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# The State of RegTech: The Rising Demand for “Superpowers”

# Survey of 12 financial authorities representing 19 countries on 4 continents and markets of 1 bn+ people



# Financial Authorities Surveyed

FINANCIAL AUTHORITY	ABBREVIATION	COUNTRY/COUNTRIES
Banco Central do Brasil	BCB	Brazil
Banco de Moçambique	BDM	Mozambique
Bangko Sentral ng Pilipinas	BSP	Philippines
Bank Al-Maghrib	BKAM	Morocco
Bank of Ghana	BoG	Ghana
Bank of Tanzania	BoT	Tanzania
Banque Centrale des Etats de l'Afrique de l'Ouest	BCEAO	Benin, Burkina Faso, Cote d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo
Central Bank of Egypt	CBE	Egypt
Central Bank of Kenya	CBK	Kenya
Central Bank of Nigeria	CBN	Nigeria
Comisión Nacional Bancaria y de Valores	CNBV	Mexico
Superintendencia de Banca y Seguros	SBS	Peru

# Summary

- The responses of financial authorities indicate that we are at a tipping point for RegTech solutions, with an open door for data “superpowers.”
- Financial authorities would like to acquire “superpowers” that would allow them to **access better tools for data analytics** and **automate data validation processes**.
- Financial authorities believe **improvement** in the **quality of collected data** and **data analytics** will have an **impact on financial inclusion** and **customer protection**, among other policy objectives.

# Highlights

## Current practices

- Financial authorities are still transmitting data from reporting institutions by **post or courier, email, and through data portals** that entail **security risks** and hamper processing **speed**.
- Extensible Markup Language (**XML**) is the commonly-used data collection and exchange protocol given its **simplicity** and **generality**.
- Most financial authorities use **Excel spreadsheets** to analyze data even though Excel is **not** designed for **processing large datasets** and **complex analytics**.

Most financial authorities collect data monthly or quarterly or as needed. The infrequent nature of data collection is a **missed opportunity** to monitor key risk metrics and identify early signs of stress.

## The challenge

- The **time spent** validating data and **insufficient human resources** for proper data analysis are the **biggest challenges** facing financial authorities.
- **Delays in report submission and incomplete data** and **low-quality data** make it difficult to generate **timely** analytics. Instead, analytics are **retrospective** and **reactive**.



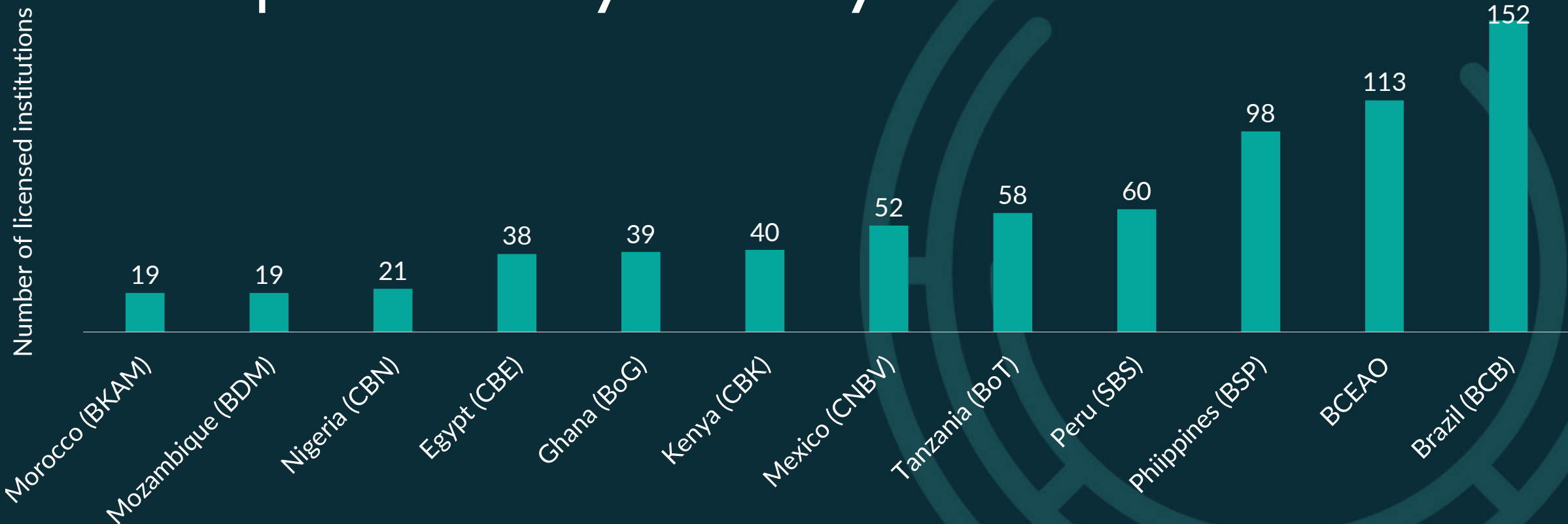
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# Retail Banking Supervision

# Number of licensed or authorized retail banks under supervision by country



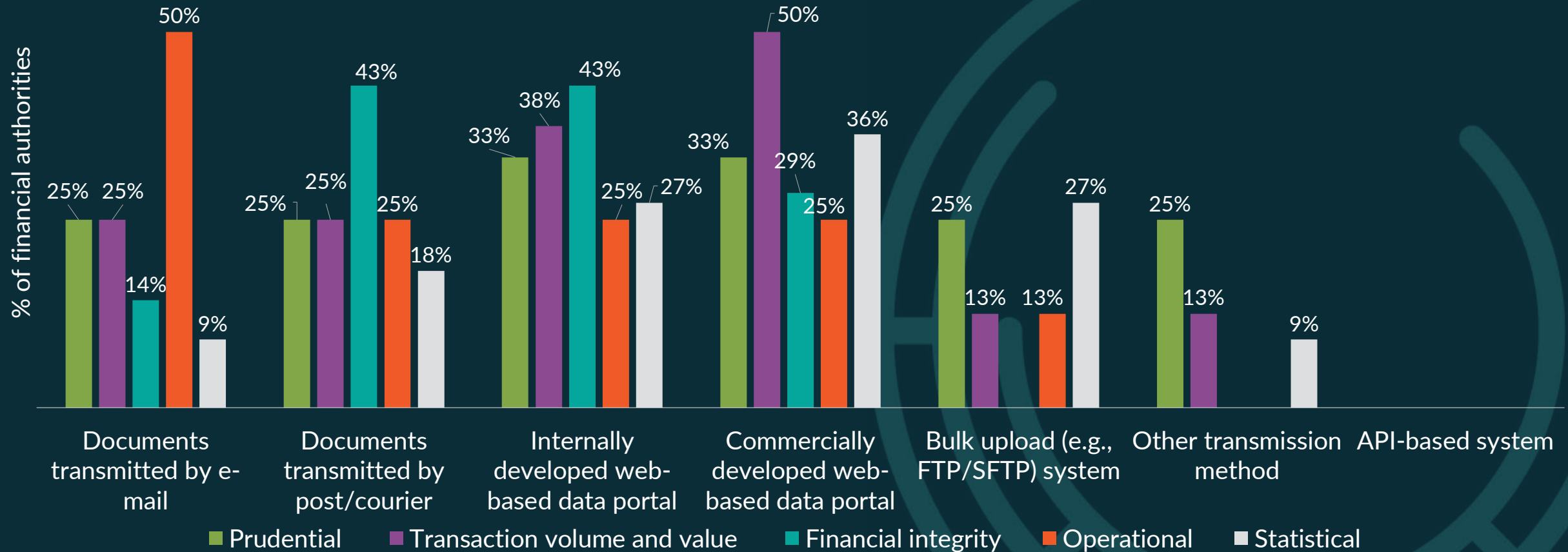
Retail banks are restricted to universal and commercial banks as well as thrift banks. The mean and median numbers of licensed institutions are 59 and 46, respectively. Brazil has the largest number of supervised retail banks (152) and Mozambique and Morocco the fewest (19).



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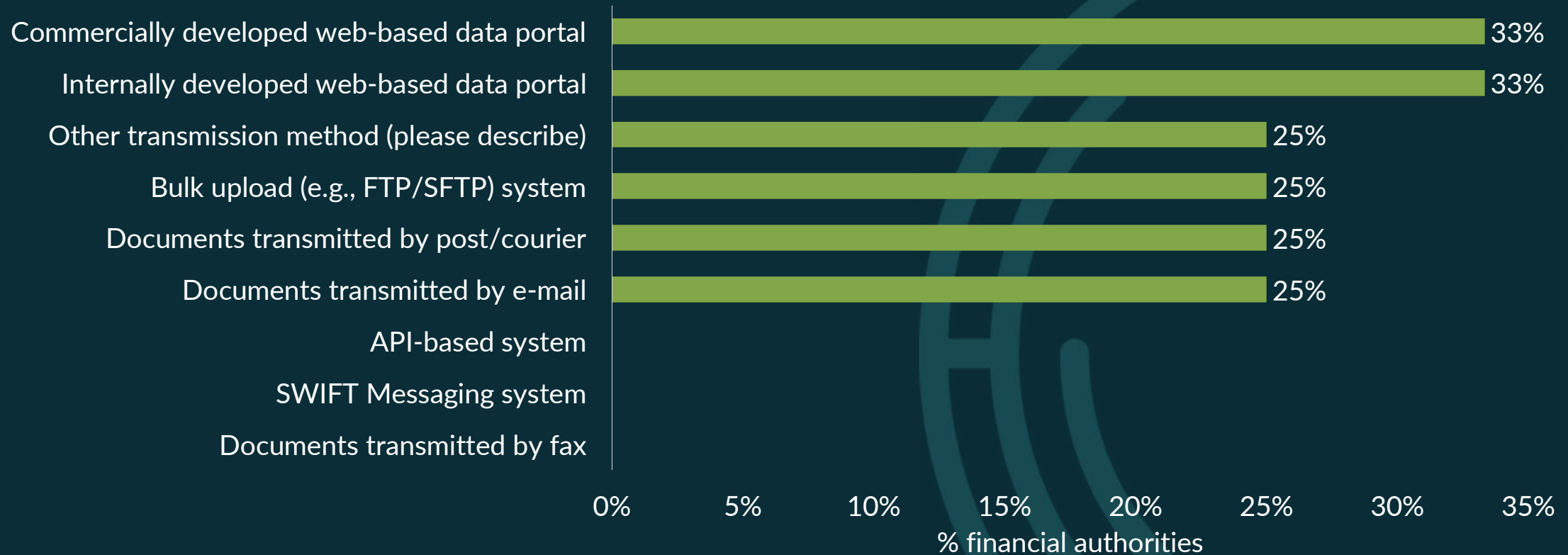
# Retail Banking Supervision – Data Collection

# Data types and collection channels



While the financial authorities surveyed used a variety of channels to collect different types of data, it is noteworthy that half receive operational reports by email and nearly half transmit financial integrity data by post/courier. Web-based data portals are also predominantly used for financial integrity and transaction data. 25% use other transmission methods including CDs and portable storage devices (USBs).

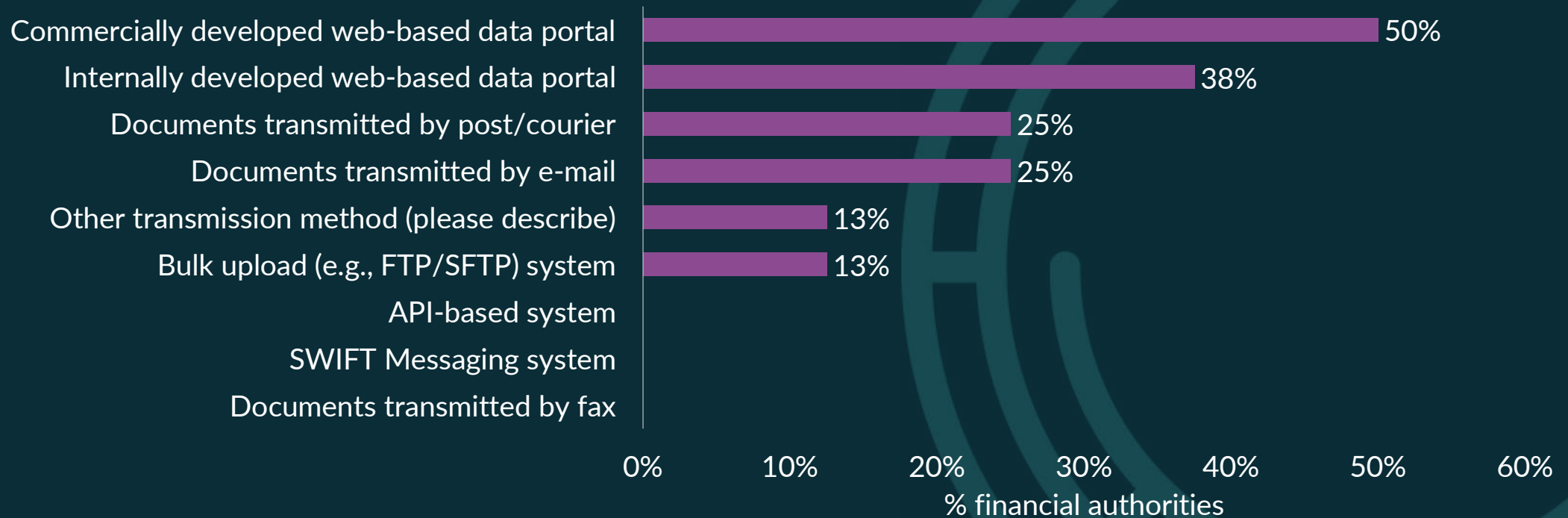
# Channels used for collecting prudential data



Note: Prudential data (e.g., capital)

All 12 financial authorities indicated which channels they use to collect prudential data; these were quite varied and sometimes involved multiple channels. The authorities use a combination of web-based data portals, bulk uploads, post/courier, and email. None of them has an API-based system in place for data transmission.

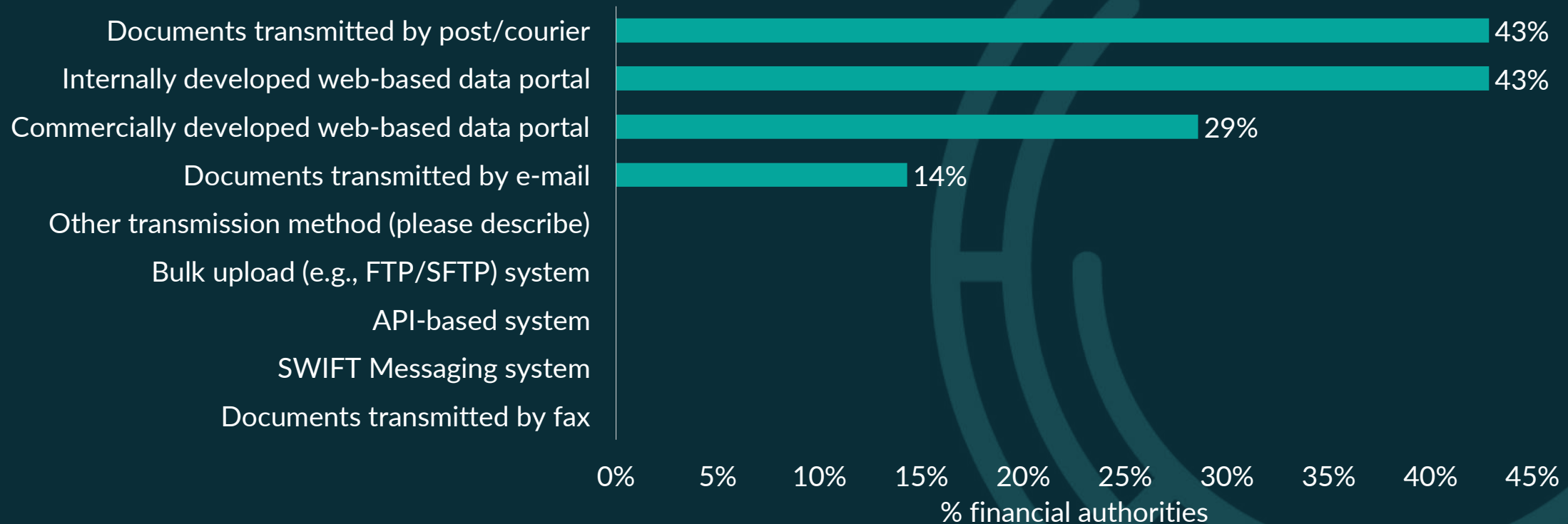
# Channels used for collecting transaction volume and value data



Note: Transaction volume and value data (e.g., deposits and withdrawals)

**Web-based portals** are frequently used for collecting transaction volume and value data. Most are commercially developed (50%), closely followed by internally-developed portals (38%). Again, authorities rely on multiple methods to collect this information, some of which are inherently insecure.

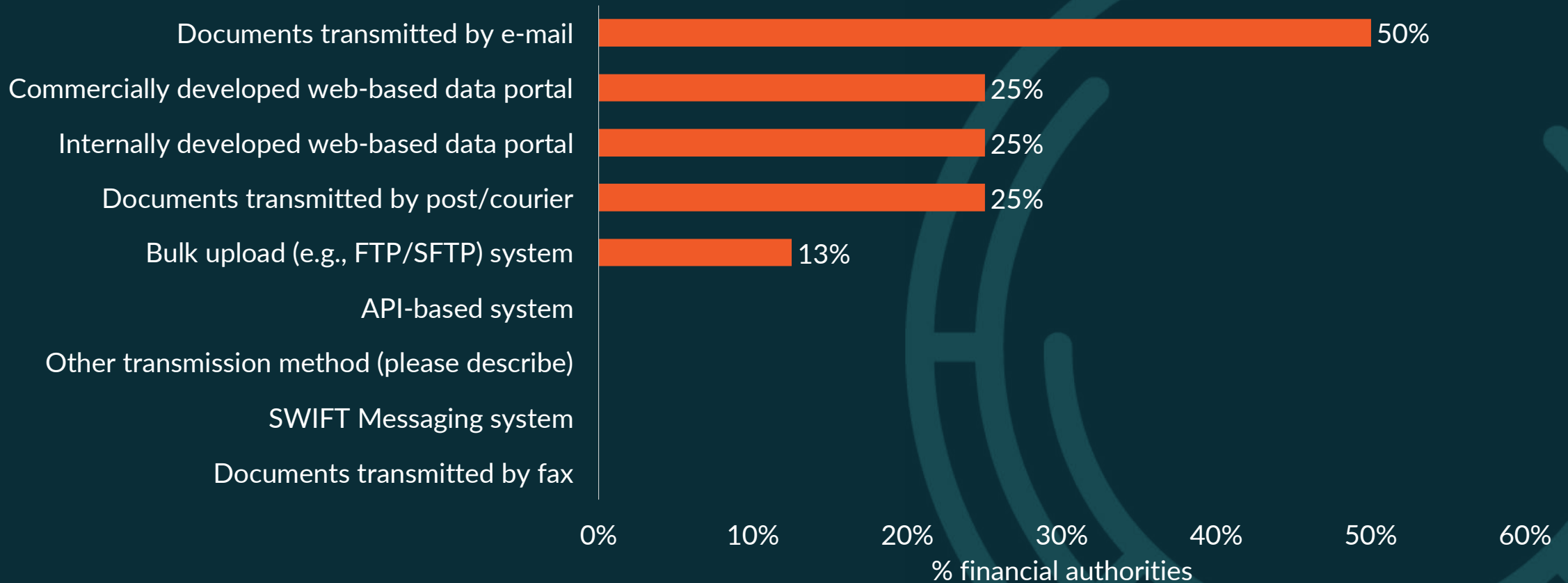
# Channels used for collecting financial integrity data



Note: Financial integrity data (e.g., suspicious transactions)

Authorities overwhelmingly use a combination of internally-developed web-based data portals (43%) and post/courier (43%) to collect financial integrity data. This is notably a less digital approach than for other data types.

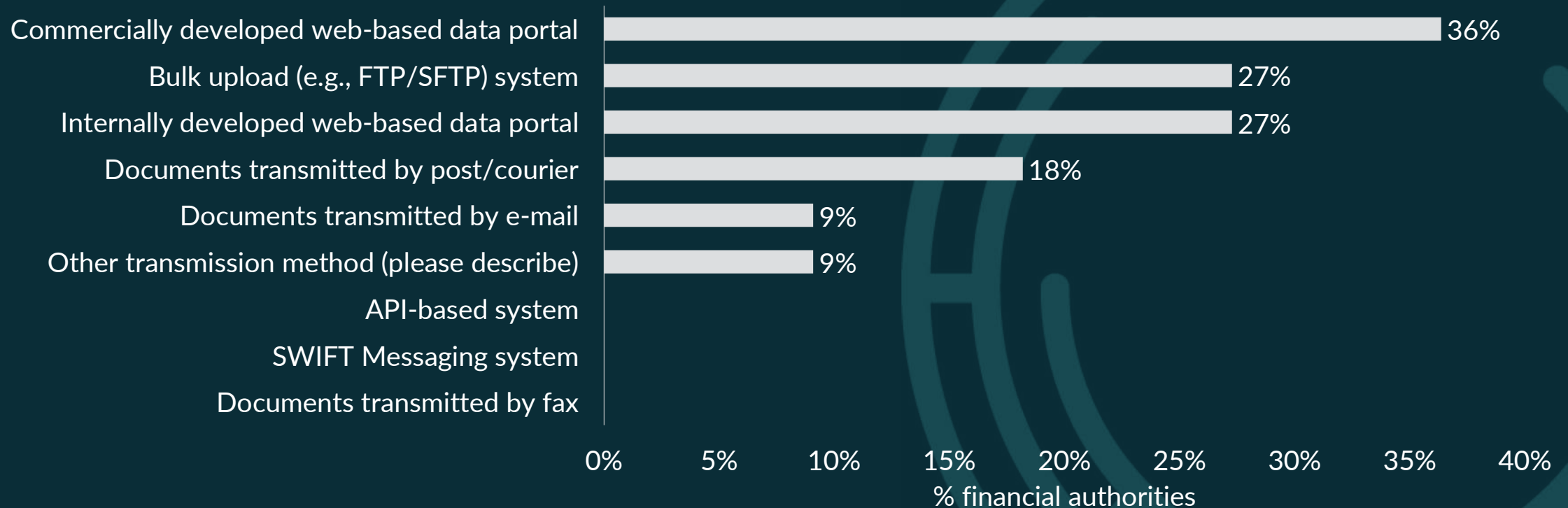
# Channels used for collecting operational data



Note: Operational data (e.g., service disruptions)

Half of the surveyed authorities reported transmitting operational data by email, followed by web-based data portals and post/courier. While email poses security risks for data transmission, operational data is comparatively less sensitive in nature.

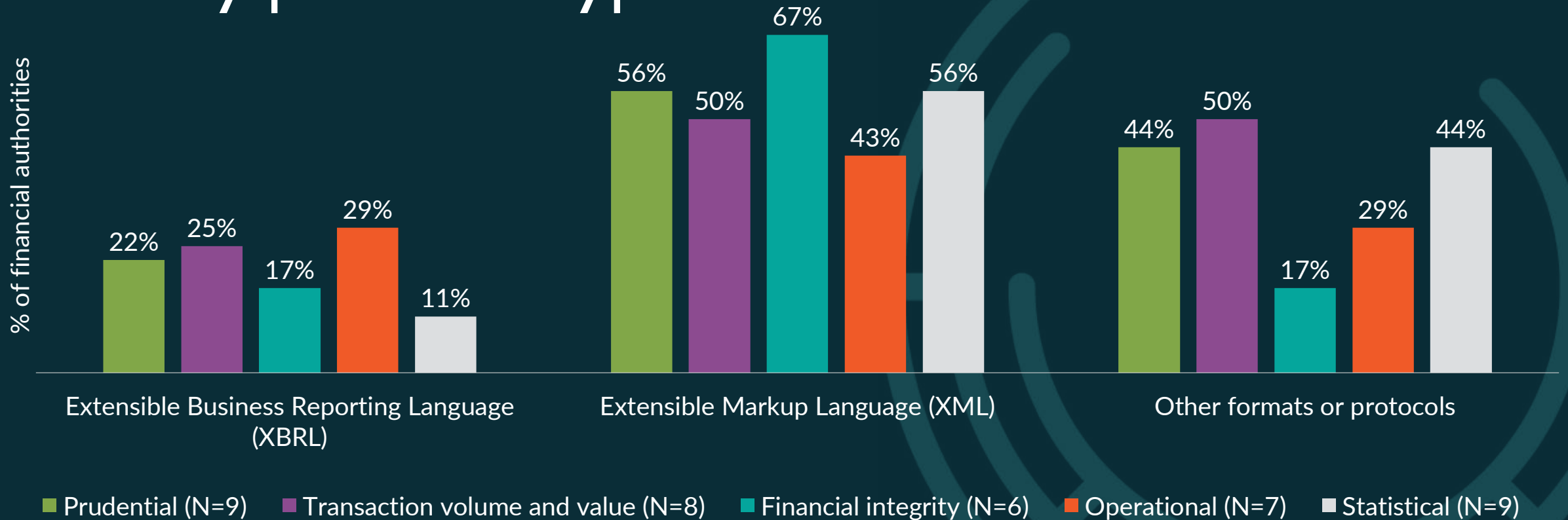
# Channels used for collecting statistical data



Note: Statistical data (e.g., number and location of clients or offices)

Authorities reported collecting statistical data through a mix of web-based data portals (36% commercially developed and 27% internally developed) and bulk upload systems (27%). They also utilize post/courier services (18%) and email (9%).

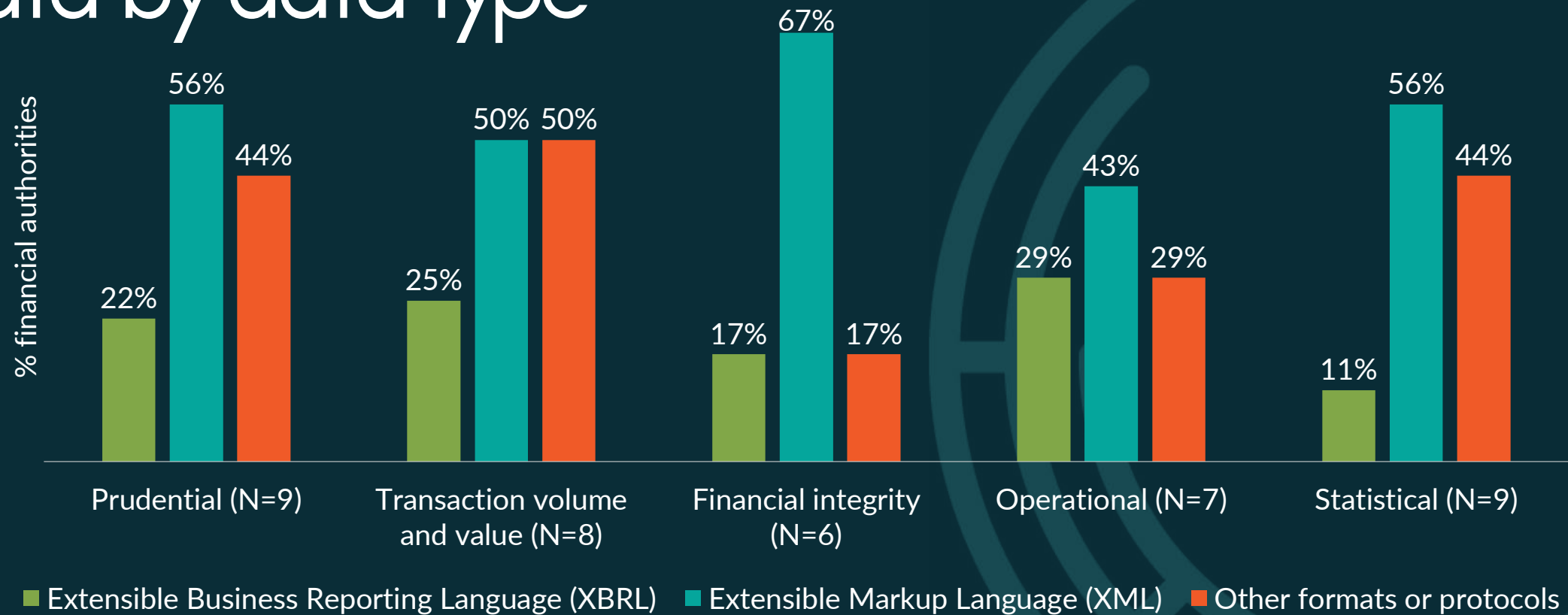
# Format or protocol used to collect and exchange data by protocol type



XML is the most commonly-used protocol, utilized by financial authorities for all types of data collection. Other formats include Excel and text files.

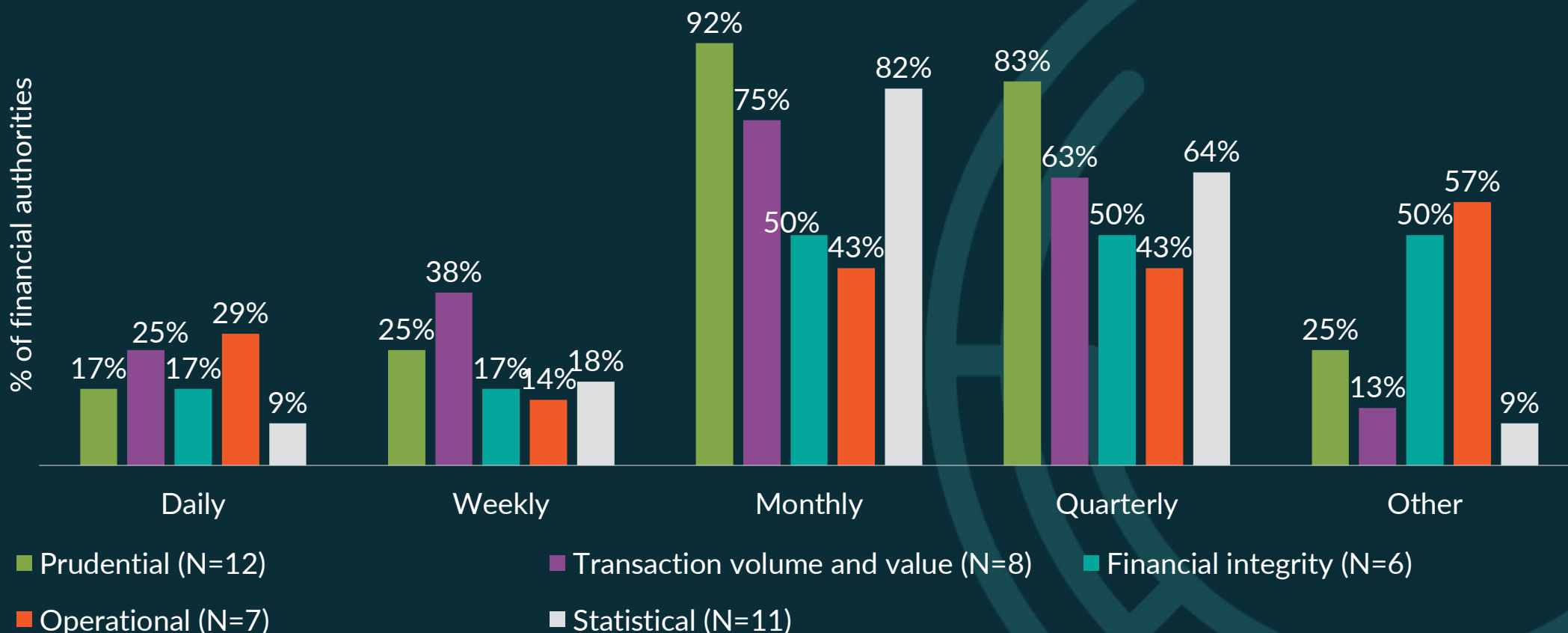


# Format or protocol used to collect and exchange data by data type



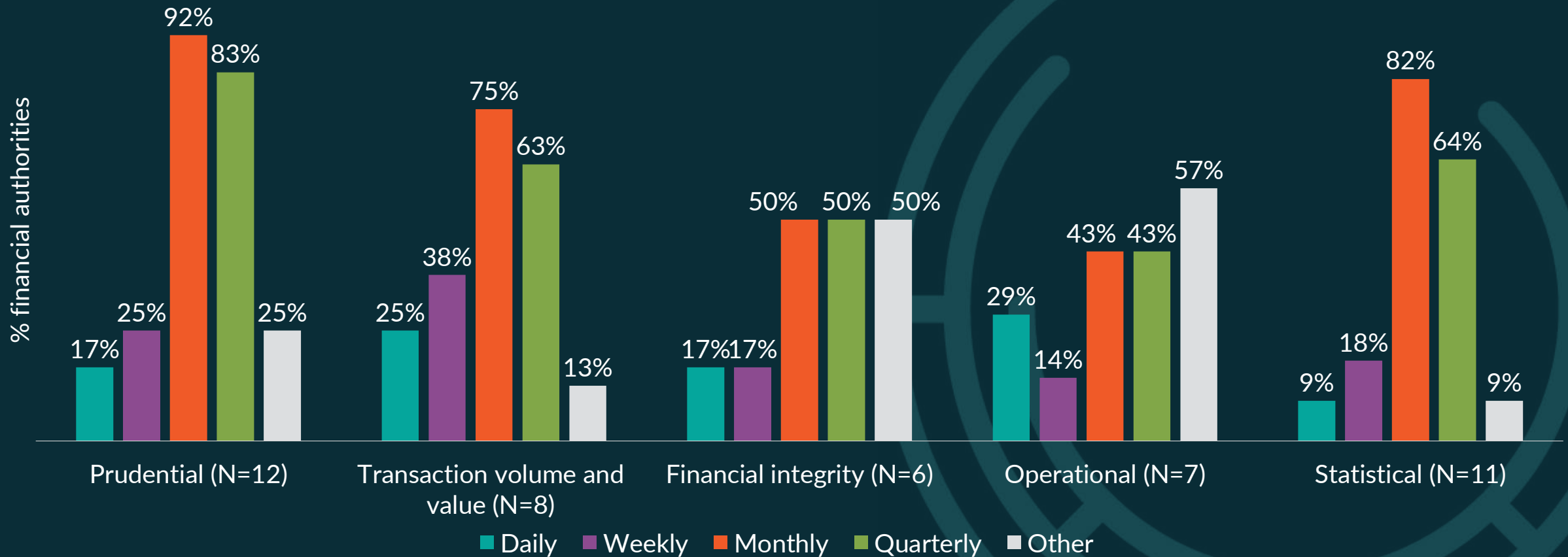
At least 50% of surveyed financial authorities collect prudential, transaction volume and value, financial integrity and statistical data through XML. Other formats, including Excel or text files are also predominantly used by financial authorities to collect data.

# Type of reports submitted by reporting frequency



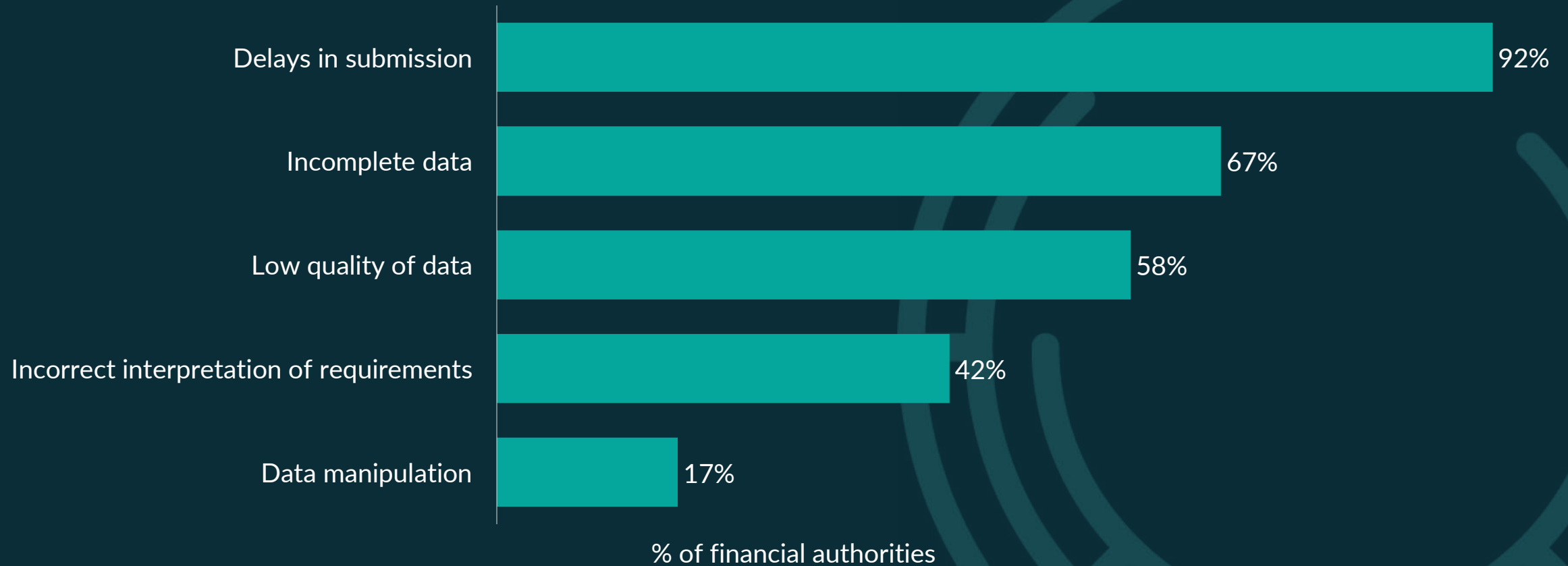
Most financial authorities collect prudential, transaction volume and value, and statistical data monthly and/or quarterly, along with financial integrity and operational reports that are additionally collected as needed. The infrequent nature of data collection is a missed opportunity to monitor key risk metrics and identify early signs of stress.

# Frequency of reports submitted by data type



Collection frequency does not vary dramatically by type of data collection, suggesting that less frequent reporting timelines were a result of limitations in collection and analysis capacity, rather than requirements specific to the data.

# Data collection challenges



Over half of surveyed financial authorities reported **delays in submission** of reports, **incomplete data**, and **low quality** of data as the main challenges regarding data collection. This suggests that it is difficult to generate **timely** and **accurate** analytics, which affects the financial authorities' ability to make sound policy decisions. Also, **analytics** tend to be **retrospective**, making policy responses more **reactive**.



# Retail Banking Supervision – Data Validation

# Data validation processes range from fully manual to fully automated

Validation is conducted manually through cross-checking different reports.

There are two check levels: the first one is automated (formal check, automated control rules); and the second level is done by off-site supervisors.

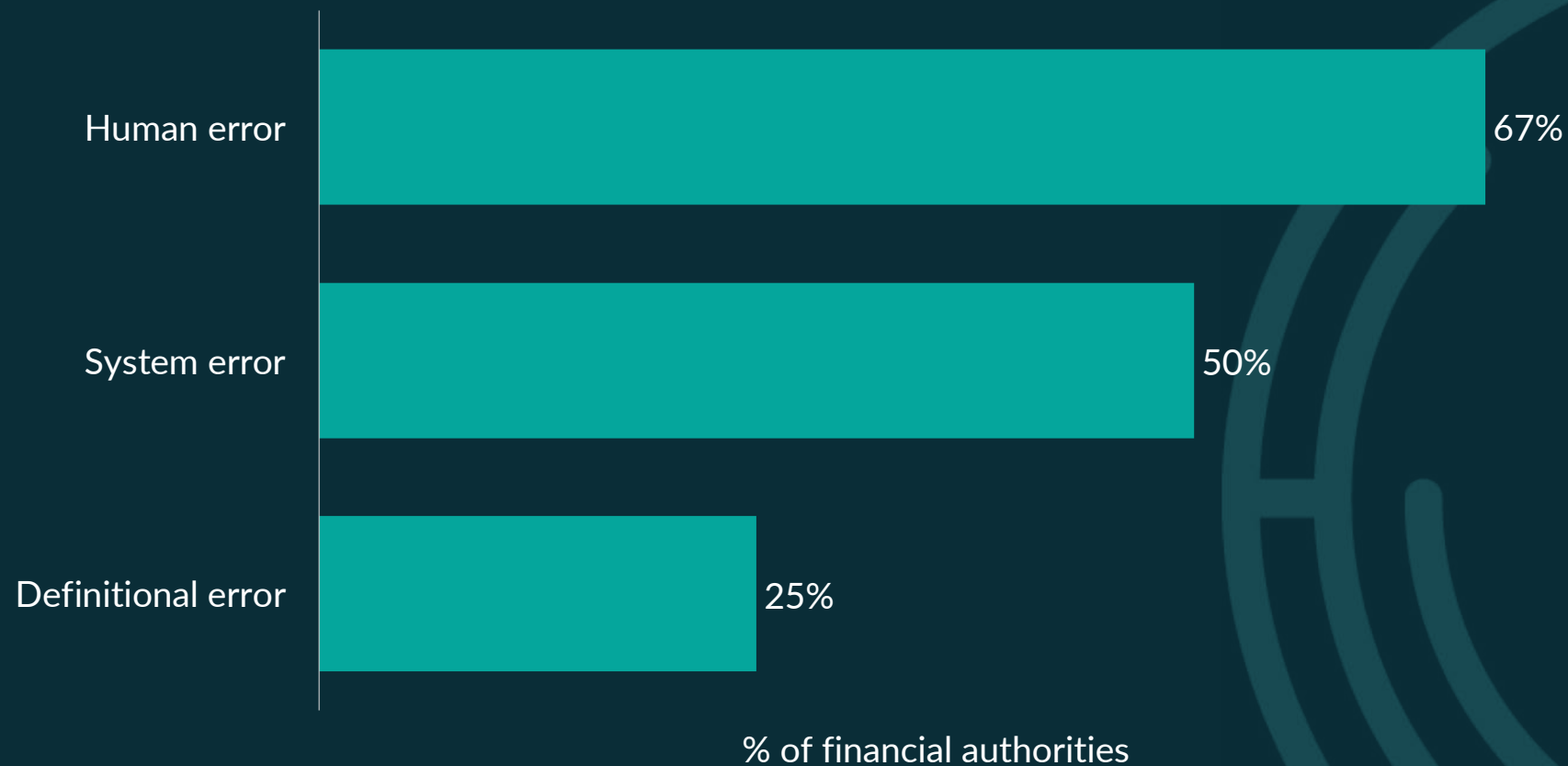
We have automated our validation process by developing rules for validating specific accounts into a program. Validation rules are able to identify arithmetical inconsistencies and produce a report. The feedback is shared with the reporting institution with a request to resubmit the report.

Currently, we have a web-based software. It enables us to collect and analyze data. Although there is a tool to validate data, it has not been fully utilized yet. So, some plausibility checks are done manually.

We have internal validation tools (automated) to ensure minimum requirements on data quality regarding integrity, consistency (historical and with other reports) and reasonability. These tools identify clearly erroneous data and make plausibility checks.

The data validation process depends on the particular system, but mostly are automated and/or complemented with assessment of reasonability.

# Data validation challenges



Given the need to manually validate data, **67%** of financial authorities cited **human error** as the main challenge they faced with respect to data validation processes. This could be minimized with the introduction of APIs and connections between various data sources, databases, and outputs.

# Suggestions given by respondents to improve data validation processes


In the future, we would like to implement artificial intelligence in our validation tools.

We would like to enable direct querying of data from core banking applications of the reporting banks.

Data validation should be conducted automatically, along with output MIS reports. Also, all reports including control rules need to be automatized.

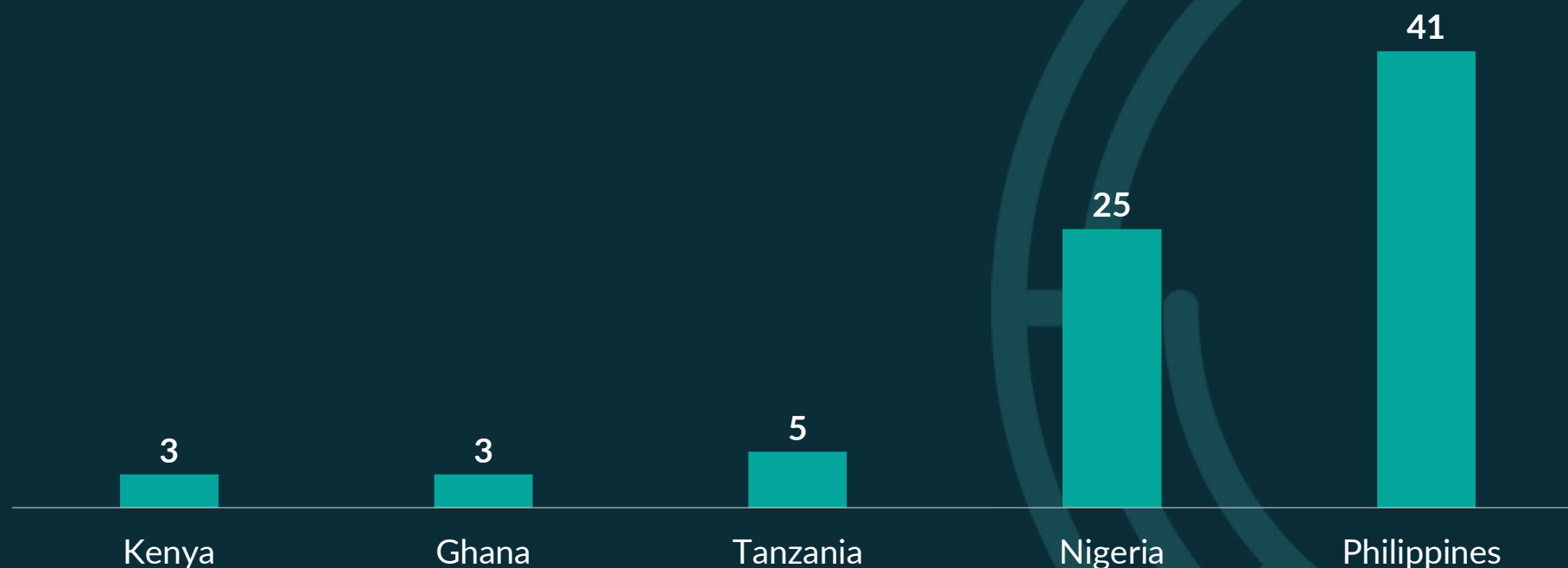
We need to use efficient file formats that can minimize file size to speed up processing and validation. Also, we could improve turnaround time by consolidating various reports to minimize waiting time before the validation process can commence.



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# Retail Electronic Money (e-Money) Issuer Supervision

# Licensed or authorized retail electronic money issuers under supervision

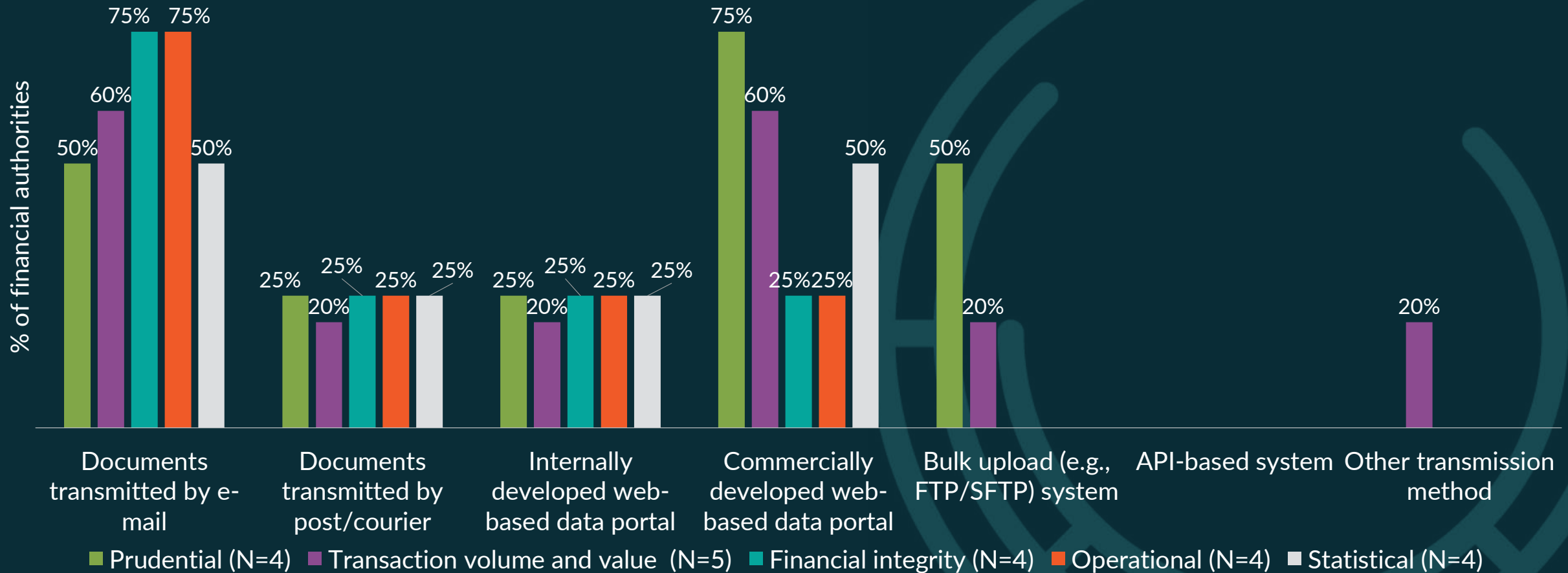


Only five central banks responded to questions related to supervision of e-money issuers. This was due in part to the fact that some do not regulate e-money providers. For others, the licensing process was in progress at the time of the survey.

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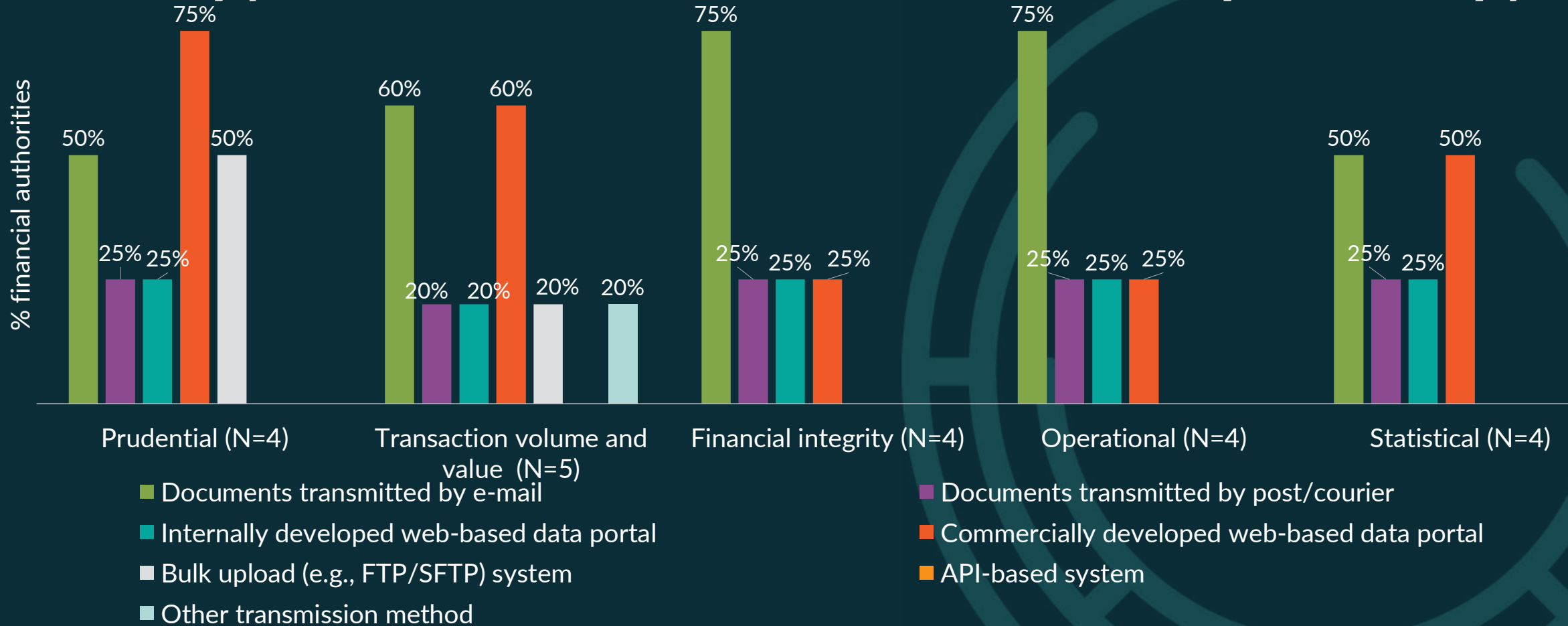
# Retail Electronic Money (e-Money) Issuer Supervision – Data Collection

# Data types and collection channels by channel



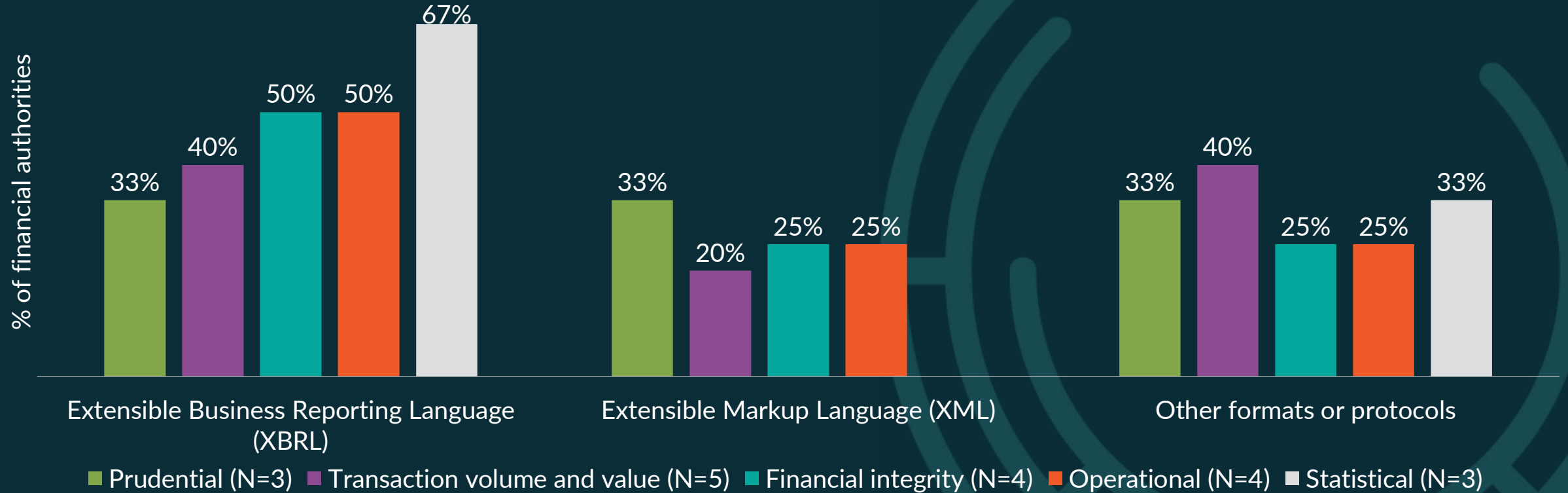
E-mail is the predominant channel for receiving financial integrity and operational data while commercially-developed, web-based data portals are most commonly used to receive prudential data.

# Data types and collection channels by data type



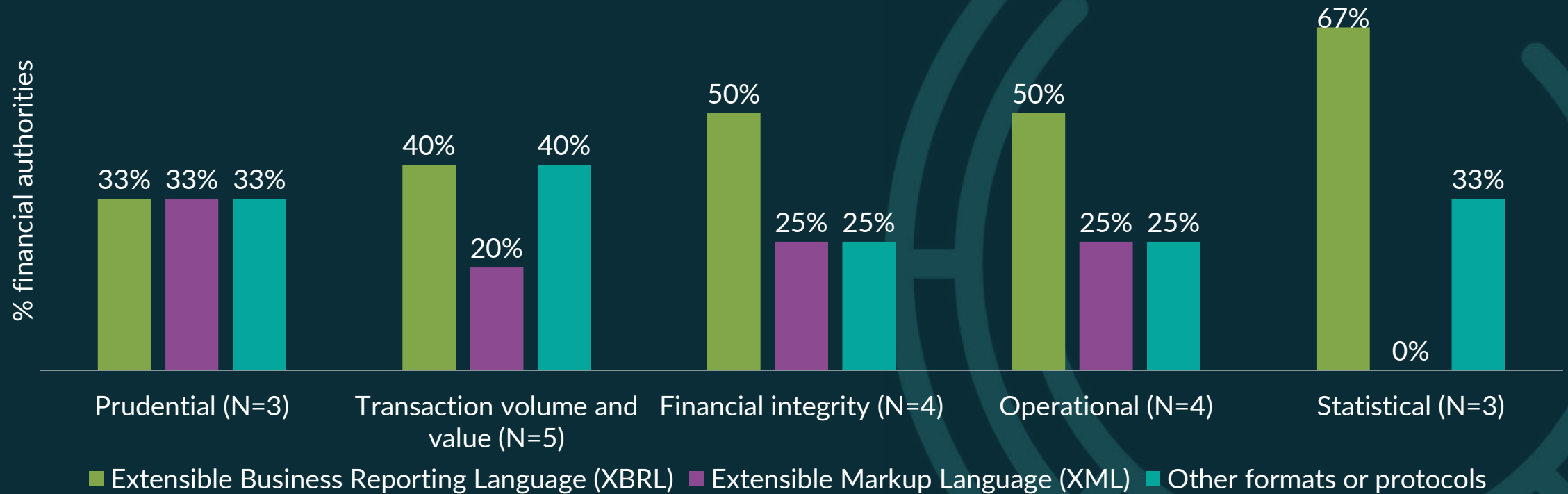
Once again, E-mail is the predominant channel for receiving financial integrity and operational data while commercially-developed, web-based data portals are most commonly used to receive prudential data.

# Format or protocol used to collect and exchange data by protocol type



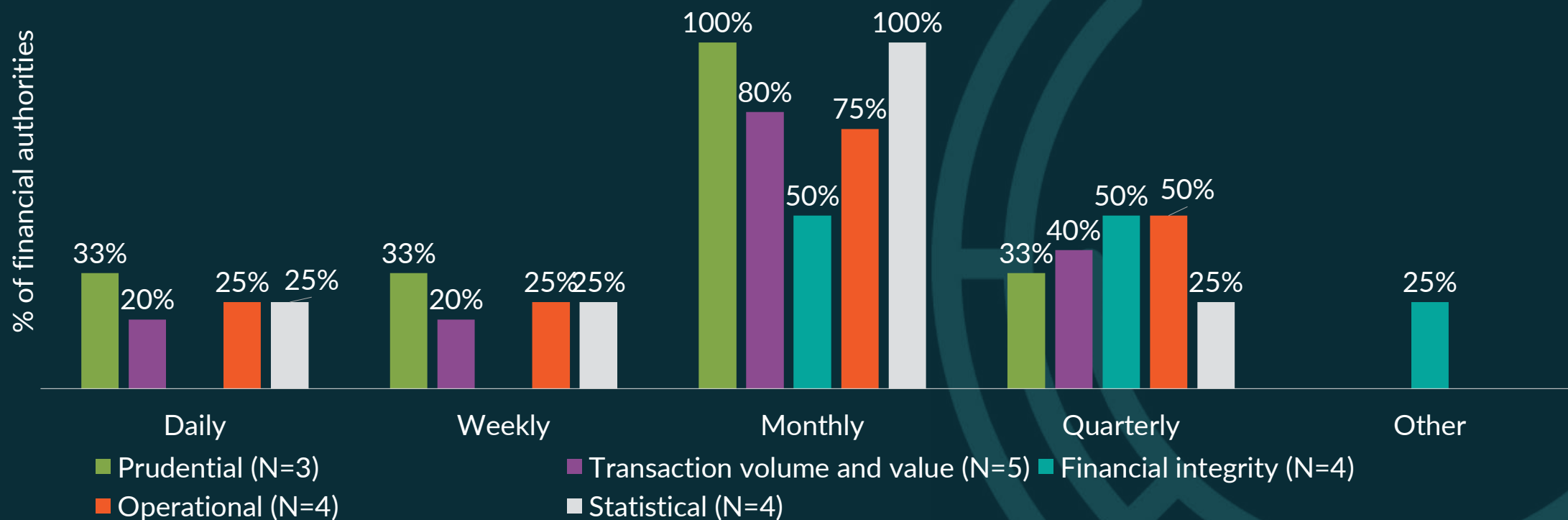
Unlike retail banking supervision, XBRL is the most-used protocol for collecting or exchanging data from reporting retail electronic money issuers.

# Format or protocol used to collect and exchange data by data type



XBRL is the most commonly-used format for all types of data collection.

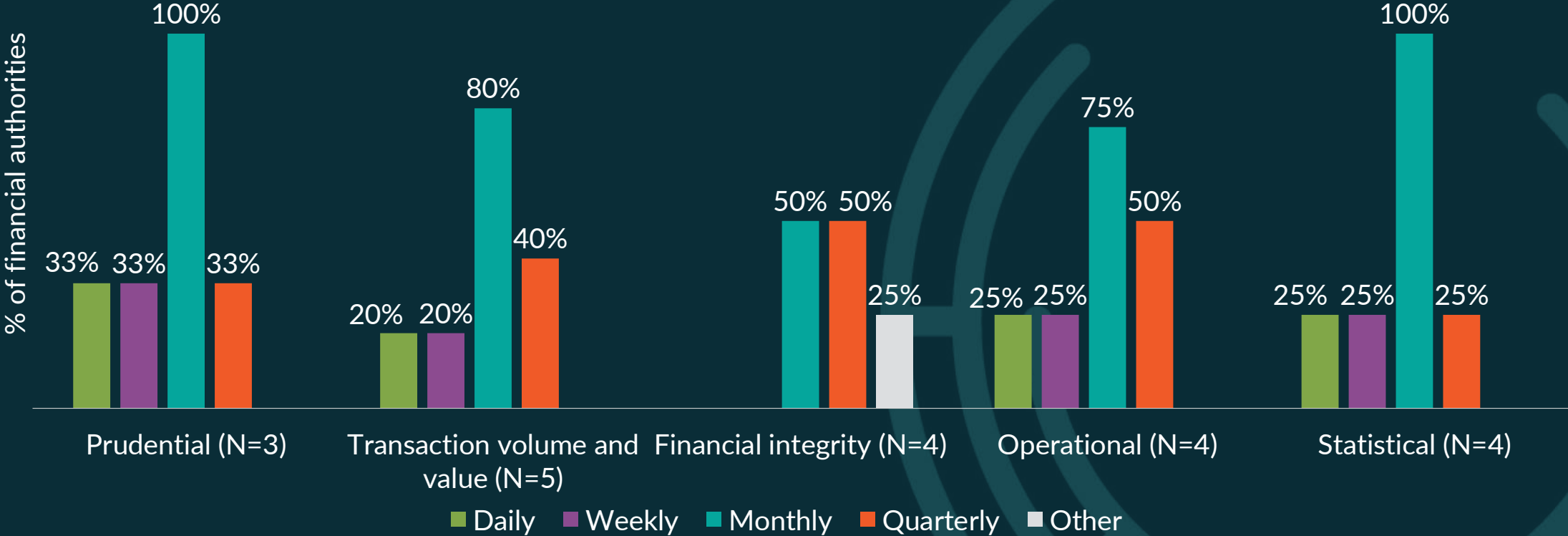
# Type of reporting by frequency of reports submitted



Similar to retail banking supervision, most financial authorities collect data from e-money issuers on a monthly basis, followed by quarterly reporting.

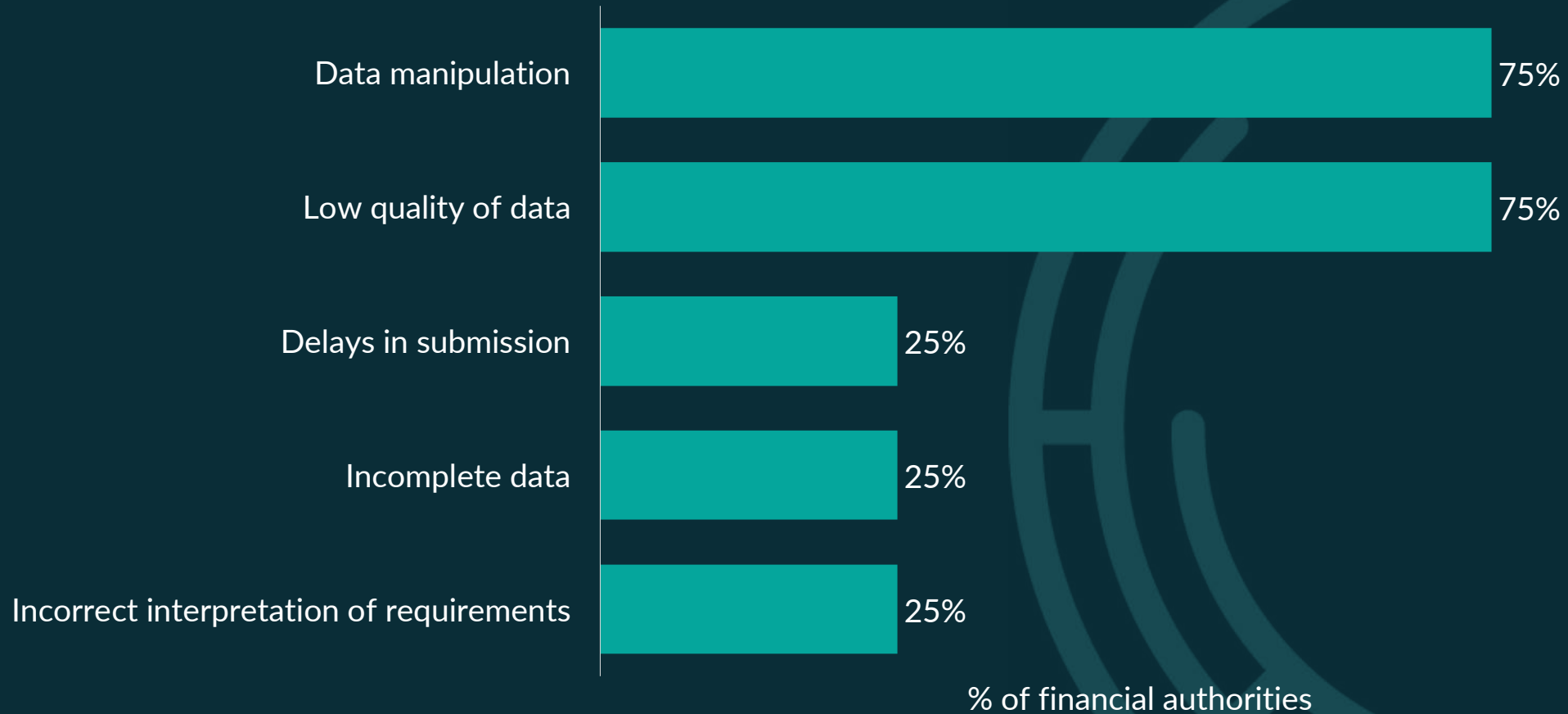


# Frequency of reports submitted by data type



Most reports are collected on a monthly basis, independent of type of data collected, implying data collection and analysis limitations for more frequent reporting.

# Data collection challenges



**Data manipulation** and **low quality** of data are the main challenges financial authorities face regarding data collection.

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# Retail Electronic Money (e-Money) Issuer Supervision – Data Validation

# Descriptions of the data validation process

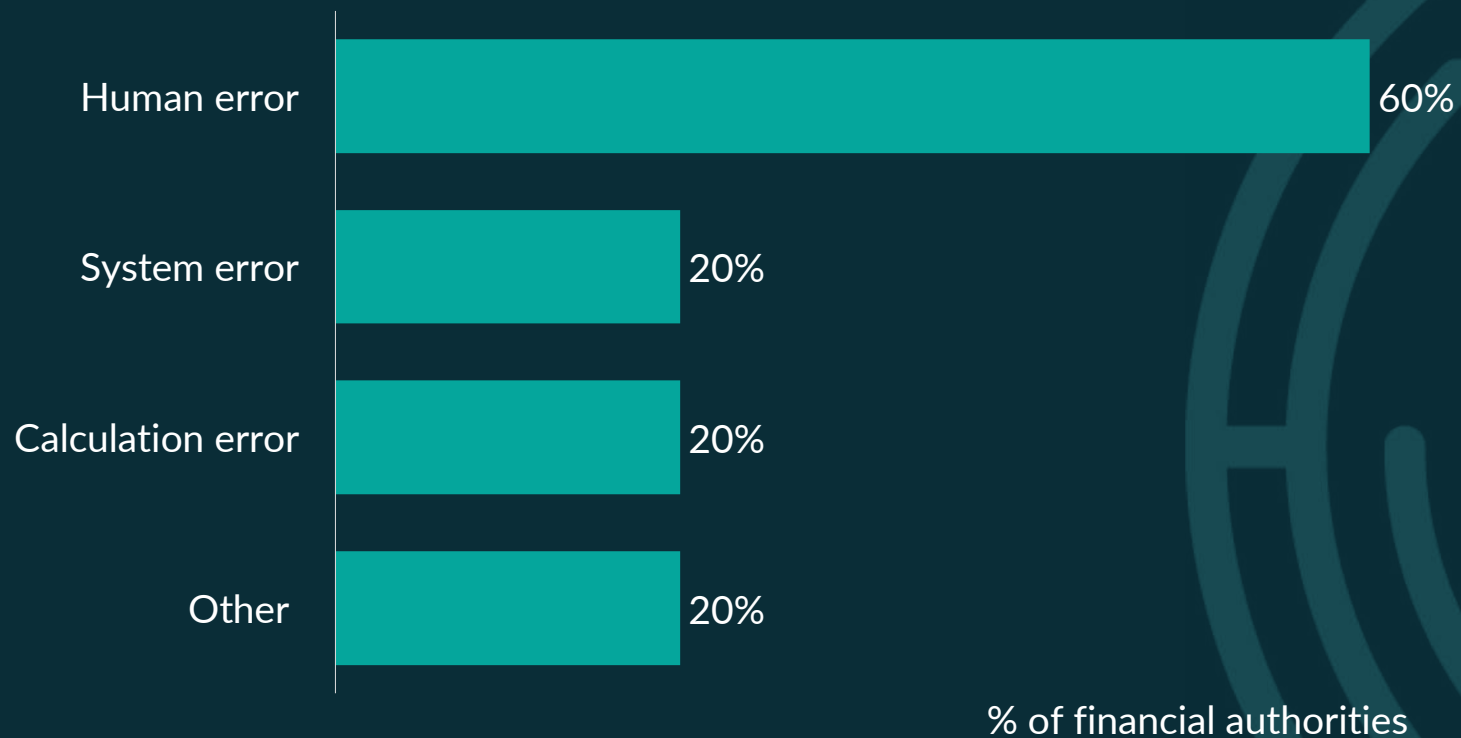
We currently analyze data through Oracle Discovery.

Our data validation system is in-built into the specialized core system.

We do comparison with previous months' data. De-duplication check is done using automated validation system.

We have automated our validation process by developing rules for validating specific accounts into a program. Validation rules are able to identify arithmetical inconsistencies and produce a report. The feedback is shared with the reporting institution with a request to resubmit the report.

# Data validation challenges




Once again, **human error** is the main challenge financial authorities face with respect to the data validation process given the manual nature of the process.

# Suggestions given by respondents to improve data validation processes

By doing a direct query of the electronic money issuers' transactional system.

Introduce more validation rules.

With data analysis software that would allow analysis to be done before the end of every month.

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# Institutional Data Storage and Sharing

# Current data storage tools

In-house storage, with separate databases according to category of institution

67%

In-house storage, with separate databases according to internal department

58%

Physical databases, such as files and binders

25%

Other

17%

Individual supervisors' computers

8%

Cloud services

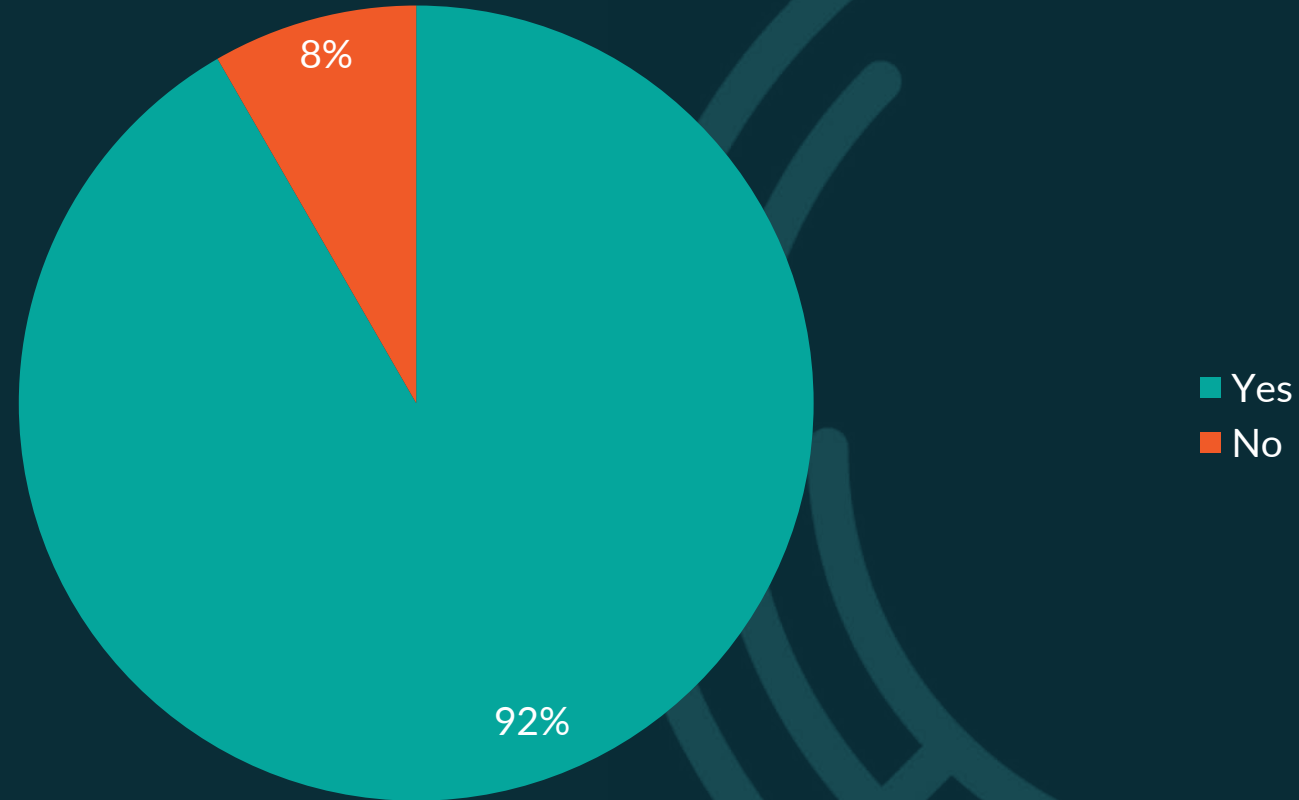
% of financial authorities

\*Other includes private servers or shared platforms such as credit registry system.

Over half of surveyed financial authorities have **in-house storage capacity**, with separate databases according to either category of institution (e.g., banks, non-bank deposit-taking institutions, retail electronic money issuers) or internal department (e.g., banking supervision, non-bank supervision, payments oversight). But some data still is stored in **physical files and binders** as reported by **25%** of financial authorities. No cloud services are in use.

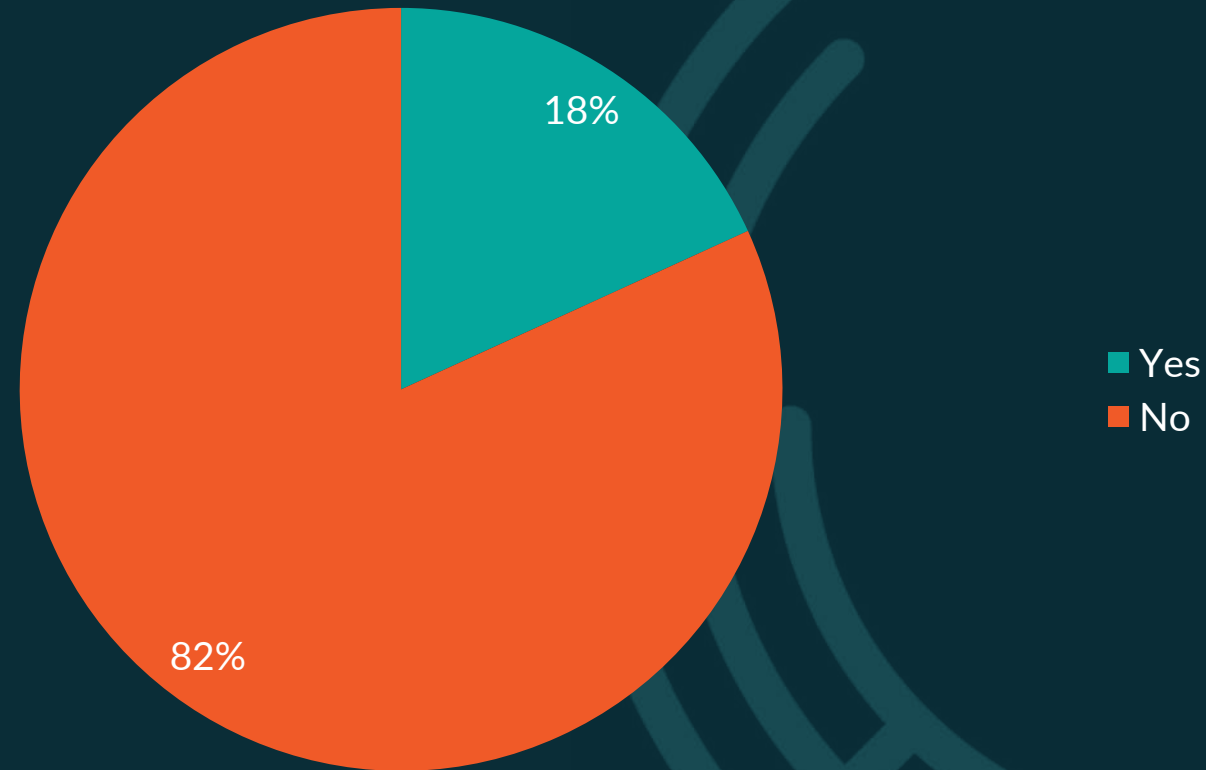


# Ability to share data across different internal databases



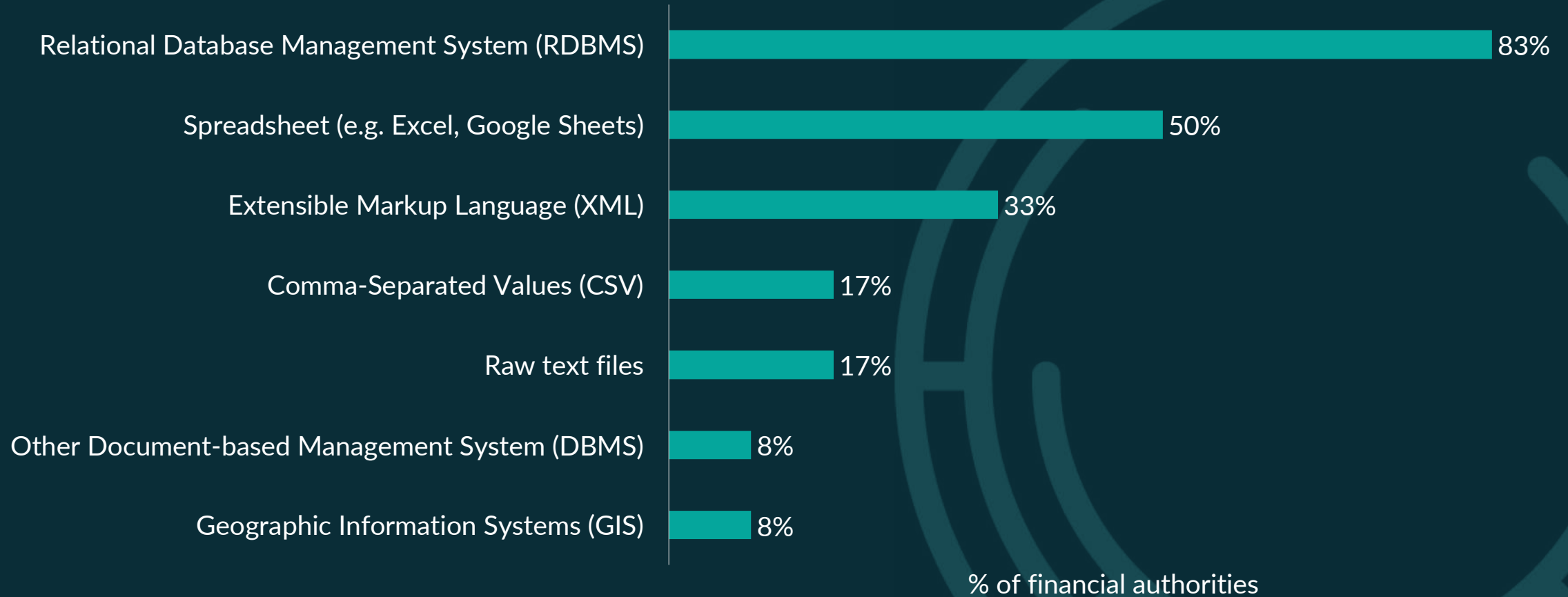
Of those reported to have separate databases, **92%** have a **shared internal platform** to enable selective restriction of access controls and linking or sharing of data across different internal databases.

# Other government entities' access to the data sharing platform



Only 18% of financial authorities provide other government entities (such as the Ministry of Finance, Financial Intelligence Unit, etc.) access to the internal data sharing platform. For those that do not provide access (82%), information is shared with other government entities in hard copy (paper documents) or by e-mail or USB.

# Digital data storage formats

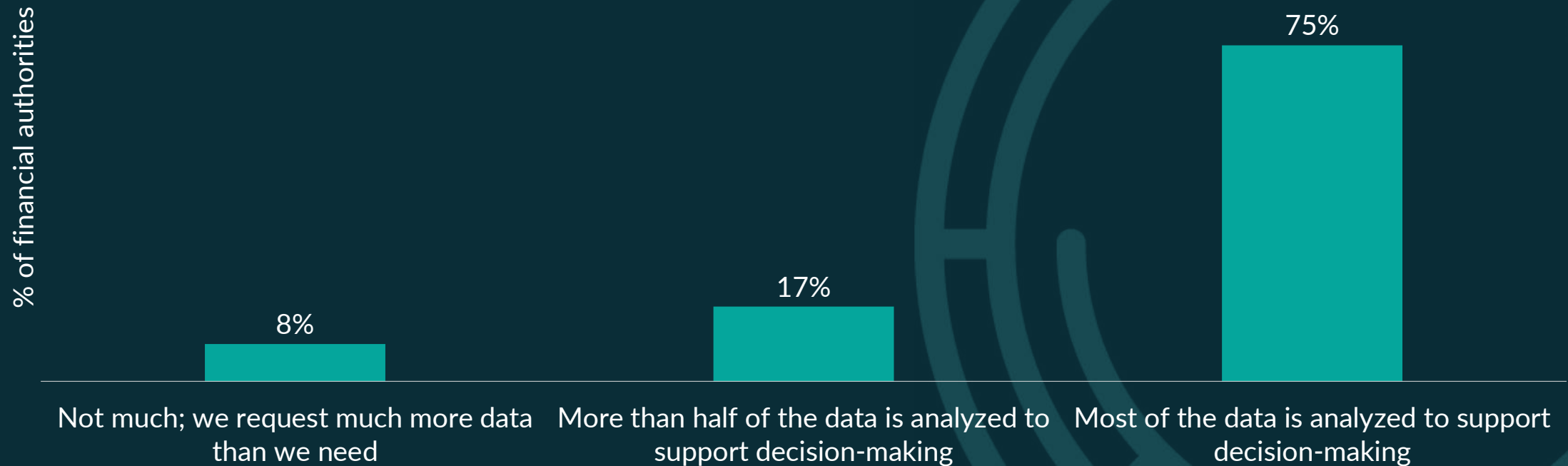


83% of financial authorities store data in RDBMS (such as MS SQL Server, IBM DB2, Oracle, MySQL, Microsoft Access, etc.) while 50% used Excel spreadsheets. These formats are designed for organizing data by common characteristics and cannot store complex images, designs, and multimedia information that defy easy categorization.

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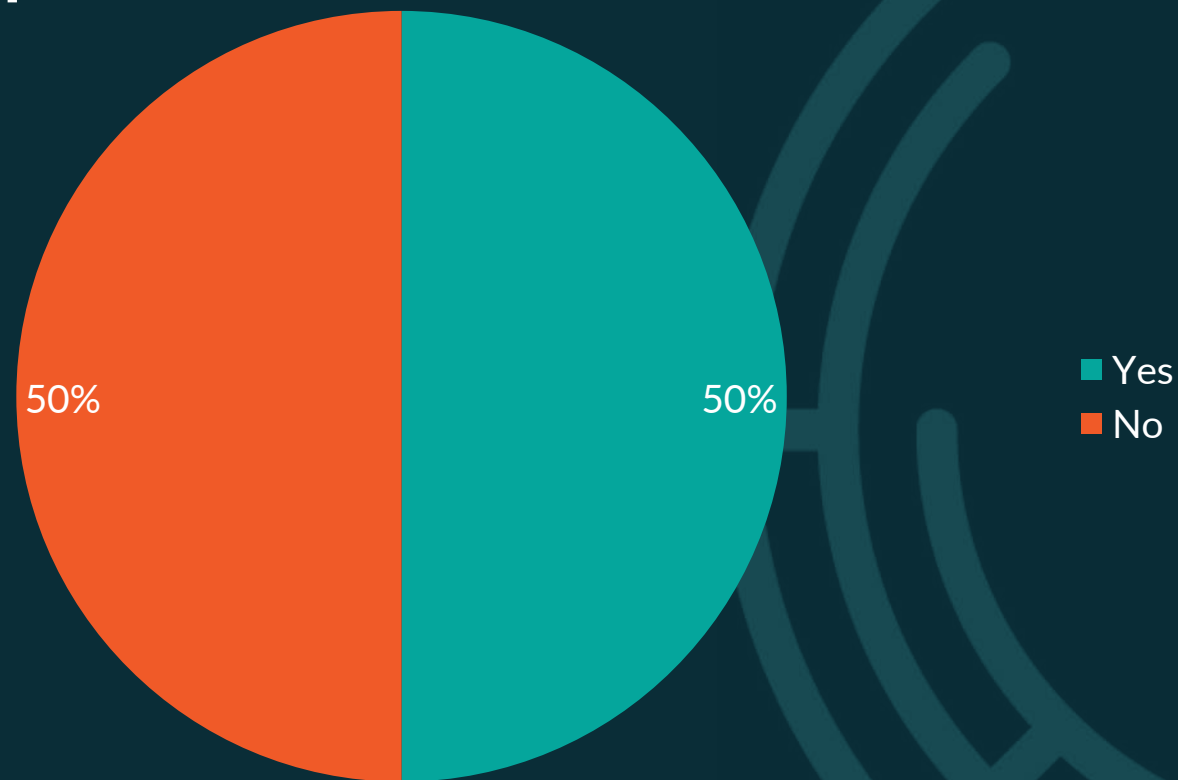
# Institutional Data Analysis and Use

# Analysis of collected data



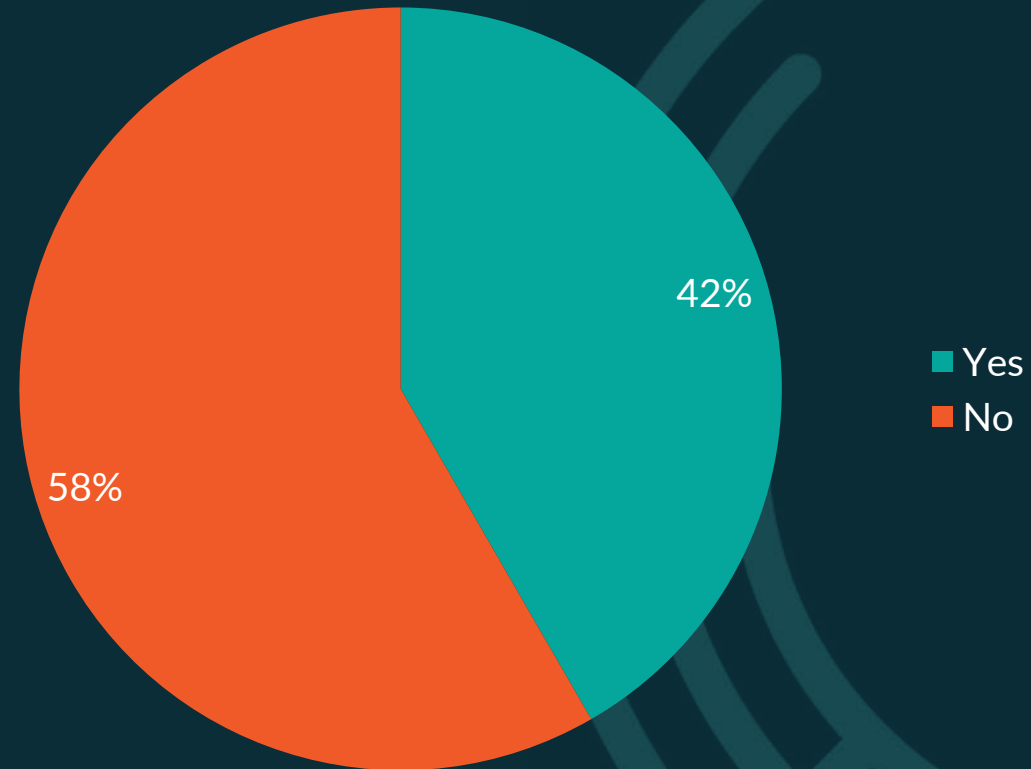
Most of the data collected is analyzed to support decision-making as indicated by 75% of surveyed financial authorities.

# Adequacy of human resource capacity to analyze data



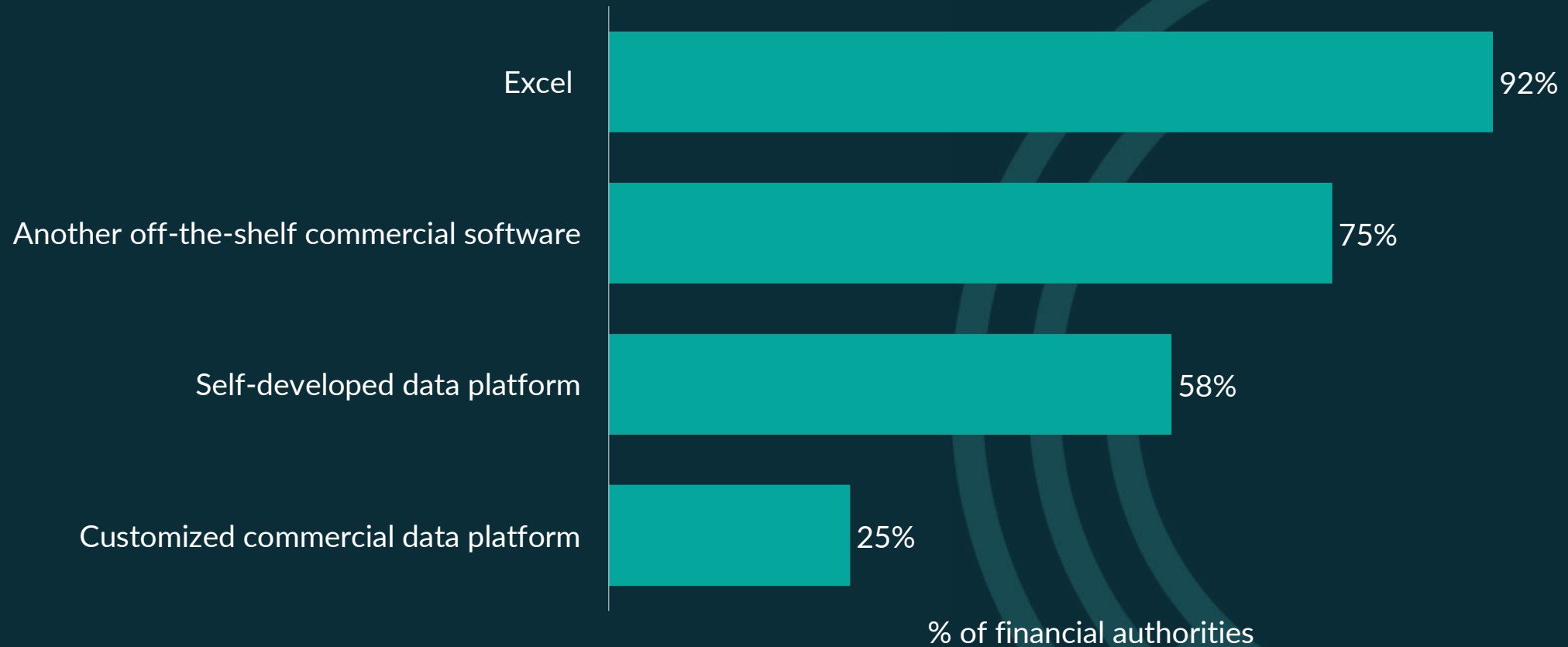
Only half of the financial authorities have adequate human resource capacity in terms of number of staff and staff expertise to analyze the collected data.

# Availability of tools for analyzing data



58% of financial authorities surveyed **lack analytical tools** appropriate for effectively analyzing the data collected.

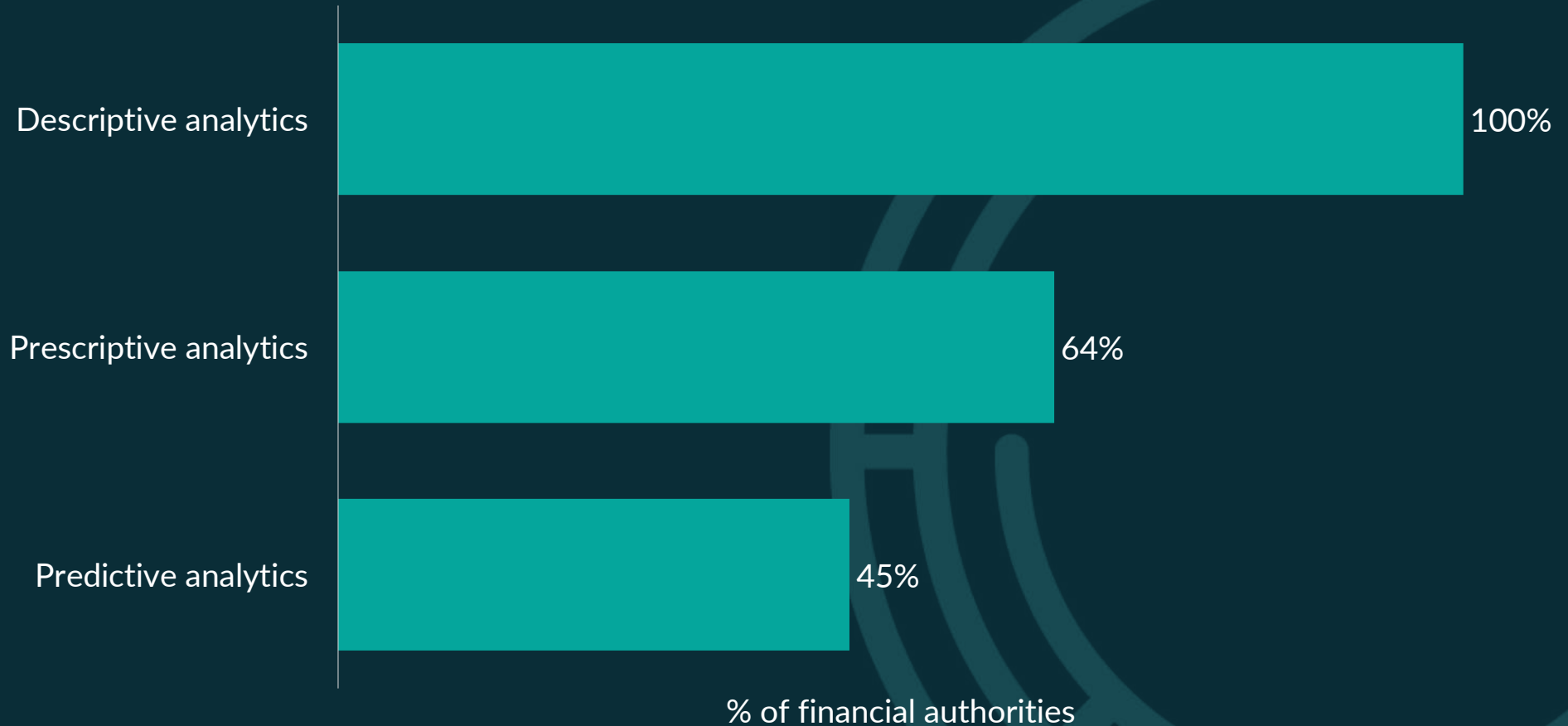
# Tools used to analyze data



92% of surveyed financial authorities use **Excel** to analyze data for decision-making purposes. Excel is not designed for processing large datasets and applying complex analytics required by today's fast-moving and large datasets. In addition, 75% report using **off-the-shelf commercial software** and 58% use **self-developed data platforms** for analysis, either in addition to or in the absence of Excel. These include software such as SAP, STATA, and R.

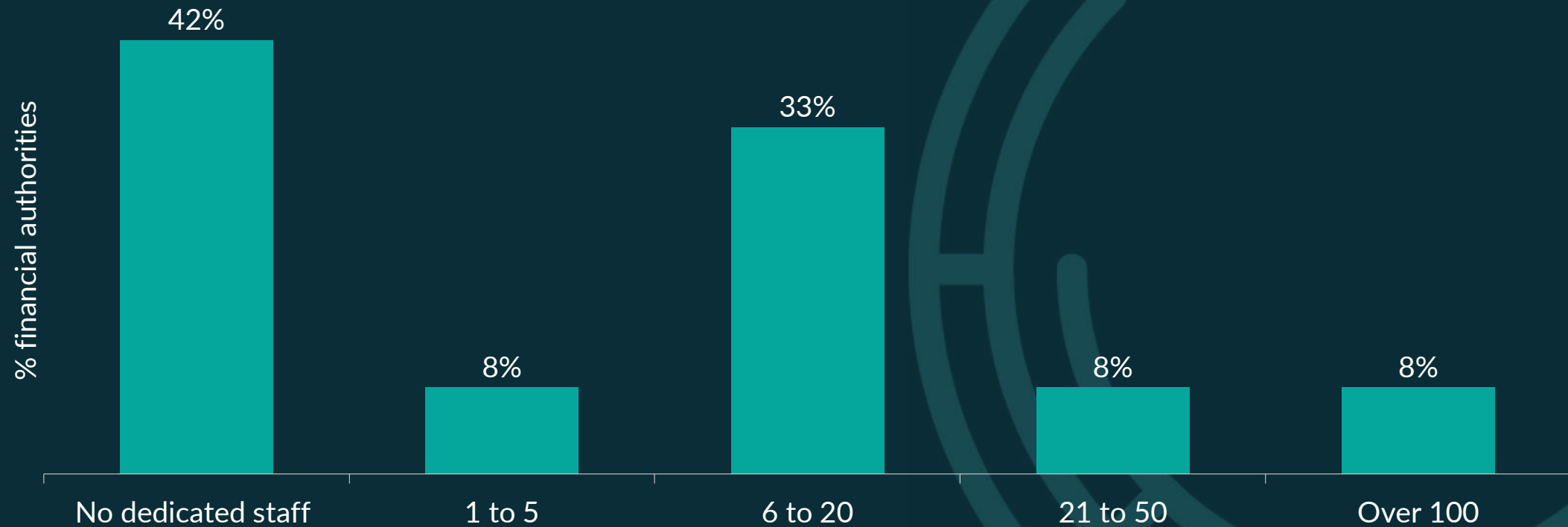


# Types of analytics conducted



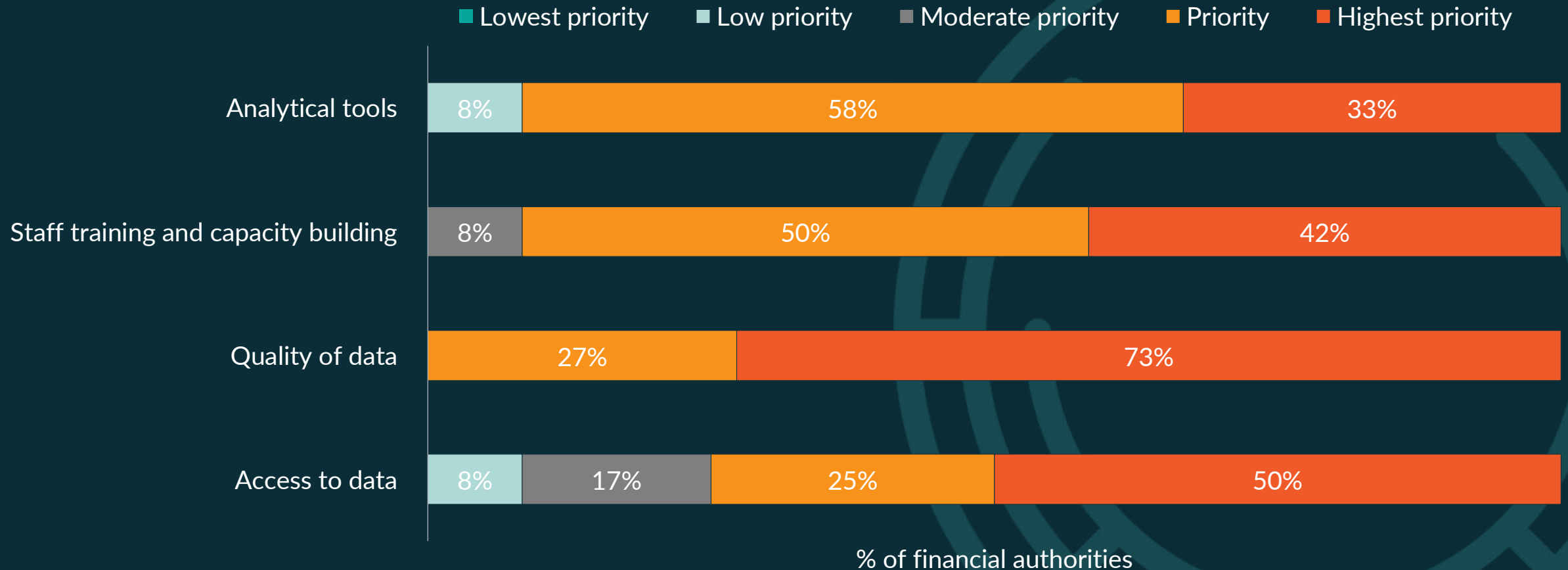
**Descriptive analytics** still dominate as all financial authorities use collected data to highlight what **has** happened. Only **64%** make predictions and offer suggestions for addressing the predictions (**prescriptive analytics**) and **45%** predict what is likely to happen in the future (**predictive analytics**) using collected data.

# Availability of specialized data analytics team and team size



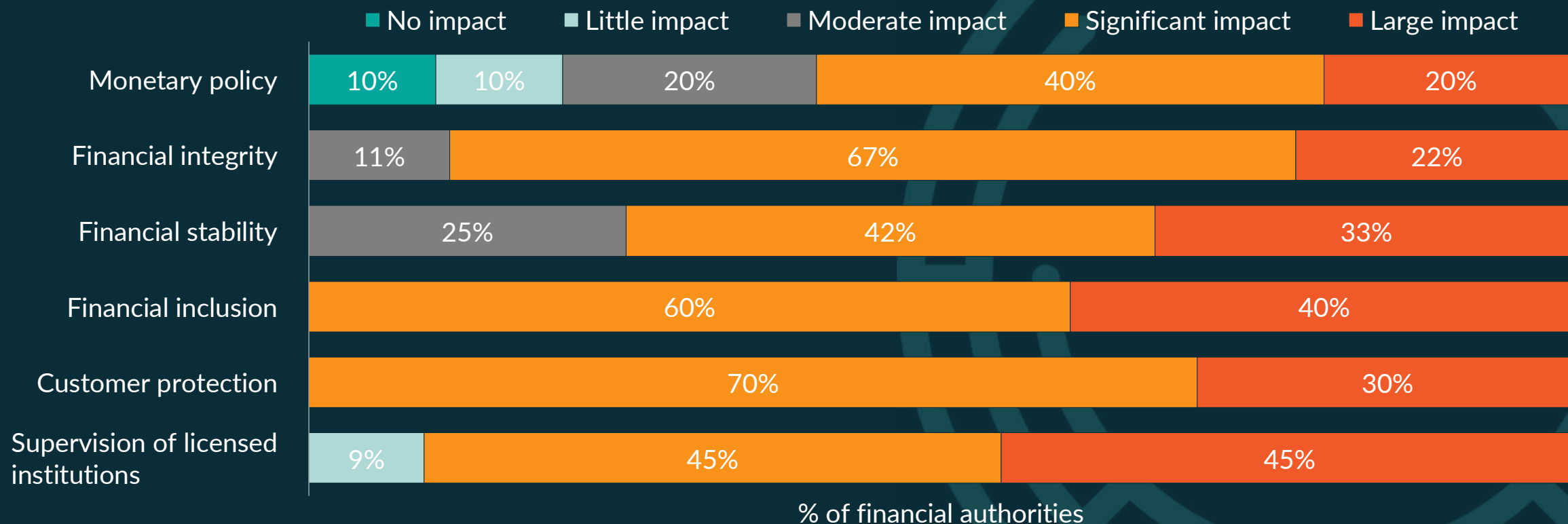
While nearly half of financial authorities have a dedicated team of at least 6 specialists, 42% lack a dedicated data analytics team.

# Investment priorities for using data analytics



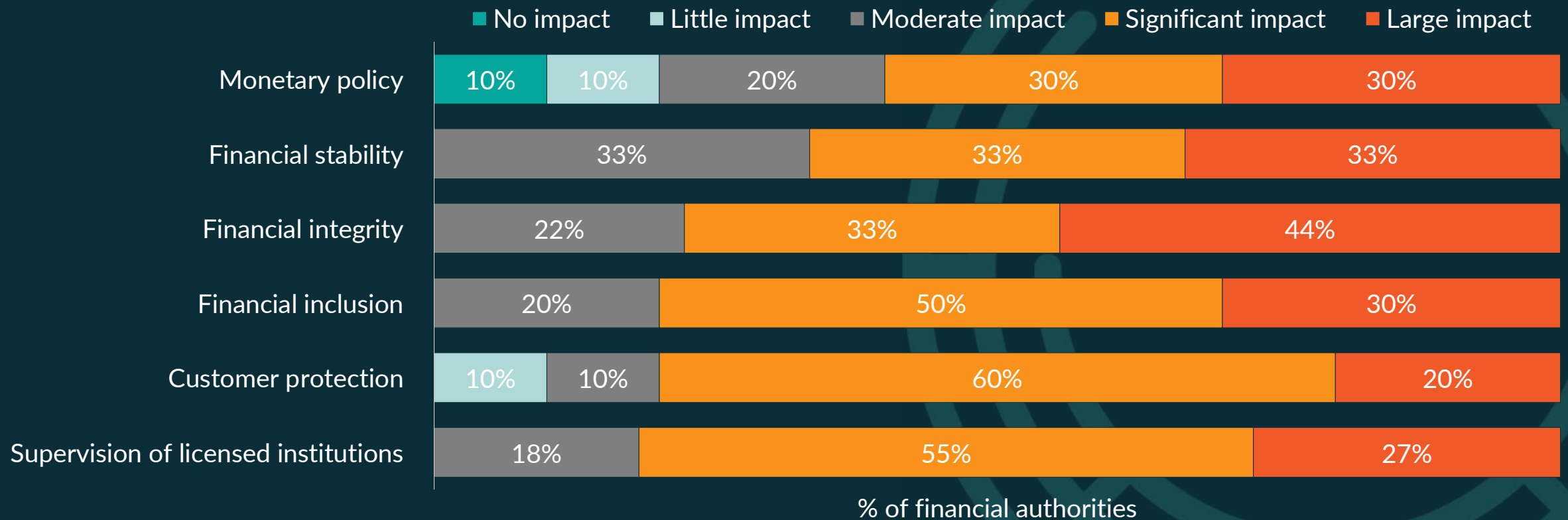
Investment priorities for financial authorities, in order of highest priority, are **quality of data**, **access to data**, **staff training and capacity building**, and **analytical tools**.

# Expected impact of improving the quality of collected data on policy areas of interest



At least **89%** of surveyed financial authorities believe that improvement in the quality of collected data will have significant impacts on **financial inclusion, customer protection, supervision of licensed institutions, and financial integrity.**

# Expected impact of improving data analytics on policy areas of interest



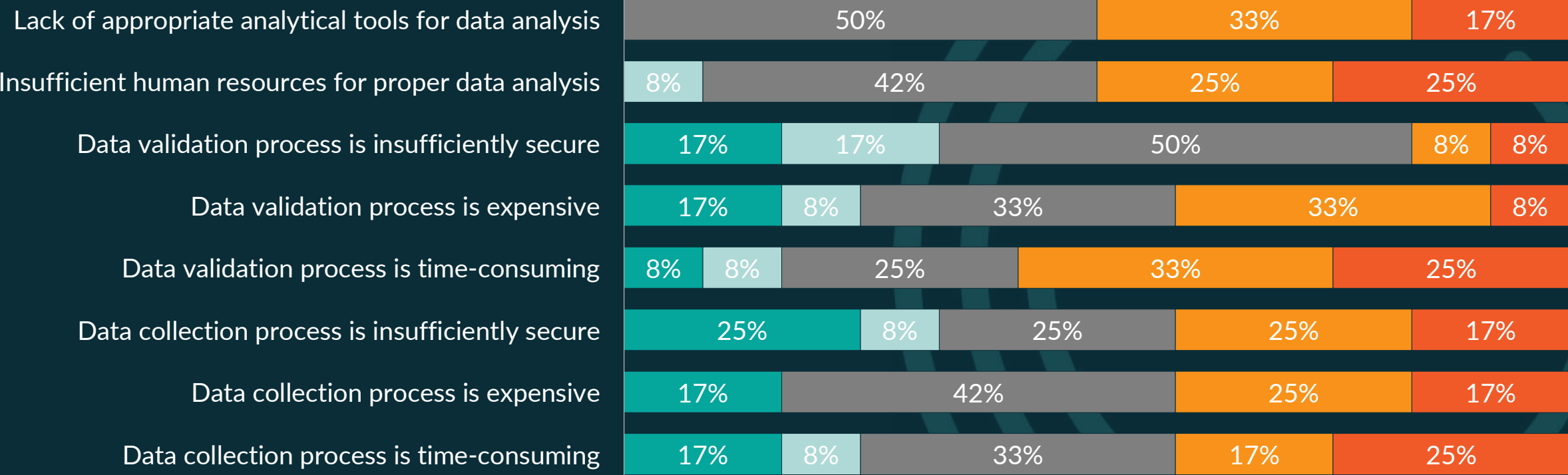
Approximately 80% of financial authorities believe improvement in data analytics will significantly impact financial inclusion, financial integrity, customer protection and supervision of licensed institutions.



# Institutional Data Challenges and Potential Tools

# Identified “pain points” in order of importance

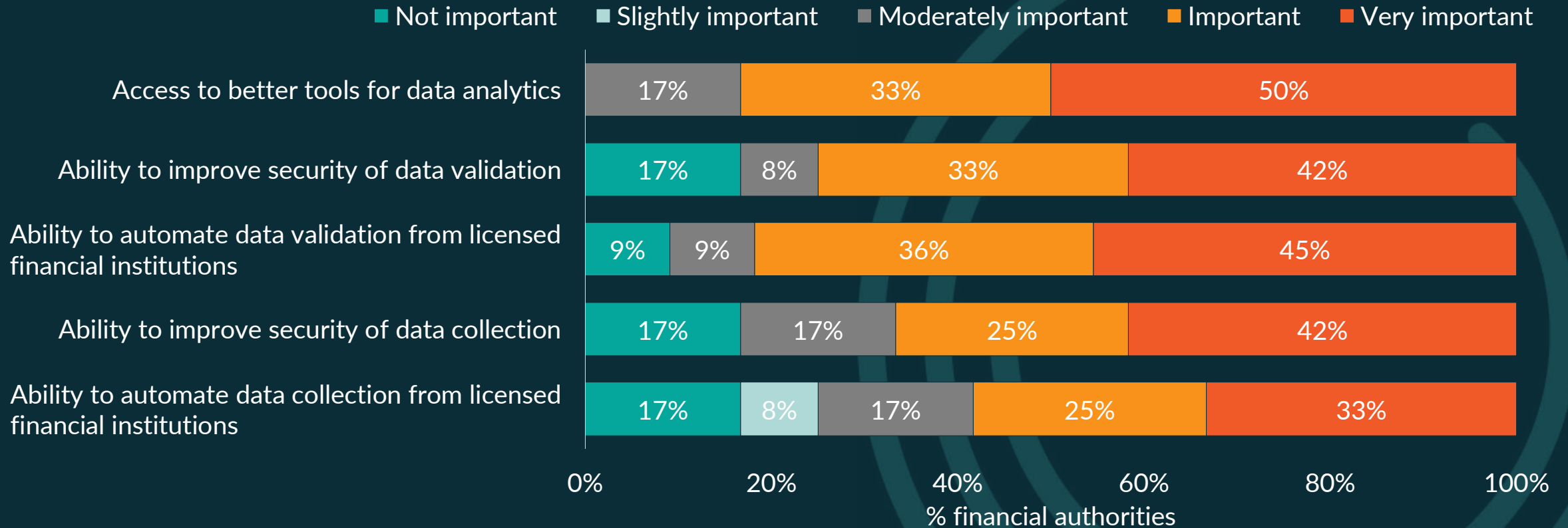
■ Not important   ■ Slightly important   ■ Moderately important   ■ Important   ■ Very important



% financial authorities

Because data validation processes are largely manual, financial authorities have ranked **time-consuming data validation** (58%) as the most important “pain point,” followed by **insufficient human resources** for proper data analysis (50%), and **lack of appropriate analytical tools** (50%).

# RegTech needs and priorities



Financial authorities have ranked **access to better tools for data analytics** (83%), and the **ability to automate data validation** (81%) as the most important “superpowers” they would like to have given the potential value to their organizations.





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