

The Forrester Guide To Cloud Modernization

Five Approaches To Balance Investment, Benefits, And Constraints

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Summary

“Modernization,” among the most dreaded words in IT, is finding new fans. Why? Cloud technologies and practices give software delivery teams new options for digital transformation that are far less career threatening than those of earlier eras. Cloud-native technologies also help teams improve customer experience and implement modular architectures that are more adaptive to change, enabling them to adopt cloud platform services that help eliminate old code and accelerate their enterprise transformation. This report defines the **three key goals of modernization, the five major modernization approaches, and the five constraints that cloud leaders will need to navigate.**

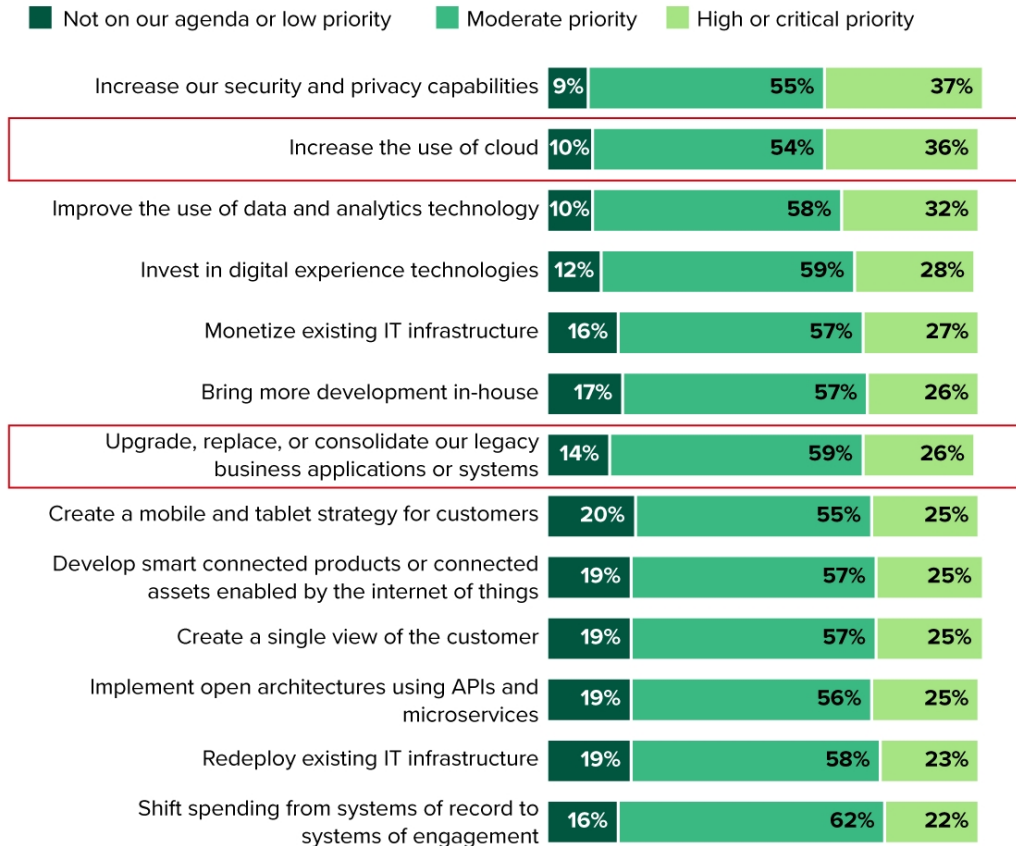
Cloud Strategies Expand To Include Core Modernization

COVID-19 has reinforced the tremendous value and necessity of cloud to the global economy. Without cloud apps, tools, and services, we couldn't have sent millions of workers home, maintained global supply chains, or shifted entire industry business models in just weeks. The rush to cloud also exposed stark contrasts between companies that embrace cloud technologies and those that have resisted or underfunded them. In 2020, more than one-third of purchase influencers at enterprises indicated that increasing the use of cloud would be a high or critical priority in the coming year (see Figure 1). Over the next two years, infrastructure decision-makers plan to increase the percentage of cloud-native applications substantially (see Figure 2). Modernizing core applications such as transactional record-keeping; foundational services like order management, billing, and scheduling; and core operating processes will be essential. **More than one-quarter of software decision-makers said that modernizing key legacy custom-developed applications and migrating existing applications would be among their organization's top software initiatives over the next 12 months.**

Figure 1

The Cloud Takes Center Stage In The Pandemic Recovery

“Which of the following technology initiatives is your IT organization prioritizing over the next 12 months?”



Note: Percentages may not total 100 because of rounding.

Base: 770 global purchase influencers (past 12 months/next 12 months) at enterprises (1,000+ employees) who responded during COVID-19

Source: Forrester Analytics Business Technographics® Priorities And Journey COVID-19 Recontact Survey, 2020 (April 29 to May 25, 2020)

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Figure 2

The Push To Cloud Is Picking Up Steam

“What percentage of your total application portfolio have you already migrated to the cloud, and what percentage do you plan to migrate in the next two years?”



Note: Percentages are the average of all responses received in each category.

Base: 1,612 global infrastructure decision-makers at enterprises (1,000+ employees) whose firms are migrating to a cloud computing infrastructure

Source: Forrester Analytics Business Technographics® Infrastructure Survey, 2020

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Application Modernization Must Embrace A “Digital First” Mindset

Application modernization is a topic almost as old as business computing, but it falls victim to prioritization because companies often kick the can down the road. Our survey findings are part of the growing body of evidence that companies can no longer delay modernizing core applications as they enter the digital world — and anecdotal evidence suggests that the COVID-19 crisis has only added to that imperative.

However, tackling application modernization as part of a digital transformation brings its own engagement requirements. Forrester defines application modernization for the digital age as:

Modernization that, through refactoring, rearchitecting, and/or replacement, delivers modern customer experiences from existing applications while increasing their business value and technical responsiveness.

The traditional reasons to modernize applications include end-of-life hardware and software, cost optimization, reliability, scale, and performance. But today, two additional

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business realities drive the desire to modernize applications:

- **Increased pressure to support digital-first business models.** Digital business is the pervasive automation of business data, operations, actions, and strategies that range from back-office record-keeping to customer experiences. The COVID-19 crisis painfully exposed the digital gaps in even highly technical companies. Few enterprises have all the software they need to be digital-first businesses. The result: a race against time as technology leaders fill gaps in their digital capabilities and digital customer experience before competitors can exploit them.
- **Continual change and evolution.** Enterprises also digitize to allow prompt responses to sudden changes in markets, customer preferences, and regulatory environments as well as unpredictable disasters, including pandemics (and events within pandemics). Digital businesses update and evolve their software continually to keep pace — or even set the pace of change in their fields.

The Three Goals Of App Modernization

Implicit in the app modernization definition are the three goals that any application modernization effort must achieve:

- **Modernize the experience.** Today's customers are accustomed to always-on web or mobile applications where they can easily access information and take action. The static screens, hard-to-navigate interfaces, and limited personalization in most core business applications can be frustrating and time consuming, even where they remain functional. It's frustrating for employees to hold different standards for customer experience expectations and their own internal technology experiences, at times serving customers behind the scenes with an app they'd be embarrassed to show a client. Up-to-date user experiences can reduce or eliminate employee training time, enable customer self-service, and give employees more time to focus on key tasks and customer interactions.
- **Increase adaptability with modular architectures.** Modular system architectures feature loosely coupled software and enable incremental releases via fewer static dependencies. The result: Development teams gain flexibility in how they deliver new features, fix defects, and pay down technical debt. Taking this approach with core applications makes it easier to accommodate changes in interactions with other systems and respond to changing customer needs.
- **Add new functionality and reduce risk by adopting cloud platform services.** The advent of software as a service (SaaS) has blurred the boundary between an

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organization's IT infrastructure and cloud platform services. Teams can now integrate managed services, from CRM to finance, e-commerce, payments, and beyond. These platform services offer modern user experiences and greater functionality. And now, "headless" cloud platforms increasingly offer managed services and robust APIs that development teams use to build highly tailored customer experiences. As teams replace core application functionality with these cloud services, they write (and maintain) less custom code.

Five Approaches To Modernizing Core Apps With Cloud

Software development leaders are on the hook to modernize applications, usually in concert with their colleagues in infrastructure and operations and enterprise architecture. In our conversations with IT decision-makers across numerous enterprises, we find teams applying five different approaches (see Figure 3). Technology organizations are using all of them in roughly equal measure as they migrate applications to the public cloud (see Figure 4). Each has its own advantages (see Figure 5). The five approaches are:

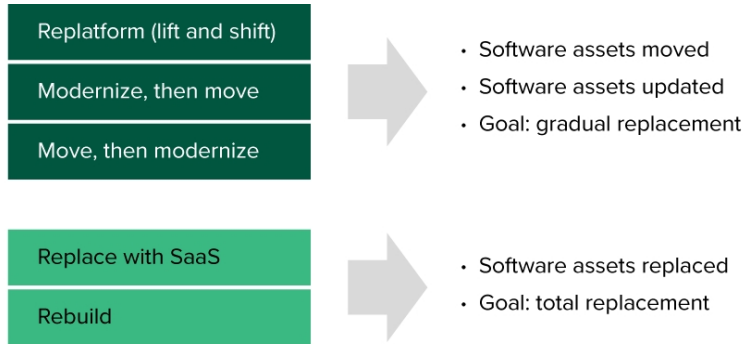
- **Replatform.** We include this lift-and-shift approach for completeness. While it's a fine tactic for teams looking to evacuate data centers and reduce ongoing operational expenses, it's a poor way to achieve the digital-first goals of app modernization. Development teams should view replatforming as a first step in a subsequent refactoring and/or rearchitecting of applications, but all too often, it becomes an end in itself. Teams taking this approach may see a reduction in hardware operating costs or change where an app is hosted, but a simple migration to a public cloud does little to make the software elements of an application easier to operate. And without changes to application architecture that increase modularity, leaders should expect minimal improvement to release velocity. A lift-and-shift also does little to improve customer experience and nothing to improve an application's user interface.
- **Modernize, then move.** When teams apply this strategy, they dive straight into modernization in place by breaking monoliths apart into microservices wrapped with APIs and events that result in fewer hard-coded dependencies. If organizations do this well, they see greater freedom to deliver incremental changes and increased velocity. Liberty Mutual launched its modernization of core apps by repackaging code into containers on-premises. That work set the stage for a transition to the public

cloud and greater operational effectiveness. Once the data was in the cloud, modernization efforts accelerated, with most new web applications built natively for the cloud and the deployment of 8 million functions as a service. The result: the retirement of 6,000 on-premises systems, closure of a data center, and an overall budget reduction of 9%.

- **Move, then modernize.** This approach often starts by replatforming existing applications, using core cloud compute, storage, and networking services. But then, teams begin to chip away at the monolith by strangling it one subsystem at a time. Another option: replacing existing subsystems with managed cloud services (e.g., replacing a MSFT SQL Server instance with Microsoft Azure SQL Database). Containers and Kubernetes made it easy for [KeyBank to scale new cloud-native workloads](#), but the bank wanted to bring “burstability” to its traditional VM-based infrastructure as well. The solution? Using Anthos, move workloads to Google Cloud, keeping some on-premises using hyperconverged infrastructure and managing it all from the cloud. Moving first, then modernizing, provides immediate operational benefits even before moving to containerization.
- **Replace with SaaS.** For many years, companies had few options for big core applications such as enterprise resource planning (ERP) and had to devote substantial IT resources to maintain and upgrade them — often with complex customizations. SaaS providers have targeted those users with a more flexible approach for a range of functions, from HR onboarding to CRM. And interest is high. A state government organization decided to replace a custom mainframe-based case management system with a SaaS alternative. To build the business case, it tallied ongoing maintenance costs and the cost of limited extensibility, which makes it difficult and expensive to meet new mandates. The organization balanced these costs against the expenses of implementation and ongoing maintenance of the new SaaS offering at scale. The benefits of improved modularity and a modern user interface helped amplify the cost saving of the SaaS alternative.
- **Rebuild with a bespoke application.** This option is exactly what it seems: Start over with a brand-new application built with cloud platforms and technologies. The option has two branches: 1) use modern coding platforms or 2) use low-code platforms. Liberty Mutual took the first route, using cloud-native technology to push data out of its traditional core to build its own content management system on the public cloud, walking away from established vendors in that space. [Banco Santander Consumer Portugal](#) took the low-code approach; over the past few years, KPMG has replaced 70% of its core systems with 14 applications built on OutSystems.

Figure 3

The Five Approaches To Modernizing Apps With Cloud

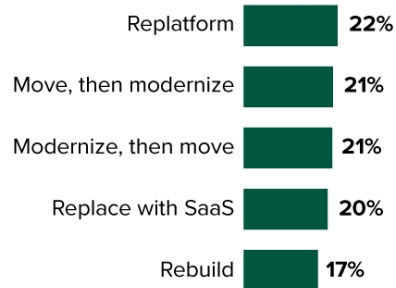


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Figure 4

Teams Take A “Yes, And ... ” Approach To Modernizing Application Portfolios

“Thinking of all the applications your organization has migrated to public cloud specifically, what percentage of workloads have used the following approaches?”



Note: Percentages are the average of all responses received in each category and do not total 100 because of rounding.

Base: 1,195 global infrastructure decision-makers at enterprises (1,000+ employees) whose firms are migrating to public cloud

Source: Forrester Analytics Business Technographics® Infrastructure Survey, 2020

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Figure 5

Each Modernization Approach Has Distinct Advantages

Strategy	Replatform	Modernize, then move	Move, then modernize	Replace with SaaS	Rebuild
Optimize infrastructure costs	✓	✗	✓	✓	✓
Optimize software costs	✗	✓	✗	✓	✗
Improve security	✗	✓	✗	✓	✓
Improve application functionality	✗	✓	✗	✓	✓
Improve operations	✗	✓	✓	✓	✓
Improve business responsiveness	✗	✓	✗	✓	✓
Minimize business disruption	✓	✗	✓	✗	✗
Modernize architecture	✗	✓	✗	✓	✓

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Five Constraints Will Shape Your Modernization Approach

When selecting an approach for each application in your portfolio, evaluate five common constraints and weigh them against the advantages. These constraints will vary by application, and as a result, expect to use multiple modernization approaches for your broad portfolio of applications. The five constraints are:

- **Cost-to-value assessment.** In short, the business case for your application modernization effort must work. You don't have the time and resources to modernize everything. However, some modernization efforts are mandatory at almost any cost; the prime examples are badly outdated and poorly supported legacy systems or

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systems that no longer comply with evolving regulations. You'll need to prioritize within your portfolio in accordance with budget constraints. What isn't obvious to most enterprises is that you must assess costs for a single application across each modernization approach or risk breaking the bank due to poor planning. For example, adding a real-time fund-balance field to an online customer form that updates balances daily with an overnight batch process could cost millions under an improve-then-move approach.

- **Special application requirements.** Some applications aren't easily moved to cloud-native architectures because of ultra-low latency requirements, data gravity issues, or a need for ACID-compliant transactions. In other cases, application interdependencies like shared databases will limit options for modernization. Mainframe-era programming languages and related product dependencies such as the IBM z/Transaction Processing Facility (z/TPF) will narrow choices for modernization, too. However, public cloud providers are aiming to fill this gap, so expect more options to emerge over time. For specialty apps, you may need to consider blending integration, x86 replatforming, and semiautomated conversions.
- **Risk of disruption to business operations.** Should you fix an application even if it isn't broken? Sometimes, the impact to the business precludes a thoroughgoing modernization of a critical core application. But there are workarounds; for example, opting for a more cost-effective and easier-to-maintain SaaS alternative, even if it's functionally inferior to the current app. Another tactic: using the [Strangler pattern](#) to gradually replace a critical application while it continues to operate. This pattern is valid for both the "modernize, then move" and the "move, then modernize" approaches.
- **Technical features of a cloud platform.** The hyperscale public cloud providers have vast capacity — but it isn't always available when, where, and how you need it. Support for hybrid cloud services, on-premises integration options, and security interconnects varies. If low latency is critical, make sure your cloud provider can support colocation of older technologies and adequate network capacity. This not only affects vendor selection but must also influence your modernization approach, as approaches are heavily tied to certain technologies. Approaches can also accentuate or alleviate shortcomings, making them a key consideration early in your modernization journey.
- **Confidence in software-delivery software processes.** Custom development requires both development talent (either on staff or via partners) and modern development processes. Without confidence in either, you may end up delaying your modernization

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or favoring approaches that replace existing solutions with managed services or low-code extensions. If you're modernizing custom applications with new custom services, be prepared to compete for talent and invest in modern software development. Developers are attracted to organizations with a commitment to modernization and the opportunity to work with cloud-native technologies.

Supplemental Material

Research Methodologies

The Forrester Analytics Business Technographics® Priorities And Journey COVID-19 Recontact Survey, 2020, was fielded from April 29 to May 25, 2020. This online survey included 1,755 respondents in Australia, Canada, China, France, Germany, India, the UK, and the US who had already completed the Forrester Analytics Business Technographics Priorities And Journey Survey, 2020. The Forrester Analytics Business Technographics Infrastructure Survey, 2020, was fielded between July and August 2020. This online survey included 3,597 respondents in Australia, Canada, China, France, Germany, India, the UK, and the US from companies with two or more employees. Forrester Analytics' Business Technographics ensures that the final survey population contains only those with significant involvement in the planning, funding, and purchasing of business and technology products and services and in marketing efforts. Dynata fielded these surveys on behalf of Forrester. Survey respondent incentives include points redeemable for gift certificates. Please note that the brand questions included in these surveys should not be used to measure market share. The purpose of Forrester Analytics' Business Technographics brand questions is to show usage of a brand by a specific target audience at one point in time.

Companies Interviewed For This Report

We'd like to thank the individuals from the following companies who generously gave their time during the research for this report. Beachbody Liberty Mutual SabreWest



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