Rethinking Cross-Platform App Development in Financial Services

A guide for technology and business leaders in financial services

NearForm

> **Digital experiences are the deciding factor for this generation in choosing financial service providers. It's not a design issue, it's a survival issue.**

- Ger O'Shaughnessy,
Head of Propositions, NearForm

Learn more about cross-platform

NearForm offers an exciting new model of technology partnership for fast-moving companies. We don't just build game-changing digital products; we help our clients build the digital capability they need to scale and evolve in an ever-changing digital world. A remote-first company since 2011, NearForm employs exceptional technology talent across 29 countries. A relentless focus on great design and progressive technologies creates digital advantage for our clients around the world.

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Introduction

Banks and other financial service providers no longer have the luxury of using technology to just automate or digitize the services they already provide. Digital disruption is here, even for the biggest of institutions.

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From neobanks and digital wallet providers to open banking and open payments - there is now a shifting of the ground. Banking is being unbundled, one service at a time. Players like Revolut, N26, Chime, KoHo and others are winning massively in the new battleground for customers - the frontend. New players are rolling out innovative, personalized experiences and features in weeks and months compared to years for older providers who are bound by legacy technologies and ways of working.

One core blocker to innovation for financial services providers is the sprawl of frontend technologies and applications. These have accumulated as siloed solutions across many services. Teams are focused on maintaining technologies and tools rather than delivering value.

The frontend, in many cases, has not been built or architected with the discipline applied to backend services - creating technical debt, slow time to market for new features and a growing cost of ownership. Customer experience is inconsistent across the various channels and platforms and it's difficult and slow to change even small features.

Starting more software projects to create more systems and applications will not fix this problem. It requires a new approach.

The most successful companies in the world are based on frontend technology platforms that are architected to be flexible, scalable and extensible. They combine smart, layered architectures with modern technologies, tools and processes to create an extensible software 'product' rather than a maintainable software system. This allows teams to focus on building new services and features, rather than worrying about technology stacks and silos.

The opportunity for financial services providers is to use retooling as a chance to rethink.

Moving to a new frontend platform with a single codebase and a federated layered architecture solves many problems at once. While this may sound daunting, there are pragmatic and achievable steps to get there.

Financial Service providers can evolve by running 'lighthouse projects' to show the way and create the culture and tools to move faster. Small 'service slices' can be moved on to the new stack incrementally - delivering change and value while implementing a pragmatic bottom-up transformation.

The rewards are massive. The move to a modern stack and ways of working can not only solve issues with delivering continuous change, but also with attracting and retaining tech talent, and, it can help position financial services providers to lead in the digital economy.

In this guide, we offer our learnings from more than twelve years of helping financial services clients modernize their technology stacks and digital services. We outline the key areas of concern and opportunity at both an organizational and technical level.

Breaking it down

Rethinking how you deliver digital financial services is not all about technology. Just as important are other elements like talent, cost and productivity. These elements, done well, support your ability to deliver new services continuously, without going back to the drawing board every few years.

In our experience, there are some key things to consider when rethinking your approach to the frontend.

Photo by Studio Republic on Unsplash

+ Stop thinking 'systems' start thinking 'platforms'. Systems provide automation for existing services - platforms support continuous change.

What's the business case?

Transformations are hard. A clear business rationale can help to focus effort and priorities throughout the change.

For the frontend, there are some relatively simple qualifying questions to justify a more detailed cost/ benefit analysis.

01 Are your teams aligned by services or by technology?

02 Does changing one facet of your frontend interface require coordinating across multiple teams and technologies?

04 Does every change have to go through testing for all device types, OS versions and desktops?

05 Do you often compromise on a consistent client experience of services due to differences in mobile/web/other platforms?

06 Is it hard to hire against your 'new-legacy' technologies that are no longer popular with the developer community?

07 Is all of this getting worse because the number of channels is increasing?

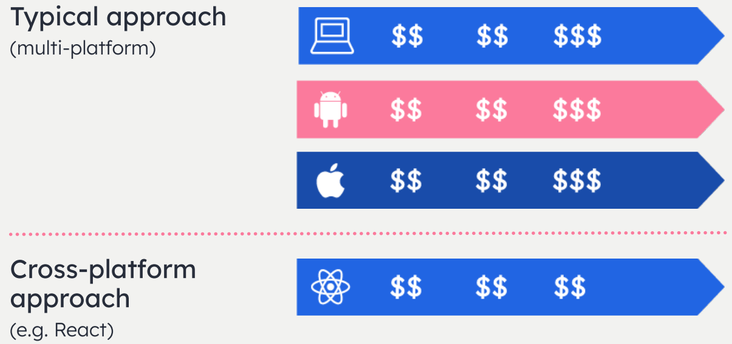
The majority of large enterprises can answer yes to some or all of the above. This can almost be accepted as 'the way things are'. However, given the new alternative frontend approaches and competition from digital native service providers, **the way things are** is now a major business risk. It is time to rethink.

Every business is different, but taking a simple view - coding, testing, deploying and maintaining across multiple platforms is inherently slower and more costly than taking a cross-platform approach and moving to a single-codebase frontend solution.

Even in terms of productivity, the time not spent customising for individual devices can be spent on 'above the value line' work focused on creating new services.

In real terms, we are seeing significant reduction in times for clients to get to market with new applications when they take a cross-platform approach.

Cost of ownership - opportunity



Up to **60% reduction in Total Cost** of Ownership

"Generally the time to market for any new app is about 30-40% less than it was, which is huge!"

Steve Tannock, Telus Digital
Director, Platform Technology and Tools

The Talent Piece

In the past, the expensive or scarce components of technology were hardware, memory and software. Today, the key constraints are around **tech talent and productivity**. How can you attract and retain the best talent and how can you apply that talent to get services to market, with the least friction and delay?

For the frontend in particular, many larger enterprises have drifted into adopting new and different technologies for each new wave of applications. As these technologies then become ‘new-legacy’, it becomes harder to find and keep good developers.

Tech leaders must think about their talent roadmap as a core component of the technology roadmap. Which technologies are at the sweet spot of adoption, maturity and popularity? Which tools and communities are best suited to keep your internal tech organization relevant?

How ‘vertical’ are the technologies you are choosing? For example, using deep native features in iOS can provide more wow factor in an application, but what is the long-term cost of keeping up with this operating system and keeping teams of specialist iOS developers?

Is there a more ‘sustainable’ choice?

Photo by Adomas Aleno on Unsplash

+ Moving to open source JavaScript-based languages could be seen as the ‘responsible choice’ for enterprise as it leads to reduced costs, broader collaboration and greater reuse.

For a long time, it was assumed that going native (iOS, Android) was the best and only way to get the experience required for high-quality mobile applications. But in the last five years, new technologies like React/ React Native have matured massively. They are used for mobile apps like Bloomberg, Facebook, Airbnb, Skype and Instagram. In parallel, React Web has grown massively in popularity for web frontends.

There is a dual opportunity here for enterprises who are rethinking their frontend. Technologies like React (JavaScript) offer the chance to move to a single codebase that works for both web and mobile and across all mobile devices. In addition, it is **the most popular frontend programming language with a huge developer community** - so hiring and retaining talent for this tech is guaranteed to be far easier for a long time to come.

Indeed, moving to open source JavaScript-based languages could be seen as the ‘responsible choice’ for enterprise as it leads to reduced costs, broader collaboration and greater reuse.

Beyond the languages and frameworks, a key part of attracting and retaining talent is the overall ‘DX’ or Developer Experience. By choosing and curating the right tools and culture to create great DX, your enterprise is not only creating a talent hub, but also enabling that talent to be highly productive. In today’s war for tech talent, we cannot underestimate the importance of your profile as a place to work for tech talent.

The Role of ‘DX’

When we talk about the frontend, we often think about what the user can see and experience. We should never forget that applications are built by developers and that the Developer Experience (‘DX’) determines the quality and timelines of applications being delivered.

In a recent Forbes survey[1], the number one reason that developers left a company was...

“They don’t feel like they are making a difference”.

To summarise the research - the core reasons developers feel this way is that a huge amount of their job is not creating innovative solutions, but navigating their way through a bad developer experience in their own company.

DX is not often deliberately designed or created in organizations, but is having a bigger and bigger impact on productivity. It is now a core component in continuous delivery, and, in retaining great developers - they will soon move on if the overall process is more friction than creation.

If you create a digital ecosystem with a great DX, then you have created a platform that allows tech talent to create impact with minimum friction. This has a direct impact on **time to market, costs and staff attrition**. There are practical ways to do this.

1https://www.forbes.com/sites/forbestechcouncil/2020/09/04/13-reasons-devs-leave-companies-and-how-to-turn-them-around/?sh=520affca48d7

At NearForm, we invest a lot in Developer Experience, because we know there are measurable returns in productivity, retention and even in the quality of code produced.

For example, for web engineering we are key contributors to Node.js and React and to web frameworks like Fastify as well as Mercurius (for GraphQL), which not only create a great experience for developers, but also give them the tools to create blindingly fast web experiences.

“Great DevEx is achieved when a dev can stay “in the flow” and you can focus on the problem at hand vs tangential concerns... a great principle is “code that changes together should stay together”, i.e. use Microservices and Microfrontends as team boundaries to help every team focus on their own codebase.”

Matteo Collina, Chief Software Architect, NearForm

“Try to have small teams, clear goals in a culture of trust. A major part of your toolkit as a developer is easy access to senior tech people in your org to ask, learn and grow. This should be core to your culture and seen as a healthy appetite to learn with no ego involved.”

Katie Roberts, Head of Engineering, NearForms

Scale and Performance

When strong digital experiences are core to customer loyalty, we must consider two key factors to ensure those experiences happen as planned.

01

Post-Covid, digital services usage has accelerated at rates beyond most predictions. This **massive increase in transactional volume and transactional peaks** is one of the reasons we see key applications, like mobile banking apps, collapsing more frequently.

02

The **performance and response time** bar is constantly being raised by massive tech platform companies who can afford to deliver rich, multimedia content to consumers at blinding speeds. Slow or bad response times are no longer tolerated by customers.

Not only is the frontend experience the new battleground for your customers' attention, it's also a battleground where slow response times or outages can lose you the entire war.

Ensuring high speed at high volume for digital services is a full-stack consideration. Well-architected and configured cloud services can handle peak, bursty traffic, but often the bottlenecks occur closer to the frontend where applications and APIs are not well-architected and are inefficient when under pressure.

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Photo by Brooke Cagle on Unsplash

For financial services, we see a variety of problems for end users caused by scaling/ performance issues, these include:

- Broken connections
- Timeouts/hung apps
- Delayed responses/poor response times above 2 seconds
- Security authentication retries/drop outs/ back to login
- In severe cases, transaction errors
- Mobile/web downtime screens/maintenance

Photo by Jason Briscoe on Unsplash

The above can be caused by a variety of overlapping problems. For example, poor capacity forecasting, lack of scale testing for releases, code interaction across backend/frontend, API comms, multiple authentication layers, etc. All of these issues can be addressed, and in many cases dramatic improvements are possible, simply by understanding how APIs and applications should be architected for scale.

NearForm has been solving major performance problems for large enterprises for years, from Amex, Condé Nast and News UK to Protocol Labs and Moody's.

We work with developers, architects and others to uncover bottlenecks and provide recommendations on how to solve them with the right tech stack implementation.

In many cases, learnings from one sector can advance another, for example, we have worked on hyper-scale problems for major video gaming providers and that work helps inform top performance in other sectors.

While working with existing technology and workflows, **we see huge opportunity for financial services in implementing more modern technologies for digital services** which can be finely tuned to eliminate bottlenecks and provide reliable, lightning quick response times to match current digital needs.

For the frontend and open source in particular, we contribute and lead in enterprise performance levels using a variety of technologies, frameworks and tools like Node.js, Fastify, HTTP2, GraphQL, Pino, Clinic.js, Mercurius and React ESX. We have built upon our expertise and our sheer focus to radically improve performance across the entire enterprise system architecture from top to bottom.

+ Check out the NearForm blog to get insights about how we use Node.js and a range of other technologies.

Choosing Technologies

Many enterprises have already decided to move towards a single codebase, cross-platform implementation for the frontend. We see this happening more and more every day across every sector, with financial services now following suit.

However, that still leaves choices around particular stacks/languages. For cross-platform mobile alone, options include Xamarin, React Native, Kotlin, Flutter and Sencha among others.

So, how to choose? As mentioned previously, this is partly a talent roadmap decision and the choice must also be right for each enterprise depending on everything from available experience, existing investments and the particular profile of usage, volume and change for the frontend.

We work with clients to understand the full picture, from the organizational to the technical aspects. How long will it take existing staff to be productive in the new language - or is that chasm too wide? For the predicted volume and type of transactions, what is the target response time and which is the best target framework to provide that?

Xamarin · Kotlin · Flutter · Sencha

Cross-Platform Checklist

- Developer availability
- Access to native functions
- Native UI features
- Development ecosystem
- Community Support
- Vendor Support
- Performance
- Code reuse
- Pricing
- App bundle size

While it's important to analyze and make data-led decisions, we find it can often help to try things out and get some end-to-end prototypes working early. This can often find hidden red flags and hidden wins for your own organization for both the technologies and ways of working before making bigger investments.

Getting Started, Getting Finished

Every organization is different. Most though, tend to struggle with changing everything (technology, organization, ways of working) all at once.

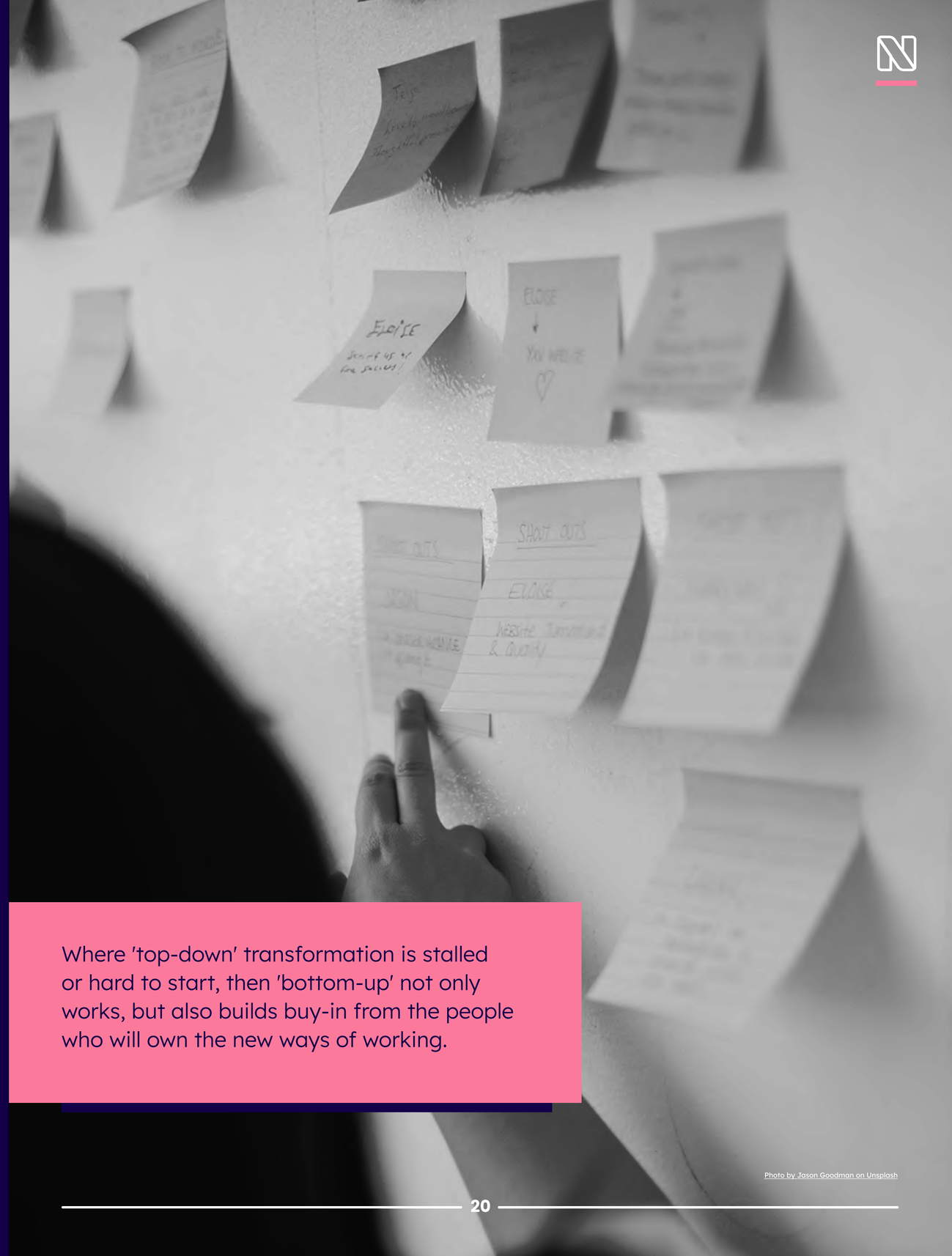
For those organizations looking for de-risked change, we find that a variety of options and tactics can help.

Lighthouse projects to prove the new stack, prove success and ‘show the way’ for the broader technical organization.

Creating working prototype services on the new stack to find red flags early and also creating something to ‘show’ in the organization that helps with buy-in.

Getting end-to-end service slices based on new technology into production incrementally. This delivers value as you go and is the essence of ‘performing while transforming’.

Lasting adoption by technology teams should be the paramount goal when moving to a new technology. Providing a full suite of ‘Developer Experience’ tools, workflows, processes and mentors helps to support adoption at every point of the journey.



Where 'top-down' transformation is stalled or hard to start, then 'bottom-up' not only works, but also builds buy-in from the people who will own the new ways of working.

Photo by Jason Goodman on Unsplash

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Some of our clients:

Walmart | TELUS | CONDÉ NAST | EY Building a better working world

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