



**ESG ECONOMIC WHITE PAPER**

# **Does Your Organization Pay Long-term Costs for Short-term Decisions? Understanding Technical Debt**

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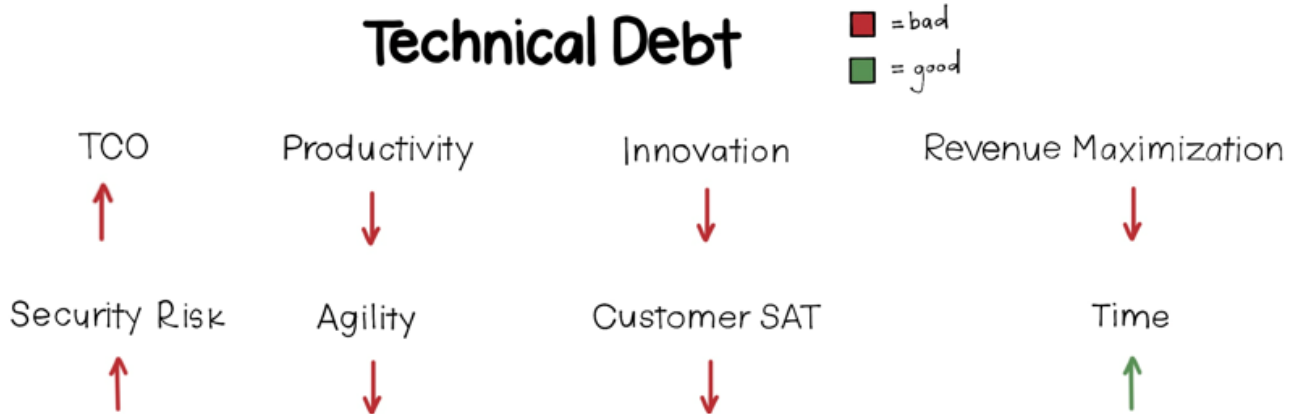
## Executive Summary

Organizations want to get as much done as quickly and cheaply as possible, but rushing initiatives like digital transformation projects may have a hidden cost. Sometimes technology decisions are accelerated, and short-term savings on the cloud, infrastructure, software, and services are leveraged to get the project launched quickly. But this often means that a tradeoff occurs between the long-term alignment to organizational goals and short-term reaction to current pressures.

Changes made in the name of expediency often result in business requirement oversights, software development shortcuts, and customer experience shortfalls. This leads to **Technical Debt**, creating longer-term technical challenges as an unintended consequence of short-term thinking. Similar to financial debt, we often borrow to accelerate what we can't afford and leverage financing to acquire assets sooner versus later. But borrowed money comes at a cost, requiring you to pay interest on the borrowed funds. Over time, unpaid interest can accrue, compounding to a rather large sum if you are not careful, and eventually you must repay the principal. This same concept impacts the effectiveness of technology when decisions are made with a rush to market and short-term considerations, taking priority over long-term alignment between technology and business goals.

ESG analysts analyzed the impact of technical debt and quantified the impact of making decisions that can accrue technical debt. ESG believes that organizations that choose to prioritize **“Rush over Rightness”** in technology investments realize higher costs for refactoring, higher total cost of ownership (TCO), an impact on productivity and especially innovation, as well as incurring significant limitations in agility, security, maximized revenue, and customer satisfaction.

**Figure 1. The Tradeoffs that Create Technical Debt**



Source: ESG, a division of TechTarget, Inc.

## Understanding the Challenges that Lead to Technical Debt

Accelerating technology initiatives via leverage and borrowing money sometimes makes sense and is not necessarily a bad thing, but organizations that leverage too much find that a high level of debt can lead to higher costs, repayment stress, and even financial ruin. This “get it done fast, figure it out later” mentality can result in systems that have limitations that can cause future pain.

Technical debt is similar to financial debt. In order to accelerate digital transformation, decisions and investments are made that may be optimizing shorter-term goals over longer-term vision, considerations, and prudence. Near-horizon parameters such as lower costs and impending deadlines take precedence over quality, ongoing maintenance, support, TCO, optimized customer functionality and experience, as well as flexibility and scalability—all of which can be compromised as a result. Organizations see digital transformation sooner with these short-term savings, but it comes with a debt and a cost: the need to pay the interest on the debt, which increases monthly costs, maintenance requirements, support, experience, functionality, availability, and risks, along with, ultimately, the principal issue of having to refactor all that wasn’t done right the first time around.

### Defining Technical Debt

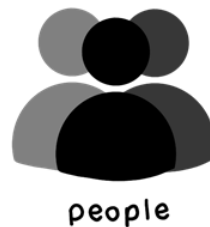
*Technical debt* can be defined as the consequences of digital investment actions that intentionally or unintentionally prioritize short-term customer goals, delivery deadlines, and budget over more strategic, agile, and extensible technical implementation and design considerations.<sup>1</sup>

Recognizing technical debt can be challenging, as it is often hidden by the day-to-day pressures of running a technical organization. A little digging reveals that most organizations are experiencing some impact and that the issue is growing, especially with the accelerated changes that have come in the past two years. Workforces have become more geographically dispersed and fluid in location, fueling customer demand for better experiences, the breadth of demand for supported devices and technology, and the rise in external business risks and threats.

## Recognizing Technical Debt

Minimizing technical debt requires that organizations recognize the factors that contribute to prioritizing short-term factors over longer-term decision-making that could better align technology capabilities to the needs of the business. In its study of technical debt, ESG found there are four P’s that allow debt to manifest:

- Planning
- People
- Process
- Productivity



<sup>1</sup> Source: Information and Science Technology, [Technical debt and agile software development practices and processes: An industry practitioner survey](#), April 2018.

## Planning

Many decisions are made at a pace that does not allow the organization to properly understand or account for the market, customer, and/or user needs and then align the business, technical requirements, and roadmap to these needs. The complexity that comes with technological advances requires careful strategy and design.

Yet, according to ESG insights, this failure to effectively plan results in systems that might fall short of real customer and user needs and can't capitalize on technology advancements or changes in the business landscape. The result is often an ecosystem that is obsolete and redundant, potentially storing data sets in a way that limits the ability to analyze data to uncover trends and opportunities that may increase revenue.

ESG believes that planning shortfalls, along with proactively addressing or “paying down” ongoing technical debt, results in **customer experiences that suffer**, leading to **higher-than-optimum customer churn** and **limited growth** in new opportunities.

## People

Companies with high technical debt often find their workforce frustrated, fragmented, and overworked. ESG believes that when decisions are made with a short-term focus, the resulting technology platforms require more maintenance and support, which grinds current resources. Employees that work in high technical debt environments spend most of their time just “keeping the lights on” and find themselves taking shortcuts in a scramble to constantly solve problems.

With employee turnover at historic highs across most industries, workers are hard to find and expensive to keep. ESG believes that organizations with high technical debt will see **higher turnover rates** when compared to similar companies that have a longer-term vision. The result is a churn in employees, a workforce with less tenure, and decisions that are made by employees with less experience and that are **plugged in at a less strategic level** than companies with lower technical debt. These organizations with high technical debt are also likely to see a higher instance of human-caused errors.

## Process

When a rush to release is prioritized, shortcuts occur, **replacing “right” with “right now.”** Most organizations that ESG examined that have high levels of technical debt lack effective project management. As a result, project prioritization is not balanced across resources, schedules, and budget, and change management consumes far more resources than what is optimal. ESG found that companies that work in this state produce end results that won't reach full potential in functionality and that lack the innovative digital transformations that the business needs.

ESG believes that a decided lack of risk management and issue mitigation leads to some hidden—but incredibly important—issues, including security flaws, limited disaster recoverability, and compliance/regulatory issues.

## Productivity

When there is a high level of technical debt, ESG believes that IT and DevOps team members spend a disproportionate amount of time refactoring shortcuts and shortfalls, fixing issues, and maintaining systems that otherwise should not require such a high level of support. ESG analysis reveals that higher technical debt environments are inherently more complex and have more quality and performance issues when compared with similar organizations that take a longer-term view. ESG believes that these high-debt ecosystems struggle to meet both internal and external SLAs and produce less revenue per employee than more forward-looking organizations.

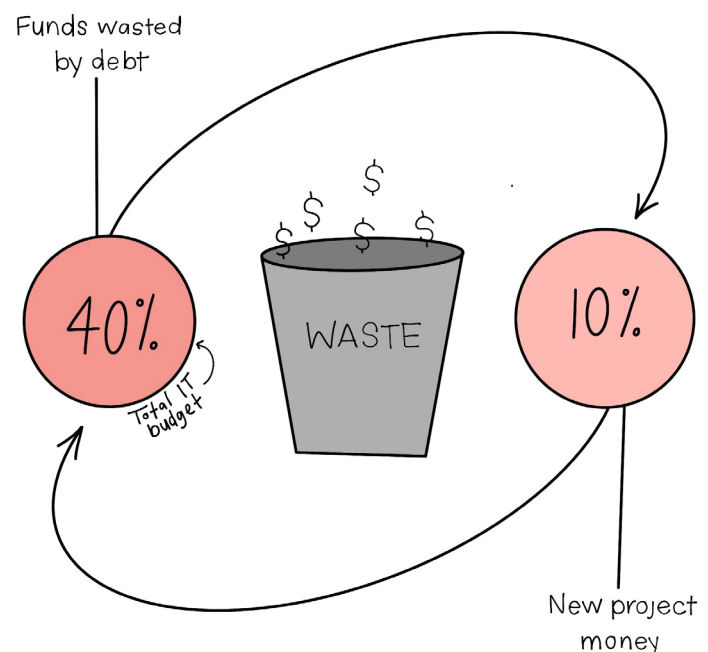
## Characteristics of Technical Debt-laden Organizations

When organizations experience a high level of technical debt, they could make decisions that negatively impact the business. Some of these decisions and results include:

- Shortcuts in business that skew the alignment between product offerings and customer need.
- Custom-developed or heavily customized software that requires frequent refactoring and support.
- Code quality and testing issues that raise costs, hurt deadlines, and lower overall quality.
- A deficit in optimizing TCO that perpetuates to future years.
- Vendor or technology lock-in that limits agility.
- Data model shortfalls that limit the ability to pull value and trends out of existing data stores.
- Standardization challenges that add complexity across global deployments and business segments.
- Poor IT and ITIL process management.
- Higher IT ops costs.
- Waste in overprovisioning and higher running costs.
- Adoption and satisfaction challenges that lead to higher customer churn, employee turnover, and growth challenges.

## The Impact of Technical Debt

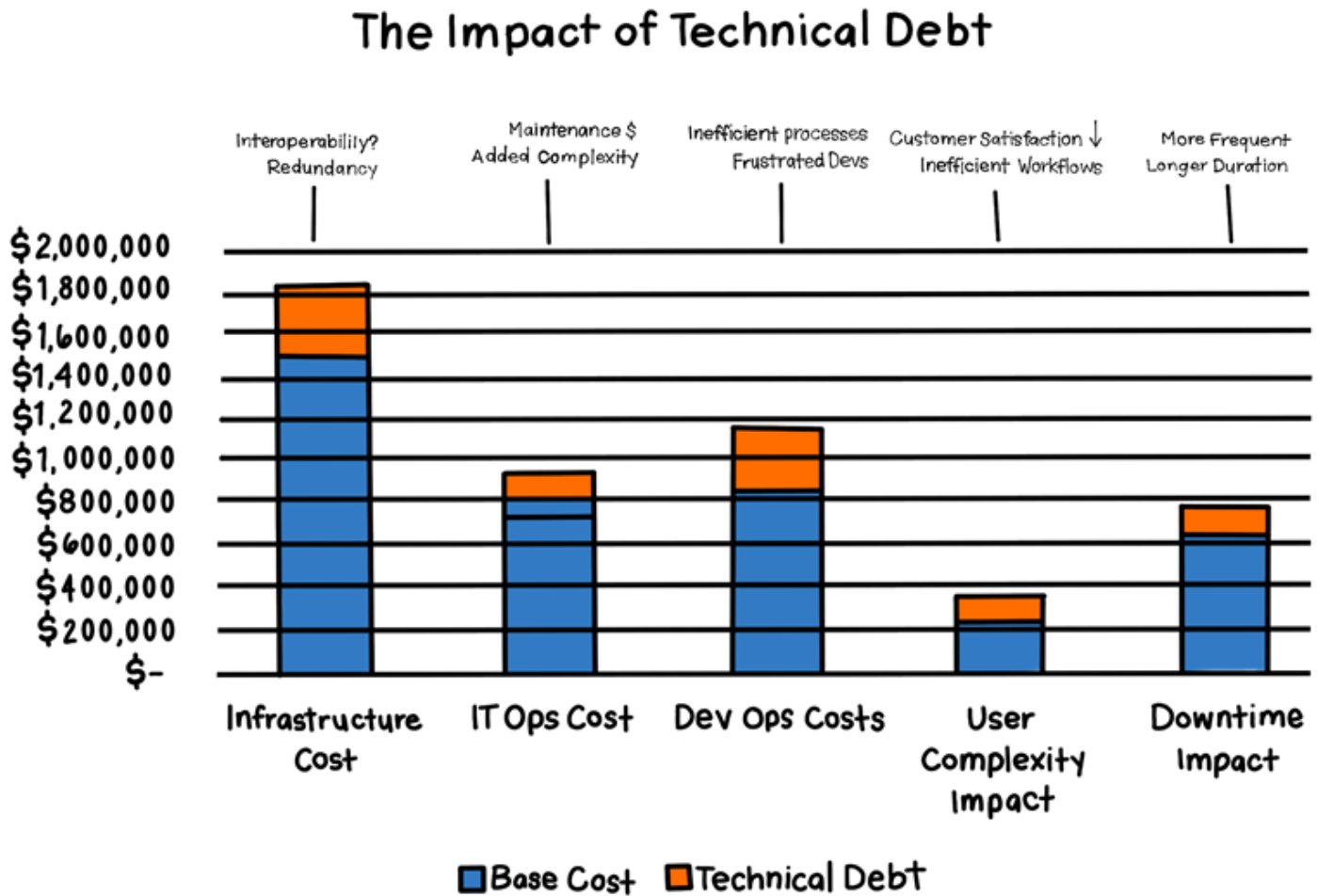
Technical debt is, indeed, growing, with **60%** of CIOs indicating that their organization's technical debt has risen perceptibly over the past three years. According to insights from 50 CIOs surveyed by McKinsey, technical debt now consumes a whopping **40%** of the total IT balance sheet for the typical organization,<sup>2</sup> including more than **10%** of new project spend allocated to resolving this old debt. This burden impacts an organization's ability to innovate, with new projects being constrained and pressure being added to continue this cycle of debt. Figure 2 shows how technical debt can impact a sample organization with \$100 million of annual revenue. This sample company represents an average organization that, while making decisions based on two-to-three-year planning cycles, often incurs technical debt due to



<sup>2</sup> Source: McKinsey Digital, [Tech debt: Reclaiming tech equity](#), October 2020.

alignment challenges between IT lifecycles and business requirements.

**Figure 2. Technical Debt Spreads Across Most Areas of IT**



*Source: ESG, a division of TechTarget, Inc.*

As technical debt grows, ESG has found that the true cost impact squanders budgets and requires debt service. The real—albeit often hidden—costs of technical debt include those shown in Figure 3.

**Figure 3. The Hidden Costs of Technical Debt**

<p><b>Risks</b></p> <ul style="list-style-type: none"> <li>• Increased security breaches</li> <li>• Downtime</li> <li>• Failure to meet SLAs</li> <li>• Disaster recovery</li> <li>• Compliance fines &amp; penalties</li> </ul>	<p><b>Business Shortfalls</b></p> <ul style="list-style-type: none"> <li>• Reduced customer sat</li> <li>• Slowed customer adoption</li> <li>• Higher customer attrition</li> <li>• Reduced market share</li> <li>• Lowered agility</li> </ul>
<p><b>Increased Costs</b></p> <ul style="list-style-type: none"> <li>• Higher TCO</li> <li>• Redundant systems</li> <li>• More overprovisioning</li> <li>• Debt service costs</li> </ul>	<p><b>Productivity Impacts</b></p> <ul style="list-style-type: none"> <li>• Longer DevOps cycle</li> <li>• Lower employee satisfaction</li> <li>• Higher complexity</li> <li>• Segmented workflows</li> <li>• Disparity in systems</li> </ul>

*Source: ESG, a division of TechTarget, Inc.*

### Telehealth Solutions Use Case

ESG recently interviewed a client about a technical debt issue at a telehealth solutions provider. The organization developed a digital customer application. The solution was planned, architected, programmed in-house, and designed to use a specific mobile device, which would be shipped to each customer so that they could use the application.

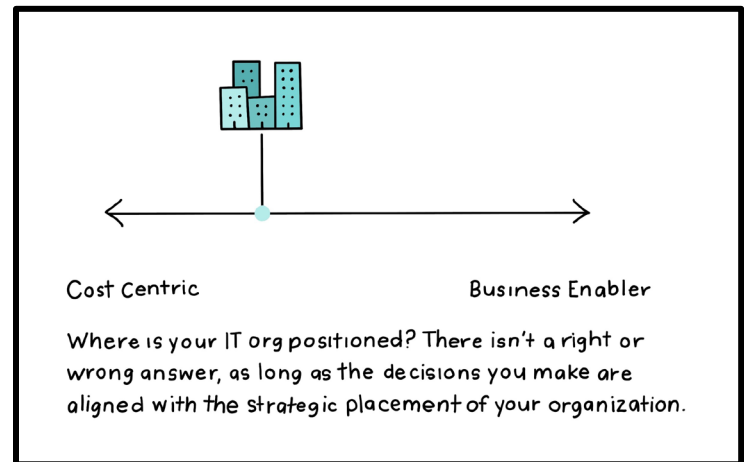
The solution was launched, and customers were trained. During the training, the challenges appeared front and center, as no one wanted to use the devices that were sent to them. Customers reported already having a favored device and/or didn't want to learn and use a new one. However, the solution's architecture and development was solely tied to the specific device.

As a result of a failure to collect user requirements and the incorrect planning around business requirements and architecture strategies, the solution incurred huge technical debt and needed to be refactored to be device-agnostic in order to match experience needs and gain adoption and usage.

The business impacts were in the millions, with hard costs for devices that were returned and not used, refactoring of the software, relaunch costs, and retraining, not to mention the adverse customer satisfaction hit and market opportunity impacts.

## Avoiding Excessive Technical Debt

Avoiding technical debt involves strategic planning that can help simplify even the most complex organization or challenge. It starts with a clearly defined vision of the role of technology in business. Is IT something that drives business, or is IT a cost center that is intended to be reactive? Where on the scale between "cost-centric" and "business enabler" does an organization belong? Clear alignment between the strategic positioning of an IT organization and the tradeoff between short-term and long-term decision-making will help ensure that an organization keeps its technical debt to an acceptable level.



Avoiding excessive technical debt comes back to the **four P's**: planning, people, process, and productivity. ESG believes that these simple questions will help keep debt in line with the strategic positioning of an IT org:

- **Planning** – Work to assure that short-term scheduling pressures and initial investment considerations do not overwhelm the process of collecting clearly defined requirements for the project. Both internal and external customers should be considered when asking these questions:
  - Does the project align with our defined vision?
  - Will the result of this project solve a problem or enable the end user in a way that produces more value than the cost of creating and maintaining the solution?
  - Have we involved the users of the end product to ensure we have a clear and complete list of functionality needs?
  - Is there an existing solution that can produce the same result and can integrate into our current environment with less complexity and cost than the planned project?
  - What is the effective lifecycle/span of the proposed solution?
  - What are the biggest risks to not completing our project as planned, and what mitigation strategies should be in place?
  - What geopolitical factors need to be considered to make sure the end solution is usable in all of the needed industries and locations?
  - Are we sacrificing long-term benefits or blinded by short-term pressures?
- **People** – Companies with low technical debt realize the importance of people to the organization, looking to prioritize DevOps, IT ops, and end-user experiences as part of the planning process:
  - Do we have access to the expertise and materials (including funds) to complete the project without causing undue stress?



- Will this project help our people grow? Will it engage them and motivate them each day?
- Will this new solution require either new people or a dramatic change in the expertise level of current employees?
- **Process** – Too often, companies that are reactive to changing conditions set unrealistic timeframes on new projects. The results are shortcuts taken and planning ignored:
  - How are changes to the plan managed? Are we changing resources to match changed expectations?
  - Are we monitoring the need for the end product as the project continues? Are we certain that our planned solution will still solve the problem it was intended to address?
  - What ancillary teams/systems need to be considered for integration before the project is released?
  - Does our architecture require more frequent refactoring than that of a peer organization?
- **Productivity** – Ensure that considerations are given to help minimize negative impacts on DevOps, IT, and end-user productivity:
  - Will the proposed solution make the intended target more effective either through improved output, enhanced accountability, or lowered costs?
  - Will the end user of the product incur a steep learning curve?
  - Does functionality that is similar to the solution’s functionality exist? If so, have we done a needs analysis that considers how a replacement impacts the end user?
  - Do our competitors seem more agile than we are when reacting to change or opportunities?
  - Do our development projects require more updates or patches than expected?

## The Bigger Truth

There is always a three-way tradeoff with tech decisions between time (procurement and deployment), cost (price and human capital), and capability. Too often, time and cost outweigh capability, resulting in decisions that create shortfalls in the alignment between business needs and technical ability. This mismatch is called *technical debt* and results in increased costs and diminished outputs going forward.

ESG researched technical debt and found that almost every organization has some level of this hidden cost. Unfortunately, too many companies go into planning, development, and evolution of their IT systems without attention being paid to the long-term inefficiencies caused by short-term decisions.

Sometimes, it is worth accruing technical debt in order to get functionality sooner, when “right now” is more important than “right.” Other times, you may want to minimize or reduce debt or make decisions that pay back some of the inefficiencies by correcting short-sighted decisions of the past. In the end, awareness of the real costs is the key to making the decisions that best fit your technical debt strategy.

Organizations do not need to do it alone. There are technology partners that have the experience and capacity to offer pre-validated solutions or create integration plans to best capitalize on current IT investments. While reducing technical debt does usually require more thought and investment up front, the end result will enhance the long-term health of an organization.

ESG recommends that companies work to recognize the tradeoffs between time, cost, and capability and the impact that decisions have on the level of technical debt, as well as understand the impact that existing debt has on your organization’s ability to reach goals.

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