



Sicherheit in Technik und Chemie

2022

Digitalization in Conformity Assessment in West Africa

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	74 accredited conformity assessment bodies (CABs) in West Africa
Data collection method	Online survey
Survey period	February 15, 2022 March 11, 2022
Sample	37 fully completed questionnaires (50% response rate)

Digitalization in Conformity Assessment
Online Survey

QI-FoKuS
Research on Conformity Assessment and Safety

Supported by



The Study - An Overview

The digital transformation of the economy as well as increasingly networked and complex products and applications are bringing digitalization into the focus of conformity assessment bodies (CABs). Innovations, new technologies and processes rely on corresponding conformity assessment services. This poses new challenges for testing and calibration laboratories, inspection and certification bodies, and other CABs. At the same time, however, new digital technologies and applications also offer new opportunities. This study is the first to comprehensively explore "Digitalization in Conformity Assessment" building on data from an online survey of accredited CABs in West Africa.

Major topic areas covered:

Digital Maturity Level

- Assessment of the digital maturity of the CABs in West Africa based on a tailored digital maturity model

Drivers, Benefits and Barriers

- What motivates CABs to transform digitally, what impact do they experience, and what hurdles must be overcome

Technology Trends

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

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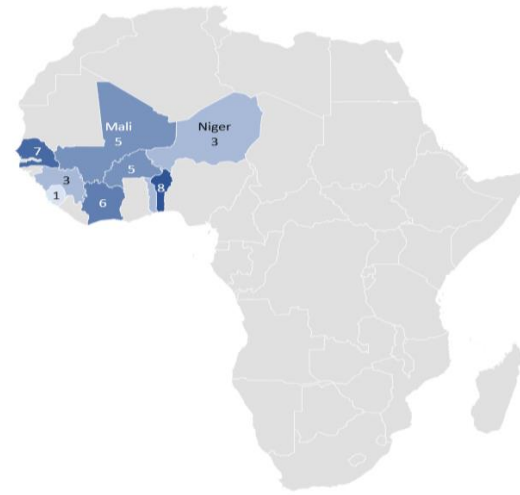
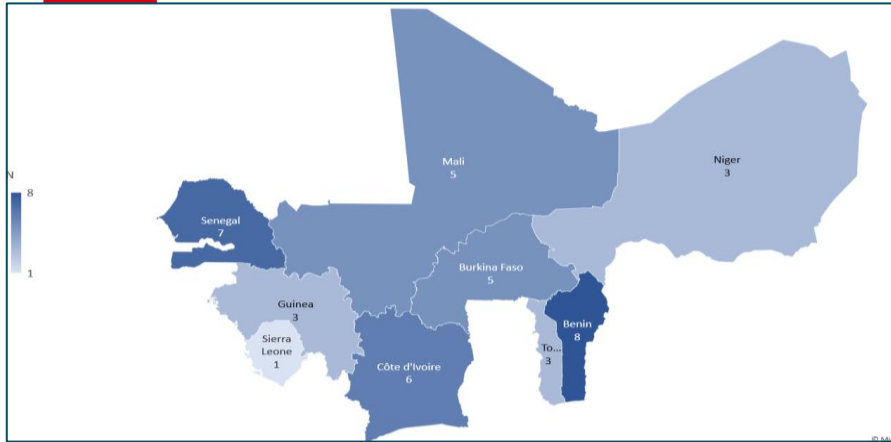
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The Sample

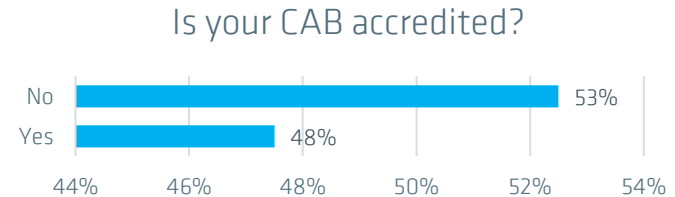
General information about the participating Conformity Assessment Bodies

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Countries of origin of the participating CABs in West Africa



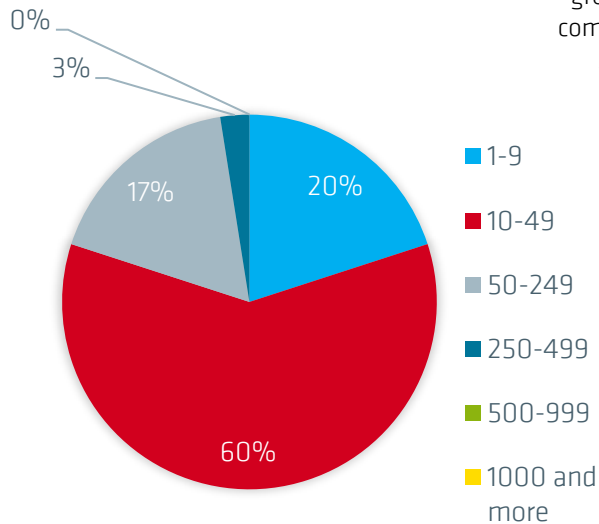
- Out of 42 CABs that participated in the regional West African survey, 8 are located in Benin, 7 in Senegal and 6 in Ivory Coast. Both in Mali and in Burkina Faso, 5 CABs took part in the study, while in Togo, Niger and Guinea, 3 CABs joined.
- In Sierra Leone only 1 CAB participated in the survey.
- 53% of the participating CABs are not accredited.



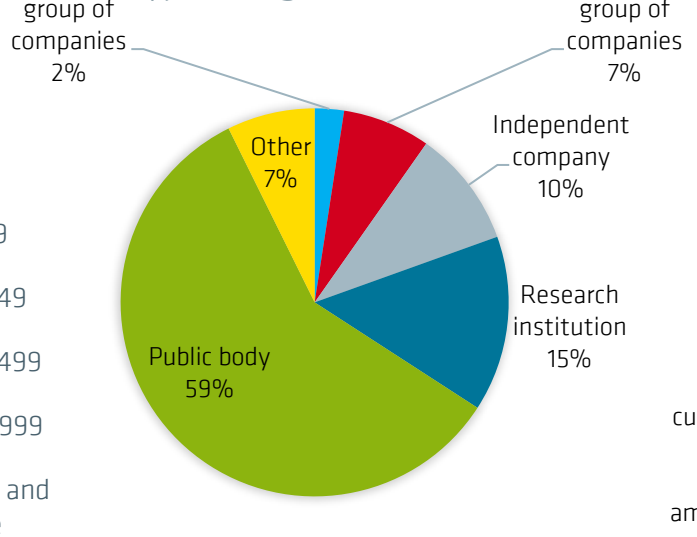
42 conformity assessment bodies (CABs) in West Africa participated in the survey

- 80% of participating CABs are **small businesses** with less than 50 employees.
- 59% are **public bodies**, 10% are **independent companies**, 2% belong to a **national group**.
- for 48% CA is the main **focus of activity** and for 28% it is **one activity among others**.

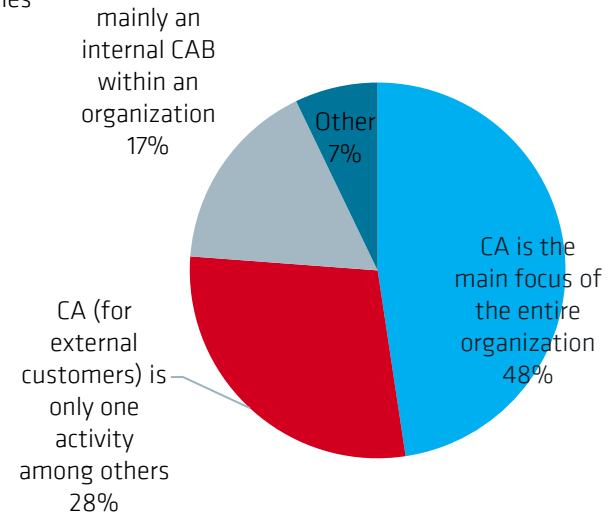
Number of employees (n=42)



Type of organization (n=41)

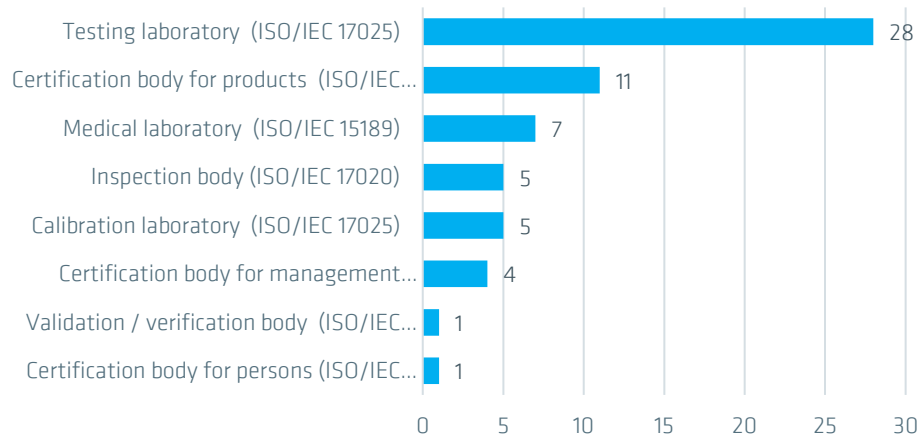


Role of CA for the organization (n=42)

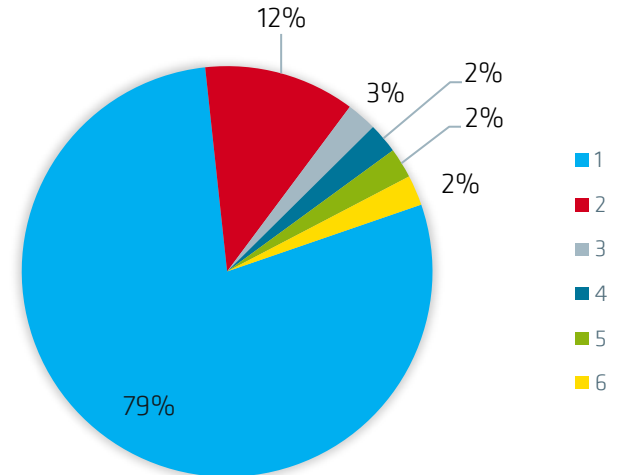


The 42 participating CABs cover a broad range of activities

Field of activity

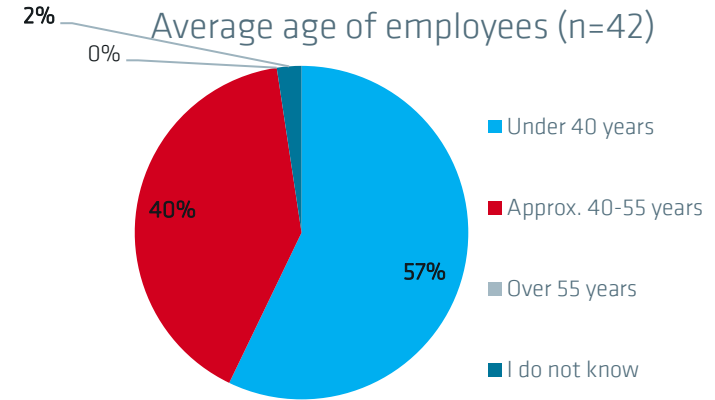
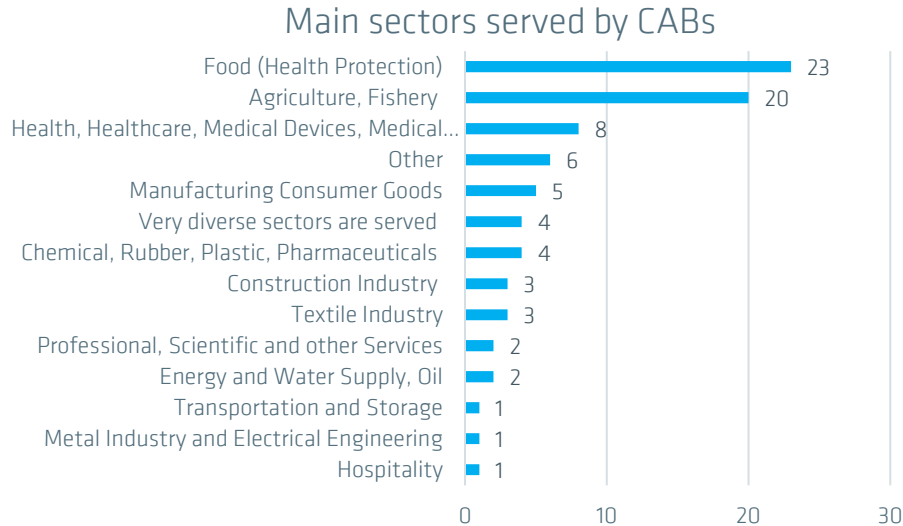


Number of fields of CA activities per CAB

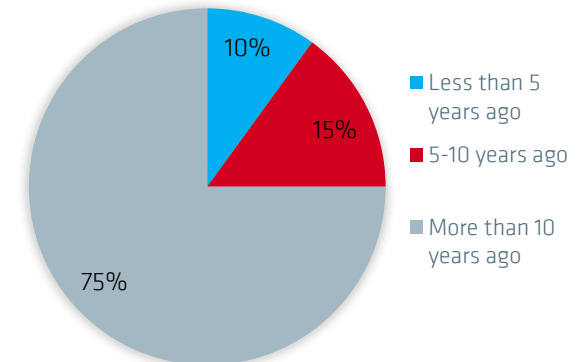


- Testing laboratories represent the **largest group of participants**, followed by product certification bodies and medical laboratories.
- 79% of CABs are **specialized** in a single field of conformity assessment activity; only a few cover a broad range of activities (up to 6).

The CABs serve a broad spectrum of sectors



Establishment of the CAB (n=42)



- The **main industries** served by the CABs are from the food sector, but also agriculture and fishery are important.
- While the **average age of the employees** is 40-55 years in 40% of the CABs, 57% have staff under 40 years on average.
- 75% of the CABs were **established** more than 10 years ago; only 10% are younger than 5 years.

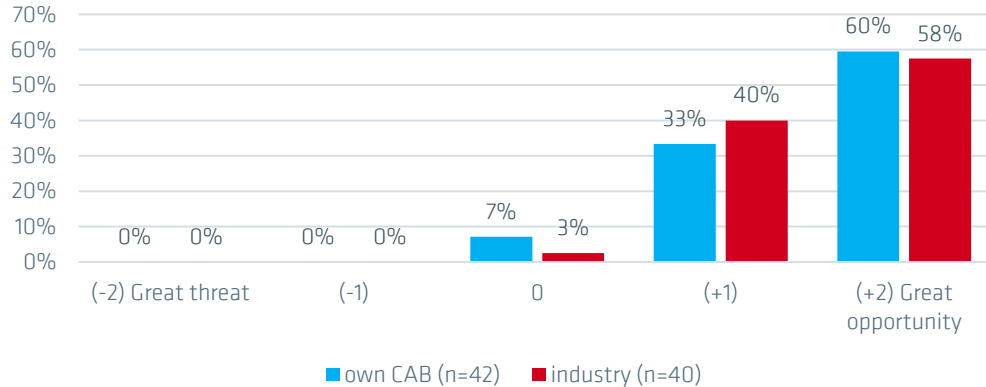
Digitalization in West African CABs A General Overview

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.

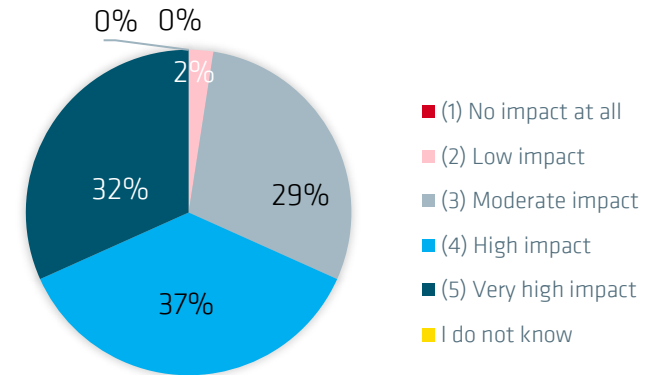
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Digitalization is perceived as an opportunity by most CABs, with high impact in the future

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



Expected impact of digitalization in the next 5-10 years (n=41)



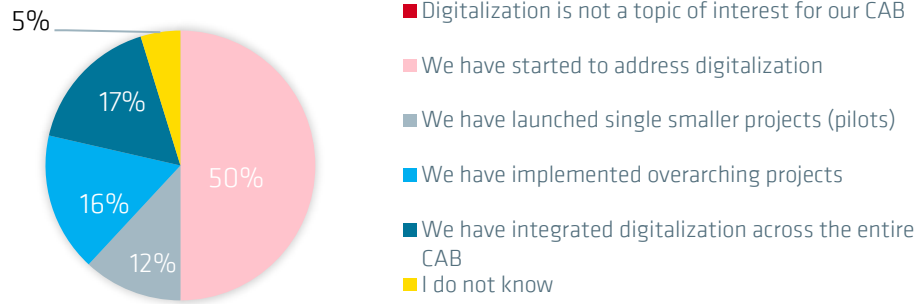
- In general, the CABs have a **positive perception** of digitalization: more than 93% of surveyed CABs recognize digitalization as an **opportunity or even a great opportunity** rather than a threat, for the own organization and even 98% for the whole CA industry.
- 69% of the participants expect a **high or even very high impact of digitalization on CA activities** in the next 5-10 years.

Diverse status of digitalization across the CABs//

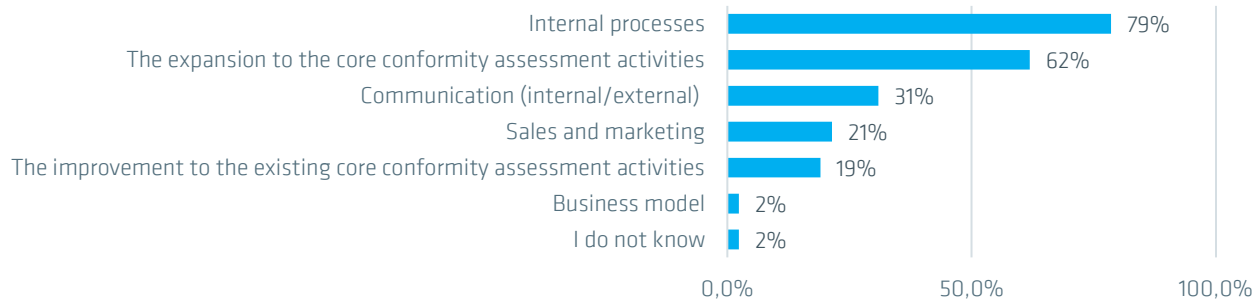
Focus mainly on internal processes



Status and extent of digitalization in the CABs (n=42)



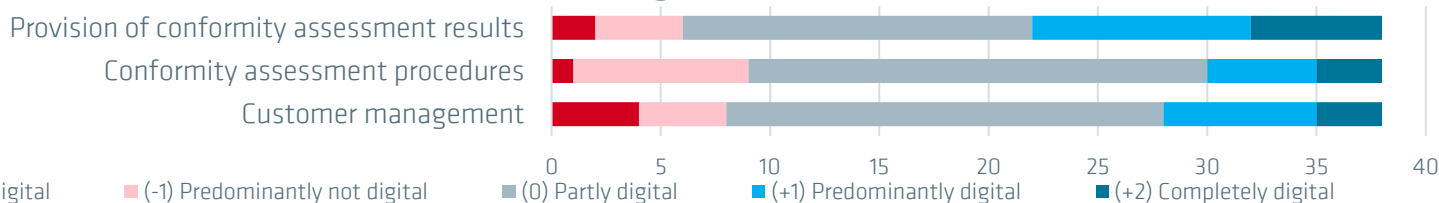
Areas targeted by digitalization (multiple answers possible, n=42)



- **The status of digitalization is quite diverse** across the CABs in West Africa: While 50% of the CABs have just started to address this topic, 12% have launched single smaller projects and 16% have already implemented overarching projects. 17% state to have integrated digitalization across the whole organization.
- Although most of the **digitalization activities concern internal processes**, digitalization is currently used by 62% of the CABs to expand the provision of CA services. However, it is used rarely to adopt new business models.

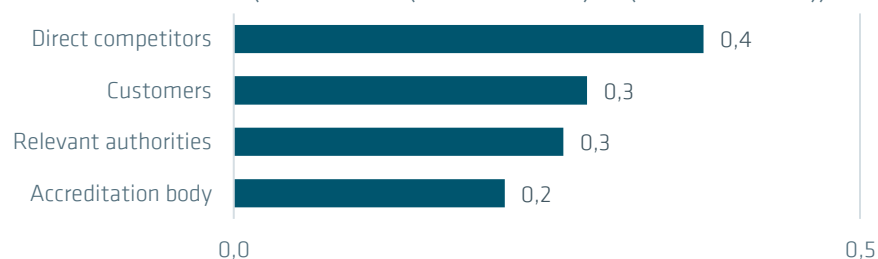
Many areas are not yet or only partly digital; CABs BAM yet rate themselves more digital than their stakeholders

Self-evaluation of the CABs' status of digitalization in different areas (n=40)



- By now, about 65% of the CABs are not or only partly digitalized in major areas such as CA procedures or customer management. Even CA results are not yet provided completely digitally by many CABs.
- When **comparing themselves to other organizations**, CABs perceive their digital status as at least as good or better, especially when compared to direct competitors, customers and relevant authorities.
- 83% of the CABs **have started to deal with digitalization** recently (during the last 5 years). Only 2% have done so at least 10 years ago.

Own status of digitalization compared to... (n=42)
(on a scale of (-2 much worse) to (+2 much better))



CABs started to deal with digitalization... (n=41)

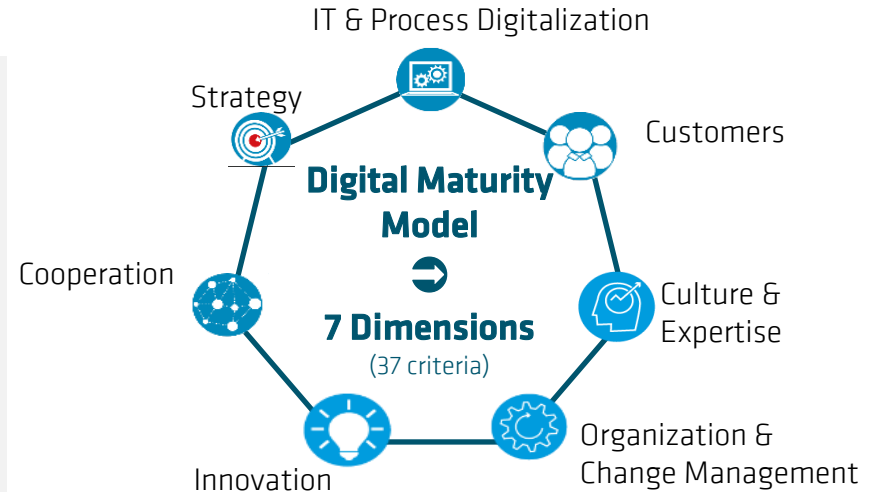


Digital Maturity of CABs

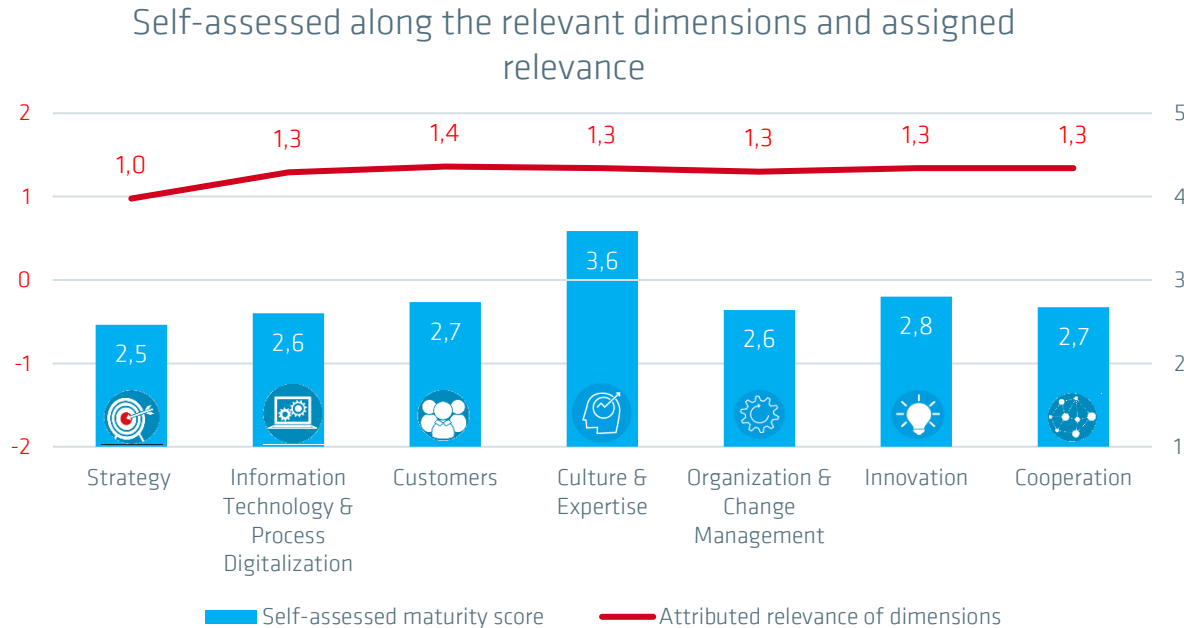
The "digital maturity" of an organization describes its status in the digital transformation. Digital maturity models use predefined dimensions and criteria to assess the ability of organizations to cope with the digital transformation. The following chapter presents the results for CABs in West Africa based on a model developed specifically for this study.

The digital maturity model for the conformity assessment industry

- The digital maturity level reflects the status of the digital transformation of an organization and includes technical as well as organizational and strategic aspects.
- Becoming a digitally mature organization requires efforts, **capabilities** and **resources** across many areas.
- These are mapped in a maturity model using various **dimensions** and **criteria**:
 - Our specially developed model takes into account 7 dimensions that are essential in the digital transformation of CABs: from technological to strategic, organizational, to cultural aspects.
 - Each dimension is operationalized by 4 to 6 criteria that describe basic success factors in terms of capabilities, capacities and resources.
- By means of a self-assessment of the participating CABs along these criteria, an individual digital maturity level is calculated - from level 1 ("beginner") to level 5 ("expert").



Different maturity of dimensions: customers advanced, organization not yet



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

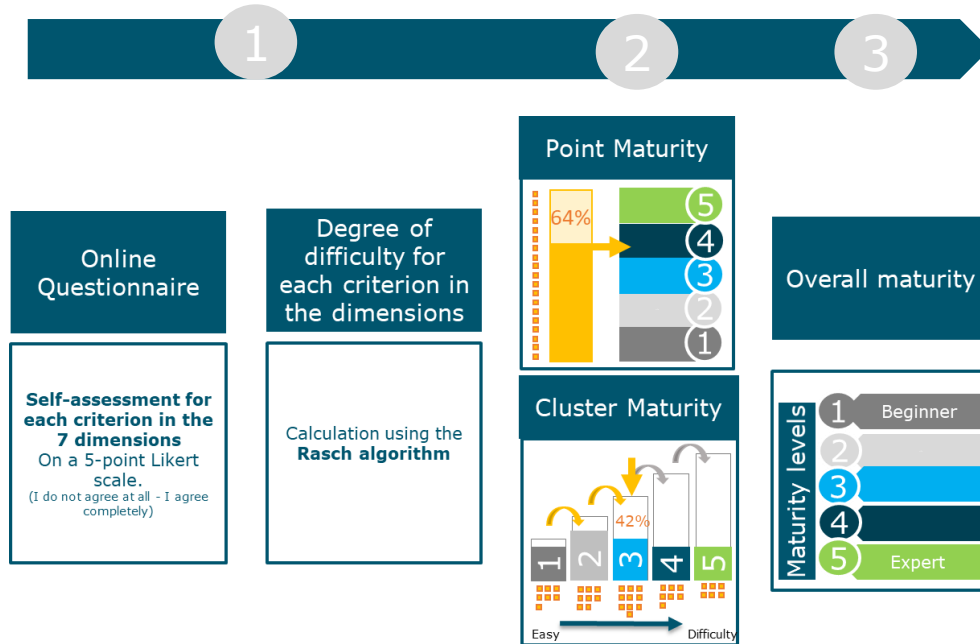
* CABs were asked to self-evaluate along statements in 7 topic areas (dimensions) on a scale from 1 (I do not agree at all) to 5 (I fully agree). These statements and dimensions are displayed in detail in the following pages. Participants were then asked to rate the importance of each dimension with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

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

Background information: Calculation of the digital maturity level

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

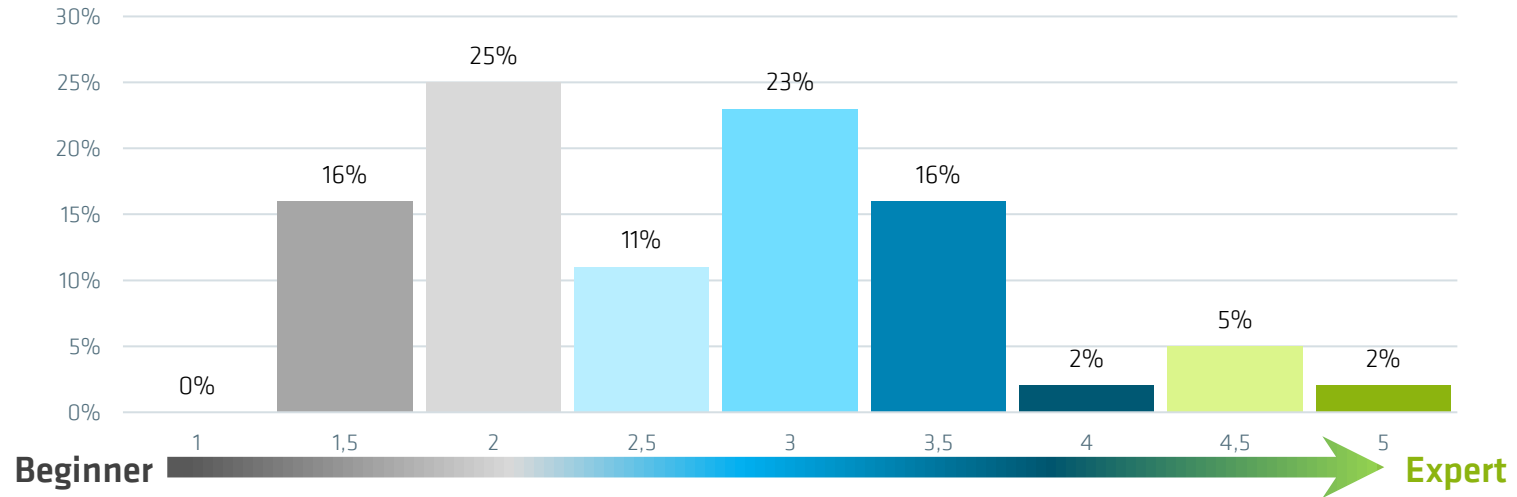
1. For each criterion, the Rasch algorithm is first used to calculate how difficult it is to achieve a good result for it (**degree of difficulty**). If, on average, a large number of participants state that they can meet this criterion, it is classified as easy to achieve.
2. Based on this, 2 types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



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

Overall Digital Maturity Scores of the West African CA industry

Distribution of overall maturity scores (n=44)



Statistically, the **digital maturity levels** achieved by the 44 participating CABs in West Africa follow a left skewed *normal distribution*:

- 52% of the CABs are still in the earlier stages of digital transformation, and 39% have reached medium level 3 (i.e., 3 and 3,5). Only 9% of the CABs have already reached a higher level of maturity.
- Only 2% of the CABs have yet achieved the expert maturity stage 5. None of the CABs is still on the very beginner level 1.

The 5 Digital Maturity stages in West African CABs

Expert

Beginner

1

2

Intermediate

3

4

5

- ✓ Open to new technologies, change, and transformation

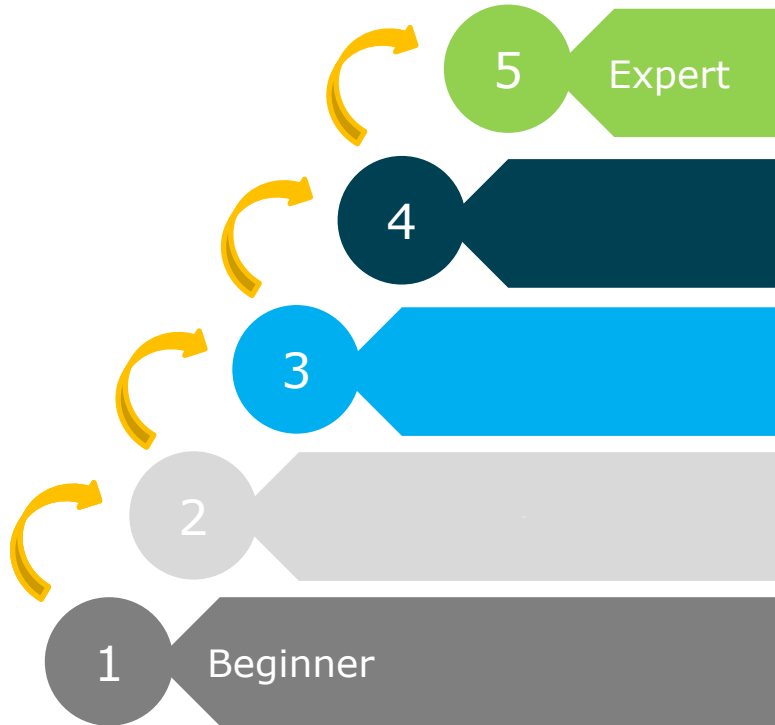
- ✓ Digitalization has a central role in strategy
- ✓ Use of digital technologies ensured
- ✓ Interactions with customers via digital channels
- ✓ Analysis of customer data
- ✓ Digital information is important
- ✓ Availability of right people and skills for successful digital transformation
- ✓ Risk of failure accepted
- ✓ Targeted training of our employees
- ✓ Digital activities integrated into core processes
- ✓ Digitalization as a new source of value creation
- ✓ External experts

- ✓ Evaluation of digital technologies with regard to innovation potential
- ✓ Networked processes
- ✓ Most important technologies are known
- ✓ Integrated, digitalized customer care
- ✓ Analysis of customer needs
- ✓ Digital innovations are driven forward systematically and purposefully
- ✓ Customers involved in development of digital innovations
- ✓ Collaboration with stakeholders
- ✓ Partner network
- ✓ Collaboration supported

- ✓ Well documented and communicated digital strategy
- ✓ Clearly defined responsibilities for implementing goals
- ✓ Investment in digital technologies
- ✓ Employees' awareness of important rules of conduct for IT Security and check of their compliance
- ✓ Defined and measurable goals of digitalization

- ✓ Key indicators for measuring the implementation of the digital strategy
- ✓ Digital Roadmap
- ✓ Automated routine processes
- ✓ Early warning system to identify relevant digital technologies and business models
- ✓ Clearly defined innovation process
- ✓ Competitive advantage generated
- ✓ Work across departments

The Digital Maturity of CABs in West Africa // Summary of the observed patterns



- At the **first maturity level**, CABs are open to new technologies, change, and transformation.
- For **stage two**, capabilities, resources, and capacities are activated in all dimensions, with a focus on organization and change management. Digitalization is recognized and pursued as a driver for new value creation and the risk of failure is accepted. Customer needs and analyses also increasingly come into focus.
- Organizations that have reached the **third maturity level** have strengthened internal and external collaboration. Digital solutions are based on customers needs and there is cross-functional and cross-departmental collaboration on this topic. Targeted partner network are established.
- In the **fourth maturity stage**, CABs have a well documented and communicated digital strategy and clearly defined responsibilities for implementing goals. They also have a strong focus on IT and process digitalization where corresponding investments are made.
- The final **fifth stage** Key indicators for measuring the implementation of the digital strategy and Digital Roadmaps are adopted. Routine processed are automatized and a competitive advantage is generated trough digitalization.

Motives, Impacts and Hurdles of Digitalization

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

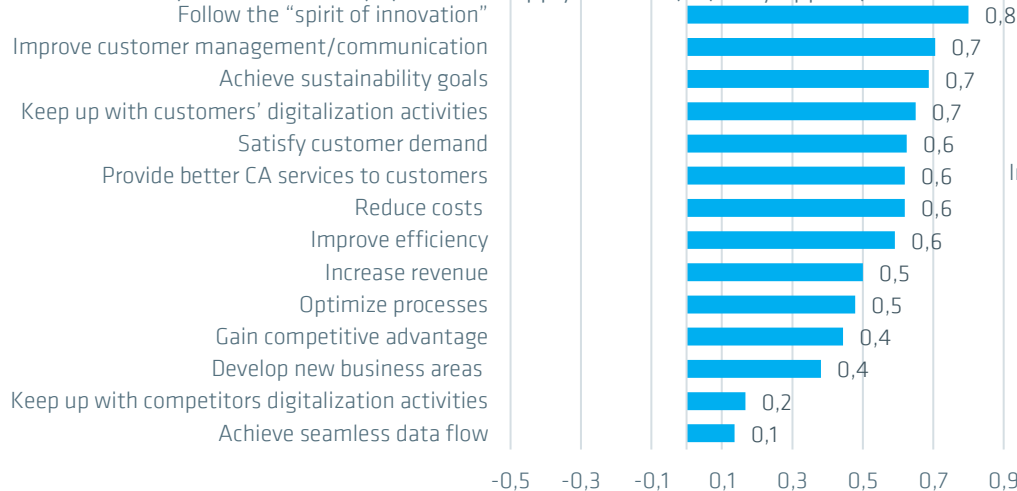
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Focus on process optimization and efficiency enhancement



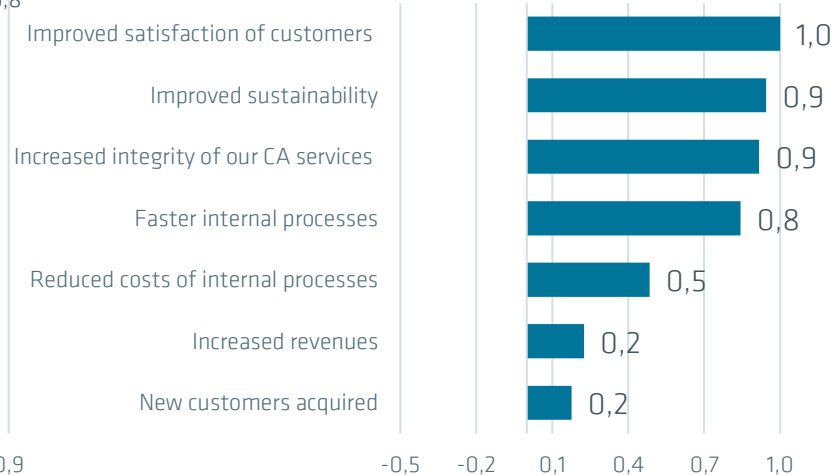
Goals behind the digitalization efforts (n=24)

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



Benefits realized from digitalization (n=39)

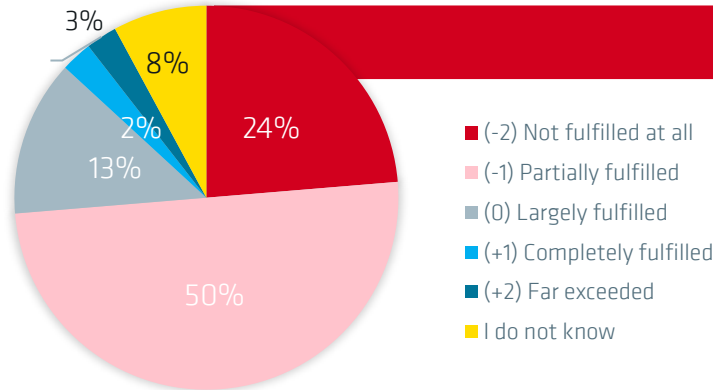
(on a scale from (-2) not agree at all to (+2) fully agree)



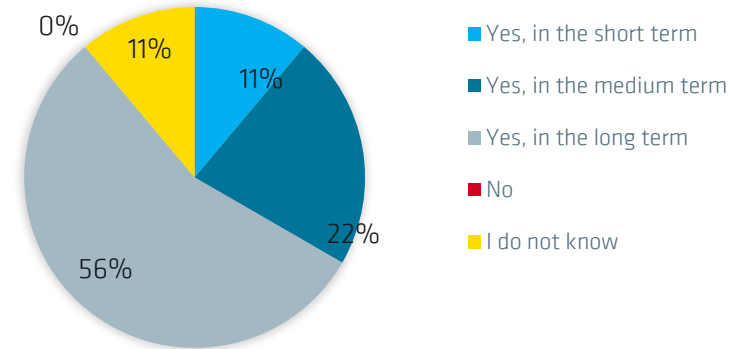
- Following the "spirit of innovation" and improving customer management/communication are the **main goals** behind the digitalization efforts of CABs in West Africa. In fact, improved satisfaction of customers and improved sustainability are considered as greatest realized benefits.
- Market objectives such as keeping up with competitors' digitalization activities or achieving a seamless data flow are not big drivers - and the effects achieved on increased revenues and new customer acquisition are correspondingly low. However, many respondents see the CABs' sustainability as well as the satisfaction of existing customers improved.

CABs' expectations in connection with digitalization are mostly partially met

Fulfilment of expectations linked to digital transformation (n=38)



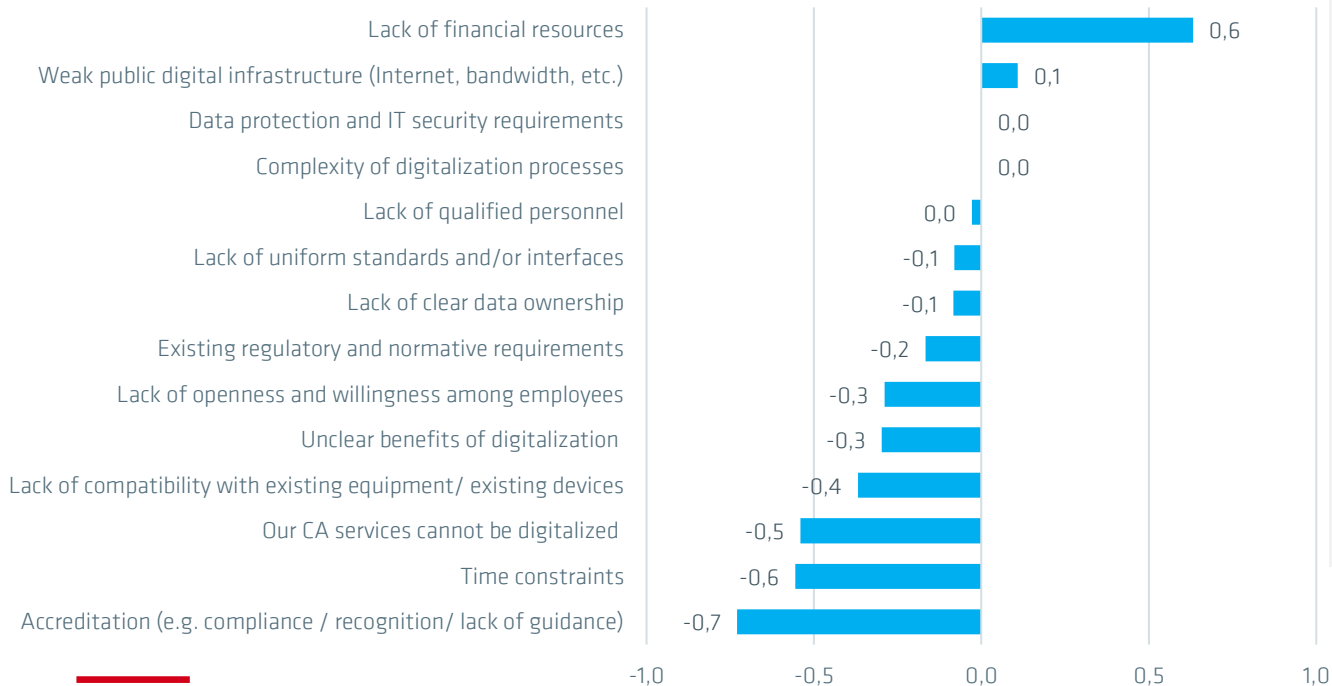
Will the expectations be met? (n=9)



- 63% of the CABs consider their expectations of the introduction of digital technologies have been largely or partially fulfilled. Another 2% find them as completely fulfilled.
- For 24% of the CABs the expectations are not fulfilled at all. However, none of them is pessimistic that this will remain the case. The CABs are confident to still meet the expectations in the future.

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

Hurdles to digital transformation (n=39)
(Scale from (-2) not at all to (+2) very much)



- The lack of financial resources is the biggest hurdle for CABs, followed by weak public digital infrastructure.
- The lack of qualified personnel and of uniform standards and/or interfaces are not considered as obstacles.

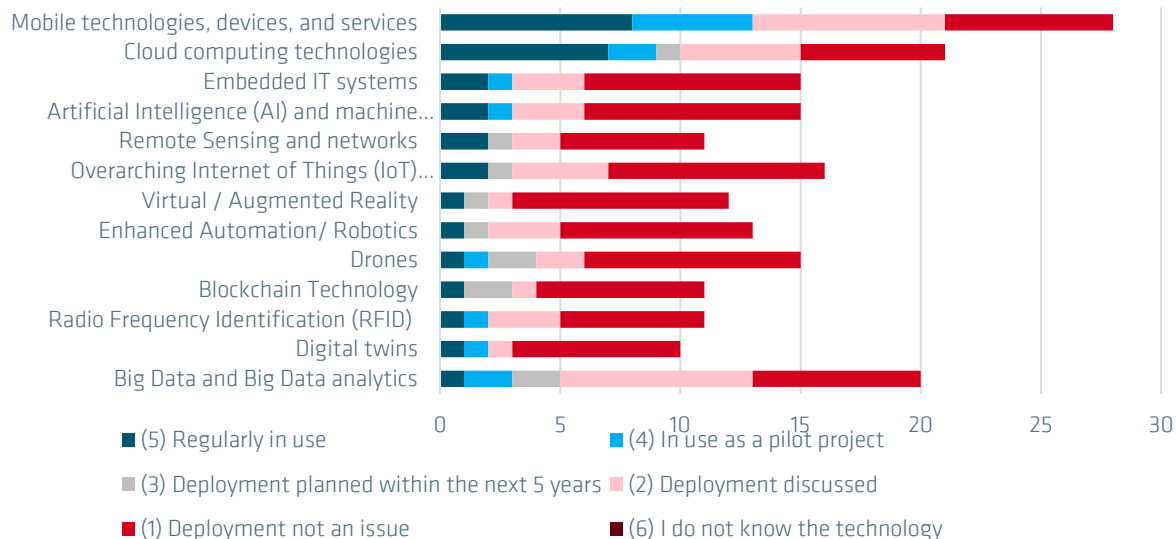
Technologies and Trends

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

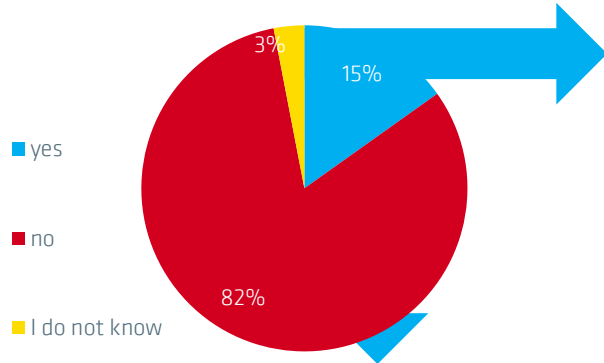
Technologies that are used or planned to be used (n=28)



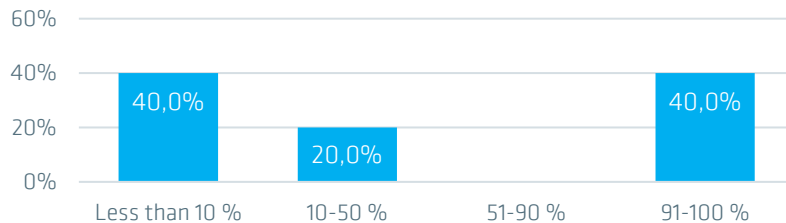
- All the participating CABs know all the latest digital technologies such as Big Data and Big Data analytics and Remote Sensing and networks.
- Many of these latest digital technologies are used by CABs in West Africa, but not yet on a large scale.
- Among CABs, Mobile technologies, devices, and services and Cloud computing technologies are the most widely used ones.

Remote methods and technologies are used by most CABs

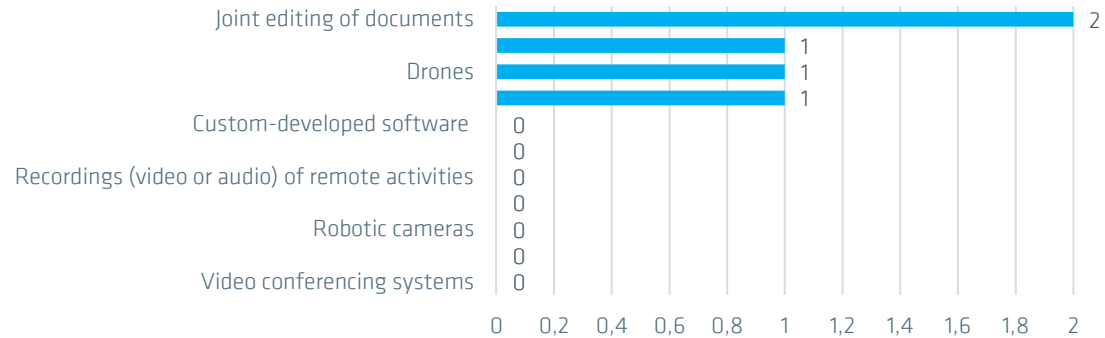
CABs that use remote methods in CA (n=33)



Share of CA services take implemented remotely (n=5)



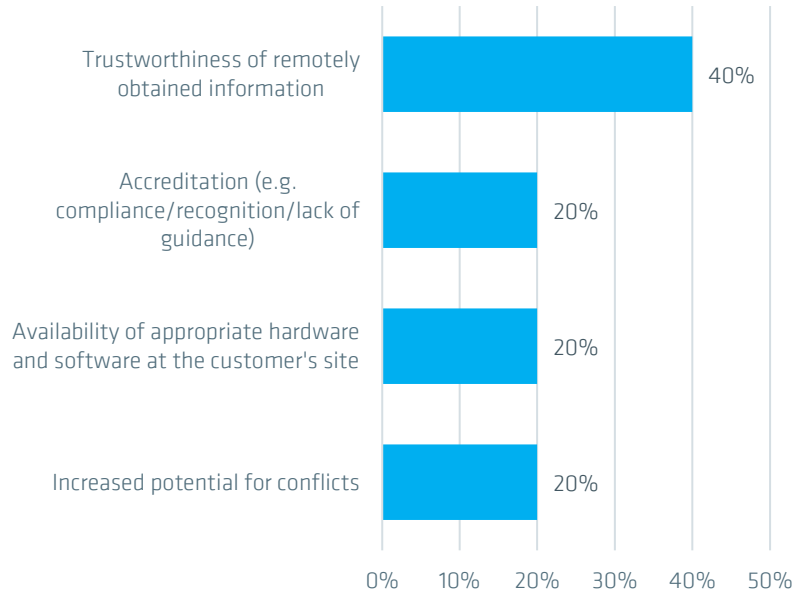
Technologies used for remote procedures (n=5)



- Only 5 CABs use **remote methods** in their CA activities.
- While two of them perform max. 10% of their activities remotely, 2 have switched completely.
- Joint editing of documents are the most commonly used **tool for remote working**. Robotic cameras are not used yet.

Diverse approaches used and experienced hurdles in remote procedures

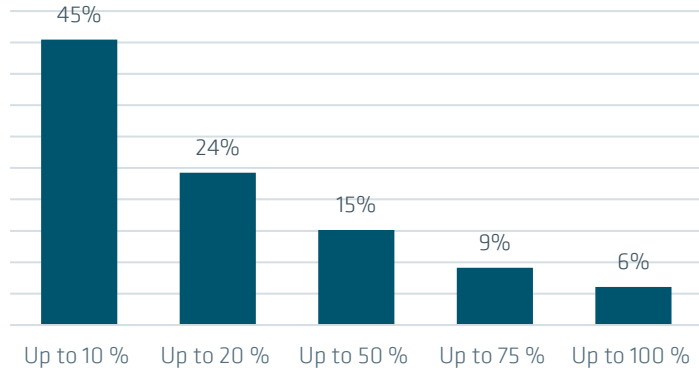
Barriers (n=5)



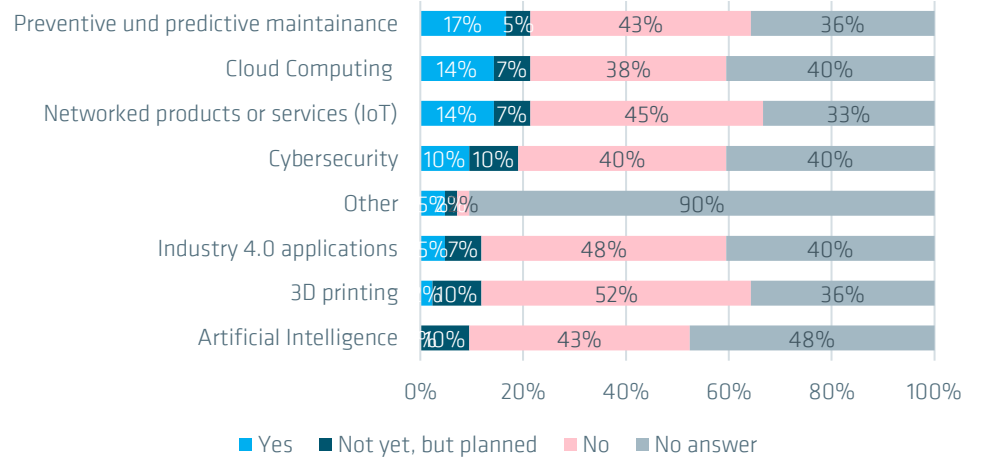
- When engaging in remote activities, the lack of trust of remotely obtained information is the main **barrier** experienced.
- Accreditation and the availability of appropriate hardware and software at the customer's side are also an important identified barrier.
- In addition, the CABs mentioned the increased potential for conflicts as a barrier.

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

Share of routine processes that are digital (n=33)



Digital products and applications for which CA is conducted (n=42)



- Only 15% of the CABs have digitalized more than half of their **routine processes**. A high share (45%) have not even digitally converted 10% of their processes.
- Only 17% of the surveyed CABs conduct conformity assessments for modern digital technologies and applications. In focus: preventive and predictive maintenance (17%) and cloud computing (14%).

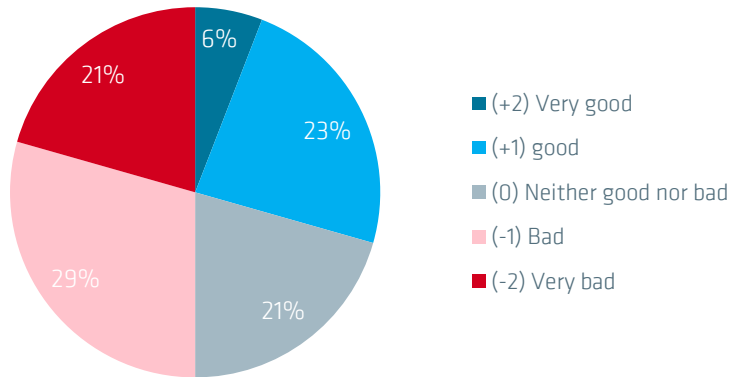
The COVID-19 Pandemic and Digitalization

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

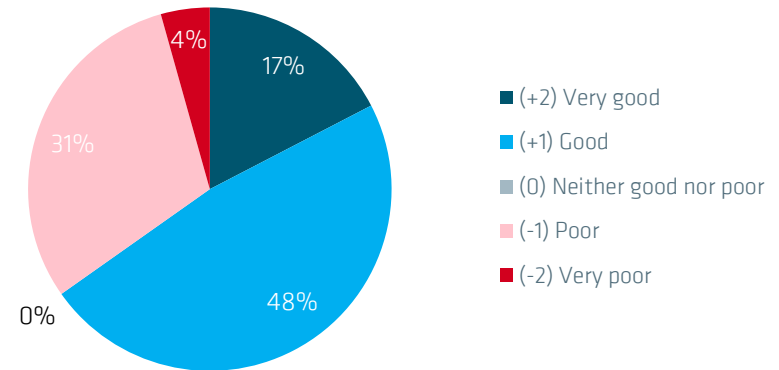
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Most CABs coped well with the COVID-19 pandemic

CABs' order situation in 2021 compared to pre-COVID-19 times (n=34)



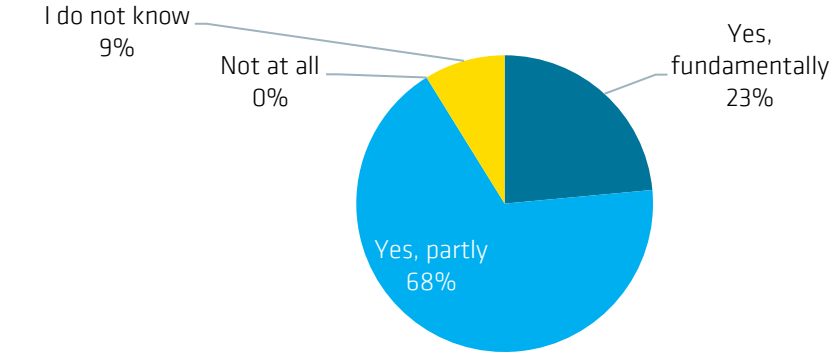
Response to the challenges of the COVID-19 pandemic (n=23)



- For 21% of the CABs, the **economic situation** in terms of incoming orders in 2021 was no better or worse than before the pandemic. 50% stated that their orders have declined, and 29% of CABs have actually seen their order situation improve.
- The majority of CABs (65%) reported that they have **responded** well or very well to the challenges associated with the COVID-19 pandemic.

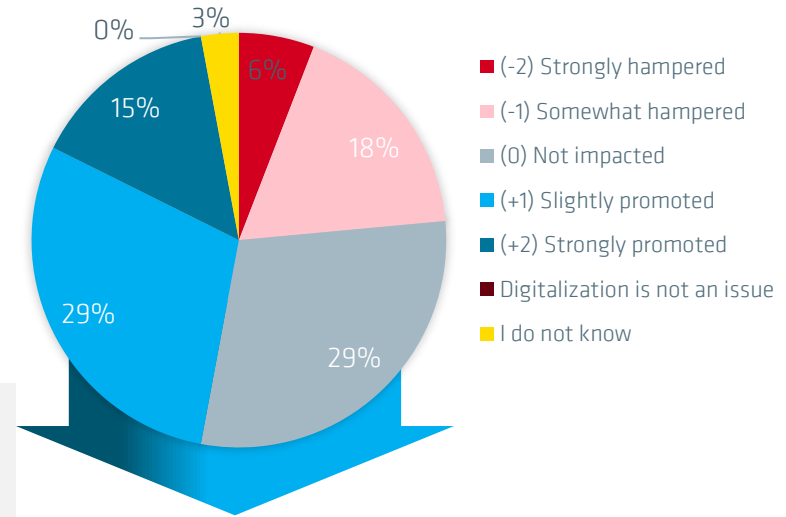
Pandemic and Digitalization

Digital technologies have helped coping with challenges of the COVID -19 pandemic (n=34)

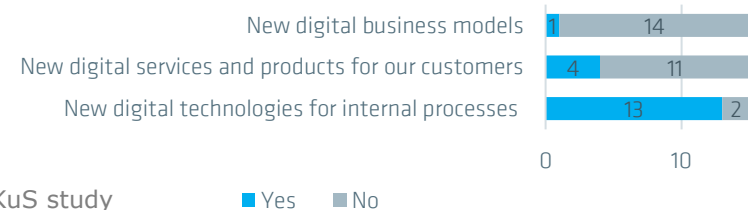


- For 91% of the CABs, digital technologies have helped coping with the challenges of the COVID-19 pandemic.
- The COVID-19 pandemic has slightly or even strongly promoted the digital transformation in 44% of the CABs. Only 18% of CABs saw their digitalization efforts somewhat hampered and 29% report no **impact of** the pandemic on its digitalization.
- The pandemic might have forced digital adaptations: 87% of the CABs have introduced new digital technologies for internal processes.
- Only 27% introduced new digital services and products for their customers, and only 1 CAB adopted new digital business models.

Impact of the Covid-19 pandemic on the digitalization of CABs (n=34)



Digital adaptation in course of COVID-19 pandemic (n=15)



Conclusion and Outlook

- CABs in West Africa clearly see digital transformation as an opportunity. The **level of digitalization** varies widely. The majority of participants has reached a medium level of digital maturity. However, a relative high share is still at the first stage of digital maturity .
- The **digital transformation process** in West African countries shows an initial focus on culture & expertise, with CABs open to new technologies, change, and transformation. This is followed by holistic organizational transformation, including strategy, strong innovation networks, IT and cooperation.
- All the **cutting-edge digital technologies** such as Big Data, artificial intelligence and virtual reality are known and used by CABs in West Africa, but not yet on a large scale.
- With their digitalization efforts, the CABs are primarily **following** the “spirit of innovation” and improving customer management/communication. In fact, improved satisfaction of customers and improved sustainability are considered as greatest realized benefits. Market objectives are not big drivers for digitalization.

West Africa in international comparison

How do West African conformity assessment bodies compare internationally? We have conducted the survey on digitalization in conformity assessment in around 20 other countries. The individual country reports and a final comparative study will be published step by step on our website. Articles and an extensive report with further detailed analyses are also planned.

➔ www.qi-fokus.de



This study was developed in the context of the QI-Digital initiative. Its goal is to develop solutions for a modern digital quality infrastructure (QI) - together with stakeholders from business, politics, science, and QI.

More information on the initiative and the opportunities for participation can be found at

➔ www.qi-digital.de

The Project and Contacts



Project partners



Supported by



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Acknowledgement

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

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

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

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

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Annexes

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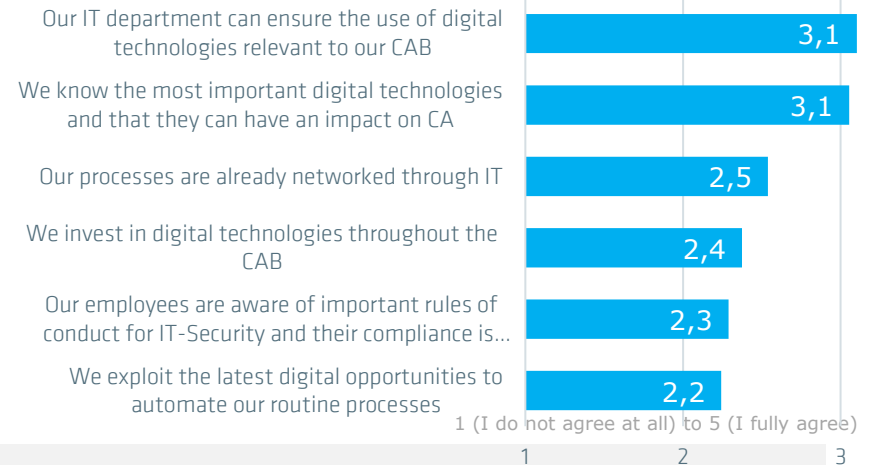
Dimensions of digital maturity: Detailed overview



Dimension: Strategy (n=40)



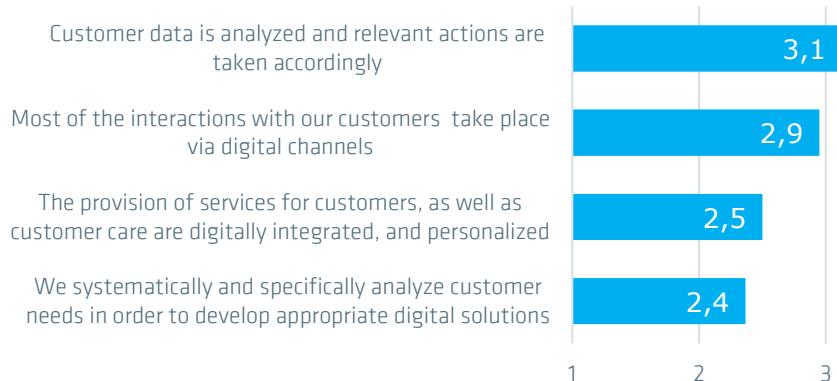
Dimension: Information Technology & Process Digitalization (n=40)



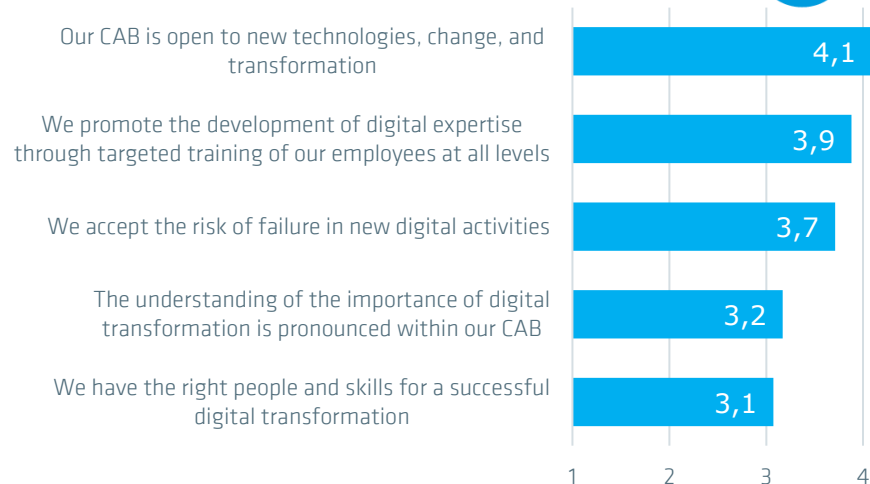
- In most CABs (66%), digitalization plays a central role in their overall strategy, with 48% having a well documented digital strategy.
- 44% have set up a Digital Roadmap and 40% use key metrics to measure the implementation status of their digitalization strategy.
- At least 62% of CABs are aware of, invest in and are able to use digital technologies properly while complying with IT security regulations. About 50% of CABs have networked their processes and automated routine procedures.

Dimensions of digital maturity: Detailed overview

Dimension: Customers (n=41)



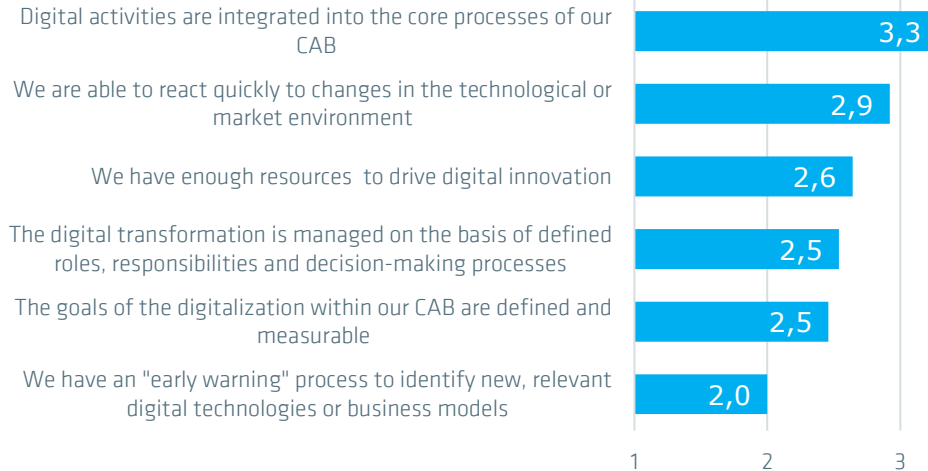
Dimension: Culture & Expertise (n=42)



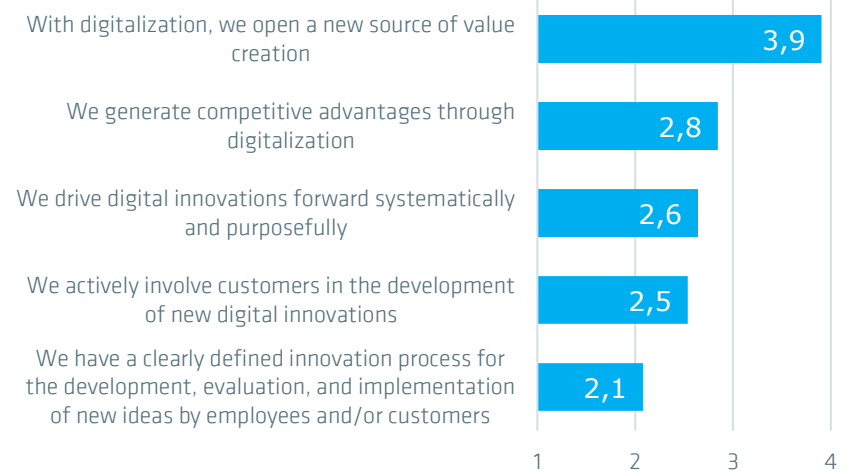
- 58% of CABs in West Africa interact with their customers via digital channels.
- 50% offer digitally integrated services to customers and 48% of them develop appropriate digital solutions based on customer needs.
- CABs in West Africa are definitely open to new technologies, changes and transformations (82%). At least 64% of them have a strong understanding of the importance of digital transformation and 62% have the right skills to successfully implement the change.

Dimensions of digital maturity: Detailed overview

Dimension: Organization & Change Management (n=39)



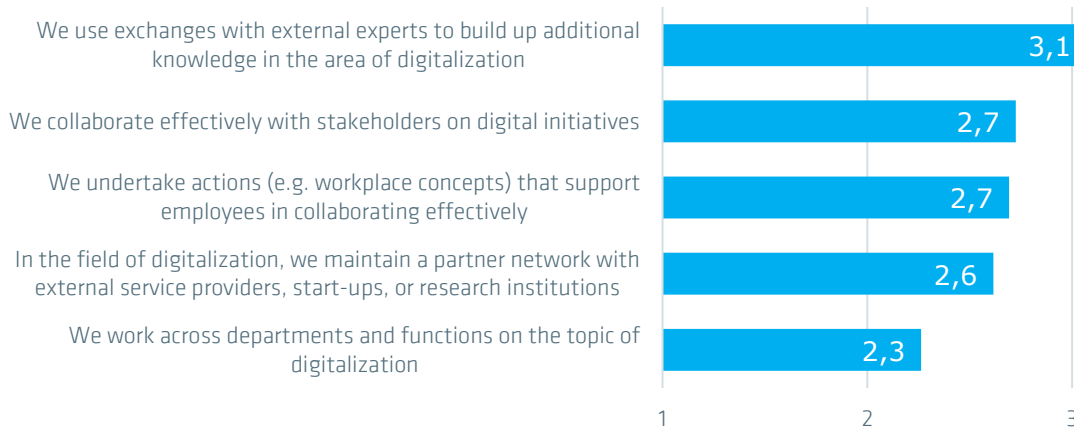
Dimension: Innovation (n=42)



- 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 (78%), digitalization represents a new source of value creation.
- However, customers are hardly involved in the innovation process.

Dimensions of digital maturity: Detailed overview

Dimension: Cooperation (n=40)

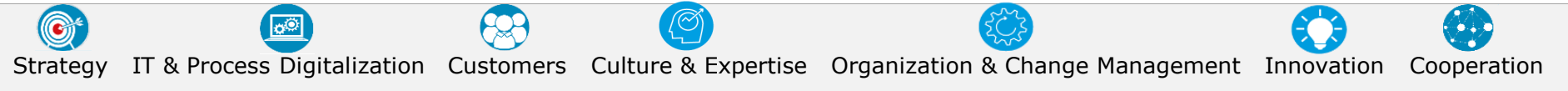


- In order to work on the topic of digitalization, 63% of CABs build additional knowledge through external expert consultations. They also collaborate effectively with stakeholders on various digital activities.
- 52% maintain a partner network with external service providers.

Digital Maturity Model








Level 1 (Beginner)








Description	Dimensions						
Level 1: Beginner							
Our CAB is open to new technologies, change and transformation							



Digital Maturity Model








Level 2








Description Level 2	Dimensions						
							
Digitalization has a central role in our overall strategy	■						
Our IT department can ensure the use of digital technologies relevant to our CAB		■					
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			■				
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				■			
We promote the development of digital expertise through targeted training of our employees at all levels				■			
Digital activities are integrated into the core processes of our CAB					■		
With digitalization, we open a new source of value creation						■	
We use exchanges with external experts to build up additional knowledge in the area of digitalization							■

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

Digital Maturity Model








Level 3

Description Level 3	Dimensions						
							
We evaluate new technologies as well as changes in customer behavior to identify potential for digital innovation	■						
Our processes are already networked through IT		■					
We know the most important digital technologies and that they can have an impact on CA		■					
The provision of services for customers, as well as customer care are digitally integrated, and personalized			■				
We systematically and specifically analyze customer needs in order to develop appropriate digital solutions			■				
We drive digital innovations forward systematically and purposefully						■	
We actively involve customers in the development of new digital innovations						■	
We collaborate effectively with stakeholders on digital initiatives							■
In the field of digitalization, we maintain a partner network with external service providers, start-ups, or research institutions							■
We undertake actions (e.g., workplace concepts) that support employees in collaborating effectively)							■

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

Digital Maturity Model

Level 4

Description Level 4	Dimensions						
							
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 invest in digital technologies throughout the CAB		■					
Our employees are aware of important rules of conduct for IT Security and their compliance is regularly checked		■					
The goals of the digitalization within our CAB are defined and measurable					■		



Strategy



IT & Process Digitalization



Customers



Culture & Expertise



Organization & Change Management



Innovation



Cooperation

Digital Maturity Model

Level 5 (Experts)

Description Level 5: Expert	Dimensions						
							
We use key metrics to measure the implementation status of our digitalization strategy	■						
We have defined a step-by-step implementation plan (Digital Roadmap) for achieving the goals	■						
We exploit the latest digital opportunities to automate our routine processes		■					
We have an "early warning" process to identify new, relevant digital technologies or business models for us					■		
We have a clearly defined innovation process for the development, evaluation, and implementation of new ideas by employees and/or customers						■	
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