How CIOs Can Prove the Value of Technology in the Age of AI

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Given AI's considerable promise to boost productivity and transform business models in every industry, it is no surprise that the technology's ascent is already increasing companies' rate of investment in IT. Yet the advent of AI raises yet again a question that business and IT leaders have been puzzling over for decades: What's the return on technology-related investments?

Much of the difficulty in answering this question is due to the disparate goals of the IT and finance functions: CFOs want financial proof that the money spent is worthwhile in the form of attributable, timely, and repeatable outcomes, while CIOs—as well as CDOs, CIDOs, and CTOs—worry that waiting for perfect evidence of returns can reduce competitive advantage and stifle innovation. The paradox is not that technology fails to create value, but that the value often seems to show up in the "wrong" places and on the "wrong" timelines and is rarely captured in bankable terms.

Sitting between them, CEOs must try to reconcile these two perfectly rational positions: the need to move fast enough to capture opportunity but not so fast that investment decisions depend on faith.

We propose a new way of looking at the return on technology investments. Rather than trying to force the measurement into a single ROI yardstick, technology-related investments should be valued in terms of their contributions in three areas: day-to-day operations, business expansion, and disruptive innovation.

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In this article, we offer evidence for why this approach works, its potential pitfalls, and how CIOs and CFOs can work together to better account for and justify their companies' IT investments.

Doubling Down on AI

The sheer amount of money that technology companies are pouring into AI is mind-boggling. Just as noteworthy is the speed at which companies are investing in the technology, hoping that if they can reap its benefits first, they will gain an almost insurmountable competitive advantage over their slower rivals. According to a recent BCG survey, company leaders across industries say they plan to more than double their investment in AI to 1.7% of revenues in 2026. But again, will all this investment pay off?

The problem is that CFOs are accountable for capital discipline and earnings predictability. So in the absence of defensible proof of ROI, their resistance to further investment isn't obstruction, it's rational governance. But CIOs see a different risk. From their perspective, the opportunity to reap the benefits of technology—and the cost of falling behind—is too great to wait for perfect evidence, especially as AI resets expectations across industries. They are accountable for increasing capabilities, boosting resilience, and ensuring future competitiveness, and the risk of failure doesn't show up neatly in quarterly financials.

What keeps this tension alive is not a disagreement about whether technology matters. Most leadership teams agree it does. The tension persists because each side operates under different proof standards and time horizons. Agreement on importance is not the same thing as agreement on evidence.

The Surprising IT Cost Curve

For more than a decade, the narrative about business technology has become louder and clearer: IT is no longer just a function; it is an enabler for driving competitive advantage. Software has changed how virtually every industry works, and AI is now extending that shift.

A story this big should leave a visible trace in company financials. To test that assumption, we analyzed two commonly used benchmarks of Enterprise IT spending over the past 15 years.

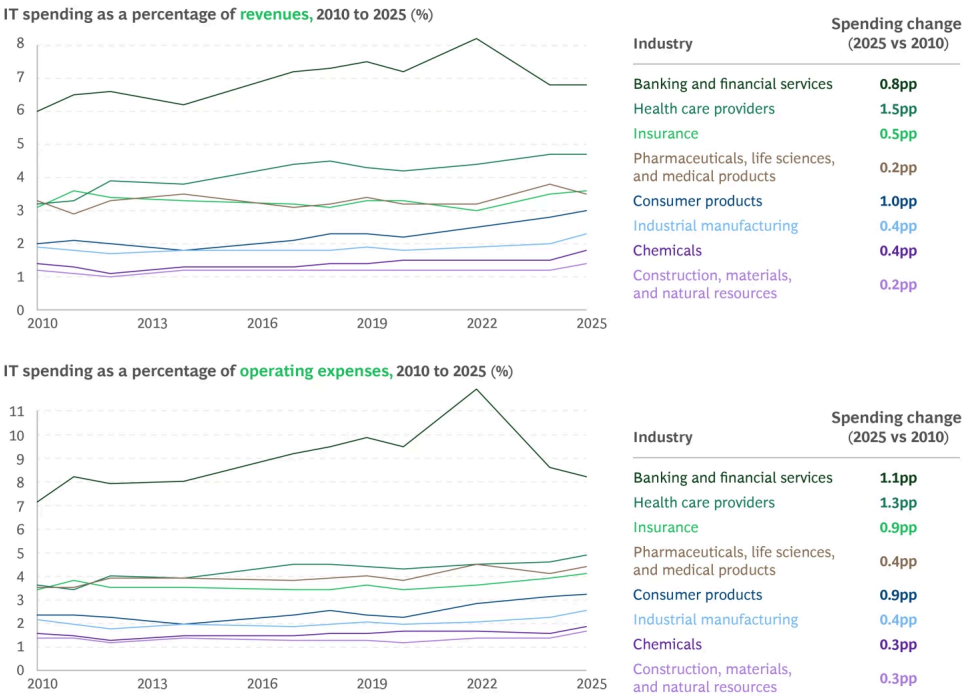
- IT spending as a percentage of revenue, which captures how much of every revenue dollar is allocated to technology
- IT spending as a percentage of operating expense, showing how much of the company's ongoing operating cost base is technology related

Across these two broad metrics, the macro signal looks surprisingly flat, with some variance by industry. Spending as a percentage of both operating expense and revenue has remained relatively stable over long horizons. Technology spending increased over the period, but it did so largely in step with enterprise growth rather than structurally outpacing it.

This proved to be true across industry verticals. Our analysis shows that while the amount of each industry's IT spending varied, it remained essentially flat as a proportion of revenue and operating expense. (See Exhibit 1.)

EXHIBIT 1

Across Industries, Spending on Technology Has Remained Flat as a Percentage of Both Revenues and Operating Expenses



Sources: Rubin Worldwide; BCG analysis.
Note: This data shows spending on enterprise technology, not operational technology or product-related technology.

Industries that are inherently data intensive, transaction heavy, and regulatory driven, such as insurance, banking, and health care, tended to spend the most, while chemicals and construction, materials, and natural resources sectors, all typically asset-heavy, capital-intensive industries, spent the least. Those that tend to balance digital capability with complex physical operations and supply chains, such as pharmaceuticals, life sciences and medical products, industrial manufacturing, and consumer products, fell somewhere in the middle.

The cost curve may be consistent across industries, but the power of the technology that companies are implementing relative to operating expenses (opex) or revenue has increased dramatically. As Moore's Law predicted, the economics of technology has changed: computing power has increased, and the cost per unit has fallen. As a result, technology now delivers dramatically more capability per dollar than it did decades ago. Thus, IT spending as a percentage of revenue can remain stable even as digital intensity surges, because a cost-accounting lens can't capture the technology's exponentially increasing power.

Moore's Law may explain the increase in technology efficiency, but it can't define the resulting business value. Organizations can run more technology, ship more code, and deploy more tools without reliably converting that capability into measurable improvements in financial performance. More capability per dollar doesn't inherently mean that value is being captured; it is evidence that technology has become more efficient to consume.

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Why Budgets Don't Expand

We know technology is a key enabler of business success. So why aren't IT budgets expanding as a share of opex or revenue? Clearly, something is constraining investment. The most consistent constraint is not the conviction that technology produces value; it is the lack of proof. Value may exist, but it is often hard to demonstrate attributable, timely, and repeatable outcomes in financial terms. And when ROI cannot be delivered with sufficient confidence, budgets stay anchored to last year's run rate, peer benchmarks, and incremental planning.

The result is predictable: technology's value becomes more visible strategically than it does financially. This tension echoes an earlier moment in economic history. In the 1980s and early 1990s, economists described the "productivity paradox" of computing, famously summarized by Robert Solow's observation that "You can see the computer age everywhere but in the productivity statistics."

The lesson from that era was not that technology failed to boost productivity but rather that productivity gains require complementary investment in process redesign, skill shifts, organizational restructuring, and management innovation. Technology alone did not drive measurable economic lift. The system around it also had to evolve. That's exactly what our 10–20–70 rule captures: roughly 10% of value comes from the technology, 20% from data and algorithms, and 70% from people, process, and operating model change.

The risk is that today's AI and digital investments will replay a similar pattern. Yes, the technology's capabilities are accelerating. But without structural redesign and disciplined capture mechanisms, financial outcomes may lag the rhetoric once again. Is there a better way to measure technology spending and by doing so, make better IT investment decisions?

Business Technology's Three Levels

Many ROI debates—and the investment decisions that follow—fail because they assume all technology investment is trying to produce margin uplift in the same way. In reality, different aspects of every company's technology portfolio have different rationales and goals. Measurement and governance cannot be a one-size-fits-all exercise.

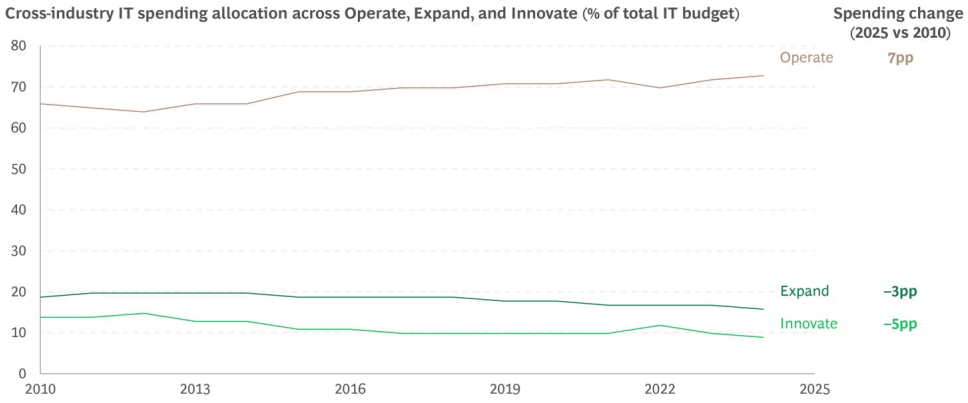
A practical way to frame the IT investment challenge—and the solution—is through a three-part Operate, Expand, Innovate lens:

- **Operate** investments sustain and secure the core business, supporting operating systems and platforms while ensuring compliance and resilience.
- **Expand** investments modernize and scale capabilities, enabling incremental performance improvements, regulatory compliance, and future viability.
- **Innovate** investments aim to create new capabilities or new business advantage, changing how the company competes, not just how efficiently it runs and scales.

Each category serves a distinctive purpose and carries a distinctive risk profile, and each should be evaluated with unique expectations for returns and time horizons. But that's not how most companies currently segment their IT investment portfolios. Cross-industry data suggests that the typical company spends roughly 70% or more on the Operate category, another 15% to 20% on Expand investments, and less than 10% at the Innovate level. (See Exhibit 2.)

EXHIBIT 2

While Total Technology Spending Has Stayed Flat, the Mix Has Shifted Toward Keeping the Lights On and Away from Innovation



Sources: Rubin Worldwide; BCG analysis.

When nearly three-quarters of the IT portfolio is devoted to keeping the lights on and protecting continuity, however, spending will (by design) be dominated by run economics. That's why the overall IT spending curve typically looks stable year over year—and why it isn't a reliable indicator of how much innovation is actually happening or where value is being created

And even within investment directed at innovation, not all bets are equal. Some are table stakes: necessary to stay current but unlikely to create durable advantage. True competitive separation comes from needle movers: investments in high-value areas tightly linked to strategy in differentiable parts of the business, where proprietary data, operating model shifts, or distinctive execution create step-change performance.

Measuring Technology Value

By segmenting the IT portfolio into this three-part structure, then making technology choices accordingly, companies can gain the greatest return on those investments while measuring the results more accurately.

Level 1: Operate. This category includes table stakes investments designed to achieve pure efficiency and productivity gains that should be measured with baseline data and output-per-unit-cost metrics. The objective is cost transparency and throughput—developer productivity relative to cost, cost per unit of compute delivered, cost per release, cost per invoice processed—all metrics that show foundational efficiency and improve predictability.

One major cloud and software company, for example, recently introduced AI tools directly into its software development life cycle, starting with the coding phase. The goal was to treat the value created as more than a simple measure of adoption. The focus was on driving meaningful day-to-day usage by software engineers and embedding the tools into real delivery workflows, which would lead, it was hoped, to improved ways of getting work done and ultimately boosting the number of features shipped.

To make the hoped-for value measurable, a major software company developed instrumentation that tracked not only adoption, but sustained usage and practical outcomes. This was combined with a deliberate effort to change behavior that included training, coaching, and embedding credible peer engineers who could model the new ways of working and end-to-end process redesign inside development teams.

Productivity rose materially, with reported improvements of around 30%, and teams shipped roughly 25% more features, all with the same unchanged engineering capacity. Just as important, engineers reported feeling more empowered, reducing resistance to future changes and creating momentum for the next wave of efficiency gains.

Level 2: Expand. The goal at this stage is to create measurable business value: initiative-level performance improvements that require explicit baselines and attribution. These outcomes should be measured with business-side KPIs such as conversion, yield, cycle time, error rates, and business productivity. This could include impact on staffing when it can be banked, such as reductions in full time-equivalent employees enabled by an AI tool or an enterprise resource planning (ERP) automation that removes work rather than simply shifting it elsewhere.

A large energy company began tracking business value from its data and analytics team back when the technology was referred to as big data. As the team grew, there was a strong desire to demonstrate impact, so they refined their tracking process to build credibility and momentum. This allowed the team to move from its humble beginnings to sustained years of more than $1 billion in new value creation.

Key to this success was a firmly agreed upon process in which hard-dollar calculations (such as through headcount reductions) were categorized separately from soft-dollar benefits such as capital avoidance, working capital reductions, lower risk, or productivity improvements—although these other areas were significant enough that they were not overlooked in the value discussion. Business unit leaders always signed off on the value and presented the outcomes themselves. This built accountability while simultaneously attracting the attention of other business units.

The company eventually shut down the analytics function when the capability had been fully embedded across the company and no longer required regular oversight. Since then, however, they have restarted these practices to track the new value driven by AI

Level 3: Innovate. At this stage, the goal is full technology-enabled business transformation, such as new operating models or new business lines. This level should be tracked with enterprise-value signals, because transformation is rarely captured by a simple business case. Equity value and valuation multiple dynamics such as the price to earnings ratio become part of the measurement system, alongside strategic scorecards for new value pools and competitive advantage.

Here, technology reshapes the business model itself, creating new revenue streams and shifting how value is delivered and captured. One large industrial company illustrates this shift: by embedding connectivity, AI-driven analytics, and cloud-based management tools into its products, the organization moved beyond selling hardware to offering data-enabled and subscription-based services.

As a result, the relevant business segment now accounts for a large share of total revenue, and it is growing at a strong double-digit pace, evidence of both the scale achieved and the strategic emphasis on technology-rich solutions. The company has also introduced usage-based and as-a-service commercial models for these technologies, expanding adoption and creating recurring revenue opportunities.

These shifts demonstrate how technology investment can extend a company’s value chain from product to platform and service, enabling differentiated advantages that go beyond traditional

product sales and opening up high-growth digital revenue streams.

What Can Go Wrong

Despite their best efforts to measure technology investment returns accurately, all too often, companies fall into the trap of using the same yardstick for three different types of investment. Productivity gains do not mean full business transformation, and business transformation rarely appears in near-term business cases. When leaders force everything through the same ROI gate, they either overpromise on what the Operate level can deliver or underfund the Expand and Innovate levels. Either way, the finance people lose confidence in the value of technology, and technology transformation loses momentum.

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Organizations often fall short not because value is absent, but because the system makes higher-level value hard to capture. Many can drive Level 1 productivity, fewer can scale Level 2 outcomes, and only a very few can sustain Level 3 transformation. Several patterns recur across industries that dilute impact, blur attribution, and prevent gains from being banked, keeping ROI contested and investment constrained:

- **Business Case and Benefits-Tracking Breakdown.** A large share of IT initiatives often have no business case at all. Many spending items, such as software upgrades required simply to stay current, may not need one. But large investments at all three levels must be justified. Yet even when business cases exist, they are all too often weak or incomplete, frequently neglecting cost implications that later appear and creating real credibility problems. Benefits realization is often not tracked, or tracked weakly, with little consequence when those benefits do not materialize.
- **Value Leakage.** Business cases frequently overpromise savings as if efficiency improvements will invariably free up capacity and behavior will change automatically. The technology may “work,” but the company does not convert it into measurable performance gains. Capacity is not freed up, processes aren’t retired, and benefits remain theoretical.

- **Budget Crowd Out.** Long-cycle mandatory programs such as ERP transformations and cybersecurity requirements absorb discretionary capacity and funding. This can make it seem as if the technology isn't producing value because the portfolio is dominated by mandatory spending while the true needle movers lose funding support.
- **Governance Mismatch.** Foundational Operate investments, Expand growth modernization, and Innovate-heavy transformation bets cannot be governed with the same rules. Treating experimentation like run-the-business activities slows learning. Treating foundational investments like venture bets creates noise and mistrust. Without distinct funding logic, ownership, time horizons, and measurement metrics, organizations optimize defensibility rather than outcomes.

Even once companies address obvious flaws in business cases, budgets, and governance, value can remain difficult to see because technology capabilities advance faster than workflows change, and workflow changes advance faster than the value can be captured. The historical lesson of productivity lags reinforces the point: the benefits of technology require complementary investments such as process redesign, skill shifts, organizational restructuring, and management innovation.

This lag in assessing value makes true ROI harder to attribute and easier to contest, even—or especially—when technology has become virtually indistinguishable from the business itself. Without a deliberate capture system, value arrives late, appears indirectly, and becomes easy to dispute. The 10-20-70 rule is a useful reminder of where true ROI impact really comes from: the curve bends only when organizations invest beyond the tool itself and redesign how work gets done.

Working Together

Resolving the paradox inherent in the effort to measure the ROI in technology must be a combined effort on the part of both the CFO and the CIO.

The CFO's role is not to slow technology down. It is to create clarity and credibility. CFOs can begin the effort by forcing transparency in the IT portfolio. By separating spending into run, mandatory change, risk versus resilience, incremental improvement, and needle-moving categories, CFOs can make sure discussions are grounded in what the money being spent is actually doing. This alone reduces the "where is the ROI?" deadlock because it clarifies which spending is intended keep the doors open and which is designed to generate uplift.

Once categorized, CFOs should apply different proof standards based on investment type: productivity and unit-cost metrics for foundational run, measurable baselines and attribution for

business outcomes, and stage-gated outcome proof for transformation bets, including an enterprise-value lens where appropriate.

Validation of investments through a “trust but verify” philosophy makes finance a partner in credibility rather than an after-the-fact auditor. The bankability test becomes decisive: strategic spending should be approved only when there is a prenegotiated path to banking gains—budget step-downs, headcount shifts, or other mechanisms that turn theoretical benefits into realized financial metrics.

For CIOs, it’s critical to remember that credibility unlocks investment. The role of the CIO needs to shift from service provider to technology portfolio manager, treating spending as a segmented portfolio with different intents, outcomes, and measures. At the Operate level, for example, demonstrating relentless efficiency and declining costs through transparency into unit costs will earn more Expand capital. And the value to be gained at the Expand level should be framed not as “IT value” separate from “business value,” but rather as measurable outcomes across the value chain.

Bets on innovation should be managed like a venture capital portfolio: fund experiments, scale winners, kill losers, and use explicit stage gates and rapid learning cycles to build a track record that changes how the enterprise perceives transformative technology investments.

Will AI Bend the Cost Curve?

Just as previous waves of computing lowered the cost of information processing, AI can lower the cost of cognition. It expands what machines can interpret, generate, predict, and optimize. In economic terms, it compresses the cost of intelligence itself. This is a profound shift.

AI can lead to huge productivity gains at the Operate level. But those gains must show up in the P&L, either through structural cost reductions or through higher output that can be converted into revenue growth. Time saved isn’t value until it is banked as dollars. It can help companies at the Expand level by redesigning operating models from end to end to take advantage of cognitive augmentation. But finance and IT must align around shared evidence standards at both levels.

And AI has the potential to increase the Innovate share of the IT portfolio, reducing experimentation costs and accelerating content creation, code generation, analysis, and decision support. It opens possibilities for new business models and expands the range of economically viable automation. But differentiation bets in high value areas must be properly funded so they can scale, not piloted indefinitely.

Without those shifts, AI may dramatically increase capability while leaving macro financial ratios looking deceptively familiar. With them, it could finally convert its potential for exponential

capability increases into visible economic acceleration.

But history offers a caution. Moore's Law gave us exponentially more powerful compute. Yet enterprise productivity gains lagged until organizations redesigned workflows, reallocated labor, and embedded technology into operating models at scale. Unless managed and accounted for properly, AI could just repeat this pattern. The spending curve will bend if CIOs and CFOs work together.

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