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NoEQUAL

# DIGITAL TRANSFORMATION: CAN ARCHITECTS MEET THE DEMANDS OF THE DIGITAL AGE?



2019 Report

# Table of Contents

Executive Summary .....	3
Part 1: Architects feeling the pressure .....	4
Part 2: Scaling back ambitions because of the data challenge .....	5
Part 3: Abandoning your legacy.....	7
Part 4: The move to the cloud.....	10
Part 5: Looking to the future.....	11
Conclusion .....	13





# DIGITAL TRANSFORMATION: CAN ARCHITECTS MEET THE DEMANDS OF THE DIGITAL AGE?

Couchbase research investigates whether digital architects have the tools and support they need to make the most of transformative technologies

## Executive Summary

There are signs we are at an inflection point where enterprises are starting to see digital transformation reach its full potential. Couchbase's September 2019 report "Digital transformation: are we finally past the unmet expectations?" showed that 73 percent of enterprises had made "significant" or better improvements to their end-user experience through digital innovation.

As organizations move their focus from planning digital transformation projects to implementing them, more and more pressure is being placed on digital architects. Responsible for building the IT infrastructures that can both meet the demands of the business and let development teams do their jobs, architects are the engine room of digital transformation.

Couchbase wanted to dig deeper into understanding architects' progress in turning their organizations' transformational dreams into reality. To do this, Couchbase commissioned a series of questions as part of its third annual survey of IT decision makers.

Architects are certainly feeling the pressure of digital transformation – 41 percent say they are under high or extremely high pressure, and 68 percent say that getting the right technologies in place for digital transformation can seem an insurmountable task.

Despite this pressure, architects are still having to scale back their ambitions. It is well understood that legacy systems and infrastructure can hold back change – and legacy databases are still one of the largest constraints. For instance, 80 percent of enterprises have had to scale back their ambitions for IoT or mobile applications, which should be at the heart of many digital transformation projects. At the same time, legacy databases are so tied into the fabric of many enterprises that moving away from them is difficult, and progress is slow.

Another challenge is the changing nature of infrastructure. Most organizations are moving towards a multi-cloud approach, using a variety of methods to deploy their database infrastructure – from private cloud to Database-as-a-Service. Regardless of the actions they take, enterprises are aware of the need to adopt new technologies with potentially ground-breaking potential. Ensuring digital architects have the technology and confidence they need to implement digital transformation projects will be key to success.



Enterprise investment in digital transformation is increasing – the average spend has risen from \$24 million in 2017-2018, to \$27 million in 2018-2019, and is expected to reach \$30 million in the next 12 months.

Part 1: Architects feeling the pressure

There are clear signs that digital transformation is maturing. Enterprise investment in digital transformation is increasing – the average spend has risen from \$24 million in 2017-2018, to \$27 million in 2018-2019, and is expected to reach \$30 million in the next 12 months. At the same time, enterprises are focusing on the practical delivery of transformation projects. 78 percent of enterprise architects say that they are no longer in digital transformation planning mode, but are trying to work out how to deliver digital projects (figure 1). This is the phase of digital transformation where more pressure comes onto architects – with the strategic goals determined, the priority is to ensure that developer teams have the support and technology they need to turn the business’s ambitions into reality.

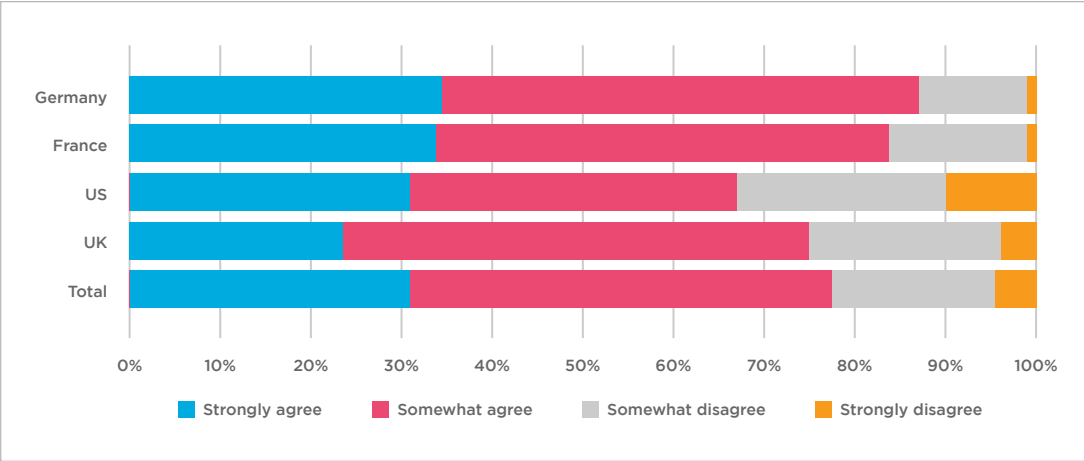


Figure 1: Do respondents agree that they are no longer in digital transformation planning mode, but are trying to work out how to deliver the company’s digital projects?

It is clear that architects are feeling this pressure. Currently 41 percent of architects say they are under “high” or “extremely high” pressure, while a further 44 percent say the pressure they’re under is “manageable” (figure 2). For many, there is still the risk that this pressure will continue to grow – 40 percent experienced an increasing amount of pressure over the last year, and 28 percent expect pressure to increase over the next year (figure 3).

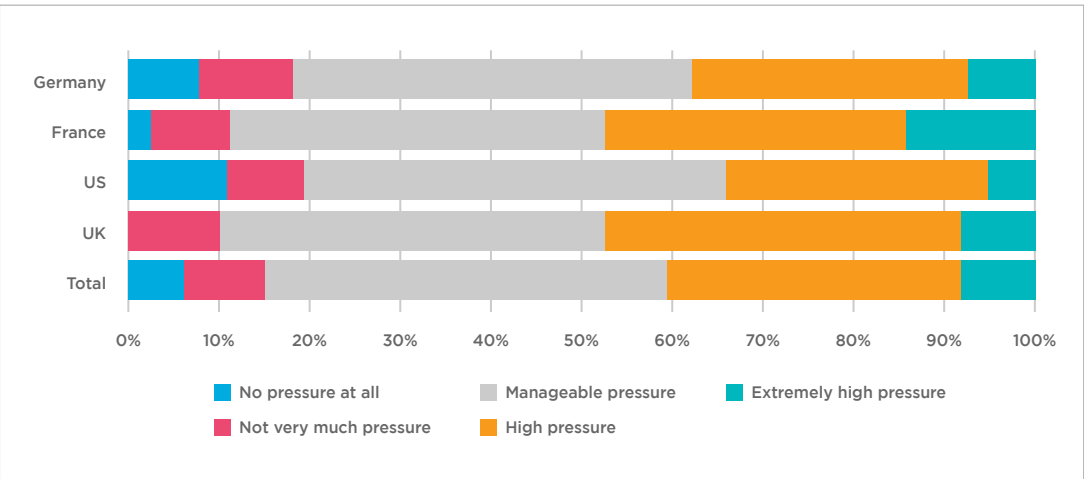


Figure 2: How much pressure are respondents currently under to deliver digital projects?



Connected devices are a core component of many digital transformation strategies: from tracking performance on a manufacturing line, to giving consumers a seamless experience on their smartphones.

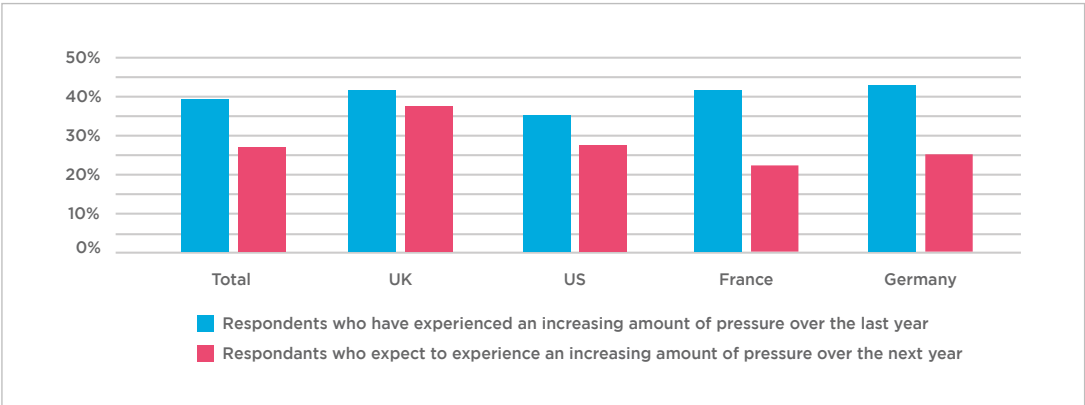


Figure 3: Respondents who have experienced or expect to experience an increasing amount of pressure

This pressure can, in turn, make the challenge facing architects seem overwhelming. More than two-thirds (68 percent) agree that getting the right technologies in place for digital transformation can seem an insurmountable task (figure 4). Regardless of an organization's specific digital transformation strategy and goals – whether a healthcare company giving physicians a better understanding of their patients; a fashion brand looking to streamline the process of creating samples and sharing with potential buyers; or a travel company aiming to create a bespoke, personalized experience for every single guest – all of its technology choices will ultimately depend on how well the business can use data. This is where architects need to focus their attention if they are to overcome the challenge of getting the right technologies in place.

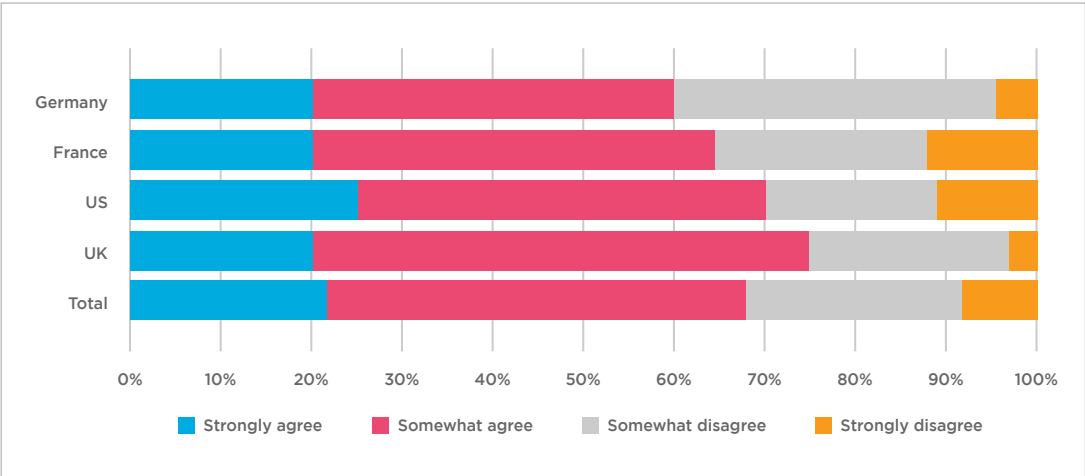


Figure 4: Do respondents agree that getting the right technologies in place for digital transformation can seem an insurmountable task?

Part 2: Scaling back ambitions because of the data challenge

Challenges using data are already affecting architects' efforts to meet their organizations' digital goals. For instance, connected devices are a core component of many digital transformation strategies: from tracking performance on a manufacturing line, to giving consumers a seamless experience on their smartphones. Yet 80 percent of architects have had to scale back ambitions for new IoT or mobile applications and services because of challenges with using data (figure 5). Unless they can understand the reasons behind this, and address them, transformation will continue to seem an overwhelming challenge.



One reason for these data challenges seems to be a reliance on legacy relational databases.

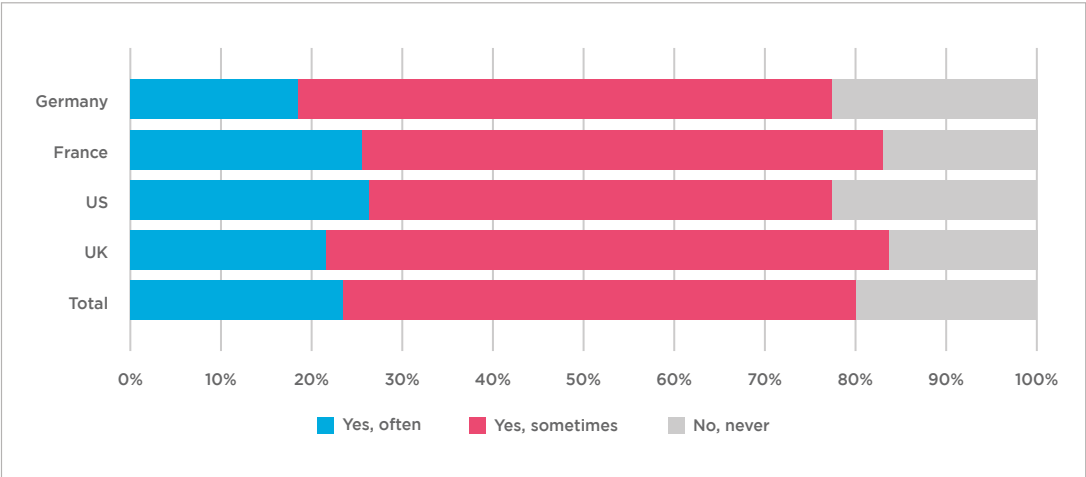


Figure 5: Do respondents have to scale back ambitions for new IoT or mobile applications and services because of challenges with using data?

One reason for these data challenges seems to be a reliance on legacy relational databases. While these perform excellently for their core functions, they were not designed with newer applications or the cloud in mind. These databases still have a significant presence in the enterprise – 90 percent of organizations rely on them, 38 percent “heavily,” and only 2 percent do not use any relational databases at all (figure 6). Yet, of the vast majority of enterprises that rely on relational databases to some extent, 72 percent say that this reliance limits their ability to implement digital transformation projects (figure 7).

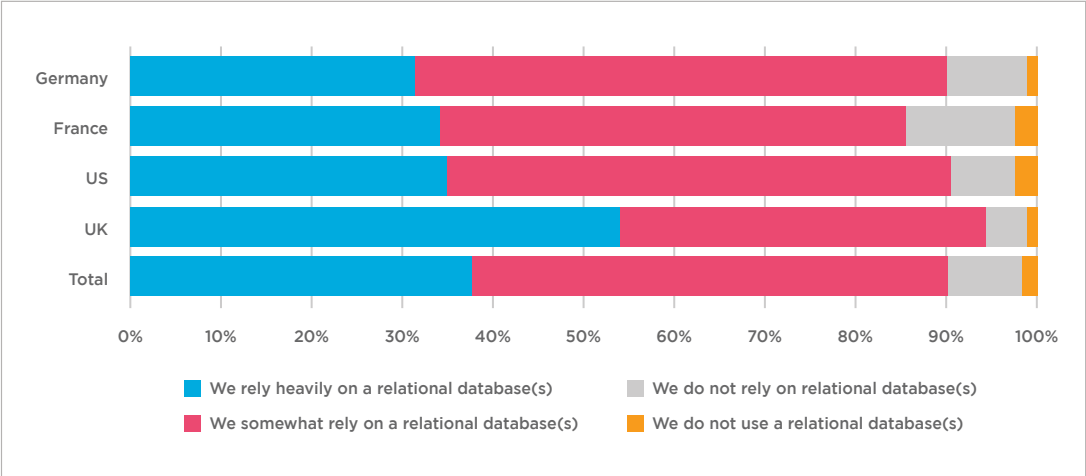


Figure 6: How much do organizations rely on traditional relational databases?



60 percent say that too much of the IT team's time spent working on digital transformation projects is wasted dealing with legacy technologies.

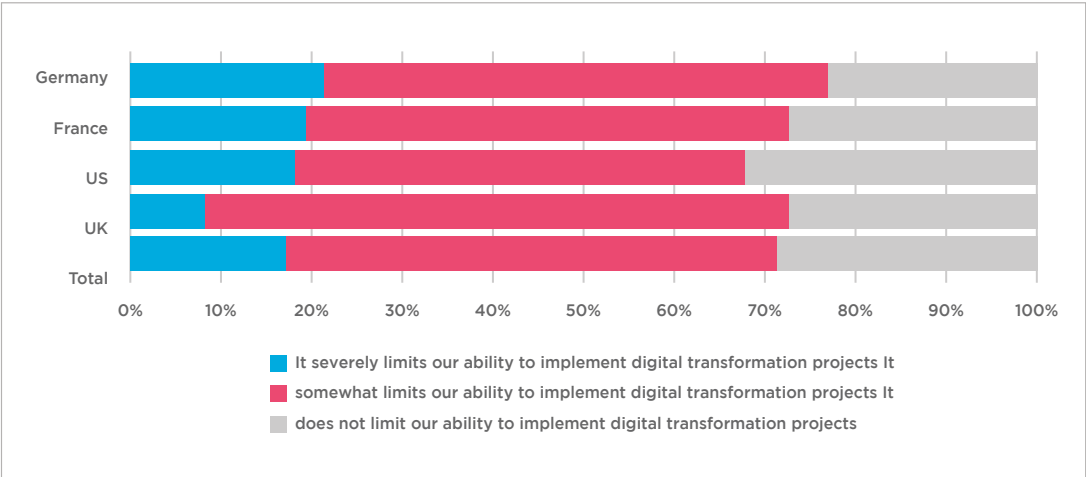


Figure 7: Does reliance on relational databases ever limit organizations' ability to implement digital transformation projects?

It is clear that enterprises that want to make the most of the opportunities digital transformation presents will need to adopt newer databases that can better support modern technologies and applications. For instance, NoSQL databases are now an established mainstream market in themselves: with feature parity between NoSQL and legacy databases, and offerings differentiating themselves in terms of enterprise-level capabilities, including security, data governance, availability, scale, and performance.

Part 3: Abandoning your legacy

Indeed, enterprises are already beginning to move away from legacy databases. 79 percent of organizations are actively planning to reduce their reliance on relational databases, and 56 percent plan to do so in the next 12 months (figure 8). However, while progress is being made, it is not smooth; 74 percent of architects say their organization is moving to newer databases more slowly than they should because they rely heavily on legacy databases for critical applications (figure 9). This in turn is affecting productivity – 60 percent say that too much of the IT team's time spent working on digital transformation projects is wasted dealing with legacy technologies (figure 10).

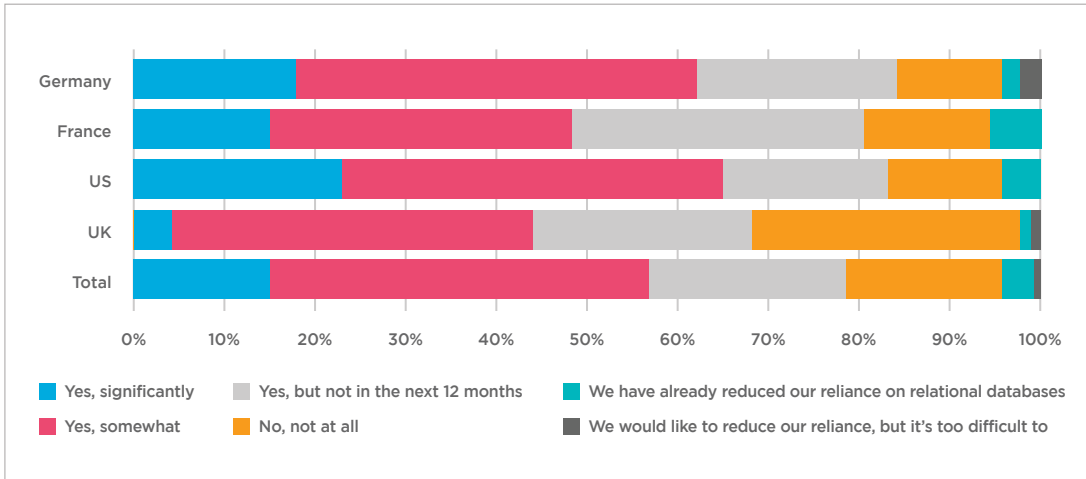


Figure 8: Are organizations actively planning to reduce their reliance on relational databases in the next 12 months?





The key will not be convincing them of modern databases' capabilities, but rather making it as simple as possible to combine relational and NoSQL databases in enterprise architecture, and to transfer skills from one technology to the other.

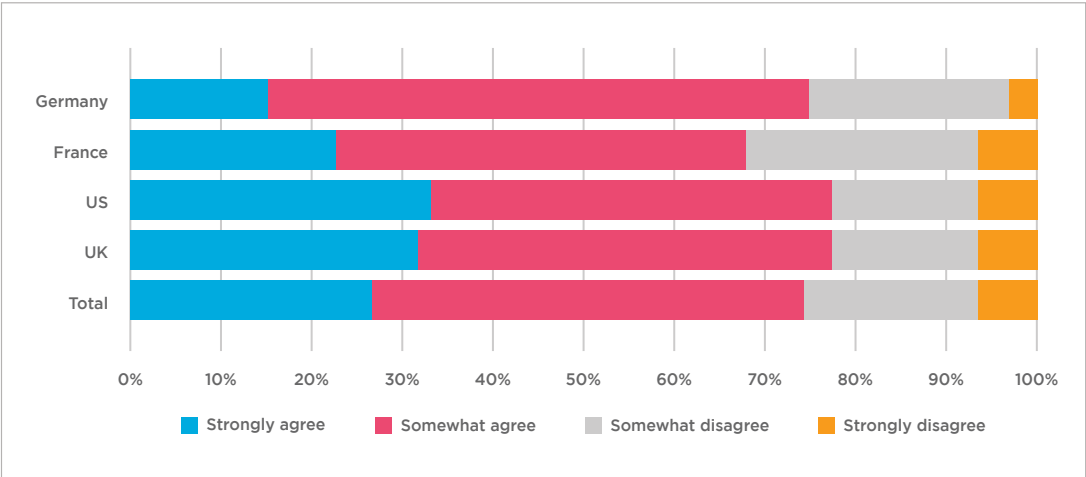


Figure 9: Do respondents agree that their organizations are adopting or moving to newer databases more slowly than they should because they rely heavily on legacy databases for critical applications?

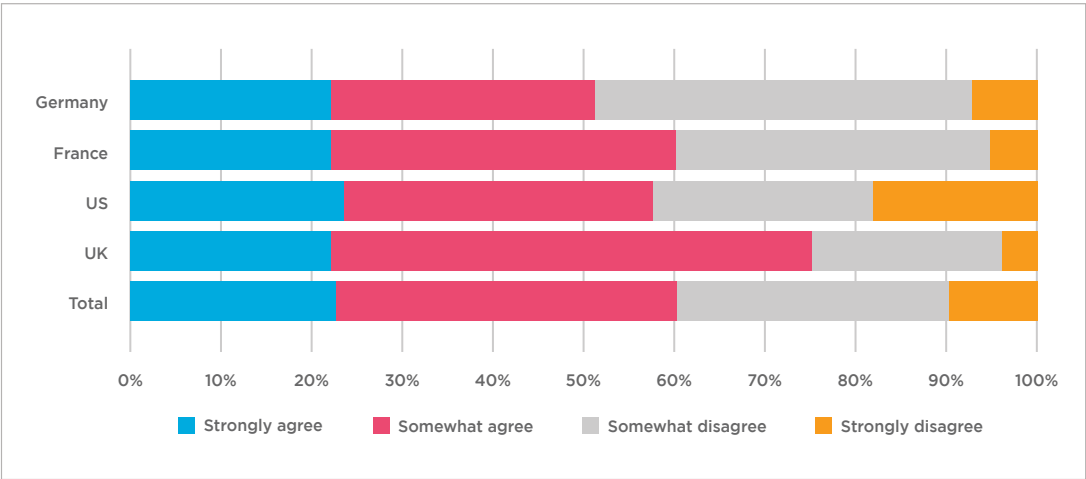


Figure 10: Do respondents agree that too much of their IT teams' time working on digital transformation projects is wasted on dealing with their legacy technologies?

Given these challenges, why are organizations still using traditional relational databases instead of newer databases such as NoSQL? 39 percent of relational database users say it's because they have built other architecture around it. 30 percent have invested in the necessary skills and don't want to have to re-train or upskill their staff, and 29 percent say it would be too complex to rip and replace. Only 15 percent say it's because they don't trust newer databases with business-critical data or applications (figure 11). In order for these organizations to modernize their database infrastructure, the key will not be convincing them of modern databases' capabilities, but rather making it as simple as possible to combine relational and NoSQL databases in enterprise architecture, and to transfer skills from one technology to the other.





63 percent of architects feel that their organization is using more databases than it should be – and 20 percent say it’s hard to cope.

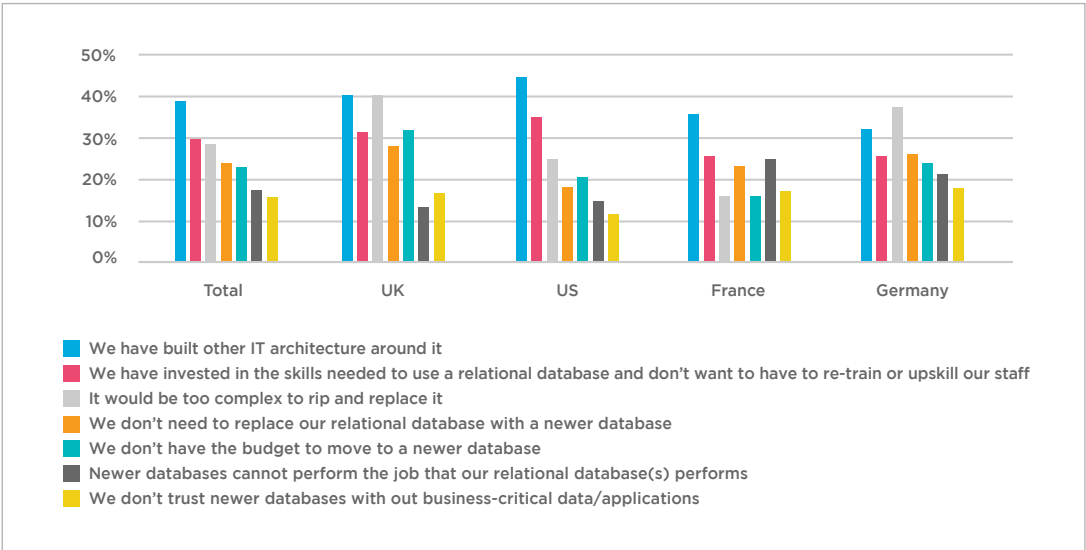


Figure 11: Why do organizations still use traditional relational databases instead of newer databases such as NoSQL?

Organizations are likely to gradually retire their older databases in favor of more modern alternatives over time. As well as modernizing their database architecture, this will be necessary in order to reduce database sprawl – and with it, technology and management costs. 63 percent of architects feel that their organization is using more databases than it should be – and 20 percent say it’s hard to cope. A further 28 percent would like to consolidate more (figure 12).

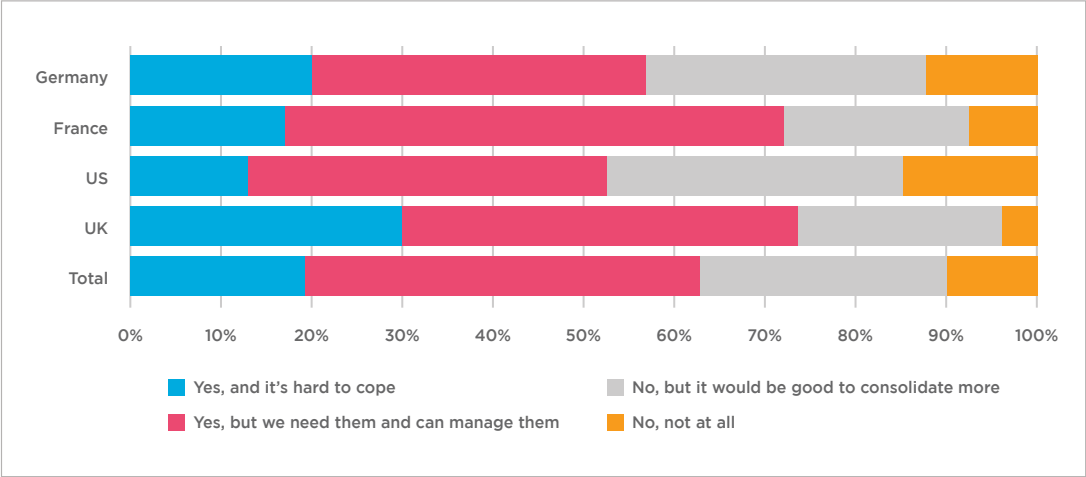


Figure 12: Are organizations using more databases than they should be?



Enterprises that want to make full use of database technology will want to choose databases that will support a number of different deployment models.

Part 4: The move to the cloud

The evolution of databases is not only taking place in the move from relational to NoSQL. There is growing flexibility in how databases are deployed, with the majority of organizations using a mix of deployment methods to support their infrastructure. The most commonly supported deployment model for database infrastructure is private cloud (used by 50 percent of respondents). The next most-used is a fully flexible hybrid cloud (used by 45 percent), followed by on-premises (39 percent) and public cloud (34 percent). 31 percent of enterprises use a Database-as-a-Service deployment model (figure 13). In this environment, enterprises that want to make full use of database technology will want to choose databases that will support a number of different deployment models. This in turn will make it easier to fit any new database into an existing architecture, instead of having to accommodate technology that has to be deployed in a specific manner.

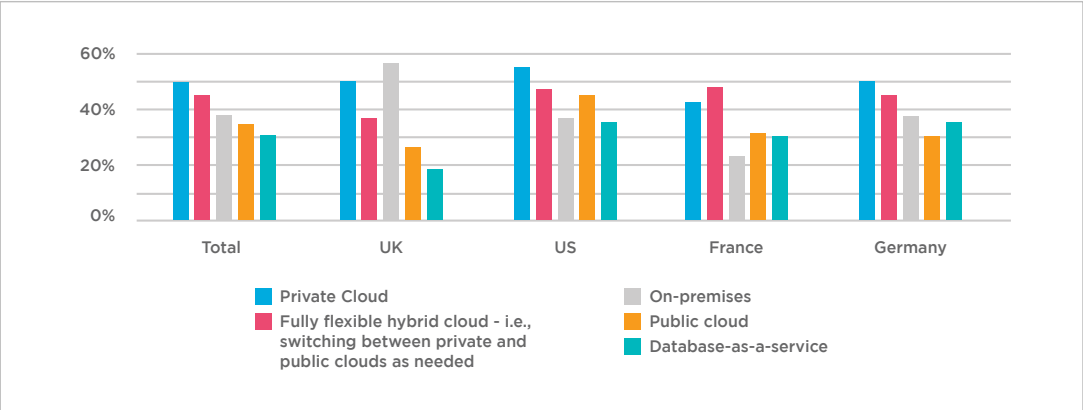


Figure 13: Which deployment models do organizations support in their database infrastructure?

Enterprises are not marching blindly into adopting the cloud – many still have concerns. The single largest issue by far is data security, raised by almost half (47 percent) of architects (figure 14). Other concerns are much less pressing, including the ability to meet future needs (15 percent) and keeping costs under control in the future (13 percent). Against this backdrop, it is perhaps unsurprising that security capabilities are on many architect’s minds. Of the technology capabilities that architects believe are, or will become, essential to their organization’s use of data in the next 12 months, the most important is encryption of data on every platform (chosen by 42 percent of respondents) (figure 15).

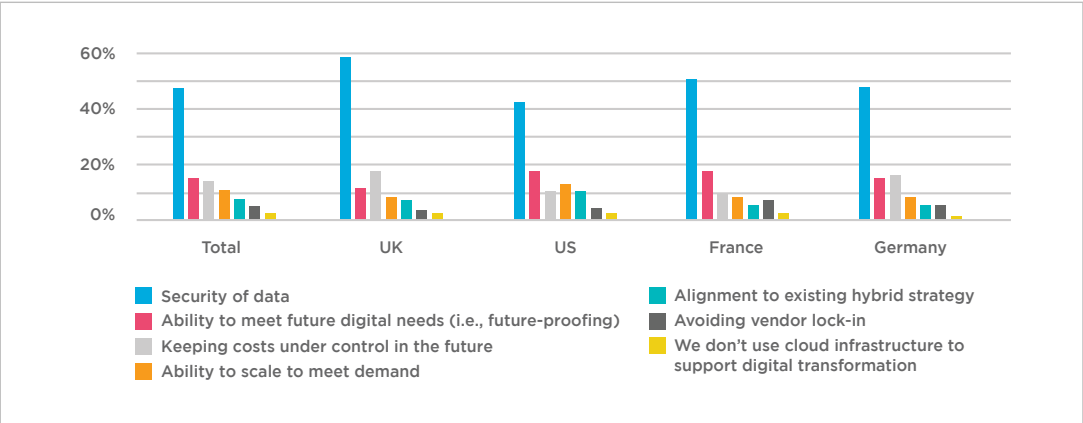


Figure 14: Respondents' biggest concerns when assessing new cloud infrastructure to support digital transformation



As databases move to the cloud and need to support IT environments that stretch from a multicloud infrastructure to the very edge of the network, being able to support portability of data in particular will be a critical capability for databases.

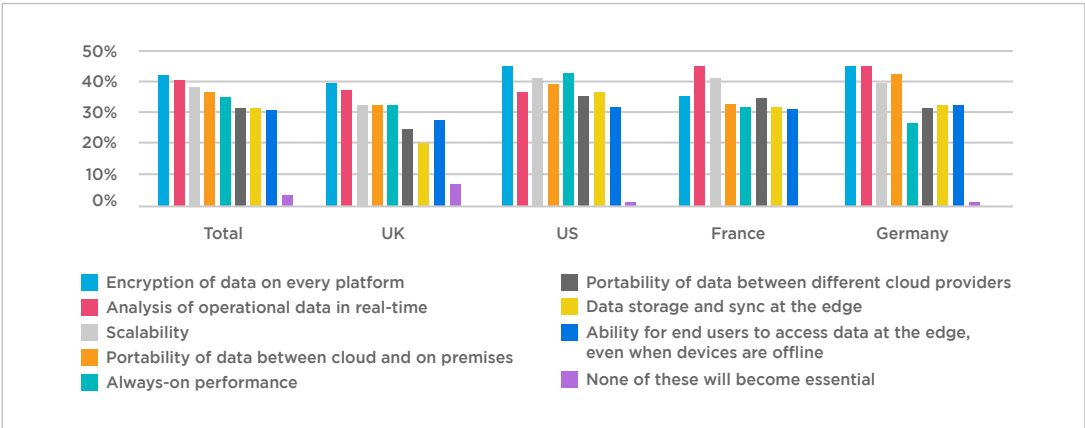


Figure 15: Capabilities that are, or will become, essential to organizations' use of data in the next 12 months

Other key priorities identified included analysis of operational data in real-time (40 percent), scalability (39 percent), portability of data between cloud and on-premises (37 percent) and always-on performance (34 percent). As databases move to the cloud and need to support IT environments that stretch from a multicloud infrastructure to the very edge of the network, being able to support portability of data in particular will be a critical capability for databases.

Part 5: Looking to the future

Whether using relational or NoSQL databases, on whichever deployment method they choose, architects are still clear that their main goal is to support their organizations' digital transformation efforts and to take advantage of new technologies. Currently there is no single technology that architects unanimously believe will have the greatest impact on their future digital transformation efforts. The most popular is Artificial Intelligence (AI) (ranked by 39 percent of respondents as the technology that will have the greatest impact), but cloud computing (35 percent) and big data analytics (32 percent) are close behind (figure 16).

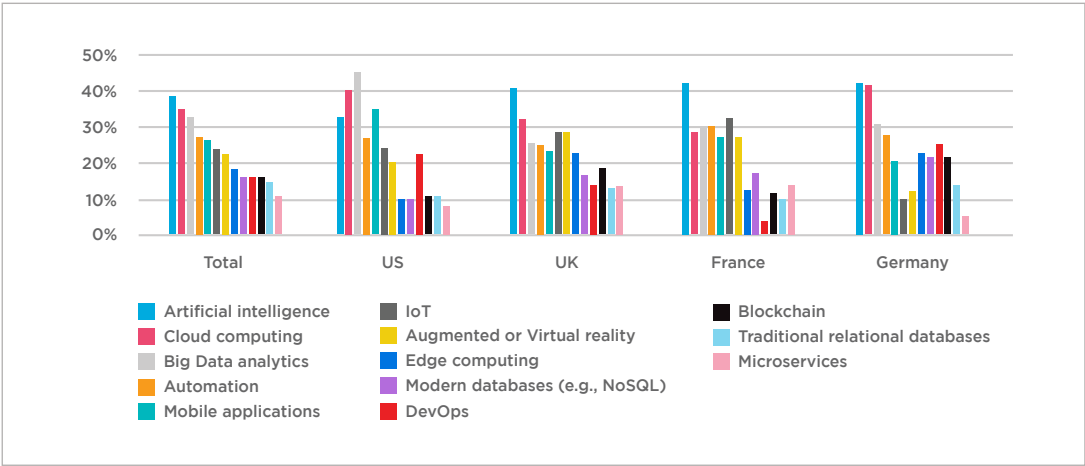


Figure 16: Which technologies do respondents rank as having the most potential to have the most revolutionary impact on their organization's digital transformation efforts in the future?



Enterprises are already forging ahead with their adoption of technologies that will demand a move away from legacy database technology.

Enterprises are already forging ahead with their adoption of technologies that will demand a move away from legacy database technology. Half (50 percent) of architects say they are either already using edge computing or will be doing so within a year. 52 percent say the same for AI, 42 percent for augmented or virtual reality, 51 percent for blockchain, and 80 percent for mobile applications (figure 17). These initiatives will all demand an underlying infrastructure that can support an increasingly agile approach to data – and in the case of mobile applications, the need is immediate. Enterprises that are committed to digital transformation need to ensure they have the right technology in place.

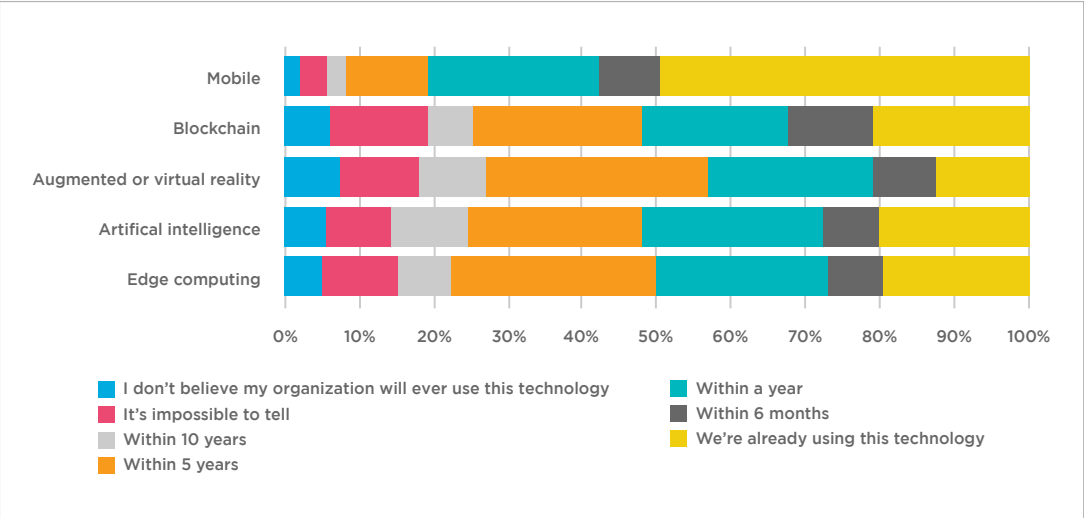


Figure 17: Expected timescale for using technologies

In terms of spending on new technology, architects' focus seems split between transformative technologies and the infrastructure that can support them. 42 percent think cloud computing will have the most money spent on it in the next five years, and 38 percent AI. Other technologies – including big data analytics (30 percent) and mobile applications (29 percent) – are some way behind (figure 18).

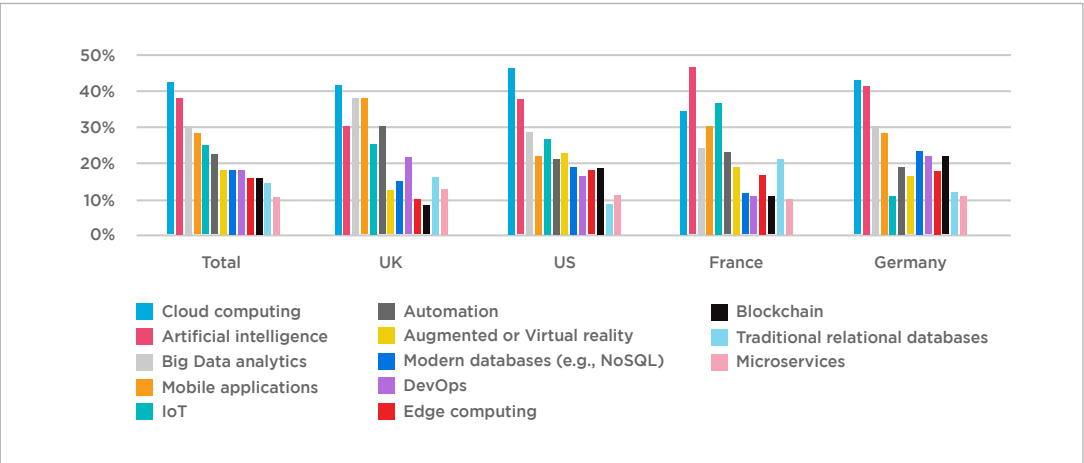


Figure 18: Which technologies to respondents believe their organizations will spend the most money on in the next five years?



## Methodology

The report is based on an online survey conducted in summer 2019 by Vanson Bourne, an independent market research organization. The survey included 450 heads of digital transformation, such as CIOs, CDOs, and CTOs, in organizations with 1,000 employees or more in the U.S., U.K., France, and Germany - 150 respondents in the U.S., and 100 each in the U.K., France and Germany.

## Conclusion:

There is no doubt that digital architects are under pressure. While the investment, and expectations, put into digital transformation increase, architects are still struggling with legacy technology - in particular relational databases - that is holding back digital projects from meeting their true potential.

However, there are clear signs that this status quo is changing. While enterprises are reluctant to move from legacy databases too quickly for several reasons, they are still becoming less reliant on them. At the same time, the cloud has opened up a wealth of new deployment models for databases that enterprises are taking advantage of.

Against this background, and with enterprises keen to explore the potential of technologies such as AI, big data analytics and mobile applications, we are likely to see the trend for widespread adoption of NoSQL databases continue, and accelerate, in the coming years. However, as with any other technology, this does not mean that enterprises should rush into any purchase. Instead they need to be certain that their new database can be deployed in a manner that suits them; and will allow a clean transition from their legacy technology. The transition from legacy databases to NoSQL is far more likely to be successful if enterprises can continue to take advantage of the SQL skills their IT teams have been building up for years. In this way, architects can focus on meeting their employers' digital transformation ambitions, instead of having to strike the right balance in their database infrastructure.

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## About Couchbase

Unlike other NoSQL databases, Couchbase provides an enterprise-class, multicloud to edge database that offers the robust capabilities required for business-critical applications on a highly scalable and available platform. Couchbase is built on open standards, combining the best of NoSQL with the power and familiarity of SQL, to simplify the transition from mainframe and relational databases.

Couchbase has become pervasive in our everyday lives; our customers include industry leaders Amadeus, American Express, Carrefour, Cisco, Comcast/Sky, Disney, eBay, LinkedIn, Marriott, Tesco, Tommy Hilfiger, United, Verizon, as well as hundreds of other household names. For more information, visit [www.couchbase.com](http://www.couchbase.com).

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