

Trend Topic: **Modernization**

By



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Driving Modernization Success Through System Transparency

Why modernization has become urgent

For many years, the highest priority for enterprise IT systems was stability. Mission-critical systems at the heart of business operations — particularly core banking systems — were expected to keep running without interruption, 24 hours a day, 365 days a year, for decades. In fact, over the past nearly half a century, many core systems have continued to operate reliably while avoiding major changes.

But stability alone is no longer enough in today's world. New AI models are emerging every few weeks, while cloud technologies, APIs and agentic systems are rapidly becoming mainstream. The assumptions on which businesses operate are changing dramatically. As market conditions and customer needs evolve at an unprecedented pace, companies need not only stability, but also adaptability — the ability to respond to change. This is where modernization, the process of renewing legacy systems, becomes essential.

At the same time, many core systems built decades ago have become black boxes. There is almost no one left within the company who fully understands systems written in older languages such as COBOL, PL/I, or assembly languages, and in many cases, there is no proper documentation or clear instruction on how to operate them. These systems have continued running largely untouched, even though almost no one knows exactly what is inside them or why they are still working. Even if organizations can find engineers who still understand legacy programming languages, many of these systems have become

so complex and bloated through decades of modifications and feature additions that they now exceed human cognitive capacity. Trying to change such a black box is like waking a sleeping lion. If the system goes down, the impact could spread across the entire business. That is why any change or modernization naturally creates a great deal of anxiety. Yet continuing to rely on such aging systems can also create significant operational risk.

If we look at the market, change has already begun. As we move into the AI era, markets and customer expectations are evolving, and business requirements will continue to evolve. Companies cannot respond to what lies ahead simply by continuing to do the same thing every day. IT is no longer just a tool; it is part of a company's assets. If a company cannot control its own systems, it cannot control its own business.



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The modernization mindset

In my view, there are three major barriers that prevent leaders from moving forward with modernization:

Fear - When executives consider modernizing their systems, many immediately picture a large-scale transformation requiring significant investment and years of effort. Taking that first step can feel daunting. In reality, "big bang modernization" projects that attempt to replace everything at once often run over budget, take longer than expected, and have relatively low success rates.

That is why a more gradual approach can be effective. We often describe it as "peeling an onion." Organizations prioritize individual business functions and services, then modernize them step by step. By breaking the challenge into smaller pieces, they reduce both risk and cost. Just as importantly, each successful outcome builds confidence for the next stage, allowing clients to see for themselves that the approach works.

When one modernized service delivers tangible results, such as reduced maintenance overhead or more scalable third-party integration, it creates a positive ripple effect. Leaders and team members from other areas see those benefits in action, shifting the organizational mindset from fearing IT risk to actively seeking business growth. What begins as a single modernization effort can therefore build momentum across the organization, encouraging others to follow and accelerating transformation as a whole.

A stability mindset - Mission-critical systems in industries such as banking, insurance, and public infrastructure operate under the constraint that they cannot stop, 24 hours a day, 365 days a year. Of course, system stability is essential. Even top tech companies such as Microsoft and Google experience system outages from time to time. But if you look at their growth over a period of years, those incidents do not define them. They continue to grow because they combine advanced technology with a strategy that allows them to adapt and evolve.

One regional bank we supported through a modernization program not only succeeded in building a next-generation core banking system ahead of many of its peers, but is now looking to turn that experience into a new business by sharing its expertise with other banks. The bank is also developing a range of new products and services. Over the course of its two-and-a-half-year modernization journey, it not only digitized customer touchpoints but also developed a culture of challenging itself to do new things. That mindset has become a source of long-term value, giving the organization the confidence to take the first step when the next wave of change arrives.

Consensus paralysis - Today's world does not reward stability. It rewards adaptability. To succeed in this environment, leaders need to change their mindset. Too often, organizations wait for someone else to initiate change, or they postpone decisions

until a broad consensus emerges. But the pace of technological and market change is simply too fast for that approach. Organizations need leaders who are willing to act, make decisions, and create the conditions for transformation before certainty arrives.

Leaders must lead by example. They need to take the first step and actively support transformation. Waiting for everyone to reach consensus can take forever. Even when people on the front line want change, they often cannot make it happen by themselves. That is why leaders must create permission to experiment and build an environment where people feel empowered to try new things.

Bringing transparency to the black box

According to research, 34% of companies cite enabling AI capabilities as a reason for pursuing modernization.¹ Also, AI is a major catalyst of modernization. Yet AI is still maturing. Simply introducing AI into a system that has been in use for nearly half a century is unlikely to make it work effectively — and may even create new risks.

A step akin to a medical diagnosis needs to take place before introducing AI. At a hospital, doctors first use X-rays, MRI scans and blood tests to examine what is happening inside the body and identify the location and extent of a problem. The same approach needs to be applied to systems. If AI is allowed to read legacy code from the outset, it tends to hallucinate. We therefore begin by analyzing the internal structure of the legacy system without using AI, then feed those findings into AI as a guide, enabling it to analyze the code and dependencies in greater detail. Research shows that the average enterprise runs 383 business-critical applications, yet 54% of companies have little understanding of the dependencies between them, and one in four has undocumented or opaque “dark applications.”¹ Using the process described, it is possible to visualize those internal structures and dependencies and produce specifications that people can understand. By making the system visible and understandable rather than creating another black box, enterprises retain the ability to understand their own systems and make their own decisions.

Then, just as a doctor discusses treatment options and priorities with a patient, it is possible to

determine what the problems are, what modernization could change, and how non-functioning elements can be removed. As I mentioned earlier, modernization is often like peeling an onion. The question is where to begin. We evaluate services through a simple matrix of business value versus technical risk. The ideal starting point is a high-friction, low-risk service, where a fast achievement builds immediate momentum. Cross-functional discussions are essential here. Business leaders identify where operational pain lives, while IT assesses system dependencies and feasibility. It is equally important to determine what does not need to be modernized. If a service is stable, low-maintenance, and meeting current business needs, we leave it alone. Modernizing these components often adds unnecessary cost and risk for minimal return.



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AI agents empower modernization

Through the use of our proprietary AI agentic solution, the analysis of source code and dependencies and the high-precision conversion of code can be carried out far more quickly, while tasks such as generating specifications and conducting tests can be automated. By combining AI with other technologies, and maintaining quality through a human-in-the-loop approach, we are making legacy systems transparent in ways that once required an enormous amount of manual effort. As the next step in this evolution, we are now exploring how these AI agents can work together as an agentic AI system to carry out modernization more autonomously, with the aim of improving both quality and efficiency. In other words, AI agents are fundamentally shifting modernization from a black-box, high-friction project into a transparent,

streamlined process. Their role does not end once the migration is complete. By embedding autonomous intelligence directly into modernized services, organizations can rapidly adapt to shifting market demands, continuously evolve their systems, and keep pace with emerging technologies. Rather than facing another massive modernization effort years down the road, they can build services that continuously grow and adapt over time.

The important point here is, however, not to hand everything over to AI agents, but to make a previously opaque system visible so that clients themselves are in a position to make informed decisions. Human control remains essential, but the role of humans is changing. An air traffic controller does not fly every aircraft, yet remains critical to ensuring the safe operation of the entire system. In the same way, organizations need visibility into system health, operational status, and where activity is flowing across their environment through a high-level control dashboard. Once the guardrails are clearly defined, including operating rules, safety parameters, and security boundaries, AI agents can run autonomously day to day. Human involvement becomes focused on management by exception. When an agent encounters an edge case, a high-value transaction, or a scenario with low confidence, the system raises an alert and hands the decision back to human.

The goal is not simply to automate. It is to create systems that remain transparent, understandable, and adaptable over time. By making the system visible first, and then using autonomous intelligence to continuously maintain and evolve that visibility, organizations can build the long-term adaptability needed to stay competitive in a rapidly changing world.

Modernization never ends

Modernization never finishes. As long as an enterprise is running, its systems will continue to run as well. If you modernize a system that has been left untouched for nearly half a century and then leave it

alone for another twenty years, you will simply create a new legacy system. As the business and technology evolve, the system must evolve with them. That is what modern systems should be: systems that continuously adapt and grow.

Even after a modernization project is completed, it is important to continue to analyze and assess the system. This allows organizations to adopt new technologies as they emerge. Most importantly, the system should be transparent enough that a new graduate engineer joining five years from now can immediately understand what is inside. The goal is not modernization for its own sake. It is to ensure long-term transparency, so that future generations can understand, maintain, and evolve the system themselves.

Forward-looking leaders recognize that standing still is no longer the safe choice. Rather than focusing solely on immediate challenges, they seek to define long-term strategies that ensure service continuity for the next 20 years and beyond. They understand that adaptability must be built into today's systems if their organizations are to remain relevant in the future. These leaders also stay deeply engaged in the modernization journey rather than handing it off entirely to the IT department. They recognize that modernization is not simply a software upgrade, but an opportunity to strengthen company culture, improve business efficiency, and deliver greater value to customers. Ultimately, continuous evolution is what enables organizations to remain competitive, resilient, and prepared for whatever comes next.

In a world where technology is changing at an extraordinary pace, simply having the latest system is not what determines success. What matters is whether an organization can continue to adapt and evolve. —

References

1. Kyndryl Modernization Report

