
portfolio
MOVING TO THE CLOUD
EXPLORING THE INFLUENCES BEHIND CLOUD ADOPTION & THE MIGRATION OF CANADIAN FINANCIAL INSTITUTIONS

CONTENTS

THE EVOLUTION & ADOPTION OF THE CLOUD

Everyone knows how the cloud works, which is to say that most people really have no idea how the cloud works. It's ironic and a contradiction, but it's by design. As consumers, we're not supposed to know *how the cloud works*, just *that it works*. That kind of irrational acceptance isn't easy for us. It requires a certain level of willful ignorance, something that humans aren't particularly good at. We're rational beings. We like to know things. So, when it comes to using a metaphor to avoid a detailed explanation of how something actually works, it's understandable why we were initially a little cautious of the cloud when it first emerged. It's even more understandable why our banks and financial institutions have been particularly slow to adopt it. Accepting *the cloud* as an explanation for where we store our data can be likened to the magician who taps a wand on the brim of a hat three times and pulls out a white, long-eared rabbit. "How does my trick work?" the magician says, stuffing the rabbit back into the hat. "It's magic!"

"Everyone knows how the cloud works, which is to say that most people really have no idea how the cloud works."

Spoiler alert: It's not magic.

Over the past several years—and thanks to large technology companies like Google, Apple,

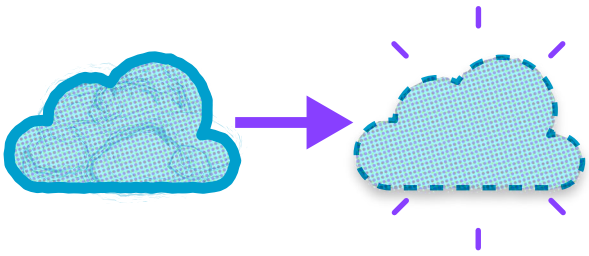
and Amazon—we've come to terms with the level of willful ignorance we need to accept in order to utilize and experience all the convenient benefits the cloud has to offer. We've learned that in order to make our digital lives more enjoyable, there are some things we're better off parting with, and there are some things we don't need to worry about at all. While that lack of detail and the acceptance of our own personal ignorance was once a reason not to adopt the cloud, those seemingly negative attributes have quickly become a part of the cloud's allure. We've collectively decided that we're comfortable trading the more technical, least exciting aspects of our personal technology—things like our limited digital storage space—for a vague, amorphous, shapeshifting, and obscure cloud, as long as it allows us to focus on those aspects of our digital lives that actually matter.

"If we run out of space in the cloud, we simply expand it in that cloud-like-push-of-the-button-way where space instantly expands and there's suddenly more available."

With the cloud, we don't have to worry about physical technology. We don't have to worry about the cost of acquiring, maintaining, updating, and protecting hardware and all the peripheral equipment that goes along with it—wires and cables and connectors and adaptors and dongles and do-dads. We don't have to worry so much about the speed of technological obsolescence that's intrinsically linked to our physical technology. We don't have to worry about the physical space that this technology occupies in our lives, either! If it's on the cloud, at least we can't misplace it or store it in a less-than-ideal location where it might get unintentionally damaged. Forget corporate technology for a moment. Think about your own experiences with personal technology—whether it was a phone you dropped or a hard drive from the early 2000s you can't seem to find—and ask yourself this: Is your data really safer in your hands?

With the cloud, we don't have to worry so much about digital space. We don't need to consider whether at any given point in the future we have enough storage capacity to hold whatever data or digital assets we've accumulated over time. If we run out of space in the cloud, we simply expand it in that cloud-like-push-of-the-button-way where space instantly expands and there's suddenly more available. The cloud's digital space is similar to actual space in that way—it's seemingly endless. When we need more, we don't need to research the best space from the best brands because with the cloud that doesn't seem to matter, anymore—more space is more space, and somehow unlocking additional space on the cloud always seems to feel like we're unlocking the newest, best kind of space. Doesn't it?

On top of all that, we don't have to worry so much about security, either. Or maybe we just worry about it differently. That's because we know there are real experts and trusted brands and billions of dollars of investments on the other end of the cloud keeping our data safe and secure—both physically and digitally. We place some our most valuable, personal



digital assets in the cloud—our family photos, videos of important moments in our social lives—and, as time passes, the cloud feels more secure. The passing of time alone helps build our trust in the cloud, and it convinces us things are better this way.

We have enough to think about, so we're done talking terabytes and gigabytes. We're done with buying chunks of plastic and metal and connectors and cords just to eventually run out of storage space and find ourselves buying new chunks of plastic and metal and connectors and cords. We're done with misplacing our digital things, stuffing our full hard drives into a cardboard box in a dark corner of the basement, like a less personal, less meaningful collection of old photographs. The cloud and its intricate fog of technology has convinced us that this is the preferred way to store our things. The cloud keeps our digital lives safe, while making our most treasured digital assets available from virtually anywhere. We've learned that the cloud is as infinitely convenient as it is infinitely expandible.

"If we took the same approach with our banks that we take with our most cherished personal digital assets, could our banks begin to forget about hardware and physical technology and start to focus on the things that really matter?"

The best part of the cloud? When we don't have to think about the physical hardware and the complex networks and the underlying technologies that store and protect our data, we can focus on the things that really matter.

As consumers, we're convinced: The cloud improves our lives.

So, for those of us that work in the financial services industry, why are things different? Why have financial professionals and decision-makers been so slow and reluctant about accepting the cloud as a viable solution for data storage and computing power? If we took the same approach with our banks that we take with our most cherished personal digital assets, could our banks begin to forget about hardware and physical technology and start to focus on the things that really matter?

A FOUNDATION FOR MODERNIZATION & DIGITAL TRANSFORMATION

The cloud as a technological solution for on-demand data storage and computer system resources hasn't been around that long, but it's quickly become a trusted mainstream technology. It's one we utilize in our personal lives and in many areas of business. Despite its mainstream status, though, it's true that end users of the cloud have very limited details about what the solution really looks like, including how the network is designed, how servers are connected, where data is physically stored and located, and how that data is kept private and secure by cloud service providers.

The cloud as a solution lends itself to a certain level of personal interpretation, meaning it means different things to different people under different circumstances. It's not one solution itself, but rather it's a way of representing different ideas of similar solutions in one particular way. That characteristic has both positive and negative attributes when it comes to adopting the cloud as a business solution for a financial institution's infrastructure. It allows providers, advocators, and supporters of cloud technology to simplify and share complex technological ideas that include a network of servers, applications,

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and databases, while also maintaining a vagueness that eliminates what are generally considered unnecessary details from the perspective of end consumers. That vagueness, however, can alternatively lend itself to both confusion and misinterpretation.

With the kind of sensitive consumer financial data that financial institutions transmit, store, and process, vagueness is understandably something most banks aren't willing to introduce into their infrastructure. As regulated institutions, banks are required to maintain a level of certainty in how their consumer data is stored and managed. That means there are no unnecessary details. As a result, the cloud—as a solution for core banking systems, processes, and workloads—has presented some obvious challenges for financial institutions. Those challenges can be easily overcome, however, as more and more banks migrate to the cloud and regulators begin to provide guidance around privacy and security related to cloud solutions.

According to the MIT Technology Review, the term "the cloud" was originally coined by Compaq executive or technologist in 1996, and it was later introduced to the masses on an August 9, 2006, when Google's former CEO, Eric Schmidt, presented it to conference attendees in San Jose, California.[1] Since then, consumer adoption and acceptance of the cloud has grown exponentially. It's no secret that financial institutions have been slow to adopt it, though, with a reported 16% of regulated workloads on the public cloud.[2] That number is expected to rise considerably in the coming years, accelerated by a number of factors, including the push toward remote and digital workloads driven by the COVID-19 pandemic.

That acceleration, of course, implies that there were other forces at play prior to the pandemic that were pressuring banks to modernize and adopt cloud technologies before the world adopted face coverings, physical distancing, and intermittent periods of quarantine.

By 2019, the majority of Canadian banks were already engaged in internal discussions and discourse about core system modernization and digital transformation strategies that included conversation about cloud migrations. Challenged by their complex, aging legacy systems—many of which were designed in the 1980s and 1990s and based on outdated programming languages—financial institutions began to explore their options. Many were looking at the emergence of open banking in the United Kingdom and the use of application programming interfaces (APIs) and API banking as one approach for bringing their monolithic core systems into the future.

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While some international regulators were amending capital requirements and supporting the launch of new bank start-up units, others were exploring consumer data rights initiatives intended to give consumers more control over their data and make it easier

to switch between service providers. Open banking had launched and gained traction in places like the United Kingdom, Australia, and Singapore. By early 2019, the Canadian federal government followed suit and began exploring the merits of open banking. At the same time, new financial services applications were being launched by fintechs that provided more personalized digital banking experiences that seemingly exceeded the technological capabilities of traditional banks. Neobanks emerged. Their platforms were fresh, user-focused, and built from scratch using modern technologies. While banks were held back by their technology, newer fintechs struggled to scale, met with regulations that ultimately prevented growth and further innovation. As a result, partnerships began to form between banks and fintechs.

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All of those collective industry forces driving change and pressuring banks to adapt were ultimately aimed at the same thing—disrupting the traditional banking model to improve the banking experience for end consumers.

Driven by the innovations of large personal technology companies like Apple and Google, consumer expectations for banking were also changing. Not only were consumer mindsets changing as digital natives and millennials began to expect more intuitive digital experiences, better insight into their spending habits, along with more options, more transparency, and more control over both their data and personal finances, but the proceeding generation of financial service consumers had become more fluent in technology, too. The consumer perception of banks was changing. Banks weren't simply viewed as financial institutions in the traditional sense, anymore. There was a changing expectation that put our financial institutions and the services they provided under a new light, and consumers began to expect digital experiences that were akin to those offered by larger technology companies.

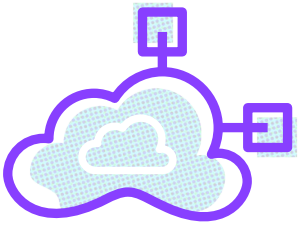
Buried among those industry pressures, cloud technologies had grown in popularity but had never held the spotlight in the larger discourse of digital transformation among most financial institutions. The cloud had become a side conversation for financial technology specialists and decision-makers, despite its potential

THE FOUNDATION FOR DIGITAL TRANSFORMATION

The cloud provides banks and financial insitutions with a secure technological foundation for consumer-directed finance and API-based system integration, while promoting scalability, adaptibility, and flexibility.

Scalable

Adaptable



Flexible

for laying a solid foundation for a bank's modernization and digital transformation.

The slow adoption rate of the cloud in the financial services industry is often attributed to a mix of complicated factors that include privacy, security, compliance, and regulatory requirements. Ironically, though, it's some of those same factors that are attributed to the benefits of cloud adoption in the financial services industry today.

Cloud service providers like Amazon Web Services (AWS) and Google Cloud invest billions of dollars in cloud security to ensure they maintain the highest standards for privacy and data security. AWS, a cloud platform and infrastructure often used in cloud banking deployments, is considered one of the most flexible and secure cloud environments available today, trusted not only by financial institutions but also government military operations that leverage it to manage and execute top-secret workloads. On top of that, cloud service providers allow financial institutions to easily monitor and receive third-party validation for key global regulatory requirements.

There's no question the industry is changing. Financial institutions are under pressure to adapt and create innovative, customer-centric digital banking experiences quickly and more efficiently, and that means making their antiquated legacy systems—the same systems that the industry has relied on and trusted for decades—more modern and more adaptable. That's no easy task. It means reevaluating internal core systems. It means adapting our infrastructures and applications and moving forward with technology that provides more flexibility and allows our institutions to scale. Technology is now and will continue to be a top priority for every bank, and the cloud is ripe with opportunities. It has the potential to set the foundation for modernization and digital transformation by offering efficiencies and opportunities across business units—from product innovation initiatives to testing, from cost efficiencies to third-party integration through the use of APIs. The cloud is an opportunity to take the lead as the industry shifts toward open banking and consumer-directed finance. For many institutions, responding efficiently and becoming more adaptable will mean migrating to the cloud sooner rather than later.

THE BENEFITS AND OPPORTUNITIES OF A CLOUD MIGRATION

A cloud migration is not simply about moving a financial institution's hardware, infrastructure, applications, data, and workloads to a public cloud service provider. Although that's a large part of what the initiative entails, a migration is an opportunity for financial institutions to reevaluate a bank's internal systems, applications, workloads, and processes in order to take advantage of the cloud's efficiencies and adaptability.

Not all cloud solutions will look the same. Every financial institution will have its own set of internal systems, applications, customizations, skillsets, and business processes. While some banks may opt for full public cloud deployments, other financial institutions may choose to take incremental or phased migration approaches. Those approaches could involve hybrid cloud deployments intended to take advantage of cloud platform benefits while also balancing security management preferences by maintaining control of some data and systems on a private cloud infrastructure. No matter what a financial services cloud solution looks like, a thorough analysis of a financial institution's internal processes and systems will help the identified cloud migration team implement changes that will improve business performance and allow the institution to strategically address how it will adapt to the changing financial landscape.

"A migration is an opportunity for financial institutions to reevaluate a bank's internal systems, applications, workloads, and processes in order to take advantage of the cloud's efficiencies and adaptability.

Ultimately, a cloud migration is an opportunity to position a bank for the future, identify the financial institution's role in the emerging consumer-directed financial ecosystem, and take advantage of the cloud's benefits, which may include the following:

- Efficiencies in operating costs and data management across business units
- Improvements to internal agile DevOps processes, rapid-testing capabilities, and product innovation-driven initiatives
- Access to on-demand data storage and elastic scalability
- Opportunities for improvements to IT security
- High availability and improved operational performance
- Improvements in redundancy and disaster recovery solutions
- Improved flexibility and adaptability of internal systems and processes
- Ability to initiate and execute core modernization strategies
- Opportunities to explore banking as a service (BaaS) and consumer-directed finance initiatives by leveraging software containerization and APIs

The right approach to cloud migration will not only balance cost, efficiency, speed, and scalability—the more obvious benefits of the cloud—but it will also ensure that banks are adopting a system that supports real technological innovation by creating a cloud-based infrastructure that allows for adaptable product development processes, DevOps improvements, rapid-testing opportunities, and the ability to expand the capabilities of core legacy systems through third-party integration and the use of APIs.

CREATING A BANKING MIGRATION PLAN & CORE MODERNIZATION STRATEGY

KEY ELEMENTS OF CREATING A CLOUD MIGRATION PLAN

The cloud is a foundational step toward a bank's digital transformation, so it's imperative for financial institutions to create a thorough strategic cloud migration plan that's designed around a detailed, deadline-driven roadmap of the cloud journey ahead. The cloud migration plan should provide a timeline and identify exactly how the financial institution will move its data, systems, and applications to the cloud, while providing a strategic perspective on how the cloud migration will directly contribute to the financial institution's overall digital transformation.

An ideal migration plan will not only capture the strategic migration of data, systems, applications, and business processes, but it will also offer a background analysis of industry-specific pressures, current infrastructure challenges, and opportunities to enhance the banking experience through APIs and modern technologies. Capturing everything from the technological challenges of legacy systems and casting them in light of an emerging paradigmatic shift toward open banking and consumer-directed finance will help ensure that stakeholders, members of the migration team, and internal business units are all aligned and understand the internal and external forces driving the cloud strategy.

A cloud migration plan may include the following:

- A detailed roadmap for the cloud migration journey
- An identified cloud service provider
- Disruptive competitive forces in the industry
- Current infrastructure challenges

- Industry-specific challenges
- Unique benefits to cloud migration
- The identified cloud migration leader and migration team
- Details of the proposed cloud-based architecture
- Information on how to effectively meet security and compliance requirements
- A list of deadline-driven key milestones
- A strategy for core modernization

EVALUATING A BANK'S CORE MODERNIZATION STRATEGY

Though the focus of cloud migration will be on building a secure, industry-compliant cloud-based infrastructure that promotes adaptability and innovation while mitigating risk to day-to-day operations, another key element of the cloud journey is evaluating how the cloud solution will lay the groundwork for a financial institution's core modernization strategy.

One of the biggest challenges in a financial institution's digital transformation is the reliance on legacy systems. Those core banking systems are some of the most trusted systems within a bank's infrastructure. Unfortunately, they are not designed or optimized to leverage new and emerging digital technologies. As a result, a cloud migration plan should carefully address and provide insight into how the financial institution plans to modernize and move forward with legacy systems and applications. Financial institutions may explore a number of strategies for modernizing legacy systems that may include API-driven rehosting strategies, replatforming, or system refactoring.

While some financial institutions may take a cloud-native approach to core modernization—effectively refactoring or recoding systems for cloud deployment—that strategy is not always a viable option. Legacy systems are complex and often designed as autonomous units, which introduces numerous challenges for financial institutions. This is where a phased approach to cloud migration might help institutions isolate and prioritize initiatives. Whether rehosting, replatforming, or refactoring systems, the cloud migration plan should outline the financial institution's strategy for core modernization.

For more information on developing an effective cloud migration strategy and moving financial institutions to the cloud, please contact Portfolio+.

ABOUT PORTFOLIO+

Portfolio+ Inc. connects financial institutions with customers and partners using innovative technologies. Its core banking software solutions and open banking technology are used by financial institutions in Canada and the UK. With its powerful +Open Banking Platform and fully documented RESTful APIs, Portfolio+ has the power to connect banks, credit unions, and financial institutions with the evolving ecosystem of financial services technology that is putting everyday customers in control of their financial data.

Located in the Greater Toronto Area (GTA), Portfolio+ is used by 5 of the 7* largest financial institutions in Canada and is a part of Volaris Group Inc.

For more information, visit portfolioplus.com.

*Based on TSE market capitalization figures retrieved in September 2020.

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