

2022

Digitalization in Conformity Assessment in Peru

A QI-FoKuS study

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



Basic statistical population for the survey	268 accredited conformity assessment bodies (CABs) in Peru
Data collection method	Online survey
Survey period	January 22, 2022 February 28, 2022
Sample	62 fully completed questionnaires (=23% response rate)

QI-FoKuS
Research on Conformity Assessment and Safety

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 Peru.

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

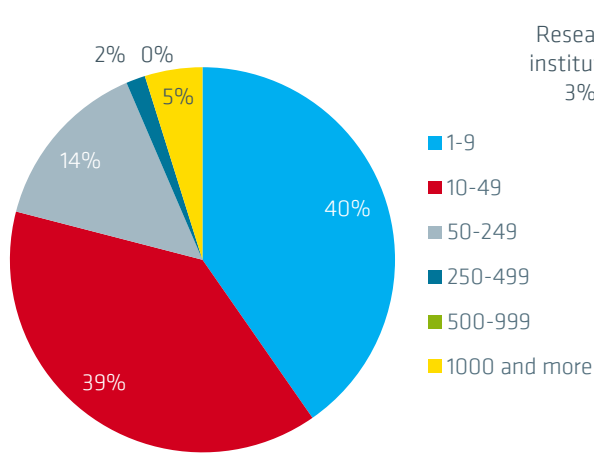
General information about the participating
Conformity Assessment Bodies

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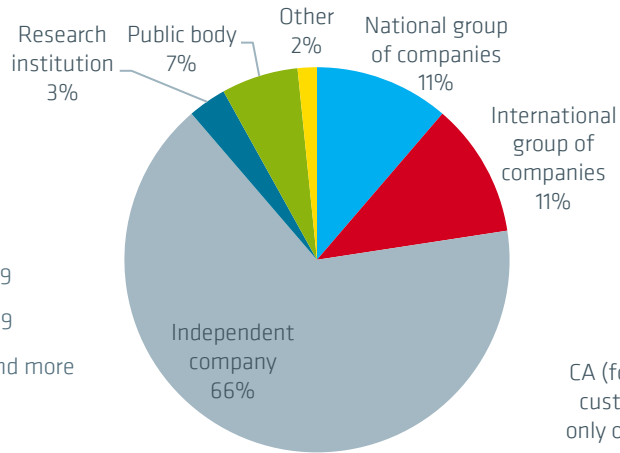
62 conformity assessment bodies (CABs) in Peru participated in the survey

- 79% of participating CABs are **small and medium-sized businesses (SMEs)** with less than 50 employees.
- 66% are **independent companies**, 11% belong to an **international group of companies**, 11% to a **national group of companies** and 7% are **public bodies**.
- For 45%, Conformity Assessment (CA) is the main economic **focus of the activity**, and for 26% it is **one activity among others**.

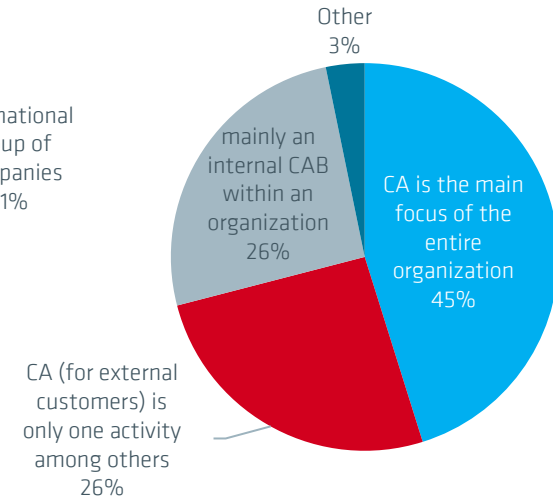
Number of employees (n=62)



Type of organization (n=62)

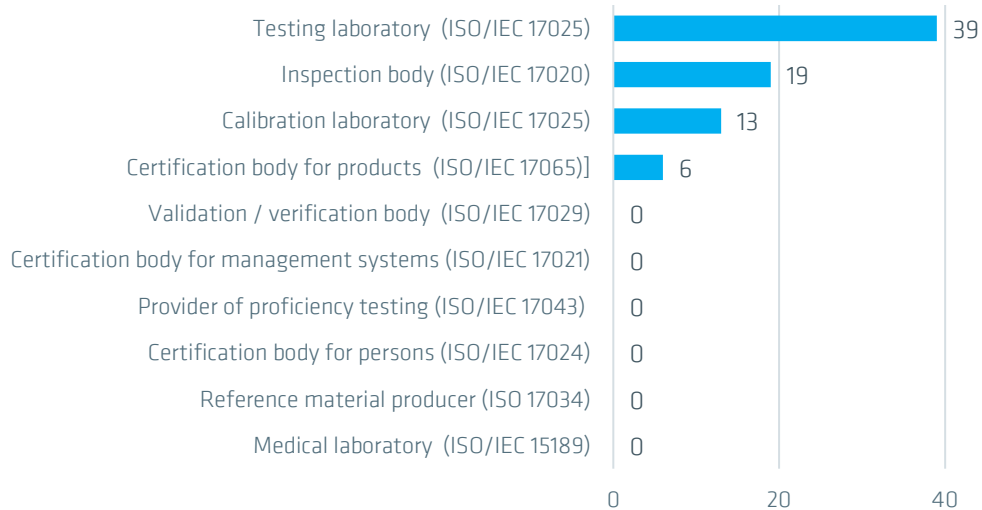


Role of CA for the organization (n=62)

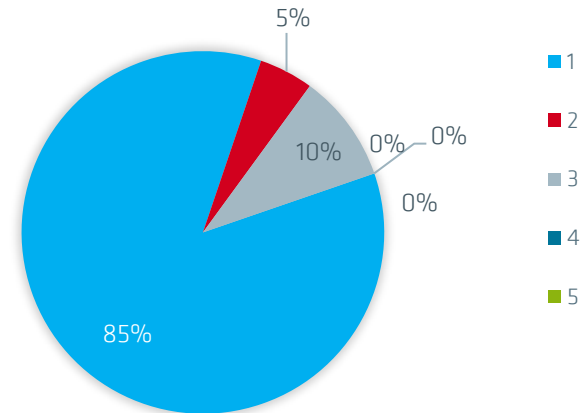


The 62 participating CABs are active in four fields of conformity assessment

Field of activity



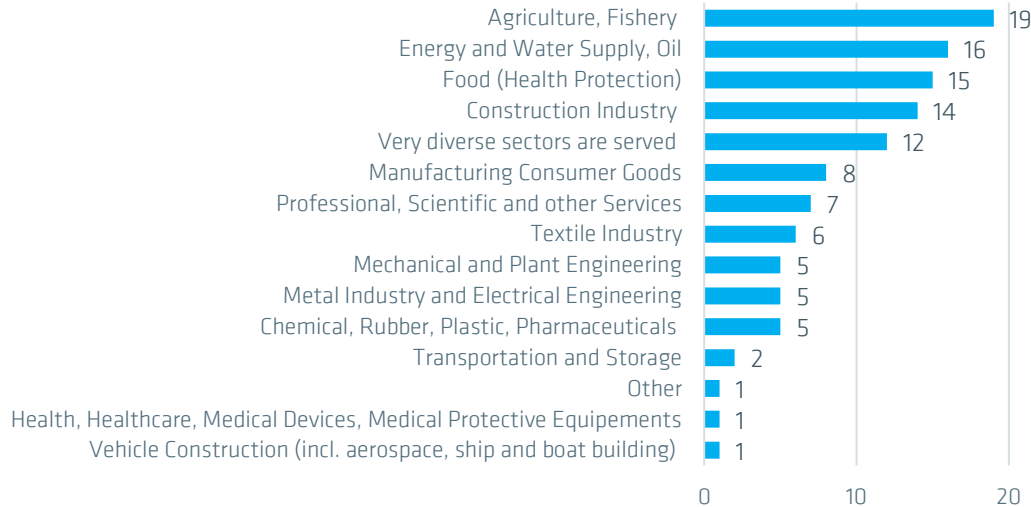
Number of fields of CA activities per CAB



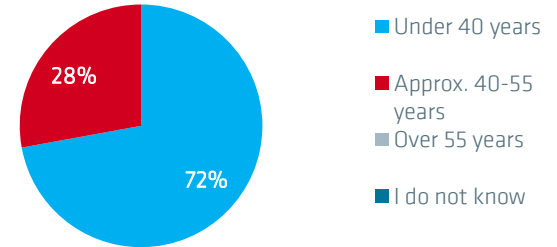
- Testing laboratories represent the **largest group of participants**, followed by inspection bodies and calibration laboratories. There are only 6 certification bodies for products.
- 85% of CABs **specialize** in a single field of activity in conformity assessment; only a few cover a broad range of fields of activity (up to 3).

The CABs serve a wide range of industries // mostly with young employees

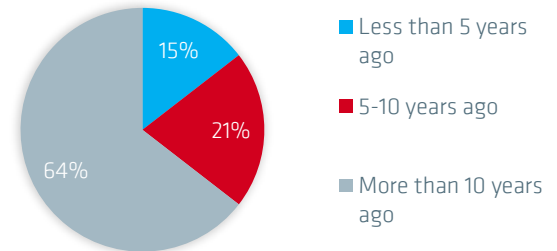
Main sectors served by CABs



Age of employees (n=61)



Establishment of the CAB (n=62)



- The customers served by CABs are mainly from the **agriculture, fishery sector**, but also the energy & water supply and food sector are important.
- Although 64% of CABs were **established** more than 10 years ago, a relevant share of 36% were established in the last 10 years.
- In 72% of the CABs, the **average age of employees** is below 40.

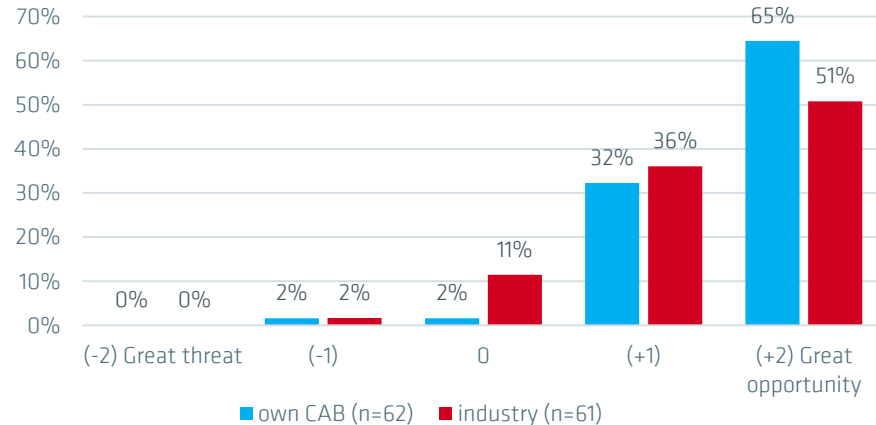
Digitalization in Peruvian CABs A General Overview

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.

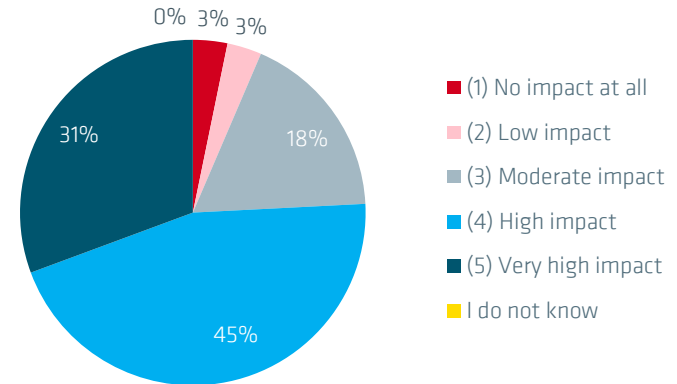
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Digitalization more of an opportunity rather than a threat // Major influence expected

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



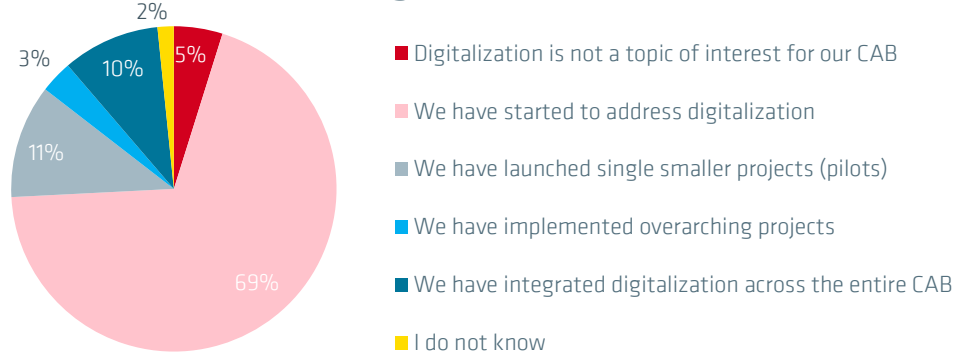
Expected impact of digitalization in the next 5-10 years (n=62)



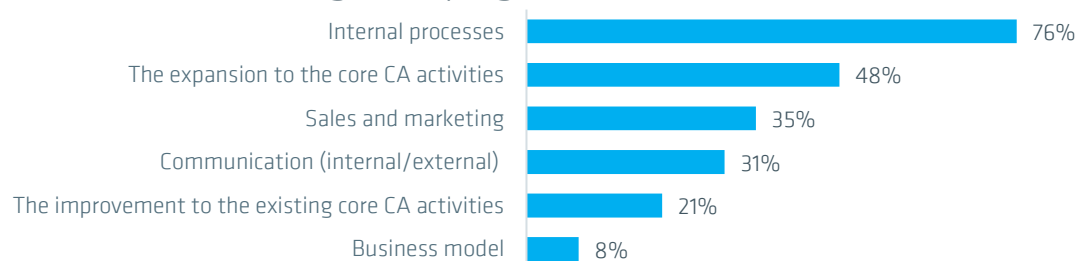
- In general, CABs have a **positive perception** of digitalization: 97% of the surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat for their own organization, and 87% with regard to the whole CA industry.
- 76% of the participants expect digitalization to have a **great or even very great impact on CA activities** in the next 5-10 years.

CABs have started to address digitalization// Focus mainly on internal processes

Status and extent of digitalization in the CABs (n=62)



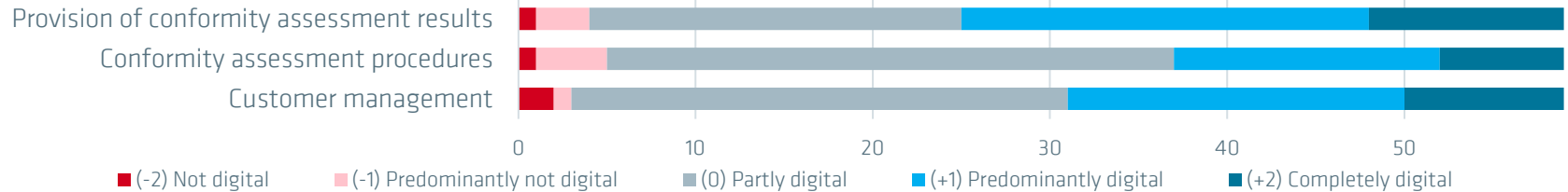
Areas targeted by digitalization (multiple answers possible, n=62)



- 69% of the CABs have started to address digitalization and 11% have launched single smaller projects. 10% of the CABs have already integrated digitalization throughout the whole organization.
- Most **digitalization activities concern internal processes**. Yet the expansion to the core CA activities 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=59)

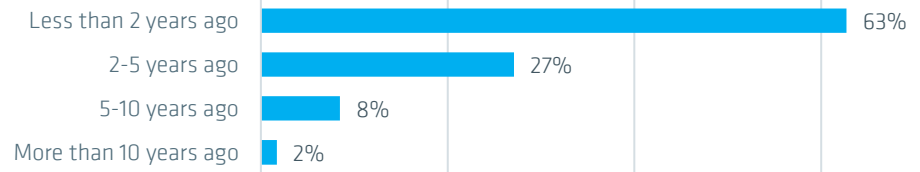


- The CA results are provided predominantly or completely digitally by the majority of CABs (58%). The CA processes themselves are less frequently digitalized.
- Compared to **other organizations** that are direct stakeholders, CABs rate their digital status on average as at least as good or slightly better, especially with regard to the relevant authorities and customers.
- Digitalization has not been a topic for long: 63% of the CABs **have only started to deal with it** during the last 2 years. Only a few have already done so at least 10 years ago.

Own status of digitalization compared to... (n=59)
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=59)

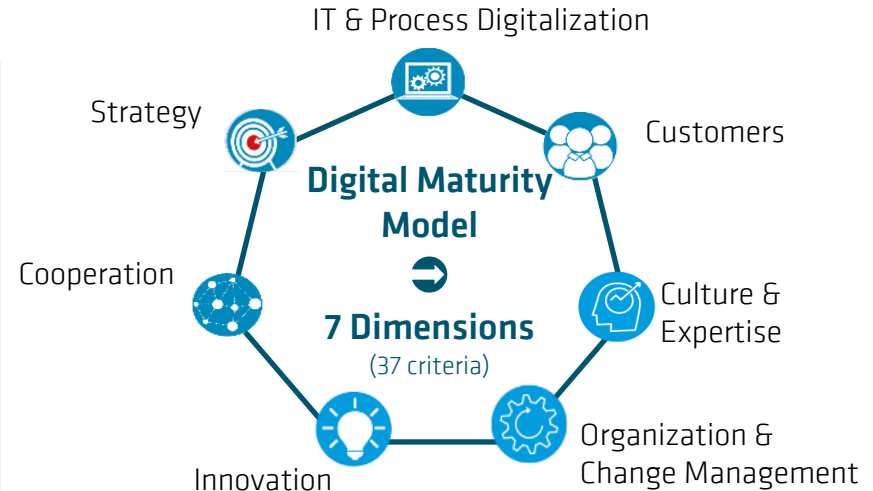


Digital Maturity of CABs

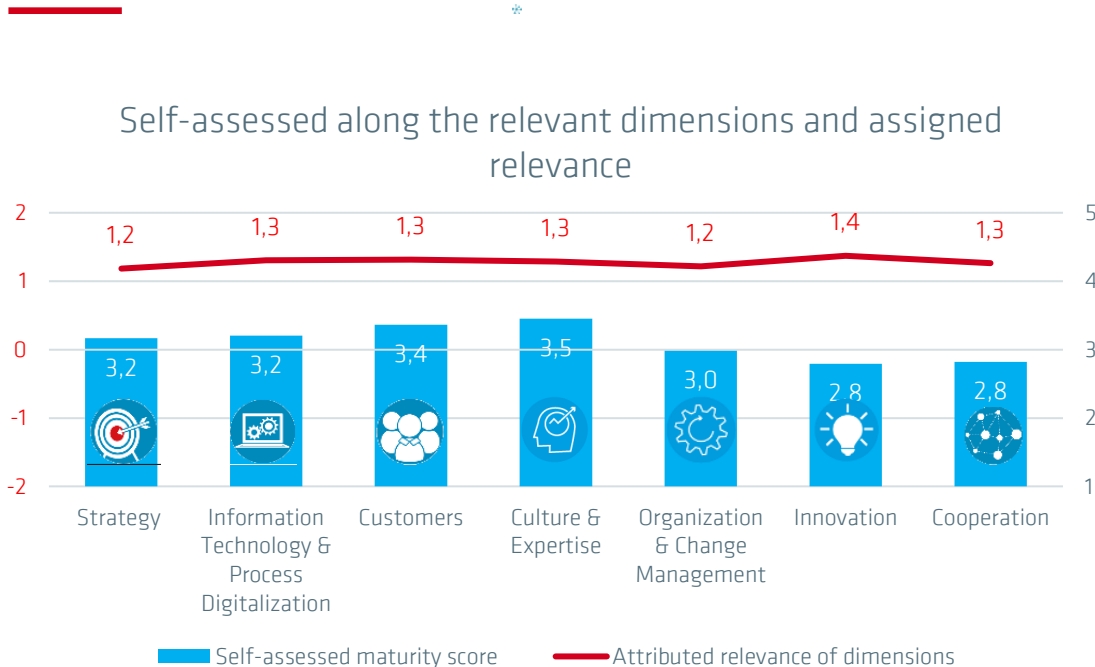
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in Peru based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

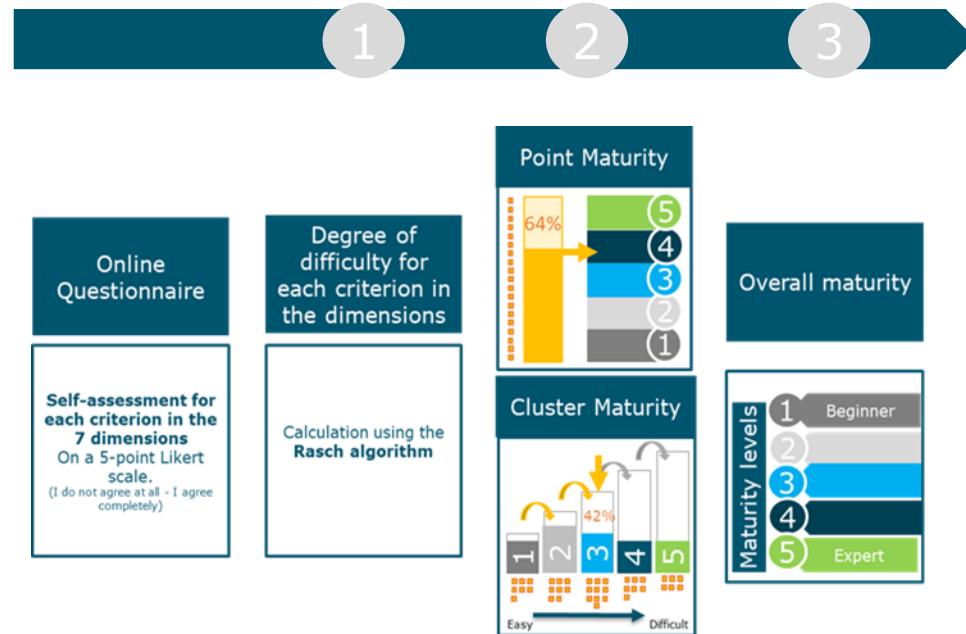
- The results of the maturity model show that the status of the CAB slightly differs in the various dimensions:
 - The CABs consider themselves to be **most advanced** in the areas of "Culture and Expertise" and "Customers".
 - The **greatest need** to catch up is in the areas of "Innovation" and "Cooperation" - although the respondents are actually aware of their high relevance.
- Culture & Expertise are seen among Peruvian CABs as the driving force behind digital transformation. Customers are also demanding digital transformation.

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

Background information: Calculation of the digital maturity level

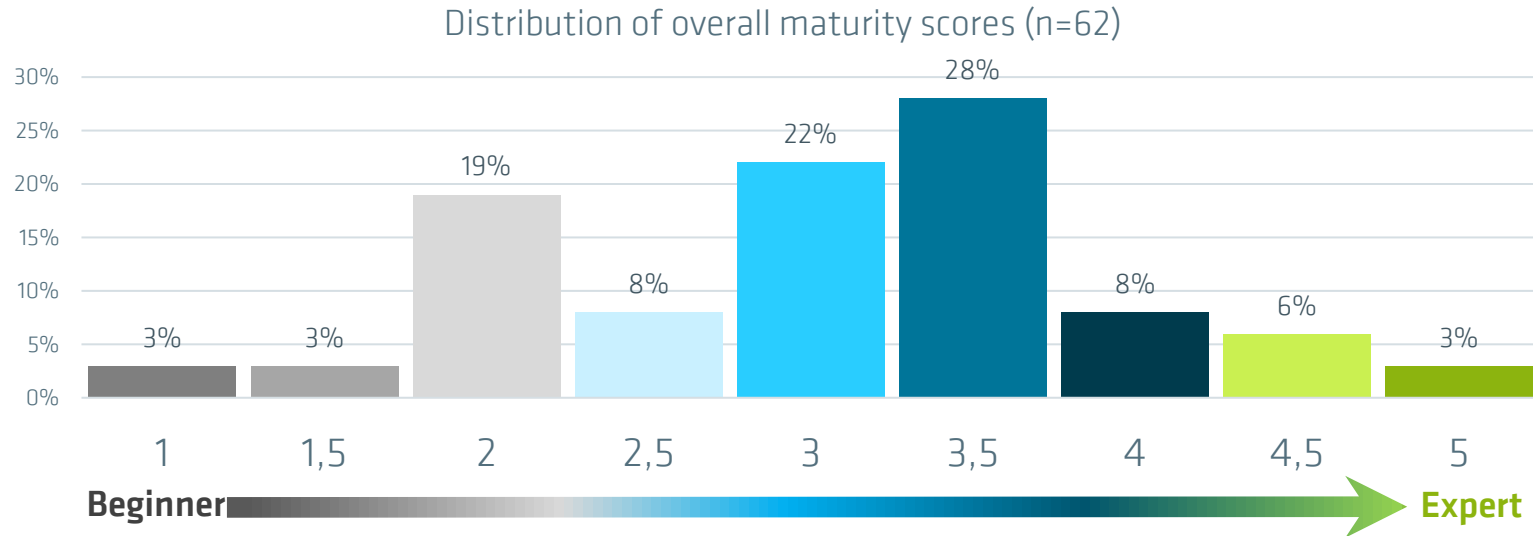
In the questionnaire, participants indicate the extent to which each of the criteria of the 7 dimensions applies to their CAB. In a **multi-stage process**, digital maturity is determined on the basis of these assessments:

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



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

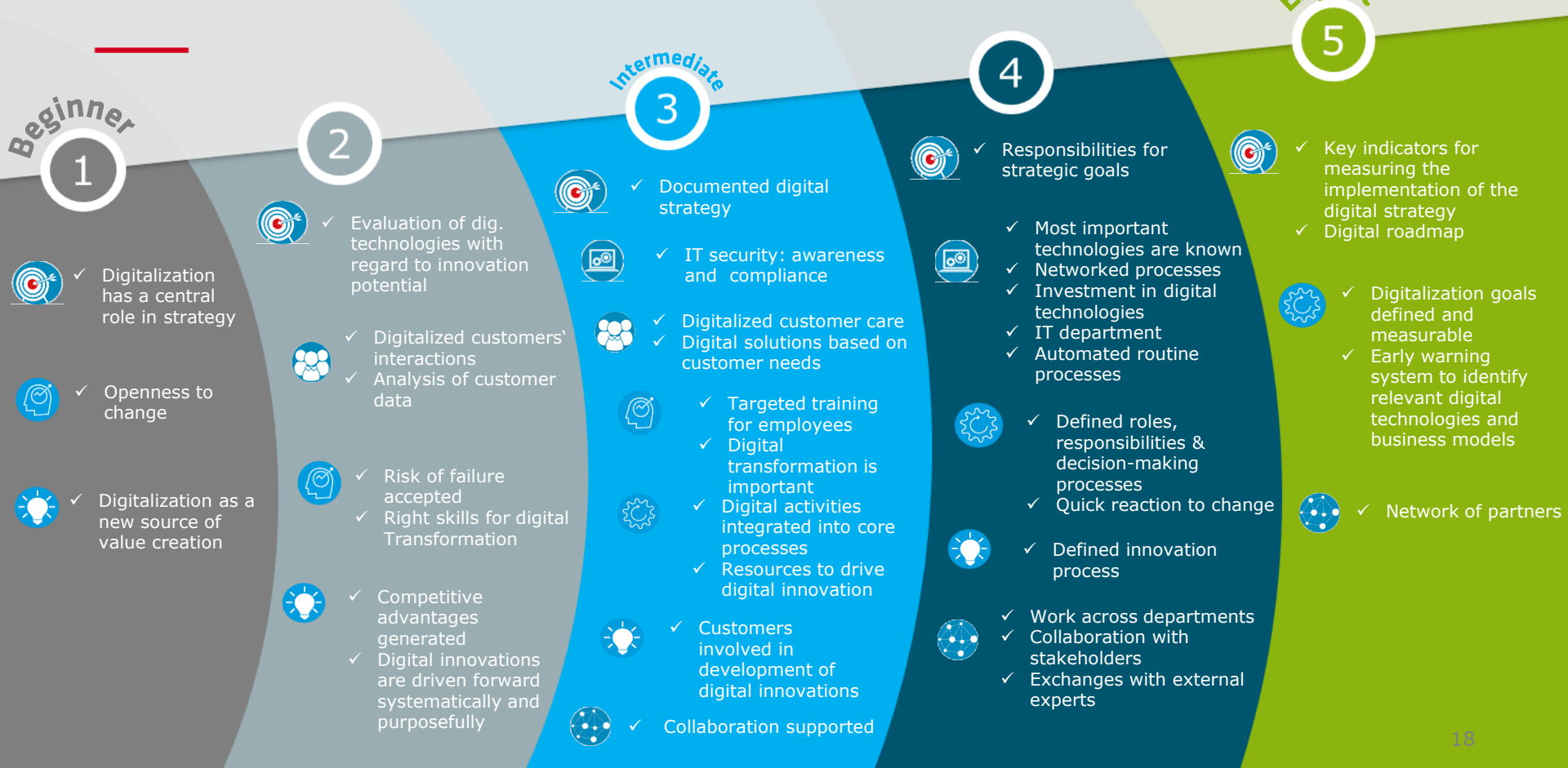
Overall Digital Maturity Scores of the Peruvian CA industry



The digital maturity levels achieved by the 62 participating CABs in Peru follow a right-skewed *normal distribution*:

- Every second CAB has reached the medium level (i.e., 3 and 3,5). 17% of CABs have already reached a higher level of maturity, while every third CAB is still in an earlier stage of transformation.
- So far, only 3% of the CABs have reached expert level 5.

The 5 Digital Maturity stages in Peruvian CABs



1 Beginner

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

2

- ✓ Evaluation of dig. technologies with regard to innovation potential
- ✓ Digitalized customers' interactions
- ✓ Analysis of customer data
- ✓ Risk of failure accepted
- ✓ Right skills for digital Transformation
- ✓ Competitive advantages generated
- ✓ Digital innovations are driven forward systematically and purposefully

3 Intermediate

- ✓ Documented digital strategy
- ✓ IT security: awareness and compliance
- ✓ Digitalized customer care
- ✓ Digital solutions based on customer needs
- ✓ Targeted training for employees
- ✓ Digital transformation is important
- ✓ Digital activities integrated into core processes
- ✓ Resources to drive digital innovation
- ✓ Customers involved in development of digital innovations
- ✓ Collaboration supported

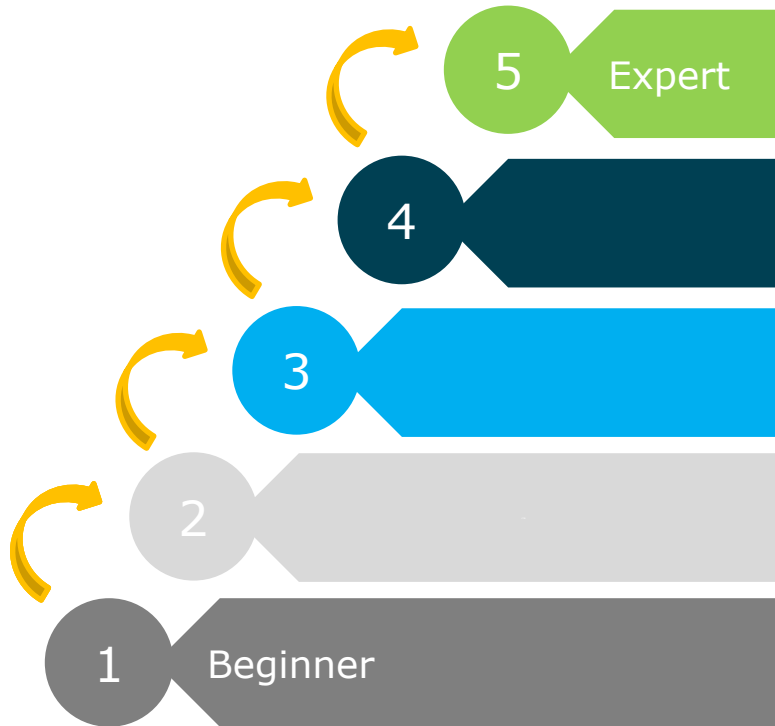
4

- ✓ Responsibilities for strategic goals
- ✓ Most important technologies are known
- ✓ Networked processes
- ✓ Investment in digital technologies
- ✓ IT department
- ✓ Automated routine processes
- ✓ Defined roles, responsibilities & decision-making processes
- ✓ Quick reaction to change
- ✓ Defined innovation process
- ✓ Work across departments
- ✓ Collaboration with stakeholders
- ✓ Exchanges with external experts

5 Expert

- ✓ 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
- ✓ Network of partners

The Digital Maturity of CABs in Peru// 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.
- Organizations at the **second maturity level** have the right skills for digital transformation and use digitalization to generate competitive advantages. Interactions with customers are digitalized.
- For **stage three**, capabilities, resources, and capacities are activated in all dimensions, especially with regard to Organization & Change Management and Culture & Expertise. Customer needs and analyses increasingly come into focus.
- In the **fourth maturity stage**, there is a strong focus on IT: most important technologies are known and corresponding investments are made. There is cross-departmental and external collaboration on digitalization.
- In the final **fifth stage**, CABs have a digital roadmap, digitalization goals are defined and measurable, and ~~there~~ **early warning systems** are in place to identify relevant digital technologies.

Motives, Impacts and Hurdles of Digitalization

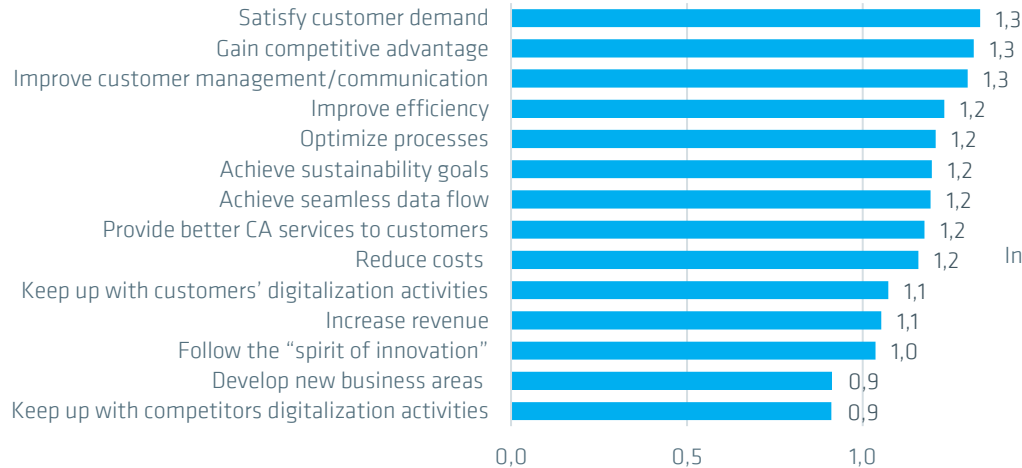
What drives digitalization in Peruvian CABs? What effects can be achieved for the organizations? Are expectations being met? And what are the biggest hurdles to overcome in the digital transformation?

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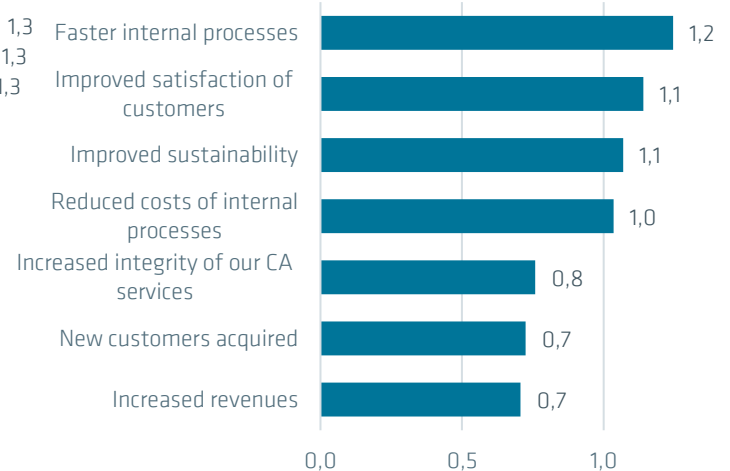
Focus on satisfying customer demand and gaining competitive advantage



Goals behind the digitalization efforts (n=58)
(on a scale from (-2) does not apply at all to (+2) fully applies)



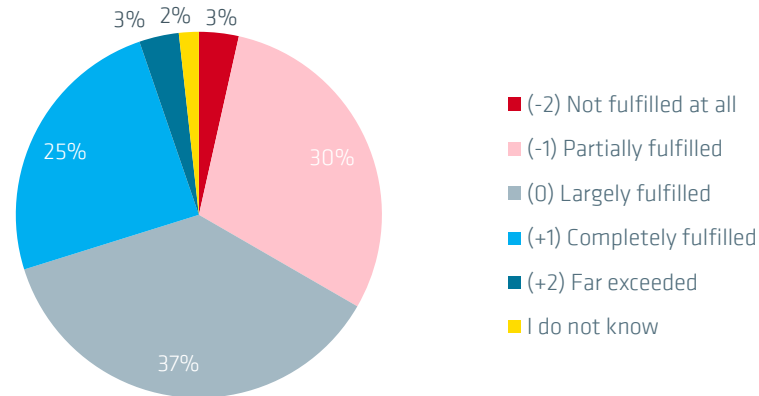
Benefits realized from digitalization (n=60)
(on a scale from (-2) not agree at all to (+2) fully agree)



- Satisfying customer demand is one of the **main goals** behind the digitalization efforts of CABs in Peru. In fact, improved satisfaction of customers is seen as the biggest realized benefit.
- Market objectives such as the development of new business and keeping up with competitors are not drivers - and the effects achieved on sales and new customer acquisition are correspondingly low.

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=57)

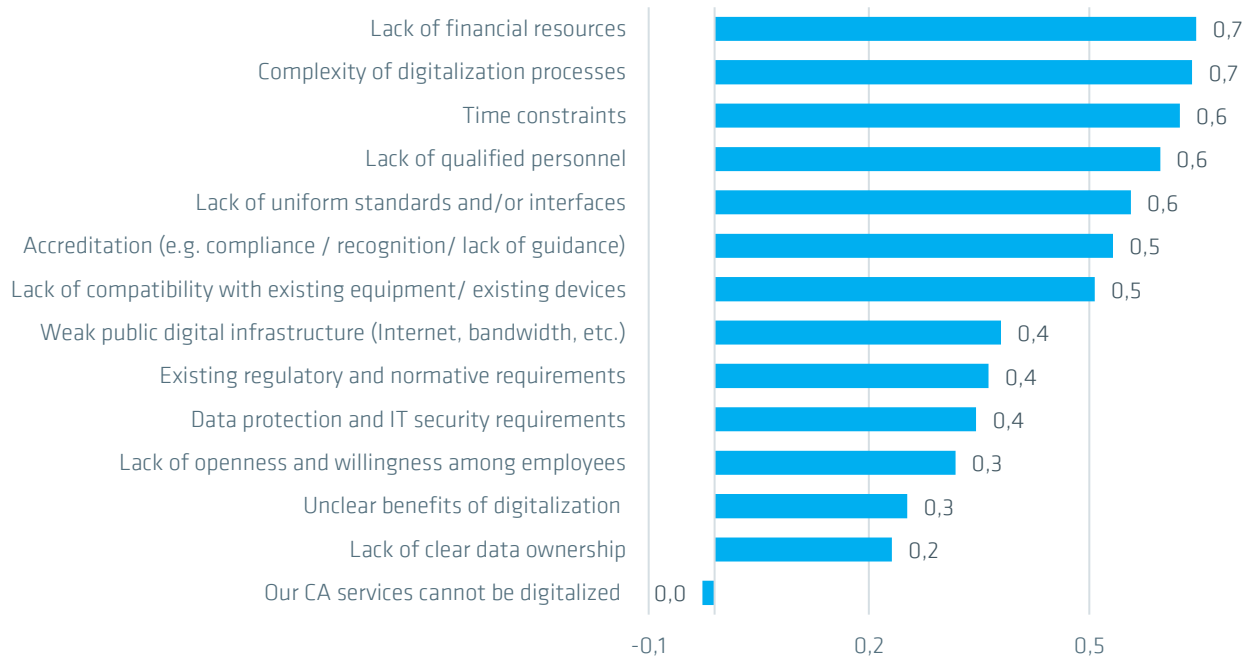


- 62% of the CABs consider their expectations behind the introduction of digital technologies to have been largely or completely fulfilled. Another 30% find them at least partially fulfilled.
- Only for 3% of the CABs are the expectations not fulfilled at all. However, they are confident to still meeting the expectations in the long term.

The lack of financial resources is the biggest hurdle to digital transformation

Hurdles to digital transformation (n=61)

(Scale from (-2) not at all to (+2) very much)



- Lack of financial resources is the biggest hurdle for CABs, followed by the general complexity of digitalization processes and time constraints.
- Lack of qualified personnel and lack of uniform/standards are also an issue for many CABs.
- In contrast, the lack clear data ownership and lack of clarity about the benefits do not represent major hurdles.

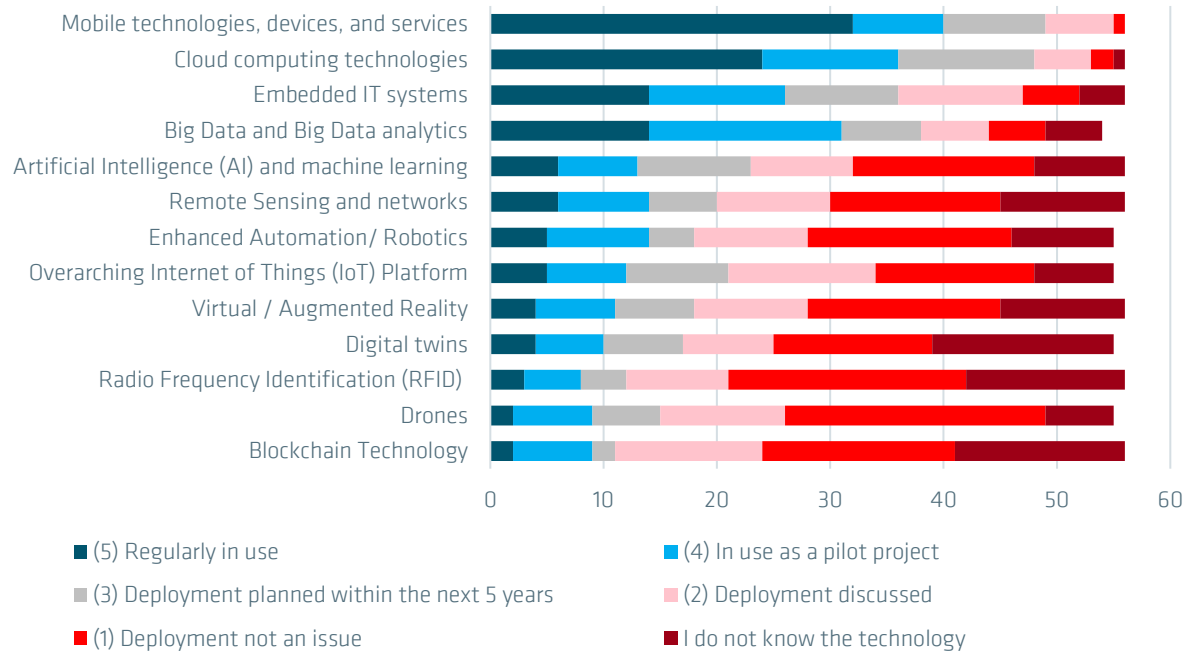
Technologies and Trends

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

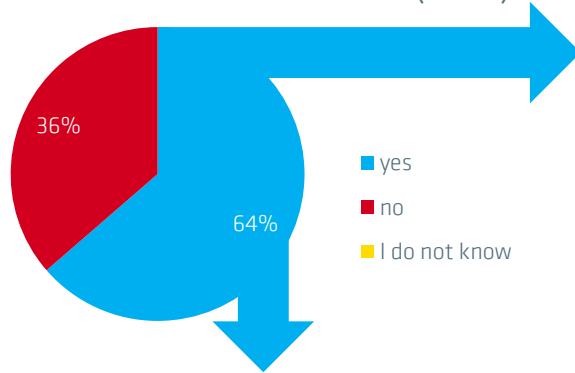
Technologies that are used or planned to be used (n=56)



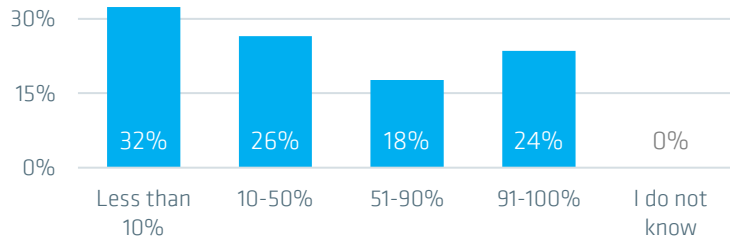
- Many of the latest digital technologies such as Big Data, artificial intelligence and virtual reality are used by CABs in Peru, but not yet on a large scale.
- Blockchain technologies mean nothing to 27% of the respondents, digital twins to 29%.
- Among CABs, mobile technologies are the most widely 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

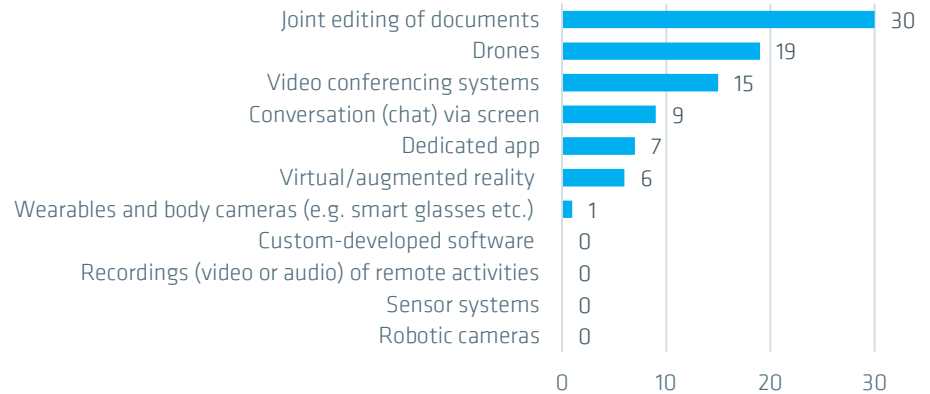
CABs that use remote methods in CA (n=55)



Share of CA services taking place remotely (n=34)



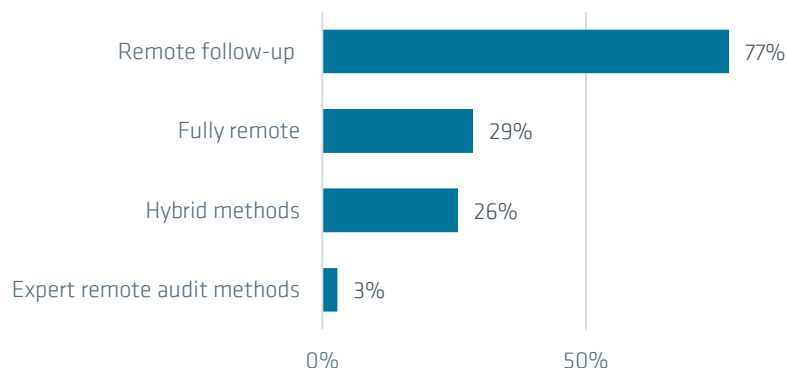
Technologies used for remote procedures (n=35)



- Nearly 2 out of 3 CABs use **remote methods** in their CA activities.
- While every third CAB still performs a maximum of 10% of their activities remotely, one in four CABs have already switched completely.
- Joint editing of documents is the most used **tool for remote working**, while sensor systems or robotic cameras are not used at all.

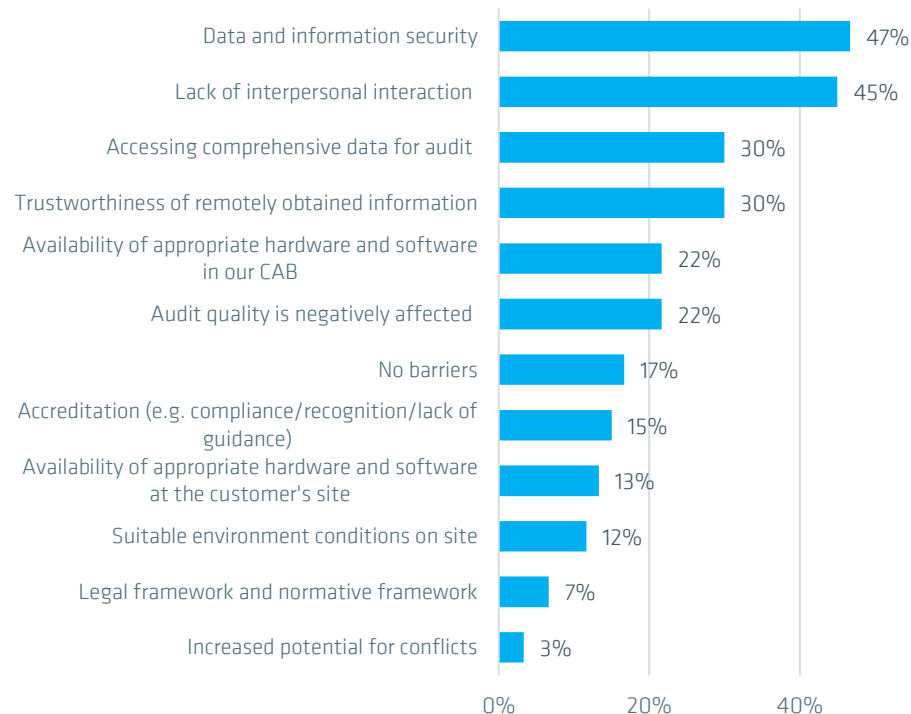
Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=35)



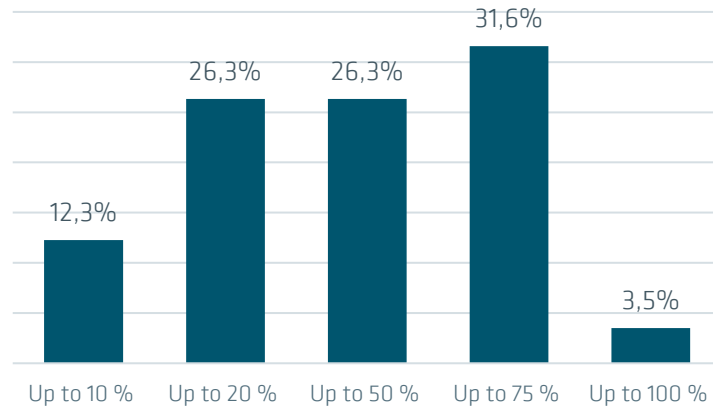
- **Remote follow-up methods** are the predominant type among remote methods used by CABs.
- **Data and information security** is seen as the biggest **hurdle** in the use of remote methods, followed by lack of interpersonal interaction.

Barriers (n=60)

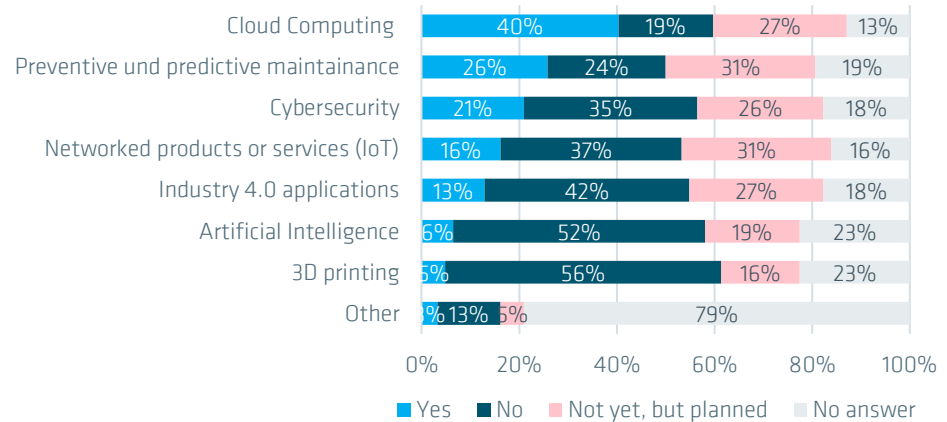


CA for advanced digital technologies is only performed by a minority of CABs so far

Share of routine processes that are digital (n=57)



Digital products and applications for which CA is conducted (n=52)



- 35% of the CABs have digitalized more than half of their **routine processes**. However, one in eight CABs has not digitally converted even 10% of its processes.
- 55% of the surveyed CABs conduct **conformity assessments for modern digital technologies and applications**. In focus: cloud computing (40%) and preventive and predictive maintenance (26%).

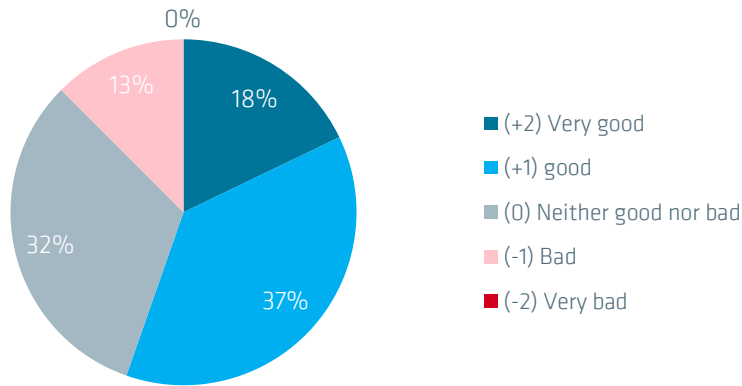
The COVID-19 Pandemic and Digitalization

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

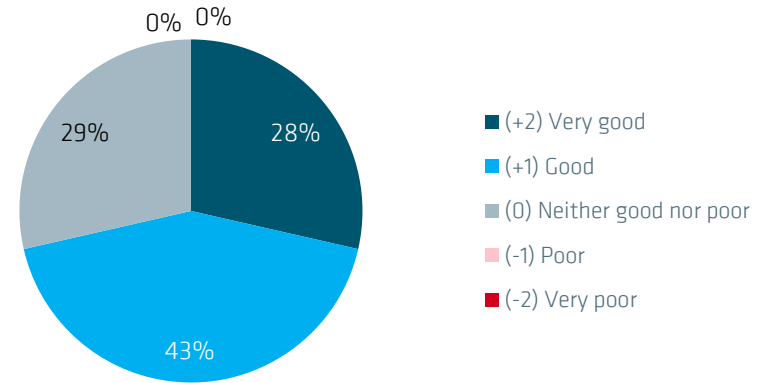
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Most CABs have coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=58)

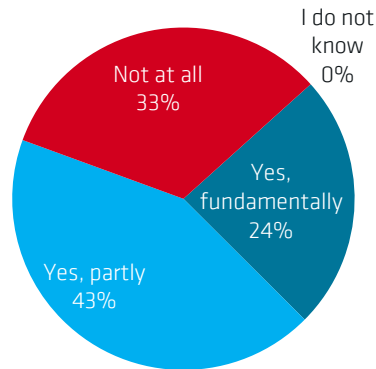


Response to the challenges of the COVID-19 pandemic (n=58)

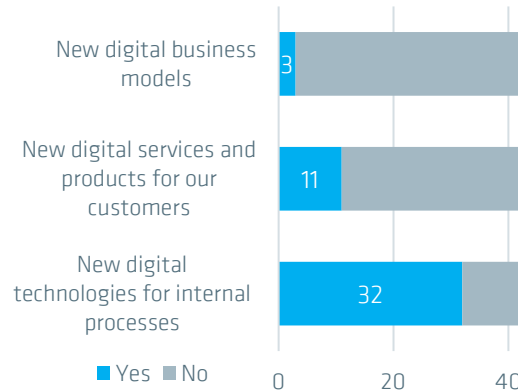


- For 32% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 55% claimed their order development had improved, for another 13% orders had declined.
- The majority of CABs (71%) reported that they had **responded** well or very well to the challenges associated with the COVID-19 pandemic.

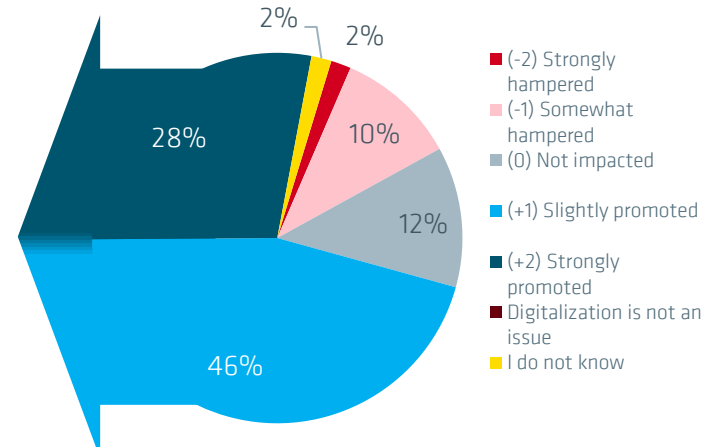
Digital technologies have helped coping with challenges of the COVID-19 pandemic (n=58)



Digital adaptation in course of the COVID-19 pandemic (n=42)



Impact of the Covid-19 pandemic on the digitalization of CABs (n=57)



- For 67% of CABs, digital technologies have helped in coping with the challenges of the COVID-19 pandemic.
- Yet, in 12% of CABs the pandemic has hampered digitalization while 74% of CABs report that digital transformation has been slightly or even strongly encouraged and has led to adaptations:
 - 76% of CABs have introduced new digital technologies for internal processes, 26% new digital services and products for their customers, 7% even new digital business models.

- CABs in Peruvian 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 Peruvian CABs are nevertheless confirmed: An initial focus on Culture and Expertise, Customers and IT is followed by holistic organizational transformation, including Strategy, Cooperation and Change Management.
- Many of the cutting-edge digital technologies such as Big Data, artificial intelligence and virtual reality are used by CABs in Peru, 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 remote follow-up.

Peru in international comparison

How do Peruvian 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



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

Support: Timo Kabierski



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

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

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Contact

Bundesanstalt für Materialforschung und –prüfung (BAM)

S.2 Accreditation and Conformity Assessment

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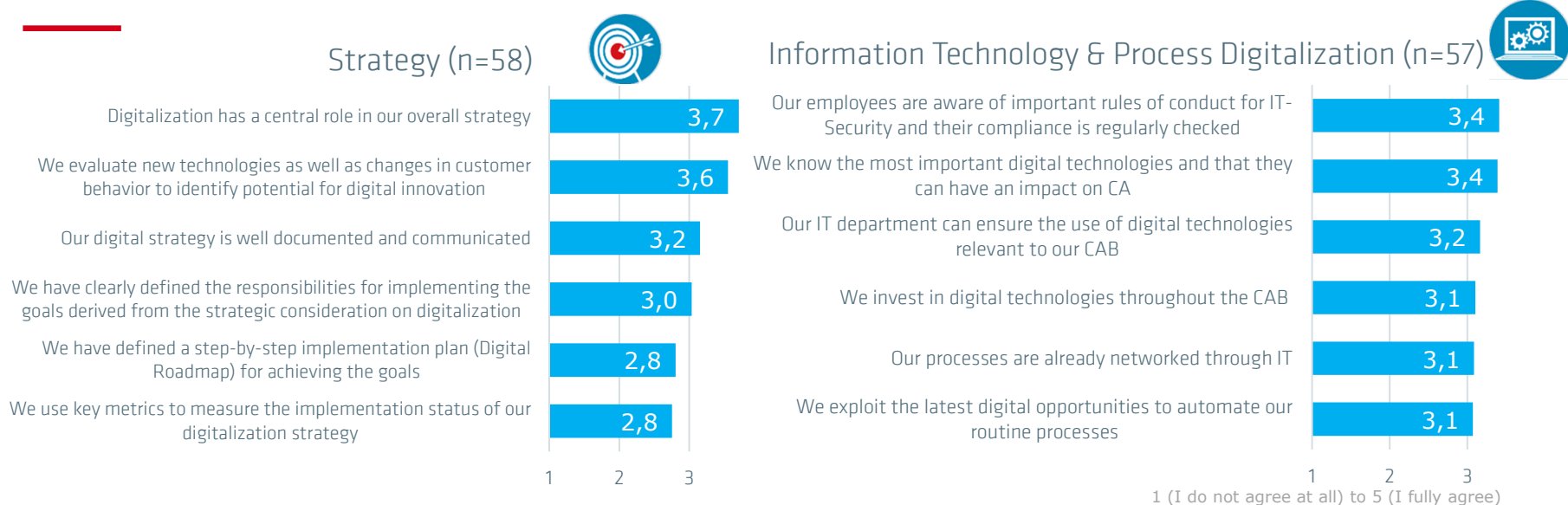
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Annexes

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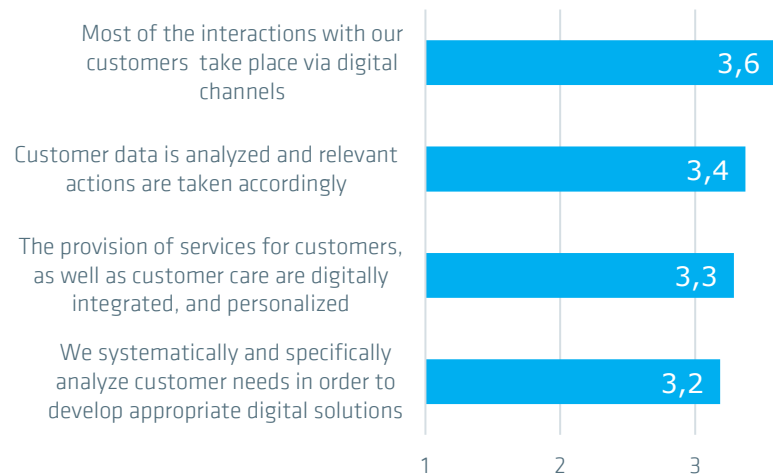
Dimensions of digital maturity: Detailed overview



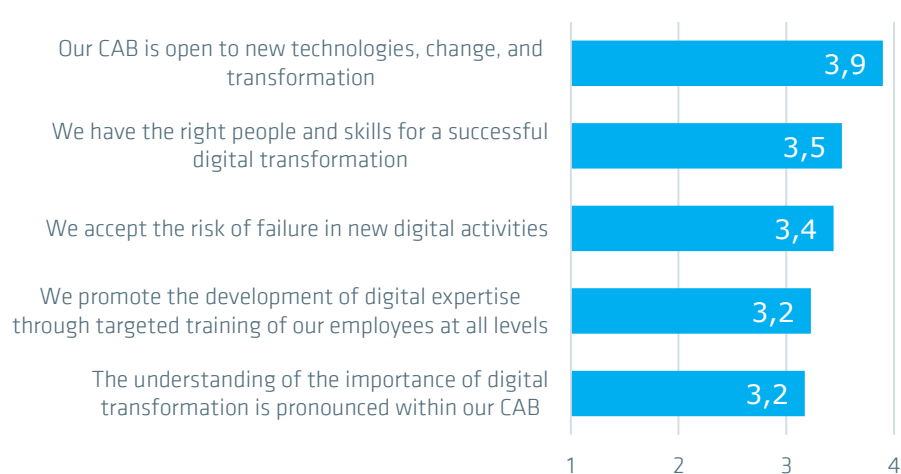
- In most CABs (74%), digitalization plays a central role in their overall strategy, with 64% having a well documented digital strategy.
- Only 56% have set up a Digital Roadmap and use key metrics to measure the implementation status of their digitalization strategy.
- At least 62% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations. 62% of CABs have networked their processes and automated routine procedures.

Dimensions of digital maturity: Detailed overview

Customers (n=59)



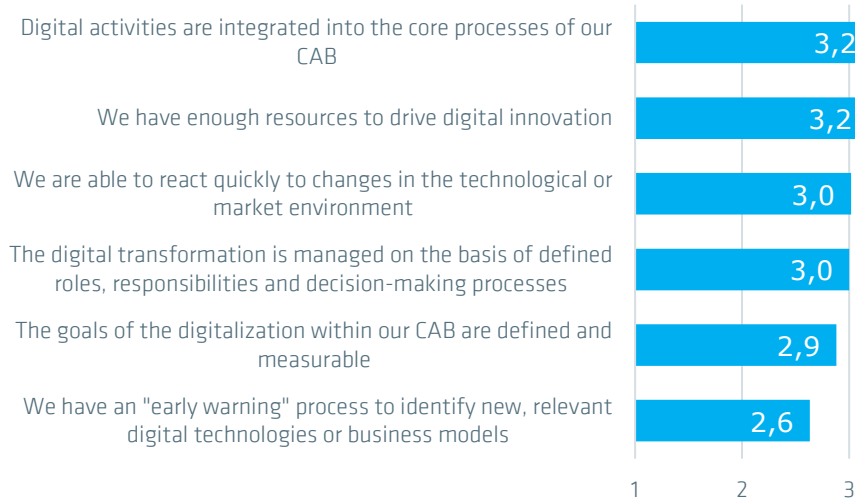
Culture & Expertise (n=58)



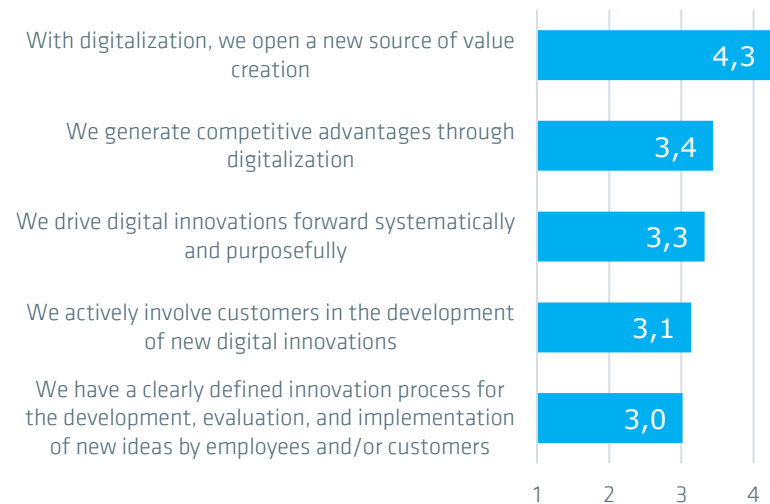
- 72% of CABs in Peru interact with their customers via digital channels.
- 66% offer digitally integrated services to customers and only 64% of them develop appropriate digital solutions based on customer needs.
- Peruvian CABs are definitely open to new technologies, changes and transformations (78%). At least 64% 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=59)



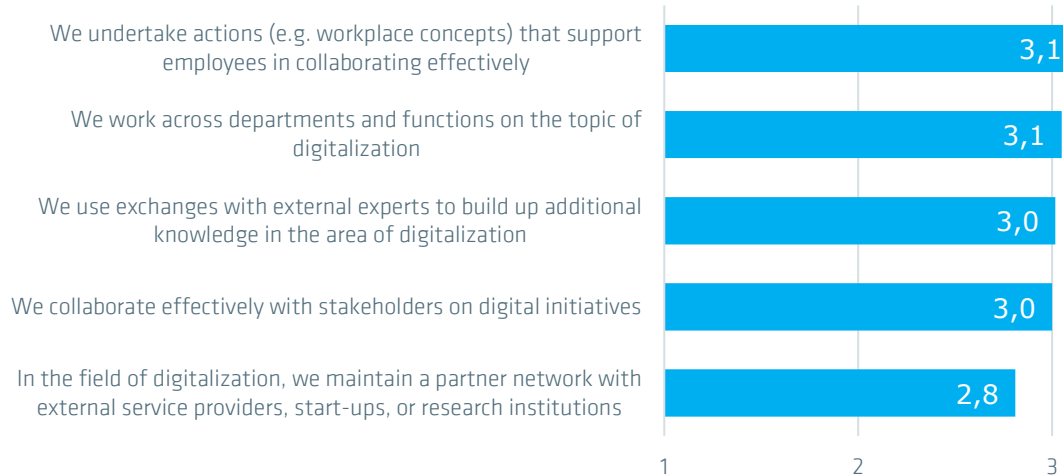
Innovation (n=59)



- 64% 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 (86%), 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=59)



- In order to work on the topic of digitalization (62%) across departments and functions, 60% of CABs build additional knowledge through external expert consultations. They also collaborate effectively with stakeholders on various digital activities.
- 56% maintain a partner network with external service providers.

Digital Maturity Model Cluster 1 (Beginner)

Description Level 1: Beginner








Dimensions

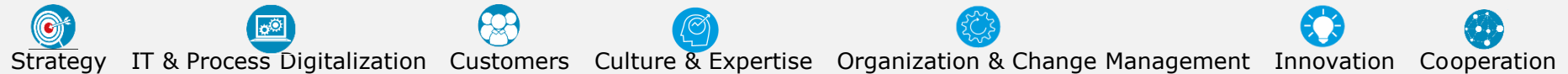


Digitalization has a central role in our overall strategy








Our CAB is open to new technologies, change, and transformation








With digitalization, we open a new source of value creation

							
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 Cluster 2


Description Level 2	Dimensions						
							
We evaluate new technologies as well as changes in customer behavior to identify potential for digital innovation							
Most of the interactions with our customers (e.g., advise, purchase conclusion and customer service) take place via digital channels							
Customer data is analyzed, and relevant actions are taken accordingly							
We accept the risk of failure in new digital activities							
We have the right people and skills for a successful digital transformation							
We generate competitive advantages through digitalization							
We drive digital innovations forward systematically and purposefully							


						
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	■						
Our employees are aware of important rules of conduct for IT Security and their compliance is regularly checked		■					
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			■				
We promote the development of digital expertise through targeted training of its employees at all levels				■			
The understanding of the importance of digital transformation is pronounced within our CAB				■			
Digital activities are integrated into the core processes of our CAB					■		
We have enough resources to drive digital innovation					■		
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 Cluster 4



Description Level 4	Dimensions						
We have clearly defined the responsibilities for implementing the goals derived from the strategic consideration on digitalization	█						
We know the most important digital technologies and that they can have an impact on CA		█					
Our processes are already networked through IT		█					
We invest in digital technologies throughout the CAB		█					
Our IT department can ensure the use of digital technologies relevant to our CAB		█					
We exploit the latest digital opportunities to automate our routine processes		█					
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 a clearly defined innovation process for the development, evaluation, and implementation of new ideas by employees and/or customers						█	
We work across departments and functions on the topic of digitalization							█
We collaborate effectively with stakeholders on digital initiatives							█
We use exchanges with external experts to build up additional knowledge in the area of digitalization							█

Digital Maturity Model Cluster 5 Experts

Description Level 5: Expert

Dimensions



We use key metrics to measure the implementation status of its 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

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