PAYMENTS MODERNIZATION

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Cloud environments and the need to rationalize

Part 5:
Cloud environments

86%

of bankers have adopted
cloud services

In the previous chapter, we covered ISO 20022, a common set of global standards that's taking its place at the heart of the payment system modernization journey.

ISO 20022 can be thought of as the language of modernized payments: It's how banks and payment systems communicate, and it means that software and services can now be more easily standardized across multiple markets.

In this chapter, the focus shifts to cloud technology, which can support ISO 20022 migration and payments modernization at a wider level, thanks to its potential to democratize and simplify payment operations.

The new frontier of technology

Moore's Law, a prediction made by American engineer Gordon Moore in 1965, argues that computer processing power doubles every two years. This has been a guiding principle for many working in the IT industry, particularly since the mid-1970s. While this law may need revising as physical limitations start to impact the size of transistors, we can't deny its historic impact.

With this exponential growth, over a sustained period of time the accumulated impact of what's possible becomes increasingly transformative. It means that what is now possible today would have been unthinkable just ten years ago.

This leads us to the growing power of cloud computing, which is revolutionizing delivery of infrastructure across many industries, including the payments industry. Research by GFT Financial has highlighted that **86% of bankers have now adopted cloud services** to some degree to harness the cloud's virtually unlimited scalability. Rapid access to consistent, compliant infrastructure coupled with cloud-native developer tooling has the potential to drive faster time to market for products and services. In this new technology landscape, barriers to change, such as costs and complexity, are being broken down in favour of efficient, open and scalable platforms available to all.

"A number of innovative companies are managing banks' payments operations externally in the cloud."

While the cloud has been around for years, the latest enhancements to computer processing power and internet bandwidth have made it possible to deploy the cloud securely for increasingly complex and critical payment application workloads. The scale at which the likes of Microsoft Azure, Amazon Web Services, Google Cloud and Alibaba Group now operate means cloud has become a genuinely viable and cost-effective option for some aspects of payments processing in production environments. As these changes percolate through the payment ecosystem, the use of cloud technology for critical national infrastructure is also starting to come into focus.

Traditionally, payment providers across the value chain have implemented technology in house, but these behaviors are changing, with a number of banks outsourcing their payments operations and other core banking services to innovative companies, and moving from 'on soil' to in the cloud.

While security, privacy and control will always be paramount within the payments industry, these are continuously being improved through focused collaboration with the financial institutions and fintechs using cloud technology.

Furthermore, the central banks and regulators that oversee the world's national payment systems are now examining the most appropriate way to manage the concentration and resilience aspects involved in the use of the cloud, while also realising the potential of such a flexible technology to drive open, inclusive and innovative payments transformation. The ability to demonstrate increased resilience and address central bank concerns with managing outsourcing risk and concentration risk will be critical to enabling the wider adoption of cloud in critical payment applications.

One notable example of a financial institution making comprehensive use of this technology is Capital One, which in 2020 announced it was 'all in on the cloud', migrating away from eight of their typical physical data centres. Goldman Sachs, Apple and Citi have followed this lead and are all now embracing cloud.
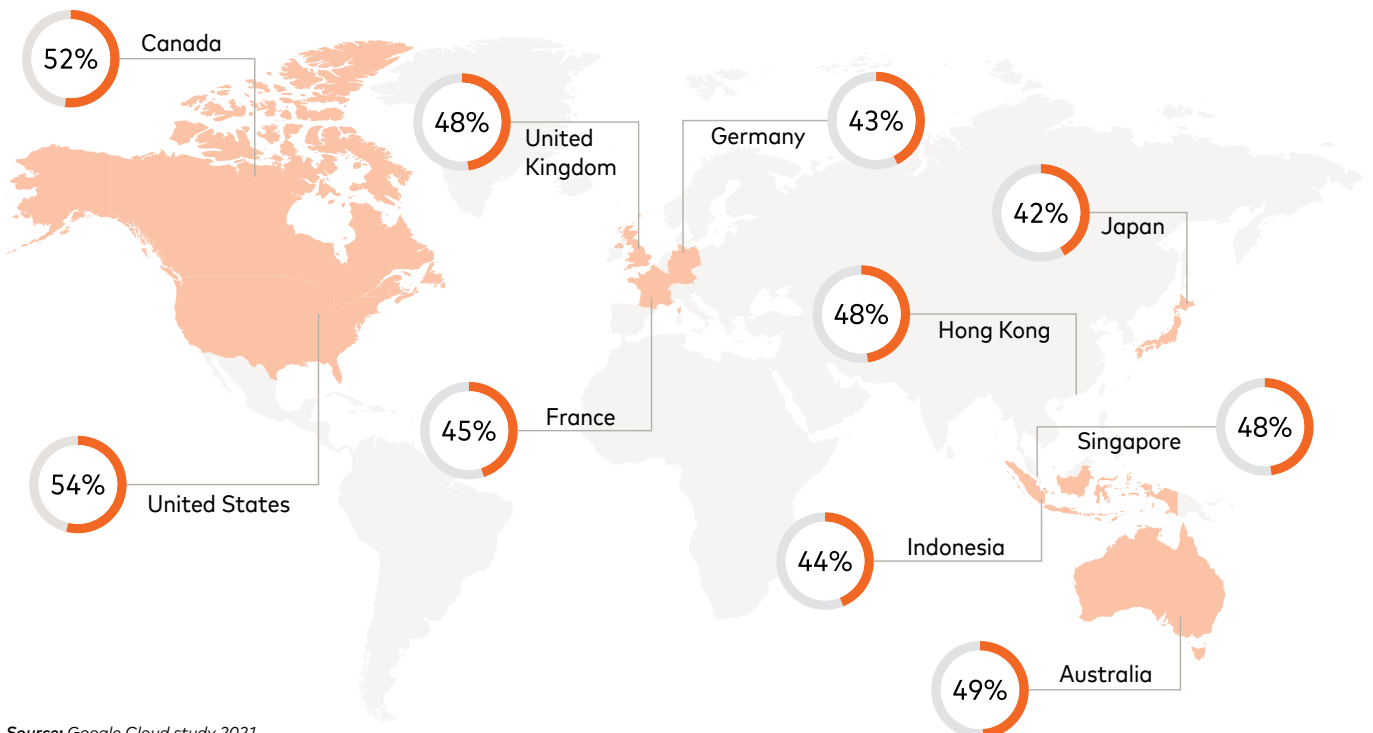
Mastercard is helping to lead the industry into a more digital world by harnessing innovation and the continued application of new technologies. During the pandemic, the world saw a prolific increase in contactless transactions, enabled in part by a cloud deployment of Tap on Phone to unlock payment acceptance opportunities via a mobile phone.

The popularity of cloud services is not only driven by the process of shifting costs from a capital expenditure model to an operating expenditure one, paying only for what is consumed. Previously cost-prohibitive, new technologies such as artificial intelligence (AI), machine learning and deep data analytics are now more accessible and achievable, though a new challenge has arisen in the shape of having enough knowledgeable resources to support this endless creativity. To meet this growing demand, it's estimated that, globally, machine learning jobs will be **worth almost $31 billion by 2024**.

Share of workloads on the cloud – financial services and banking industry worldwide, 2021

Workload adoption on cloud

Percentage of workloads on the cloud for organization deploying a cloud strategy

52% Canada

48% United Kingdom

43% Germany

42% Japan

48% Hong Kong

45% France

48% Singapore

54% United States

44% Indonesia

49% Australia

Source: Google Cloud study 2021

"Edge computing opens the door to a raft of advanced services, such as hyper-personalization."

Pushing payments to the edge

As the possibilities grow, the cloud faces a newer problem. It is constantly connecting to new devices – from smartphones to tiny sensors – and offering them more and more services. This means more and more data and computing is being shuttled back and forth across the cloud's connections, and yet more is coming. There is simply too much happening to solely rely on a central node for the kinds of technology – such as AI and machine learning – that enables these innovations.

This is where edge computing comes in, where more data flow and computation happens at the edges of a network instead of just in the center. It's an extension of cloud services that will push the boundaries for new services and behaviors, and ultimately might come to be supported by real-time infrastructures as well.

Networks, by their very definition, have always had 'edges' that can be used to communicate with machines and users outside the network itself, but now more and more computing is being done there – for example when we tap our phones to make a purchase or catch a train.

There are two significant technological shifts behind this push to make more use of the network edge. The first is the shift from private to public (and hybrid) clouds. Public clouds are computing and storage for rent that enable financial institutions and other businesses to scale up their services without having to build their own data centers. The other shift is the move to 5G wireless data networks, which greatly speeds up the ability to move data to and from devices.

Edge computing opens the door to a raft of advanced services, such as hyper-personalization and 'smile to pay', the next generation of in-person payments that will only need a quick smile or wave of a hand. No more reaching for a phone or wallet when someone has their hands full – with Mastercard's new Biometric Checkout Program, all they will need is themselves. Other possibilities include AI-driven virtual advisors and additional fraud benefits, such as real-time geo location, digital footprint and expression analysis.

190+

countries have data privacy laws, with many modelled on GDPR

A shared journey towards rationalization

There are, of course, challenges that accompany these exciting opportunities. It is a shared journey for us all when assessing this new market environment, especially when it comes to modern payment system design.

One such challenge is the question of data and privacy, which is essential to the required trust and security needed to promote the use of any given payment system. This trust is built through demonstrable commitment to strong data principles – such as those **Mastercard has set out** – as well as adherence to a common standard.

Today, privacy regulations exist in over 190 countries where they have some form of data privacy laws, many of which are modelled on General Data Protection Regulation (GDPR) but reflect a national context. Some markets are also considering data localization laws, which make provisions to store and process data within a country's borders. This seeks to overcome some of the geopolitical concerns we see across the world today, though it will likely create complexity and as such raise costs, which in turn stifles potential innovation. Such laws restrict the ability to provide network-level services on a global scale, especially in areas such as fraud and cybercrime, where criminals actively exploit scheme, system and national borders.

So how does this intersect with cloud? In the standard payment infrastructure design, you may construct data centers across two separate sites as part of an active-active environment. Or now, as is becoming more common, three sites for full disaster recovery and business continuity purposes. Having three sites invariably adds cost and complexity: additional buildings, floor space, hardware and software, support resources… the list goes on.

Cloud deployment challenges the status quo by using regions and availability zones which aren't bound by specific borders. A region is a site location with multiple data centers, also known as availability zones, which command their own power, cooling and networking to ensure the required redundancy.

This design not only offers resilience, reliability and redundancy, but also the required availability and scalability. The growth of cloud has prospered thanks to the ability to provision services around the world, which has been implemented by organizations at the vanguard of this movement.

When we take cloud-enabled possibilities and wrap in the data and privacy requirements, there are promising initiatives for global commerce. One example is the Asia Pacific Economic Cooperation (APEC) Cross-Border Privacy Rules (CBPR) system, which has created a certification process for companies that comply with internationally recognized data privacy protection, allowing them to share data within a region. This regional scheme can be extended and ultimately become a global forum for data flows, open to any country in the world.

So why is adoption not yet at a much greater scale? To answer this, we must consider everything around the data and privacy concerns, which are understandably, and rightly, in the sights of central banks and regulators. Rapid advancements in cloud technology also play a part, as keeping up with this ferocious pace of change is a significant undertaking.

But the clear advantage of cloud-related technological advancements is they can increase the pace of payment system modernization as new capabilities can be brought to market quicker than ever before. These solutions are actively in-market and workable. They reduce complexity, they are scalable and they have the potential to reduce the costs of capital expenditure while implementing the necessary level of data and privacy provisions.

To this end, it's the responsibility of everyone within the payments landscape to co-operate and define a shared and consistent strategy to help address concerns and find a collaborative way forward together.

For the other chapters and further information on payments modernization, please visit **b2b.mastercard.com/paymentsmodernization**

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