



Sicherheit in Technik und Chemie

2022

# Digitalization in Conformity Assessment in New Zealand

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	635 accredited conformity assessment bodies (CABs) in New Zealand
Data collection method	Online survey
Survey period	February 21, 2022 October 15, 2022
	57 fully completed questionnaires (= 9% response rate)

## Digitalization in Conformity Assessment

Online Survey



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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 New Zealand.

## 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)

# Table of Contents

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

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# The Sample

General information about the participating  
Conformity Assessment Bodies

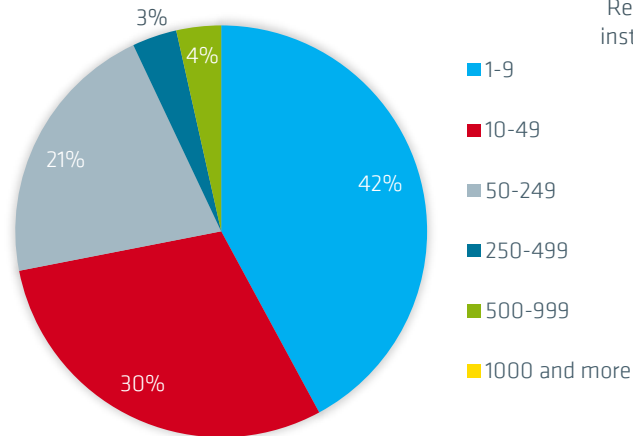
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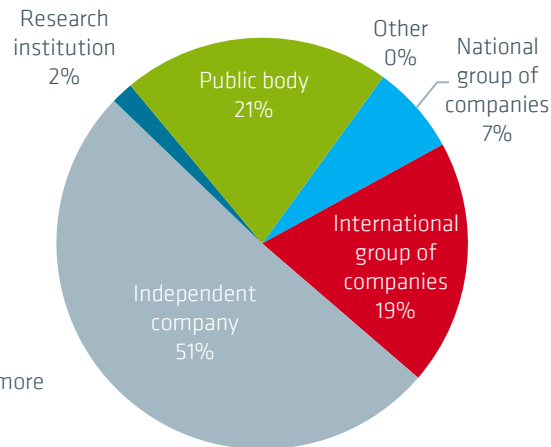
# 57 conformity assessment bodies (CABs) in New Zealand participated in the survey

- 72% of participating CABs are **small businesses** with less than 50 employees.
- 51% are **independent companies**, 21% are **public bodies** and 19% belong to an **international group**.
- For 39%, Conformity Assessment (CA) is the main economic **focus of activity** and for 27% it is **one activity among others**.

Number of employees (n=57)



Type of organization (n=57)

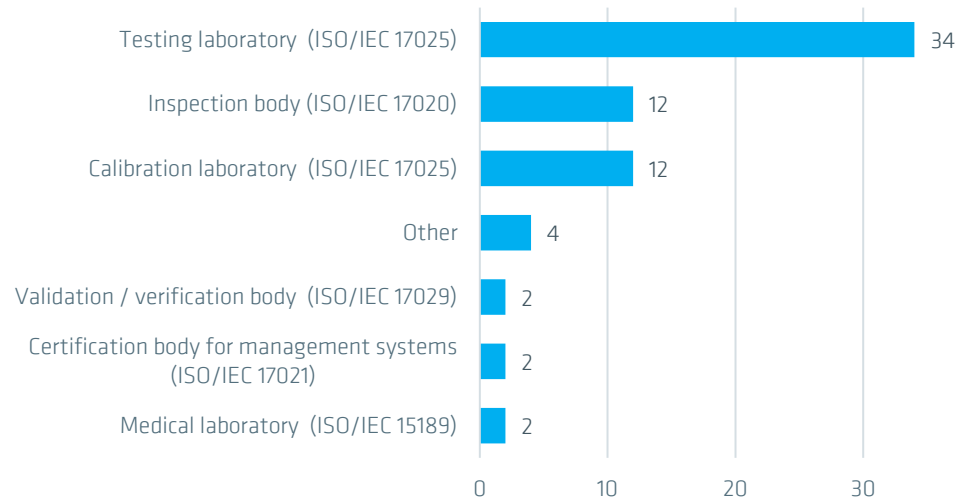


Role of CA for the organization (n=56)

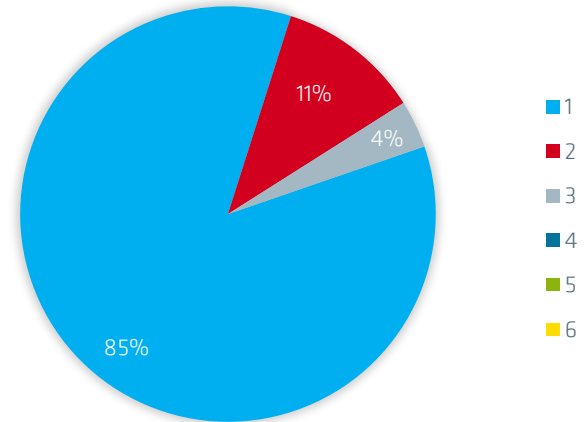


# The 57 participating CABs cover a broad range of activities

Field of activity



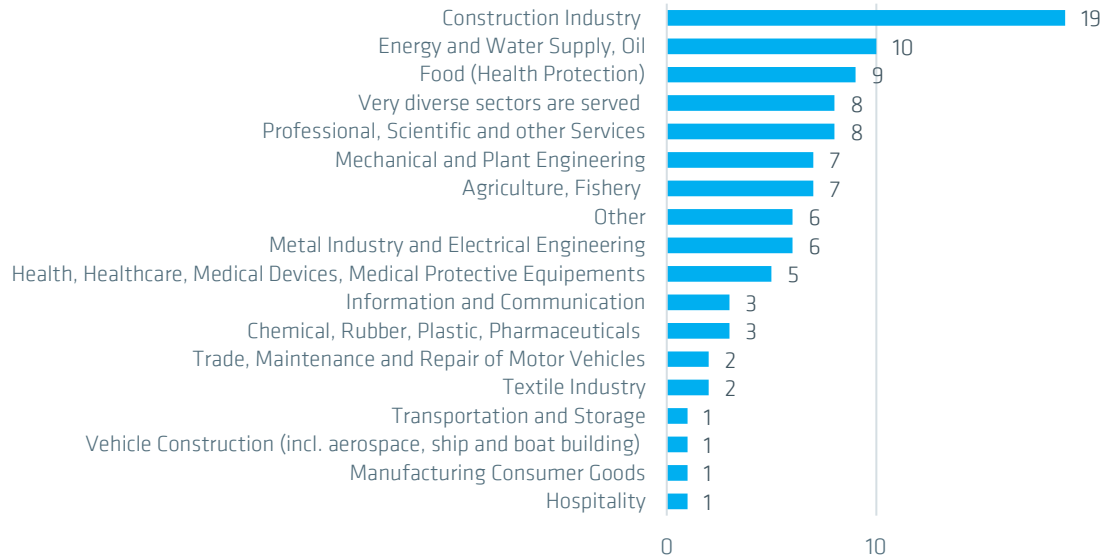
Number of fields of CA activities per CAB



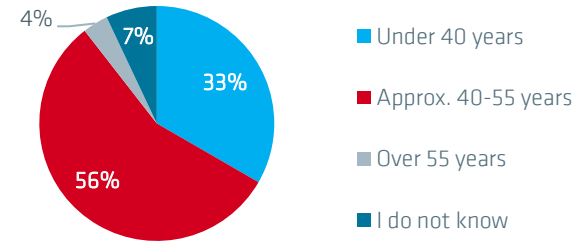
- Testing laboratories represent the **largest group of participants**, followed by inspection bodies and calibration laboratories.
- 85% of CABs are **specialized** in a single field of conformity assessment activity; only a few cover a broad range of activities (up to 3).

# The CABs serve a broad spectrum of sectors

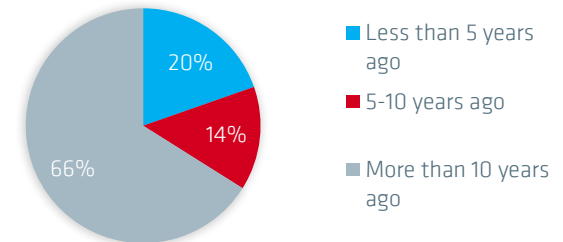
## Main sectors served by CABs



## Average age of employees (n=57)



## Establishment of the CAB (n=57)



- The **main industries** served by the CABs are from the construction industry, but also energy and water supply, oil and the food sector are important.
- While the **average age of the employees** is 40-55 years in 56% of the CABs, 33% have staff under 40 years on average.
- 66% of the CABs were **established** more than 10 years ago; every fifth CAB is younger than 5 years.



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# Digitalization in New Zealand CABs A General Overview

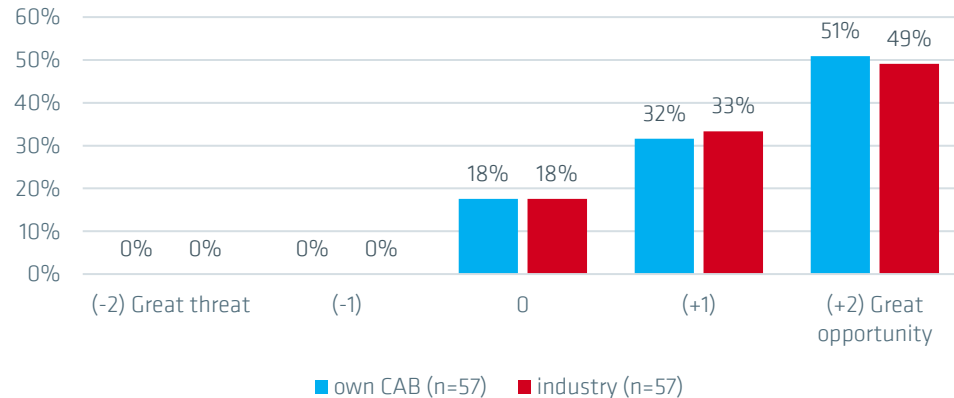
This section sheds light on how the participating CABs perceive digitalization for their organization (now and in perspective) and how they self-evaluate their current state of digital transformation.

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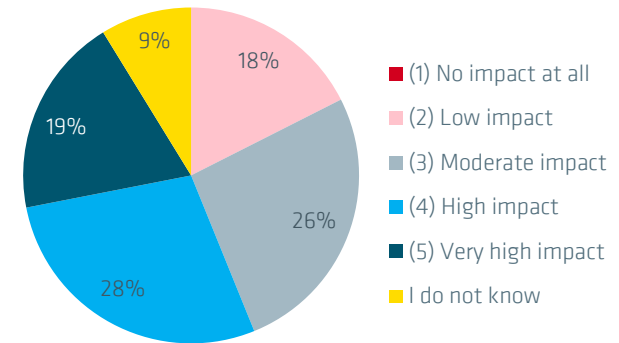
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# Digitalization more of an opportunity rather than a threat // Major influence expected

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)

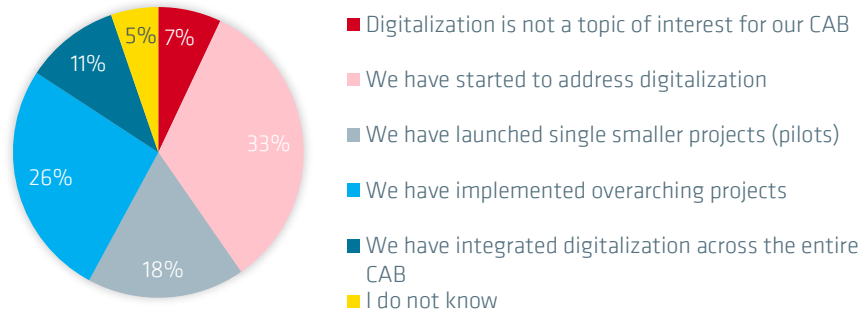


- In general, the CABs have a **positive perception** of digitalization: 83% of the surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat for their own organization, and 82% with regard to the whole CA industry.
- 47% of the participants expect a **high or even very high impact of digitalization on CA activities** in the next 5-10 years. Every fourth CAB expects a moderate impact.

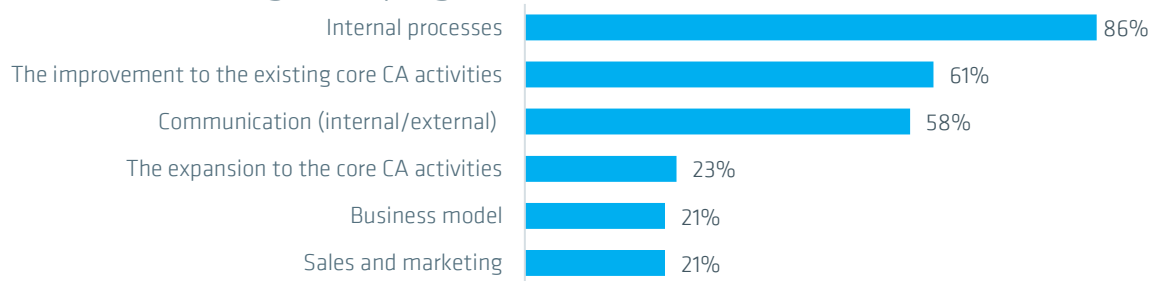
# Diverse status of digitalization across the CABs//

## Focus mainly on internal processes

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



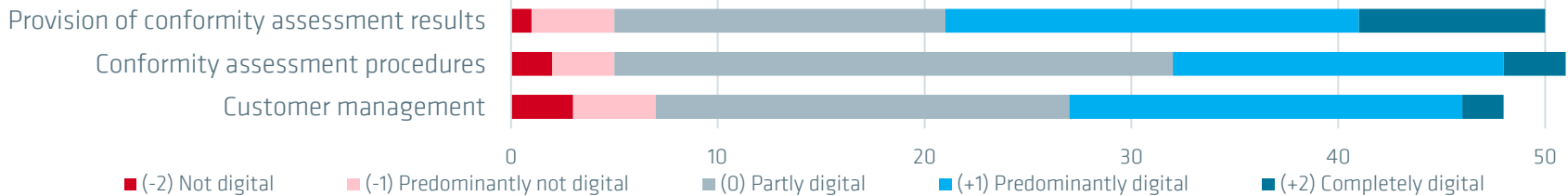
Areas targeted by digitalization (multiple answers possible, n=57)



- **The status of digitalization is quite diverse** across the CABs in New Zealand: The majority of CABs (33%) have just started to address this topic, 18% have launched single smaller projects and 26% have already implemented overarching projects. 11% state to have integrated digitalization across the whole organization. However, for 7% digitalization is not a topic of interest.
- Most **digitalization activities concern internal processes**. Yet the improvement to the existing core CA activities and communication are also relevant areas. However, digitalization is currently rarely used for sales and marketing or to adopt new business models.

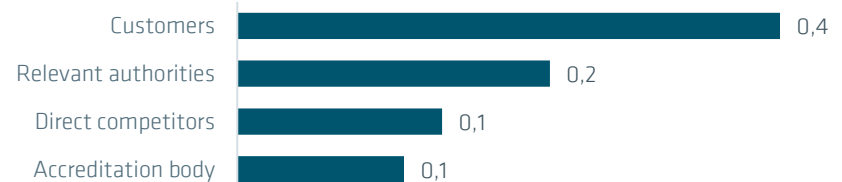
# Positive self-assessment on digitalization in core areas - and in comparison with stakeholders

Self-evaluation of the CABs' status of digitalization in different areas (n=53)

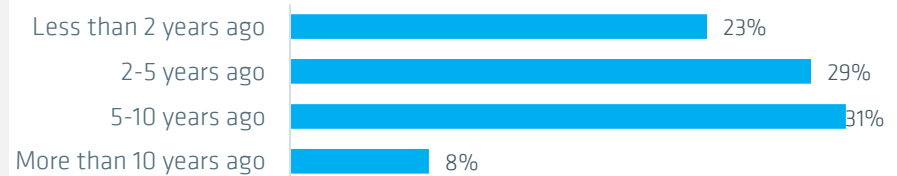


- The CA results are provided partly, predominantly or completely digitally by the majority of CABs. Customer management are less frequently digitalized.
- Compared to **other organizations** that are direct stakeholders, CABs rate their digital status on average as at least as good or slightly better, especially with regard to customers and relevant authorities.
- Digitalization has not been a topic for long: the majority of CABs (52%) **has only started to deal with it** during the last 5 years. Only 8% has done so at least 10 years ago.

Own status of digitalization compared to... (n=57)  
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=52)



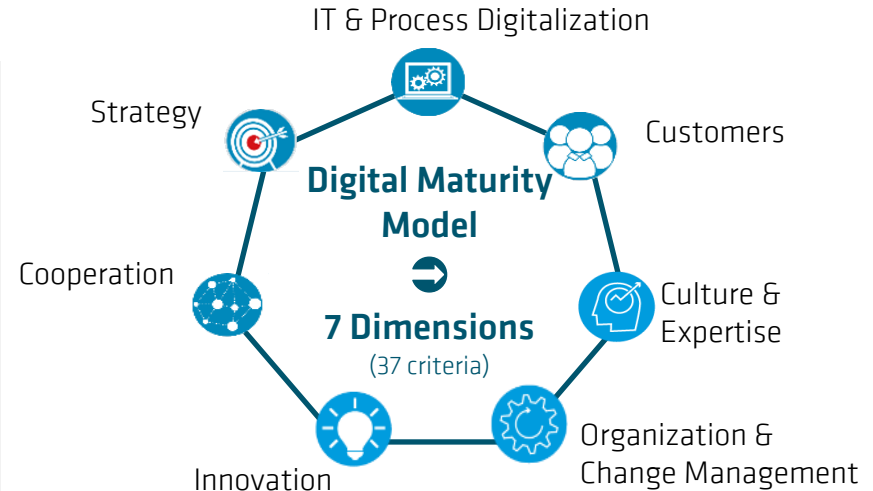
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## Digital Maturity of CABs

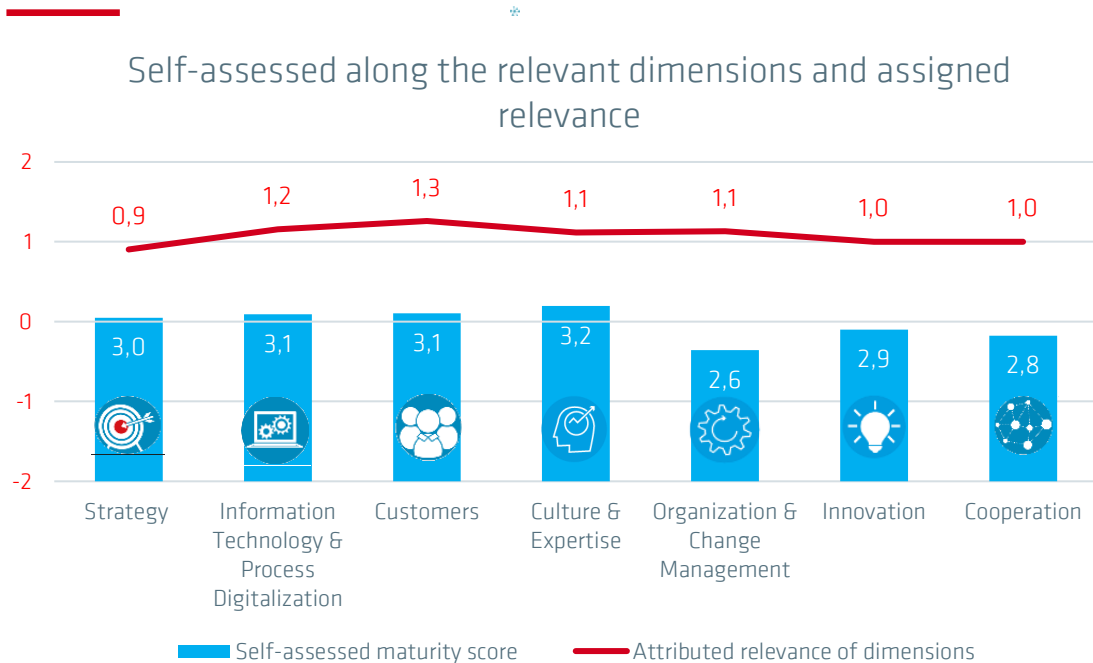
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in New Zealand 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, customers and IT advanced, organization at a lesser extent



\* 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).

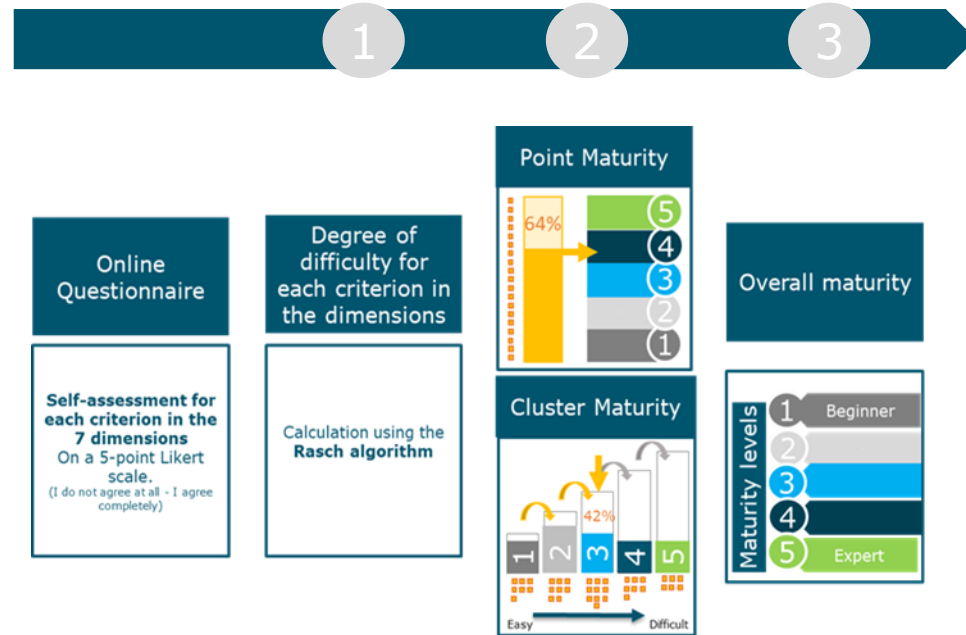
- The results of the maturity model show that the status of the CABs slightly differs in the various dimensions:
  - The CABs consider themselves to be **most advanced** in the area of "Culture and Expertise", "Customers" and "IT & Process Digitalization".
  - The **greatest need** to catch up is in the area of "Organization and Change Management", "Cooperation" and "Innovation".
- Respondents are aware of the high relevance of the "Customers" and "IT & Process Digitalization" dimensions.

➔ *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.

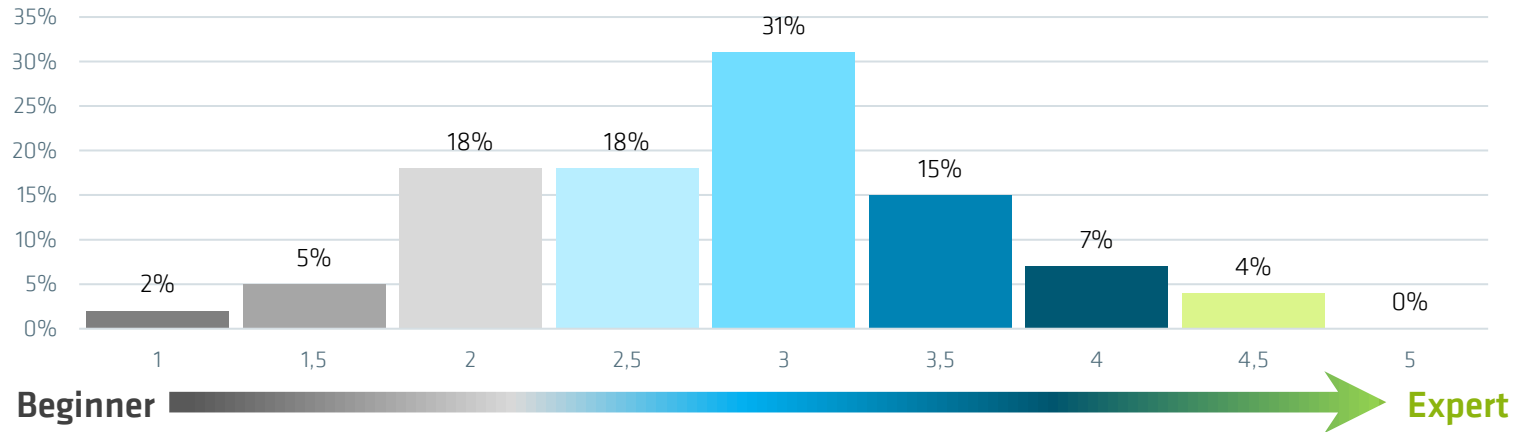


*The calculation is based on the method of the St. Gallen Maturity Model. See Back & Berghaus (2016). Digital Maturity & Transformation Study; Berghaus & Back (2016). Stages in Digital Business Transformation; and Friedel & Back (2012). Determination of enterprise 2.0 development levels with a maturity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



# Overall Digital Maturity Scores of the New Zealand CA industry

Distribution of overall maturity scores (n=57)



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

- Although only 7% of the CABs is still in an earlier stage of transformation, 36% reached level 2.
- Almost every second CAB has reached medium level (i.e. 3 and 3,5). However, only 11% of CABs have already reached a higher level of maturity. So far, no CAB has reached expert level 5.

# The 5 Digital Maturity stages in CABs in New Zealand

## Beginner

1

- ✓ Central role of digitalization in overall strategy
- ✓ Identification of potentials for digital innovation
- ✓ IT security: awareness and compliance
- ✓ Digitalized customer interactions
- ✓ Openness to change

2

- ✓ Networked processes through IT
- ✓ Digital activities integrated into core processes
- ✓ Digitalization as a new source of value creation

## Intermediate

3

- ✓ Documented digital strategy
- ✓ Automated routine processes
- ✓ Investments in digital technologies
- ✓ IT usage reliably ensured
- ✓ Integrated, digitalized customer care
- ✓ Customer data analyzed
- ✓ Understanding of the importance of digital transformation
- ✓ Availability of right people and skills
- ✓ Risk of failure accepted
- ✓ Targeted training
- ✓ Competitive advantages through digitalization
- ✓ Innovations driven forward systematically and purposefully
- ✓ Collaboration across departments
- ✓ Exchanges with external experts
- ✓ Effective collaboration with external stakeholders

4

- ✓ Clear responsibilities for digitalization goals
- ✓ Knowledge of most important digital technologies
- ✓ Digital solutions based on customer needs
- ✓ Measurable goals
- ✓ Defined roles, responsibilities & decision-making processes
- ✓ Rapid response to change
- ✓ Effective internal collaboration

## Expert

5

- ✓ Key indicators to measure the implementation of the digital strategy
- ✓ Digital Roadmap
- ✓ Early warning system to identify relevant digital technologies and business models
- ✓ Sufficient resources to drive digital innovations
- ✓ Customers involved in development of digital innovations
- ✓ Clearly defined innovation process
- ✓ Partner network with external providers

# The Digital Maturity of CABs in New Zealand // Summary of the observed patterns



- Even at the **first maturity level**, digitalization is given a central place in the corporate strategy. CABs are open to change and interactions with customers are digitalized.
- In the **second maturity stage**, CABs pursue digitalization as a driver for new value creation and digital activities are integrated into core processes.
- For **stage three**, capabilities, resources, and capacities are activated further in almost all dimensions. Organizations have documented digital strategies and automated routine processes. The importance of digital transformation is well understood. Corresponding investments in digital technologies are made. CABs offer targeted training to employees and generate competitive advantages through digitalization. Collaboration across department and also with external stakeholders is strengthened.
- CABs in the **fourth maturity stage** focus on organizational adaptation. CABs have well defined and measurable digitalization goals and sufficient innovation resources are available. CABs systematically analyze customer needs in order to develop appropriate digital solutions.
- In the final **fifth stage** organizations use key indicators to measure the implementation of the digital strategy and have a digital roadmap. CABs have an early warning system to identify relevant digital technologies, and customers are involved in the development of digital innovations.

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# Motives, Impacts and Hurdles of Digitalization

What drives digitalization in New Zealand 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?

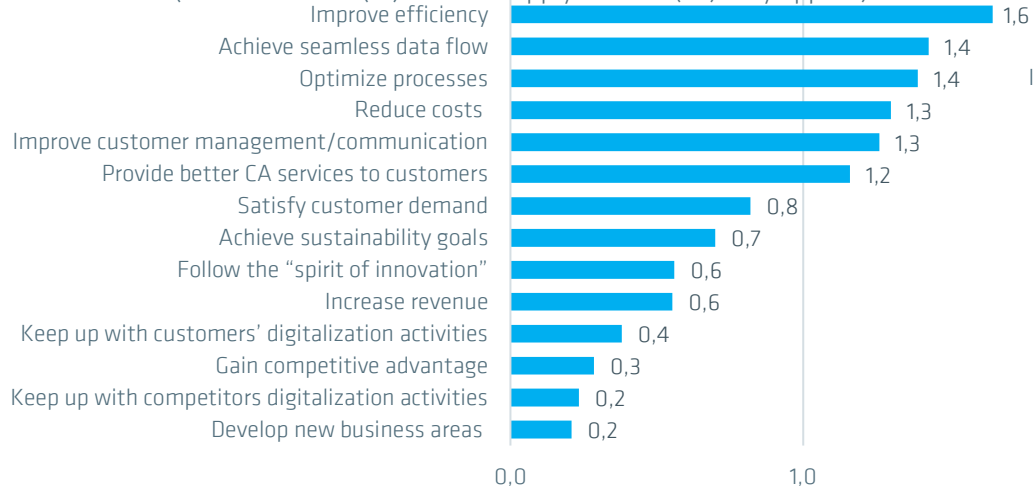
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# Focus on efficiency enhancements

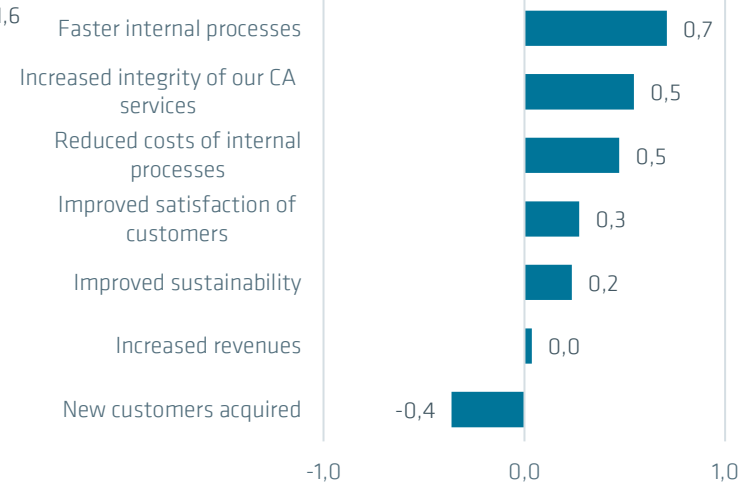
## Goals behind the digitalization efforts (n=51)

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



## Benefits realized from digitalization (n=55)

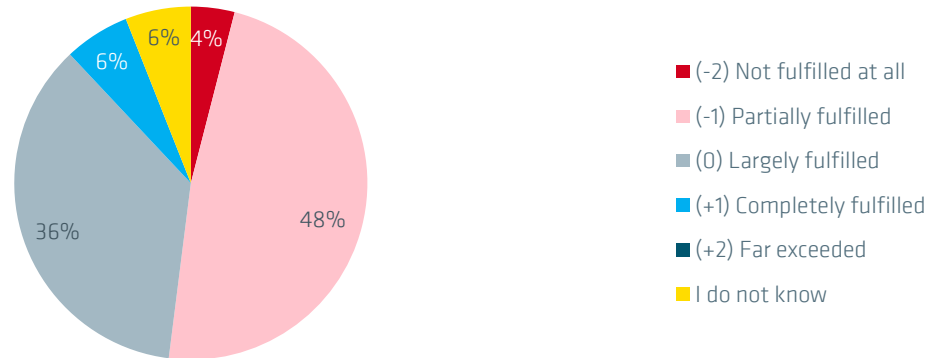
(on a scale from (-2) not agree at all to (+2) fully agree)



- Improving efficiency, achieving seamless data flow and optimizing processes are the **main goals** behind the digitalization efforts of CABs in New Zealand. In fact, faster and more cost-effective internal processes are considered as the greatest realized benefits.
- Market objectives such the development of new business areas and increase revenues are no big drivers - and the effects achieved on sales and new customer acquisition are correspondingly low. However, many respondents see the integrity of CA services and satisfaction of existing customers improved.

# CABs' expectations in connection with digitalization are partially met

Whether the expectations behind the introduction of digital processes/technologies have been fulfilled overall so far (n=50)

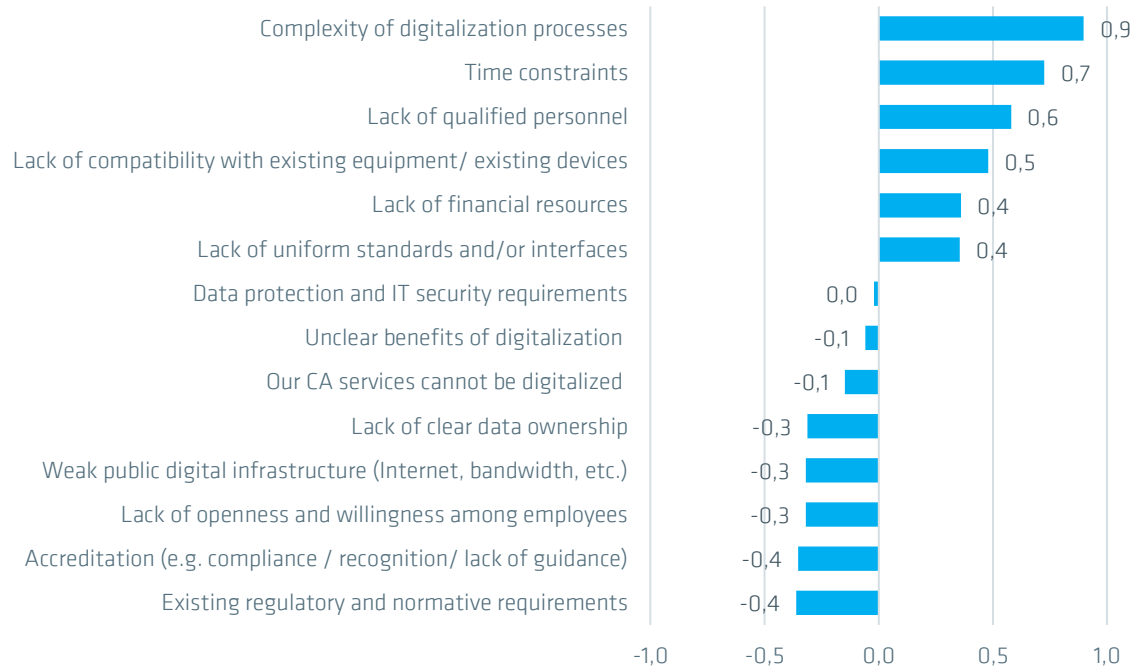


- 42% of the CABs consider their expectations behind the introduction of digital technologies to have been largely or completely fulfilled. However, almost every second CAB finds them only partially met.
- 4% of the CABs state that their expectations were not met at all.

# Complexity of digital processes is the biggest hurdle to digital transformation

## Hurdles to digital transformation (n=55)

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



- The general complexity of digitalization processes is the biggest hurdle for CABs, followed by time constraints.
- Lack of qualified personnel and lack of compatibility with existing equipment are also barriers.
- While the lack of qualified personnel is an obstacle, a lack of openness/ readiness on the part of employees is not.
- Accreditation and existing regulatory and normative requirements are not considered an obstacle.

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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.

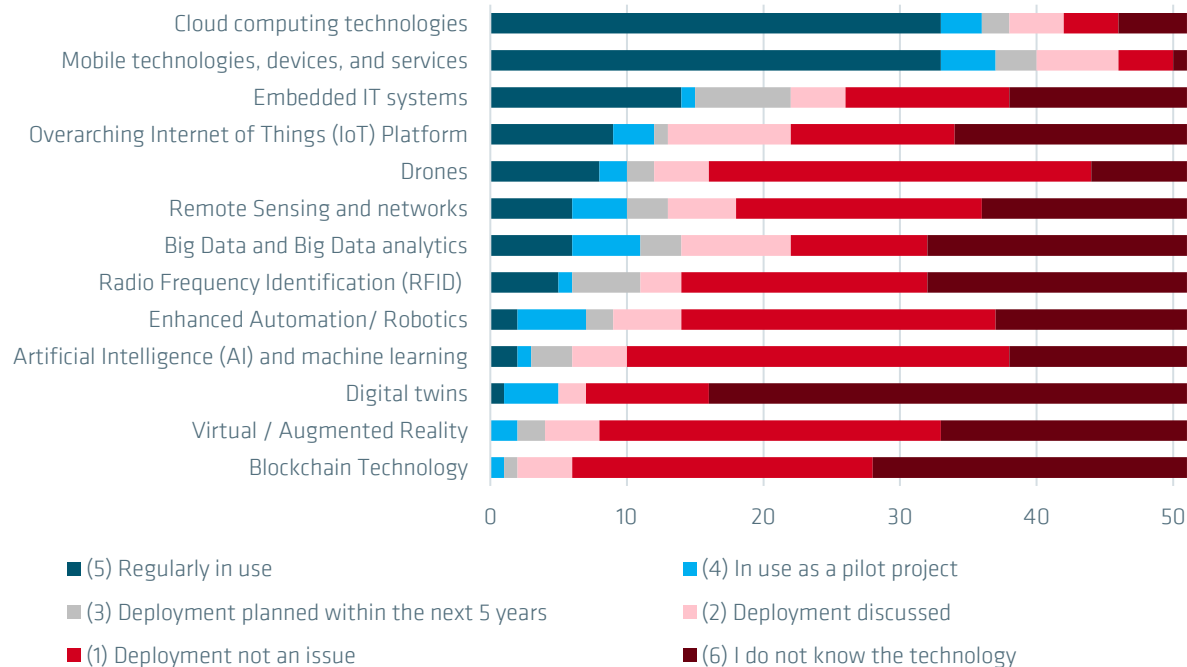
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# Latest digital technologies are not yet widely used in CABs

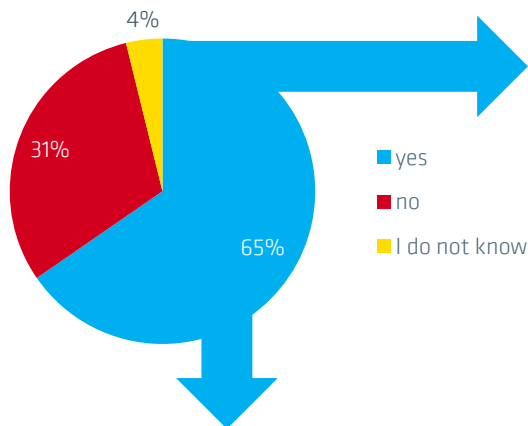
Technologies that are used or planned to be used (n=51)



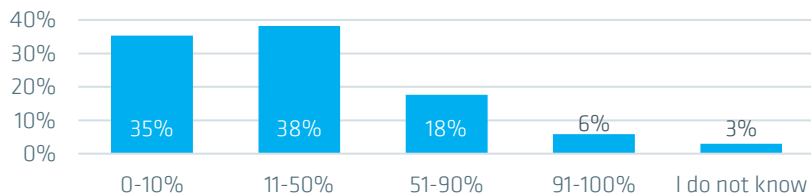
- Many of the latest digital technologies such as Big Data, artificial intelligence and digital twins are used by CABs in New Zealand, but not yet on a large scale.
- Blockchain technologies mean nothing to 45% of the respondents, digital twins to 69%.
- Among CABs, cloud computing technologies are widely used, followed by mobile technologies and embedded IT systems.

# Use of remote methods and technologies

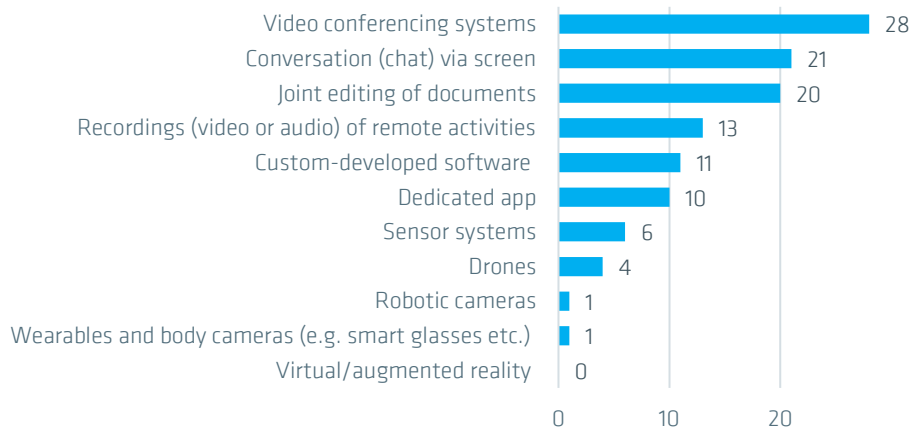
CABs that use remote methods in CA (n=52)



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



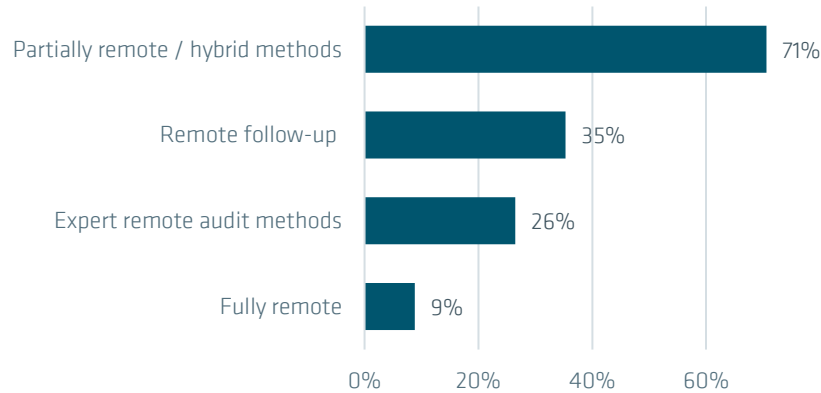
Technologies used for remote procedures (n=34)



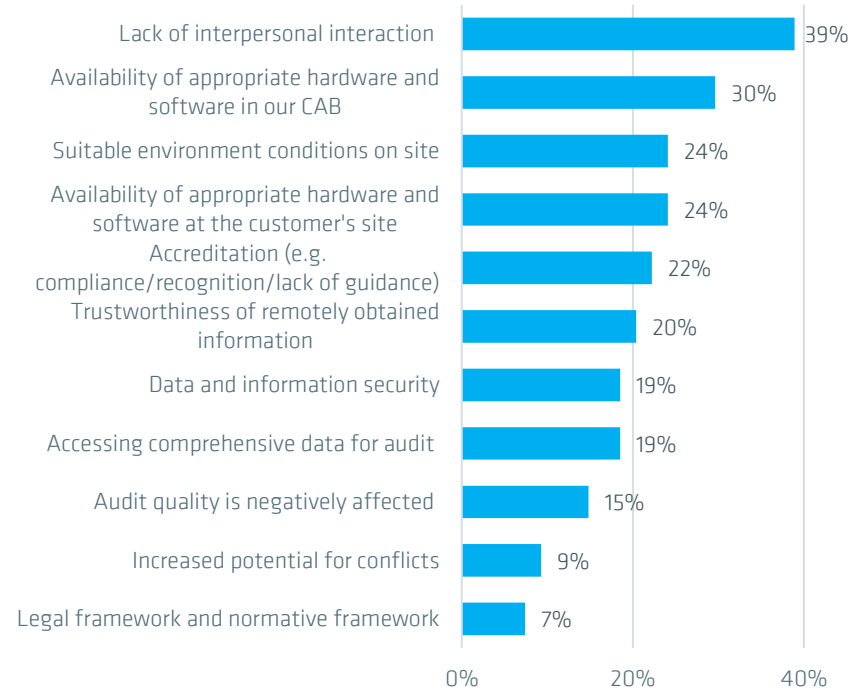
- Two out of three CABs use **remote methods** in their CA activities.
- 35% of the CABs perform a maximum of 10% of their activities remotely. Only 6% of the CABs have already switched completely.
- Video conferencing systems are the most commonly used **tool for remote working**, followed by conversation via screen.

# Diverse approaches used and experienced hurdles in remote procedures

Type of remote procedures used (n=34)



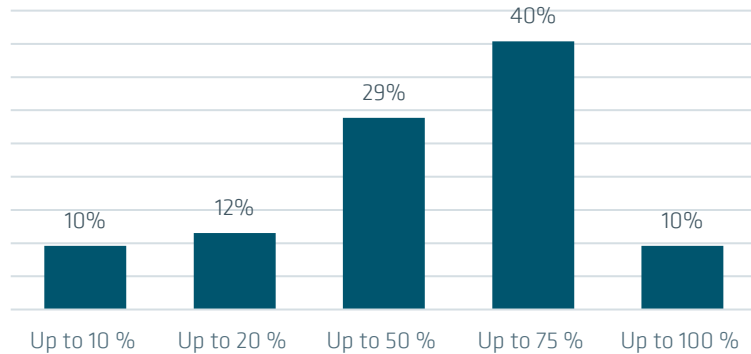
Barriers (n=54)



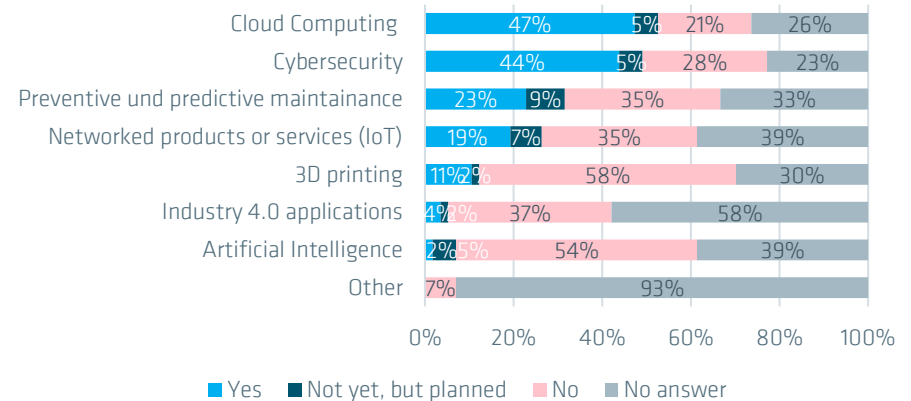
- **Hybrid methods** are the predominant type among remote methods used by CABs.
- Lack of interpersonal interaction is seen as the biggest **hurdle** in the use of remote methods, followed by the availability of appropriate hardware and software at the customer's site.

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

Share of routine processes that are digital (n=52)



Digital products and applications for which CA is conducted (n=44)



- Every second CAB has digitalized more than half of its **routine processes**. However, one out of ten CABs has not even digitally converted 10% of their processes.
- 28% of the surveyed CABs conduct **conformity assessments for modern digital technologies and applications**. In focus: cloud computing (47%) and cybersecurity (44%).

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# The COVID-19 Pandemic and Digitalization

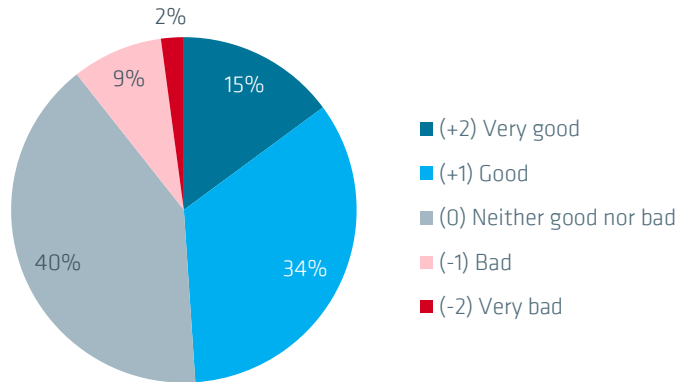
The role of digitalization in responding to the challenges posed by the COVID-19 pandemic and the impact of the pandemic on digitalization.

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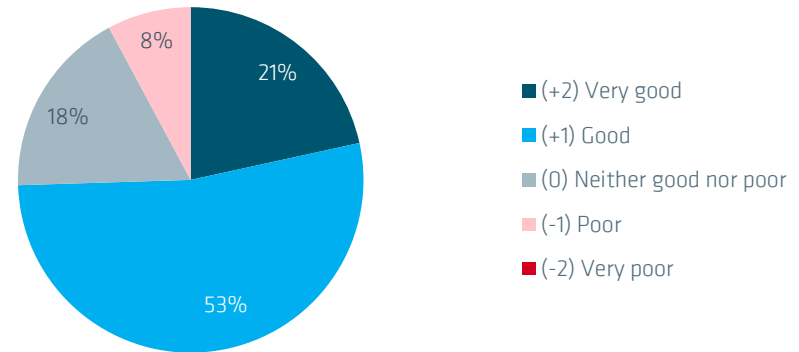
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# Most CABs have coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=50)



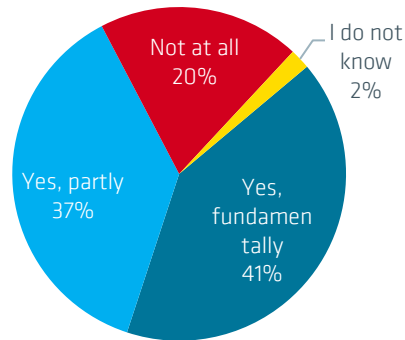
Response to the challenges of the COVID-19 pandemic (n=51)



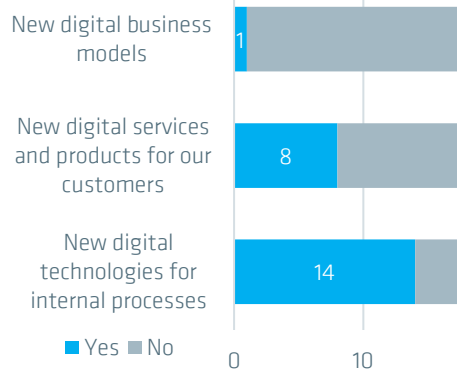
- Although, for 40% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic, for the majority (49%) their order situation improve. Only 11% of the CABs stated that their orders have declined.
- The majority of CABs (74%) reported that they had responded well or very well to the challenges associated with the COVID-19 pandemic.

# Pandemic and digitalization

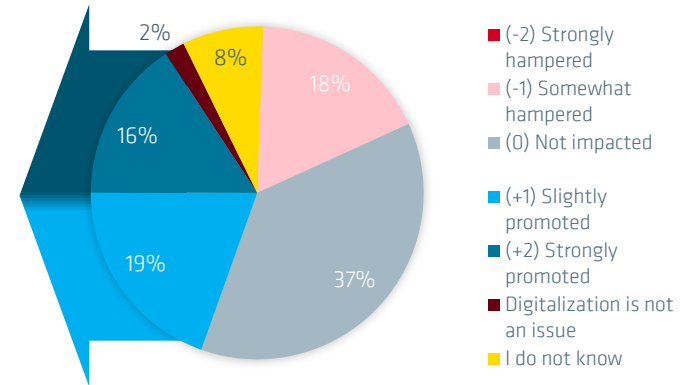
Digital technologies have helped coping with challenges of the COVID-19 pandemic (n=51)



Digital adaptation in course of the COVID-19 pandemic (n=18)



Impact of the Covid-19 pandemic on the digitalization of CABs (n=51)



- For 78% of the CABs, digital technologies have helped in coping with the challenges of the COVID-19 pandemic.
- The majority of the CABs (35%) reports that digital transformation has been slightly or even strongly encouraged and has led to adaptations:
  - 78% of CABs have introduced new digital technologies for internal processes, 44% new digital services and products for their customers, 6% even new digital business models.

- CABs in New Zealand clearly see digital transformation as an opportunity. The **level of digitalization** varies among CABs. The majority of participants has reached a medium level of digital maturity.
- Even though digital transformation is an individual project for each organization, **typical patterns of digital maturity** in New Zealand CABs are nevertheless confirmed: An initial focus on technology, customers and culture 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 digital twins are used by CABs in New Zealand, but not yet on a large scale.
- With their digitalization efforts, the CABs are primarily **aiming** at internal process improvements. Routine processes are increasingly being digitalized and there is a switch to – mostly hybrid - remote processes.

## New Zealand in international comparison

How do New Zealand 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



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

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

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

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# Annexes

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# Digital Maturity Model Cluster 1 (Beginner)

## Description Level 1: Beginner

### Dimensions



Digitalization has a central role in our overall strategy

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

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

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

Our CAB is open to new technologies, change and transformation




Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management










Innovation



Cooperation

# Digital Maturity Model Cluster 2



Description Level 2	Dimensions						
							
Our processes are already networked through IT							
Digital activities are integrated into the core processes of our CAB							
With digitalization, we open a new source of value creation							



# Digital Maturity Model Cluster 3

## Description Level 3

### Dimensions



Our digital strategy is well documented and communicated	Strategy						
We exploit the latest digital opportunities to automate our routine processes		IT & Process Digitalization					
We invest in digital technologies throughout the CAB		IT & Process Digitalization					
Our IT department can ensure the use of digital technologies relevant to our CAB		IT & Process Digitalization					
The provision of services for customers, as well as customer care are digitally integrated, and personalized			Customers				
Customer data is analyzed, and relevant actions are taken accordingly			Customers				
The understanding of the importance of digital transformation is pronounced within our CAB				Culture & Expertise			
We have the right people and skills for a successful digital transformation				Culture & Expertise			
We accept the risk of failure in new digital activities				Culture & Expertise			
We promote the development of digital expertise through targeted training of our employees at all levels				Culture & Expertise			
We drive digital innovations forward systematically and purposefully					Organization & Change Management		
We generate competitive advantages through digitalization					Organization & Change Management		
We work across departments and functions on the topic of digitalization						Innovation	
We use exchanges with external experts to build up additional knowledge in the area of digitalization							Innovation
We collaborate effectively with stakeholders on digital initiatives							Cooperation



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		■					
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					■		
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 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 5 (Expert)

## Description Level 5: Expert

### Dimensions



We use key metrics to measure the implementation status of our digitalization strategy

We have defined a step-by-step implementation plan (Digital Roadmap) for achieving the goals

We have an "early warning" process to identify new, relevant digital technologies or business models for us

We have enough resources to drive digital innovation

We actively involve customers in the development of new digital innovations

We have a clearly defined innovation process for the development, evaluation, and implementation of new ideas by employees and/or customers.

In the field of digitalization, we maintain a partner network with external service providers, start-ups, or research institutions

	Strategy	IT & Process Digitalization	Customers	Culture & Expertise	Organization & Change Management	Innovation	Cooperation
We use key metrics to measure the implementation status of our digitalization strategy	Green						
We have defined a step-by-step implementation plan (Digital Roadmap) for achieving the goals	Green						
We have an "early warning" process to identify new, relevant digital technologies or business models for us					Green		
We have enough resources to drive digital innovation					Green		
We actively involve customers in the development of new digital innovations						Green	
We have a clearly defined innovation process for the development, evaluation, and implementation of new ideas by employees and/or customers.						Green	
In the field of digitalization, we maintain a partner network with external service providers, start-ups, or research institutions							Green



Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management



Innovation



Cooperation

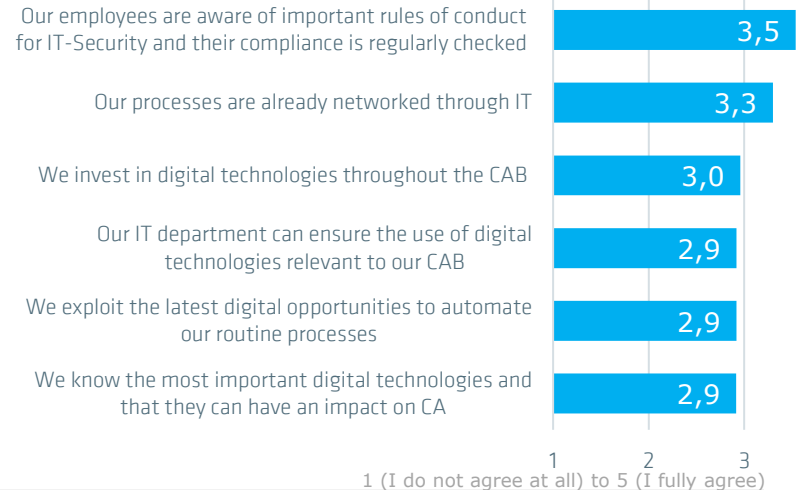


# Dimensions of digital maturity: Detailed overview

## Strategy (n=51)



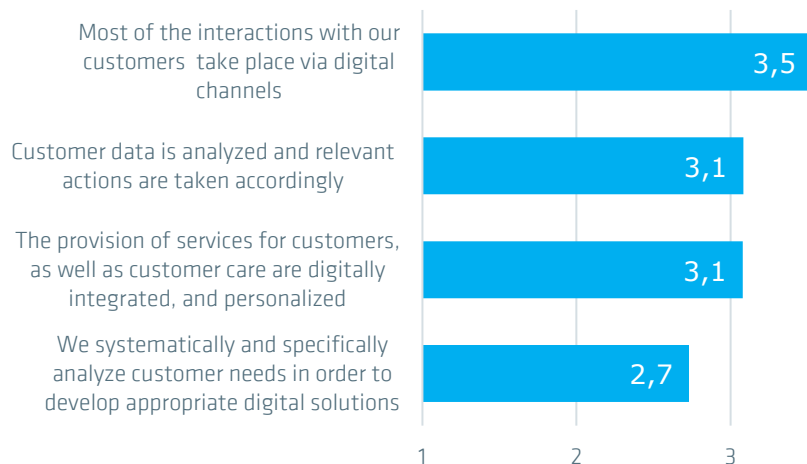
## Information Technology & Process Digitalization (n=50)



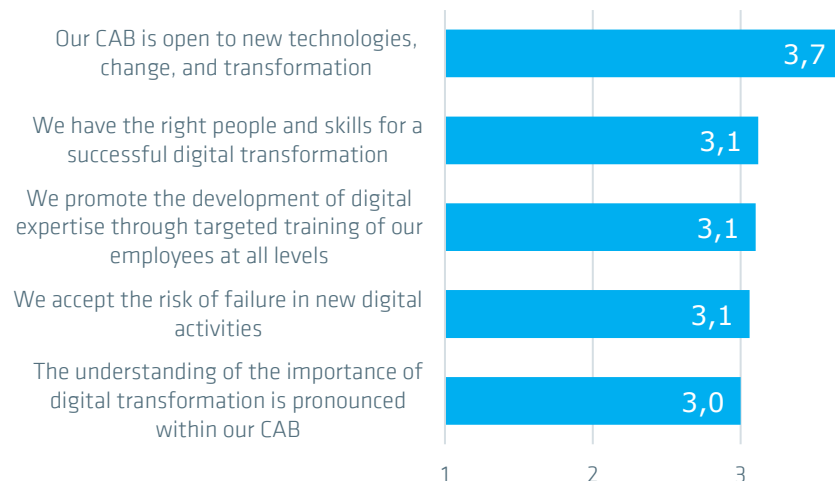
- In most CABs (76%), digitalization plays a central role in their overall strategy, with 58% having a well documented digital strategy.
- 50% have set up a Digital Roadmap and 56% use key metrics to measure the implementation status of their digitalization strategy.
- At least 58% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations. 66% of CABs have networked their processes and 58% have automated routine procedures.

# Dimensions of digital maturity: Detailed overview

## Customers (n=53)



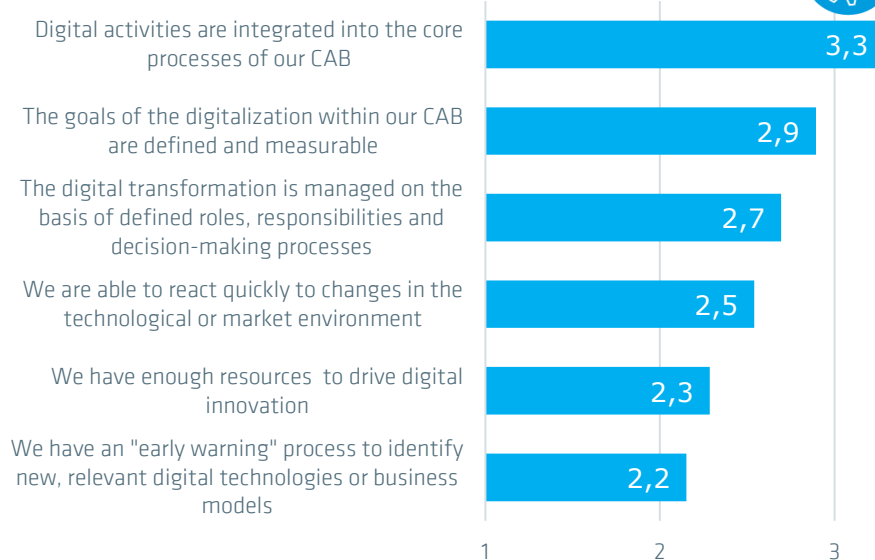
## Culture & Expertise (n=51)



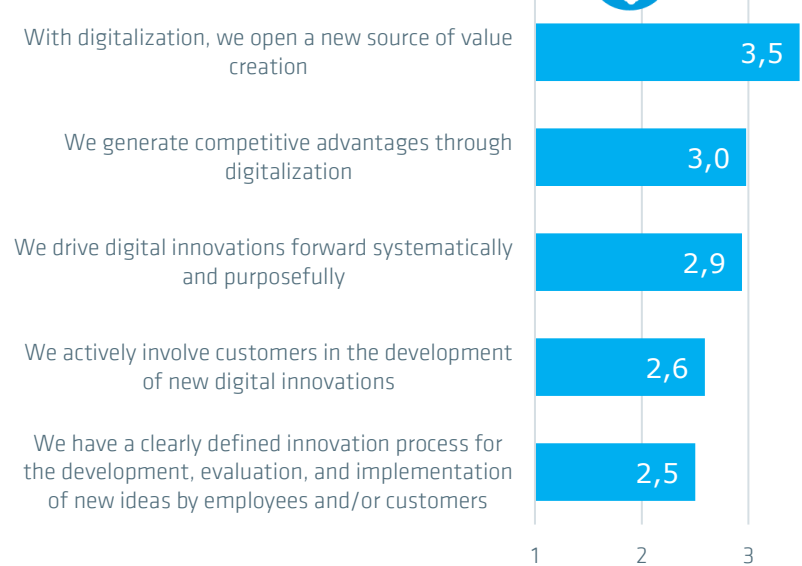
- 70% of CABs in New Zealand interact with their customers via digital channels.
- 62% offer digitally integrated services to customers and only 54% of them develop appropriate digital solutions based on customer needs.
- New Zealand CABs are definitely open to new technologies, changes and transformations (74%). At least 60% 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=50)



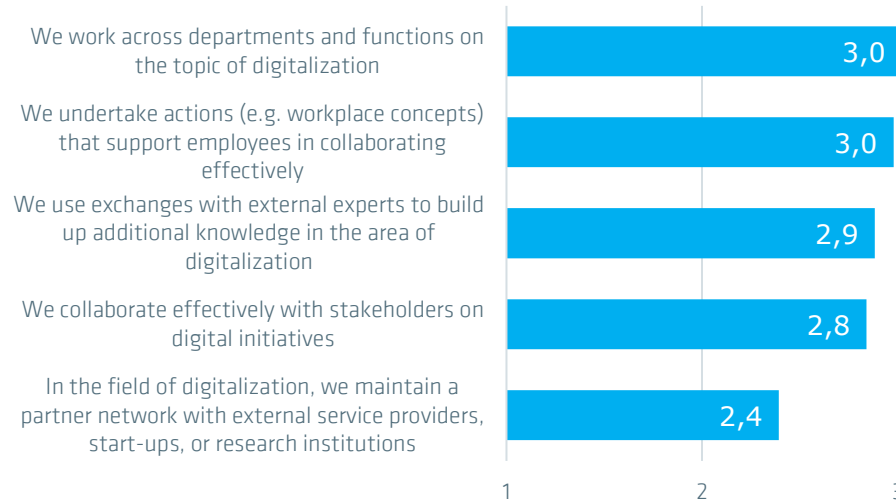
## Innovation (n=49)



- 66% 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 (70%), 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=51)



- In order to work on the topic of digitalization across departments and functions (60%), 58% of CABs build additional knowledge through external expert consultations. They also collaborate effectively with stakeholders on various digital activities.
- 48% maintain a partner network with external service providers.