

2022

Digitalization in Conformity Assessment in Colombia


A QI-FoKuS study

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




Basic statistical population for the survey	720 accredited conformity assessment bodies (CABs) in Colombia
Data collection method	Online survey
Survey period	January 22, 2022 March 6, 2022
Sample	69 fully completed questionnaires (10% response rate)



QI-FoKuS
Research on Conformity Assessment and Safety

Digitalization in Conformity Assessment

Online Survey





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 depend 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, digitalization also offers new opportunities. Our QI-FoKuS study explores "Digitalization in Conformity Assessment" based on data from an online survey of accredited CABs in Colombia.

Major topic areas covered

Digital Maturity Level

- Assessment of digital readiness and status of digital transformation in CABs based on a tailored digital maturity model

Drivers, Benefits and Barriers

- Drivers and motives for digital transformation, the benefits and impacts realized, and barriers faced by CABs towards digital transformation

Technology Trends

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

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The Sample

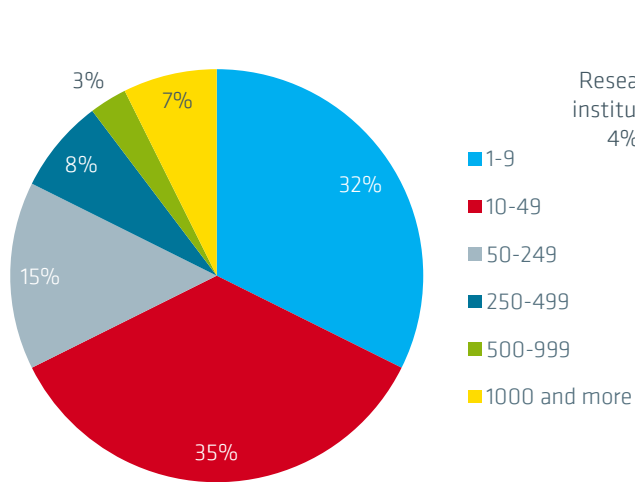
General information about the participating
Conformity Assessment Bodies

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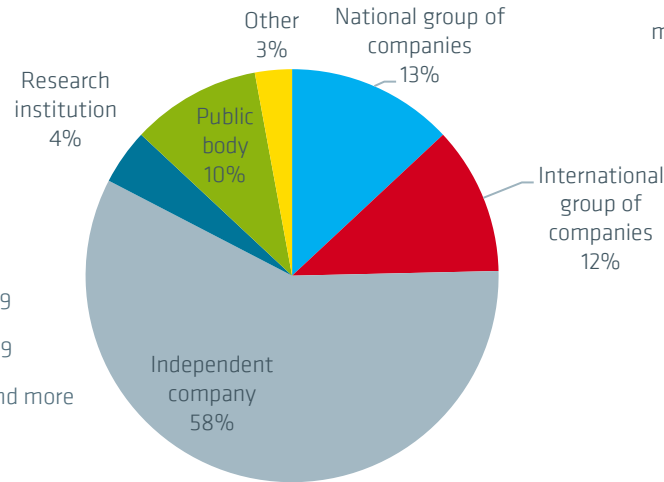
69 conformity assessment bodies (CABs) in Colombia participated in the survey

- 67% of participating CABs are **small businesses** with less than 50 employees
- 58% are **independent companies**, 12% belong to an **international group** and 10% are **public bodies**
- For 45%, Conformity Assessment (CA) is the main economic **focus of activity** and for 33% it is **one activity among others**

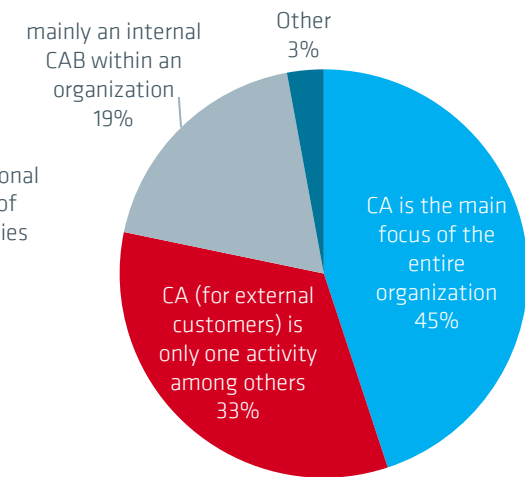
Number of employees (n=69)



Type of organization (n=69)

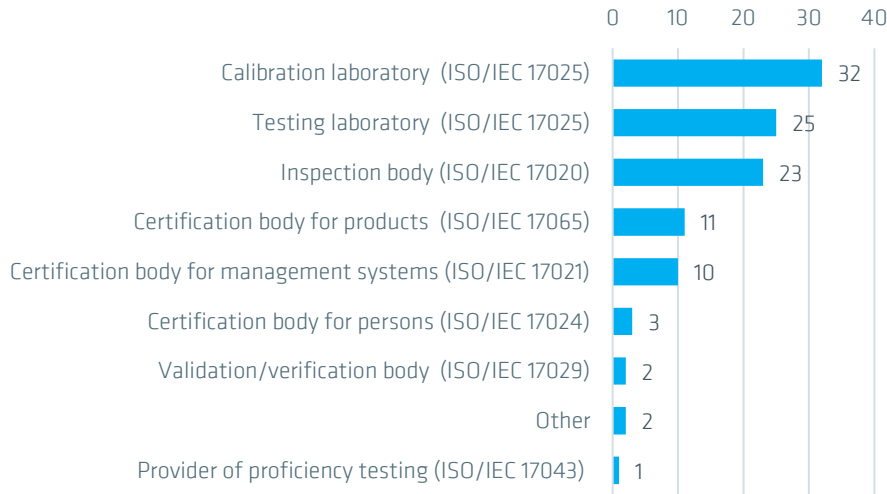


Role of CA for the organization (n=69)

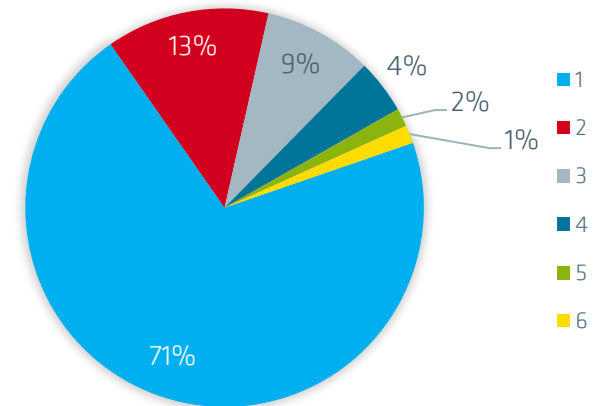


The 69 participating CABs cover a broad range of activities

Field of activity



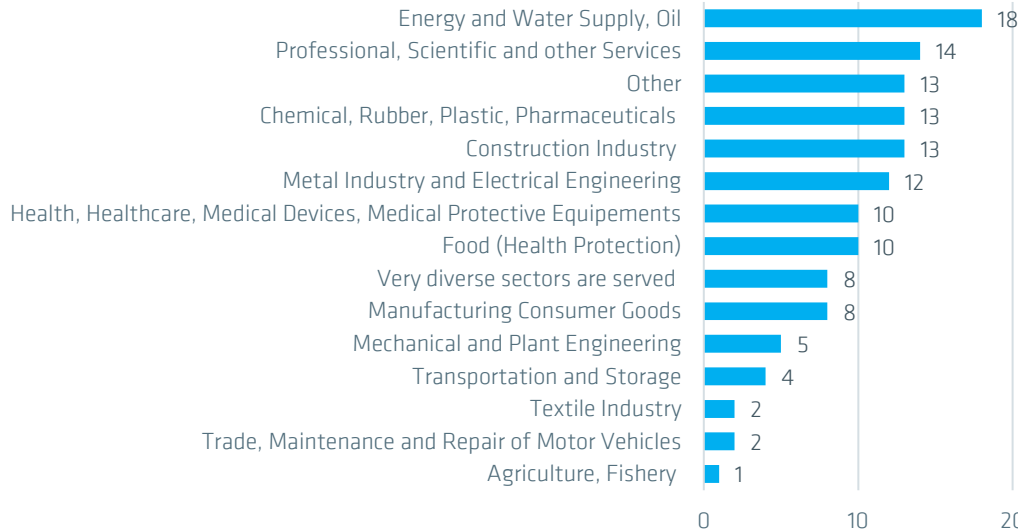
Number of fields of CA activities per CAB



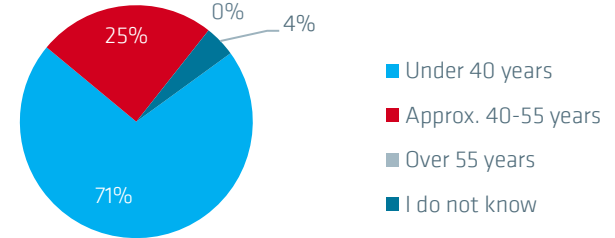
- Calibration laboratories represent the **largest group of participants**, followed by testing laboratories and inspection bodies
- 71% of CABs are **specialized** in a single field of conformity assessment activity; only a few cover a broad range of activities (up to 6)

The CABs serve a broad spectrum of sectors, mainly manufacturing

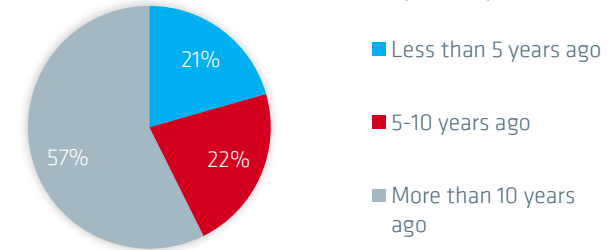
Main sectors served by CABs



Age of employees (n=69)



Establishment of the CAB (n=69)



- The **main industry** served by the CABs is the energy and water supply, oil sector, but also professional, scientific and other services are important
- The majority of CABs (71%) have staff under 40 years on average, while only in 25% of the CABs the **average age of the employees** is 40-55 years
- 57% of the CABs were **established** more than 10 years ago; one out of four CABs is younger than 5 years

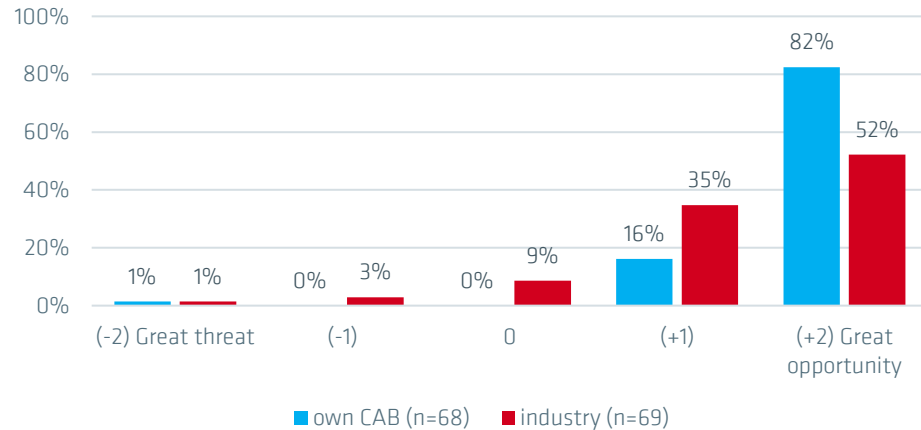
Digitalization in Colombian CABs A General Overview

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.

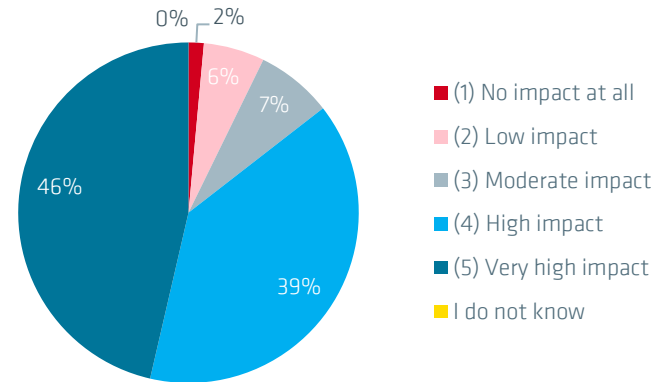
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Digitalization more of an opportunity rather than a threat // Major influence expected

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



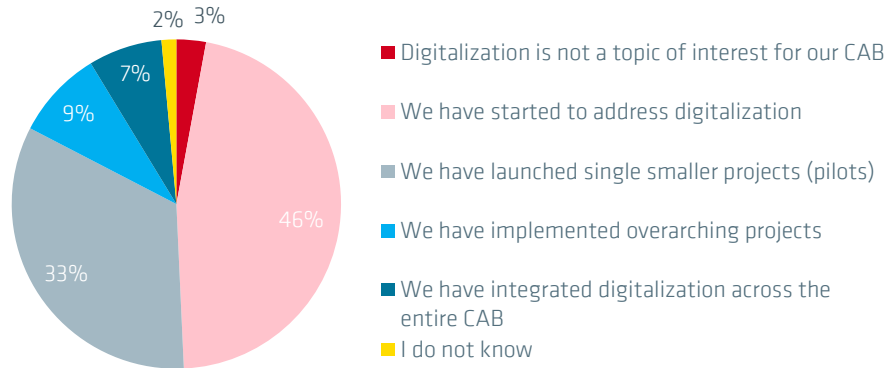
Expected impact of digitalization in the next 5-10 years (n=69)



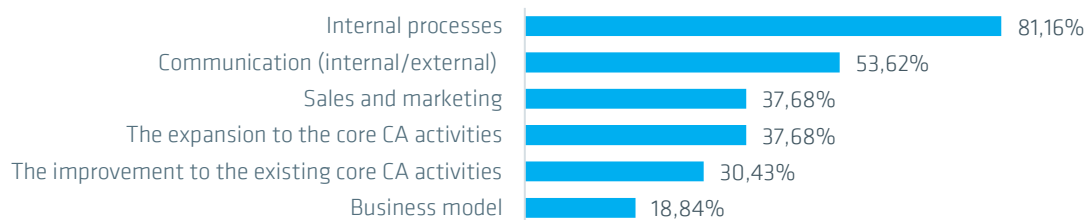
- In general, CABs have a **positive perception** of digitalization: 98% of the surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat for their own organization, and 87% with regard to the whole CA industry
- 85% of the participants expect digitalization to have a **great or even very great impact on CA activities** in Colombian in the next 5-10 years

Majority of CABs just started to address digitalization//Focus mainly on internal processes

Status and extent of digitalization in the CABs (n=69)



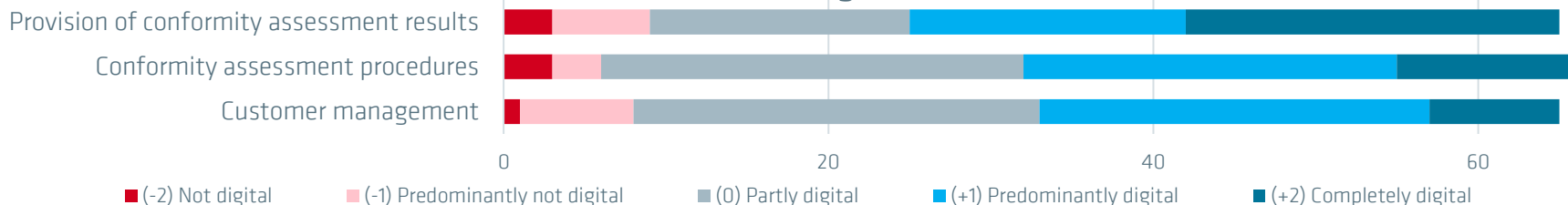
Areas targeted by digitalization (multiple answers possible, n=69)



- **The status of digitalization is quite divers** among the CABs in Colombia: While the majority of the CABs (46%) have just started to address this topic, 33% have launched single smaller projects and 9% have already implemented overarching projects. 7% state that they have integrated digitalization throughout the whole organization.
- **Most digitalization activities concern internal processes.** Yet communication and sales and marketing are also relevant areas. However, digitalization is currently rarely used to improve CA services or even less to adopt new business models.

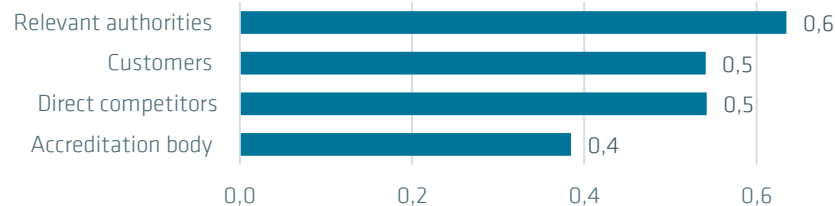
Positive self-assessment on digitalization in core areas - and in comparison with stakeholders

Self-evaluation of the CABs' status of digitalization in different areas (n=67)

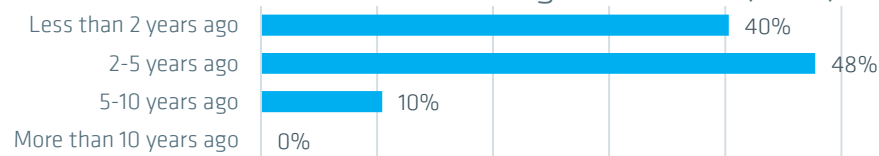


- The CA results are provided predominantly or completely digitally by the majority of CABs. Customer management is less frequently digitalized.
- Compared to **other organizations** that are direct stakeholders, CABs rate their digital status on average as at least as good or slightly better, especially with regard to the relevant authorities and customers.
- Digitalization has not been a topic for long: the majority of CABs (88%) **has only started to deal with it** during the last 5 years. No CAB has done so at least 10 years ago.

Own status of digitalization compared to (n=69)
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=67)

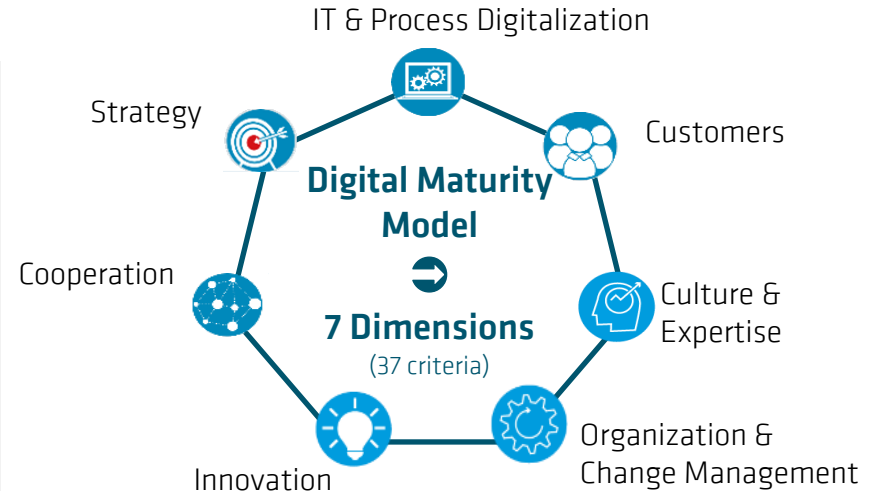


Digital Maturity of CABs

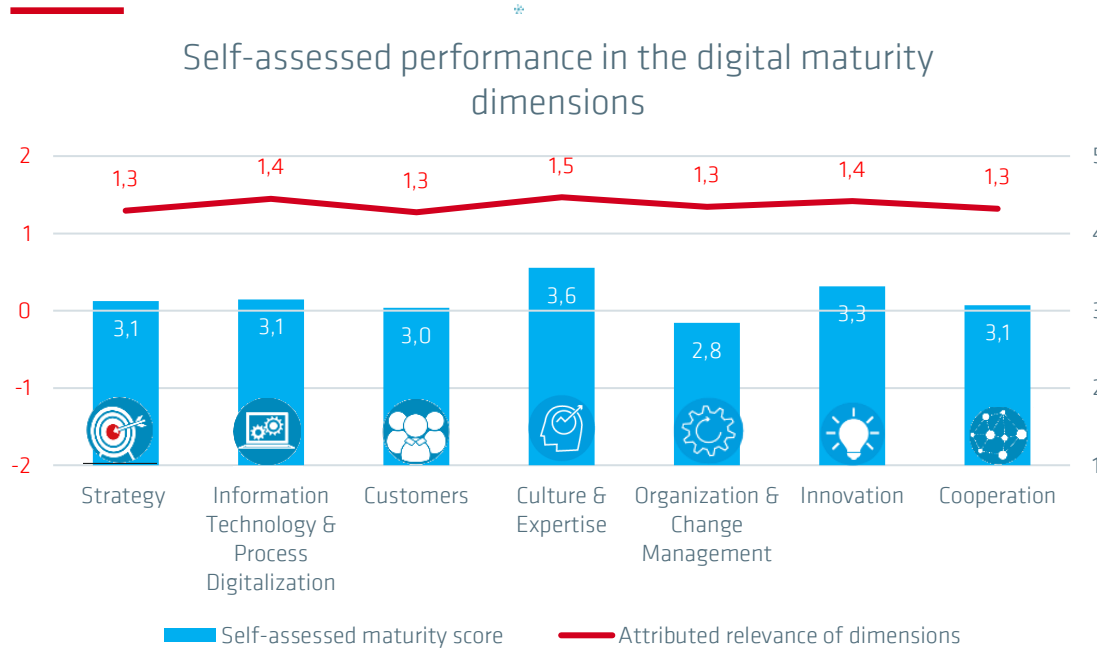
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in Colombia 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").



Different maturity of dimensions: Culture and Innovation 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).

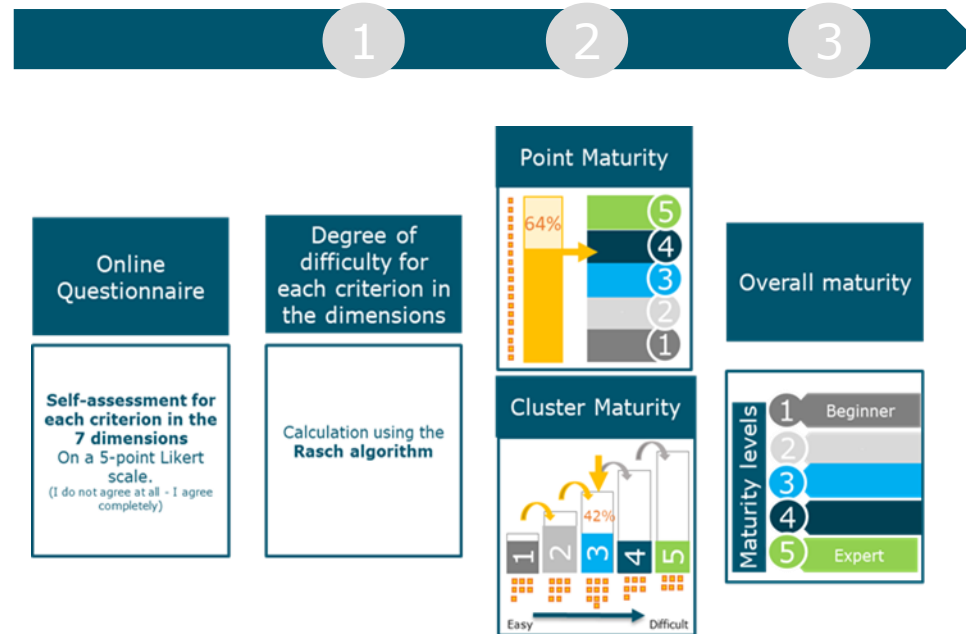
- The results of the maturity model show that the status of the CAB slightly differs in the various dimensions:
 - The CABs consider themselves to be **most advanced** in the area of "Culture and Expertise" and "Innovation".
 - The **greatest need** to catch up is in the areas of "Organization and Change Management" and "Customers".
- Respondents are aware of the high relevance of the Culture dimension as well as Innovation and Information Technology.

➔ *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

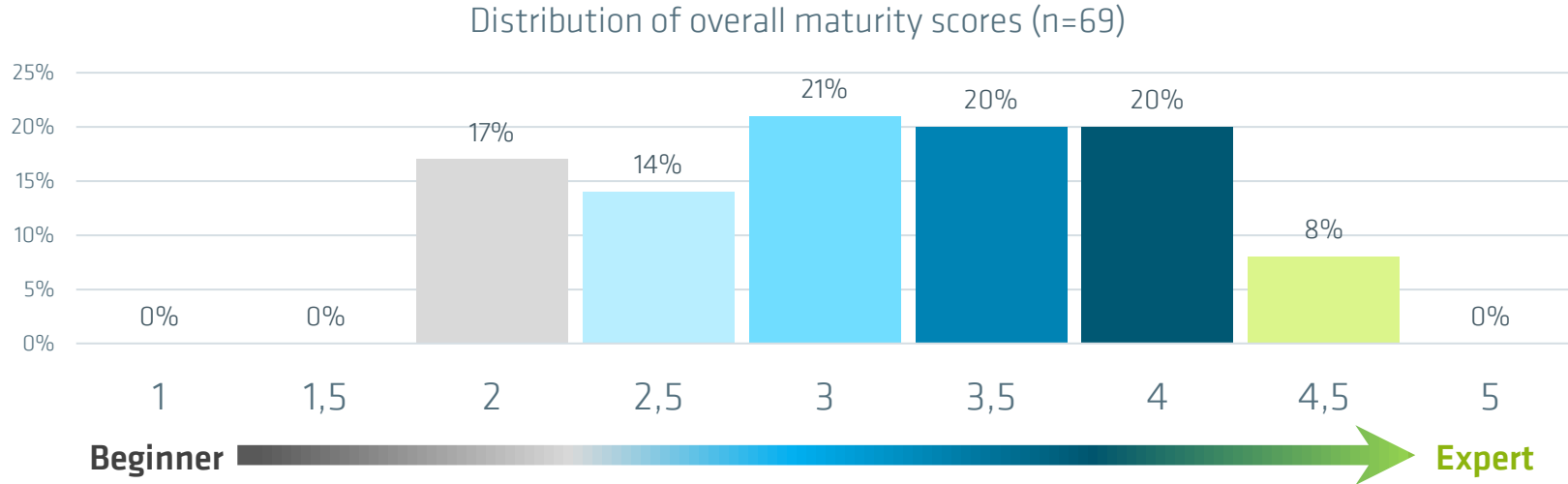
In the questionnaire, participants indicate the extent to which each of the criteria of the 7 dimensions applies to their CAB. In a **multi-stage process**, digital maturity is determined on the basis of these assessments:

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 Colombian CA industry



Statistically, the **digital maturity levels** achieved by the 69 participating CABs in Colombia follow a right-skewed *normal distribution*:

- 41% of the CABs have reached medium level (i.e. 3 and 3,5). 28% of CABs have already reached a higher level of maturity, while every third CAB is still in an earlier stage of transformation.
- So far, no CAB has reached expert level 5, but at the same time there are no more CABs at beginner levels 1 and 1.5.

The 5 Digital Maturity stages in Colombian CABs

Beginner

1

- ✓ Digitalization has a central role in strategy
- ✓ Openness to change
- ✓ Digitalization as a new source of value creation

2

- ✓ Evaluation of digital technologies with regard to innovation potential
- ✓ IT usage reliably ensured
- ✓ IT security: awareness and compliance
- ✓ Digitalized customer interactions
- ✓ Digital transformation is important
- ✓ Suitable personnel and know-how for digital transformation
- ✓ Risk of failure accepted
- ✓ Digital activities integrated into core processes
- ✓ Digital innovations are driven forward systematically and purposefully
- ✓ Work across departments

Intermediate

3

- ✓ Documented digital strategy
- ✓ Automated routine processes
- ✓ Investments in digital technologies
- ✓ Targeted training of our employees
- ✓ Competitive advantages generated
- ✓ External experts
- ✓ Collaboration supported

4

- ✓ Clear responsibilities for strategic goals
- ✓ Networked processes
- ✓ Most important technologies are known
- ✓ Integrated, digitalized customer care
- ✓ Digital solutions based on customer needs
- ✓ Analysis of customer data
- ✓ Defined roles, responsibilities & decision-making processes
- ✓ Quick reaction to change
- ✓ Sufficient resources to drive digital innovations
- ✓ Customers involved in development of digital innovations
- ✓ Collaboration with stakeholders

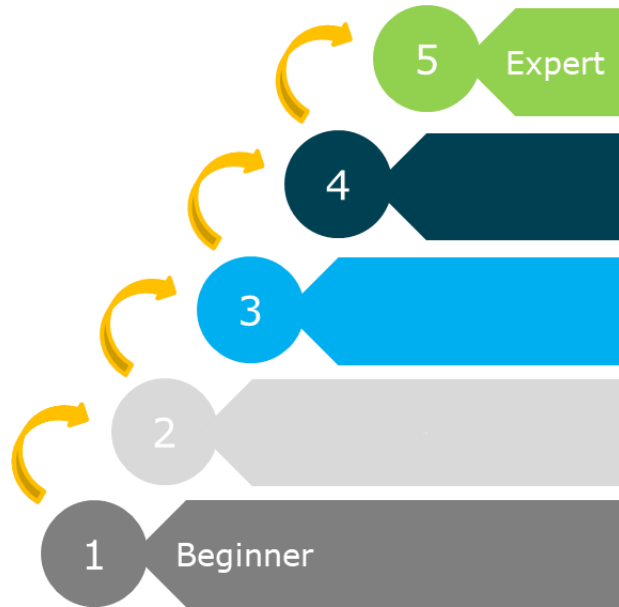
Expert

5

- ✓ Key indicators for measuring the implementation of the digital strategy
- ✓ Digital Roadmap
- ✓ Digitalization goals defined and measurable
- ✓ Early warning system to identify relevant digital technologies and business models
- ✓ Clearly defined innovation process
- ✓ Partner network

The Digital Maturity of CABs in Colombia //

Summary of the observed patterns



- Even at the **first maturity level**, digitalization is given a central place in the corporate strategy. It is recognized and pursued as a driver for new value creation and CABs are open to change.
- In the **second maturity stage**, capabilities, resources, and capacities are activated further in all dimensions. The necessary personnel skills/competences are available and there is cross-departmental collaboration on this topic.
- Organizations at the **third maturity level** have a strong focus on IT, where corresponding investments are made. Collaboration is strengthened, also with external stakeholders. Innovation is shifting into focus to generate competitive advantages.
- In the **fourth maturity stage**, the focus is on organizational adaptation with the definition of responsibilities and allocation of resources. Organizations are also increasingly involving customers by analyzing their data and basing digital solutions on it.
- CABs in the final **fifth stage** use key metrics to measure the implementation status of its digitalization strategy and have a digital roadmap. A partner network for digital transformation is established. Also, a clear innovation process is available.

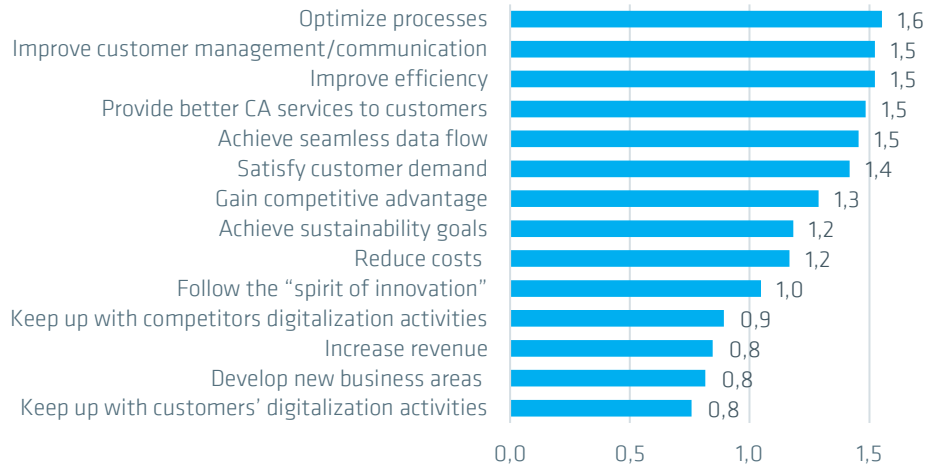
Motives, Impacts and Hurdles of Digitalization

What drives digitalization in Colombian 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?

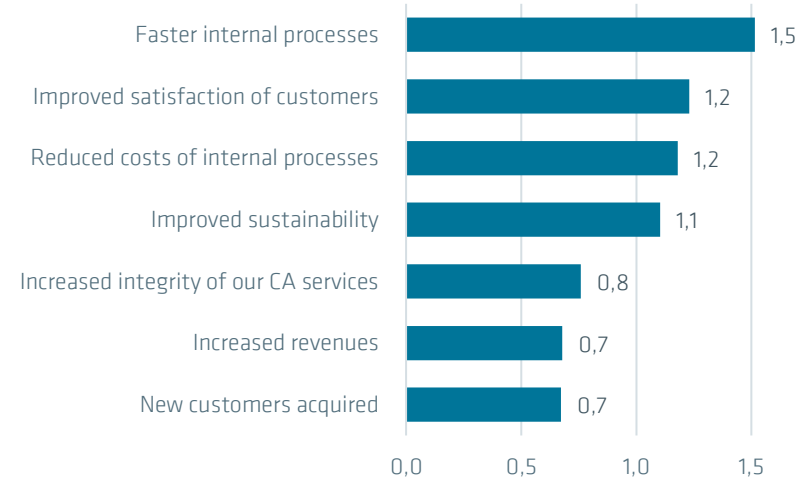
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Focus on process optimization and customer relations - partially realized on a large scale

Goals behind the digitalization efforts (n=67)
(on a scale from (-2) does not apply at all to (+2) fully applies)



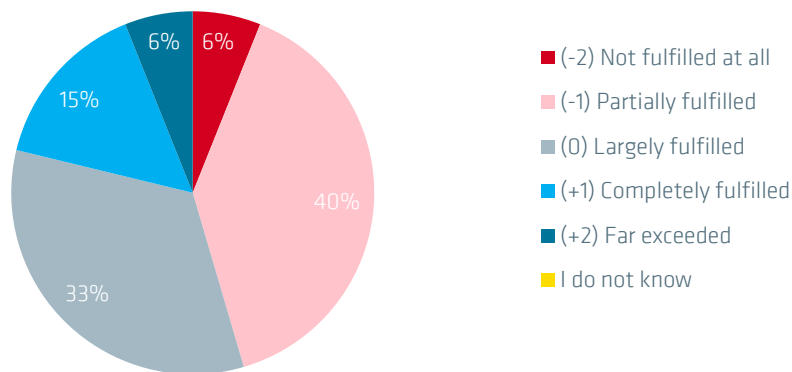
Benefits realized from digitalization (n=68)
(on a scale from (-2) not agree at all to (+2) fully agree)



- Process optimization and improving customer management/communication are the **main goals** behind the digitization efforts of CABs in Colombia. 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

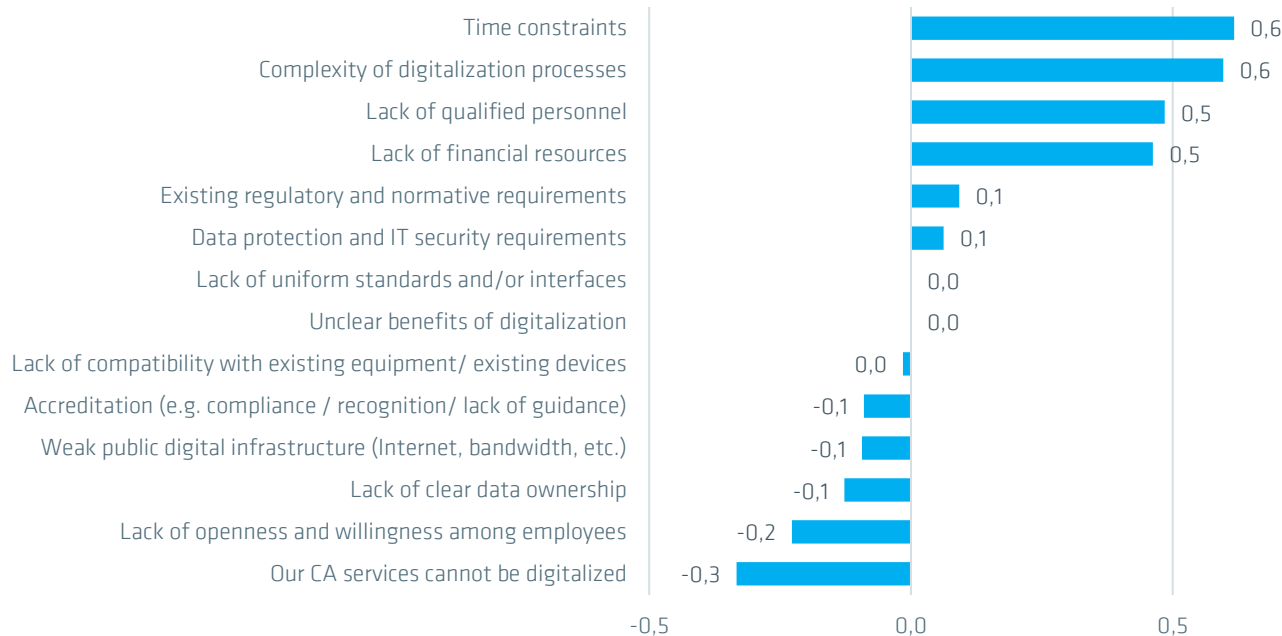
Whether the expectations behind the introduction of digital processes/technologies have been fulfilled overall so far (n=66)



- 48% of the CABs consider their expectations behind the introduction of digital technologies to have been largely or completely fulfilled. Another 40% find them at least partially fulfilled.
- Only for 6% of the CABs the expectations are not fulfilled at all. However, they 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=68)
(Scale from (-2) not at all to (+2) very much)



- Lack of time is the biggest hurdle for CABs, followed by the general complexity of digitalization processes.
- While the lack of qualified personnel and financial resources is an obstacle, a lack of openness/ readiness on the part of employees is not.
- The inability to digitalize CA services is not a hurdle for CABs.

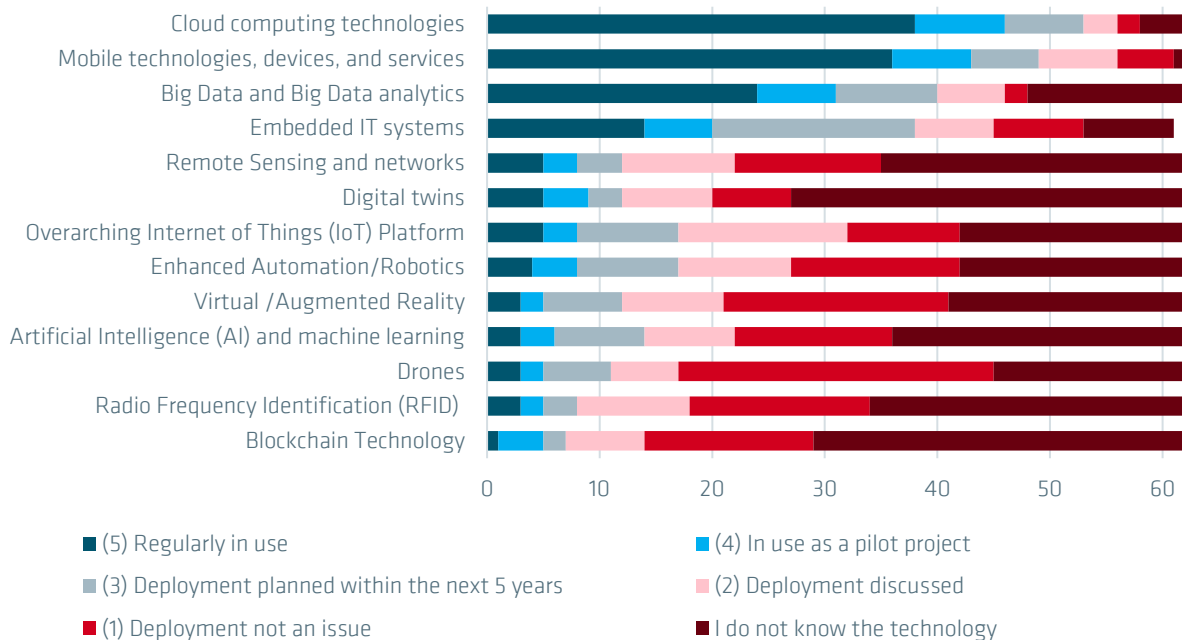
Technologies and Trends

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

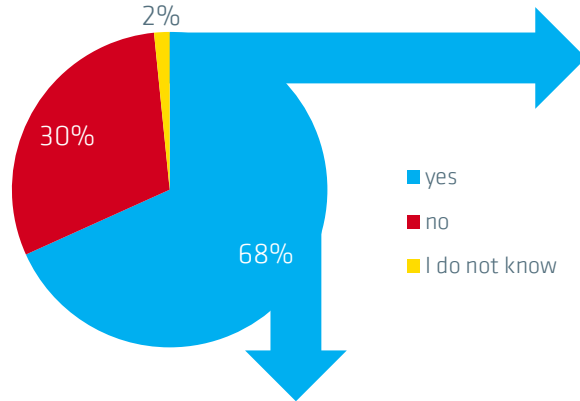
Technologies that are used or planned to be used (n=63)



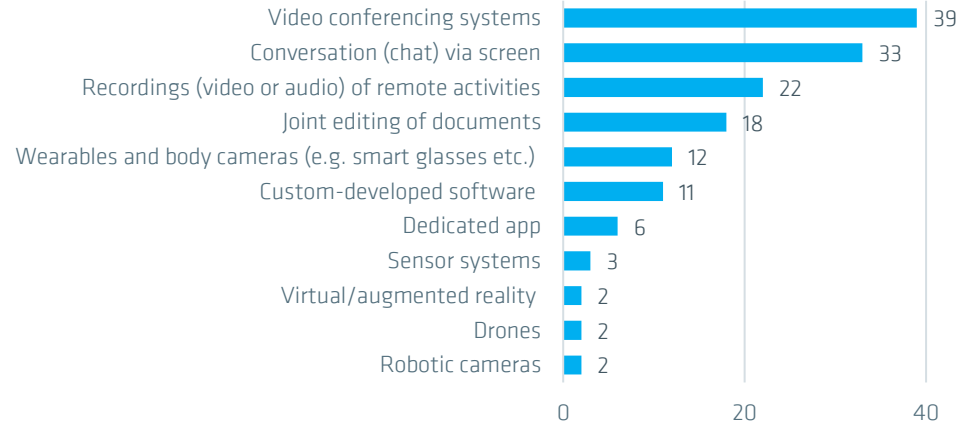
- Many of the latest digital technologies such as Big Data, virtual reality and artificial intelligence are used by CABs in Colombia, but not yet on a large scale.
- Blockchain technologies mean nothing to 53% of the respondents, digital twins to 56%.
- Among CABs, cloud computing technologies are the most widely used ones.
- Mobile technologies and Big Data are also in use in many CABs.

Remote methods and technologies are used by most CABs

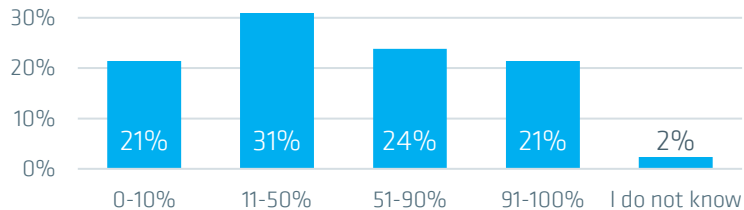
CABs that use remote methods in CA (n=63)



Technologies used for remote procedures (n=43)



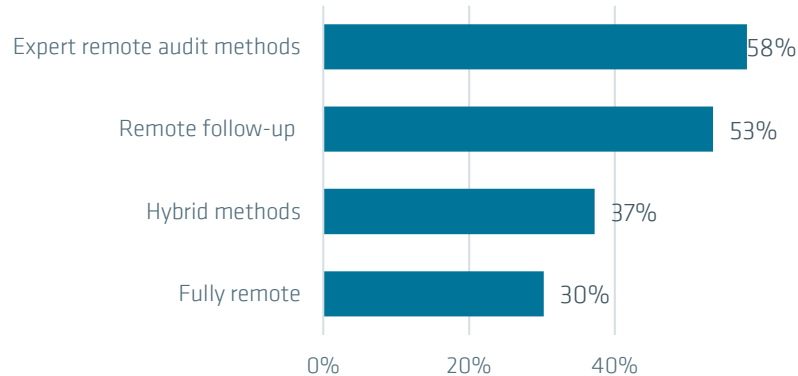
Share of CA services taking place remotely (n=42)



- 68% of the CABs use **remote methods** in their CA activities.
- While one in five CABs still performs a maximum of 10% of their activities remotely, the same number of CABs have already switched completely.
- Video conferencing is the most commonly used **tool for remote working**, while virtual reality or drones are rarely used.

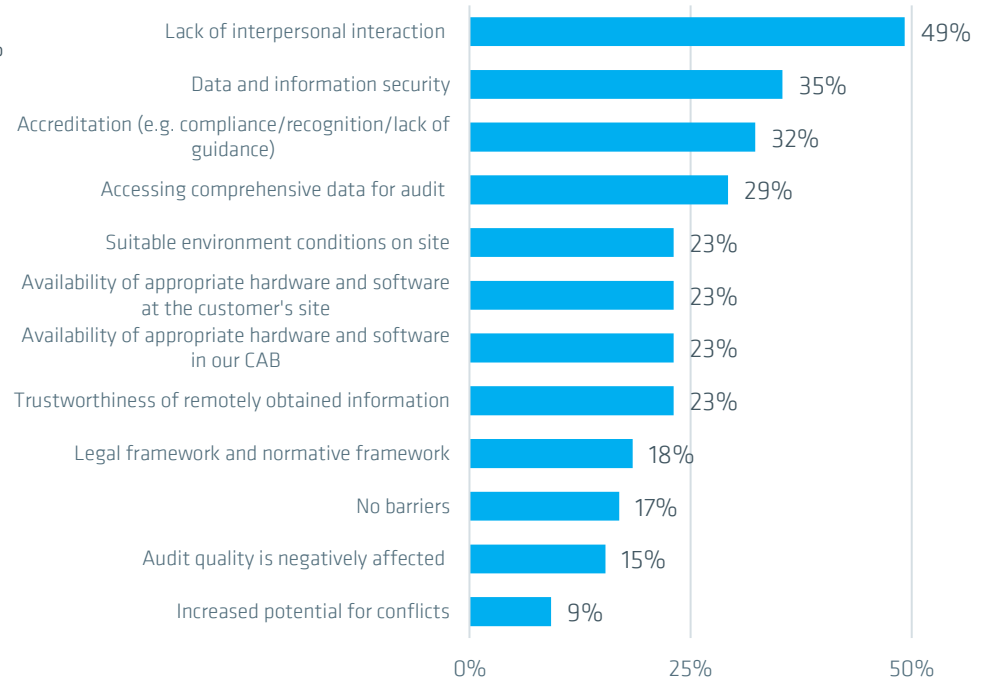
Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=43)



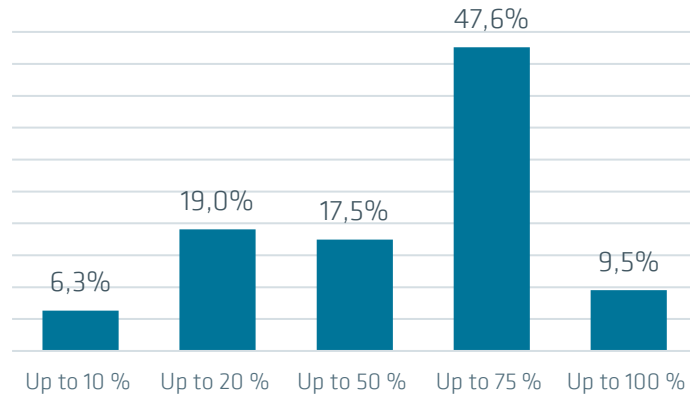
- **Expert remote audit methods** are the predominant type among remote methods used by CABs.
- Lack of interpersonal interaction is seen as the biggest **hurdle** to using remote procedures, followed by data and information security.

Barriers (65)

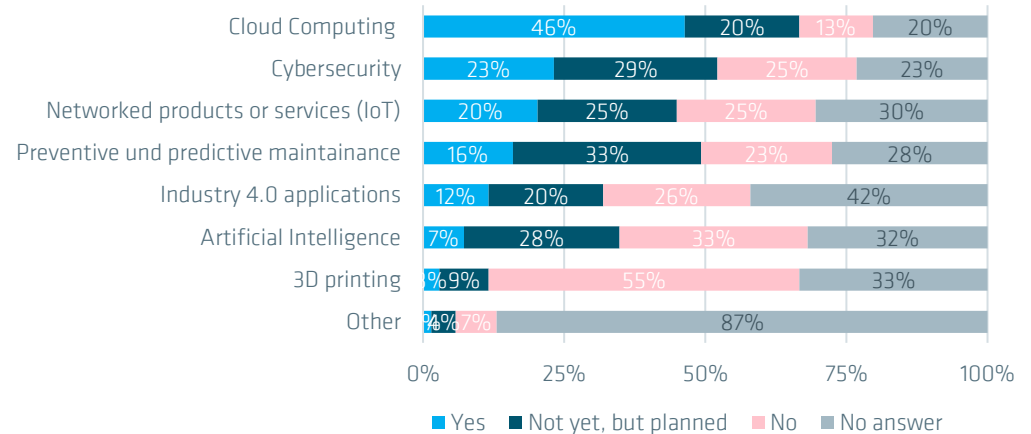


CA for advanced digital technologies is only performed by a minority of CABs so far

Share of routine processes that are digital (n=63)



Digital products and applications for which CA is conducted (n=69)



- 57% of the CABs have digitalized more than half of their **routine processes**. Only 6% of the CABs have not even digitally converted 10% of their processes.
- 57% of the surveyed CABs conduct **conformity assessments for modern digital technologies and applications**. In focus: cloud computing (46%) and cybersecurity (23%).

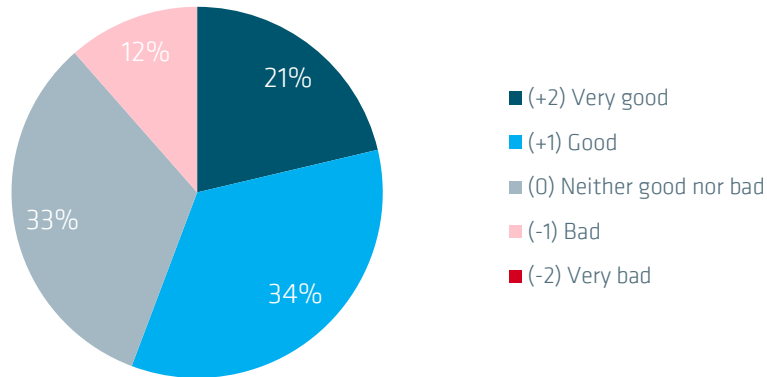
The COVID-19 Pandemic and Digitalization

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

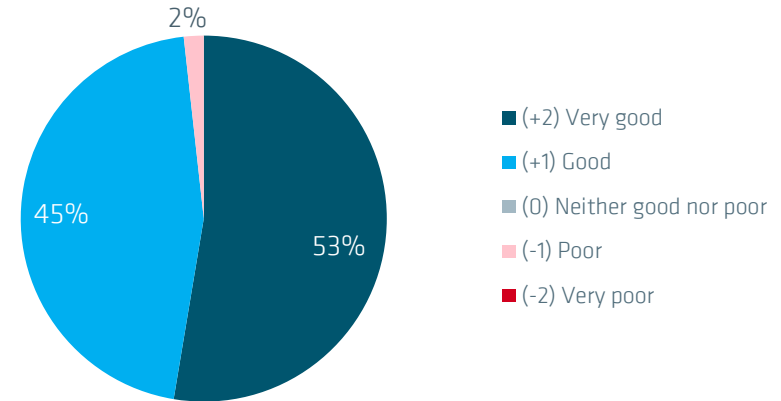
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Most CABs have coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=62)

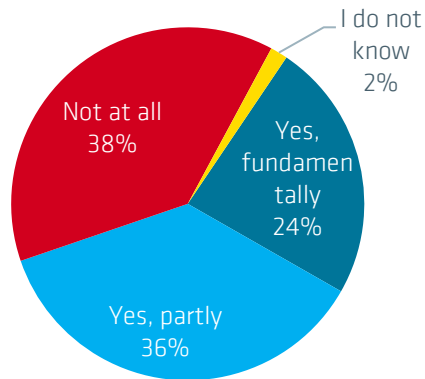


Response to the challenges of the COVID-19 pandemic (n=57)

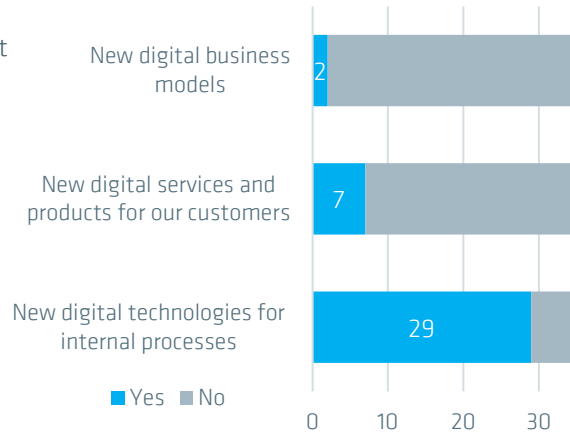


- For 33% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 21% of the CABs stated that their orders have declined, and 55% of CABs have actually seen their order situation improve.
- The majority of CABs (98%) reported that they had responded well or very well to the challenges associated with the COVID-19 pandemic.

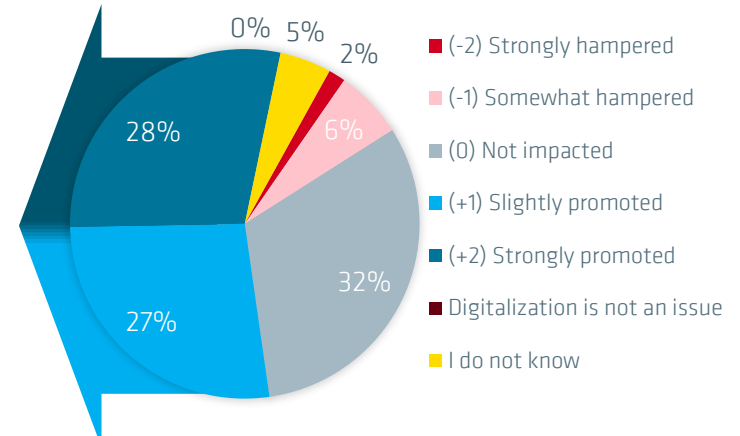
Digital technologies have helped coping with challenges of the COVID-19 pandemic (n=63)



Digital adaptation in course of the COVID-19 pandemic (n=35)



Impact of the Covid-19 pandemic on the digitalization of CABs (n=63)



- For 59% of CABs, digital technologies have helped in coping with the challenges of the COVID-19 pandemic.
- Yet, in 8% of CABs the pandemic has hampered digitalization while 55% of CABs report that digital transformation has been slightly or even strongly encouraged and has led to adaptations:
 - 83% of CABs have introduced new digital technologies for internal processes, 20% new digital services and products for their customers, 6% even new digital business models.

- CABs in Colombia clearly see digital transformation as an opportunity. The **level of digitalization** varies among CABs. 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 Colombian CABs are nevertheless confirmed: An initial focus on culture, innovation, and technology is followed by holistic organizational transformation, including strategy, cooperation and change management.
- Many of the cutting-edge digital technologies such as Big Data, virtual reality and artificial intelligence are used by CABs in Colombia, 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 remote processes - mostly expert remote audit methods.

Colombia in international comparison

How do Colombian 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 and Contacts

Project partners



Supported by



Scientific execution / authors

Dr. Luana Ladu, Dr. Claudia Koch, 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 ONAC (Organismo Nacional de Acreditación de Colombia) 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.

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

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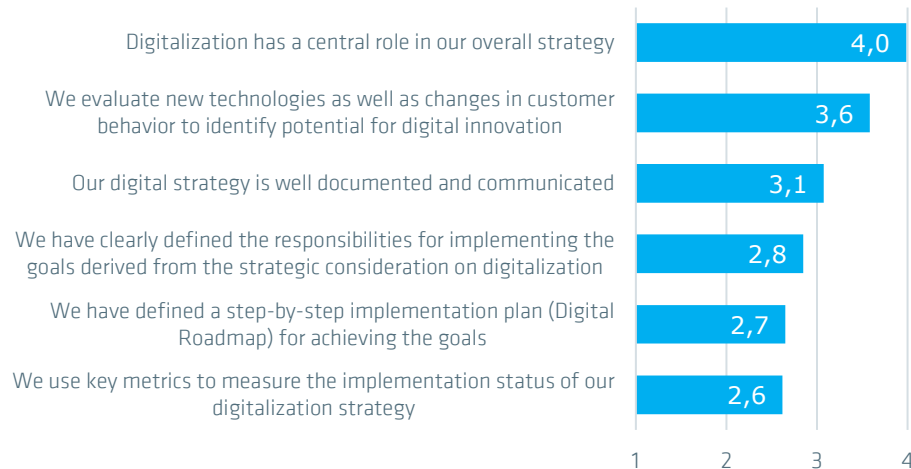
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Annexes

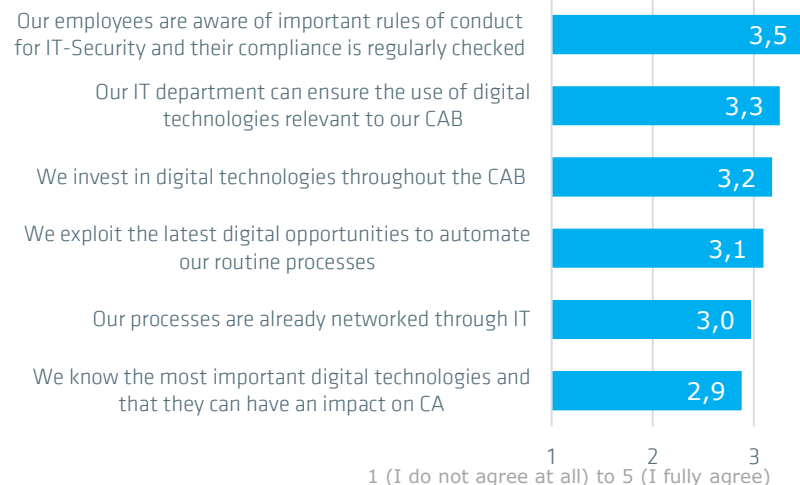
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Dimensions of digital maturity: Detailed overview

Strategy (n=67)



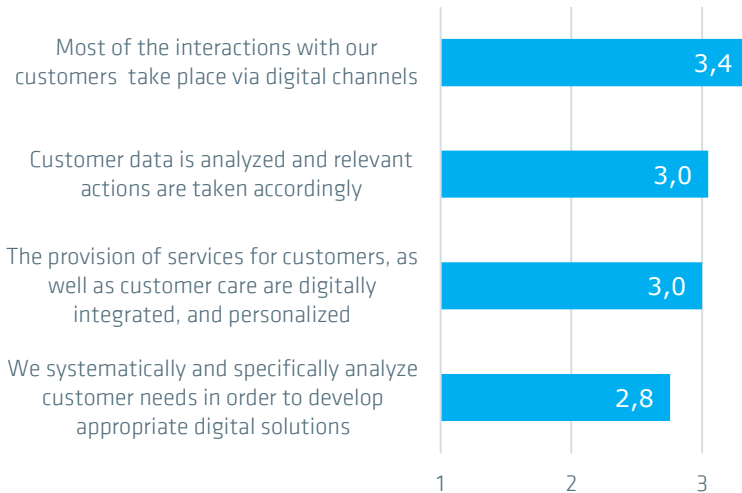
Information Technology & Process Digitalization (n=67)



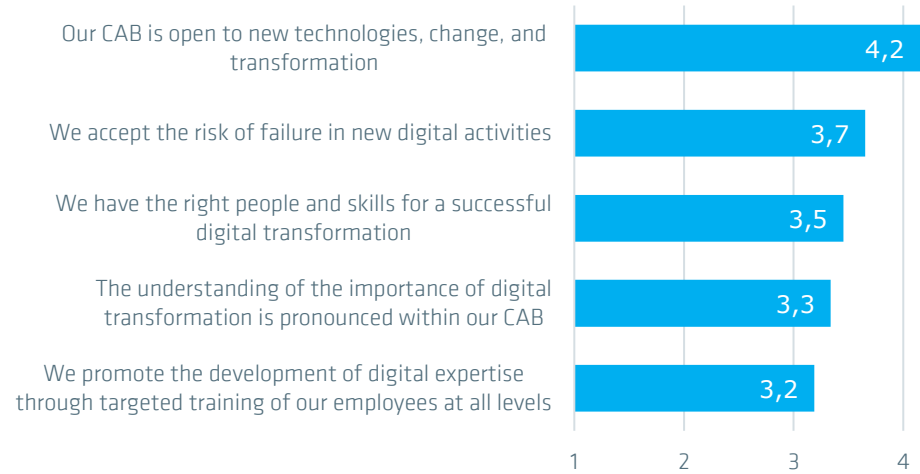
- In most CABs (80%), digitalization plays a central role in their overall strategy, with 62% having a well documented digital strategy.
- Only 54% have set up a Digital Roadmap and 52% use key metrics to measure the implementation status of their digitalization strategy.
- At least 64% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations. More than 60% of CABs have networked their processes and automated routine procedures.

Dimensions of digital maturity: Detailed overview

Customers (n=66)



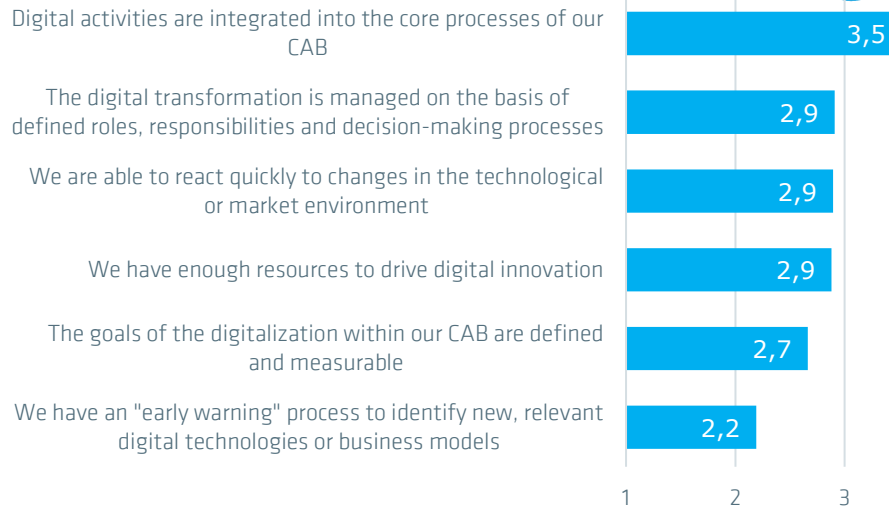
Culture & Expertise (n=65)



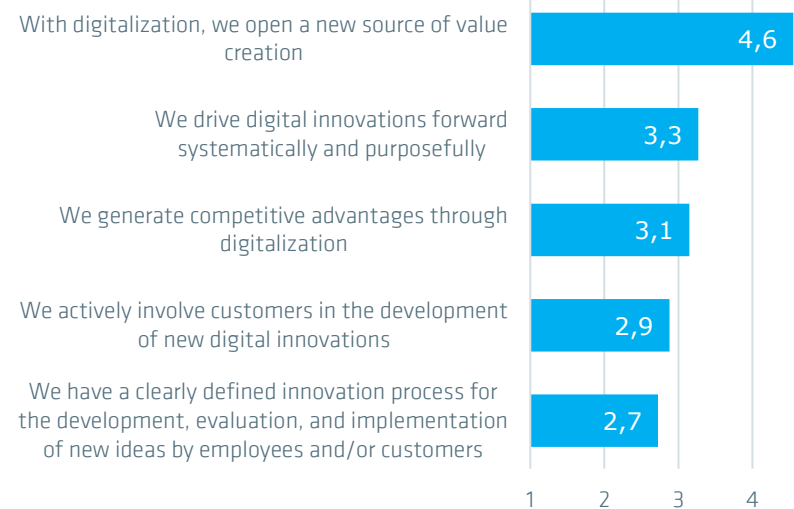
- 68% of CABs in Colombia interact with their customers via digital channels.
- 60% offer digitally integrated services to customers and only 56% of them develop appropriate digital solutions based on customer needs.
- Colombian CABs are definitely open to new technologies, changes and transformations (84%). At least 66% of them have a strong understanding of the importance of digital transformation and have the right skills to successfully implement the change.

Dimensions of digital maturity: Detailed overview

Organization & Change Management (n=67)



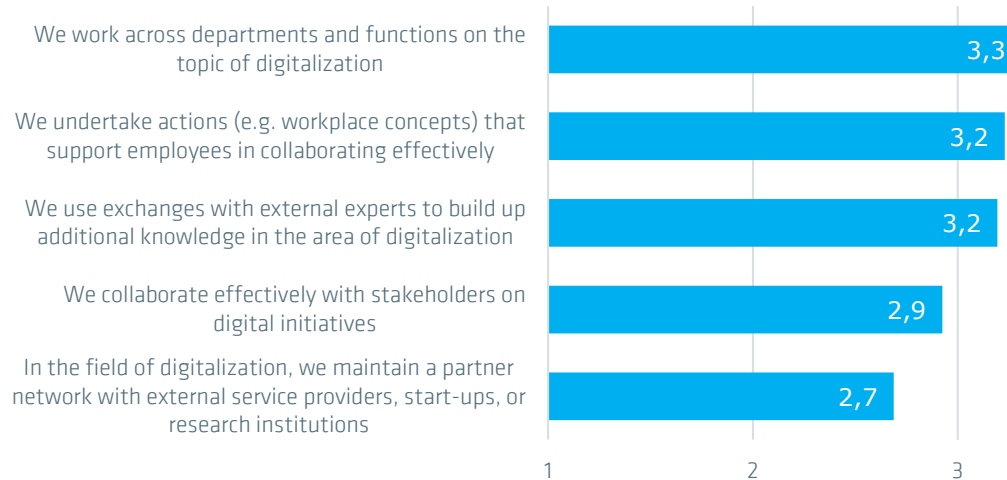
Innovation (n=67)



- 70% 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.
- For the majority of participants (92%), digitalization represents a new source of value creation.
- However, customers are hardly involved in the innovation process.

Dimensions of digital maturity: Detailed overview








Cooperation (n=67)

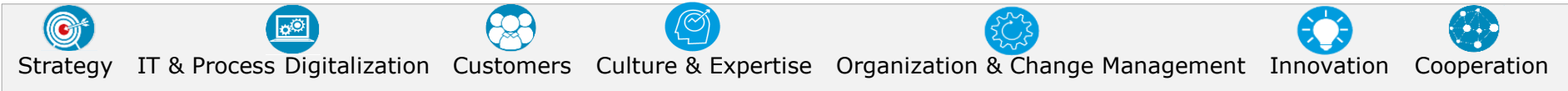


- In order to work on the topic of digitalization (66%) across departments and functions, 64% of CABs build additional knowledge through external expert consultations. They also collaborate effectively with stakeholders on various digital activities.
- 54% maintain a partner network with external service providers.

Digital Maturity Model








Level 1 (Beginner)

Description Level 1: Beginner	Dimensions						
							
Digitalization has a central role in our overall strategy	■						
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						
							
We evaluate new technologies as well as changes in customer behavior to identify potential for digital innovation							
Our IT department can ensure the use of digital technologies relevant to our CAB							
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							
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 drive digital innovations forward systematically and purposefully							
We work across departments and functions on the topic of digitalization							



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

Digital Maturity Model

Level 3

Description Level 3	Dimensions						
							
Our digital strategy is well documented and communicated	■						
We exploit the latest digital opportunities to automate our routine processes		■					
We invest in digital technologies throughout the CAB		■					
We promote the development of digital expertise through targeted training of our employees at all levels				■			
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							■



Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management



Innovation



Cooperation

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	█						
Our processes are already networked through IT		█					
We know the most important digital technologies and that they can have an impact on CA		█					
The provision of services for customers, as well as customer care are digitally integrated, and personalized			█				
We systematically and specifically analyze customer needs in order to develop appropriate digital solutions			█				
Customer data is analyzed, and relevant actions are taken accordingly			█				
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 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							
The goals of the digitalization within our CAB are defined and measurable							
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							

