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# PREVENTING TECHNICAL DEBT

## From DRAINING Your Full Potential

By Kathryn Schneider



**IN RECENT YEARS, THE CONSTRUCTION INDUSTRY HAS WITNESSED AN INFLUX OF NEW TECHNOLOGIES** including advancements in AI applications, robotics and automation, virtual and augmented reality, predictive analytics, and a surge to the cloud creating a crowded technological landscape. Because of this rapid change, technical debt has become a critical concern.

This article explores the impact of technical debt on a company through a real-world case study and provides actionable steps for construction financial professionals (CFPs) to manage and mitigate this often-overlooked potential burden.

### WHAT IS TECHNICAL DEBT?

Technical debt refers to suboptimal technology infrastructure that accumulates over time that can significantly impact a company's profitability, operational efficiency, and overall growth trajectory. For CFPs, understanding and contending with technical debt is crucial for maintaining your organization's financial health and paving the way for long-term success.

By making technical debt a business priority, companies can intend to refine their technology investments, enhance operational efficiency, and support long-term viability and resilience.

To illustrate these outcomes, let's look at a real-world example of a company with constraining technical debt and how it was resolved.



# TECHNICAL DEBT

## TECHNICAL DEBT CASE STUDY

Founded in the 1960s as a family-owned construction company and in its third generation of leadership, ABC has achieved remarkable growth, boasts a robust portfolio, impacts a broad demographic of end users with three generations in its workforce, and possesses a strong presence across multiple locations. With revenues exceeding \$300 million and a dedicated team of 250 employees, ABC continues to shape the Midwest regional construction landscape.

However, with its systems and processes rooted in tradition, it failed to evolve with the company’s growth. Despite its success, the need for modernization became evident, and the importance of addressing technical debt emerged to meet the demands of the business. Over two decades, ABC’s ongoing practices gradually contributed to the accumulation of technical debt:

- Growth in different markets, service lines, and geographies influenced one-off software purchases to solve the problems at hand. The lack of a cohesive, long-term strategy around procuring technology applications created a web of integrations and manual processes across the entire business.

- Siloed departments (e.g., project management, finance, estimating, business development, and human resources) made individual software decisions without considering the bigger picture. These rogue purchases created a fragmented technology landscape where solutions-based stopgaps did not communicate effectively, leading to inefficiencies.

- These siloed purchases also created a lack of control in ownership and the costs of applications, software, integrations, databases, etc. There was little oversight on how much was spent as the liability lived within the silos with no visibility.

- Solutions-oriented software for promised functionality overlooked their alignment with business requirements and strategic objectives, which led to oversold or overbought products.

- Maintaining outdated solutions-oriented software and putting projects “on the shelf,” while still paying for support and maintenance, led to spending money on vendors and products that were not adding value.

These practices had a lasting negative impact on ABC’s business, including:

- Lost dollars: Throwing good money to bad solutions-based approaches and

paying for technology that was not adding value.

- Talent retention: Legacy systems and disjointed applications created a divide among departments and project teams. Employees even left the company because their jobs were hindered rather than supported by technology (and required an advanced understanding of Microsoft Excel).

- Attracting talent: ABC was unable to attract strong candidates because it could not equip its people with efficient processes or leading tools in the market.

- Overworked employees: With a lack of systems integration, employees (especially in finance and project management) used tools like Microsoft Excel that involved manual entry, which led to unnecessary overtime for field workers inputting, approving, and assisting in time entry review, that resulted in lost productivity.

- Lack of data integrity: Data existed in different systems and was not accessible by shared departments. Financial and project reporting was done after the fact and not in real time. Data was pulled from many spreadsheets and systems. This lack of integrity led to a breakdown in trust in the data.

Exhibit 1: Technical Debt Estimate Tool Example

Technical Debt	Direct Cost Impacts		Strategic Impacts***				Level of Impact Total
	Annual Cost*	Productivity Loss**	Productivity Impact	Usability Impact	Impact on Customers	Impact on Risk & Compliance	
On-Premises ERP	\$25,000	\$105,000	3.1	3.9	1.5	2.0	10.5
Time-Tracking Application	\$8,000	\$0	1.0	1.0	None	1.1	3.1
Document Storage	\$22,500	\$48,000	1.4	1.6	1.0	2.1	6.1
Timekeeping to Payroll Integration	\$12,000	\$18,000	3.0	2.7	None	1.0	6.7

\*Annual Cost = fees associated with the care and feeding; support, maintenance, subscription, etc.

\*\*Productivity Loss = fees associated with FTE’s manual processes, dual entry, overtime, etc.

\*\*\*Strategic Impacts Scoring Scale (scores impact of downtime, manual processes, duplicate entry, etc.):

- High = 3.0 to 3.9, significant impact to 50% or more of stakeholders
- Medium = 2.0 to 2.9, significant impact to 25% or more of stakeholders
- Low = 1.0 to 1.9, less than 10% of stakeholders are impacted
- None = No impact



## THE BIG PAY-OFF

When ABC finally identified technical debt and took the necessary steps to identify it, measure its impact, and help establish standards and processes, the company experienced a turnaround over 18 months and recognized these business outcomes:

- IT now allocates and assists in administering its team with a set of standards and controls put in place.
- Technical spend was reduced by 32% in the first 12 months. This money was then reallocated to fund new initiatives.
- With real-time dashboards and metrics, project teams can now make data-driven decisions and focus on the key items that influence their day-to-day work.
- These changes created a culture of curiosity and innovation. People were excited to take advantage of emerging applications, such as AI tools, to make their jobs easier.

## MAKING TECHNICAL DEBT A BUSINESS PRIORITY

### Step 1: Technical Debt Check

A technical debt check begins with a detailed and precise estimate of existing technical debt, such as assets, license and subscription fees, data management tools, integrations, and middleware with their links to business value. This initial step paves the way for garnering genuine stakeholder support, setting realistic budgets, allocating resources accurately, and prioritizing those initiatives that will have the greatest impact.

In the case study, ABC faced significant technical debt and operational inefficiencies. However, with the arrival of a new IT director ("Bob"), positive changes began. Supported by the CFO and executive team, Bob meticulously gauged the company's technology landscape. He questioned the purpose of each system, identified redundancies, and reported whether solutions-oriented software aligned with business needs.

### Step 2: Measure the Impact on the Bottom Line

It is crucial to gather technical debt at the asset or application level to grasp how each component either enhances or

diminishes overall value. As you quantify the financial impact of technical debt, consider factors such as lost productivity, increased support costs, and missed opportunities.

In addition, the estimate should consider numerous variables including license fees, hardware costs, maintenance expenses, productivity losses, customer impact, and compliance risks (Exhibit 1). The goal of this holistic approach is to assist in developing a technical debt balance sheet that key stakeholders can easily recognize, enabling them to streamline decision-making and proactively reduce debt.

In the case study, Bob created a small team to take on this task. He discovered multiple on-premises applications, unused software, and overlapping services from various vendors. Moreover, point solutions-based options were streamlined, collaboration improved, and security risks were addressed.

The primary areas of technical debt centered around finance, the IT help desk, and project management. Bob's strategic approach transformed ABC's technology ecosystem, paving the way for greater efficiency and innovation.

### Step 3: Enable Standards & Processes to Assist in Handling Technical Debt

To effectively grapple with technical debt, set clear standards for technology adoption and define best practices. In addition, systematically prioritize projects that address critical areas to help reduce technical debt.

Approach the management of technical debt as you would any project for an external customer. In this case, your customers are your internal stakeholders, your business's operational performance, and your overall balance sheet. Consider regular technical debt check meetings as opportunities to sustain momentum, gain insights into the process, and create a platform for decision-making.

By addressing technical debt proactively, stakeholders gain a transparent view of the project's status, allowing them to

## TECHNICAL DEBT RISKS

**Efficiency:** Technical debt slows processes, increases maintenance efforts, and hampers productivity.

**Risk:** Outdated software and security vulnerabilities pose significant risks. Technical debt increases the likelihood of system failures, data breaches, and compliance violations.

**Cost:** Technical debt accumulates hidden costs – maintenance, training, and lost opportunities. These expenses impact the bottom line.

**Agility:** A debt-free technology stack allows companies to adapt swiftly to market changes. It enables innovation, scalability, and competitive advantage.

adjust their strategies and tackle emerging issues before they escalate into significant setbacks.

Bob took decisive steps to transform ABC's technology landscape. First, he helped form an innovation committee comprised of stakeholders from every department representing diverse generations. This inclusive approach allowed for a broad spectrum of end users and technical knowledge.

Next, Bob assisted in the creation of a model that set clear governance and standards, allowing flexibility when needed. Previously, technology purchases were ad hoc; now, all proposals must go through the committee, complete with a business case.

Gradually, the company addressed its technical debt, migrating nearly 80% of applications to the cloud. By moving on-premises applications to the cloud, the company reduced its hardware and infrastructure costs, reduced its cybersecurity risk, and enabled employees to take advantage of working from home or remotely.

The innovation committee now plays a crucial role by test-driving new technologies, performing inquiries to understand if they align with business goals, and avoiding failed application. Bob's strategic leadership has propelled ABC toward greater efficiency and innovation.

## CONCLUSION

As your company looks to take on a similar endeavor, keep these important considerations in mind:

- **Acknowledge technical debt:** Recognize existing debt and its impact. Acknowledge that technical debt accumulates over time due to shortcuts, suboptimal design, or postponed maintenance.
- **Prioritize and classify debt:** Categorize debt based on severity and business impact; document specific technical debt items such as outdated databases, lack of integration capabilities, and poor usability; and prioritize addressing high-impact debt to help mitigate risks and improve overall system health.
- **Align with business goals:** Balance investment in new features or systems with debt reduction; involve key stakeholders including business leaders, finance teams, and operations; and focus debt reduction alignment with strategic objectives and long-term sustainability.
- **Form a target operating model:** Systematically improve technical debt using a common language; make informed trade-offs between modernization and debt reduction. Regularly read and report on whether there is progress and adjust strategies as needed.

There are numerous benefits to construction companies adopting technological modernization. In the ABC case study, the acknowledgement of technical debt and the strategic plan to reduce it made a significant difference in the company's overall vitality.

Process changes and new systems are daunting, but organizations that adapt will have a fresh approach to technology issues that may arise. **BP**

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