10 Principles for Modernizing Your Company’s Technology

Today’s technology platforms are not just new versions of legacy systems. They allow you to design a completely new digital enterprise — as long as you follow these guidelines.

BY LEON COOPER AND MILAN VYAS
The life cycle of information technology is becoming shorter every year. New competitors are disrupting industries by leveraging state-of-the-moment digital practices and processes. Customer expectations are constantly evolving in an accelerating race for the most advanced, hyperconnected, seamless experiences. IT functions are under unrelenting pressure to support leading-edge capabilities such as data analytics, cybersecurity, automated processing, and integration with third-party systems. The easiest way to do this is through platforms that connect everyone to the same cloud-based cross-industry digital infrastructure.

In this context, your company’s legacy IT system, which seemed so capable a few years ago, is rapidly becoming obsolete. The systems modernization you need today is more than an upgrade; you’re playing a new game with new rules, in which you modernize not just the tools and functions, but the way you do IT. The vendors are largely the same, but the options and principles of the past no longer apply. Hardware no longer stands alone. Sensors and Internet connections are embedded in practically every tool, including those that used to be purely mechanical. Software is no longer sold as a package to install. It is offered as a platform, by subscription from the cloud, is automatically upgraded, and is programmed in new ways.

Yet some of the most important factors have not changed at all. Organizations must remain focused on their competitive edge. Modernization efforts must create value for the enterprise. Investors and other stakeholders are as demanding as ever.

Understanding what to get right — the elements of your IT system necessary...
to reach your goals — is essential. Knowing how to get it right — how to plan, sequence, invest, design, and engage the enterprise around your technological modernization — is equally important. Some efforts fare better than others. We have distilled 10 principles that are common to successful efforts. You can think of these principles as essential guidelines for your digital transformation, from your legacy system to the platforms of the future.

1. **Put Customer Value First**

Although any number of factors may trigger an IT modernization decision, one explicit goal is paramount: to deliver value. Every investment in technology should amplify the benefits for end customers, whether through better experiences, higher product quality, or operating efficiencies that reduce prices and add value.

Start by developing a solid business case for the modernization effort, showing expected value and innovation. Explicitly include (and agree upon) the most important outcomes for customers. Articulate, with clarity and precision, how each facet of the new IT system will contribute. You should be able to point to measurable improvements in key metrics — for example, customer retention, user experience, sales, productivity, and recruiting.

Use cross-functional teams to plan and design this modernization effort. Functional experts from areas such as IT, strategy, R&D, customer interaction,
and operations can all work together in an agile “sandbox” environment to design the changes around a set of coordinated specifications. In this early stage, and throughout the initiative, you thus link leading-edge knowledge of the changing technology with deep, day-to-day awareness of the desired results. As you bring these teams together, you will establish a shared frame of reference — a common language to describe the features you want and the capabilities you are building. This also will help engage new stakeholders as they join in the effort.

A major transportation company revamped its online system this way, improving the integration between the website that handled passenger bookings and the back-office functions that, among other things, routed travel. In its intensive sandbox sessions, the company set up temporary cross-functional working groups, which became known as “tribes.” Charged with planning and executing the modernization, the tribes included IT specialists along with people from finance, operations, and R&D.

In the public sector, customer value translates to public service, but the principle still holds. When the Ottawa Police Service (OPS) in Canada’s capital city resolved to fundamentally transform its service delivery model to better connect with and serve the public, its leadership recognized that the change needed to be driven by the needs of frontline officers and the public. They put in place a robust process to ensure that these officers would generate and validate ideas for technology modernization and IT innovation. OPS’s initiative has been successful enough to be held up as an example for many other policing organizations contemplating similar transformations.

Questions for putting customer value first:
• Why do we need to enhance or transform our technology right now?
• What problems do we expect to solve?
• How will this change deliver value to our customers?

2. Simplify Your Architecture
As organizations have evolved over the past 10 years, the underlying architecture of information technology has tended to evolve with them, often in a haphazard and as-needed fashion. A single organization might have had IT systems based
on a variety of coding languages, data structures, integration requirements, and support arrangements. The result was often a complex network of technologies: fit for purpose in each individual application, but difficult to adapt, refresh, and integrate. It often required significant effort to make changes, or even to understand the implications of changes on stakeholder needs and business performance.

Modern modular platforms have changed all that. Standardization of software code and integration standards have enabled systems to interact more fully without requiring bespoke designs. Tools such as application programming interfaces (APIs) allow companies to develop interoperable components that fit together in standard ways and interact seamlessly. Formerly separate systems, such as those for payments or customer relationship management (CRM), can now be linked to a single, configurable platform, with the ability to share data across the enterprise.

Instead of assuming a trade-off between simplicity and the features you need, look for systems that give you both. Many modern systems can combine simplicity at the back end with enhanced functionality at the front end. The leaders at GE Digital exploited this when they designed their modular platform that they use in-house and for customers such as airlines. Based on a cloud infrastructure and incorporating the Internet of Things, the system integrates applications built by other companies (such as Oracle), by GE’s customers, and by GE itself. GE followed the model of smartphone apps, but on an enterprise scale.

Simplicity makes it easier to take advantage of the software-as-a-service (SaaS) model, which allows organizations to procure increasingly complex functions on demand from their existing software providers without needing to manage the implementation or underlying resources. As with the consumer smartphone apps revolution, the new SaaS enterprise-level apps compete on quality and ease of use. The best ones rise to the top, containing costs and providing better experiences for the people interacting with your organization. As you implement these systems, you’ll learn that most customers and employees don’t want an overabundance of menus and features. They prefer simple, flexible commands that move them quickly to their desired results.

Embracing a simplified architecture requires a change in thinking,
particularly when considering options for new systems and partnering arrangements. Establish clear IT design principles, focused on simplicity and strategic functionality. Shift from asking “How do we connect our components?” to asking questions about adding value, attracting customers, and making life easier for your employees.

Questions for simplifying your architecture:
• How can we best simplify our technology systems environment?
• Where is the modularity in our current system environment? Is it flexible enough for our needs?
• What data and functionality will be accessible — from customers, business partners, and operations — when we better integrate our system?

3. Design for Flexibility and Speed
Modern organizations have a constant need to adapt within an ever-changing environment, requiring continuous innovation in products, services, and practices. Their systems must also have the flexibility to keep up.

The technology systems of the past competed on functionality. They were designed to do one or two things very well, and the organization adapted to focus on those one or two activities. When the enterprise needed to change its focus, the structures and processes of the system held it back.

Today’s more modular systems can be much more flexible. They can rapidly accommodate a range of possibilities for connection and configuration. So seek out modular platforms that can accommodate a wide range of plug-and-play functions for your business — including those that haven’t been designed or even imagined yet.

Develop your own capabilities for the design and deployment of future-ready IT systems that can flex as needed for innovation. Learn to use them to quickly reorient your operations while retaining the quality of user experience that your customers and staff expect. For example, your sales and service staff can reconfigure your customer engagement systems as the market changes. Your CRM system can lead teams to think more creatively about identifying and approaching customers.
To assess the fitness of new IT systems or upgrades, adopt a minimum viable product (MVP) approach. This approach consists of a “bare-bones” installation, covering the few features that are absolutely necessary to demonstrate the system’s value. Release an MVP to a small group of employees or customers, and then ask those early adopters for responses — or better yet, observe them using the system. You will learn what features customers care about, what features they don’t, and what features are missing.

The use of artificial intelligence and machine learning is also critical for flexibility and speed. Employees and customers are used to apps and search engines that guess what they are going to type or select. They understand and accept systems that learn their habits. Already, users expect as much from their enterprise software. A company whose systems understand their behavior, and guide them rapidly to work more productively, will gain their commitment.

Questions for designing with flexibility and speed:
• What aspects of our existing systems are constraining our speed with respect to change?
• Are these aspects necessary? Are there better ways to change direction while managing risks?
• What kinds of unexpected changes have we needed to deal with in the past? What do they suggest about future designs?

4. Engage with Your Workforce and Culture
IT modernization is often seen solely as a matter of changing technology. But changes in technology sustain themselves only if people accept and embrace them. You must therefore align your new systems with the company’s culture — starting with a clear recognition of the new habits that people will need to adopt.

An evolution in technology architecture may well involve a significant cultural shift, with a new structure and new competencies. Consider where the stumbling blocks may be. For example, do employees understand how to analyze the data your company collects while protecting your privacy? Do they have the operational skills to coordinate with external partners? Do they have concerns or qualms that have not been addressed? Armed with that information,
This approach redefines the IT function. Where once you hosted and managed systems internally, now you oversee a more open platform.

your leadership can determine what types of training, support, recruitment, and workforce changes are needed.

Engage users of the new technology, encouraging them to play an active role in the transformation effort. At GE Digital, for example, managers fostered engagement by bringing in all stakeholders from 20 different departments to be certain the right voices were heard. They made sure that users felt they were part of the process, giving them roles to play in implementation and providing regular updates on the delivered benefits. As a result, employees who used the system felt invested in the outcomes. Engagement on that scale isn’t easy, but it is essential.

For more guidance on organizational culture, see The Critical Few: Energize Your Company’s Culture by Choosing What Really Matters, by Jon Katzenbach, James Thomas, and Gretchen Anderson (Berrett-Koehler, 2019). There already are some powerful elements of your culture — including attributes of the company and behaviors that work well — that you can muster on the side of effective change. In addition, every company has “authentic informal leaders,” people at every level of the hierarchy who are already demonstrating the behaviors you need for modernization because they believe in the new direction. Find these individuals and work closely with them. They can tell you about the readiness of your organization to change, the places where resistance will occur, and the magnitude of effort required to overcome resistance.

For a large insurance provider in Australia, the critical starting point for modernization was to create cultural acceptance of the idea “decommission the old,
and embrace the new.” To achieve this, the technology leadership provided a strong mandate for simplification, and communicated it consistently. The mandate helped to rally the teams around a common set of priorities, decisions, and behaviors.

At Ottawa Police Service, where there was a strong culture and deeply held values and beliefs, the new initiative sought to modernize critical policing applications with newer foundational technologies to enable frontline mobility. Staff needed to be convinced that security and privacy issues could be properly addressed as the technologies changed. PwC helped OPS to put in place a strong and collaborative change management process, along with providing expertise in cybersecurity and public safety, to create confidence that the technical solutions were appropriate for use given the many regulatory, privacy, and security considerations. In the end, more than 150 police officers regularly contributed ideas. When they were valued and implemented, that created a virtuous circle of more engagement, faster uptake, and still better results.

Questions for engaging your workforce and culture:

• What do people need from the new IT systems to be productive? How do we know?
• How technologically capable is our existing workforce? What skills do they already have and what do they need to develop?
• What kind of cultural changes need to occur for new systems to be adopted? How do we create this?

5. Adopt a Services Mind-Set

The traditional approach to technology treats systems as assets that a company owns and operates. A modern approach treats technology as a set of services that a company can consume and integrate as needed, without necessarily owning the systems at all. Companies can then select and combine services from a range of best-in-class providers, within an overall framework that suits the organization’s unique needs.

This approach redefines the IT function. Where once you hosted and managed systems internally, now you oversee a more open platform. Services are
outsourced and dynamically managed; when a service component is not effective, you can adapt or replace it. You no longer care as much about the source of a service; you care about how well it serves your needs and creates value. You judge its financial performance in operational terms — productivity and results measured against cost — rather than by return on asset costs and the costs of maintenance.

One major bank redesigned or replaced a large number of critical systems within a five-year time frame. The refresh affected customer systems, analytics, product development, and core ledgers. When communicating the changes with the bank leadership, the IT group explicitly avoided describing their hardware and software assets; instead, they focused on the services they would provide to internal functions.

This approach made it easier to add new IT functions. For example, when the group installed analytics packages, they naturally gravitated to talk about new ways to use them. The same was true of new marketing tools and the new network for linking branches. Ultimately, the bank made its message about services public. It was investing in modernization, it announced, because it knew the investment would help the bank become the type of financial institution that its customers and partners needed.

Adopting a services mind-set also promotes a more open approach to sharing value with service providers. By using your providers as ongoing partners in innovation, you can shift your focus from negotiating terms to collaboratively generating results.

**Questions for adopting a services mind-set:**

- What are the essential technology services we provide to our organization?
- Are we organized and funded according to the outcomes we provide rather than the assets we manage?
- What other services could we offer in a cost-effective way if we were better organized to do so?

**6. Plot the Journey before Starting**

Just as successful transformation is a staged journey, so too are systems
modernization efforts. In their s+b article “The Four Building Blocks of Transformation,” PwC organizational change experts Al Kent, David Lancefield, and Kevin Reilly describe how iconic companies — the likes of Apple, IKEA, Starbucks, and Honda — have achieved their success through a fully coherent, differentiated, strategic identity. They methodically developed the capabilities and business models they needed to deliver this vision.

Your systems modernization can help you do something similar. Having set a direction based on customer value (as in principle number 1), you now plot a systems modernization road map, that is, a sequence of milestones and markers that you can expect along the way. For example, you might introduce cloud-based capabilities early, so they can be used for other initiatives. Or you may need to modernize some legacy systems as a prerequisite for improving time-to-market for product launches.

For a technology modernization at GE, the business units and geographies shared the responsibility to get core applications up and running. Progress was tied to explicit deadlines and goals, including “reduce quarter close time by 50 percent” and “cut 40 percent in IT expenditures.” Each milestone also included progress toward a predetermined set of core business needs: expanding market share, automating processes, deploying common platforms, rethinking shared services, and ensuring quick wins.

When your organization is early in this journey, ensure up-front buy-in from key senior stakeholders. In his book Leading Change, John Kotter calls this the “powerful guiding coalition.” It consists of change champions from every key area of the business at all line management levels. This coalition helps to ensure ongoing business alignment.

Although it’s planned, your IT modernization should not be rigid. Set it up as a self-correcting journey. In each step, you learn from previous iterations and discuss what could be done better next time.

**Questions for plotting the journey:**

- What are the critical steps in our migration to a new system? Who will we bring together to implement each step?
The benefits of organizing by capabilities include enhanced business–IT alignment, ability to deliver faster innovation and greater value, and a simplified vendor landscape.

- How will we adapt our plan to “course correct” when things don’t go as expected?
- Who needs to be part of our powerful guiding coalition?

7. Organize by Capabilities

Most large and midsized companies cannot reorganize their legacy IT system all at once. Their efforts must be divided, prioritized, and sequenced, or they will be too large and complex to manage. Most IT modernization efforts are organized by project; they are short-lived efforts, framed by conventional enterprise software categories, budgeted and delivered through development teams that disband when the project is complete. This leads to a short-term focus that can distract efforts from the most important goal: building the capabilities that deliver value.

What if you organized by capabilities instead? Your organization’s most distinctive capabilities are the combinations of systems, processes, and functions that deliver value in a way that no other enterprise can match. Think of your systems modernization initiative as an opportunity to energetically improve these capabilities, drawing on your digital expertise. For example, Inditex (the Spanish apparel company best known for its retail brand Zara) has long had distinctive capabilities in customer insight, fashion-forward product design, rapid-response manufacturing, and globally consistent branding. In recent years, it has enhanced these capabilities with an IT modernization that included, among other things, setting up RFID tags for every item it sells. Now it also has an
integrated online–offline inventory capability, so that any clerk in a Zara store can instantly locate a garment in a specified size and color, and arrange for it to be shipped directly to the customer — giving the company strengths in customer satisfaction that few, if any, other retailers can match.

Your organization’s customer-facing products and services are central in this approach (it’s sometimes called the “product management–based IT operating model.”) You logically group applications and infrastructure by the business capabilities they primarily support. Then you find the necessary applications and hardware needed to fill the gaps in those capabilities, and (better yet) to refine and expand your conception of those capabilities, staying steps ahead of competitors.

Organizing the IT operating model in this way offers many benefits. They include enhanced business–IT alignment, ability to deliver faster innovation and greater value, more effective investments, and a simplified vendor landscape. Consider procuring a managed services and solutions provider with which to partner; they may be more familiar with the newer technologies and thus able to deliver more quickly and effectively than you can.

When you organize by capabilities, you don’t worry about the different layers of the technology stack. They’re all in scope. Your IT organization is no longer wedded to legacy concepts; it can help accelerate a digital transformation by applying principles such as mobile access, API-based design, microservices, cloud-based infrastructure, and modular IT structures.

Questions for organizing by capabilities:
• What are the most critical capabilities that differentiate our company and provide value?
• How will our IT modernization enable and enhance these capabilities?
• What technological solutions and vendors fit best with these critical capabilities?

8. Be Agile and User-Centric
When executing the modernization, look for ways to realize benefits faster. Avoid the “big bang” approach, in which you gradually build toward a single
all-encompassing systems release. This can involve many months’ wait before results start to be seen. Divide the modernization road map into discrete delivery increments, releasing usable functions on a frequent release cycle. It’s better to be incomplete and rapid than complete and slow, as long as you obtain system user feedback frequently and let that feedback guide you to shift your direction. (Users of your systems include customers, employees, and anyone else who interacts with your company, including regulators, suppliers, and sometimes community members.)

Use established agile frameworks for design and development. These include scrum (consisting of self-organizing teams), disciplined agile delivery (a process for team decision making), the scaled agile framework (which aligns multiple teams), DevOps (practices aimed at reducing software development time), and lean IT (which is based on quality and continuous improvement approaches). Whichever frameworks you choose, train all stakeholders properly in it, so they have a shared understanding of the practices involved.

Even as you embrace agility, remain user-centric, that is, attentive to customer and employee responses, and responsive in the way you incorporate their reactions into your designs. Roll out new features in a way that allows you to test them on different user and customer profiles. For example, you might roll out two different features to members of the same customer group or geographic region to see if they trigger different responses.

Establish a disciplined and consistent approach to user-centricity. You might track people’s behavior on your system by monitoring keystrokes, through surveys, or through direct observation of users struggling with the prompts on their screens or smartphones. Adapt and adjust your system iteratively, building your own capacity for interpreting user feedback. Adopt a continuous improvement mind-set, so you are always looking for opportunities to learn and make your system better. Seize those opportunities.

Questions for taking an agile and user-centric approach:
• Who will benefit most from the changes, and how are they engaged?
• How do our analytics improve our knowledge of their experiences?
• How do we pivot and change our approach when we need to?
9. Invest in Resources That Make the Change Stick

Before commencing modernization, perform a careful analysis of the breadth and diversity of resources needed for a successful outcome. Project management and transformational leadership capabilities are as important as technical capabilities. Be highly selective in forming the team that oversees the effort. Choose people with a strong bias for change, a strong desire and ability to learn, a high tolerance for complex and uncertain situations, and a solid reputation for collaboration and teamwork.

Financial resource allocation is just as important. Align funding to your highest modernization priorities. Be very clear about which areas you will not spend money on. Scrutinize your choices about desired features and technologies to ensure that financial resources are aligned with highest value.

Avoid locked-in situations, in which a single vendor has control over your interactions (because, for example, your data resides in a closed and proprietary system). Insist on open APIs that can connect to a range of other systems. Experiment with open source software and make interoperability and integration a critical part of your technological due diligence. For example, if you use commercial off-the-shelf software, make sure it can link to a variety of databases, including open source products. Look for technologies that easily integrate and work together because of the languages they’re written in and the technology stacks they are built on.

Think through resourcing for the legacy system to keep it running adequately while the new system is being built. Even during the transition, you may need to fund must-do modifications to the legacy system (for example, to meet new regulatory and legislative requirements). Ensure that funding for these types of changes, for both the old and the new systems, has been factored into the overall budget.

Plan for funding to decommission and retire the old system, and to move people to the new one. Include funding for learning and development. Be clear and up-front about the transition plan so that the team with responsibility for maintaining the legacy system understands how important their role is, and what options are available to them. Provide incentives to make sure that these people remain highly motivated while doing what may seem to be unglamorous work.
Questions for investing in resources that make the change stick:
• Which IT investments are linked to the greatest return?
• How do we realign resources to support the transformation while running the business?
• What skills will be needed with the new systems, and how do we build them?

10. Partner Based on Shared Values and Trust
The technological systems that you are modernizing are key to your organization’s future. Therefore, do not treat modernization — or the procurement of the goods and services needed to support it — as a transactional event. When selecting long-term partners, invest in special due diligence in excess of your standard evaluation criteria. Your goal is to find companies that can deliver mutual benefits and with which you can develop a working relationship that involves mutual commitment and creative collaboration as well as a fair deal.

If you don’t get this right, not only could the project fail, but the switching costs could be substantial. Therefore, use informal as well as formal ways of gathering information. Seek out companies whose values you share and whose leadership has proven trustworthy. Evaluate the credibility of their work by looking at the technology systems they have built for themselves. Think about how well those systems support their own distinctive capabilities, especially those that would benefit you as their customer.

A good example of how to find the right partner comes from ATB Financial, based in the Canadian province of Alberta. It was founded in 1938 as a government-owned corporation, with the mandate of providing the citizens of Alberta with sources of alternative credit. After a strategic review, the company’s leaders set out to stand up a cloud-native digital-first challenger bank. The challenger bank — Brightside — is designed to provide a unique value proposition to a group of consumers that ATB believes is underserved: digital-native and digital-savvy customers.

Recognizing the long-term relationships they would need to stand up Brightside, ATB’s leaders were very deliberate in the way they evaluated vendors. They started by developing a list of 37 potential partner organizations identified
through PwC’s research and knowledge of the financial services digital landscape. The list was shortened to four through an RFI process using standard criteria such as technological considerations, the ability to meet requirements and commitments, references, financial health, and long-term viability.

However, those criteria were just table stakes. The right partner also needed to share the values that ATB Financial held, and to verify that it could be trusted. ATB thus conducted site visits for each of the four semifinalists. It tested each company’s flexibility and speed by asking it to complete a proof-of-concept task, with only two days to work on it after receiving the specs. In addition, during the visits, the evaluation team spoke to employees at multiple levels.

ATB ultimately settled on two: a first choice, and a second choice kept on standby. On a fee basis, the first-choice partner delivered a two-month pilot designed to build out 5 to 10 percent of the critical requirements. This allowed ATB Financial to fully evaluate how open the partner was to change, how fast it actually worked, what tools it used, and overall how compatible the two teams were. The system modernization has made considerable progress and is meeting all key metrics, and the companies’ superior working relationship is credited for much of this initial success.

**Questions for selecting a trustworthy partner with shared values:**

- What are we looking for in a partner? What values are important to us?
- What criteria will we use to ensure that our partner has similar values?
- In committing fully to a partner, how can we build mutual trust?

In modernizing your company’s technology, your goal is an effective and sustainable vehicle for strategic success. The critical issues, as with any organizational IT effort, are not purely technical. They involve learning how to design systems more effectively, engage individuals, and help facilitate constructive change throughout the enterprise. Taken together, these 10 principles can guide your way.