

2022

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# Digitalization in Conformity Assessment in Mexico

A QI-FoKuS study

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



Audience of the survey	Accredited conformity assessment bodies (CABs) in Mexico
Data collection method	Online survey
Survey period	February 25, 2022 April 6, 2022
Sample	57 fully completed questionnaires



## Digitalization in Conformity Assessment

Online Survey



Supported by



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 Mexico.

## 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 5-year perspective)

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# The sample

General information about the participating  
Conformity Assessment Bodies

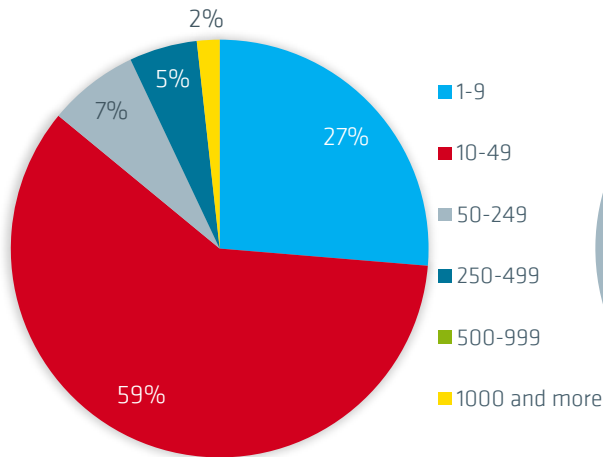
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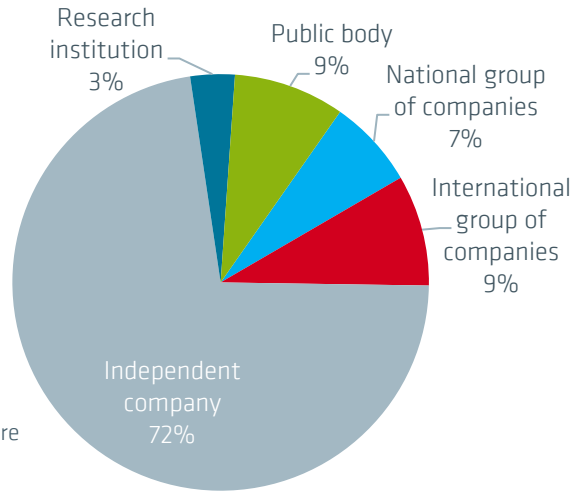
# 57 conformity assessment bodies (CABs) in Mexico participated in the survey

- 86% of participating CABs are **small businesses** with less than 50 employees
- 72% are **independent companies**, 9% belong to an **international group** and 9% are **public bodies**
- For 49%, Conformity Assessment (CA) is the main economic **focus of activity** and for 42% it is **one activity among others**

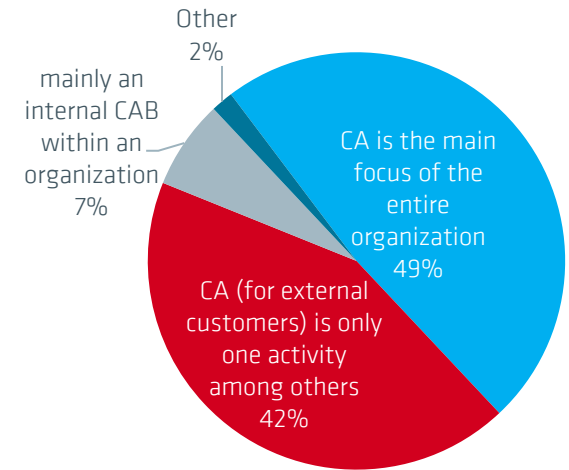
Number of employees (n=57)



Type of organization (n=57)

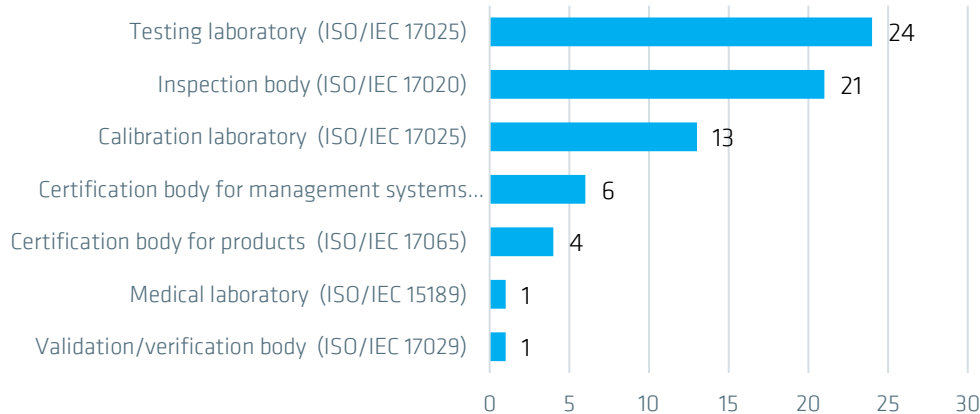


Role of CA for the organization (n=57)

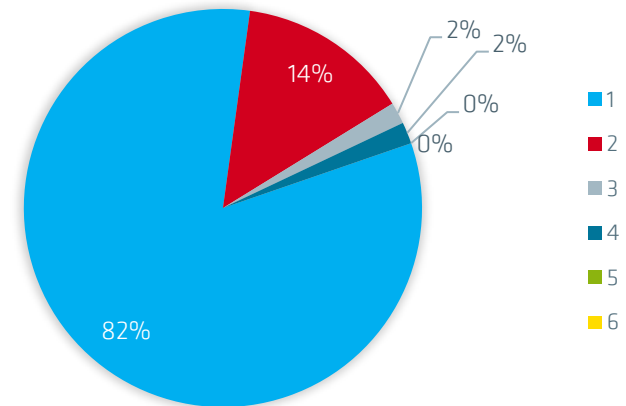


# The 57 participating CABs are active in many fields of conformity assessment

Field of activity



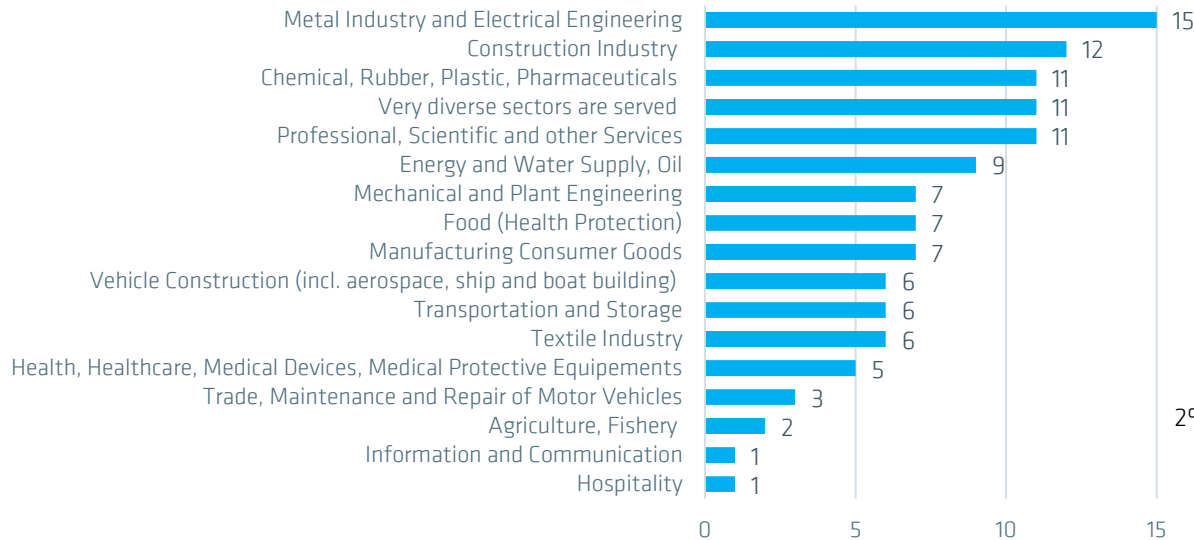
Number of fields of CA activities per CAB



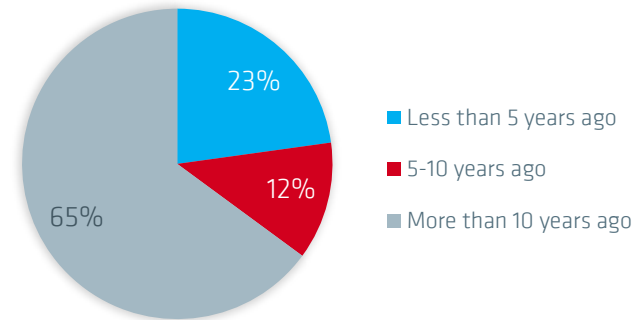
- Testing laboratories represent the **largest group of participants**, followed by inspection bodies and calibration laboratories
- 82% of CABs **specialize** in a single field of activity in conformity assessment; only a few cover a broad range of fields of activity (up to 4)

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

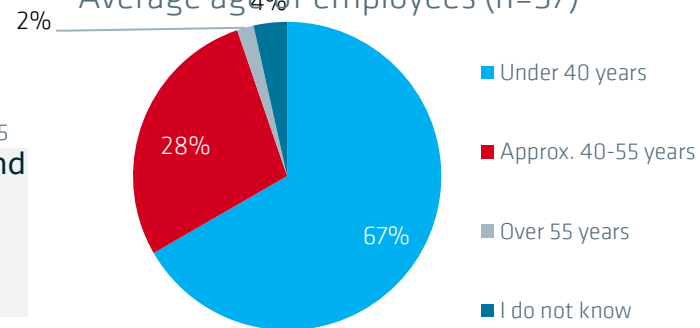
Main sectors served by the CABs



Establishment of the CAB (n=56)



Average age of employees (n=57)



- The customers served by CABs are mainly from the metal industry and electrical engineering sector, followed by the construction industry.
- 65% of CABs were **established** more than 10 years ago.
- While the **average age of the employees** is below 40 years in 67% of the CABs, it is between 40 and 50 years in 28% of the CABs



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# Digitalization in Mexican CABs A General Overview

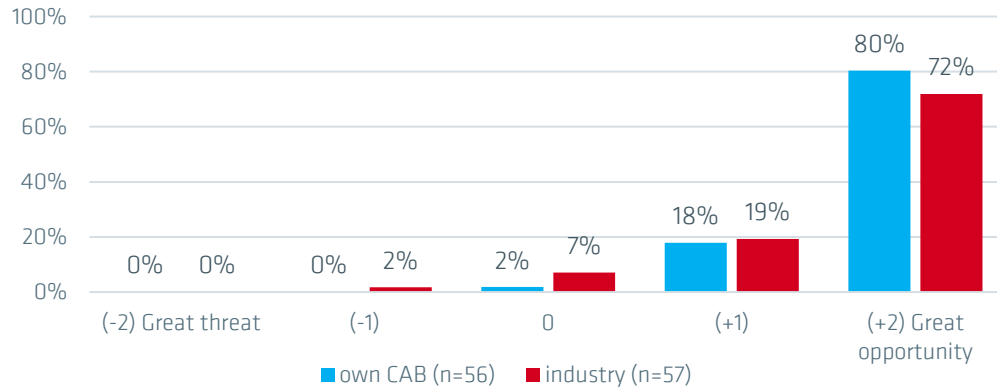
This section sheds light on how the participating CABs perceive digitalization for their organization (now and in perspective) and how they self-evaluate their current state of digital transformation.

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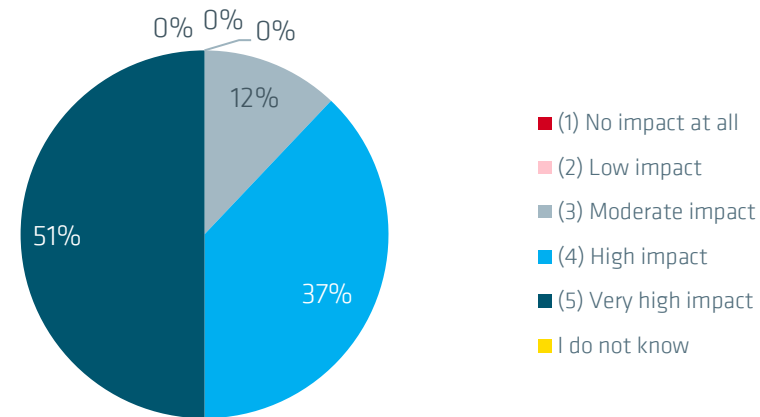
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# Digitalization more of an opportunity rather than a threat // Major influence expected

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



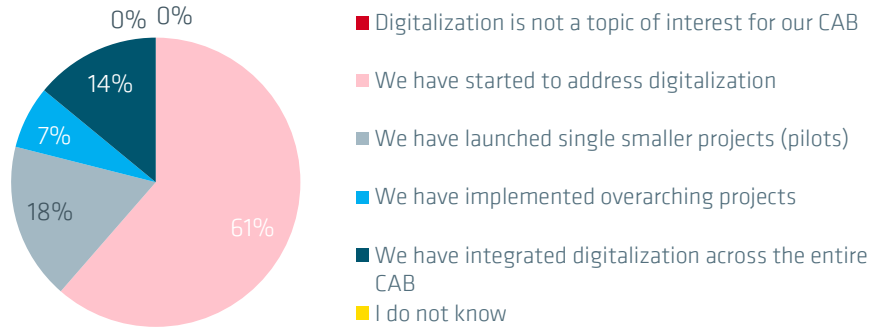
Expected impact of digitalization in the next 5-10 years (n=57)



- 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 91% with regard to the whole CA industry
- 88% of the participants expect digitalization to have a **great or even very great impact on CA activities in Mexico** in the next 5-10 years

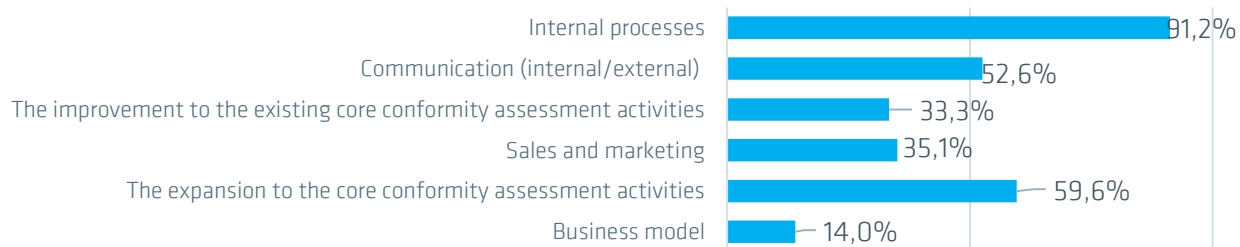
# Majority of CABs just started to address digitalization//Focus mainly on internal processes

Status and extent of digitalization in the CABs (n=57)



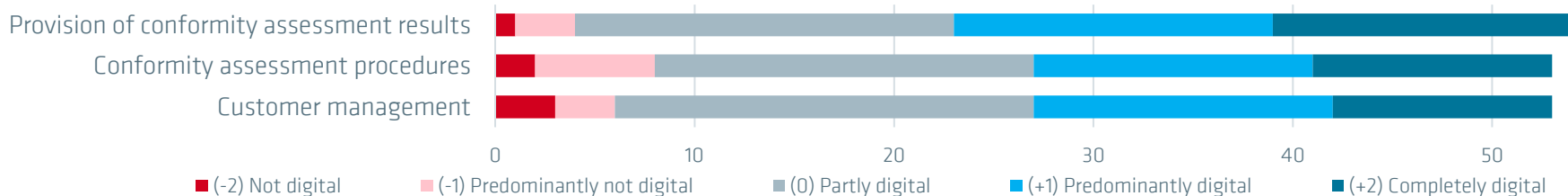
- **The status of digitalization is quite divers** among the CABs in Mexico: While the majority of the CABs (61%) have just started to address this topic, 18% have launched single smaller projects and 7% have already implemented overarching projects. 14% state that they have integrated digitalization throughout the whole organization.
- **Most digitalization activities concern internal processes.** Yet expansion to the core CA activities and communication are also relevant areas. However, digitalization is currently rarely used to improve CA services or even less to adopt new business models.

Areas targeted by digitalization (multiple answers possible, n=57)



# 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=55)

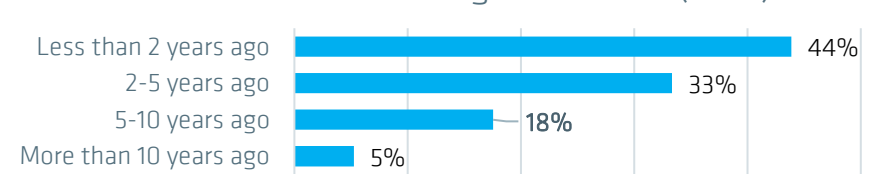


- The CA results are provided predominantly or completely digitally by the majority of CABs. Customer Management is less frequently digitalized.
- Compared to **other organizations** that are direct stakeholders, CABs rate their digital status on average as at least as good or slightly better, especially with regard to customers and the relevant authorities.
- Digitalization has not been a topic for long: the majority of CABs (77%) **has only started to deal with it** during the last 5 years. Only 5% have already done so at least 10 years ago.

Own status of digitalization compare to (n=53)  
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=57)



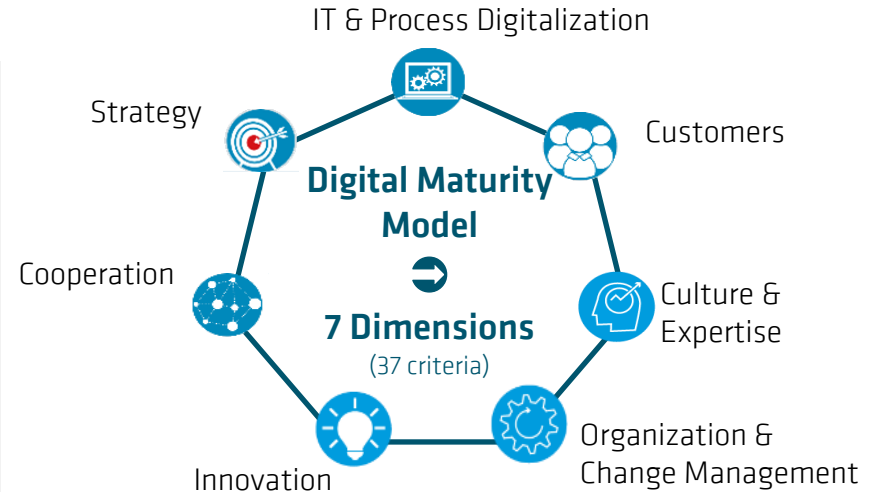
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## Digital Maturity of CABs

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 Mexico based on a model developed specifically for this study.

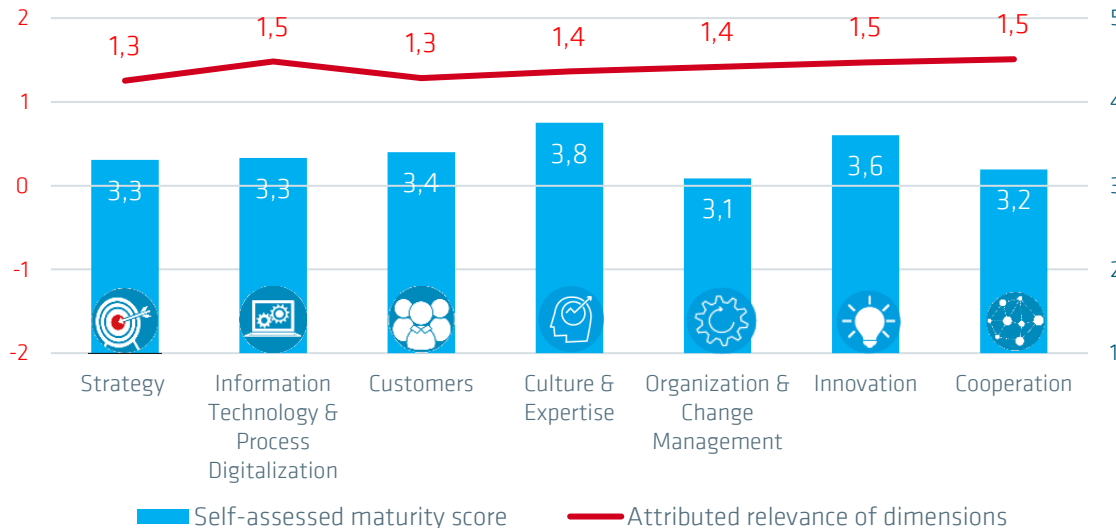
# The digital maturity model for the conformity assessment industry

- 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

Self-assessed performance in the digital maturity dimensions



\* 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).

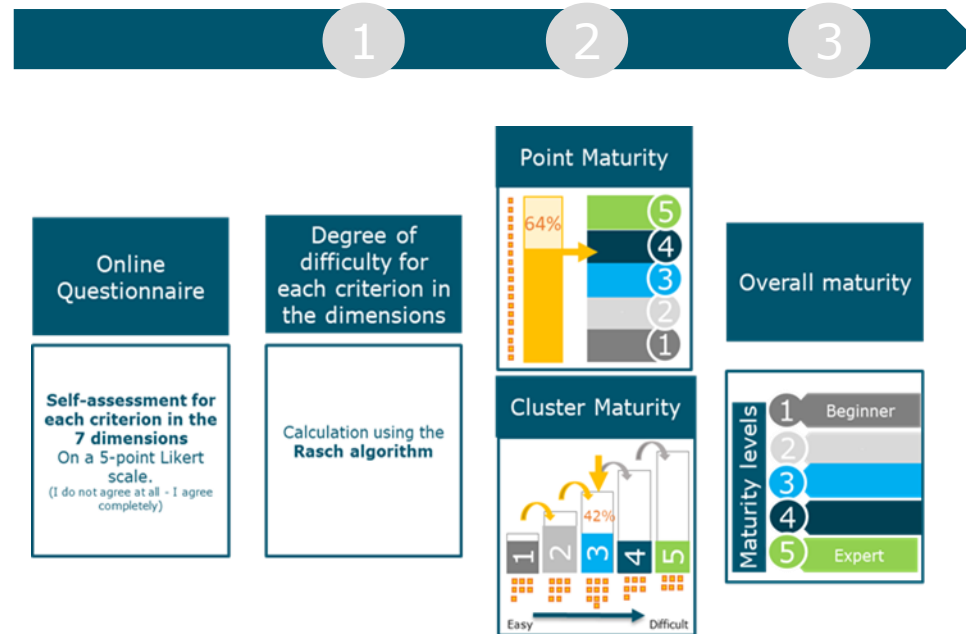
- The results of the maturity model show that the status of the CAB slightly differs in the various dimensions:
  - The CABs consider themselves to be **most advanced** in the area of "Culture and Expertise" and "Innovation" followed by "Customers"
  - The **greatest need** to catch up is in the areas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



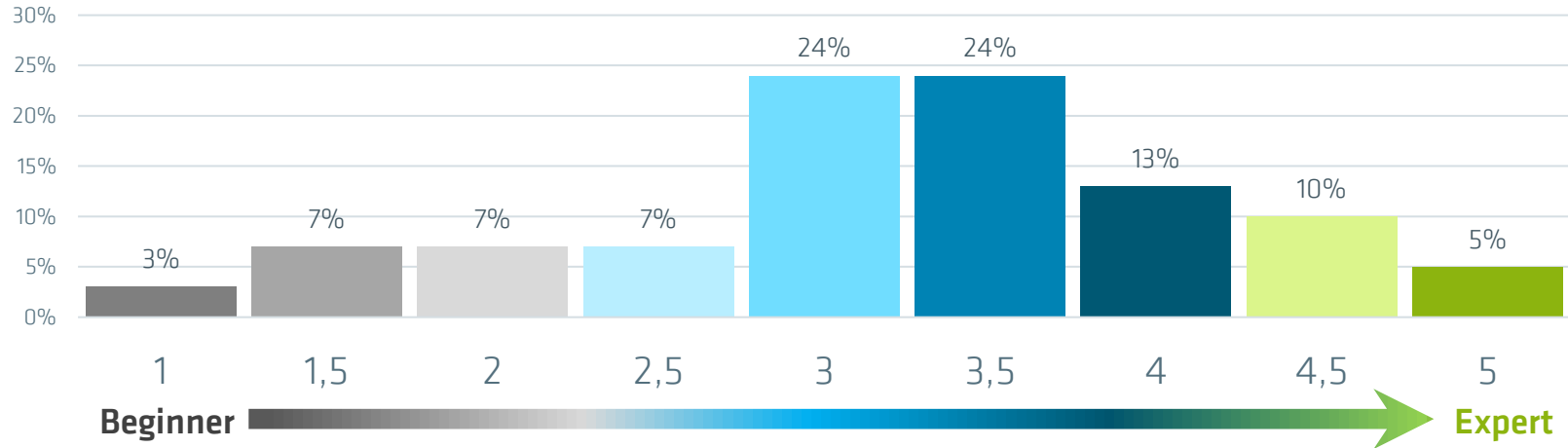
*The calculation is based on the method of the St. Gallen Maturity Model. See Back & Berghaus (2016). Digital Maturity & Transformation Study; Berghaus & Back (2016). Stages in Digital Business Transformation; and Friedel & Back (2012). Determination of enterprise 2.0 development levels with a maturity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



# Overall Digital Maturity Scores of the Mexican CA industry



Distribution of overall maturity scores (n=58)



Statistically, the **digital maturity levels** achieved by the 57 participating CABs in Mexico follow a right-skewed *normal distribution*:

- 48% of the CABs have reached medium level (i.e. 3 and 3,5). 28% of CABs have already reached a higher level of maturity whereas every fourth is still in the earlier stages of transformation.
- Only 5% of the CABs have yet achieved the expert maturity stage 5 and 3% are still on the very beginner level 1.

# The 5 Digital Maturity stages in Mexican CABs

## Beginner

1

- ✓ Digitalization has 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
- ✓ Automated routine processes
- ✓ 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
- ✓ Competitive advantages generated
- ✓ Work across departments

## Intermediate

3

- ✓ Networked processes
- ✓ Integrated, digitalized customer care
- ✓ Analysis of customer data
- ✓ Targeted training of our employees
- ✓ External experts
- ✓ Collaboration with stakeholders

4

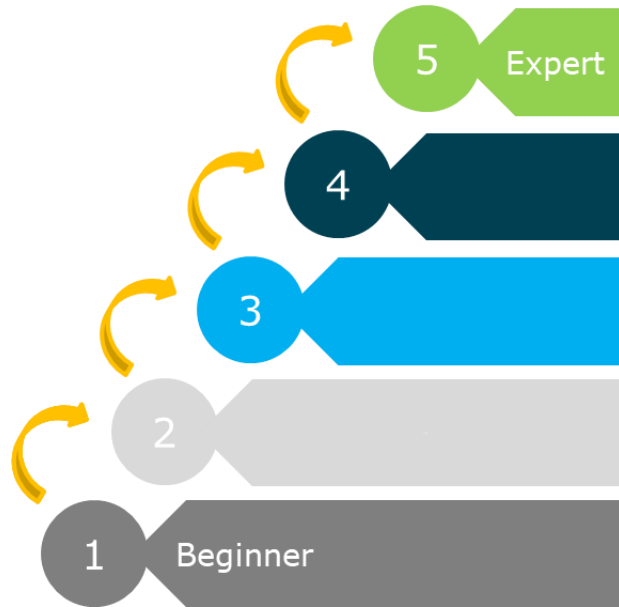
- ✓ Documented digital strategy
- ✓ Clear responsibilities for strategic goals
- ✓ Most important technologies are known
- ✓ Investments in digital technologies
- ✓ IT usage reliably ensured
- ✓ IT security: awareness and compliance
- ✓ Digital solutions based on customer needs
- ✓ Digitalization goals defined and measurable
- ✓ Quick reaction to change
- ✓ Customers involved in development of digital innovations
- ✓ Collaboration supported

## Expert

5

- ✓ Digital Roadmap
- ✓ Key indicators for measuring the implementation of the digital strategy
- ✓ Early warning system to identify relevant digital technologies and business models
- ✓ Sufficient resources to drive digital innovations
- ✓ Defined roles, responsibilities & decision-making processes
- ✓ Clearly defined innovation process
- ✓ Partner network

# The Digital Maturity of CABs in Mexico // 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. Innovation is shifting into focus, both, on a strategic and systematic level to generate competitive advantages. The necessary personnel skills/competences are available and there is cross-departmental collaboration on this topic. Importance is also given to process digitalization.
- On **stage three**, customer data are increasingly analyzed and collaboration is strengthened, also with external stakeholders.
- Organizations at the **fourth maturity level** have a strong focus on IT, where corresponding investments are made. Also, a documented digital strategy and responsibilities for strategic goals are available.
- CABs in the final **fifth stage** have a digital roadmap and a clear innovation process. Special emphasis is given to organizational adaptation i.a. with allocation of sufficient resources and defined responsibilities. A partner network for digital transformation is established.

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# Motives, Impacts and Hurdles of Digitalization

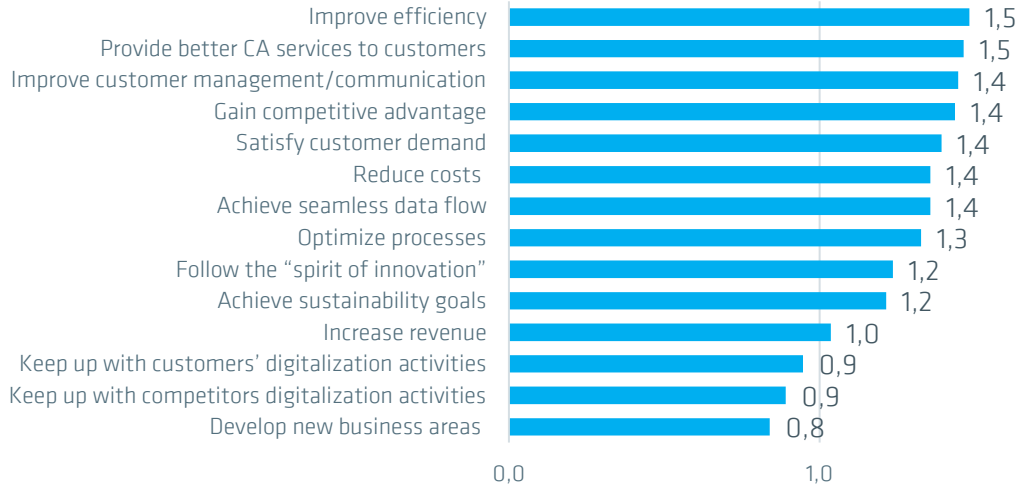
What is driving digitalization in Mexican CABs? What effects can be achieved for the organizations? Are expectations being met? And what are the biggest hurdles to be overcome in the digital transformation?

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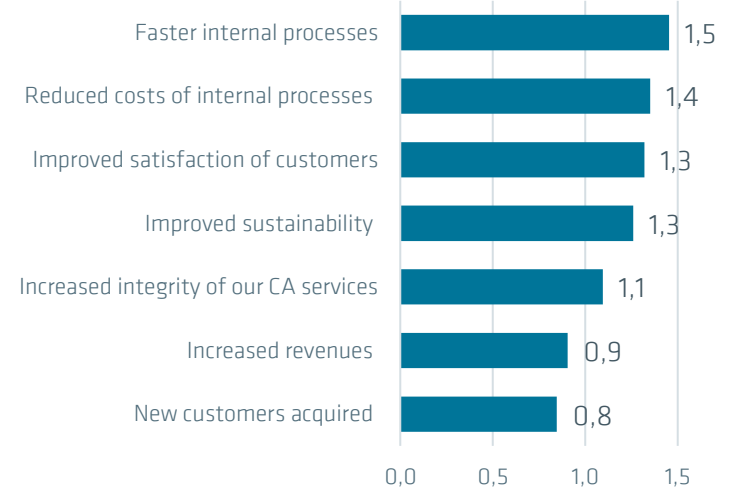
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# Focus on efficiency enhancement and customer relations - partially realized on a large scale

Goals behind the digitalization efforts (n=57)  
(on a scale from (-2) does not apply at all to (+2) fully applies)



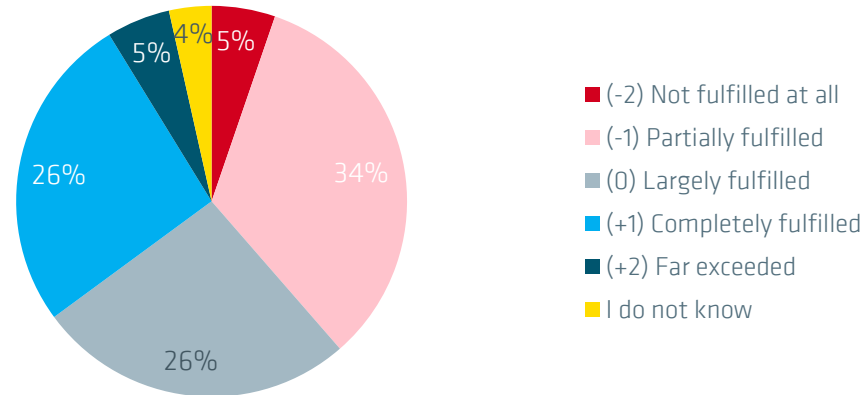
Benefits realized from digitalization (n=57)  
(on a scale from (-2) not agree at all to (+2) fully agree)



- Increased efficiency and the provision of better CA services to customers are the **main goals** behind the digitization efforts of CABs in Mexico. 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=57)

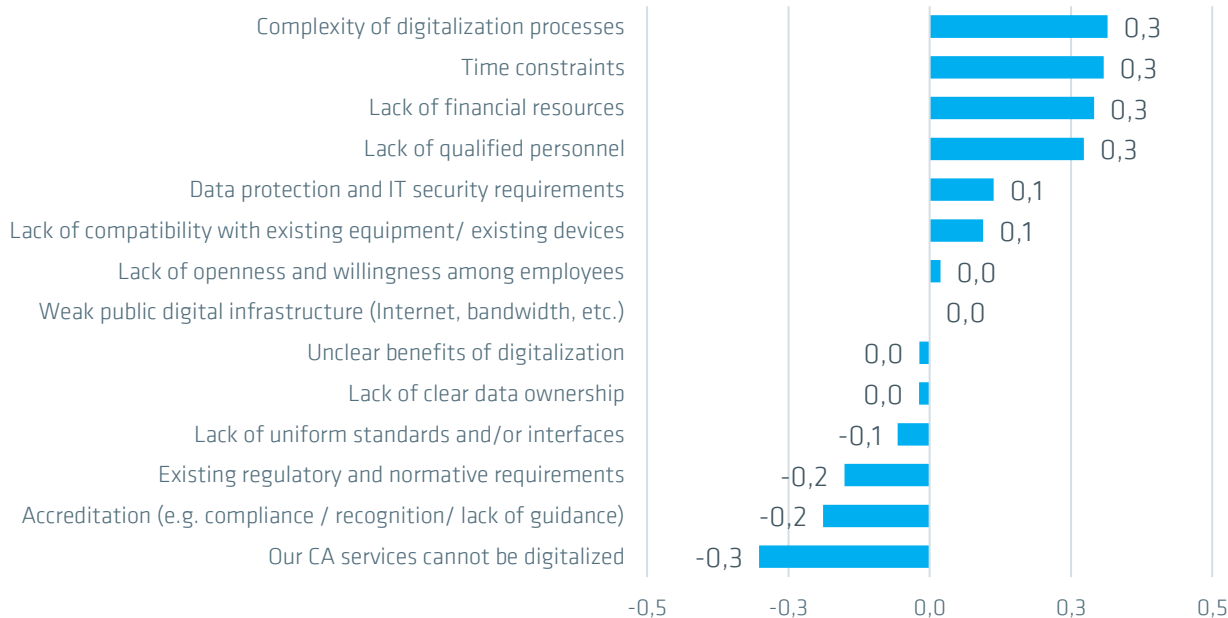


- 52% of the CABs consider their expectations behind the introduction of digital technologies to have been largely or completely fulfilled. Another 34% find them at least partially fulfilled.
- Only for 5% of the CABs the expectations are not fulfilled at all and they are pessimistic that this will remain the case.

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

## Hurdles to digital transformation (n=56)

(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 constraint in managing the digital transformation.
- While the lack of financial resources and qualified personnel is an obstacle, a lack of openness/ readiness on the part of employees is not.
- Accreditation processes and technical issues such as lack of standards and/or interfaces are not an issue for many CABs.

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## 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.

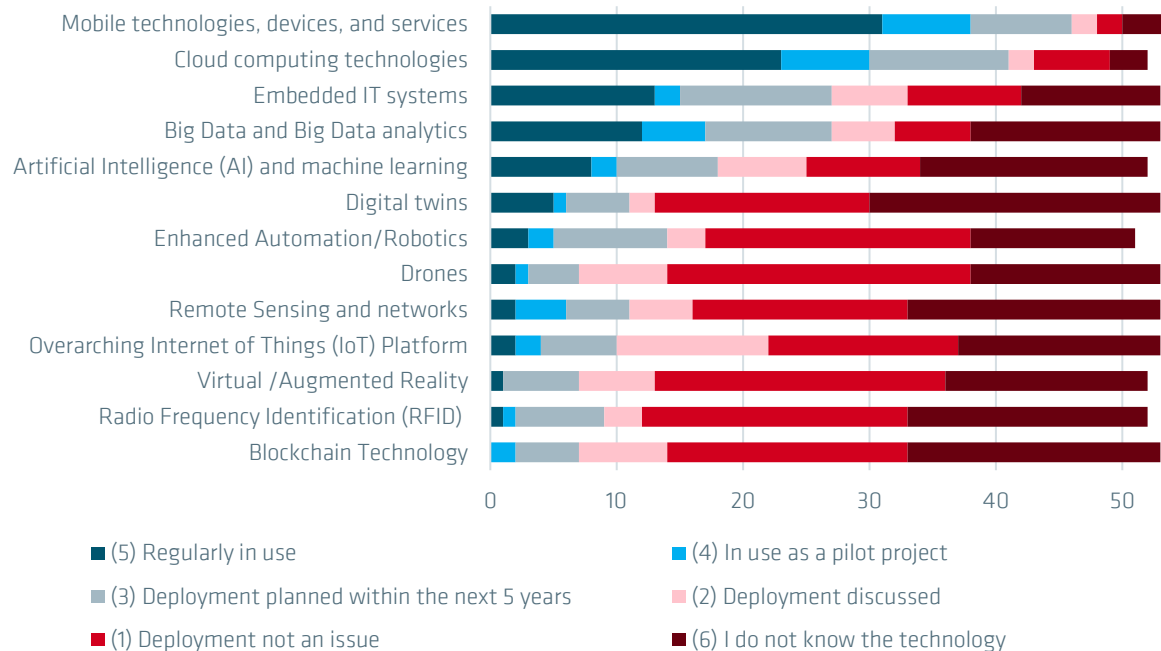
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# Latest digital technologies are not yet widely used in CABs

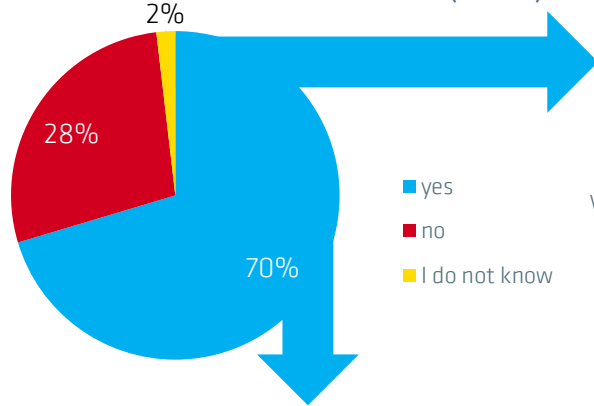
Technologies that are used or planned to be used (n=54)



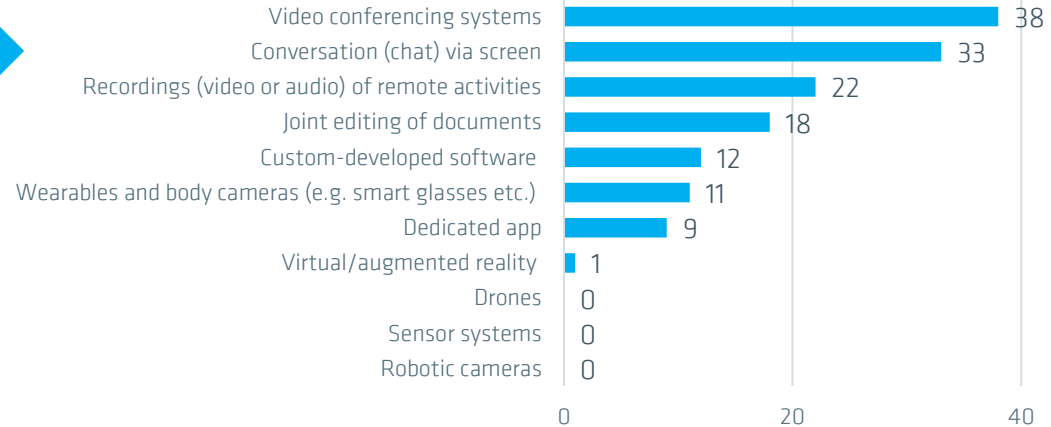
- Many of the latest digital technologies such as Big Data, artificial intelligence and virtual reality are used by CABs in Mexico, but not yet on a large scale. Blockchain Technology is not deployed at all.
- Blockchain technologies mean nothing to 38% of the respondents, digital twins to 43%.
- Among CABs, mobile technologies are the most widely used ones.
- Cloud computing technologies and embedded IT systems are also in use in many CABs.

# Remote methods and technologies are used by most CABs

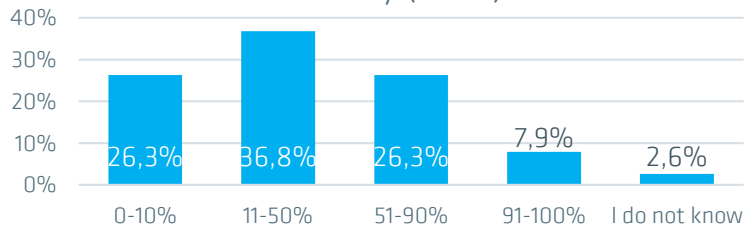
CABs that use remote methods in CA (n=54)



Technologies used for remote procedures (n=38)



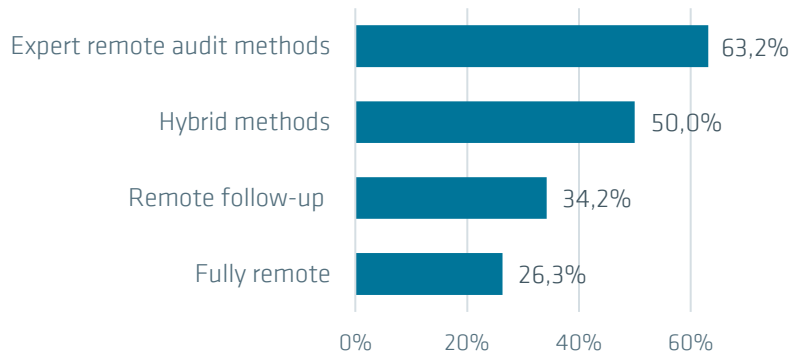
Share of CA services taking place remotely (n=38)



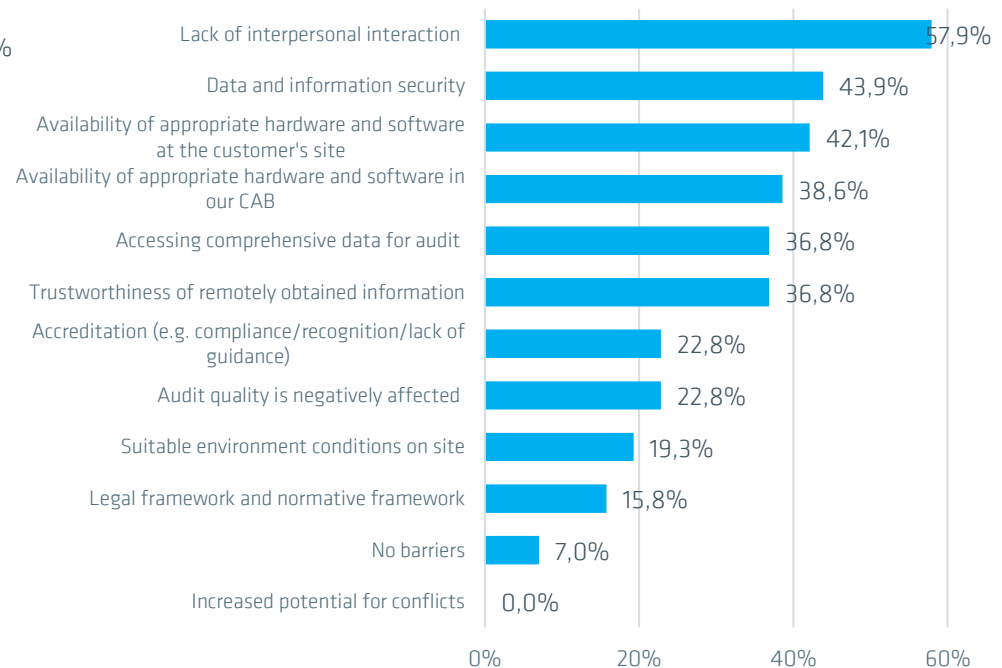
- 70% of the CABs use **remote methods** in their CA activities.
- Of these, however, 26% perform max. 10% of their activities remotely. Only a few (8%) have switched completely.
- Video conferencing is the most common used **tool for remote working**, while virtual reality or drones are rarely or not used at all.

# Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=38)



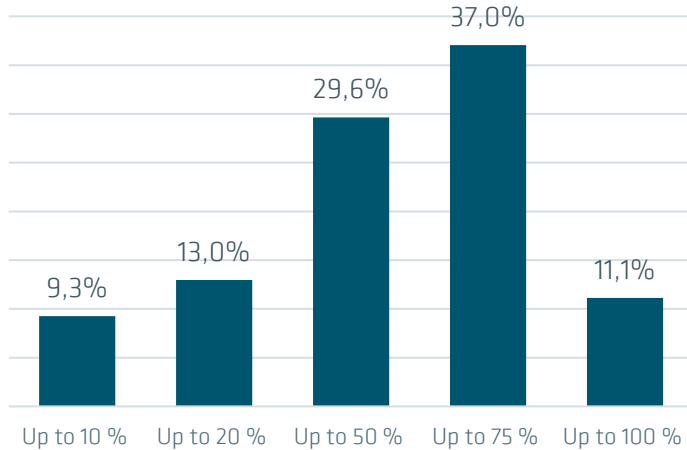
Barriers (n=57)



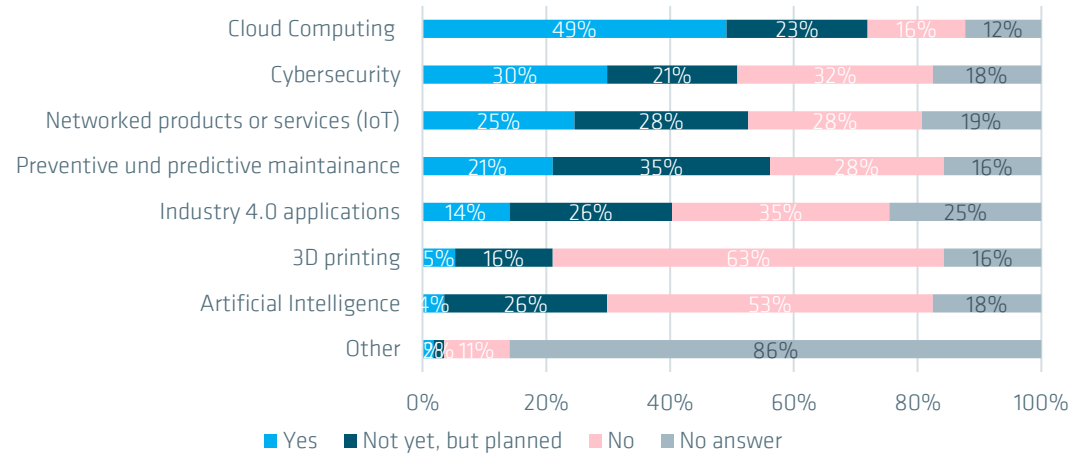
- **Expert remote audit methods** are the predominant type among remote methods used by CABs.
- Lack of interpersonal interaction is seen as the biggest **hurdle** to using remote procedures, followed by data and information security.

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

Share of routine processes that are digital (n=54)



Digital products and applications for which CA is conducted (n=59)



- 48% 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.
- 65% of the surveyed CABs conduct **conformity assessments for modern digital technologies and applications**. In focus: cloud computing (49%) and cybersecurity (30%).

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# The COVID-19 Pandemic and Digitalization

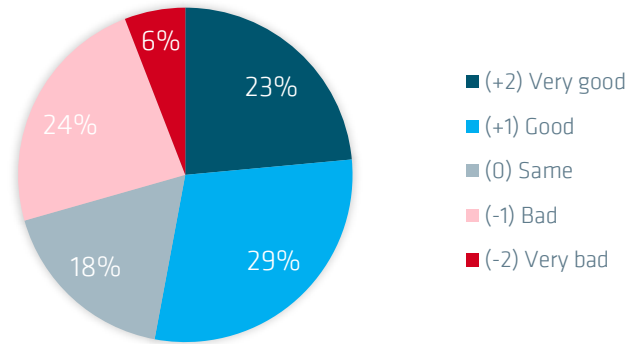
The role of digitalization in responding to the challenges posed by the COVID-19 pandemic and the impact of the pandemic on digitalization.

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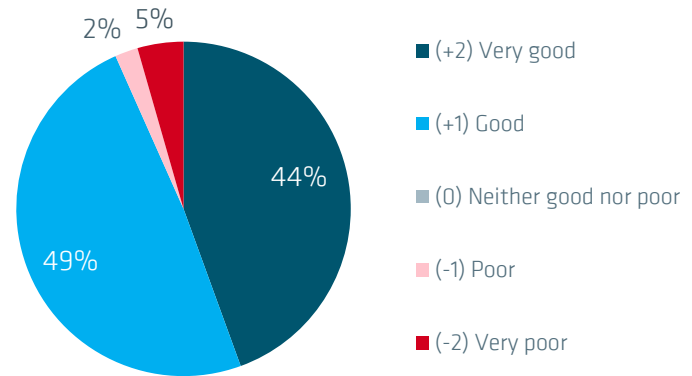
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# Most CABs have coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=52)

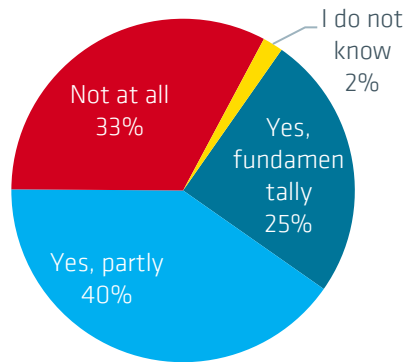


Response to the challenges of the COVID-19 pandemic (n=46)

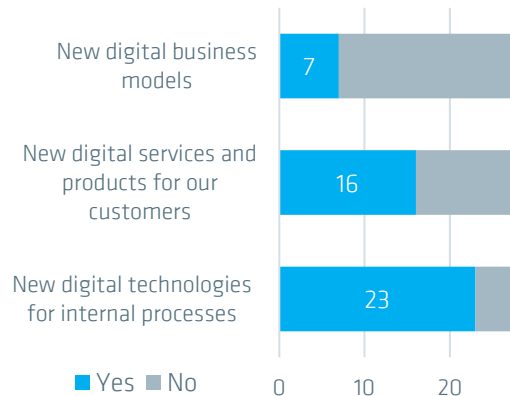


- For 18% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 30% of the CABs stated that their orders have declined, and 52% of CABs have actually seen their order situation improve.
- The majority of CABs (93%) reported that they had responded well or very well to the challenges associated with the COVID-19 pandemic

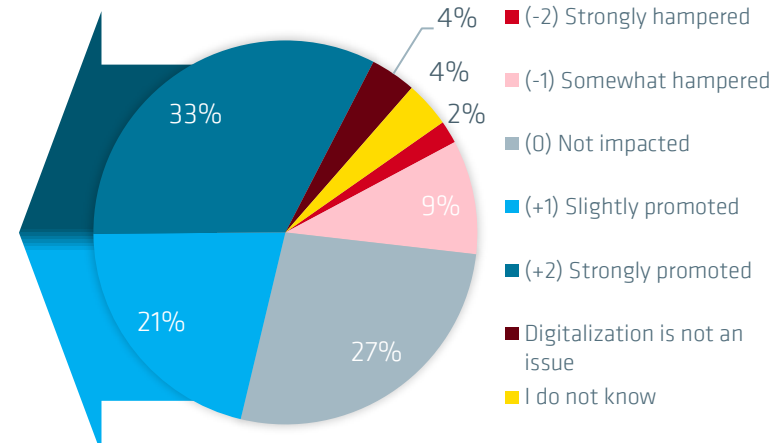
Digital technologies have helped coping with challenges of the COVID-19 pandemic (n=52)



Digital adaptation in course of the COVID-19 pandemic (n=28)



Impact of the Covid-19 pandemic on the digitalization of CABs (n=52)



- For 65% of CABs, digital technologies have helped in coping with the challenges of the COVID-19 pandemic.
- Yet, in 11% of CABs the pandemic has hampered digitalization while 54% of CABs report that digital transformation has been slightly or even strongly encouraged and has led to adaptations:
  - 82% of CABs have introduced new digital technologies for internal processes, 57% new digital services and products for their customers, 25% even new digital business models.

- CABs in Mexico 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 Mexican CABs are nevertheless confirmed: An initial focus on culture, innovation, customers and technology is followed by holistic organizational transformation, including strategy, cooperation and change management.
- Many of the cutting-edge digital technologies have not yet found their way into application in CABs. Only Big Data and artificial intelligence are regularly in use by few CABs in Mexico.
- 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.

## Mexico in international comparison

How do Mexican 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](http://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](http://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



**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](http://www.qi-fokus.de)

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# Annexes

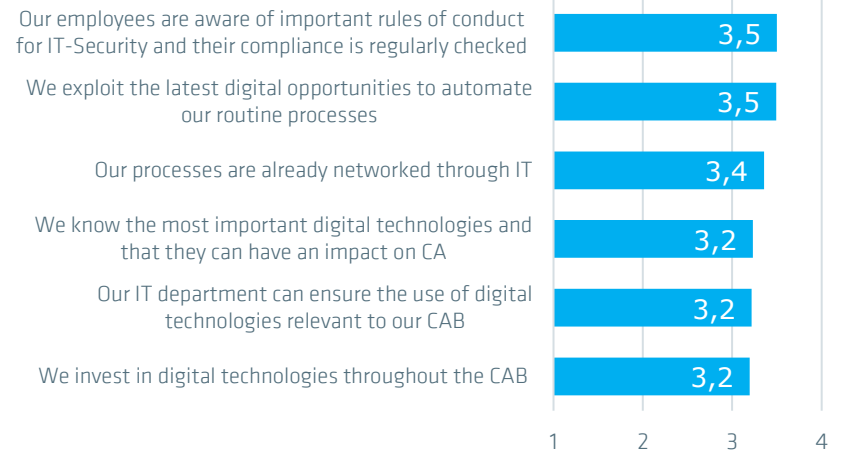
[www.bam.de](http://www.bam.de)

# Dimensions of digital maturity: Detailed overview

## Strategy (n=57)



## Information Technology & Process Digitalization (n=56)

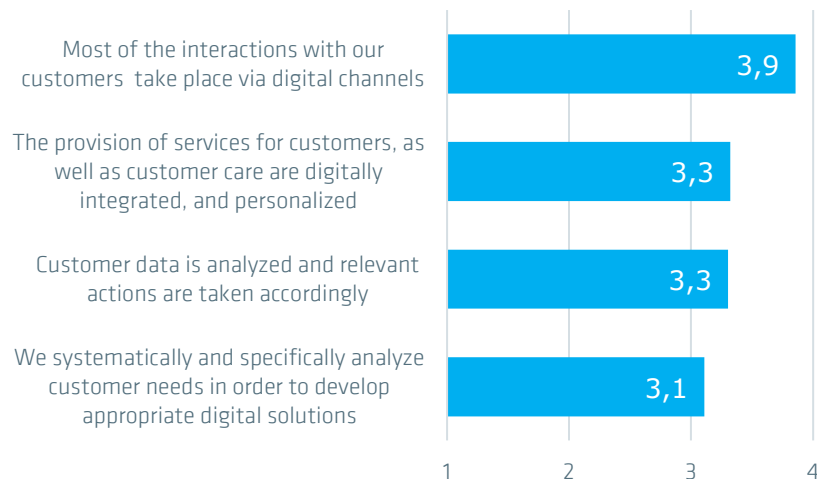


1 (I do not agree at all) to 5 (I fully agree)

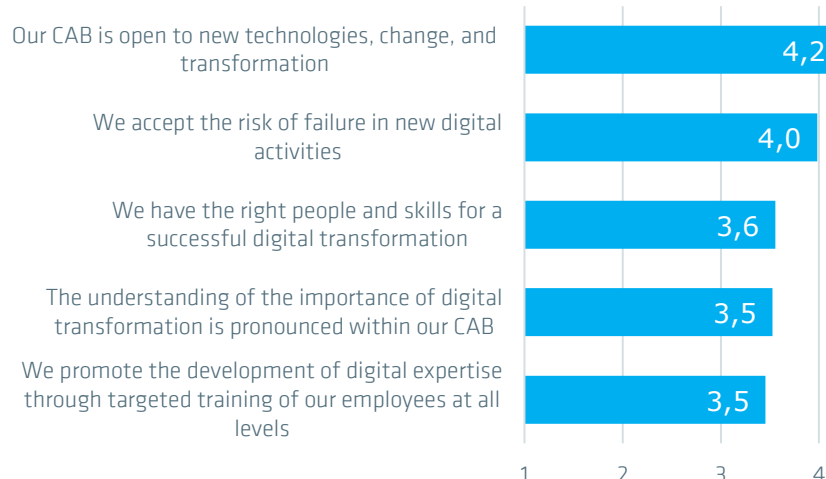
- In most CABs (82%), digitalization plays a central role in their overall strategy, with 66% having a well documented digital strategy.
- Only 56% have set up a Digital Roadmap and use key metrics to measure the implementation status of their digitalization strategy.
- At least 64% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations. More than 68% of CABs have networked their processes and automated routine procedures.

# Dimensions of digital maturity: Detailed overview

Customers (n=56)



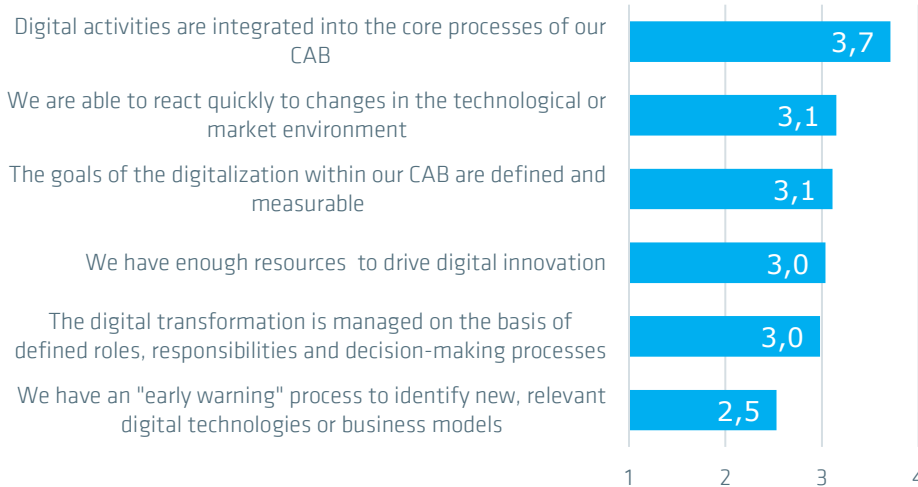
Culture & Expertise (n=56)



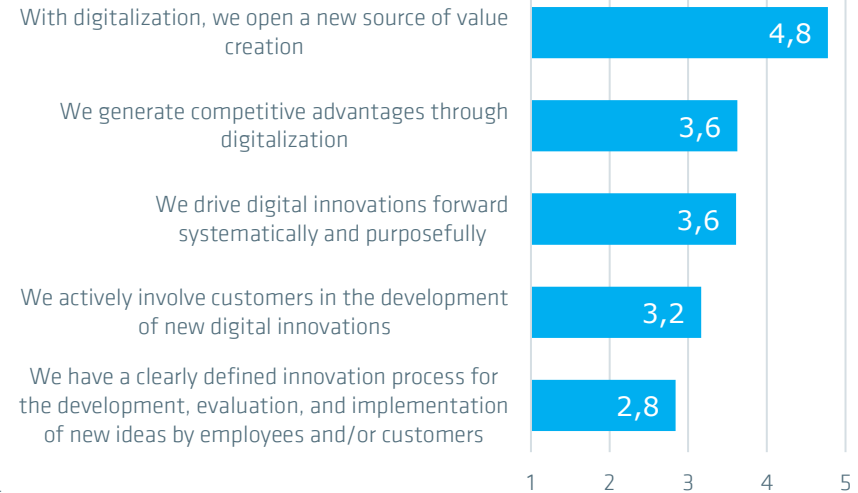
- 78% of CABs in Mexico interact with their customers via digital channels.
- 66% offer digitally integrated services to customers and only 62% of them develop appropriate digital solutions based on customer needs.
- Mexican CABs are definitely open to new technologies, changes and transformations (84%). At least 70% 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=55)

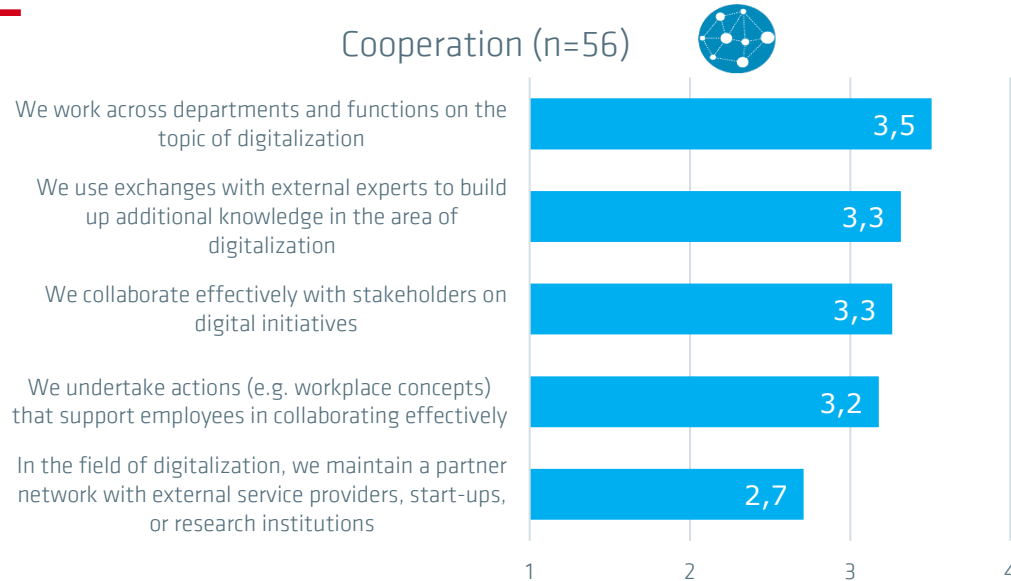


## Innovation (n=56)



- 74% 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 (96%), digitalization represents a new source of value creation.
- However, customers are hardly involved in the innovation process.








# Dimensions of digital maturity: Detailed overview

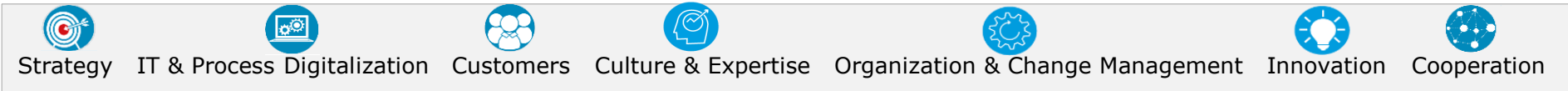


- In addition, to work across departments and functions on the topic of digitalization (70%), two-thirds of the CABs build additional knowledge through external expert consultations. They also work effectively with stakeholders on different digital activities. Every second CAB maintains a partner network 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	■						
We exploit the latest digital opportunities to automate our routine processes		■					
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 generate competitive advantages through digitalization						■	
We work across departments and functions on the topic of digitalization							■


  
Strategy


  
IT & Process


  
Digitalization

  
Customers

  
Culture & Expertise








  
Organization & Change Management

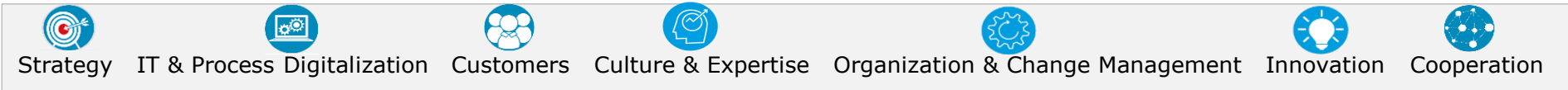
  
Innovation

  
Cooperation

# Digital Maturity Model








## Level 3

Description Level 3	Dimensions						
							
Our processes are already networked through IT		■					
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			■				
We promote the development of digital expertise through targeted training of our employees at all levels				■			
We use exchanges with external experts to build up additional knowledge in the area of digitalization							■
We collaborate effectively with stakeholders on digital initiatives							■



# Digital Maturity Model

## Level 4

Description Level 4	Dimensions						
							
Our digital strategy is well documented and communicated	█						
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 invest in digital technologies throughout the CAB		█					
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		█					
We systematically and specifically analyze customer needs in order to develop appropriate digital solutions			█				
The goals of the digitalization within our CAB are defined and measurable					█		
We are able to react quickly to changes in the technological or market environment					█		
We actively involve customers in the development of new digital innovations						█	
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 5 (Experts)


Description Level 5: Expert	Dimensions						
							
We have defined a step-by-step implementation plan (Digital Roadmap) for achieving the goals							
We use key metrics to measure the implementation status of our digitalization strategy							
We have an "early warning" process to identify new, relevant digital technologies or business models for us							
We have enough resources to drive digital innovation							
The digital transformation is managed on the basis of defined roles, responsibilities and decision-making processes							
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