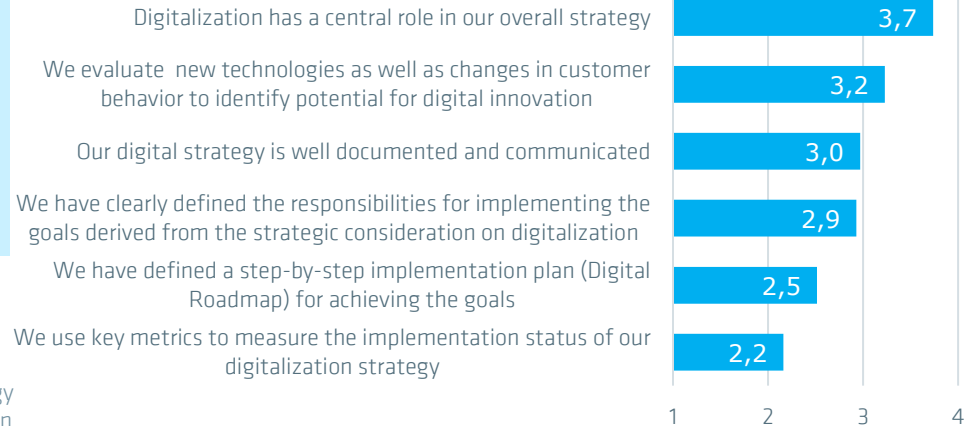
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Dimensions of digital maturity: Detailed overview

Each dimension of the maturity model consists of 4-6 criteria that describe its content. This includes, for example, relevant skills and resources. The survey participants were presented with corresponding statements for agreement on a 5-point scale (from 1 - I do not agree at all - to 5 - I fully agree). These values form the basis for calculating the digital maturity. The average results for the individual criteria in all dimensions are presented in detail below.



Strategy (n=100)



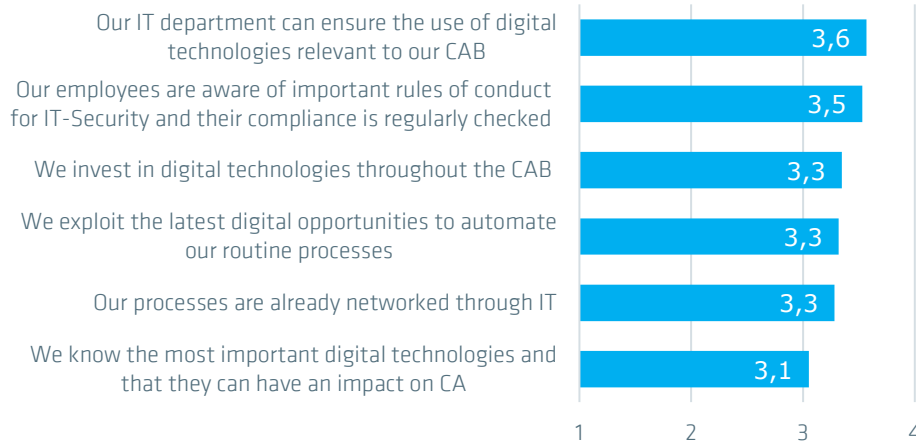
1 (I do not agree at all) to 5 (I fully agree)

- In most CABs (74%), digitalization plays a central role in their overall strategy, with 60% having a well documented digital strategy.
- Only 50% have set up a Digital Roadmap and 44% use key metrics to measure the implementation status of their digitalization strategy.

Dimensions of digital maturity: Detailed overview



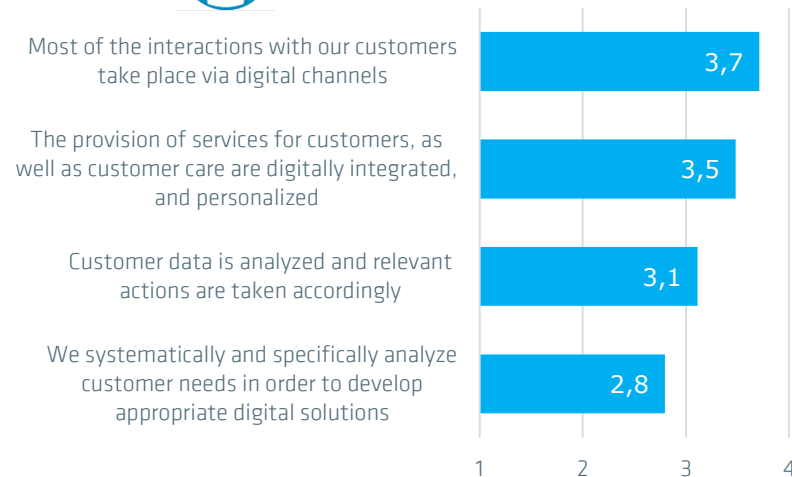
Information Technology & Process Digitalization (n=100)



- At least 66% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations.
- More than 66% of CABs have networked their processes and automated routine procedures.



Customers (n=100)

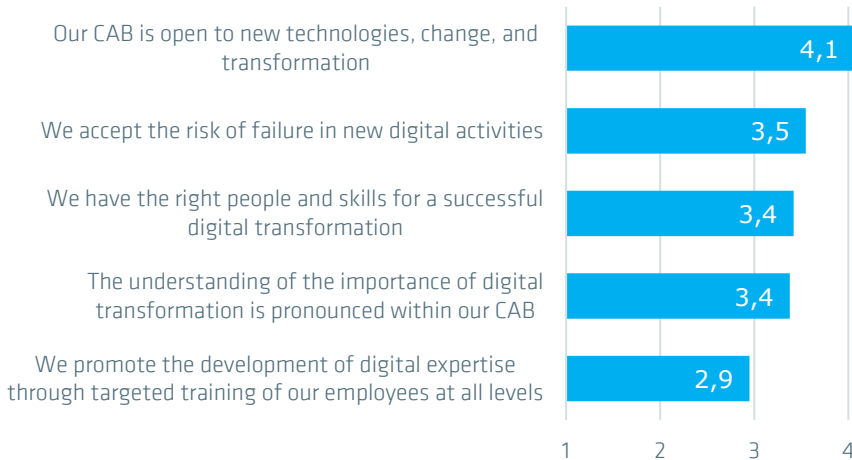


- 74% of CABs in Spain interact with their customers via digital channels.
- 70% offer digitally integrated services to customers and only 56% of them develop appropriate digital solutions based on customer needs.

Dimensions of digital maturity: Detailed overview



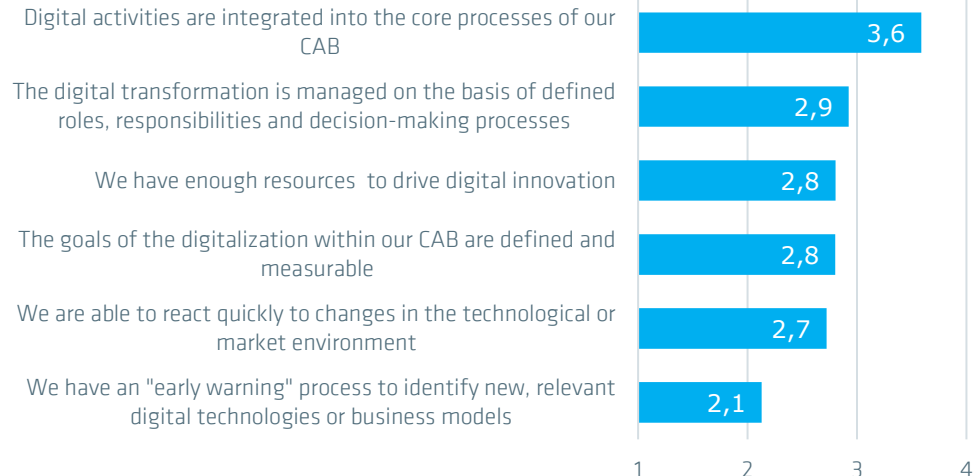
Culture & Expertise (n=99)



- Spanish CABs are definitely open to new technologies, changes and transformations (82%).
- 68% of them have a strong understanding of the importance of digital transformation and have the right skills to successfully implement the change.



Organization & Change Management (n=97)

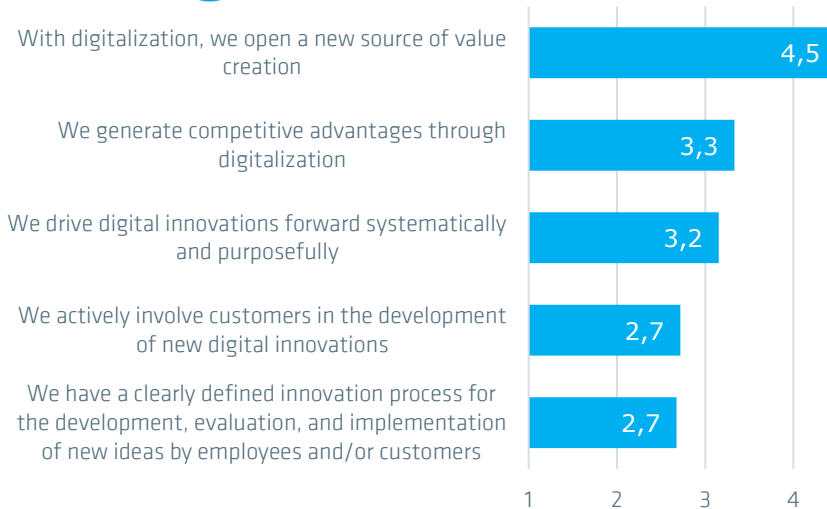


- 72% of CABs have integrated digital activities into their core processes. The clear definition of responsibilities and strategic goals is key to the implementation of digital transformation.

Dimensions of digital maturity: Detailed overview



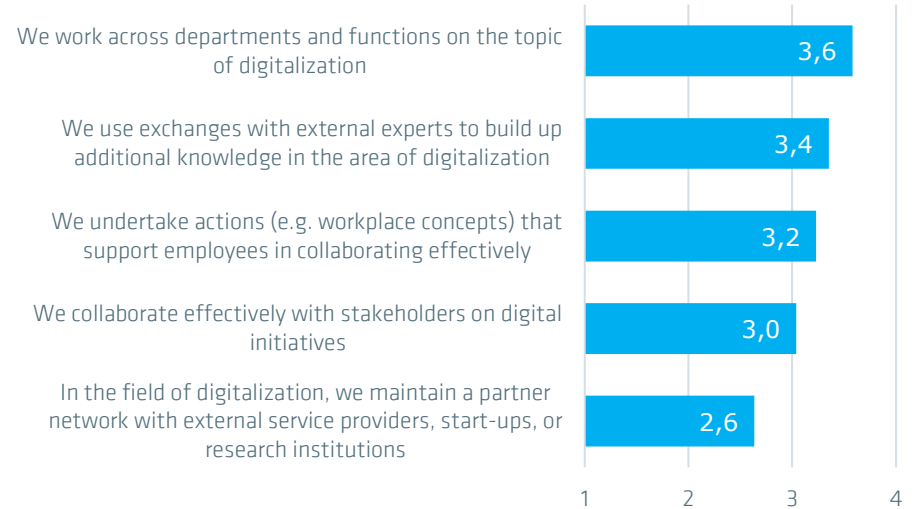
Innovation (n=99)



- For the majority of participants (90%), digitalization represents a new source of value creation.
- However, customers are hardly involved in the innovation process.










Cooperation (n=98)



- The majority of CABs work across departments and functions on the topic of digitalization and obtain additional knowledge by consulting external experts.
- Collaboration with specific stakeholders of the CAB is less intensive. 52% maintain a partner network with external parties.

Digital Maturity Model








Level 1 (Beginner)

Description Level 1: Beginner	Dimensions						
							
Our CAB is open to new technologies, change and transformation							
With digitalization, we open a new source of value creation							










Digital Maturity Model

Level 2

Description Level 2	Dimensions						
							
Digitalization has a central role in our overall strategy							
We exploit the latest digital opportunities to automate our routine processes							
We invest in digital technologies throughout the CAB							
Our employees are aware of important rules of conduct for IT Security and their compliance is regularly checked							
Our IT department can ensure the use of digital technologies relevant to our CAB							
Most of the interactions with our customers (e.g., advise, purchase conclusion and customer service) take place via digital channels							
The provision of services for customers, as well as customer care are digitally integrated, and personalized							
The understanding of the importance of digital transformation is pronounced within our CAB							
We have the right people and skills for a successful digital transformation							
We accept the risk of failure in new digital activities							
Digital activities are integrated into the core processes of our CAB							
We work across departments and functions on the topic of digitalization							

Digital Maturity Model

Level 3

Description Level 3	Dimensions						
							
We evaluate new technologies as well as changes in customer behavior to identify potential for digital innovation	■						
Our digital strategy is well documented and communicated	■						
Our processes are already networked through IT		■					
Customer data is analyzed, and relevant actions are taken accordingly			■				
We drive digital innovations forward systematically and purposefully						■	
We generate competitive advantages through digitalization						■	
We use exchanges with external experts to build up additional knowledge in the area of digitalization							■
We undertake actions (e.g. workplace concepts) that support employees in collaborating effectively							■


Digital Maturity Model

Level 4

Description Level 4	Dimensions						
							
We have clearly defined the responsibilities for implementing the goals derived from the strategic consideration on digitalization	■						
We know the most important digital technologies and that they can have an impact on CA		■					
We systematically and specifically analyze customer needs in order to develop appropriate digital solutions			■				
We promote the development of digital expertise through targeted training of our employees at all levels				■			
The goals of the digitalization within our CAB are defined and measurable					■		
We have enough resources to drive digital innovation					■		
We are able to react quickly to changes in the technological or market environment					■		
The digital transformation is managed on the basis of defined roles, responsibilities and decision-making processes					■		
We actively involve customers in the development of new digital innovations						■	
We collaborate effectively with stakeholders on digital initiatives							■

Digital Maturity Model

Level 5 (Experts)

Description Level 5: Expert	Dimensions						
							
We use key metrics to measure the implementation status of our digitalization strategy	■						
We have defined a step-by-step implementation plan (Digital Roadmap) for achieving the goals	■						
We have an "early warning" process to identify new, relevant digital technologies or business models for us					■		
We have a clearly defined innovation process for the development, evaluation, and implementation of new ideas by employees and/or customers						■	
In the field of digitalization, we maintain a partner network with external service providers, start-ups, or research institutions							■