

# Breaking technical debt's vicious cycle to modernize your business

Develop data-driven insights to build a strategy for paying down the tech debt that stands in the way of business modernization.

*by Aamer Baig, Sven Blumberg, Arun Gundurao, and Basel Kayyali*



**A large B2B business** faced an agonizing quandary: its leadership team was considering dozens of modernization initiatives that could bring a \$2 billion margin expansion opportunity. But 70 percent of them depended on technology that would cost a staggering \$400 million—much higher than expected. The reason for such a high price tag? Its tech stack had become massively complex after years of building quick workarounds and one-off solutions to favor speed over good design for the long term.

This reality forced the company to ratchet back its investment to about \$300 million and walk away from 25 percent of the potential margin expansion. Cutting back on these tech initiatives had a compounding effect, though, because the unaddressed issues would continue to fester and undermine future projects. That became painfully

clear two and a half years later when the team was able to complete only half of the planned work because of ongoing technical issues.

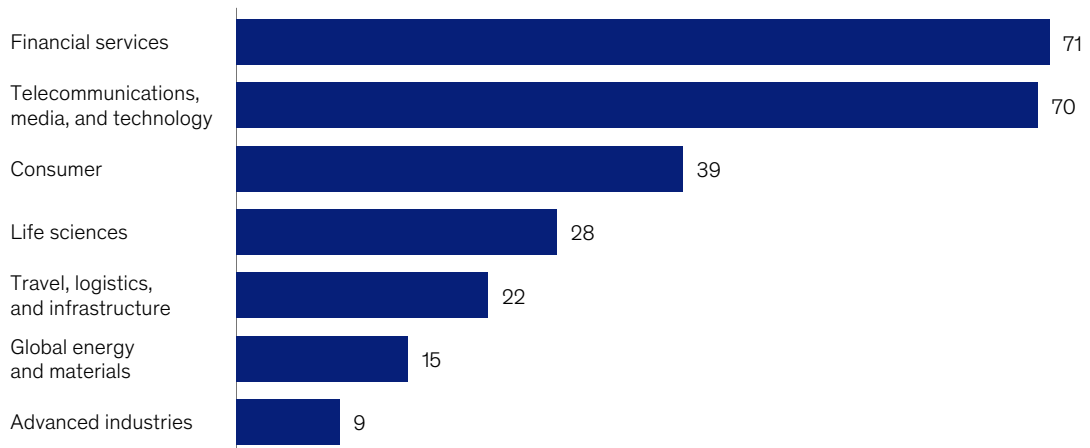
This example is all too typical across businesses today. As much as 71 percent of the impact from business transformations depends on technology, according to our research (Exhibit 1). This is particularly concerning given that so many companies need to modernize if they are to remain competitive.

While many companies understand the importance of technology in meeting their strategic goals, the silent killer of technology modernization efforts—technical debt—often stands in their way. Technical debt is basically the “tax” a company pays on any development to redress existing technology issues, and it accounts for about 40 percent of IT balance

Exhibit 1

### Technology enabled up to 71 percent of the value derived in business transformations across different sectors.

Percentage of business transformation impact dependent on technology



Source: McKinsey analysis

sheets, according to our research. Companies pay an additional 10 to 20 percent to address tech debt on top of the costs of any project.<sup>1</sup> Some 30 percent of CIOs we surveyed believe that more than 20 percent of their technical budget ostensibly dedicated to new products is diverted to resolving issues related to tech debt.

As such, the benefits of paying down technical debt can be game changing. They include: freeing up engineers to spend as much as 50 percent more of their time working on value-generating products and services; reducing costs by cutting back on time needed to manage complexities; and improving uptime and resiliency. Cutting back tech debt is the key to becoming tech forward: a company where technology is an engine for continual growth and productivity.

So how can organizations begin paying down their technical debt? It starts with insights—knowing which aspects of technical debt are most tied to

value offers a path into a more strategic approach to resolving technical debt.

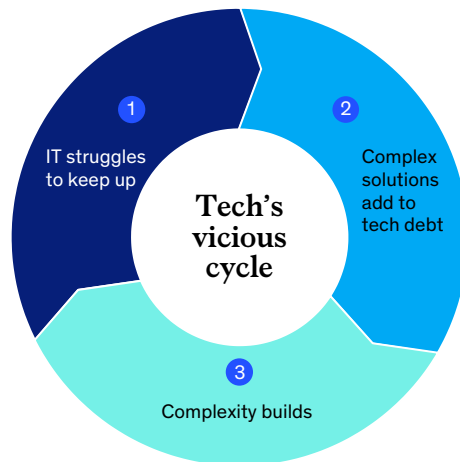
### A closer look: Technical debt's vicious cycle

Technical debt is the result of a range of practices. These can include making temporary fixes that inevitably become permanent, not updating solutions that become outdated, favoring fast technology delivery over long-term benefits, or implementing one-off solutions to meet business priorities. Many of these decisions make sense at the time and are necessary. But complexity builds, and future projects become more difficult. This vicious downward cycle translates into an enormous cost for the business in the form of lost opportunities and wasted resources (Exhibit 2).

These layers of tech debt create a huge drag on any business transformation effort—it's like trying to run while pulling an increasingly heavy anchor

Exhibit 2

### Multiple factors lead to technology's vicious cycle.



- 1 Increasing business demand leads to suboptimal point solutions; the business side's need to move quickly creates suboptimal requirements for IT; lack of coordination and collaboration prevents better decision making for the long term
- 2 Suboptimal point solutions lead to complex "spaghetti" of point-to-point solutions and one-off applications, adding more tech debt to the system
- 3 Vicious cycle makes future projects more difficult and adds hidden cost in the form of lost opportunities and wasted resources

<sup>1</sup>"Tech debt: Reclaiming tech equity," McKinsey, October 6, 2020.

behind you. CIOs estimate that tech debt amounts to 20 to 40 percent of the value of their entire technology estate (before depreciation), according to our research.<sup>2</sup> Companies in the bottom 20th percentile in terms of tech debt severity are 40 percent more likely to have incomplete or canceled IT modernizations than those in the top 20 percent.

Escaping this vicious cycle is not easy. Knowing where and how to start is a serious challenge. A poorly sequenced approach can easily result in time and money spent without much change to the tech debt profile. The business side of the house may be overwhelmed by the task and want to delegate the problem to IT, but both sides will need to work together to identify solutions that allow the organization to compete and build value.

### **Gaining an edge to break the cycle**

Modernizing the business requires companies to build up an edge in three areas: insights, structural commitment, and execution.

#### **1. Insights edge: Granular transparency tied to financial value**

Any serious tech modernization effort starts with an accurate and detailed accounting of current technical debt, documenting assets, data, and their links to business value. This will enable building meaningful support in the business, setting

realistic budgets, making accurate allocations, and prioritizing initiatives that will have the most impact.

Developing this kind of balance sheet is no trivial task. It begins with calculating the cost of time lost by developers to dealing with problems resulting from tech debt and the costs of resolving the tech debt itself. It's important to analyze tech debt at the asset level, such as an application or a database, to be able to see how each piece connects to value (see sidebar, "Measuring tech debt"). Further, the analysis needs to account for almost a dozen different types of tech debt, such as infrastructure, code, and documentation, because each requires a different type of remediation.

The goal of this level of detailed analysis is to develop a tech debt balance sheet that any CFO or CEO will recognize and be able to use to simplify the trade-offs in paying down tech debt and build a strategy (Exhibit 3).

From our experience doing this kind of analysis, we have observed that the following basic truths seem to be true across companies:

- *Tech debt is not spread evenly.* There is always a set of ten to 15 assets that are responsible for the majority of the tech debt in an enterprise. This is where companies need to focus their efforts.

## **Measuring tech debt**

The gold standard for tech debt measurement requires classifying applications by their deployment types—on-premises, virtualized, containerized, software as a service (SaaS), or function as a service (FaaS), for example—and collecting specific application metadata by that type to reflect the amount of tech debt. This approach yields a set of tech debt cost curves, against which all applications can be benchmarked. One leading financial institution, for example, built an algorithmic model that ingests a variety of data from tools such as asset inventories, code repositories, and ticketing systems, and targeted its analyses to automatically profile and size tech debt drivers on an asset level.

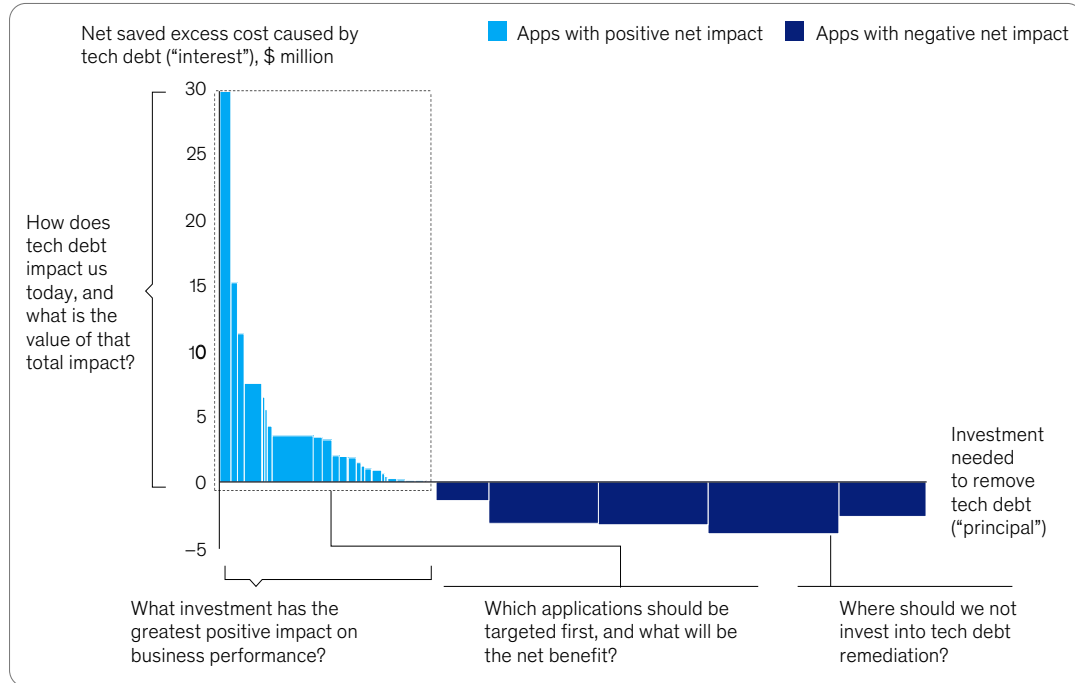
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<sup>2</sup> Ibid.

Exhibit 3

**Maintain a tech balance sheet that tracks tech debt, allows economics-based prioritization, and triggers actions.**

**Illustration of tech debt abatement curve prioritizing application modernization**



Source: McKinsey analysis

- *The severity of tech debt varies.* The amount of tech debt between applications can vary by as much as two to three times.
- *Some tech debt is best left alone.* In some cases, the cost of addressing the tech debt of a given asset is not worth it.

One technology company suspected that more than 50 major legacy applications had major amounts of technical debt. Its tech debt balance sheet instead revealed that just 20 asset types drove the majority of the tech debt, and just four debt types drove 50 to 60 percent of the share of debt impact. This analysis identified between

\$200 million and \$300 million in real trackable benefits over a three- to five-year span, which was instrumental in helping the CEO and top team understand the true value of addressing the debt.

**2. Commitment edge: Ensure strong governance and allocation scaffolding is in place**

Decades of work helping companies define and execute business strategies have taught us that strategy is ineffective unless it is translated into allocation of resources, both people and budget. Making such allocations effectively requires a governance scaffolding to structure decision making, including who the decision makers are and

what criteria they use. This structural commitment is essential, as tech modernizations are multiyear programs.

Three considerations are key to success here: funding, accountability, and pricing tech debt remediation into development.

#### **Fund and protect for the long term**

The capital-allocation framework for tech debt remediation is a strategic decision that needs to be made jointly by the CEO, CFO, and CIO. This is much more than an exercise in earmarking funds; simply carving out 15 to 20 percent of IT's budget to address tech debt is insufficient.

The most successful organizations instead explicitly account for technical debt in all asset budgeting and development processes. In practice, that means each dollar apportioned to address technical debt needs to come with a clear commitment to specific KPIs and business outcomes, whether that's improving resiliency, increasing customer satisfaction, or generating incremental revenue. The analysis generated in quantifying your business's tech debt (your insights edge) provides the foundation for that commitment.

Since tech modernization programs will often outlast top leadership's tenure, the board of directors has a critical role. They need to help set and protect the capital designated to pay down tech debt and track progress. At one banking group, for example, the board decided to set up a technology subcommittee, supported by a handful of tech advisers, to regularly dive into the tech debt transformation program. One of the core agenda points was a capacity review of key resources and how much time they had allocated to tech debt removal.

#### **Put in place governance with teeth**

Governance is one of those topics that everyone agrees is important, yet practicing it effectively often remains a challenge. In our experience, this problem stems from the oversight team lacking sufficient authority and representation. Having a steering committee with leaders from both IT and business is a good start, but they need to be senior

enough to enforce change and break through the inevitable turf battles and competing priorities. For this reason, it's crucial to include the CFO or finance leader as part of the team, and ideally that person should have a sufficient understanding of key technology issues.

When a large financial services group, for example, went through a core system upgrade, it set up a central committee chaired by the group COO and group CFO. Their involvement helped to break deadlocks and ensure business leaders adhered to tech debt goals. This setup was instrumental in eliminating 94 percent of all customizations and generating double-digit millions of dollars in cost savings. More importantly, the erosion of tech debt and adherence to a common code base helped the business reduce time to market when rolling out other features. This lesson is broadly applicable to other private and public sectors.

The steering committee's other chief role is to establish (and enforce) a set of objectives and key results (OKRs) so that development teams focus on delivering outcomes rather than reporting on activity. The best OKRs for tracking progress against tech debt address matters such as team productivity (time spent on developing new capabilities versus dealing with tech debt issues) and speed to market (the rate and pace of new capabilities released), as well as reliability and elimination of rework. A system of quarterly business reviews (QBRs) to track progress and assess performance is also critical to staying on track with execution.

#### **Price tech debt into (almost) all development**

Even the most far-reaching and thoughtful governance structures and plans can wither in the face of realities on the ground. This is where internal pricing can help.

For example, a common challenge we see is that even though IT may cost out a project that includes good practices, such as including APIs or paying down tech debt, the business side may still believe a faster, cheaper, and more secure one-off solution is a better choice, even if it increases the overall enterprise's tech debt.

Cloud-native companies tackle this issue by giving development teams a tech debt “budget” that delineates, for example, the number of code reviews needed or the number of outdated components allowed. They also bring the tech debt of any initiative onto a business’s P&L to represent the true cost of development, which forces the business to take a closer look at its requirements and requests. One company even instituted a policy that any tech debt exception had to be approved by the CEO. This mechanism forced teams to develop strong cases for any short-term needs and present a plan to pay down the tech debt later.

In establishing these practices, it’s important to remain focused on value. It usually doesn’t make sense to get below 10 percent of tech debt, because some tech debt isn’t worth paying down. Sometimes it’s even necessary to take on additional tech debt to be able to move quickly to seize an opportunity.

The trick is to keep from becoming overleveraged, just as one would in managing financials. Companies need to put in place systems to continuously monitor tech debt and remediation and to trigger an alarm when there is risk of overleverage. This is particularly true when migrating applications to the cloud. The cloud must be a core component of any tech modernization program, but tech debt issues that exist on-premises won’t magically disappear in the cloud. In fact, they can exacerbate costs and prevent companies from taking advantage of the many services cloud providers offer, which are a large source of the cloud’s value.

### **3. Execution edge: Interrogate your progress and reallocate continually**

Failure to execute is the biggest reason tech modernizations fail that we see. While there are often many causes for this breakdown, the essential one is that companies do not have the mechanisms to track what’s happening and intervene aggressively.

#### **Drive progress every quarter**

Long-term plans will break down unless there is a mechanism to maintain momentum. QBRs are the most effective way to maintain that momentum,

by providing transparency into the process and a venue for making decisions. As often practiced by companies, however, QBRs are a passive review process that lacks quality data to enable good decision making. At high-performing companies, senior leaders on the steering committee have a much more forensic and interventionist posture during QBRs. They interrogate team performance against OKRs to determine root causes of either good progress (so they can replicate a best practice) or poor progress (to identify the underlying issue). In this way, the QBR provides the committee with a clear view of the “realities on the ground” so they can adjust goals and can be an early warning system to address an issue before it becomes a serious concern. Most importantly, the committee takes action based on this information to reallocate resources to support high-performing initiatives and reduce exposure to (or even cancel) poor-performing ones. Through these practices, the QBR becomes an engine that constantly delivers value.

To support the steering committee, companies need to invest in tooling and performance management systems that continuously monitor performance. These tools let leadership see progress quickly on a more real-time basis and also provide predictive intelligence to see how likely teams are to deliver on their targets. Companies often have a lot of helpful tools and data already on hand initially. Code-quality tools, for example, can automatically tell you what code is undocumented or whether there’s any unused code.

#### **Make product teams accountable for their technical debt**

The core unit of this tech modernization effort is the product team, which develops the solutions and does the work of reducing tech debt. The best teams are autonomous, focused on value, and supported with the right capabilities.

The core tenet of the modern product team is that it is responsible for building applications and also running and managing them. This means that any tech debt issues remain the product team’s problem, not someone else’s. Many start-ups follow this approach, dedicating two sprint cycles (about four

weeks) every quarter specifically to cleaning up their applications and eliminating tech debt. In this way, product teams ensure that they are able to continue to develop at pace and deliver value.

technical debt immediately. Addressing this issue requires companies to understand the extent of their tech debt and the value of paying it down—and to commit to doing so. For technology to be the engine of growth that it can be, companies need to break out of the vicious cycle of tech debt and modernize.

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As challenging as your technology situation might be now, it will only get worse if you don't address

**Aamer Baig** is a senior partner in McKinsey's Chicago office, **Sven Blumberg** is a senior partner in the Düsseldorf office, **Arun Gundurao** is a partner in the New York office, and **Basel Kayyali** is a senior partner in the New Jersey office.

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