



QI-FoKuS
Research on Conformity
Assessment and Safety



Sicherheit in Technik und Chemie

2022

Digitalization in Conformity Assessment in Brazil

A QI-FoKuS study

www.bam.de

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



Basic statistical population for the survey	2976 accredited conformity assessment bodies (CABs) in Brazil
Data collection method	Online survey
Survey period	February 15, 2022 March 11, 2022
Sample	226 fully completed questionnaires (8% response rate)

**Digitalization in
Conformity Assessment**
Online Survey

QI-FoKuS
Research on Conformity
Assessment and Safety



Supported by



The Study - An Overview

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 Brazil.

Major topic areas covered:

Digital Maturity Level

- Assessment of the digital maturity of the CABs in Brazil 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)

Table of Contents

Page	Chapter
<u>5</u>	<u>The Sample</u>
<u>9</u>	<u>Digitalization in Brazilian CABs: A General Overview</u>
<u>13</u>	<u>Digital Maturity of CABs</u>
<u>20</u>	<u>Motives, Impacts, Hurdles of Digitalization</u>
<u>24</u>	<u>Technologies and Trends</u>
<u>29</u>	<u>Digitalization and the COVID-19 Pandemic</u>
<u>33</u>	<u>The Project and Contacts</u>
<u>35</u>	<u>Annexes</u>

The Sample

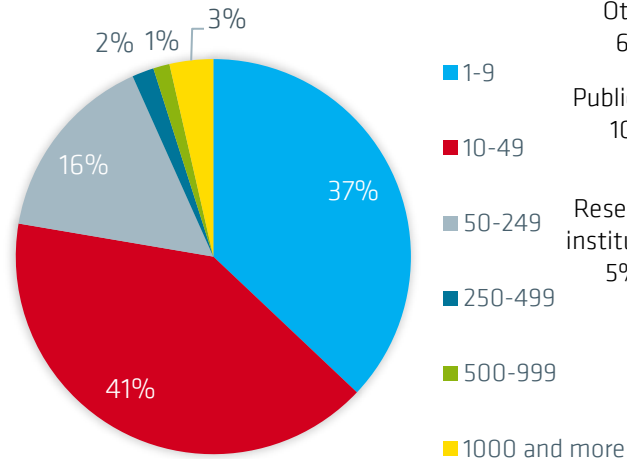
General information about the participating Conformity Assessment Bodies

www.bam.de

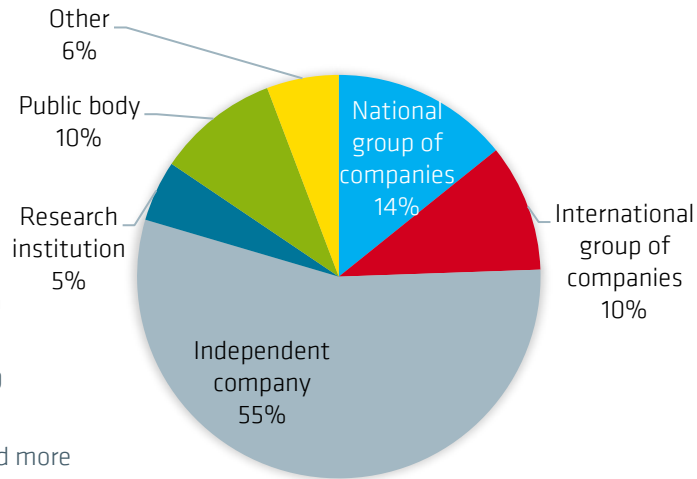
226 conformity assessment bodies (CABs) in Brazil participated in the survey

- 78% of participating CABs are **small businesses** with less than 50 employees.
- 55% are **independent companies**, 14% belong to a **national group**, 10% are **public bodies**.
- for 33% CA is the main **focus of activity** and for 40% it is **one activity among others**.

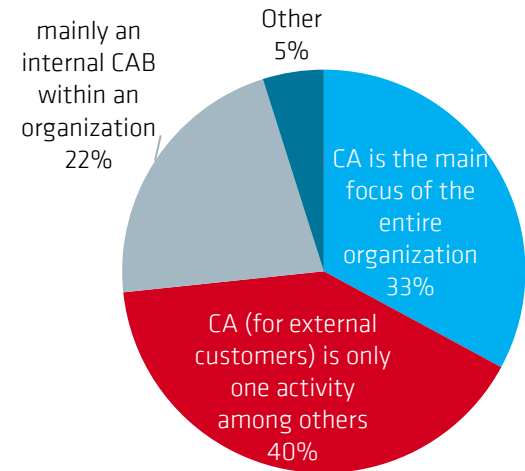
Number of employees (n=225)



Type of organization (n=225)

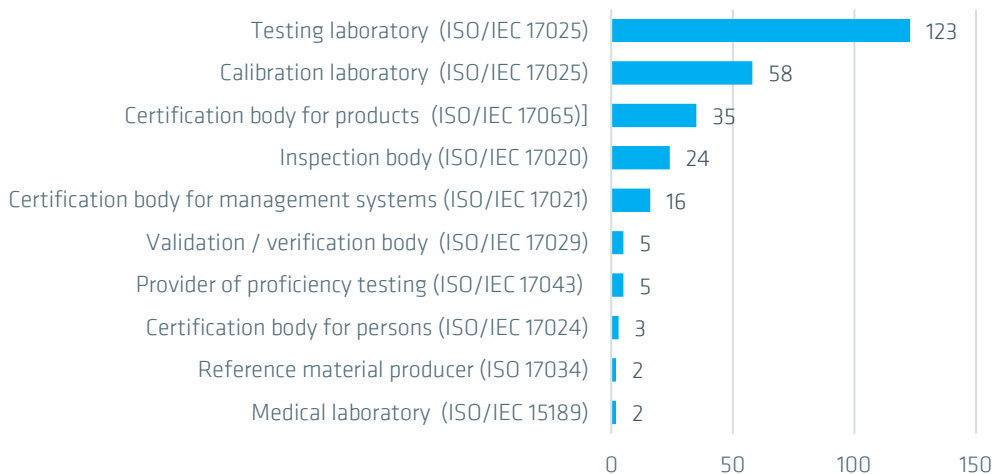


Role of CA for the organization (n=225)

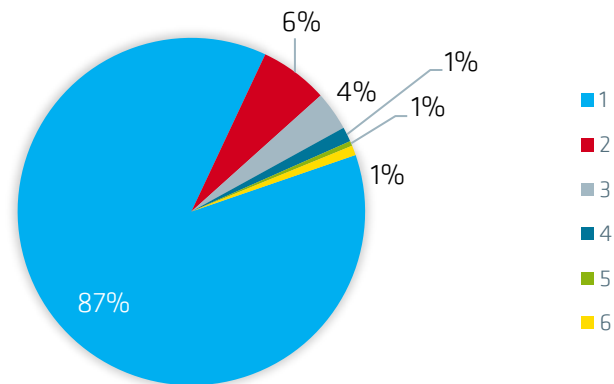


The 226 participating CABs cover a broad range of activities

Field of activity



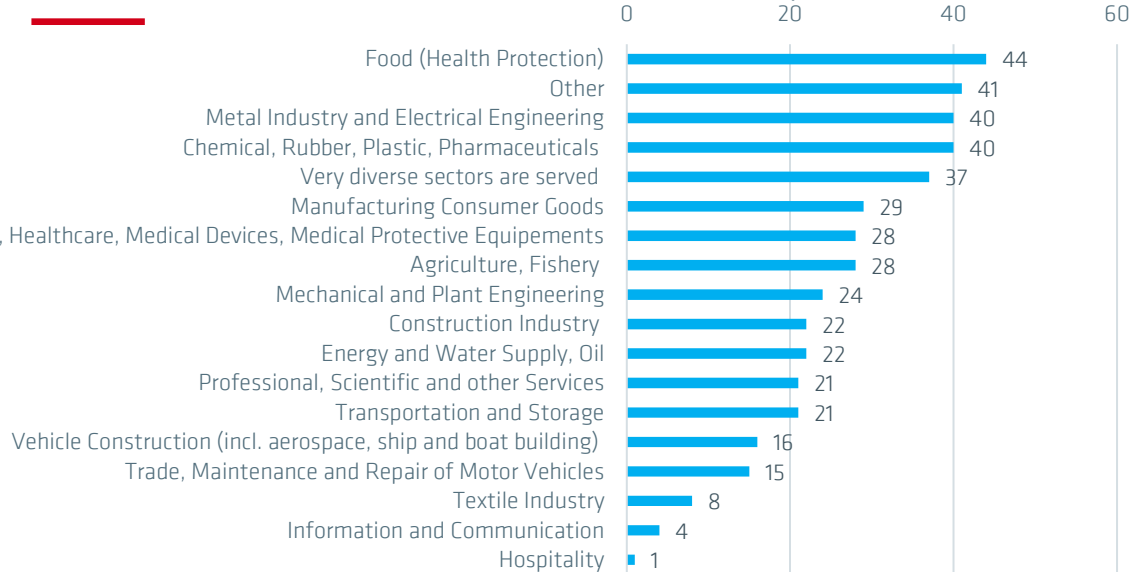
Number of fields of CA activities per CAB



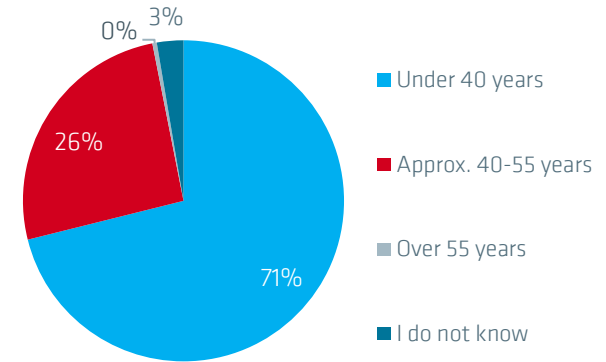
- Testing laboratories represent the **largest group of participants**, followed by calibration laboratories and certification bodies.
- 87% of CABs are **specialized** in a single field of conformity assessment activity; only a few cover a broad range of activities (up to 6).

The CABs serve a broad spectrum of sectors

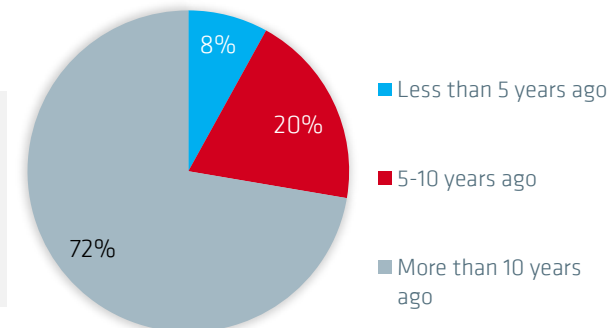
Main sectors served by CABs



Average age of employees (n=225)



Establishment of the CAB (n=226)



- The **main industries** served by the CABs are from the food sector, but also the metal and chemical industries are important.
- While the **average age of the employees** is 40-55 years in 26% of the CABs, 71% have staff under 40 years on average.
- 72% of the CABs were **established** more than 10 years ago; only 8% are younger than 5 years.

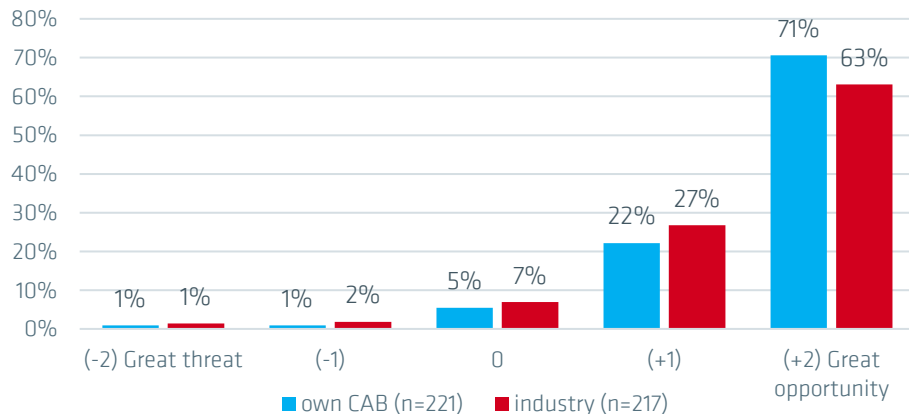
Digitalization in Brazilian CABs A General Overview

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

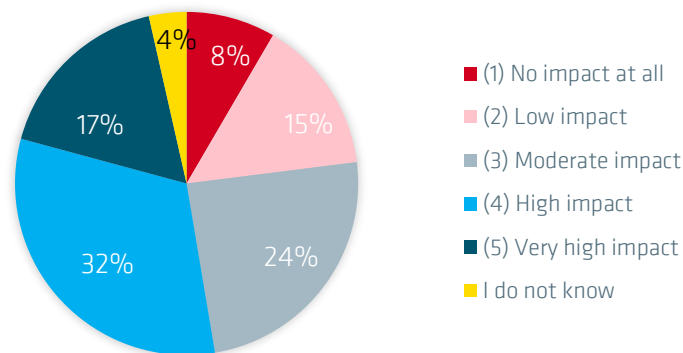
www.bam.de

Digitalization is perceived as an opportunity by most CABs, with high impact in the future

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



Expected impact of digitalization in the next 5-10 years (n=226)



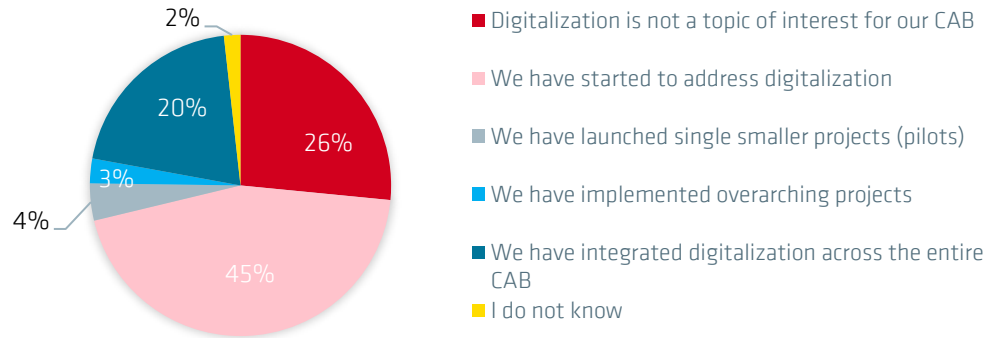
- In general, the CABs have a **positive perception** of digitalization: more than 90% of surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat, both, for the own organization and for the whole CA industry.
- 49% of the participants expect a **high or even very high impact of digitalization on CA activities** in the next 5-10 years.

Diverse status of digitalization across the CABs//

Focus mainly on internal processes

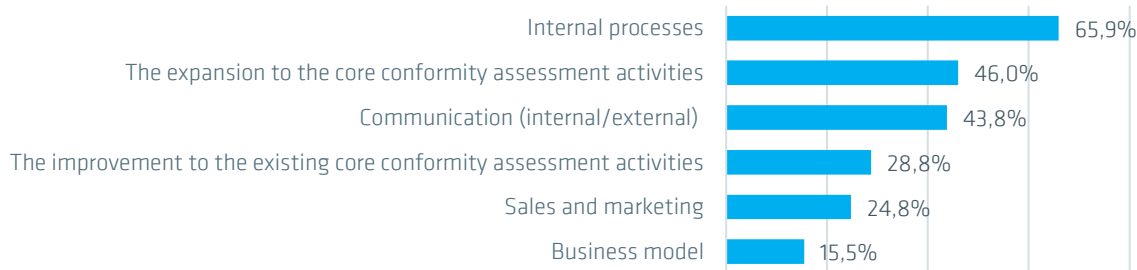


Status and extent of digitalization in the CABs (n=226)



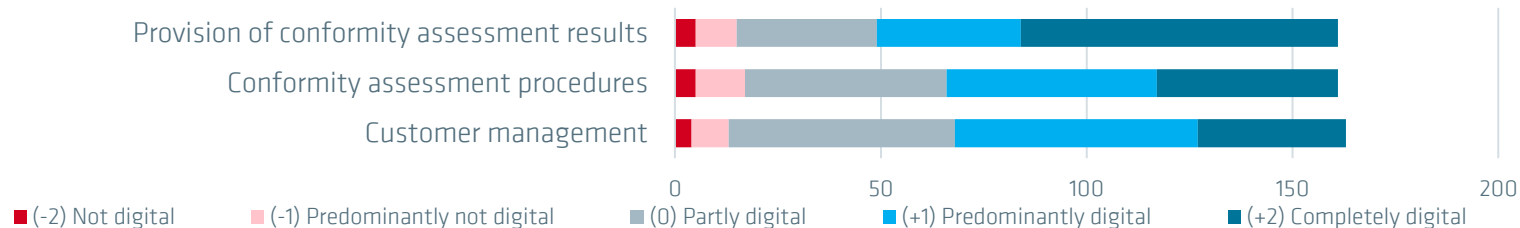
- **The status of digitalization is quite diverse** across the CABs in Brazil: While 45% of the CABs has just started to address this topic, 4% have launched single smaller projects and 2% have already implemented overarching projects. 20% state to have integrated digitalization across the whole organization.
- Although most of the **digitalization activities concern internal processes**, digitalization is currently used by 46% of the CABs to expand the provision of CA services. However, it is used rarely to adopt new business models.

Areas targeted by digitalization (multiple answers possible)



Many areas are not yet or only partly digital; CABs BAM yet rate themselves more digital than their stakeholders

Self-evaluation of the CABs' status of digitalization in different areas (n=164)

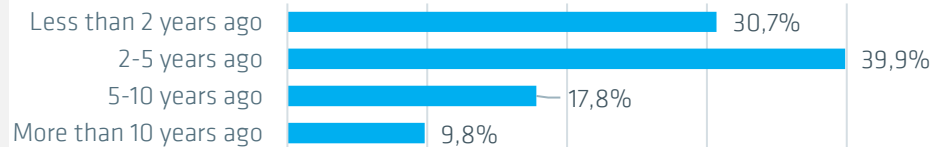


- By now, about 40% of the CABs are not or only partly **digitalized in major areas** such as CA procedures or customer management. Even CA results are not yet provided completely digitally by many CABs.
- However, when **comparing themselves to other organizations**, CABs perceive their digital status as at least as good or better, especially when compared to customers and relevant authorities.
- 71% of the CABs **have started to deal with digitalization** recently (during the last 5 years). Only 10% have done so at least 10 years ago.

Own status of digitalization compared to... (n=225)
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=163)

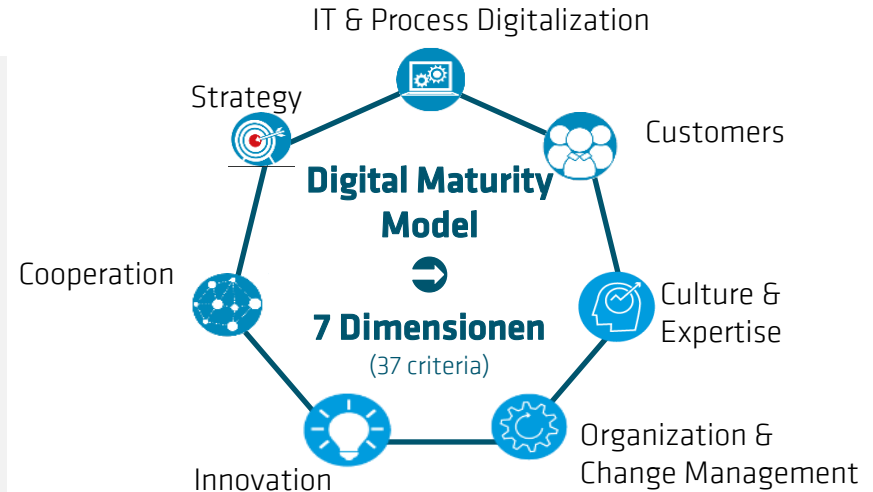


Digital Maturity of CABs

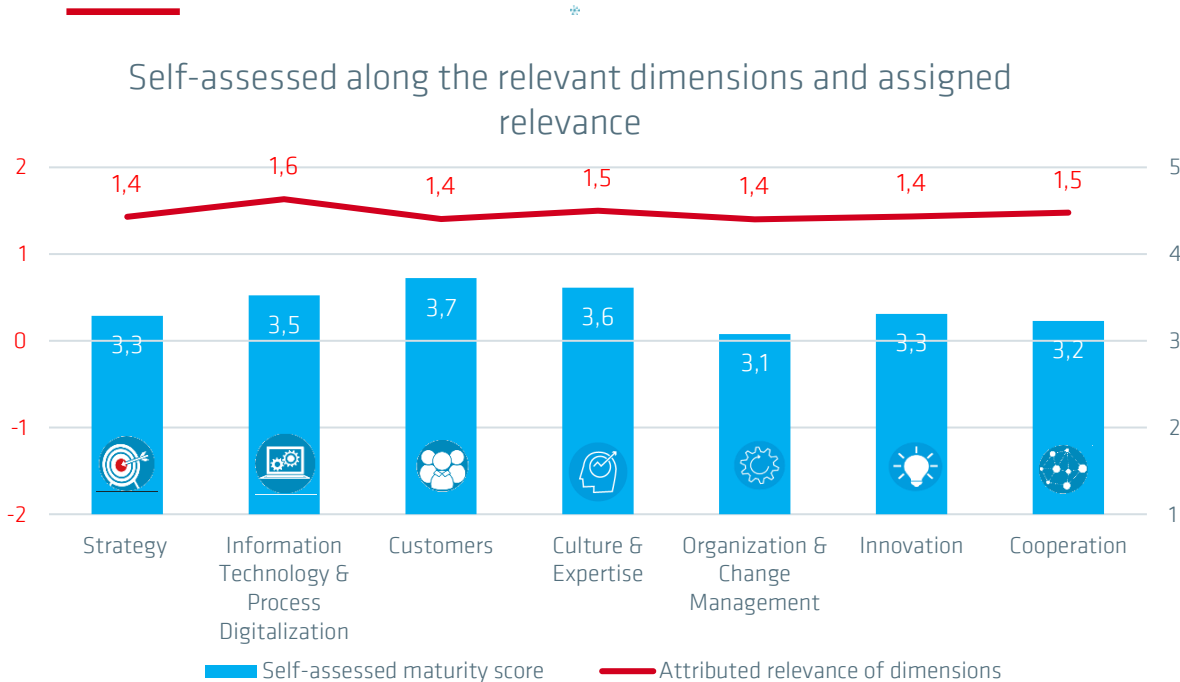
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in Brazil based 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 the 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 in the digital transformation of CABs: from technological to strategic, organizational, to cultural aspects.
 - Each dimension is operationalized by 4 to 6 criteria that describe 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").



Different maturity of dimensions: customers advanced, organization not yet



- The results of the maturity model show a difference in the average status of the CABs in the various dimensions:
 - The CABs consider themselves to be **most advanced** in the areas of “Customers”, “Culture and Expertise”, “IT and Process Digitalization” followed by “Strategy” and “Innovation”.
 - CABs consider to be less digital matured in the areas of “Cooperation” and “Organization & Change Management”.
- Respondents are aware of the high relevance of the IT dimension, followed by Culture and Cooperation.

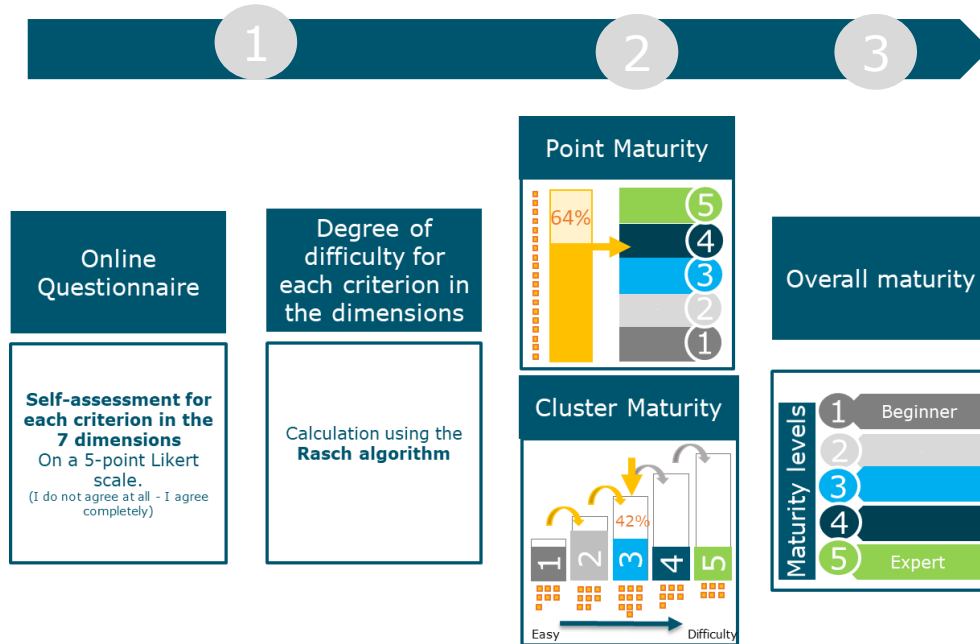
* CABs were asked to self-evaluate along statements in 7 topic areas (dimensions) on a scale from 1 (I do not agree at all) to 5 (I fully agree). These statements and dimensions are displayed in detail in the following pages. Participants were then asked to rate the importance of each dimension with regard to a successful digital transformation on a scale from -2 (not important at all) to +2 (very important).

➔ *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 in 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 higher maturity, the thresholds of the lower maturity levels have to be met first. In addition, the **point maturity** is calculated: Here, the achieved points count in comparison to the possible total points.
3. The **overall digital maturity score** is the average of the cluster and point maturity scores.

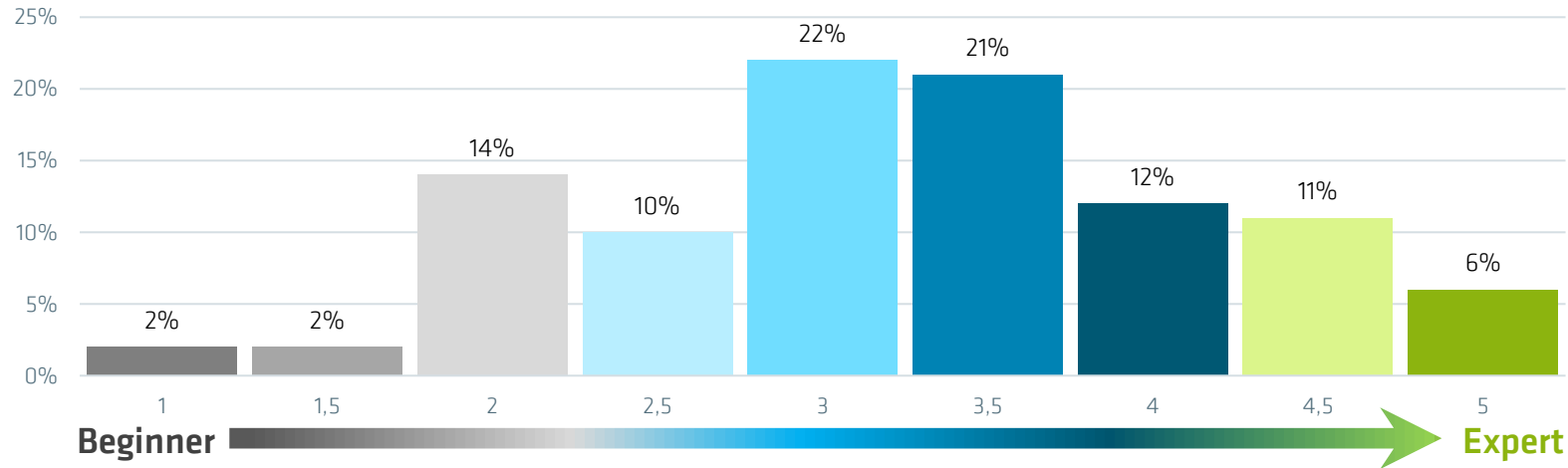


The calculation is based on the method of the St. Gallen maturity model. See Back & Berghaus (2016). Digital Maturity & Transformation Study; Berghaus & Back (2016). Stages in Digital Business Transformation; and Friedel & Back (2012). Determination of enterprise 2.0 development levels with a maturity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

Overall Digital Maturity Scores of the Brazilian CA industry



Distribution of overall maturity scores (n=226)



Statistically, the **digital maturity levels** achieved by the 226 participating CABs in Brazil follow a right-skewed *normal distribution*:

- 43% of the CABs have reached medium level 3 (i.e. 3 and 3,5). 29% of the CABs have already reached a higher level of maturity whereas 28% is still in the earlier stages of transformation.
- Only 6% of the CABs have yet achieved the expert maturity stage 5 and 2% are still on the very beginner level 1.

The 5 Digital Maturity stages in Brazilian CABs

Beginner

1

- ✓ Digitalization has a central role in strategy
- ✓ IT security: awareness and compliance
- ✓ Digitalized customer interactions
- ✓ Openness to change

2

- ✓ Evaluation of digital technologies with regard to innovation potential
- ✓ Knowledge of most important digital technologies
- ✓ IT usage reliably ensured
- ✓ Integrated, digitalized customer care
- ✓ Analysis of customer data
- ✓ Understanding of the importance of digital transformation
- ✓ Suitable personnel and know-how
- ✓ Digital activities integrated into core processes
- ✓ Digitalization as a new source of value creation

Intermediate

3

- ✓ Documented digital strategy
- ✓ Automated routine processes
- ✓ Networked processes
- ✓ Investments in digital technologies
- ✓ Digital solutions based on customer needs
- ✓ Risk of failure is accepted
- ✓ Driving innovations forward in a targeted manner
- ✓ Competitive advantages through digitalization
- ✓ Cross-functional and cross-departmental collaboration
- ✓ Effective collaboration with external stakeholders
- ✓ Effective internal collaboration

4

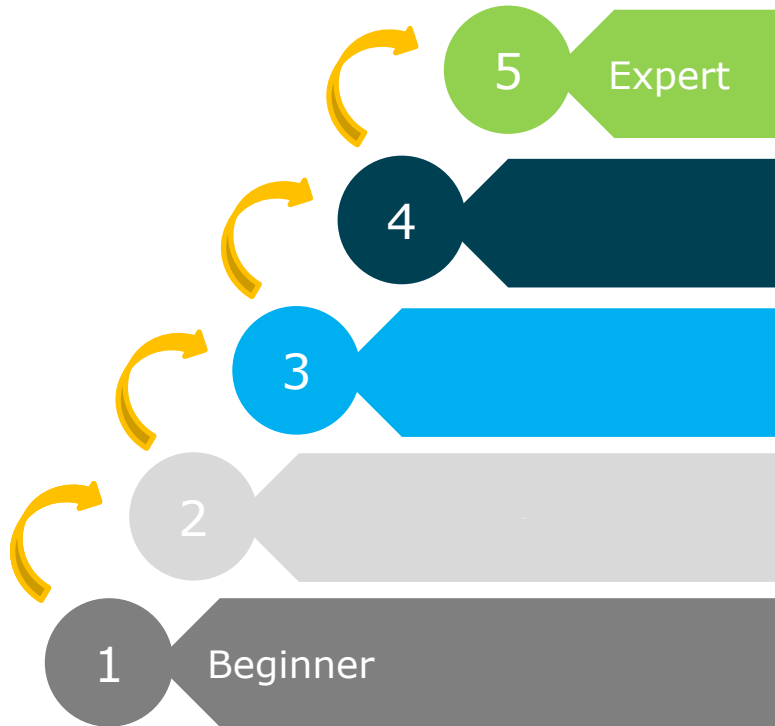
- ✓ Clear responsibilities for digitalization goals
- ✓ Targeted training
- ✓ Measurable goals
- ✓ Defined roles, responsibilities & decision-making processes
- ✓ Rapid response to change
- ✓ Sufficient resources to drive digital innovations
- ✓ Exchanges with external experts

5

- ✓ Key indicators to measure the implementation of the digital strategy
- ✓ Digital Roadmap
- ✓ Early warning system to identify relevant digital technologies and business models
- ✓ Customers involved in development of digital innovations
- ✓ Clearly defined innovation process
- ✓ Comprehensive partner network for digitalization

Expert

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



- Even at the **first maturity level**, digitalization is given a central place in the corporate strategy.
- For **stage two**, capabilities, resources, and capacities are activated in all dimensions. Digitalization is recognized and pursued as a driver for new value creation. Customer needs and analyses also increasingly come into focus.
- Organizations that have reached the **third maturity level** have strengthened internal and external collaboration. They also have a strong focus on IT and process digitalization where corresponding investments are made. Digital solutions are based on customers needs and there is cross-functional and cross-departmental collaboration on this topic.
- In the **fourth maturity stage**, the focus is on organizational adaptation with the definition of responsibilities and allocation of resources.
- The final **fifth stage** is characterized by collaboration, in particular through the establishment of a targeted partner network and the involvement of customers, as well as clear innovation processes.

Motives, Impacts and Hurdles of Digitalization

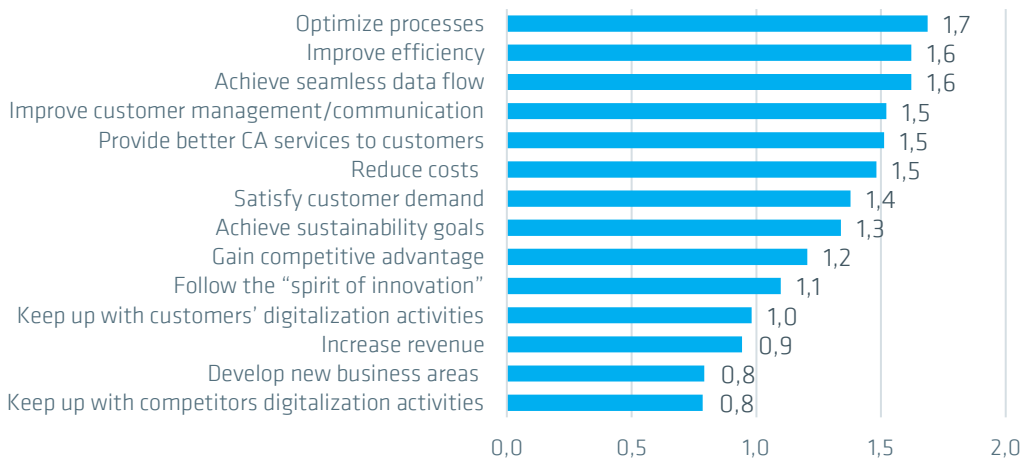
What drives digitalization in the Brazilian CABs? What effects can be achieved for the organizations? Are expectations being met? And what are the biggest hurdles to overcome in the digital transformation?

www.bam.de

Focus on process optimization and efficiency enhancement

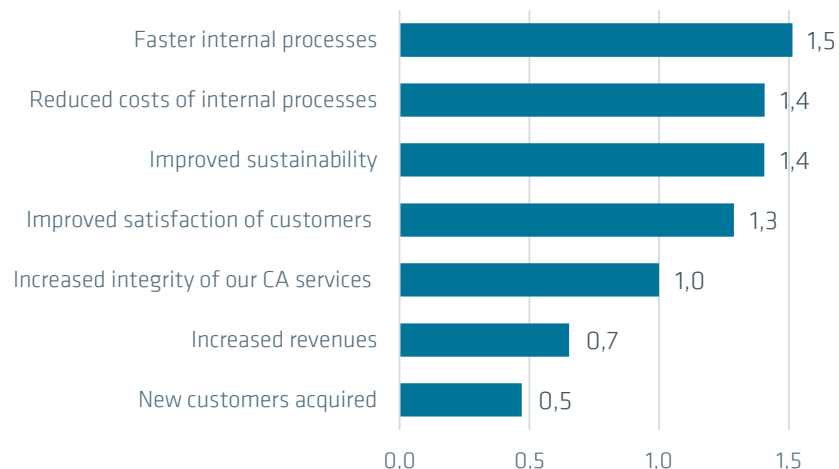
Goals behind the digitalization efforts (n=165)

(on a scale from (-2) does not apply at all to (+2) fully applies)



Benefits realized from digitalization (n=224)

(on a scale from (-2) not agree at all to (+2) fully agree)

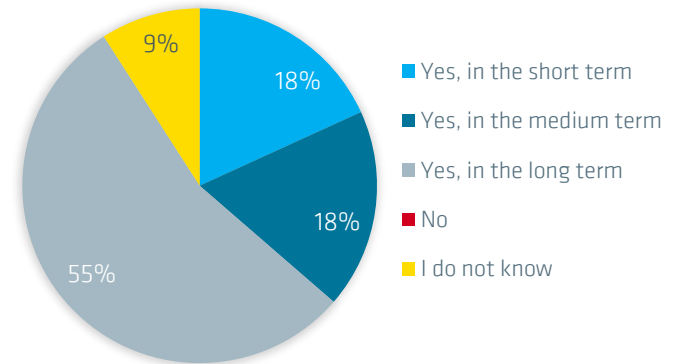
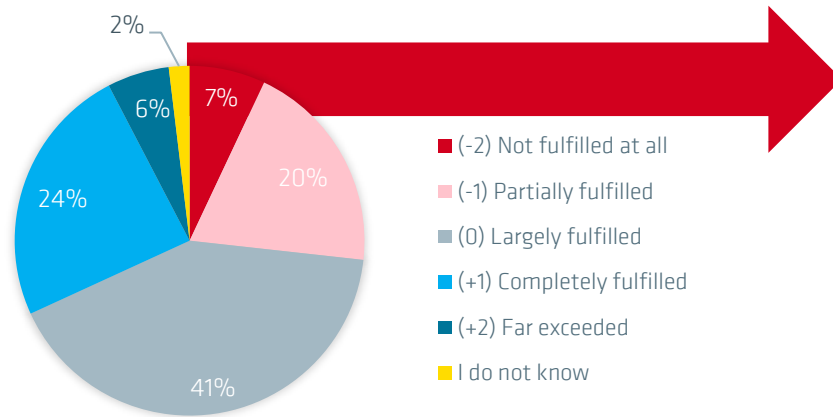


- Process optimization and increased efficiency are the **main goals** behind the digitalization efforts of CABs in Brazil. In fact, faster and more cost-effective internal processes are considered as greatest realized benefits.
- Market objectives such as increased revenues or the development of new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

CABs' expectations in connection with digitalization are mostly partially met

Fulfillment of expectations linked to digital transformation (n=157)

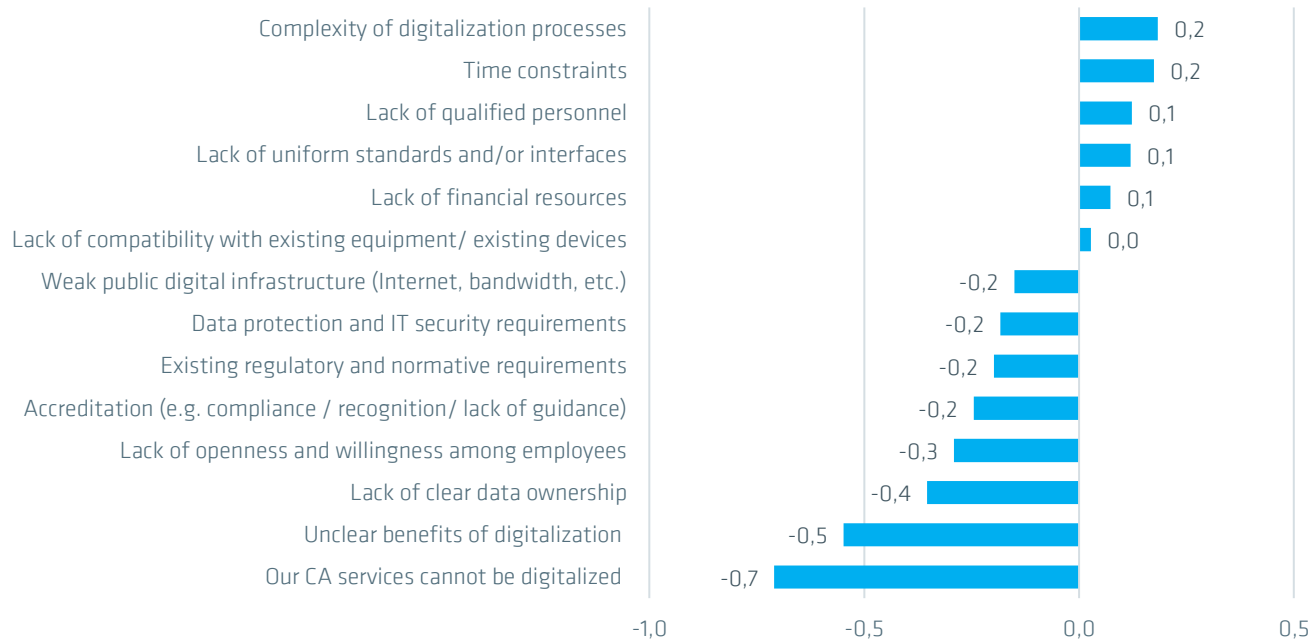
Will the expectations be met? (n=11)



- 65% of the CABs consider their expectations of the introduction of digital technologies have been largely or completely fulfilled. Another 20% find them at least partially fulfilled.
- For 7% of the CABs the expectations are not fulfilled at all. However, none of them is pessimistic that this will remain the case. The CABs are confident to still meet the expectations in the future.

Complexity of the topic and lack of time are the main hurdles to digital transformation

Hurdles to digital transformation (n=223)
(Scale from (-2) not at all to (+2) very much)



- The general complexity of digitalization processes is the biggest hurdle for CABs, followed by time constraints in managing the digital transformation.
- Technical aspects such as standards and/or interfaces are also an issue for many CABs.
- While the lack of financial resources and qualified personnel is an obstacle, a lack of openness/ readiness on the part of employees is not.

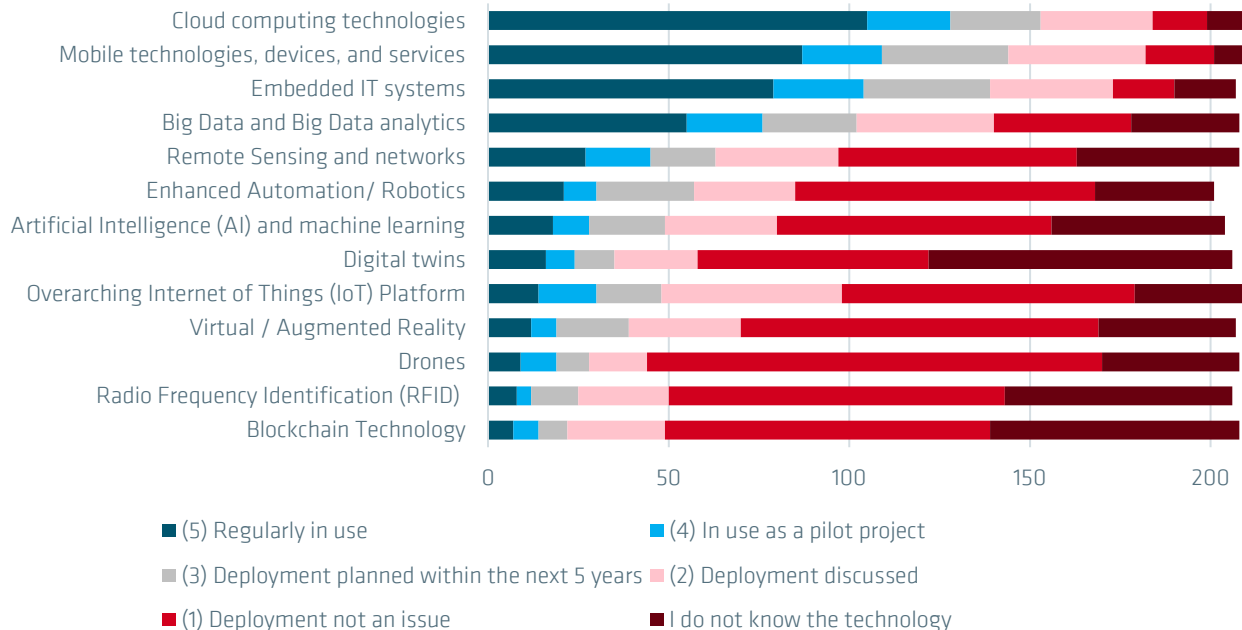
Technologies and Trends

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.

www.bam.de

Latest digital technologies are not yet widely used in CABs

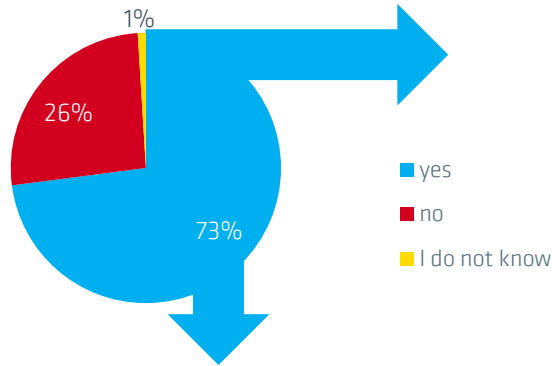
Technologies that are used or planned to be used (n=209)



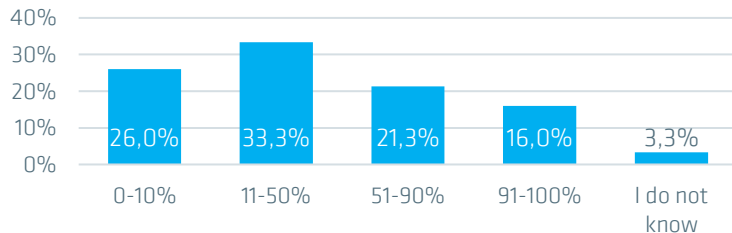
- Many of the latest digital technologies such as Big Data, artificial intelligence, virtual reality and blockchain technology are used by CABs in Brazil, but not yet on a large scale.
- Blockchain technologies mean nothing to 33% of the respondents, digital twins to 41%.
- Among CABs, cloud computing technologies are the most widely used ones.
- Mobile technologies and embedded IT systems are also in use in many CABs.

Remote methods and technologies are used by most CABs

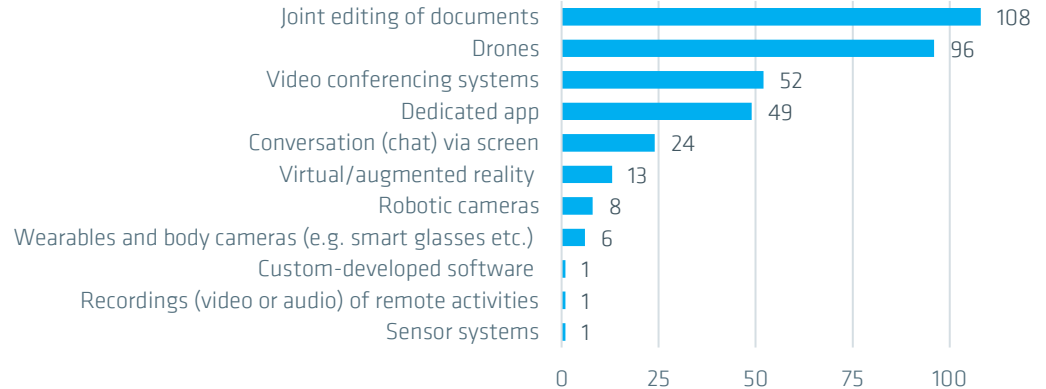
CABs that use remote methods in CA (n=207)



Share of CA services taking place remotely (n=150)



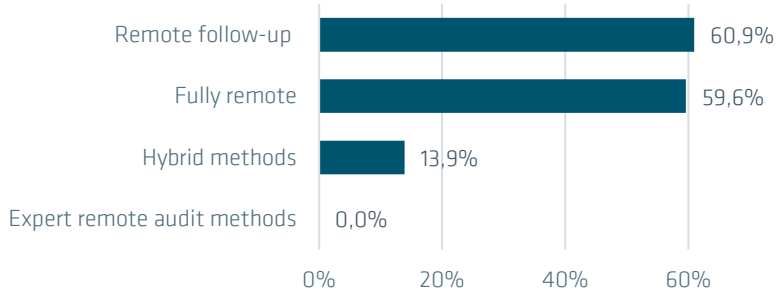
Technologies used for remote procedures (n=151)



- 73% of the CABs use **remote methods** in their CA activities.
- Of these, however, Every fourth CAB performs max. 10% of their activities remotely. Only 16% have switched completely.
- Joint editing of documents and drones are the most commonly used **tool for remote working**. Recordings of remote activities and sensor systems are still rarely used.

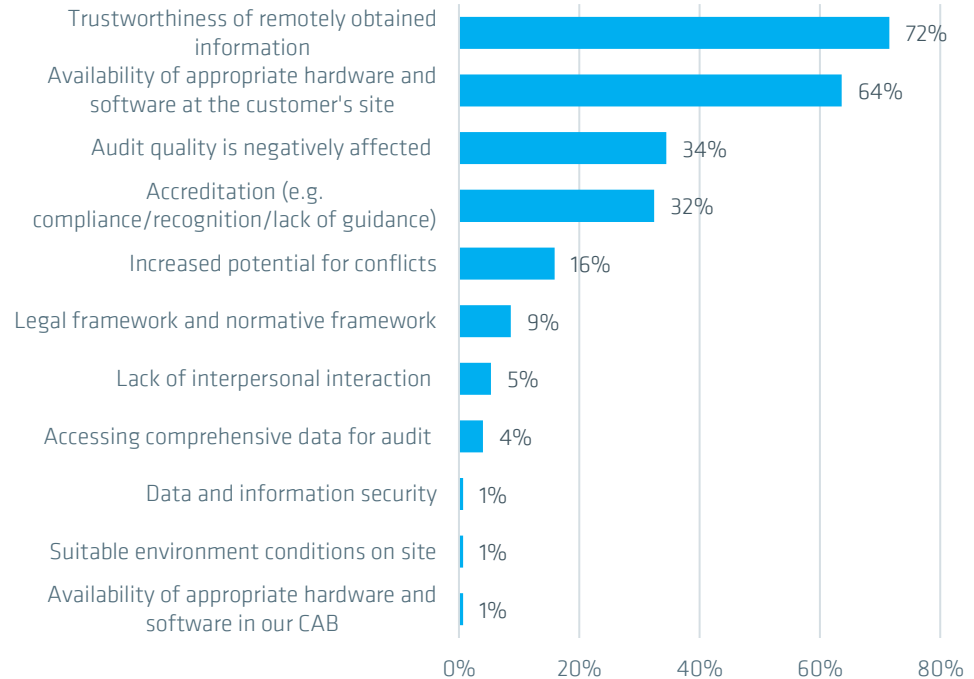
Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=151)



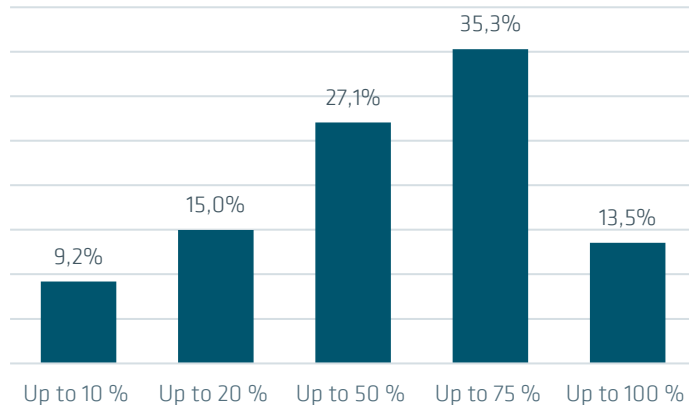
- Remote follow-up and fully remote are the predominant types among remote methods used by CABs in Brazil.
- When engaging in remote activities, the lack of trust of remotely obtained information is the main **barrier** experienced. The availability of appropriate hardware and software at the customer's side is also an important identified barrier. The negative impact on audit quality and accreditation related problems are also considered relevant barriers.

Barriers (n=151)

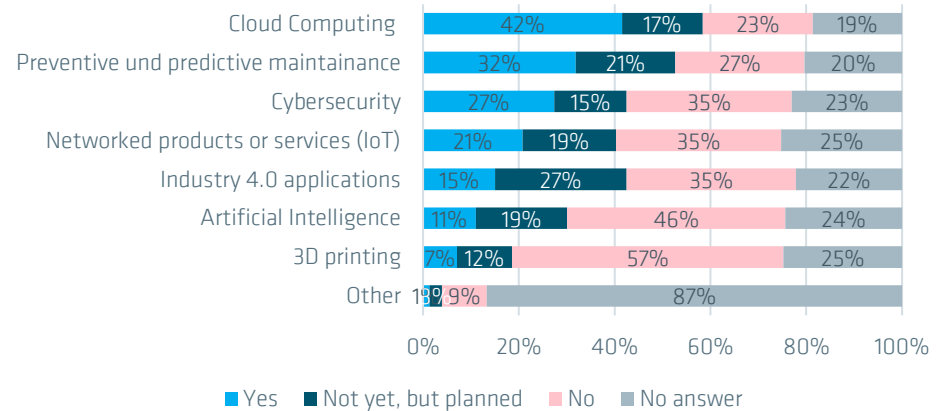


CA for advanced digital technologies is only performed by a minority of CABs so far

Share of routine processes that are digital (n=207)



Digital products and applications for which CA is conducted (n=184)



- 49% of the CABs have digitalized more than half of their **routine processes**. Only 9% of the CABs have not even digitally converted 10% of their processes.
- 56% of the surveyed CABs conduct conformity assessments for modern digital technologies and applications. In focus: cloud computing (42%) and preventive and predictive maintenance

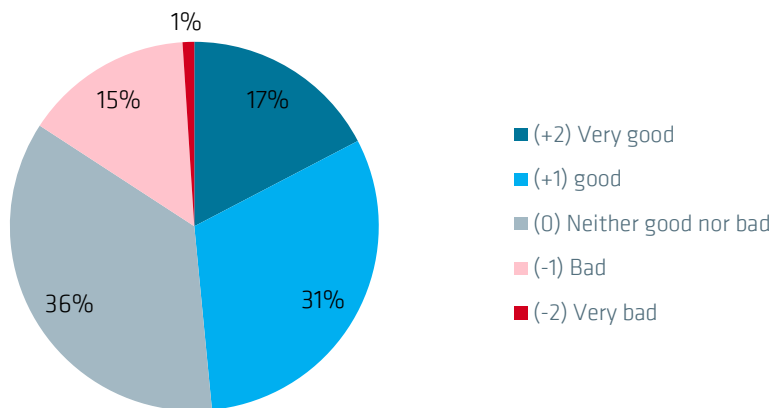
The COVID-19 Pandemic and Digitalization

The role of digitalization in responding to the challenges posed by the COVID-19 pandemic and the impact of the pandemic on digitalization.

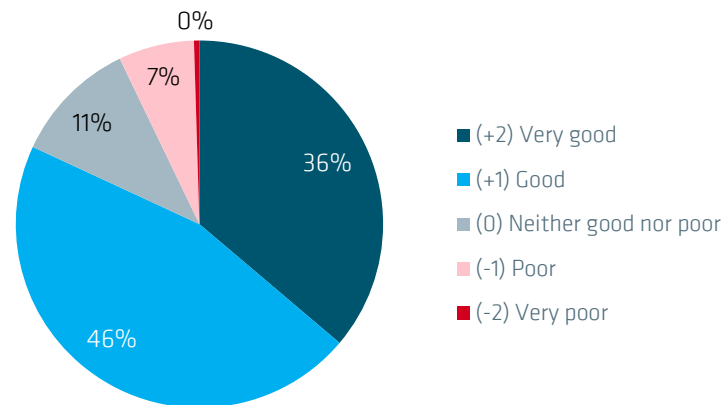
www.bam.de

Most CABs coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=211)



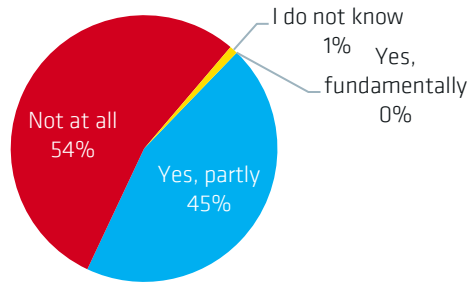
Response to the challenges of the COVID-19 pandemic (n=210)



- For 36% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 16% stated that their orders have declined, and 48% of CABs have actually seen their order situation improve.
- The majority of CABs (82%) reported that they have **responded** well or very well to the challenges associated with the COVID-19 pandemic.

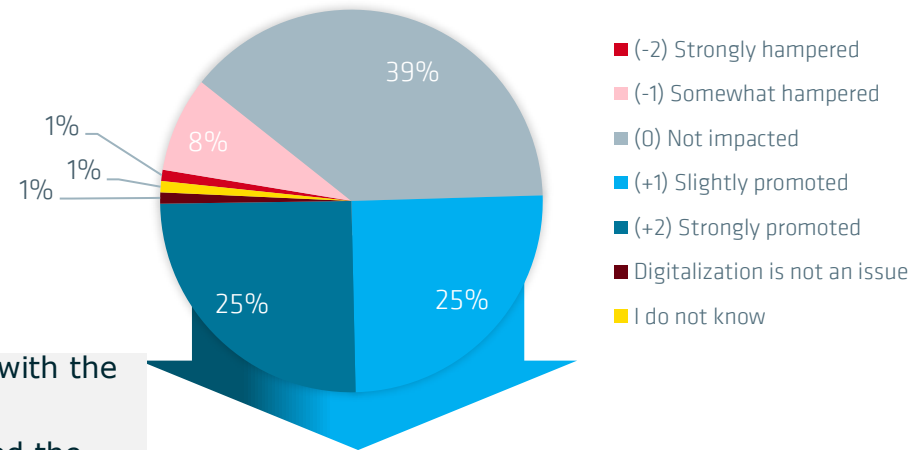
Pandemic and Digitalization

Digital technologies have helped coping with challenges of the COVID-19 pandemic (n=201)

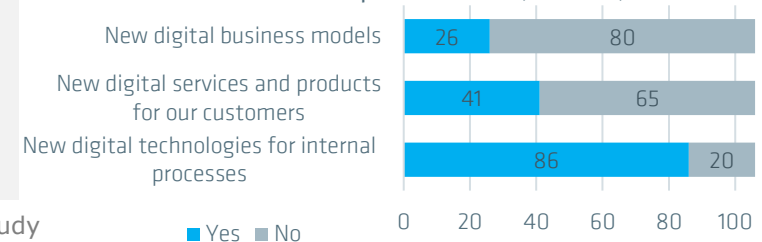


- For 45% of the CABs, digital technologies have helped coping with the challenges of the COVID-19 pandemic.
- The COVID-19 pandemic has slightly or even strongly promoted the digital transformation in 50% of the CABs. Only, 8% of CABs saw their digitalization efforts somewhat hampered and 39% report no **impact of the pandemic on its digitalization**.
- The pandemic might have forced **digital adaptations**: 81% of the CABs have introduced new digital technologies for internal processes.
- Only 39% introduced new digital services and products for their customers, and 25% have adopted new digital business models.

Impact of the Covid-19 pandemic on the digitalization of CABs (n=211)



Digital adaptation in course of the COVID-19 pandemic (n=106)



- CABs in Brazil clearly see digital transformation as an opportunity. The **level of digitalization** varies widely. The majority of participants has reached a medium or higher level of digital maturity.
- Even though digital transformation is an individual project for each organization, typical patterns of digital maturity in Brazilian CABs are nevertheless confirmed: An initial focus on customers, culture and technology is followed by holistic organizational transformation, including strategy, strong innovation networks and cooperation.
- All the **cutting-edge digital technologies** such as Big Data, artificial intelligence and virtual reality are used by CABs in Brazil, but not yet on a large scale.
- 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 follow-up and fully - remote processes.

Brazil in international comparison

How do Brazilian 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. Articles and an extensive report with further detailed analyses are also 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 and Contacts

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)

Support: Timo Kabierski



Acknowledgement

We would like to thank CGCRE and INMETRO for their support in conducting this study. Our thanks further goes to all those who were involved in the preparation and implementation of this study, e.g. who were available for expert interviews and questionnaire tests.

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 (BMWK).

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.

 www.qi-fokus.de

Contact

Bundesanstalt für Materialforschung und –prüfung (BAM)

S.2 Accreditation and Conformity Assessment

www.qi-fokus.de

qi-fokus@bam.de

Dr. rer. oec. Claudia Koch

Tel.: +49 30 8104-3718

e-mail: claudia.koch@bam.de

Dr. rer. oec. Luana Ladu

Tel.: +49 30 8104-4485

e-mail: luana.ladu@bam.de

www.bam.de

Annexes

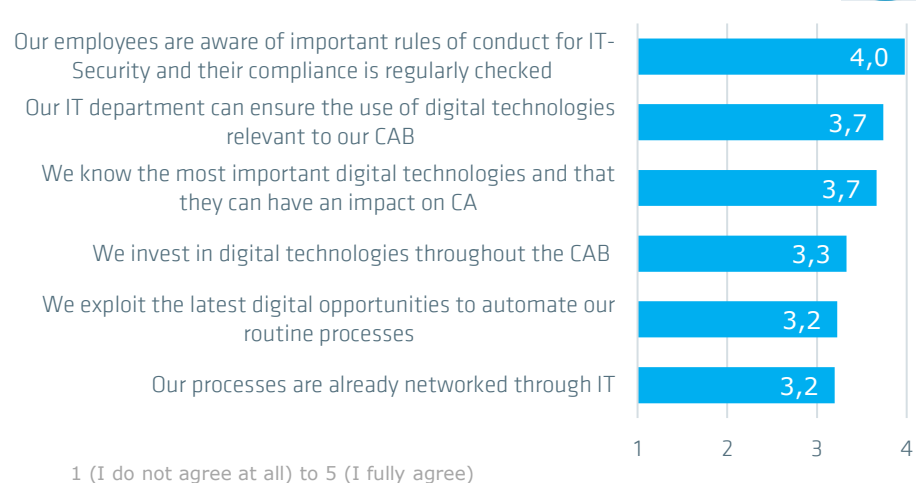
www.bam.de

Dimensions of digital maturity: Detailed overview

Strategy (n=163)



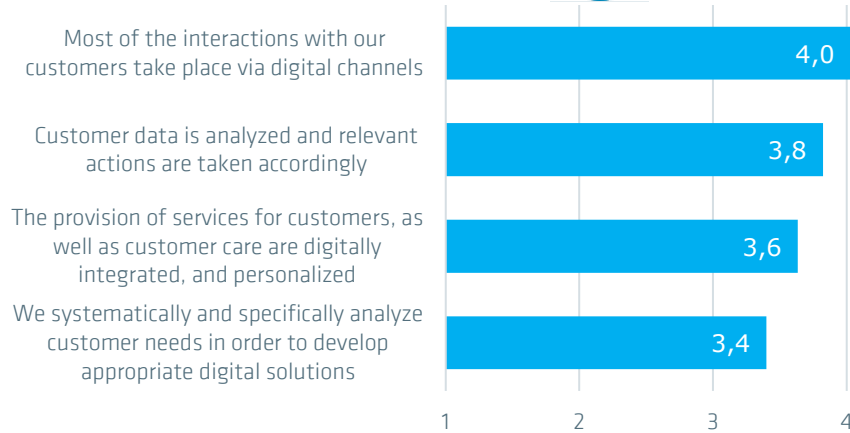
Information Technology & Process Digitalization (n=163)



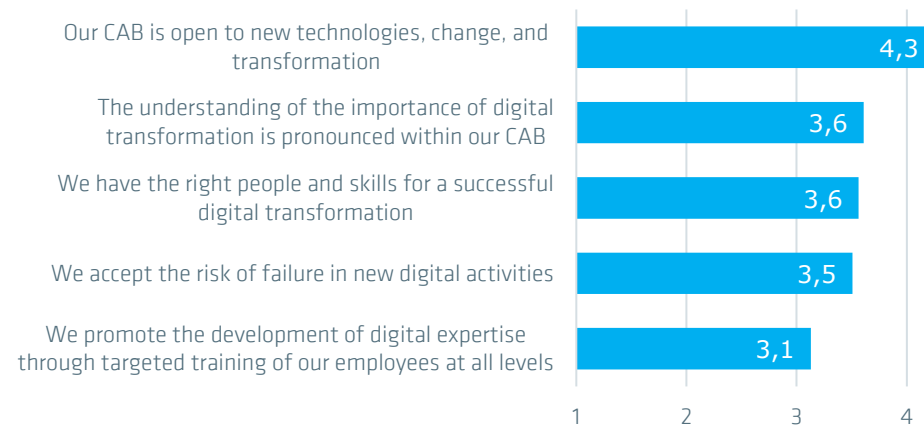
- In most CABs (78%), digitalization plays a central role in their overall strategy, with 68% having a well documented digital strategy
- Only 58% set up a Digital Roadmap and 54% use key metrics to measure the implementation status of their digitalization strategy.
- At least 66% of the CABs are aware of, invest in and are capable of properly using new digital technologies, respecting IT-Security rules; more than 64% of the CABs have networked processes and automatized routine processes.

Dimensions of digital maturity: Detailed overview

Customers (n=161)



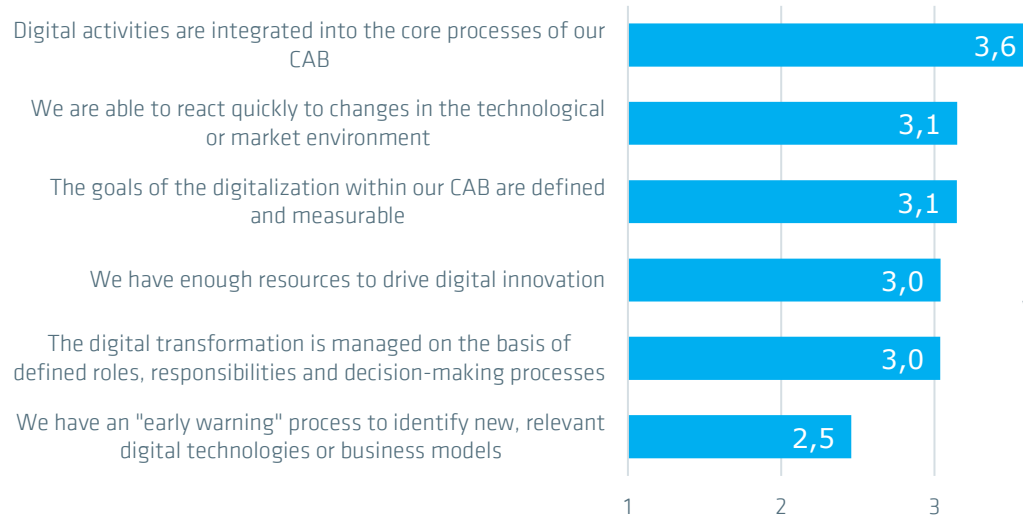
Culture & Expertise (n=163)



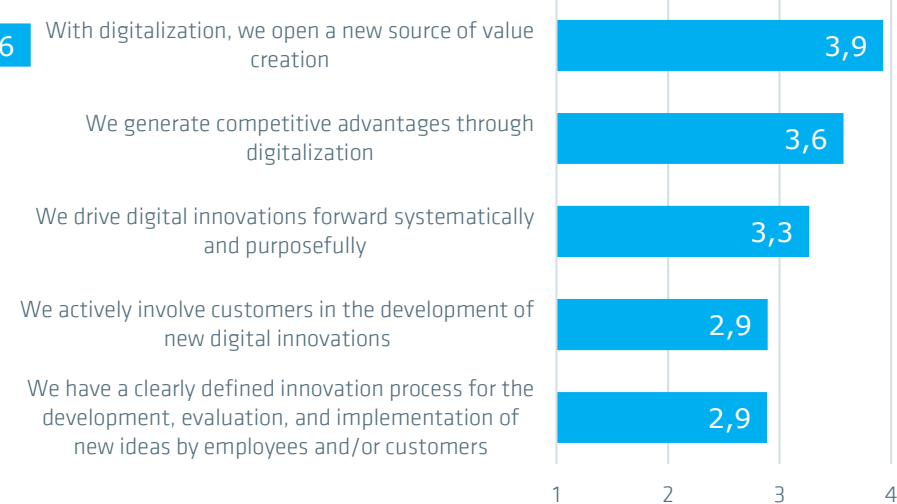
- 80% of CABs in Brazil interact with customers using digital channels. However, a lower share of CABs (72%) provides services for customers in a digitally integrated way, and only 58% of them develop appropriate digital solutions based on the needs of customers.
- Brazilian CABs are open to new technologies, change and transformation (86%). 72% of them have a pronounced understanding of the importance of digital transformation and count with the right skills needed to successfully implement the transition.

Dimensions of digital maturity: Detailed overview

Organization & Change Management (n=161)



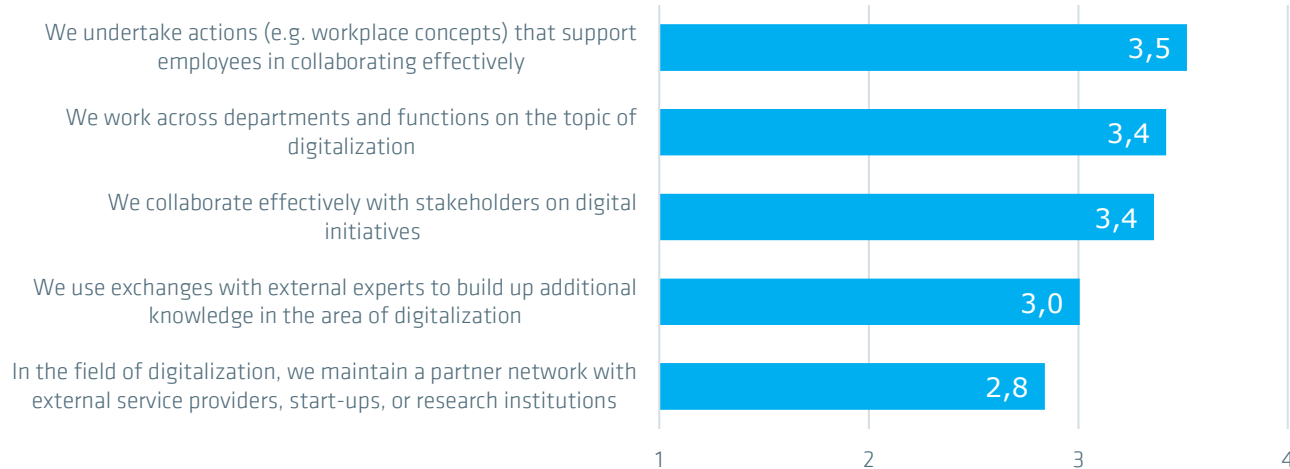
Innovation (n=162)



- 72% of the CABs have integrated digital activities in their core processes. The clear definition of responsibility and of strategic goals are keys for implementing the digital transformation.
- For the majority of the participants (78%), digitalization represents a new source of value creation and generates competitive advantages.

Dimensions of digital maturity: Detailed overview

Cooperation (n=162)



- In addition, to work across departments and functions on the topic of digitalization (68%), the majority of CABs builds additional knowledge through external expert consultations (60%). They also work effectively with stakeholders on different digital activities. However, a lower share of CABs (56%) maintain a partner network with external service providers.

Digital Maturity Model Cluster 1 (Beginner)



Description Level 1: Beginner

Dimensions



Digitalization has a central role in our overall strategy

Our employees are aware of important rules of conduct for IT Security and their compliance is regularly checked

Most of the interactions with our customers (e.g., advise, purchase conclusion and customer service) take place via digital channels

Our CAB is open to new technologies, change and transformation



Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management



Innovation



Cooperation

Digital Maturity Model Cluster 2

Description Level 2

Dimensions



We evaluate new technologies as well as changes in customer behavior to identify potential for digital innovation

We know the most important digital technologies and that they can have an impact on CA

Our IT department can ensure the use of digital technologies relevant to our CAB

The provision of services for customers as well as customer care are digitally integrated and personalized

Customer data is analyzed, and relevant actions are taken accordingly

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








Digital activities are integrated into the core processes of our CAB








With digitalization, we open a new source of value creation










Strategy IT & Process Digitalization Customers Culture & Expertise Organization & Change Management Innovation Cooperation








Digital Maturity Model Cluster 3

Description Level 3	Dimensions						
							
Our digital strategy is well documented and communicated	█						
We exploit the latest digital opportunities to automate our routine processes		█					
Our processes are already networked through IT		█					
We invest in digital technologies throughout the CAB		█					
We systematically and specifically analyze customer needs in order to develop appropriate digital solutions			█				
We accept the risk of failure in new digital activities				█			
We drive digital innovations forward systematically and purposefully						█	
We generate competitive advantages through digitalization						█	
We work across departments and functions on the topic of digitalization							█
We collaborate effectively with stakeholders on digital initiatives							█
We undertake actions (e.g. workplace concepts) that support employees in collaborating effectively							█

 Strategy
  IT & Process Digitalization
  Customers
  Culture & Expertise
  Organization & Change Management
  Innovation
  Cooperation

Digital Maturity Model Cluster 4

Description Level 4	Dimensions						
							
We have clearly defined the responsibilities for implementing the goals derived from the strategic consideration on digitalization	■						
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					■		
The digital transformation is managed on the basis of defined roles, responsibilities and decision-making processes					■		
We are able to react quickly to changes in the technological or market environment					■		
We have enough resources to drive digital innovation					■		
We use exchanges with external experts to build up additional knowledge in the area of digitalization							■

						
Strategy	IT & Process Digitalization	Customers	Culture & Expertise	Organization & Change Management	Innovation	Cooperation

Digital Maturity Model Cluster 5 (Expert)

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 actively involve customers in the development of new digital innovations					■		
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						■	



Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management



Innovation



Cooperation