KPMG

Luxembourg Cloud Adoption Survey

ABBL

Second Edition

July 2022

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Foreword: ABBL & KPMG

Foreword ABBL

Conducting surveys amongst our ABBL members on topics that are important to them, and to the future of our industry, is vital to ensure that we can prioritize our actions and advocate effectively on their behalf.

Agility and innovation

The financial sector is constantly evolving, and digitalization of our services has been a significant investment line in everyone's budget for several years now. The acceleration of working from home caused by the Covid-19 pandemic pushed the sector to rethink data access and storage, and cloud solutions have multiplied. Working from home will continue, and fast, secure access to all kinds of data are critical if we want to continue to develop our business and serve our customers. Remaining agile and innovative are vital.

Understanding the framework

Issues around security, supervisory permissions and a clear legal framework meant that cloud solutions have not been adopted as quickly in our sector compared to others. This survey shows that there is a positive shift towards this technology in the Luxembourg financial sector, accompanied by a more innovative approach from the regulator, and a clearer framework for cloud solutions.

Thank you to our members

These surveys are only useful if we can collect high quality data, and we would like to thank our members for their valuable contribution. Output collected will be analyzed within our dedicated working groups and will provide guidance on working priorities and actions. To conclude, we would like to thank KPMG Luxembourg for partnering with the ABBL on this important study.

Ananda Kautz
Head of Innovation, Digital Banking & Payments

Andrey Martovoy
Adviser – Innovation & Digital

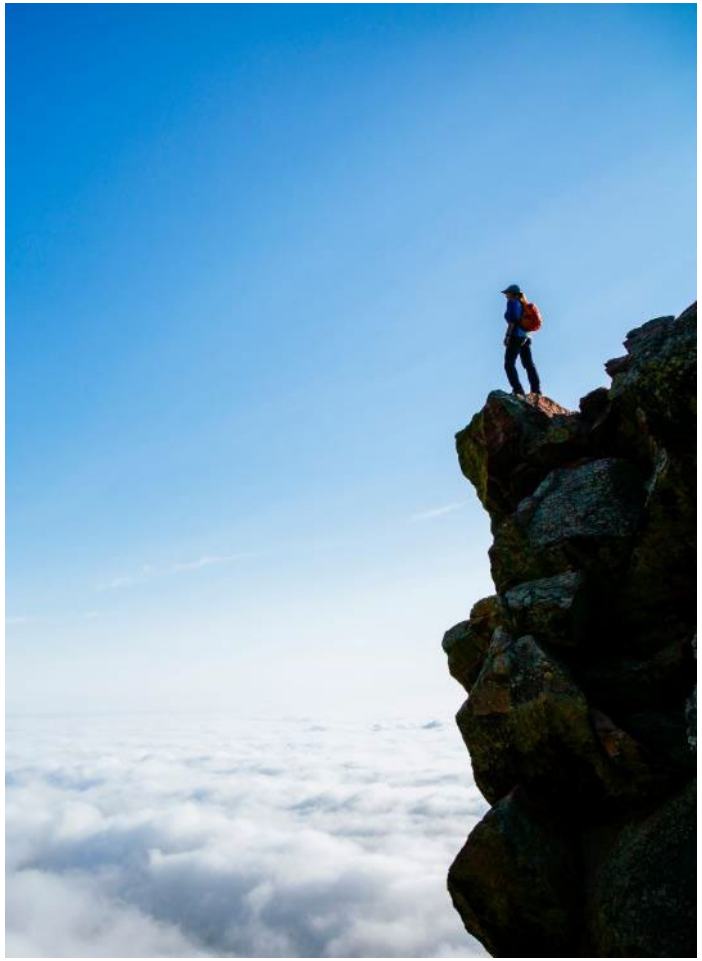
Foreword KPMG

Cloud computing democratizes access to technology, giving large and small companies alike equal access to computing power and cutting-edge innovation. With cloud, workloads can be provisioned quickly - whenever they are needed. Cloud technology is in many ways ideal for data collection and processing because it offers almost infinite storage capacity, on-demand computing and real-time data analysis on a single comprehensive platform.

50 institutions present in Luxembourg answered a questionnaire containing a series of about 40 questions between December 2021 and February 2022. The majority of respondents were banking institutions, with 35 respondents; 12 of them with more than 500 full-time equivalents working in Luxembourg, thereby ensuring a representative sample of the larger players present in our market.

A first edition of this survey was successfully conducted in 2019. Since then, the Luxembourg cloud landscape has changed significantly (update of CSSF circulars, COVID-19, implementation of the EBA Guidelines on outsourcing, etc.). There has also been a growing demand from ABBL members for information related to the approval of specific cloud computing services, statistics on cloud adoption use cases, criticality / materiality assessment, etc.

In this context, the second edition of this survey intends to capture market insights on overall cloud computing adoption drivers as well as issues; strategy and governance; detailed information on Infrastructure and/or Platform as a Service use cases; information on Software as a Service use case(s); and IT architecture and information security considerations.



Foreword KPMG (cont'd)

What is cloud computing?

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. Cloud computing service models are generally categorized as follows:

- Infrastructure as a Service ("IaaS") which is a type of cloud computing service that offers essential compute, storage, and networking resources on demand, on a pay-as-you-go basis;
- Platform as a Service ("PaaS") which is a complete development and deployment environment in the cloud, with resources that enable financial institutions to deliver everything from simple cloud-based apps to sophisticated, cloud-enabled enterprise applications; and
- Software as a Service ("SaaS") which allows users to connect to and use cloud-based apps over the Internet.

This survey's results show that these concepts are being translated into reality by financial institutions in Luxembourg with respectively 70% and 85% of respondents having adopted (or planning to adopt) cloud services for IaaS and/or PaaS use cases and SaaS use cases.

Looking forward

As announced in its 2020 annual report, the CSSF reflected on the objectives and organization of its IT risk supervisory activity and has defined a new strategy, the implementation of which started in October 2021 with the publication of Circular CSSF 21/785 (few weeks before we launched our questionnaire for the present survey and recently repealed in favor of Circular CSSF 22/806). The circular introduced the replacement of the prior authorization obligation by a prior notification obligation in the case of critical / material IT outsourcing. Since then, supervised entities have had to notify the CSSF of their critical / material cloud computing projects at least three months before the planned outsourcing becomes effective.

In our experience, this new pragmatic approach has allowed local market players to clarify the timelines of their transformation projects. Let's hope for this important evolution in the regulatory dialogue to further support the adoption of cloud computing in Luxembourg.

Thank you to the ABBL community

We would like to extend a warm thank you to all the participating institutions for their contribution and openness, and we hope that the information provided in this report will provide you with useful insights.

Laurent de la Vaissière
Partner

Jean-Christophe Denis
Associate Partner

Key takeaways – what should you do?

01 The majority of financial institutions rely on legacy IT, so cloud adoption will be a longer journey for them. The sooner institutions begin this journey, the easier and quicker it will be. We recommend prompt preparation, and if possible, in a gradual manner. For example, starting by adopting some non-material/critical cloud use cases.

02 Educating your existing workforce the right way is key. Training is the bedrock of any organization looking to seize cloud computing's many opportunities. We suggest training starts at the top and moves down: Ops and IT leadership must understand the impact of cloud, its ecosystem and its concepts.

03 Your security professionals need to be included in your cloud journey. The amount of cloud knowledge required from your SecOps and IT risk teams should not be underestimated; chances are that your "gate" controls – like security assessments – will need a major overhaul to remain relevant for cloud deployments.

04 While financial regulation is often perceived as an obstacle for cloud adoption, some of the respondents went "all cloud" despite being regulated too. Your internal control functions, such as Legal and Compliance, also need to be part of your cloud journey to support you as you tackle these regulatory requirements.

05 Can you afford to miss out on software which is only available in the cloud? Both well-established and rising vendors don't offer (or no longer offer) on-premise versions of their solutions. This may restrict your options to maintain and/or expand your information system in the fields of the modern workplace, CRM, business intelligence, data warehouse, etc.

06 By now, the fresh graduates arriving in Luxembourg are all digital natives. In an increasingly competitive landscape for recruiting and retaining talented employees, organizations must deploy the right technology to enable a modern workplace and prepare for the future of work.

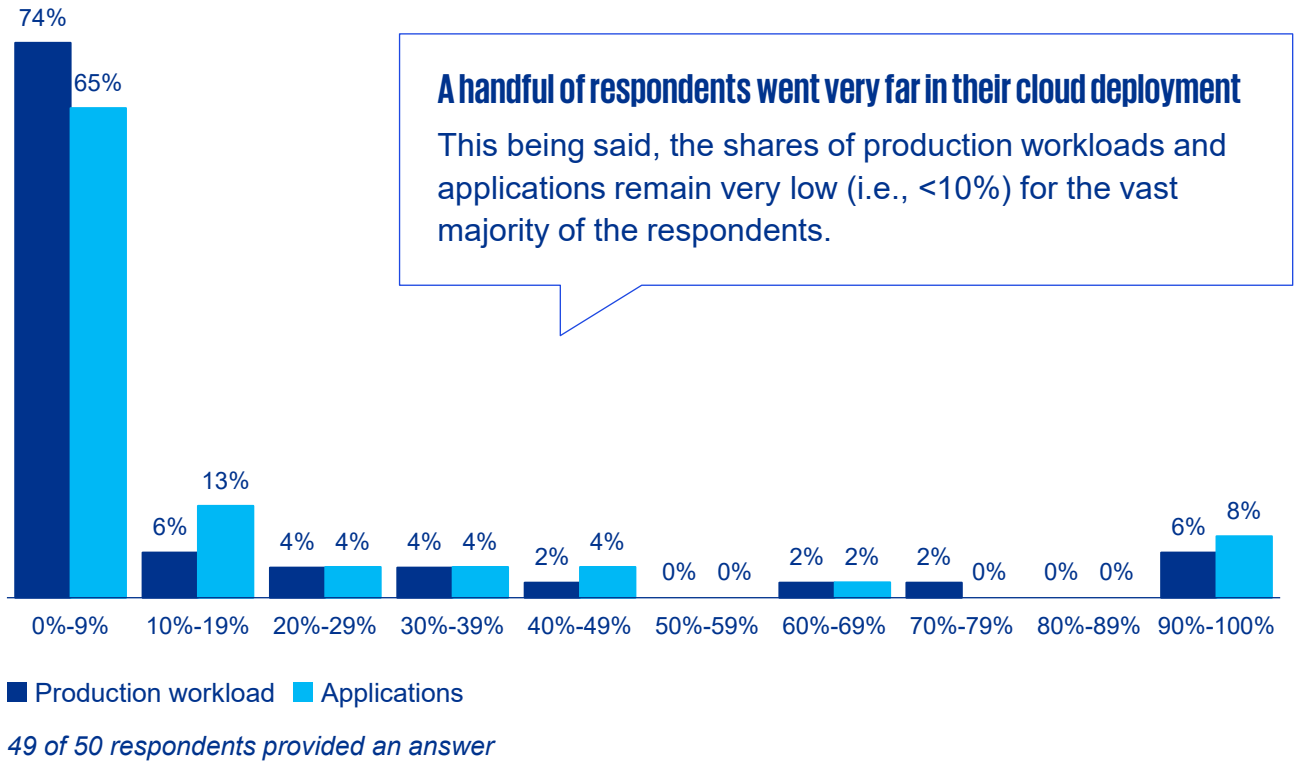
02

Overall adoption, drivers & issues

Overall adoption: CURRENT STATUS

Should your institution have already adopted Cloud Technology for some of its computing/ infrastructure needs, what are the approximate respective percentages of production workload and applications currently running from cloud computing services?

One direct way to measure cloud adoption is to look at the proportions of production workloads (i.e. IT resources running in the cloud) and IT applications running in the cloud. When it comes to the average shares of those measurements already running in the cloud, it turns out that only a handful of respondents went very far – "all cloud" – in their deployment with 6% and 8% of respondents respectively running 90% or more of their production workloads and applications in the cloud. The vast majority of respondents seems to be still testing the waters with 74% and 65% of respondents respectively running up to 10% of their production workloads and applications in the cloud.



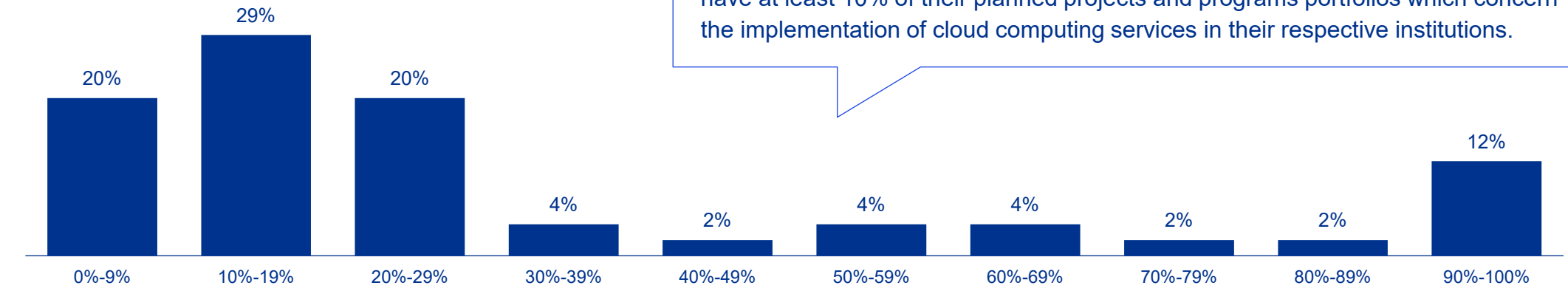
49 of 50 respondents provided an answer

A handful of respondents went very far in their cloud deployment

This being said, the shares of production workloads and applications remain very low (i.e., <10%) for the vast majority of the respondents.

Overall adoption: PROJECTIONS

Looking forward in the short-/medium-term, what approximate percentage of projects and programs concern the implementation of cloud computing services in your institution?



Looking forward, cloud adoption is taking off

Whereas the previous question looked into the current status, this one provides a forward looking view based on the project portfolios of the respondents.

We can expect cloud adoption to take off given that over 80% of respondents have at least 10% of their planned projects and programs portfolios which concern the implementation of cloud computing services in their respective institutions.

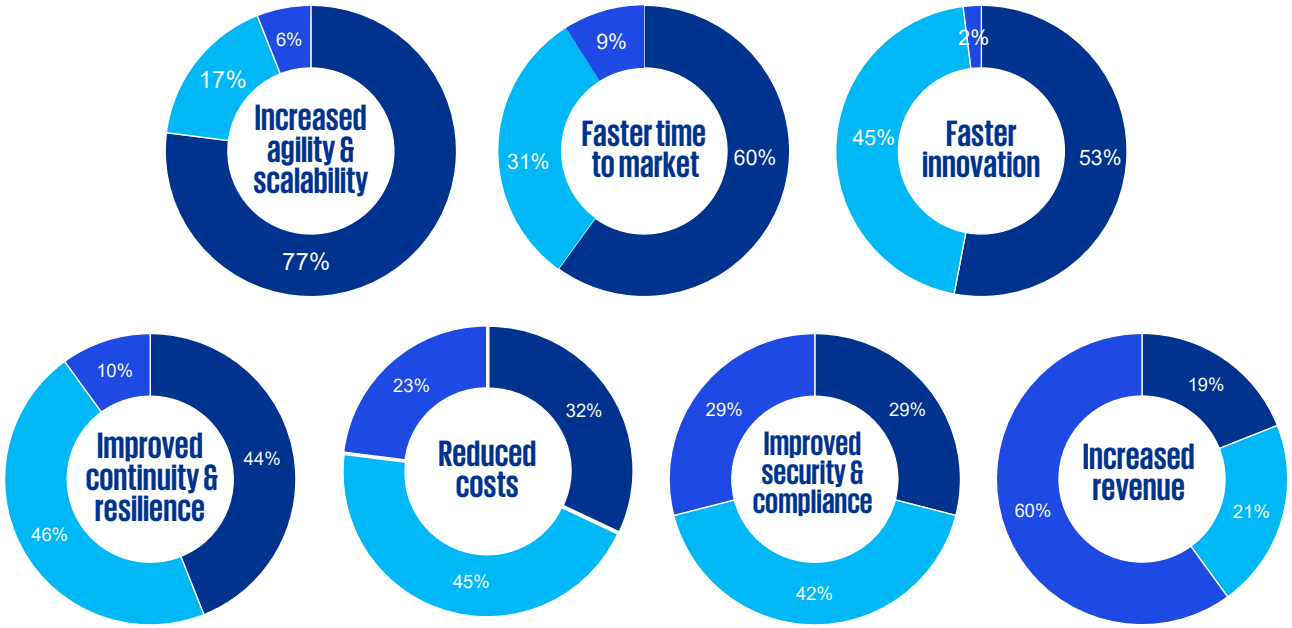
49 of 50 respondents provided an answer

What are the adoption drivers?

For each of the following generic drivers in adopting cloud computing services, could you please rank their relative importance in the context of your institution (high / medium / low)?

Increased agility & scalability ranked first, and faster time to market second, with respectively 77% and 60% of respondents considering these drivers having a relatively higher importance. This should not come as a surprise given that these drivers are very much aligned with the core value proposition of public cloud providers ever since their inception.

It is worth noting that a significant proportion of respondents perceived improved continuity & resilience, as well as improved security and compliance, as significant drivers for adopting cloud computing; these drivers were considered as having higher importance by respectively 44% and 29% of respondents. Indeed, we all know that a couple years ago, the main concern over public cloud was around security; while this change might appear at first surprising, it is actually well aligned with what seems to be a global trend in the financial sector

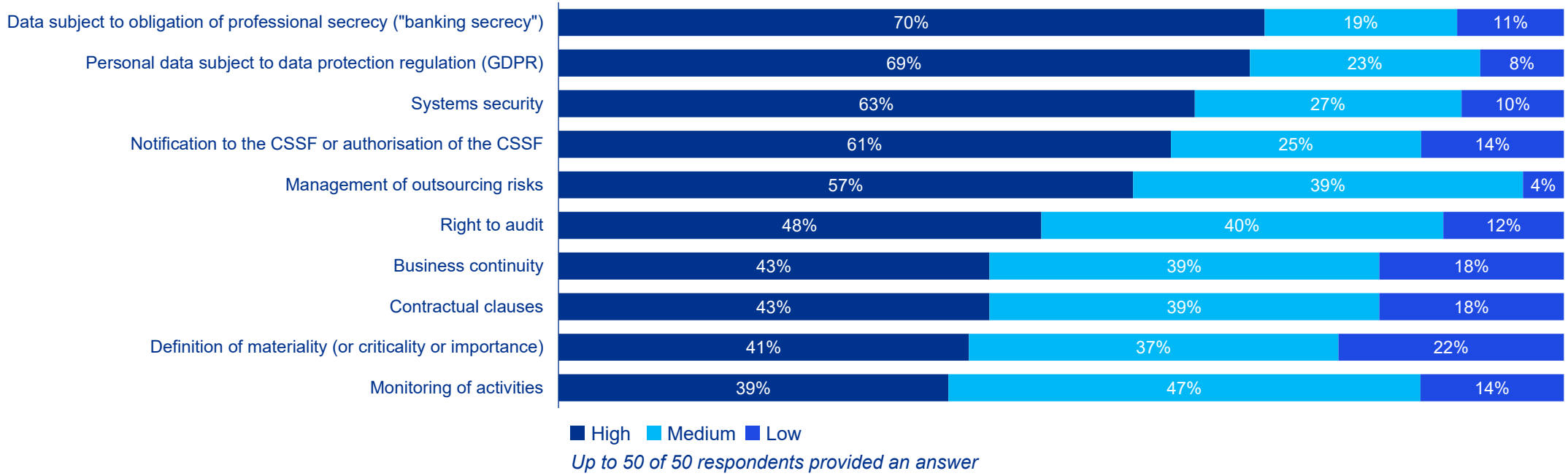


Up to 48 of 50 respondents provided an answer

What are the adoption issues?

So why don't we see higher and faster adoption numbers? Top concerns include data that is subject to the obligation of professional secrecy (so called "banking secrecy"), personal data that is subject to data protection regulation (i.e. GDPR), system security, regulatory dialogue (i.e. notification to / authorization of the CSSF), and management of outsourcing risks.

For each of the following generic issues in adopting cloud computing services, could you please rank their relative importance in the context of your institution? (only the top 10 issues are shown)



Up to 50 of 50 respondents provided an answer

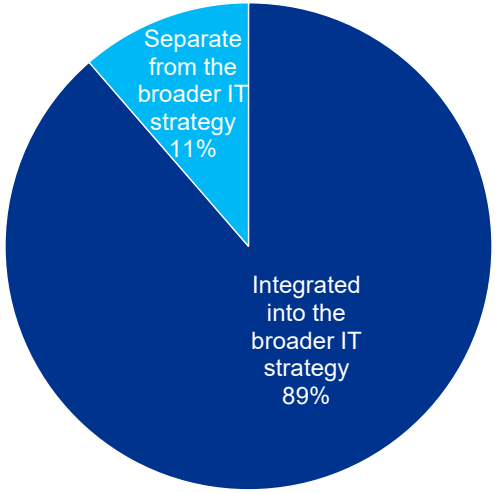
03

Strategy & Governance

Strategy & Governance

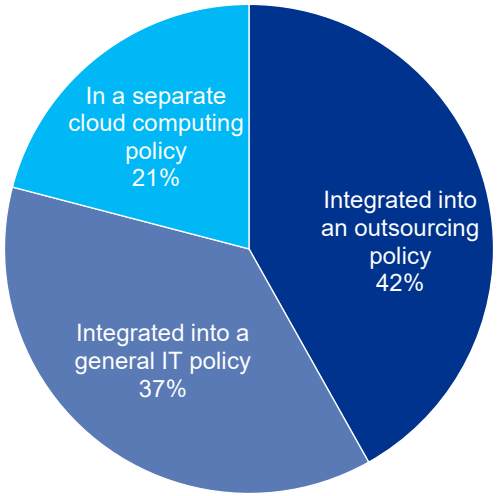
The bulk of respondents (89%) integrate their cloud computing strategy in their broader IT strategy and more than half of the respondents (57%) have someone in charge of cloud computing technology in their respective institutions.

How is (or will) the Cloud Computing strategy of your institution documented?



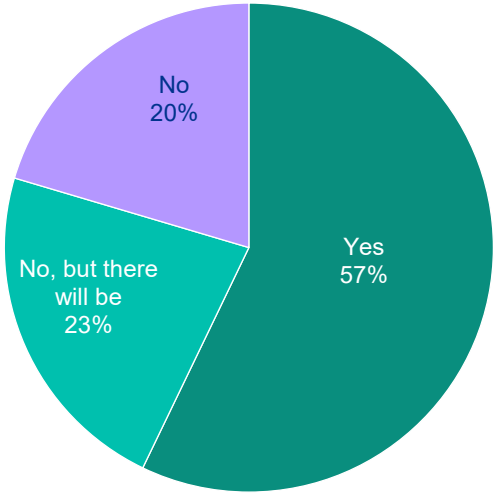
44 of 50 respondents provided an answer

How is (or will) the Cloud Computing policy of your institution documented?



43 of 50 respondents provided an answer

Is there someone within your institution in charge of Cloud Computing technology?*



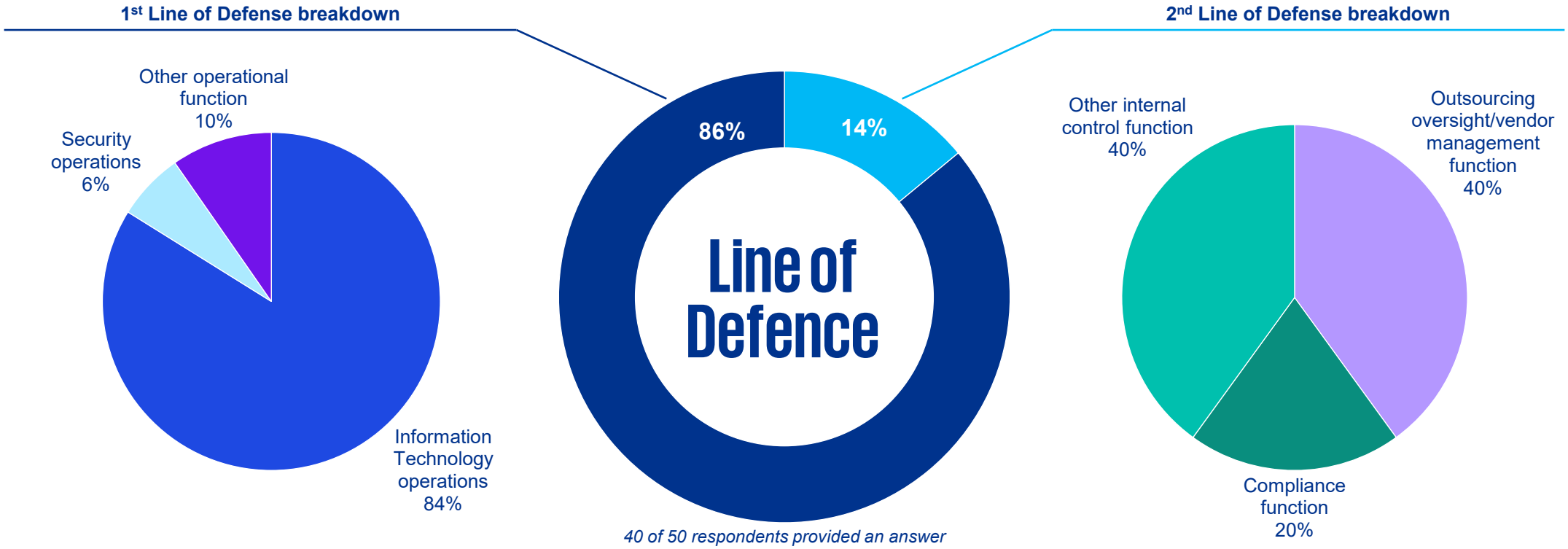
49 of 50 respondents provided an answer

* This question does not necessarily refer to the "Cloud Officer" role as defined in the CSSF's circulars on Cloud Computing

Strategy & Governance

Most respondents (72%) have their Information Technology operations in charge of Cloud Computing technology.

What is the reporting line of the person in charge of Cloud Computing technology in your institution?



40 of 50 respondents provided an answer

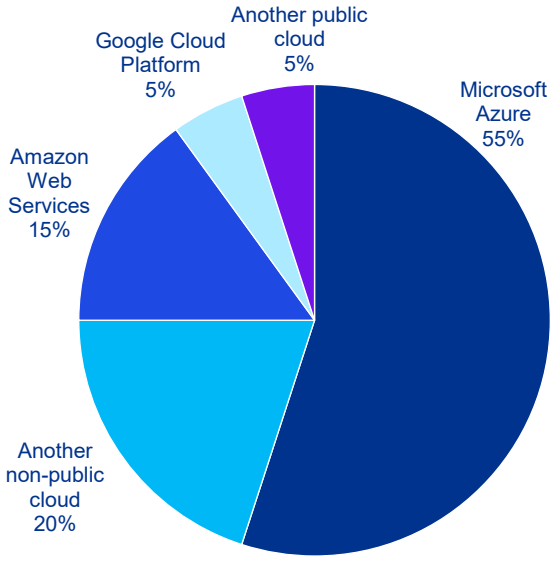
04

Infrastructure & Platform as a Service

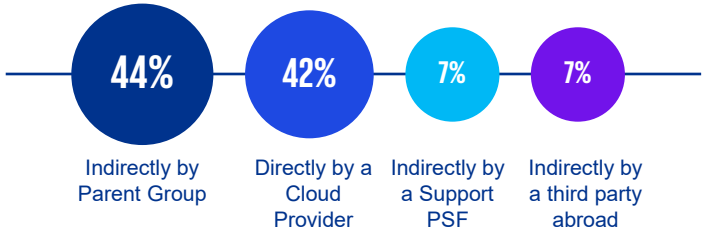
IaaS & PaaS: Providers, sourcing and deployment models

70% of respondents have adopted (or plan to adopt) cloud services for IaaS and/or PaaS use cases, i.e. where their institution have direct or indirect control over the assets deployed in the cloud.

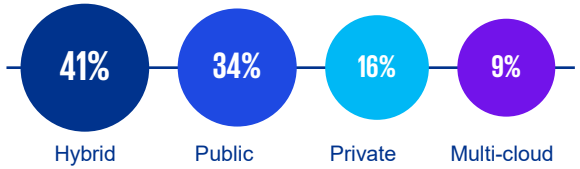
Which Cloud Computing service provider does (or will) your institution partner with?



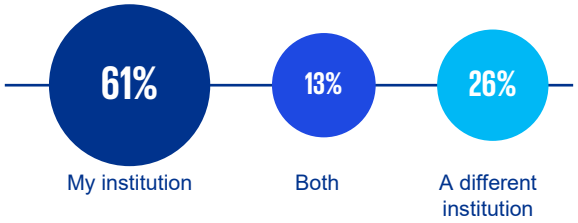
How does (or how will) your institution source the Cloud Computing technology?



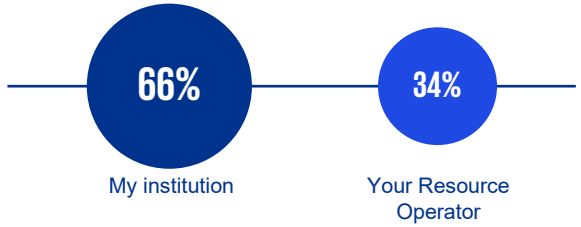
What is (or will be) the deployment model?



Who is (or will be) the Resource Operator / Cloud Officer (in the sense of CSSF circulars)?



Who is (or will be) the Signatory (in the sense of Circular CSSF 17/654)?

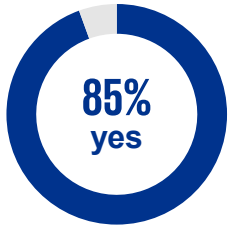


Up to 32 of 50 respondents provided an answer

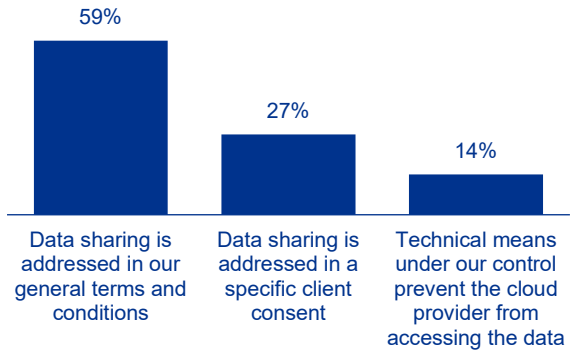
IaaS & PaaS: Confidential data, criticality & regulatory dialogue

The overwhelming majority of use cases involve confidential data (85%) and a majority of respondents (59%) have approached the related legal challenges (i.e. obligation of professional secrecy) by updating their general terms and conditions, i.e. adopting transparency over the services outsourced, the type of data being shared and who has access to this data.

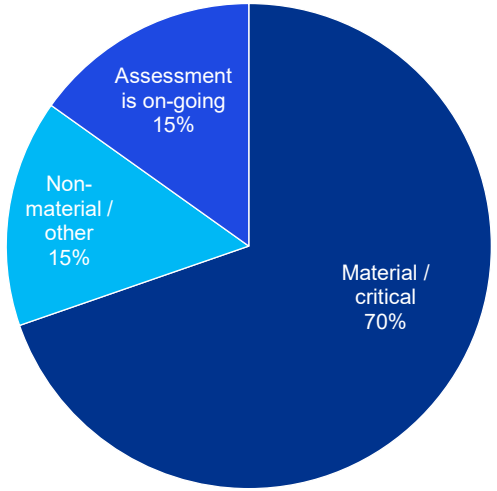
Does this use case involve confidential data?



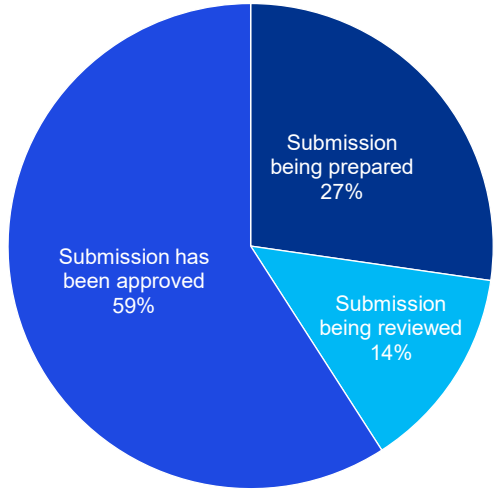
Where it involves confidential data, how does your institution satisfy (or plan to satisfy) its obligation of professional secrecy?



How have you assessed the materiality / criticality of this use case?



In material / critical cases, where do you stand in terms of regulatory dialogue?



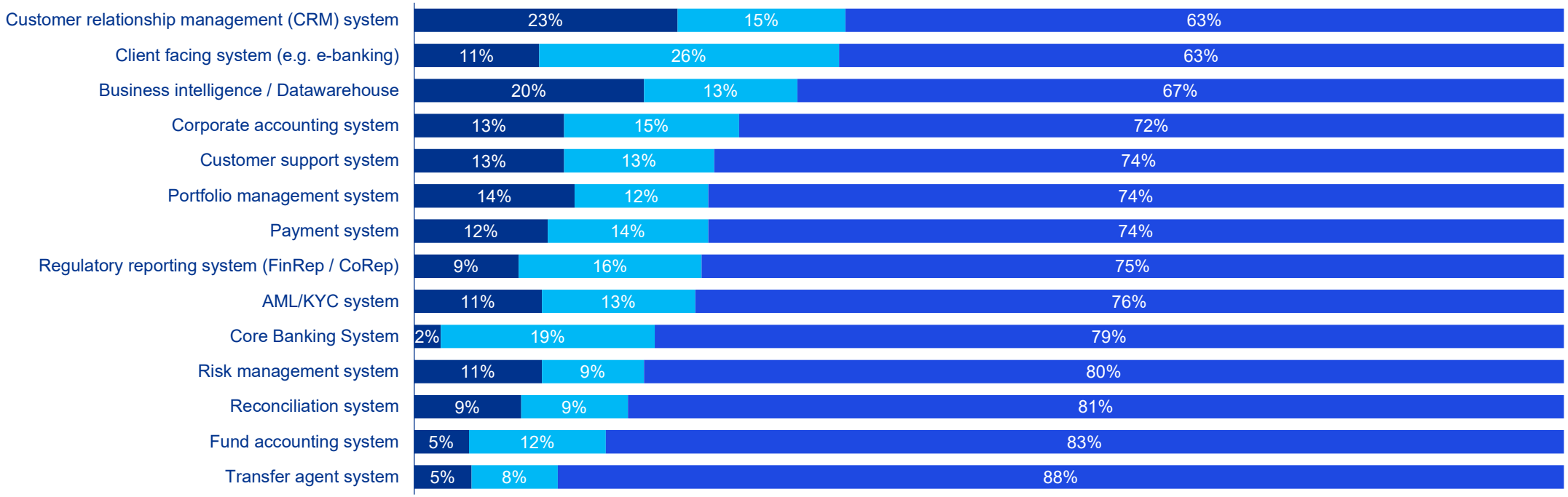
52% of respondents have completed their register of outsourcing and the others are currently completing it

33 of 50 respondents provided an answer

IaaS & PaaS: Supported IT systems (all respondents)

We can observe a correlation between the main drivers for adoption – i.e. increased agility & scalability / faster time to market – and the types of IT systems being most frequently deployed as part of IaaS/PaaS cloud computing setups. Indeed, we can see IT systems related to customer-facing digital channel and to data-intensive analytics systems are consistently in the top 3 for both all the respondents and respondents from banks only.

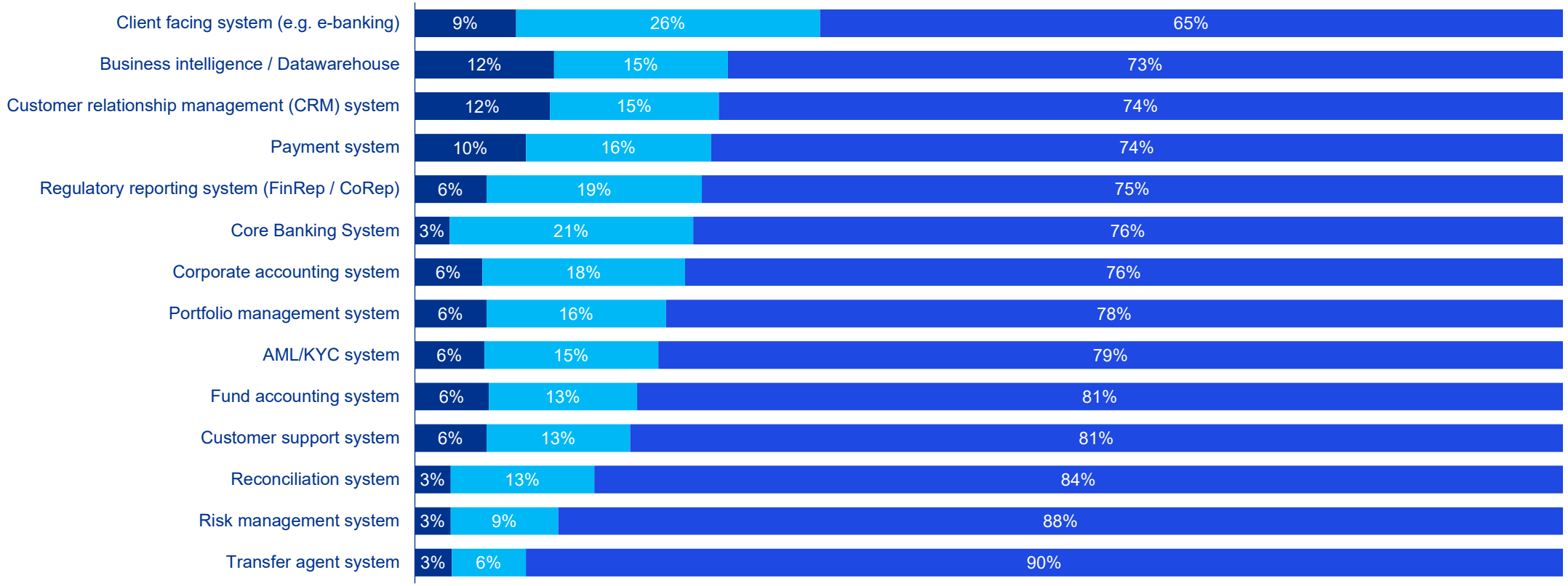
Have you implemented (or plan to implement) any of the following IT systems in this IaaS and/or PaaS use case?



Up to 31 of 50 respondents provided an answer

IaaS & PaaS: Supported IT systems (banks only)

Have you implemented (or plan to implement) any of the following IT systems in this IaaS and/or PaaS use case? Banking respondents only:



Up to 21 of 50 respondents provided an answer

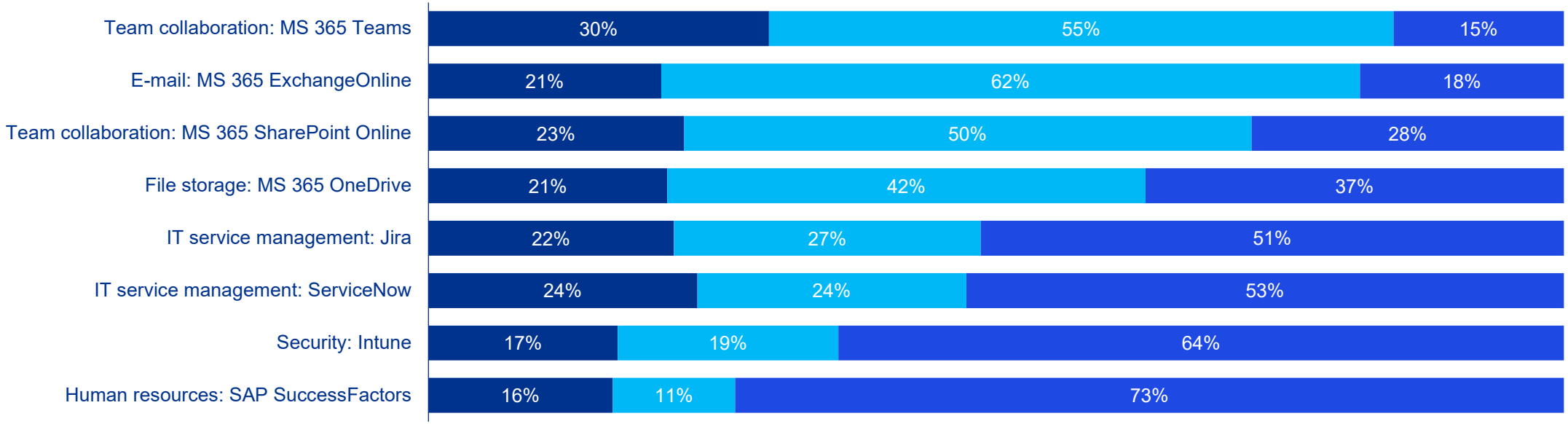
05

Software as a Service

SaaS: Support use cases

85% of respondents have adopted (or plan to adopt) cloud services for SaaS use cases, i.e. where the SaaS solution providers limit the respondents' institutions control to the application layers of those solutions. The pandemic has forced us to work from home – an important change in working habits which is here to stay – and this has been a clear driver for massive adoption of modern workplace cloud-based solutions, such as Microsoft 365 – not only Teams, but also Exchange Online and SharePoint Online meaning workloads offering document storage capabilities.

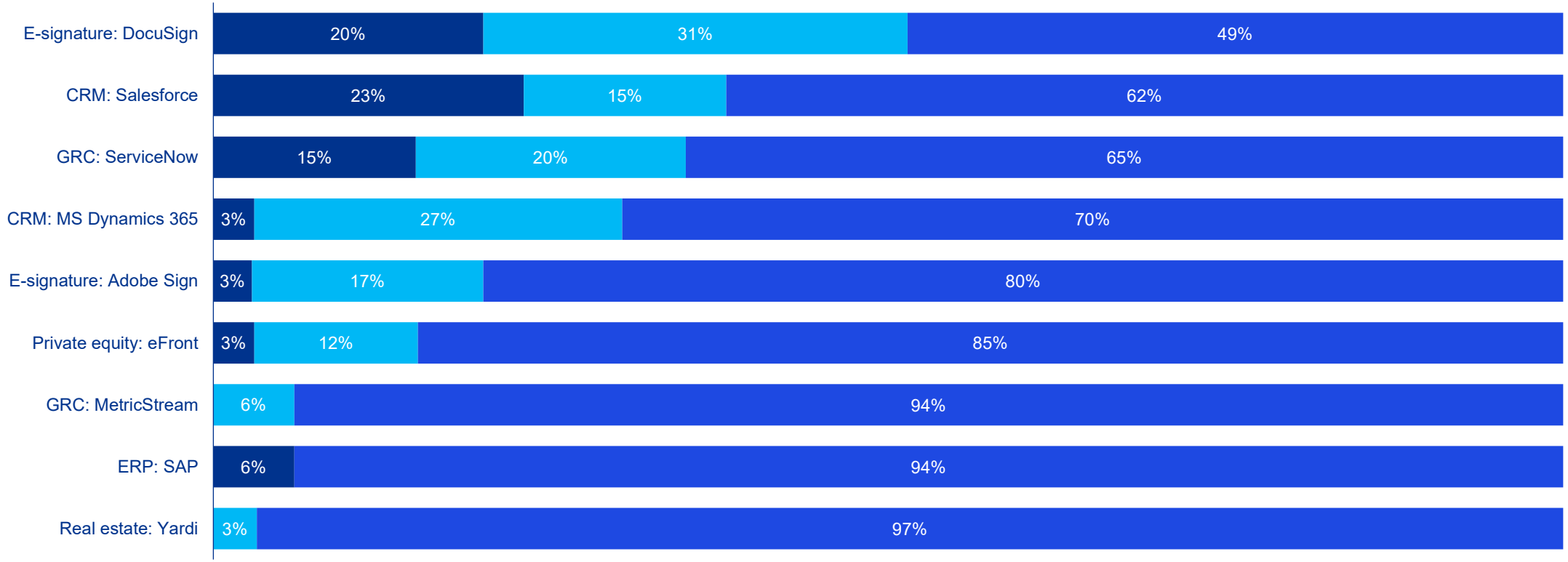
Among the following popular SaaS use cases for support needs, which Cloud Computing service provider(s) does (or will) your institution partner with for its SaaS use case(s)?



Up to 38 of 50 respondents provided an answer

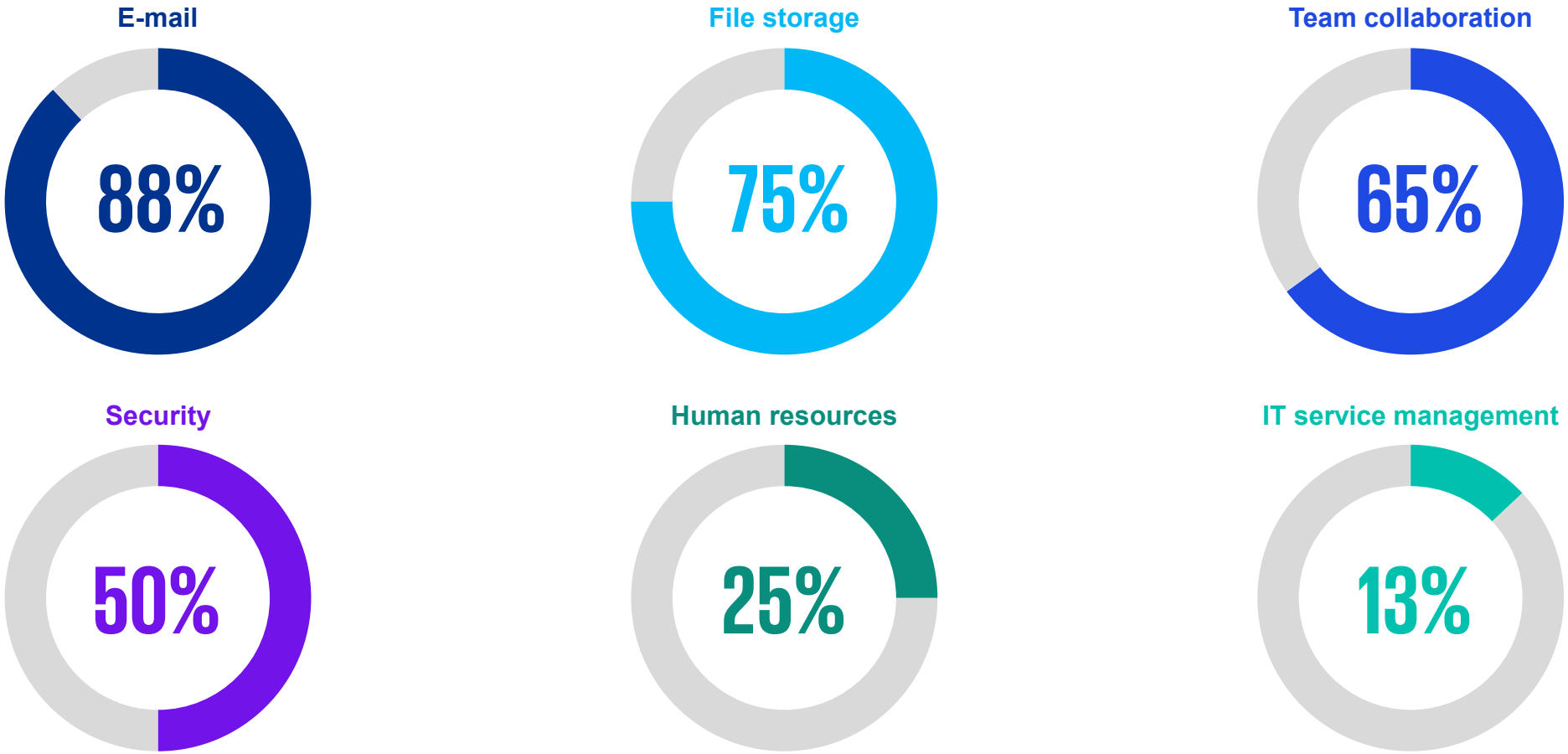
SaaS: Business use cases

Among the following popular SaaS use cases for business needs, which Cloud Computing service provider(s) does (or will) your institution partner with for its SaaS use case(s)?



Up to 37 of 50 respondents provided an answer

SaaS: Proportion of use cases assessed material / critical



Up to 23 of 50 respondents provided an answer; materiality / criticality rates percentages based on the respondents who had adopted the use case

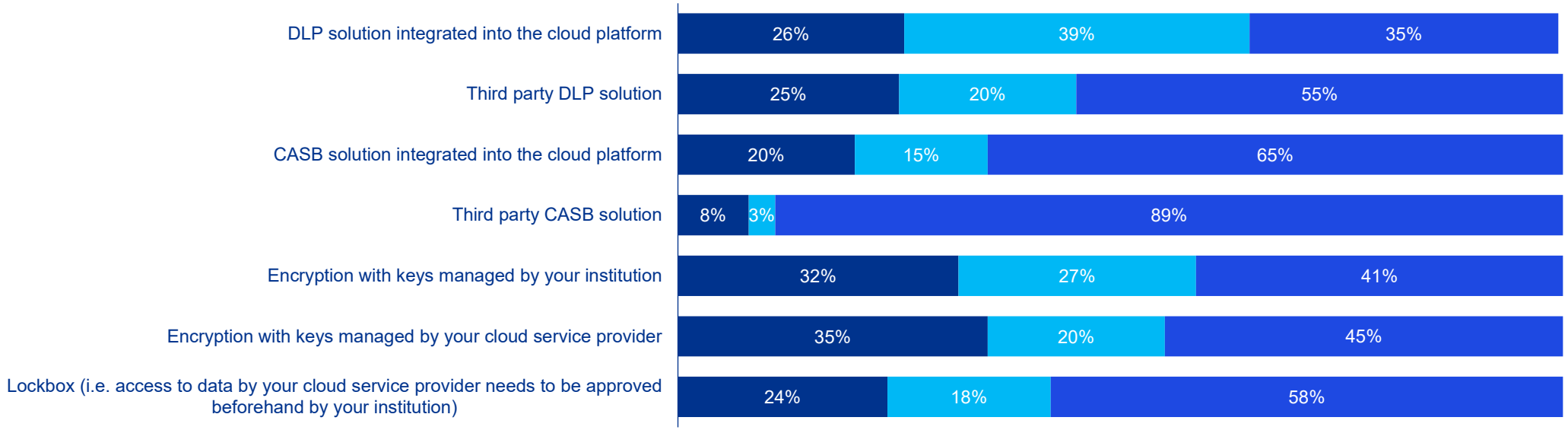
06

IT architecture & information security

Solutions to secure data in the cloud

Given that the obligation of professional secrecy and GDPR come as the main issues impairing adoption of the cloud, it is particularly interesting to see what approaches the respondents take to secure their data in cloud solutions with detailed insights on technical topics, such as identity providers, multi-factor authentication and backups.
We were surprised by the relatively higher adoption of cloud-based solutions vs. third party solutions to secure the data of financial institutions (e.g. Data Leakage Prevention and Cloud Access Security Brokers). Similarly, we see high levels of implementation of cloud-based mobile device management solutions, or plans to implement them, which is noticeable because such on-premise solutions were well established on the local market.

Have you implemented (or plan to implement) any of the following solutions to secure your data in your cloud solution(s)?

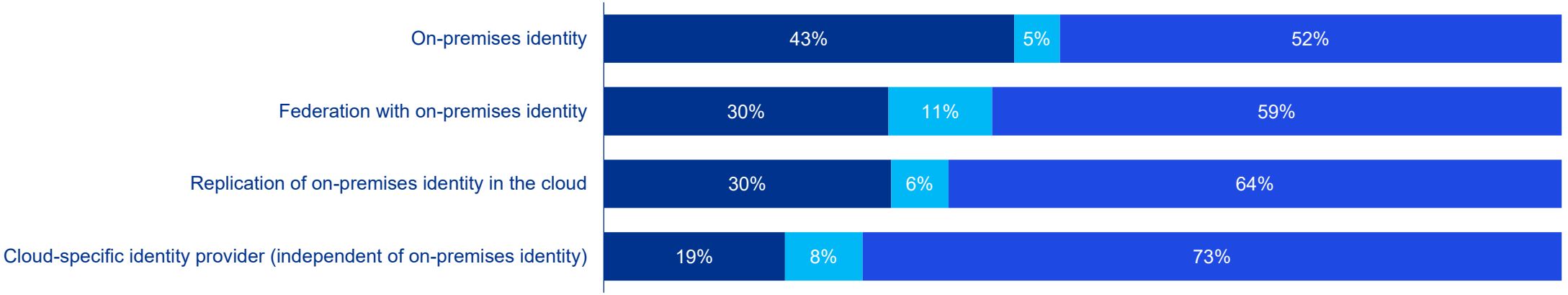


DLP: Data Loss Prevention | CASB: Cloud Access Security Broker |
Lockbox: access to data by the cloud service provider needs to be approved beforehand by the institution

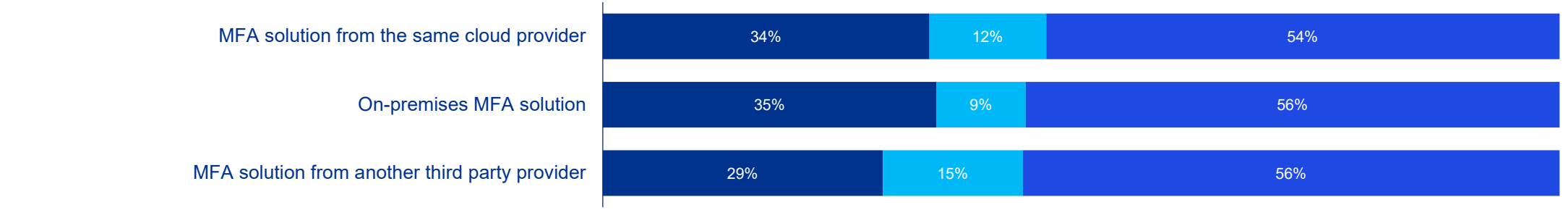
Up to 36 of 50 respondents provided an answer

Identity Providers & Multi-Factor Authentication

Have you implemented (or plan to implement) any of the following Identity Providers (IdP) to authenticate your users to your cloud solution(s)?



Have you implemented (or plan to implement) any of the following Multi-Factor Authentication (MFA) solutions to authenticate your users to your cloud solution(s)?

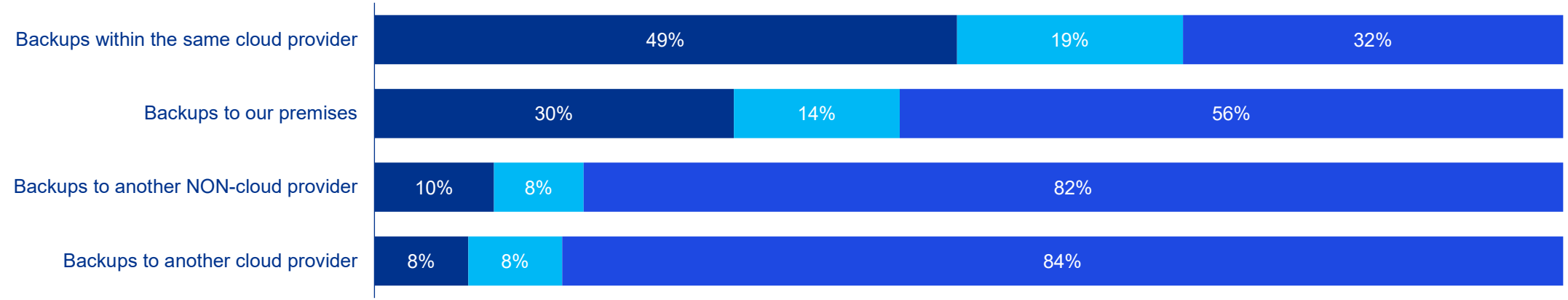


Have implemented Plan to implement Do not plan to implement

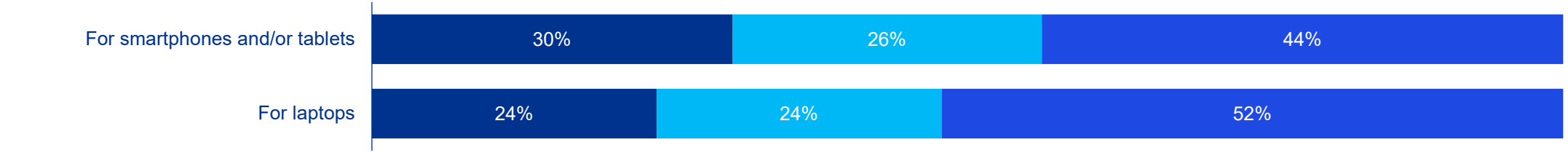
Up to 38 of 50 respondents provided an answer

Backups & Mobile Device Management

Have you implemented (or plan to implement) backups for your cloud solution(s)?



Have you implemented (or plan to implement) a Cloud-based Mobile Device Management (MDM) solution?

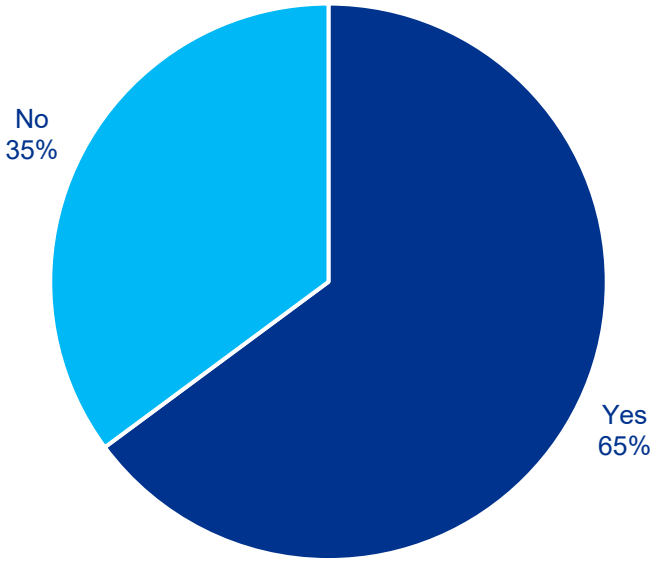


Have implemented Plan to implement Do not plan to implement

Up to 38 of 50 respondents provided an answer

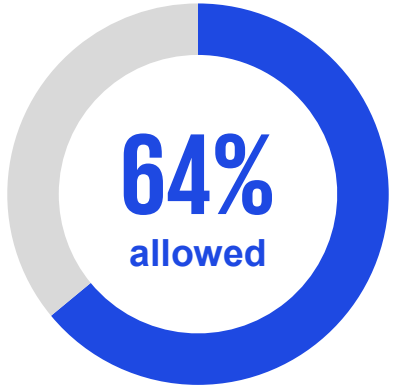
Document storage in cloud-based collaboration solutions

Do you allow documents to be stored in a cloud-based collaboration solution?



Non-confidential documents

Confidential documents



Respondents seem to be less reluctant to store confidential information in cloud-based collaboration solutions. 41% of respondents who store documents in a cloud-based solution also store confidential information.

07

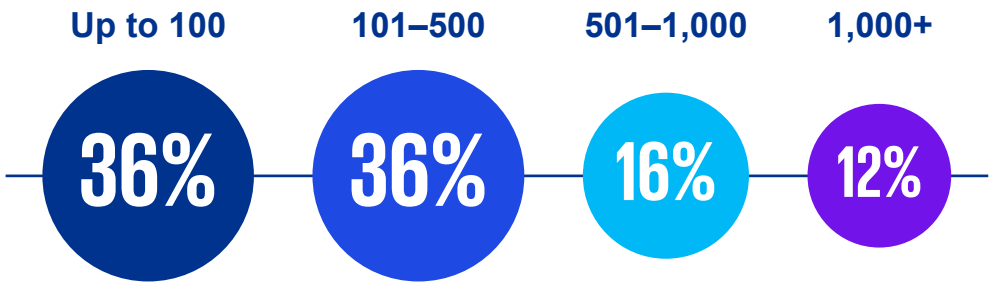
Respondents' demographics

Respondents & their demographics

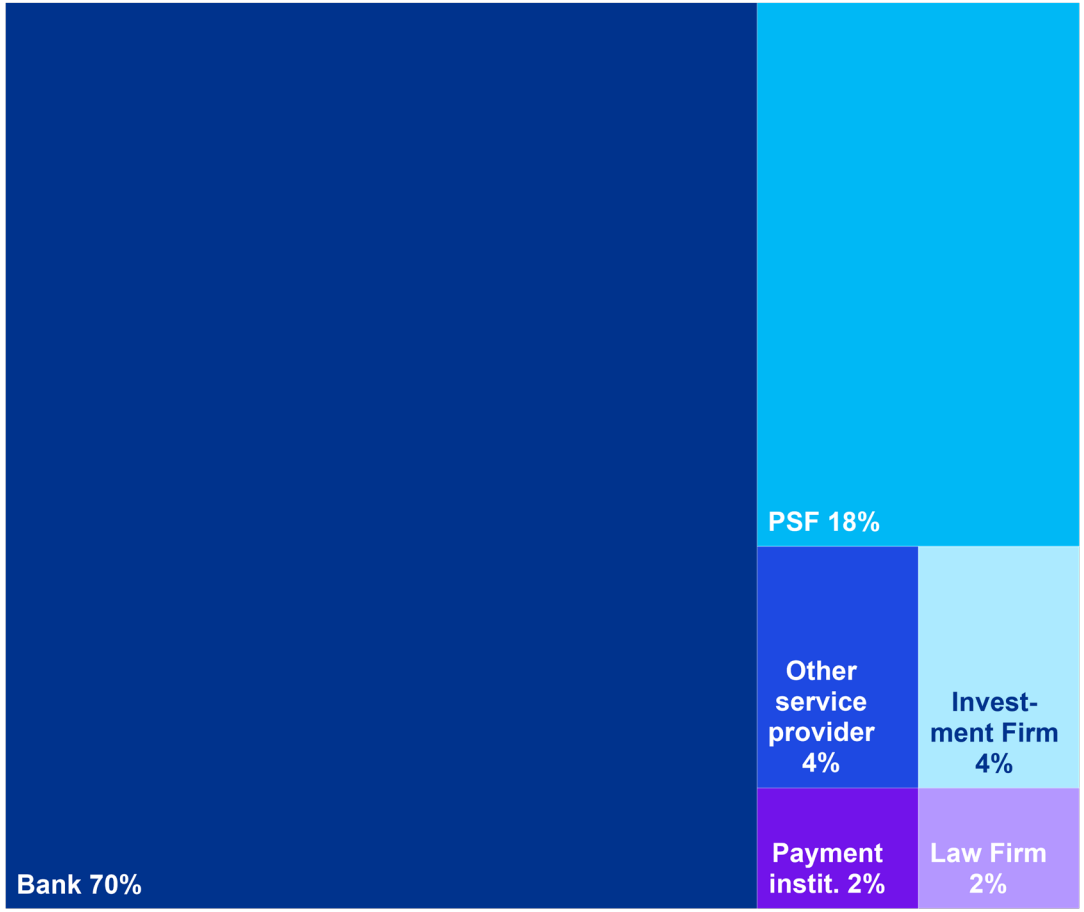
50 respondents

… of which 26% are headquartered in Luxembourg

Size of respondents' organizations (approx. number of FTEs working in Luxembourg)



ABBL's member categories to which respondents belong



Acknowledgements

Again, we would like to extend a warm thank you to all the participating institutions for their contribution and openness, and we hope that the information provided in this report will provide you with useful insights.

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