



Move Fast Without Breaking Things

Navigating the Modernization Paradox

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The core paradox: Stability vs. innovation

The pressure to innovate in IT has never been greater. The rise of AI, the demand for data-driven insights, and the relentless pace of digital transformation are driving organizations to modernize. At the same time, enterprise IT faces a fundamental challenge: the mission-critical systems that power the global economy are often the most difficult to modernize. This tension is what we call the Modernization Paradox.

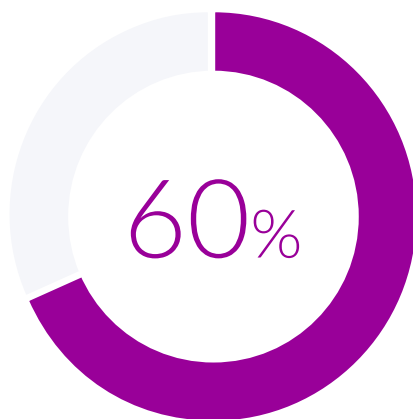
More than 60% of C-suite executives identify IT modernization as a top priority. However, over 70% of large-scale transformation projects fail to deliver.

Common approaches, such as full system rewrites, frequently lead to budget overruns, extended timelines, and project failure.

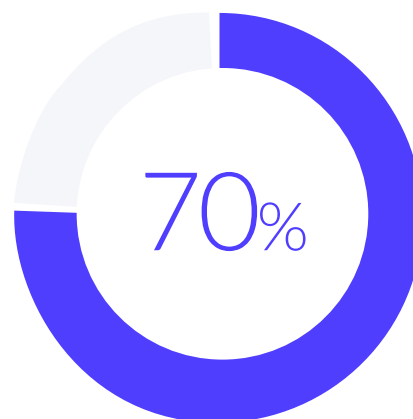
Organizations are left struggling to balance the need for innovation with the risks of disruption.

Precision Modernization offers a better path forward. This framework focuses on incremental, high-impact changes that unlock data, build momentum, and bridge the gap between established systems and modern technologies. It allows IT leaders to move quickly while preserving the stability of what already works.

By addressing the challenges at the heart of this paradox and adopting a deliberate, strategic approach, you can drive meaningful innovation, reduce risk, and position your organization for long-term success.



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The enduring power of core systems

Despite decades of hype cycles predicting their demise, platforms like mainframes and IBM® i remain the bedrock of global commerce. These systems aren't relics; they're resilient, secure, and high-performing engines that process a staggering volume of transactions. Every day, they support \$3 trillion of commerce, from credit card swipes and flight bookings to banking and insurance claims.

However, a significant disconnect exists. According to a recent IDC study, less than 30% of organizations are fully leveraging the data within their mainframe systems. This data represents the crown jewels of your business — a rich, transactional history that's essential for context-aware AI and intelligent decision-making. The inability to access and utilize this data is a massive roadblock to innovation, especially given AI's voracious appetite for high-quality information.

Several factors contribute to this challenge:

Compliance and security

The average company spends around \$5.5 million annually on data compliance, with highly regulated industries spending upwards of \$31 million. This significant investment is a necessary defense, aimed at protecting sensitive data and avoiding breaches.

The skills gap

Finding talent with expertise in these core systems is becoming increasingly difficult. The IT skills shortage is estimated to cause \$5.5 trillion in losses from project delays, quality issues, and lost revenue. This gap not only slows progress but also introduces significant modernization risk.

Unstructured data

Up to 90% of an organization's unstructured data, locked away in emails, PDFs, and log files, is barely used. While AI offers a path to unlock this information, its full value is realized only when combined with the transactional data from core systems.



The failure of "big bang" transformations

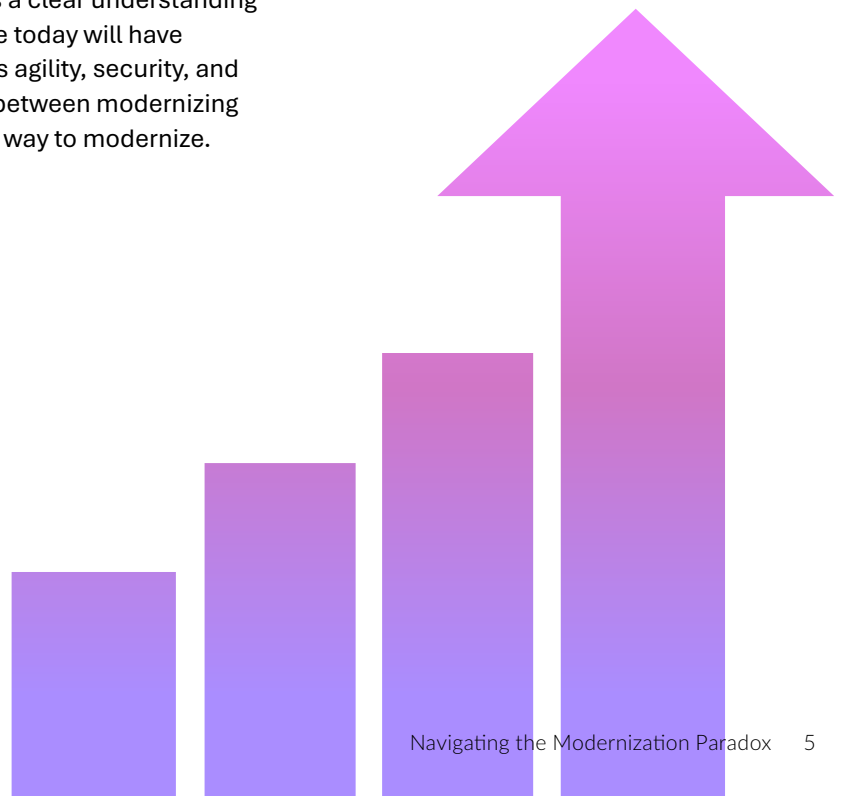
Faced with these challenges, many organizations fall into the "rewrite trap." The idea is to tear everything down and start from scratch with a new, cloud-native or AI-native architecture. While appealing in theory, this approach is fraught with risk. In fact, around 90% of these large-scale rewrite projects fail.

Organizations consistently underestimate the complexity of their existing applications and the challenges involved in modernizing them. Decades of business rules, exception handling, and custom logic are often embedded directly in the source code, with little or no external documentation. Attempting to replicate this intricate logic from scratch is a primary reason why projects fail to deliver, as a large public sector financial institution in the Asia-Pacific region discovered firsthand. The institution spent seven years and nearly a billion dollars trying to rewrite a critical application, only to have the project fail due to scale and performance issues. The new system never launched, and the organization ended up exactly where it started, but with immense financial and reputational damage.

Unfortunately, this story isn't unique. The problem isn't the technology itself, but the assumption that a complete overhaul is the only path forward. The reality is that a more measured, strategic approach is required.

Strategic implications: The price of action and inaction

Navigating the Modernization Paradox requires a clear understanding of the strategic stakes. The decisions you make today will have profound consequences for your organization's agility, security, and competitive standing. The choice isn't simply between modernizing or standing still — it's about choosing the right way to modernize.



The risks of the status quo

Inaction isn't a viable strategy. While your core systems may be stable today, failing to evolve them creates compounding risks that threaten the future of your business.

Data paralysis

Keeping your most valuable transactional data locked in core systems prevents you from harnessing the full power of AI and analytics. Without access to the data that reflects what's happening in your business at this moment, any insights derived from unstructured data will lack critical context.

Knowledge drain

As experienced professionals retire, critical system expertise goes with them. This increases operational risk and further complicates and increases the cost of future modernization efforts.

Competitive disadvantage

While you stand still, nimble competitors and fintechs are innovating. They're using modern development practices and data strategies to deliver superior customer experiences and capture market share. Maintaining the status quo is a slow but certain path to obsolescence.

Increased security and compliance burden

Older systems can become more difficult to secure and bring into compliance with evolving regulations. The cost and effort required to protect these environments will only increase over time, redirecting resources away from innovation.



The benefits of strategic modernization

A thoughtful, incremental approach to modernization delivers powerful benefits without the existential risk of a full rewrite. It allows you to build on the strengths of your existing infrastructure while systematically addressing its limitations.

01

Unlocking business value

By connecting modern APIs to your core systems, you can leverage critical data and functionality. This enables new digital services, improves the customer experience, and creates new revenue streams, as demonstrated by a national railway company that implemented differentiated pricing by modernizing its core application piece by piece.

02

Accelerated innovation

Adopting modern DevOps tools and CI/CD pipelines for existing applications allows your teams to iterate and deploy changes as quickly as they do with modern languages like Python or Java. This agility empowers you to respond faster to market demands.

03

Risk mitigation

An incremental approach allows you to achieve "big little breakthroughs." By beginning with smaller, well-defined projects in contained environments, you can prove the value of your strategy, build confidence with regulators and stakeholders, and gain momentum for future phases. This was the strategy of a large public services agency that successfully modernized its COBOL applications by starting in a single, highly regulated market before scaling globally.

04

Bridging the skills gap

Modernization empowers you to bring in new talent. By creating modern interfaces and using tools that abstract away the underlying complexity, junior developers can become productive on core systems without needing decades of specialized experience. AI-powered tools can also assist with code explanation, up-leveling your existing teams, and making them more effective.



An actionable framework: Precision modernization

The path through the modernization paradox isn't a wrecking ball but a scalpel. We call this approach Precision Modernization: a framework for moving fast without breaking things. It's about knowing exactly where to optimize, what to change, and what to preserve. This strategic and incremental method allows you to build on what already works, making steady progress without disrupting the core business.

Step one: Strengthen the foundation

Before extending your systems, optimize them. Focus on improving the operational efficiency and development agility of your current environment.

Enhance observability and performance

Implement modern monitoring tools to gain deeper insight into the performance of your core applications. Optimizing the "run side" of your systems reduces costs and frees up resources for innovation.

Adopt modern DevOps

Introduce modern CI/CD pipelines and automated testing for your existing codebase. A large public services agency successfully did this for their COBOL applications, enabling them to iterate with the same speed as their fintech competitors. This allows you to implement change faster and more safely.



Step two: Modernize at the edges

With a stable core, you can innovate around the periphery. Focus on improving how other systems and users interact with your core platforms.

Expose data with APIs

Build secure APIs to provide controlled access to the data and business logic locked within your mainframe or other core systems. This is often the fastest way to deliver value, enabling new mobile applications, customer portals, or data analytics initiatives.

Improve the user experience

Create intuitive, user-friendly interfaces for existing applications. This not only improves productivity but also reduces training time and makes it easier for new employees to become effective quickly.

Integrate and automate

A national railway company we worked with added an integration server around its core system. This allowed them to connect the application with modern tools, automate processes, and enable programmers to work in Python rather than the original programming language.



Step three: Evolve the core incrementally

Modernizing the core is essential, but it must be done with surgical precision. Avoid the "rewrite trap" by targeting specific components for change.

Identify high-impact areas

Analyze your applications to find the functions that are creating the biggest business bottlenecks. For example, the railway company focused on modernizing the part of its system that handled pricing to unlock new revenue.

Modernize piece by piece

Instead of rewriting an entire application, refactor or replace individual modules. This phased approach mitigates risk and allows you to deliver business value at each stage of the process.

Leverage AI as an accelerator

Use AI for code explanation and analysis to help your teams understand complex legacy code. While AI isn't a silver bullet for rewriting applications, it can greatly accelerate the process of untangling business logic and identifying dependencies, making your modernization efforts faster and more accurate.



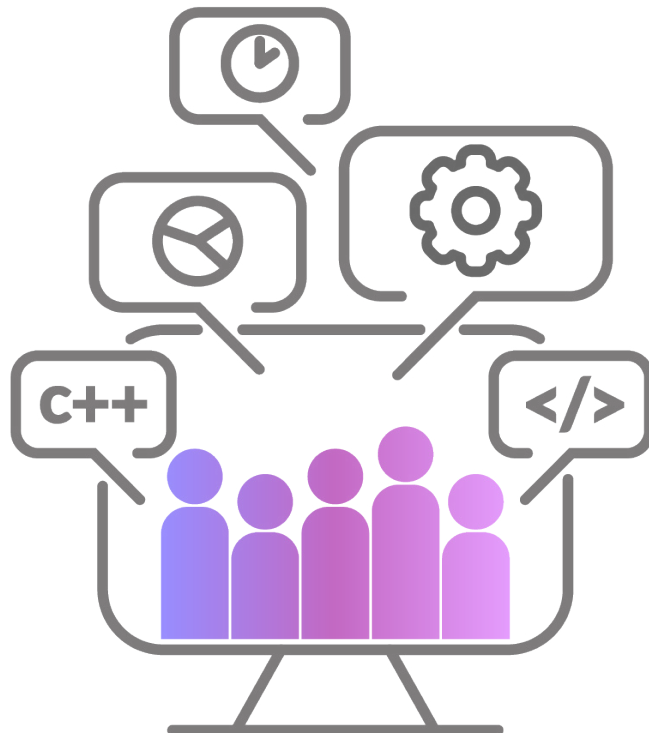
The future is hybrid

The IT landscape is littered with the hype of bygone eras, each promising to solve everything. Today, that hype is centered on AI. But real progress does not come from adopting a single technology or betting everything on a grand transformation. Instead, the most resilient organizations recognize the enduring value of their core systems and embrace the future through integration, not replacement.

A hybrid approach — bridging trusted core infrastructure with cloud platforms, analytics, and new AI capabilities — enables businesses to unlock the strengths of both worlds. Precision modernization empowers you to deliver value rapidly and reliably by making deliberate, incremental changes that respect the complexity and proven stability of your most mission-critical applications. This approach reduces risk, accelerates time to value, and ensures continuity for your users and customers.

Looking ahead, IT leaders who combine vision with pragmatism will be best positioned to meet growing business demands. By forging ahead with intentional, step-by-step modernization, you build a strong foundation for innovation while safeguarding daily operations.

Your modernization journey is ongoing. With a strategic, hybrid mindset and a commitment to continuous progress, your organization can capture new value from existing investments, leverage emerging technologies, and ensure enduring success in a rapidly changing world.



About Rocket Software

Rocket Software is a global technology leader in modernization and a partner of choice that empowers the world's leading businesses on their modernization journeys, spanning core systems to the cloud. Trusted by over 12,500 customers and 750 partners, and with more than 3,200 global employees, Rocket Software enables customers to maximize their data, applications, and infrastructure to deliver critical services that power our modern world. Rocket Software is a privately held U.S. corporation headquartered in the Boston area with centers of excellence strategically located throughout North America, Europe, Asia and Australia. Rocket Software is a portfolio company of Bain Capital Private Equity.



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