Capgemini Perspectives:

Cloud Native Comes of Age in Banking

How banks are increasing business velocity and customer satisfaction with applications and services built for the cloud

Contents

Executive overview

In an age where business velocity and innovation are critical to success, a growing number of companies in the banking industry are embracing a cloud-native approach to application development and deployment. This approach is helping companies realize value around key business priorities:

- Creating differentiated customer experiences through continuous innovation - thanks to the agility and flexibility of cloud native.
- Developing customer insights using big data and analytics applications - enabled by elastic and scalable cloud-native architecture.
- Complying with regulatory reporting requirements - through burst processing in the cloud.
- Unlocking data to comply with regulations such as PSD2, CMA, GDPR and CRS - by developing secure APIs for an ecosystem of partners.

Taking the pulse of the market

To understand how well companies in this industry are embracing the cloud-native opportunity, their motivations for doing so, and the success they're seeing, Capgemini recently commissioned a global survey. The findings confirm the growing importance of cloud native in this industry, with banks expecting to spend 41% of their cloud budget on PaaS three years from now.

And many cloud-native leaders are already seeing significant results:

- **88%** of cloud-native leaders say that it has improved the agility of their organization.
- **84%** say that cloud native has helped them increase revenues and cut operating costs.

But adoption isn't always easy, and many barriers still stand in the way of their transformation journeys:

- **More than 60%** of respondents say that integrating cloud-native applications with legacy infrastructure poses a significant challenge.
- **61%** agreed that organizations face a significant cultural challenge in the move to cloud native.

The benefits of being a cloud-native leader:

88%
Improved the agility of their organization

84%
Revenue up, operating costs down
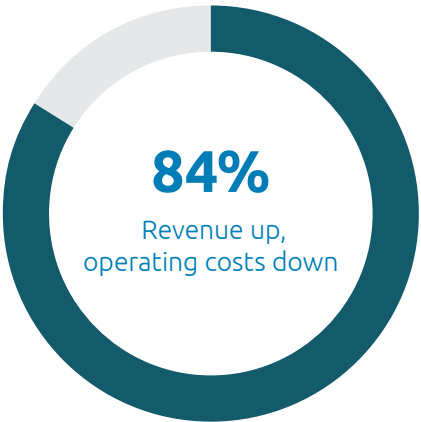
Why read this report

In this paper, learn how banks can overcome the barriers to effectively embrace and make the most of a cloud-native approach. They must:

- Consider the motivations driving cloud-native adoption in this industry.

- Transform DevOps in line with new cloud-native capabilities and development approaches.

- Select a platform or technology option that supports these goals.

- Evaluate their existing applications and services portfolio to decide:
  - Which should be lifted and shifted to the cloud
  - Which should be rewritten for cloud
  - Which should be retired.

- Ensure that the workforce and the culture are ready for the move to cloud native.

Introduction

IT leaders in banks are on board with the cloud revolution. They recognize the benefits of cloud, have mitigated their security concerns, and have started moving core applications to the new environment.

But many of the banking applications running in the cloud today were originally built for an on-premises world. They've been migrated to a cloud environment, rather than being developed from the ground up to take advantage of cloud's elasticity and scalability.

Truly cloud-native applications—applications that are developed and deployed as a set of flexible microservices using Platform-as-a-Service (PaaS) tools—can go much further to reduce costs, boost performance, and increase business velocity. So, are banks taking advantage?

Uncorking creativity with open banking

It is evident that many banks are forging ahead with their cloud-native strategies. They have little choice, as the 2017 Capgemini World Retail Banking Report[1] points out: "The future success of banks will require a shift toward an open banking model. This can uncork the creativity of third

parties, generating unprecedented opportunity for building and distributing innovative new products, while offering customers transparency and a ubiquitous banking experience."

Cloud-native applications sit at the heart of this digital evolution. As an example, Capgemini worked with a leading US-based bank on its move to cloud native as part of a strategy to develop and securely expose new application programming interface (API) channels.

This helped the bank develop an innovative new operating model with a new architecture enabling greater agility and speed-to-market. This led to an impressive tenfold reduction in quality assurance costs and a release cycle slashed to weeks instead of months.

> " *The future success of banks will require a shift toward an open banking model."*

Cloud Choice Podcast series: Reasons to consider a cloud-native strategy.

Discover reasons why businesses are considering cloud native more than ever before in this podcast.

Listen Now

1 https://www.worldretailbankingreport.com/

Cloud native comes of age in banking

The survey results show that cloud native is gaining noticeable traction in the banking industry, with 27% of executives saying that cloud native is already a "core part" of their overall cloud strategy. Our survey indicates that, on average, banks spend around 27% of their cloud budget on PaaS. This is only set to increase, with banks expecting to spend 41% of their cloud budget on PaaS three years from now.

The ability to deliver new applications at speed has become an essential capability in today's banking industry. New applications and service delivery models have transformed the face of consumer banking in recent years and, as consumer demands continue to evolve, cloud native will prove instrumental in helping banks adapt to serve them best.

Unsurprisingly, customer-facing websites were named as the most popular cloud-native application priority in our survey—with 38% of our survey respondents placing them above all other applications in importance.

The governance and compliance challenge

Yet despite the clear applications for a cloud-native approach in banking, one significant challenge remains—governance. Fear over how DevOps delivery and management on the public cloud will impact governance remains the most significant barrier to cloud-native adoption in this industry—a challenge that CIOs must navigate carefully as they guide their organizations toward cloud-native banking success.

Further, as banks increasingly step up their collaboration with FinTechs and other external partners to deliver differentiating customer experiences through APIs, safeguarding customer data across all channels becomes not just a governance challenge, but one of reputation and revenue as well.

Of course, one of the most significant challenges is compliance. In the highly regulated financial services sector, compliance with current and impending regulations for sharing data and providing regulatory bodies with access to banking systems is clearly a strategic imperative. This includes regulations governing data use and storage (GDPR), the sharing of tax and financial information (CRS), and open banking (PSD2).

Yet all of these concerns actually strengthen the business case for cloud native. That's because cloud native and the use of APIs help banks to securely open their systems to external partners and regulatory bodies.

As banks move from being secure vaults of data to having to control a broader and more open ecosystem where data flows between parties, policies and processes designed for the closed world are no longer fit for purpose.

Cloud-native applications are inherently designed for this new ecosystem—enabling secure and efficient operations as banks shift to an "outside-in" view of IT operations.

With applications and services designed to support the way data is shared today, it's easier for banks to maintain compliance with new data storage, processing, and usage regulations—and work closely with regulators during inspections.
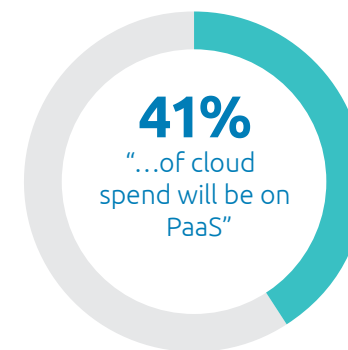
Adapt or die

The value of a strong customer engagement model is emphasized in the 2017 World Retail Banking Report,[2] which revealed that banks are losing ground to non-traditional firms in the desirable customer segment of Gen Y and tech-savvy consumers. The population of digital natives is expanding and older generations are becoming comfortable with modern technology, placing banks under more pressure to deliver speed, personalization, and instant gratification on online/mobile channels to matchup with experiences offered by tech-innovators, such as Apple, Amazon and Facebook.

Strong interest in the cloud-native approach:

27%
"A core part of our cloud strategy now"

By 2020

41%
"...of cloud spend will be on PaaS"

2 https://www.worldretailbankingreport.com/

Three typical use cases driving cloud-native adoption in the banking industry

Companies have different motivations for planning their move to cloud native. The three most common use cases in the banking industry are:

1) Transform the business for greater agility and flexibility

As companies in this industry drive flexibility and agility to help enhance customer experiences and accelerate product releases, they need the right technology strategy to enable this transformation.

Traditional monolithic applications can severely limit agility as applying even simple updates can take weeks. In this industry, defined by the emerging competition from FinTechs and increasing regulatory demands, cloud native offers a microservices architecture that allows companies to rapidly adapt and develop new business models in the most efficient way possible.

2) Optimize operational efficiency using public cloud IaaS

Digitalizing operations to improve efficiency and gain actionable real-time insights requires a well-oiled infrastructure and set of processes in the background.

Cloud native offers significant opportunities for improving operations—especially the processes that tie application development to IT operations (DevOps). Companies are able to improve DevOps efficiency, achieve continuous delivery with CICD, and optimize their operations.

Cloud-native development running on the public cloud enables DevOps teams to overcome numerous issues that frequently impact development process efficiency and speed, and the quality of outputs, such as:

- Inconsistencies in environment configurations when going between the dev, test, and release stages
- Drops in quality due to significant increases in the size and scale of releases each year
- Long time to market caused by unexpected integration collisions and unresolved dependencies.

3) Adopt an API ecosystem

Banks that want to deliver innovative, new hyper-connected services for customers, comply with emerging regulations, and build a platform for future growth need to break their monolithic integration flows into microservices that enable them to achieve greater business velocity. This has led to an increased adoption of APIs for building agile integrations and opening new channels for growth.

Cloud-native development and microservices architecture help achieve this by moving towards an API ecosystem. This allows banks to develop a services architecture where they can manage connections with partners, regulators, and different parts of their own business through APIs to deliver innovative services and new business models, and comply with regulations.

Overcoming the challenges of legacy IT investments

As the pace of change increases, banks are under pressure to deliver rapid and effective transformation while still relying on legacy IT investments. Achieving that isn't easy, and it's a long process of trial and error. This has led many banks to realize the need to fully embrace a cloud-native approach.

In the **first phase**, we saw changes in the way the applications were delivered as banks moved to new cloud-native technologies and agile methods—particularly for new digital channel development. However, they didn't realize the benefits expected, due to the constraints of the delivery and release model.

In the **second phase**, banks moved to embrace DevOps and automate the development, test, and release process, leveraging internal cloud platforms. However, these platforms were found to be ineffective at supporting this model, which required "infrastructure as code" to deliver the intended results.

In the **third phase**, we see banks fully embrace cloud native—utilizing new technologies, agile, and DevOps delivery models which fully embrace public cloud—increasing both the speed and effectiveness of delivery.

However, even with the proven benefits of cloud native, legacy IT investments remain a major barrier. Historic investment in data centers and applications that have been fully capitalized represent very low running costs. So, the challenge now is to identify how to embrace all aspects of cloud native from the outside in.

Once the number of applications moved into this model achieves critical mass, banks can start making large changes to the existing infrastructure to keep costs low. But, until that happens, legacy investment will continue to be a major impediment to the rapid move to cloud native that is necessary to address the changing customer and regulatory environment.

> "Once the number of applications moved to cloud native achieves critical mass, banks can start making large changes to their existing infrastructure to keep costs low."

Moving to an outside-in delivery model

Capgemini has been working with a major multi-national bank to transform their core cards processing platform by progressively moving components off and rebuilding them as cloud-native microservices.

This represents a key element of the bank's cloud-native platform strategy, as all applications are transformed progressively into this new form following an "outside-in" delivery model. This will enable banks to create a responsive and rapidly evolving customer experience while supporting the drive to an open banking model.

Assessing your applications portfolio

Before you can embark on your cloud-native journey, a major question remains—how to move away from the monolithic and antiquated applications and deployments that companies have grown accustomed to, and adopt an agile, efficient cloud-native approach?

Not everything has to be moved to cloud native. Applications that require frequent updates, and can benefit the most from extreme elasticity, are the best candidates.

Many companies in this industry are heavily invested in their core banking applications. These don't need to move to cloud native right away, but a progressive move of components of these platforms to cloud native or a cloud-based deployment can help smooth the transition to a future, cloud-native applications suite.

A critical activity is to evaluate the existing IT landscape and future requirements for new applications that support growth ambitions. By analyzing the current application portfolio aimed at growth, banks can determine:

- Which existing applications could be lifted and shifted to the cloud to reduce costs and increase agility
- Which are no longer fit for purpose and should be retired
- Which could be rewritten or re-architected for a cloud environment and take advantage of cloud elasticity, accelerated innovation, and rapid updates.

Your **first option** is to enable new application development with a cloud-native approach using microservices, containers (e.g. Docker, Kubernetes, etc.), and platforms such as Pivotal Cloud Foundry. The microservices approach provides several unique features, including re-use, rapid updates, elasticity, and scalability. This is especially relevant for applications with:

- A high number of users (or potentially high)
- Dynamic usage (lots of spikes and valleys)
- Externally accessible applications (customers, suppliers, partners, employees, etc.).

The **lift-and-shift** option requires migrating existing application platforms to the cloud with little or no code modifications. This is the fastest and simplest option, and can commonly be used for:

- Applications where the business case doesn't support rewriting them for the cloud
- COTS (commercial-off-the-shelf) applications including ERP, Human Resource Management, and other enterprise workloads.

Re-architecting applications to take advantage of cloud features by decomposing monolithic applications into easily consumable domain-specific business transactions as microservices. You'd typically want to consider this for the same type of applications in the lift-and-shift option for new application development—high number of users, dynamic, and external usage.

Replacing, on the other hand, enables you to completely replace core application and service platform features with external services by adopting a buy-not-build approach to leverage Software-as-a-Service. This offers greater scalability for core application features and is a good choice when dealing with:

- Applications that are maintenance-intensive but do not carry features specific to the organization
- Applications that require specialized skills to develop and maintain
- Applications that use tools/frameworks with high licensing costs.

Finally, some applications (e.g., mainframe or AS/400 applications for core banking functionality) may need to be completely transformed by **rewriting** them for a modern language and framework.

We are seeing a lot of investment and energy in this area due to the large percentage of such applications across the industry. To this end, many organizations strive to progressively remove complex non-core functions from their mainframes as well as data reporting and queries.

This process of "hollowing out" or "impoverishment" is aimed at reducing these platforms to core processing engines while moving all the applications with a high degree of change into cloud native and microservices applications.

This offers the greatest cost and agility benefits in the long term, but requires more upfront work, and should be considered for:

- Applications with tightly coupled functionalities
- Applications that have a complex domain model which needs to be normalized
- Applications that drive business value
- Applications that are built as a monolith.

Weighing up the technology options

The right technology path for your enterprise will depend on the overall direction of your business and its cloud strategy, which vendors you have already chosen, and whether you prefer an off-the-shelf platform that is ready to deploy or full control of your own platform built in-house.

47%
plan to choose an off-the-shelf platform

27%
are developing a custom platform in-house

41%
are seeking external support to choose the right platform

Option 1:
Off-the-shelf
Platform-as-a-Service

Proven, Cloud Foundry-based Platform-as-a-Service solutions, such as Pivotal Cloud Foundry and IBM Bluemix, make it easier for you to develop, deploy, and manage applications. They remove undifferentiated workloads and make pre-developed functionality, connections, and frameworks available for your own deployments so that your developers can focus on building business services.

These solutions can incur significant upfront costs that need to be balanced against the return on investment from your applications in the longer term. Vendor lock-in is a concern for many companies, but workloads will usually be portable to different underlying cloud providers.

Recommended for companies with significant cloud budget, that favor simplicity and speed.

Option 2:
Public
Platform-as-a-Service

Leading public cloud providers such as AWS and Microsoft also offer PaaS-like capabilities that enable developers to create applications easily on their platforms. If you are already working with one of these vendors, extending your existing investments to PaaS may offer advantages. Banks looking to build their machine learning capabilities should also evaluate what these vendors are able to offer on their platforms to enable these capabilities.

This option will most often imply a major commitment to that public cloud provider for a long time.

Recommended for companies that have a clear strategy to concentrate investments in one market-leading public cloud vendor.

Option 3:
Custom PaaS solution

Another option is to create your own custom PaaS platform, or work with a partner to tailor one to you, typically leveraging containers and container orchestration. This can be exactly tailored to the specifications of your business, people, DevOps processes, and innovation goals while minimizing vendor lock-in.

This approach can lead to complexity and a greater management workload. It demands a strong skills base. Significant initial investment in time and resources will be needed to reach the functionality offered by a pre-built PaaS.

Recommended for companies with clearly-defined, unique cloud ambitions and significant in-house expertise.
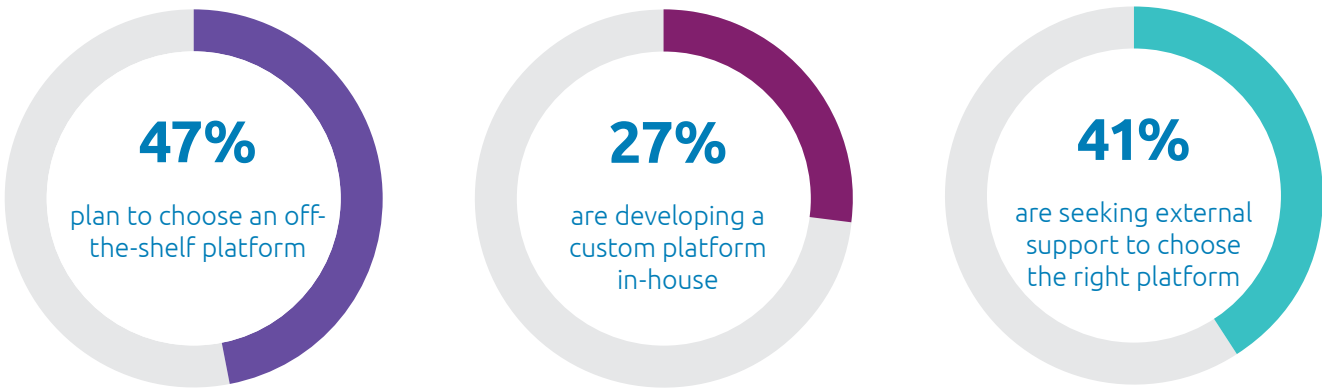
Whatever their technology choice, in order to realize the desired results from their move to cloud native, banks need to have a strong cloud foundation. This includes a robust strategy to manage their hybrid cloud environment and a culture that supports the microservices and DevOps way of delivery.

> *To comply with regulations, banks must ensure that they have an alternate fallback option to their preferred PaaS, which may even be an on-premises PaaS.*

Effecting cultural change

As those who've already made the move know, the shift to cloud native is more than just a technical transition; it's a complete culture change. And, in traditionally risk-averse industries such as banking, resistance to change is often to be expected. In our survey, **61% of respondents said cloud native represents a cultural challenge for their business.**

In banks, a huge amount of tech tasks and processes are still supported by legacy technology. In some cases, that technology has been around for so long that itself has become a part of the industry's culture. People know that technology, they trust it, and in many cases, they may defend it with an "if it's not broken, don't fix it" attitude. To overcome this, CIOs must:

- Communicate the benefits of a cloud-native approach for everyone
- Prioritize business flexibility and velocity
- Drive a culture of innovation that helps keep the business ahead of its competitors.

By 2020

61%
"move to cloud native is a significant cultural challenge"

" *To fully unlock the power of cloud native, CIOs and other senior business leaders need to ensure everyone is on the same team— one that's not only ready for change, but willing to embrace it."*

Building the team of the future

Getting everybody to adopt a cloud-native culture is only half the challenge. Developing cloud-native applications requires a team with strong knowledge of PaaS and cloud-native solutions. According to the survey, banks don't have all the necessary skills today. **68% of respondents in banking said that cloud native represents a skills challenge for their business.**

DevOps is operational optimization, so it represents significant changes for development, test, and operational teams and the skills they need to succeed. To begin with, teams need to be organized around products instead of functions, so that the dev, test, and ops teams can all support one another, work more effectively in tandem, and become self-sustaining.

The cloud-native approach goes one step further, enabling fast, flexible DevOps by connecting everyone in the cloud and enabling easy collaboration as well as simpler automated testing and deployment. This will provide the ideal platform for experimentation and innovation.

In the cloud-native world, developers need many skills that aren't traditionally related to development. Rather than purely doing development tasks, as they would when operating in a functional silo, they also need operations skills to make cross-functional teams self-sustaining.

Agile, cloud-based development, underpinned by a DevOps strategy, can be a huge change for current development teams, and the skills required are very different to traditional development. The industry-recommended, 12-factor[3] cloud development capabilities are still rare for many companies, and represent a significant step forward for banks at the beginning of their cloud-native journey.

A team with cloud-native skills will naturally think cloud native—and to do so, it needs to be:

- **Empowered** with the tools and platforms to develop cloud-native applications and services
- **Freed** from legacy culture and process burdens, so they can develop at speed
- **Aligned** to a common goal, with a shared understanding of how cloud native can help them achieve it.
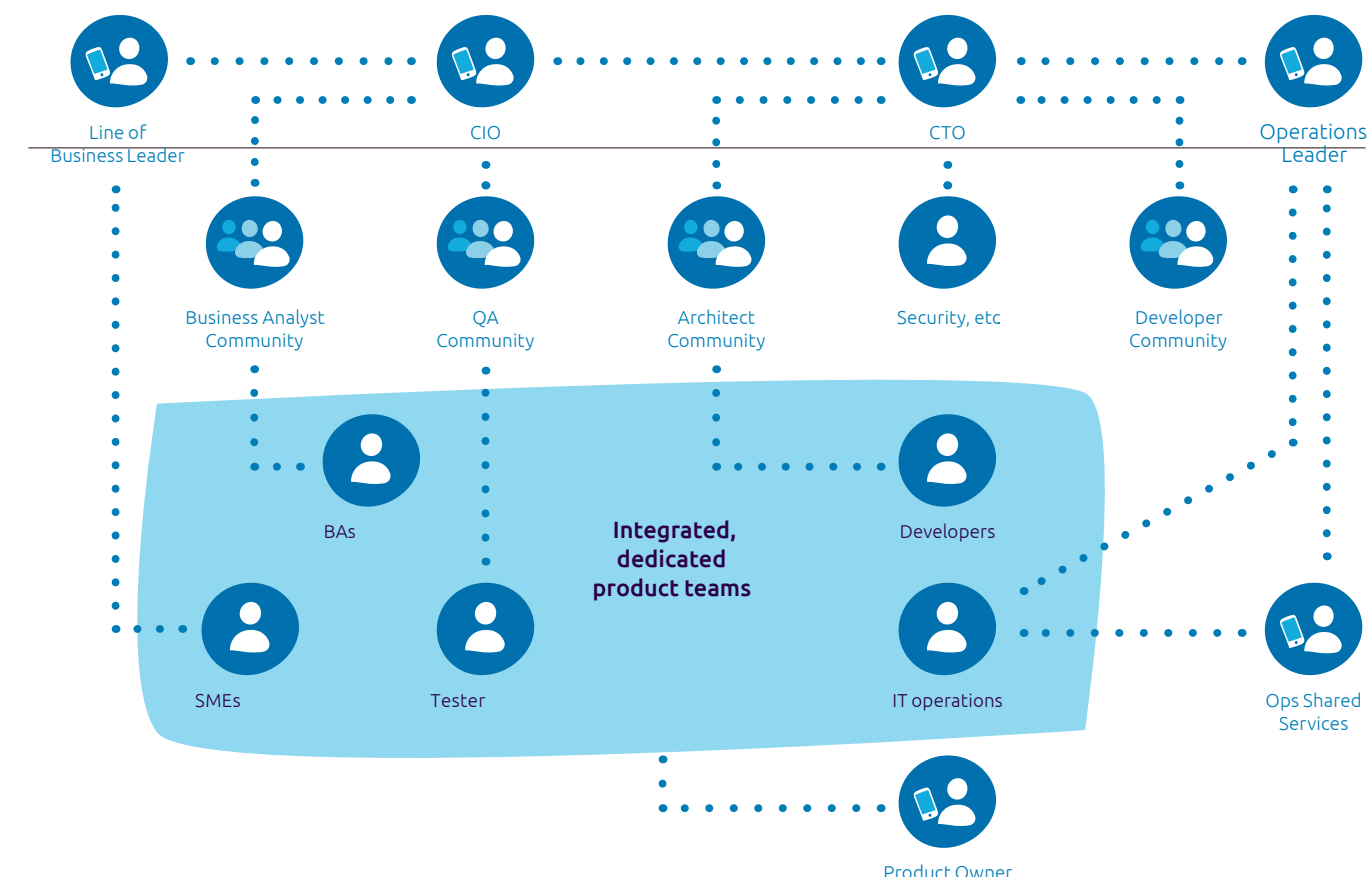
A team-building challenge

68%
"...cloud native represents a skills challenge"

Aligning operations around product teams

Line of Business Leader · CIO · CTO · Operations Leader

Business Analyst Community · QA Community · Architect Community · Security, etc · Developer Community

Integrated, dedicated product teams

BAs · Developers · SMEs · Tester · IT operations · Ops Shared Services

Product Owner

The diagram above shows how operations look when they're built around dedicated product teams instead of siloed functional IT teams. Each product team has all the skills it needs from all of the discrete IT functions required to serve those products effectively.

These teams facilitate more efficient operations and communication across the company, ensuring everyone involved with a product fully understands the needs and requirements of those working alongside them.

This is the backbone of efficient DevOps and ultimately ensures the timely delivery of the very best outcomes possible, every time.

Getting there won't be simple

In practice, this will require an evolutionary approach—acquiring and nurturing new capabilities slowly. Many companies setting off on their cloud-native journeys are defining their own standards, customized to their ambitions, opting to strive only for the factors that really impact them and help them achieve their goals. CIOs acquiring and developing these skills within their companies need to look at the big picture. This isn't a short-term project that requires temporary support—it's a long-term investment in building the team of the future. Although the ambition will be to build a team that can develop cloud-native applications based on the 12-factor application guidelines, it might not always be practical to consider this as the starting point.

3 https://12factor.net/

Educate, enable, and enforce: making cloud native a reality

With the right team in place, the next step is to secure buy-in to a cloud-native approach across the organization. We should also observe that buy-in doesn't just refer to users and IT staff. 44% percent of respondents believe a lack of senior stakeholder engagement is a barrier to their cloud-native strategy.

This senior-level support is vital, as evidenced in Capgemini's World FinTech Report 2017.[4] Executive leadership support and buy-in is the most cited (64%) of all the success factors for applying innovation as part of a FinTech strategy—and, as we have seen, cloud native underpins this innovation. It helps to improve agility and a bank's risk-taking ability, both of which are increasingly essential as banks start to work with, or compete against, the FinTechs.

For employees below the senior level, getting them on board may be slightly more complicated. That this wider buy-in is a major contributory factor in achieving competitive advantage (and taking on the FinTechs) through innovation, is borne out in the World FinTech Report 2017. A "lack of conducive culture for innovation" is the most-cited factor (40%) holding back traditional firms while implementing innovative and FinTech capabilities.

Rather than rolling cloud native out like another approach to development, everyone needs to learn to think cloud native before making any technical leaps. Beyond the physical and technical changes required to execute a cloud-native strategy, people must learn to:

- Fail fast and accept failure as an essential method of identifying issues early
- Think in terms of specific working patterns such as replatforming and refactoring to make the best decisions based on application, time, and cost demands
- Share knowledge and communicate continuously.

Each business will execute cloud native in its own way, but the key to everyone's success will be breaking the process down, and approaching it iteratively—tackling the technical, cultural, and structural challenges separately, and over time.

To help promote cloud-native adoption and overcome reluctance to change, IT leaders can follow the three "Es":

Educate:
Teach everyone to work in cloud-native ways, show them that it's OK to fail fast, and train them for the technological changes, as well as the operational ones that will impact who they work with, and how they work with them.

Enable:
Provide software frameworks and sample code to developers to help them become accustomed to cloud-native development faster, and give your people the means to communicate, collaborate, and work effectively as they adapt to agile, cloud native, and DevOps.

Enforce:
All your teams need to be supported by clearly defined digital standards that keep them aligned. Standards and governance ensure that while self-sustaining teams work freely in the ways that best suit them, everything is kept aligned across the organization, and efforts are never duplicated when building similar microservices.

> " *Executive leadership support and buy-in is the most cited (64%) of all the success factors for applying innovation as part of a FinTech strategy"*

What cloud-native success looks like

Banks that successfully transition to a cloud-native approach can expect to enjoy increased agility, flexibility, and scalability. In fact, 84% of leaders feel confident they are now ahead of their peers financially thanks to their move to cloud native.

Our research shows that cloud-native leaders are already seeing significant results , including:

- 84% of cloud-native leaders say cloud-native applications have increased their revenue—compared to just 44% of cloud-native laggards
- 83% of cloud-native leaders consider themselves ahead of their peers when it comes to financial performance, compared to 59% of cloud-native laggards
- 88% of cloud-native leaders say that the cloud-native approach has improved their business agility, while 87% say it has enabled them to provide a better experience to their customers.

For banks, the end result of successful cloud-native adoption is:

- A faster, more agile, and more flexible business capable of changing and rolling out new applications and services to meet new demands at speed
- An infrastructure built to support the flexible experiences demanded by today's digital customers
- A simplified approach to complying with emerging regulations governing this industry

- A platform for continuous operational improvement and innovation
- A more cost-effective base for all enterprise technology, free from the burdens of legacy monoliths
- A faster, more collaborative, and more empowered development team with all the tools necessary to innovate with ease.

Measuring success for cloud-native leaders:

84% … increased revenue

83% … ahead of peers in terms of financial performance

88% … improved business agility

87% … enabled better customer experience

Learning from cloud-native leaders

Discover how companies are using their move to cloud native to reinvent themselves for digital business.

Listen Now

Recommendations

Three things that will help your bank maximize the benefits of its cloud-native transformation.

Managing compliance with current and impending regulations

Every country has its own interpretation of the regulations governing the banking industry, such as GDPR, CRS, and PSD2. Cloud native requires engineering discipline and enforcement of standards. These characteristics mean that compliance with emerging standards can be built in to new applications and services proactively, instead of being addressed as an afterthought.

Focus on differentiated sales and marketing applications to deliver winning customer experiences

The supreme agility and flexibility of cloud-native applications are critical to the continuous innovation that helps banks differentiate their customer experiences. Banks should focus their cloud-native adoption plans around such applications as online banking, customer-facing websites or mobile apps, loyalty programs, digital marketing, in-branch digitization, etc. This is where cloud-native applications help banks build sustained competitive advantage and take on the FinTechs in today's fast-paced market.

Build insights from digital customer data for personalized digital engagement

The extreme elasticity and scalability of cloud native makes it ideal to run big data and analytics applications to manage the growing variety, velocity, and volume of data being generated today. This will enable banks to quickly convert this data into meaningful insights that fuel personalized digital engagement programs.

Get the full research report

See how banking compares to other industries in the race to go cloud native—and get a closer look at what a cloud-native strategy could help you achieve. Download the full research report:

Cloud native comes of age: What businesses need to know.

Download ⬇

About
Capgemini

With more than 190,000 people, Capgemini is present in over 40 countries and celebrates its 50th Anniversary year in 2017. A global leader in consulting, technology and outsourcing services, the Group reported 2016 global revenues of EUR 12.5 billion. Together with its clients, Capgemini creates and delivers business, technology and digital solutions that fit their needs, enabling them to achieve innovation and competitiveness. A deeply multicultural organization, Capgemini has developed its own way of working, the Collaborative Business Experience™, and draws on Rightshore®, its worldwide delivery model.

Learn more about us at

www.capgemini.com

People matter, results count.

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