

DIGITAL BANKS AND THE

POWER OF THE CLOUD

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MAY 2020 ■



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ACKNOWLEDGMENT

The Digital Banks And The Power Of The Cloud Tracker® was done in collaboration with Nuodb, and PYMNTS is grateful for the company's support and insight. **PYMNTS.com** retains full editorial control over the following findings, methodology and data analysis.

WHAT'S INSIDE

Financial institutions (FIs) worldwide are having to juggle an inflated volume of customer requests and traffic due to the new coronavirus while also making sure digital platforms run without hiccups. This means they cannot overload their networks as service outages would deny users access to their accounts while branch locations remain closed and stay-at-home bans keep consumers home. Providing this level of service is proving to be a strain for some banks, especially those still utilizing outdated legacy infrastructure to support their daily banking operations. This represents a high portion of the financial industry, with 92 of the world's top 100 banks still **relying** on physical mainframe systems.

Established banks have been dealing with the frictions outdated core banking systems cause for decades — the COVID-19 pandemic has simply **highlighted** the need for new innovation strategies. FIs are examining how cloud platforms from third-party cloud providers as well as artificial intelligence (AI) and machine learning (ML) could address some of these strains. These entities are not just competing in this innovation race against other legacy banks with the same systems and same set of problems, either. FIs in Europe, the United States and United Kingdom are all **competing** against a rising fleet of chal-

lenger banks that offer digital solutions designed to attract customers who are frustrated with online glitches or delays caused by overwhelmed servers.

Challengers such as Monzo and Revolut have **turned** to the cloud to support core banking services, and many FinTechs and digital- or mobile-only banks are following their lead. Legacy banks must examine how to best adopt or develop cloud solutions of their own to provide that same nimble customer support during a time when customers are going digital first and branch second.



AROUND THE CLOUD BANKING WORLD

Established FIs are giving this type of innovation a closer look as their level of competition increases. Seventy percent of legacy FIs are now in the **testing** or trial periods for cloud-native platforms. French FI BNP Paribas, for example, just **completed** a deal with technology giant IBM for the creation of a private cloud server. Private clouds provide more security for banks and similar institutions that protect sensitive data, such as healthcare or insurance agencies, because they can only be accessed with permission from the hosting entities. The 172-year-old bank is planning to use its

private cloud to support some of its digital banking solutions and may also use this cloud-based service to build out new products and enhance its digital banking offerings.

Another traditional financial services firm **turning** to the cloud for faster and more secure support is investment and asset management firm BlackRock. The company, which manages \$7.43 trillion in assets for its clients, will be migrating its “Aladdin” network to cloud computing service Microsoft Azure so it has more room to grow, according to company statements. Aladdin, or the Asset, Liability, Debt and Derivative Investment Network, is one of the main platforms BlackRock utilizes to help monitor and analyze risk while also providing insights and recommendations to clients. The main benefit of moving this network to the cloud is that it grants Aladdin more capacity to store data and allows BlackRock to build new solutions.

FinTech startup Bambu, meanwhile, is relying on the cloud to **power** its mission to serve unbanked and underbanked customers with its mobile banking products. The bank, which is offering FDIC-insured mobile banking services, such as prepaid accounts and international bill payments and remit-

tances, is focused on U.S. consumers who lack access to traditional financial products. Bambu believes the cloud will allow it to administer its own offerings to these customers with more flexibility.

For more on these stories and other cloud banking headlines, check out the Tracker's News and Trends section (p. 12).

WHY CLOUD COMPUTING IS CRITICAL TO BANKING INNOVATION

Today's businesses and consumers are expecting seamless services from their FIs, including swift and easy access to online tools. This means that banks need to run on networks that can support an increasingly high volume of digital transactions as well as the development of new tools that can help process all the data attached to these transactions. It also means banks must think about their customer relationships and their expectations in a different light now that banking has become more digital and interconnected. In this month's Feature Story (p. 8), Ali Niknam, CEO and founder of European digital bank **Bunq**, discusses the importance of cloud computing for the future of digital banking.

DEEP DIVE: EXAMINING THE LEGACY INFRASTRUCTURE STRUGGLE HAMPERING CLOUD INNOVATION

Many established banks have recently been drawn to cloud technologies, but they are facing problems when adopting them due to their legacy infrastructures. Forty-three percent of such banks still **rely** on an over 60-year-old programming language as part of their banking systems, which makes it difficult for them to support digital banking transactions and requests at the speeds and with the seamlessness that customers expect. These established banks must now also deal with a growing crop of digital-only challengers that offer enhanced financial products to consumers who may have grown frustrated with service outages caused by outdated systems. This month's Deep Dive (p. 19) analyzes why legacy systems represent a growing problem for established FIs and how they could follow challenger banks and reexamine their infrastructure innovation strategies to remain competitive in today's digital banking ecosystem.

EXECUTIVE INSIGHT

What are some of the common misconceptions concerning use of cloud-based infrastructure that may be holding incumbent banks back from implementing it at scale?

“In today’s global economy, cloud adoption by financial institutions is no longer a ‘wait and see.’ It is now a fundamental component of their architectural strategy. All banks recognize that their ability to access a global market of consumers is highly dependent on how they implement their cloud strategies.

Organizations must overcome some of the common misconceptions about the infrastructure layer. [These include]:

- **Perceived risk:** During the early stages of cloud computing, there were concerns that operating in the cloud created significant risk. [Cloud providers now have] more than a decade’s worth of experience and added security features built in [and have] invested billions in protecting their customers.
- **Organizational process overhaul:** This is both a perceived risk and, to some degree, an actual risk that just needs to be solved for. Migrating to the cloud is going to force [firms] to make changes to [the] processes and controls [they] have in place. It just takes time and dedication.
- **A new type of vendor lock-in:** For banks migrating away from legacy infrastructure, the fear of moving from one lock-in situation to another is significant. Choosing technology partners that can give you the flexibility to migrate from one to another with ease can help remove this concern, however.

None of these are trivial concerns, but for the [chief information officer], overcoming them with their teams can be a tremendous differentiating factor in the bank’s success.”

ARIFF KASSAM,
chief technology officer at **NuoDB**

FIVE FAST FACTS

92

Number of the top 100 global banks still utilizing mainframes

70%

Share of FIs that are still in the testing or trial phases for their cloud operations

46%

Portion of banks that view outdated infrastructure as their biggest obstacle to growth

\$20B

Projected amount the banking industry spent on public cloud services in 2019

\$411B

Estimated amount that spending on cloud native technologies will reach by 2022

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WHY BUNQ BANKS

ON THE CLOUD FOR AN

INNOVATIVE

EDGE

Customer satisfaction is critical in any industry, and that typically means providing convenient access to digital tools. Losing customers can be as easy as experiencing one too many online glitches, however, which can drive clients into the competition's arms. Customers have more options than ever in the banking industry, where they can find plenty of digital- or mobile-only challenger banks to replace older FIs that have failed to keep up with their needs.

That is why it is critical for FIs to build out networks that can handle an increased amount of transactions or swiftly analyze large reams of data, according to Ali Niknam, CEO and founder of European digital bank **Bunq**. The challenger bank has run on a cloud banking model since its 2012 launch and is available for business and consumer use in 30 European markets, including Austria, Germany and the Netherlands.

“Because we built the whole system up fresh, from the ground up, our entire system is running on the cloud,” Niknam said in a recent interview with PYMNTS. “The [greatest] benefit is that it is just so much more scalable. ... Because we are on the cloud, we always have enough capacity, so our users never have to wait.”

Utilizing the computing power the cloud provides enables the bank to respond to customers' requests with more flexibility, he continued. It is not the technology itself that is important, however, but the strategy behind it: Banks that are looking to upgrade to the cloud must first take an

“ Because we are on the cloud, we always have enough capacity. ”

introspective look at how they are providing services to their customers and if they can fit in an ecosystem where banking is becoming more digital than physical.

COMPLEX BANKING REQUIRES SIMPLE NETWORKS

Today's businesses and consumers have more complicated banking needs thanks to an expanding global economy. Customers want to digitally manage multiple accounts without having to wade through time-consuming login screens or authentication processes each time. They want holistic views of their personal checking and savings accounts alongside their business accounts or investment portfolios in the same place, which means the old assumption that one account is equal to one user no longer really applies, Niknam said.

"With Bunq, one user account results in multiple sub accounts," he explained. "We do not think in a traditional sense that one bank account equals one user equals one card. Rather, we think you as a user can have as many bank accounts as you want so you can budget easily and keep a good overview."

Bunq, which officially received its banking license from Dutch authorities in 2014, applies this strategy by offering solutions like Dual Payments, which allows consumers to use one card to make payments from

two separate accounts simply by inputting separate PIN codes. This is similar to the card aggregation solutions that fellow Fin-Tech **Curve** offers. User details are kept in the cloud with the help of Bunq's third-party cloud provider, meaning the bank does not have to struggle against server limitations and can ensure these switches from one bank account to another are seamless.

"Usage of the cloud basically categorizes [into] three benefits," Niknam said. "One is the scalability, which allows for [better] performance, ... so [one] always has a seamless experience as an end user. [The second] is the added security, because obviously, as a bank, security is paramount, and [third], it allows for new technologies to be deployed rapidly."

The third benefit is becoming critical to the evolving banking industry. Legacy banks are slowly adapting their platforms and innovation strategies in response to these developments while challenger banks continue to sprout all over markets in Europe and the U.S. Bunq is competing with entities like Monzo and Revolut as well as more established European players such as Deutsche Bank and ING, for example.

ML, THE CLOUD AND COMPETITION

It is imperative to examine how newer technologies can play into customer sat-

isfaction. ML combined with the cloud platform adds a layer of protection to its services, Niknam noted, while also allowing for the development of more customer-facing features.

“We are using ML to link invoices [scanned] through [customers’] phones automatically with payments,” he said. “We are using ML to add an extra security layer to keep [customers] safe. ... We have a lot of ML modules running, and actually there, too, having this access to a lot of computing power in the cloud really helps because it allows us to analyze huge, huge, huge amounts of data in a [quicker amount of] time so we can actually deploy these ML modules.”

Using AI and ML goes hand in hand with collecting larger caches of personal data, and banks must first be prepared to handle this flood of information. Events such as the COVID-19 pandemic have shone light on FIs that are able to keep their online platforms running seamlessly with **increased** digital transaction volume, for example. Banks that do want to stay competitive and stand out during this time will therefore need to go back to basics and create core banking infrastructure that allows for quick, convenient transactions, no matter how flooded the network.



NEWS & TRENDS

LEGACY FINANCIAL FIRMS TURN TO CLOUD TECHNOLOGIES

BNP PARIBAS SIGNS DEAL WITH IBM TO BUILD PRIVATE CLOUD

Legacy banks are taking strides to make sure their financial innovations keep pace with those of their digital-only peers. French FI BNP Paribas recently **signed** an agreement with technology provider IBM to create a private cloud solution for the former. The deal is worth approximately \$2 billion and follows several major steps IBM has taken to improve its cloud banking infrastructure offerings over the past two years.

BNP Paribas believes that building out a private cloud will allow it to focus more heavily on its plans for online banking innovation. It will also enable it to provide faster support for its existing services as it will be able to more easily access information that is stored on the cloud as opposed to hunting for this data across its mainframes.

BPI UPGRADES MOBILE BANKING WITH CLOUD PARTNERSHIP

Using the cloud to enable quicker access to data is also critical to supporting faster mobile banking platforms. The Bank of the Philippine Islands (BPI) will be **upgrading** customers' experiences on its mobile banking apps and digital platform in this manner, relying on Swiss Fin-Tech Avaloq's cloud-based software to enable more flexibility and scale. It will use Avaloq's offerings to host all of its banking products on the cloud and look to its cloud solutions for potential future innovations.

BPI, one of the largest and most established banking groups in the Philippines, announced the partnership after **seeing** steady growth on its digital channels in the past year. The number of BPI Online and BPI Mobile users increased by 8 percent from 2018 to 2019 to 1.9 million or 22 percent of all their customers.

BLACKROCK MOVES INVESTMENT PLATFORM TO MICROSOFT AZURE

Asset management firm BlackRock is another established financial company looking to migrate to the cloud to enhance its clients' experiences, according to a recent **announcement**. BlackRock will be moving its investment and operations management platform Aladdin to technology firm Microsoft's Azure cloud computing service to help it further scale out its solutions. Aladdin helps monitor and analyze risk for the more than \$7.43 trillion in assets BlackRock manages for its clients. It supports individual portfolio management as well as trading and operations, according to the company. Supporting the Aladdin platform with the cloud also reflects the company's drive to accelerate its innovation plans and keep pace with other companies in this digital space.



CHARLES RIVER TURNS TO THE CLOUD FOR ENHANCED RISK MANAGEMENT

Fellow investment management company Charles River is following in BlackRock's footsteps by expanding its partner relationship with Microsoft. The Burlington, Massachusetts-based firm, owned and operated by State Street Corporation, **announced** last month that it **moved** its Charles River Investment Management Solution (IMS) to Azure. This comes a year after the firm first made its partnership for cloud development with Microsoft public. It is now moving its software-as-a-service (SaaS) clients — as well as its new clients — to the platform.

Charles River **manages** approximately \$29 trillion in assets and is looking to the cloud to help provide security and scalability as well as to mitigate risk. The company works with asset managers, insurance companies and wealth managers in over 30 countries.

DIGITAL BANKS AND CLOUD UPGRADES ---

CHALLENGER BANK MONEYBASE TAPS CLOUD FOR CUSTOMER GROWTH

Many bank branches remain closed because of the COVID-19 pandemic and consumers are thus turning to digital banking channels. Digital-only banks are getting their time in the spotlight as a result and must reach new customers before their competitors do. Cloud technology can help these banking services improve speed and security while also contributing to growing customer bases. Malta-based financial services company Calamatta Cuschieri is **integrating** cloud technology into its new challenger bank's platform for greater support and customer service. The new FI, Moneybase, will launch later this year, and its core banking system will run completely on the cloud, potentially granting it an edge over FIs that may still be using legacy infrastructures.

BAMBU SUPPORTS UNDERBANKED CONSUMERS WITH FIS

U.S. challenger bank Bambu is looking to innovate its core banking infrastructure to ensure it can easily connect and communicate with underbanked and unbanked consumers. The bank is **working** with

technology provider FIS for its software-as-a-service (SaaS) solutions and cloud platform, which it hopes will allow it to quickly bring its mobile-only banking solutions to market.

Bambu is particularly **focused** on assisting underbanked Hispanic or Latin American consumers in the U.S. who need to make international money transfers regularly. Its solutions are mobile-only to better appeal to those who may not be able to utilize traditional banking tools but still have mobile devices, said Douglas Quay, chairman and CEO of Bambu.

TEMENOS TEAMS WITH NUODB ON CLOUD-NATIVE SOLUTIONS FOR CHALLENGER BANKS

Challenger banks must be ready to handle a rising amount of online payments and customer requests on their networks. Core banking infrastructure that allows them to quickly scale and remain compliant with shifting banking regulations is essential. Cloud systems can help challengers accomplish this, but cloud providers and partners must be chosen strategically to ensure they can adapt to FIs' personalized needs.

Banking software company Temenos together with SQL database company NuoDB are offering such tools tailored to challenger banks' specific needs. The two have partnered to provide Temenos' software to these FIs on the cloud, including products that allow challengers to quickly answer customers' queries. Such solutions can also cut down on infrastructure costs for challenger banks, enabling them to turn their funds toward the continued development of more innovative digital solutions.

TRANSFERWISE PROMOTES FASTER BANKING TRANSFERS

Sending payments quickly has become a high priority for businesses and consumers, especially for international transactions. The currency conversions and international regulations attached to these payments often stall such transactions, leaving money stuck in limbo or damaging customer relationships. Cross-border payment service TransferWise is looking to enable faster transactions for such users, including financial clients that regularly send international payments to other banks and businesses. TransferWise has integrated its own services with a third-party cloud banking platform provider to enable these payments.

Increasing these transactions' speed provides multiple benefits, such as allowing companies to complete more payments in less time and enabling them to focus more on growing their businesses. Clients will be able to access the third-party provider's platform, where they can then use TransferWise's application programming interfaces (APIs).



COVID-19 AND THE CLOUD

NUODB EXAMINES THE IMPORTANCE OF CLOUD AGILITY

The COVID-19 pandemic has had a marked impact on the financial industry, pushing banks, businesses and FinTechs to adapt to mostly digital models to keep up with customer needs and meet social distancing recommendations. It is essential for these entities to analyze how they are storing and treating data, however, Ariff Kassam, chief technology officer for cloud and distributed SQL database company NuoDB said in a recent [interview](#) with PYMNTS. Banks' platforms must have the necessary flexibility to quickly answer customers' questions and provide seamless service, especially during the pandemic, he stated.

Kassam noted that banks and businesses should also view the pandemic as a warning for outdated systems or those without the customer service agility that is proving so critical. Companies need to consider important questions, such as what would happen if their cloud service provider crashed and how they would be able to access sensitive data, he warned. Agility in cloud platforms also means the ability to respond to dramatic upticks in transaction volume or data requests to avoid costly outages.

GOOGLE CLOUD RELEASES SOLUTION TO HELP AUTOMATE LOAN APPLICATIONS

The pandemic has also made it more important for businesses to access their funds as quickly as possible. Technology firm Google is thus looking to help companies that have been financially affected by the COVID-19 pandemic. The company's Google Cloud department recently [released](#) its Paycheck Protection Program (PPP) Lending AI Solution, which will help decrease the time it takes for loans to be fully approved by processors and lenders. It is designed to help lenders automate the vast quantity of loan requests coming in for the PPP, which the U.S. Small Business Administration (SBA) created to help support small to mid-sized businesses (SMBs) that are struggling to stay afloat during the pandemic.

Google's AI-powered, cloud-based solution can be integrated directly into lenders' systems, according to the company. It then allows access to a Loan Processing Portal, which enables SMBs to apply quickly and includes data analytics tools that can analyze the information attached to these loan applications.



FRAUD PROTECTION AND SECURITY

GOBEAR ENHANCES PRODUCT FOR GREATER FINANCIAL INCLUSION

GoBear is another financial services platform looking to power greater customer satisfaction on its site. The Singapore-based FinTech, which allows users to compare different products, including car, health and travel insurance as well as lending solutions, is now **working** with a third-party cloud provider to better support its comparison platform. It will utilize cloud-based risk analytics and decisioning software to promote more financial inclusion during the COVID-19 pandemic. This technology will also allow the platform to process loan applications in real time, granting its users greater financial access.

GoBear is also upgrading its infrastructure to ensure that its identity verification and fraud protection processes can be conducted securely. This is especially critical during the pandemic, during which fraud has been rampant.

FFIEC ISSUES CLOUD SECURITY REMINDER TO BANKS

Data security and protection has always been an important priority for the financial industry, but just who is responsible for this security is a matter of debate. Cloud security is no different, with U.S. regulatory body the Federal Financial Institutions Examination Council (FFIEC) recently issuing a **statement** promoting its importance to banks as well as their cloud providers. It is not important which entity is responsible for the bulk of the fraud and privacy protections, the FFIEC stressed, but merely that the cloud platform itself is secure for clients and consumers.

Questions surrounding cloud security management have persisted for the past several years. Amazon, which operates cloud-based platform Amazon Web Services (AWS), **responded** to privacy questions last year by noting that data security was the responsibility of banks and businesses and not their cloud providers. The FFIEC recommended that FIs and cloud



providers come to their own agreements as long as the end result is a safe, protected cloud environment.

REFINITIV ANNOUNCES CLOUD-BASED COMPLIANCE AND ANALYSIS SOLUTION

The question of compliance and how it will relate to cloud platforms is becoming a more important topic to FIs. Financial data and technology firm Refinitiv recently **announced** the launch of its Refinitiv Compliance Archive (RCA), which is meant to help its clients organize trade and unstructured or uncategorized message data. Compliance departments can then use the cloud-based archive for increased transparency into communication and trade movements, enabling them to efficiently analyze and oversee activity.

It can be both costly and time consuming for many firms to properly approve this type of trade data, the company noted in a recent press release. The product is designed to help mitigate those costs as well as maintain compliance.

DEEP DIVE

LEGACY BANKS AND THE INFRASTRUCTURE STUMBLING BLOCKS KEEPING THEM FROM THE CLOUD

An expanding number of challenger banks have eschewed the industry's traditionally slow and steady innovation approach. These banks are **offering** digital or mobile-only platforms powered by cutting-edge technologies like AI, biometrics and ML to fulfill users' needs with greater speed and a little more flair. Legacy banks have been obliged to pick up the pace to stay competitive. Many banks are still facing one large barrier to faster digital development, however: their core banking infrastructures.

This is not for lack of trying or lack of funds. Ample FIs have the technological ability and budgets, but they first must graft those products into their legacy systems. Forty-three percent of established U.S. FIs still **use** systems that were first built on the 1959 programming language COBOL and are adding new layers of infrastructure

on top of these original systems to support the latest banking tools. This enables banks to create and launch digital products in a way that helps them compete, but also makes them more prone to outages.

Banks must upgrade their legacy infrastructures swiftly as challenger banks and

FinTechs may take advantage of outages or lagging service times that cause customer frustrations. Even markets like the U.S., where there are only approximately 40 challenger banks **operating** at present, have seen consumers paying more attention to these entities in the past couple of months thanks to the **entrance** of European competitors such as Monzo and N26. Chime is one native U.S. digital player that has seen steady growth, and it now **dominates** 60 percent of the country's challenger bank market.

Legacy banks are therefore starting to view their outdated infrastructures as a more pressing issue, with one 2019 **study** noting that 46 percent of bankers now view this as their biggest hurdle to achieving future growth. The following Deep Dive examines how large a problem these outdated systems represent, what technologies, such as the cloud, can do to help and how FIs can best integrate cloud solutions into their digital banking platforms.

LEGACY SYSTEMS LEAD TO LEGACY THINKING

FIs struggling to run banking platforms on six-decade-old infrastructure face the same problem as many other essential services that can't slow down to make upgrades. High passenger volume rarely allows New York City's Metropolitan Transportation Authority (MTA) the time it needs to do maintenance that will leave rails run-

ning more smoothly, for example. The MTA **shuttered** all of its lines for the first time in its 115 years of existence to deeply sanitize trains and stations amid the COVID-19 pandemic and to **complete** much-needed maintenance and extensions for well-traveled lines. COVID-19, however, has not afforded legacy banks the same opportunity to repair weaknesses in their banking platforms. The pandemic increased the amount of digital traffic for FIs as more consumers go online to manage their finances.

Banks therefore need to balance providing 24/7 year-round service without outages that will frustrate user bases. American consumers' confidence in banks dipped in 2018 to just 33 percent, according to one **survey**. Wells Fargo **saw** a massive data outage in 2019 due to smoke detected at one of its data storing facilities, for example, leading to the automatic shutdown of its servers and ATMs and leaving its customers unable to use their debit cards or access their digital banking accounts.

The potential for digital shutdowns due to the expanding data flow from COVID-19 is a very real fear within the banking industry, especially when large-scale outages mean customers would be greatly stripped of access to their accounts as they follow stay-at-home orders. Customers who do experience glitches are also more likely to look for alternatives to these services and options in the financial industry are abun-

dant. Established banks are therefore taking steps to avoid these missteps, though approaches to innovation may also be outdated.

FOLLOWING THE 80/20 RULE

Recent research suggests that FIs may be upgrading their legacy infrastructures from the wrong angle. Thirty-four percent of bankers in a 2019 [survey](#) noted that a lack of IT talent — or the in-house training resources required to cultivate it — were the biggest challenges to implementing more innovative technologies, for example. This concern over in-house talent may also be a holdover from previous decades of banking, especially when compared to how challenger banks are approaching innovation and infrastructure support.

What is most critical about challenger banks' approaches is that many of them are not attempting to build out their own systems, instead taking advantage of partner services' existing capabilities. Challenger banks operate by cultivating mastery over one, more narrow banking aspect, leaving support for other features in partners' hands. This strategy also applies to how many of them view core banking infrastructures. Challenger banks appear to be following a principle known as the 80/20 rule, which [suggests](#) that 20 percent of their activities will account for 80 percent of their results. Challengers are [applying](#) that 20 percent to the cost of partnering

with third-party cloud providers and computing resources, and letting the results speak for themselves. More challengers are [utilizing](#) third-party cloud providers to support their services at scale, [including](#) N26 and Starling Bank. Monzo is [turning](#) to both AWS and Google Cloud for its data storage.

It may be time for legacy banks to begin reorganizing their core banking innovation strategies with this rule in mind. Many FIs have taken tentative steps toward this strategic change by [spending](#) \$20 billion on public cloud services in 2019. Another [study](#) predicted that the money spent on cloud-native technologies and partners will continue to grow, reaching \$411 billion by 2022.

Creating cloud-based strategies could have a noticeable effect on the ways that banking relationships between challengers, FIs and their customers continue to progress in the future. The continued use of COBOL in 2020, for example, and the crashing of mainframe systems has [led](#) to widespread problems across various states as citizens wait to collect unemployment checks. FIs that do not consider changes to their infrastructure strategies will repeatedly deal with such issues until they think like challengers and fix them.

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