



STRATEGIC REPORT

Proven Cost Transformation Strategies for Global Manufacturing Executives

**HOW TO SHIFT FROM COST REDUCTION TO VALUE CREATION
ACROSS MANUFACTURING – FROM PRODUCT DESIGN TO SOURCING**

Introduction

Manufacturers face ongoing pressure from investors and customers to improve amid stubborn inflation and economic uncertainty. Incremental budget cuts to staffing, R&D, and other line items reduce expenses during the short term, but these savings typically erode over time because they don't address the underlying cost drivers.

Companies can unlock new levels of profitability and efficiency by aligning each phase of the product development lifecycle to reduce material spend, which can be 40-60% of total costs.

This report outlines how forward-thinking manufacturing leaders are taking a strategic approach to cost transformation by fostering short- and long-term value creation.

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Why Traditional Cost-Cutting Initiatives Often Miss the Mark

Can paying 4% more to manufacture a product actually improve your company's overall bottom line? Surprisingly, the answer might be "yes," depending on the circumstances. For example, manufacturing a part in-house instead of using a discounted supplier generates revenue for another business unit and keeps more cash in the company. And selecting a manufacturing region with a higher overhead could be a prudent way to avoid hefty tariffs and minimize risk - thereby achieving a net cost savings.

But traditional cost-cutting efforts don't always drill-down to this level, which is a missed opportunity for manufacturers. Despite the importance of curtailing costs, the Information Services Group (ISG) reports that nearly [one-third \(31%\)](#) of executives surveyed in the U.S. and Europe did not meet their cost-saving targets.

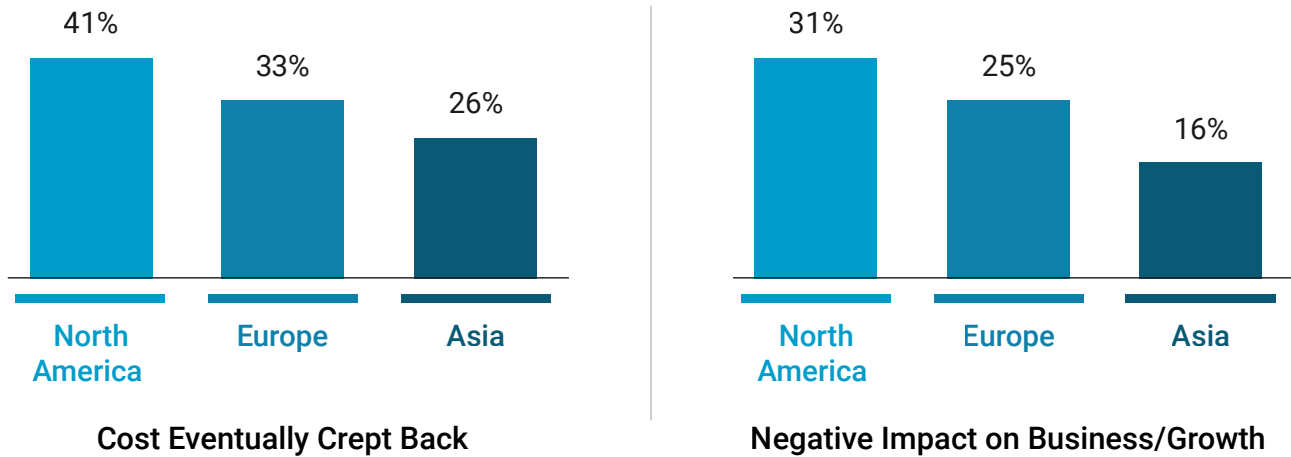
Cost-cutting efforts are typically the impetus for sweeping changes (e.g., layoffs) or a directive for each business unit to reduce its expenses (e.g., 8% cuts across each department).

Neither of these common strategies addresses systemic inefficiencies across departments or processes. This department-level approach could partially explain why short-term cost savings often erode and can negatively impact growth, according to a [BCG survey](#) of C-level executives.

Without a coordinated cost strategy, there's no overarching directive to align cost-cutting efforts across departments to meet short-term targets, reach long-term goals, and uncover new opportunities for savings. And there's no blueprint to implement meaningful changes required to transform operational cost models.

How Effective Were Prior Cost Reduction Efforts?

% survey respondents who agreed or strongly agreed with each statement



Source: BCG, The CEO's Guide to Cost & Growth.



Figure 1. Misaligned cost management initiatives can have limited results and a negative impact

Successful manufacturing leaders are taking a strategic approach to cost transformation, which focuses on fostering long-term value creation and innovation. This includes adopting a bottom-up approach (known as a zero-based approach), applying artificial intelligence (AI) and digital transformation (DX) capabilities, and implementing operational changes to drive added value.

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A Zero-Based Strategy for Cost Transformation

New ideas often require a new framework to recalibrate the “we’ve always done it this way” mindset to achieve transformational savings instead of incremental reductions. So, rather than examining longstanding department-level budgets and operations to identify cuts, try a “zero-based” approach.

This strategy encourages manufacturing executives to reimagine their organizations from scratch using a bottom-up approach – and focus on company-wide opportunities to meet their targets. This process can include justifying every expense at the beginning of each budget cycle to encourage a thorough review.

According to [Accenture](#), a zero-based model is “a new way to drive profitability that emphasizes the future over the past.” And more than just a cost-cutting exercise, a zero-based approach is a strategic realignment of resources, talent, and processes.



Transforming a series of cost-focused activities into a cohesive program requires manufacturers to rethink cost ownership and accountability beyond departmental siloes.

Rethink Cost Estimation

The zero-based approach incorporates elements of [Peter Drucker's](#) “systematic abandonment” process to eliminate activities on a regular basis that are no longer useful. This process also includes ranking and prioritizing activities based on their perceived value to the organization and its goals.

[McKinsey](#) advocates focusing on resources allocated throughout an organization to help determine staffing levels, identify redundancies, and further refine roles and responsibilities.

Transforming a series of cost-focused activities into a cohesive program requires manufacturers to rethink ownership and accountability beyond departmental siloes. Organizations that empower employees to contribute to change tend to increase employee commitment to making new initiatives successful.

Managers and employees with visibility into corporate progress against key performance indicators (KPIs) can identify opportunities to make improvements quickly without waiting for formal reviews. That said, a formal review process enables stakeholders to assess their progress to date and adjust accordingly.

As with any new process, internal training and a commitment to open communication is integral to a successful rollout and ongoing success.



Learn how control solutions innovator [Woodward implemented new DX capabilities](#) within its corporate procurement operations.



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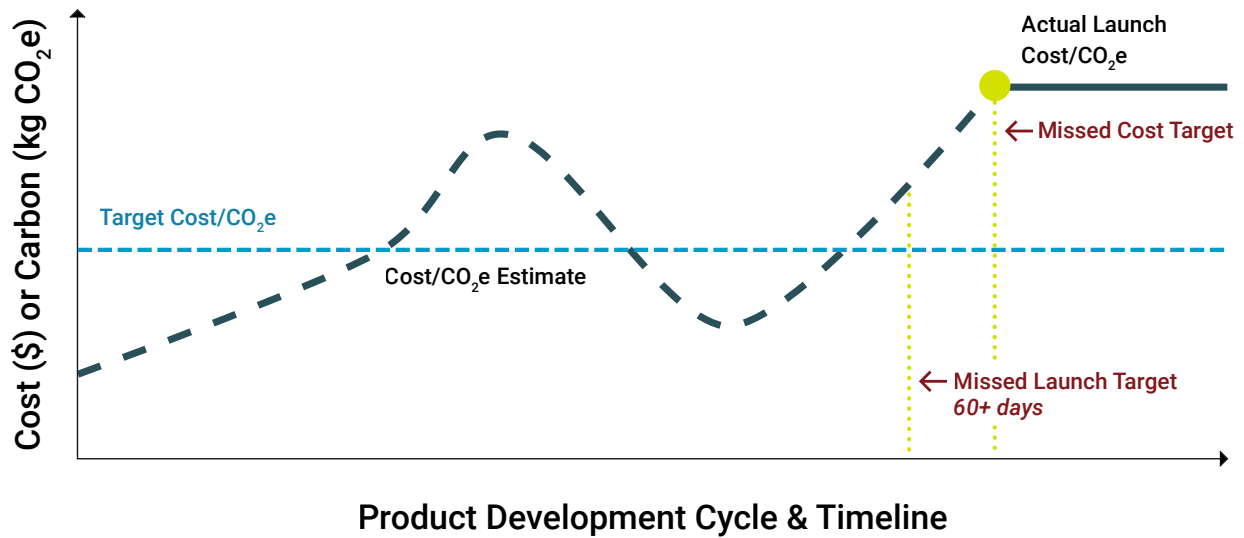
Four Ways to Shift from Cost Reduction to Value Creation (with Examples)

Learn how manufacturers are embedding a cost culture across the enterprise using the following techniques.

1. Adopt a “Shift Left” Mindset for Cost Reduction

Because up to 80% of product cost is set during the design phase, more manufacturers are addressing cost, manufacturability (DFM), sustainability, and risk earlier in the product development process. By shifting left and identifying potential issues earlier, manufacturers can mitigate expensive late-stage redesigns.

In addition to design and cost engineers, manufacturers are giving procurement, manufacturing operations, and sustainability teams a seat at the table to address potential issues early in the design phase. Using collaboration tools such as [aP Workspace](#), cross-functional teams can use automated insights to identify problems in real time and streamline their workflows. This could include exponential increases in specific material costs, skyrocketing overhead costs in select countries, or the requirement to source high-quality components.



Source: aPriori



Figure 2. Manufacturers often miss cost and launch targets due to late-stage problems

Figure 2 illustrates how and where new product development (NPD) projects typically miss their cost and launch targets. The gray cost curve fluctuates significantly and often increases when procurement – and then manufacturing engineering – becomes engaged in the project.

For example, a procurement team may report that raw material costs for a product line have increased significantly since the last design update. Additionally, a DFM problem identified in the proof of concept (POC)/prototyping phase may require design changes that increase costs.

Issues uncovered during pilot production (production trial run) can also require time-consuming fixes – including inconsistent production quality, assembly challenges due to tight tolerances (tolerance stack up), and more.

Time and cost challenges impact manufacturers across industry segments. Consulting firm BCG reports that U.S. automakers lose approximately \$6,000 on each electric vehicle (EV) they sell in the \$50,000 range.

Adopt a Clean-sheet Mindset for Design and Cost Optimization

This shift-left approach also encourages cross-functional teams to adopt a new way of thinking to achieve transformational savings instead of incremental reductions.

Rather than using similar existing products as a baseline for new initiatives, teams look at designs and associated costs from a fresh perspective. Using this model, teams can reimagine their organizations from scratch using a clean-sheet design methodology.

From a strictly cost perspective, this model is known as a bottom-up approach or zero-based budgeting. It focuses on company-wide opportunities to increase efficiency, expand capabilities, and contain costs. Executives can apply this methodology to justify every cost at the beginning of each budget cycle to encourage a thorough review of all expenses.

To support this approach, procurement teams can examine the should cost of raw materials and components, along with a supplier's direct and indirect costs (including variances based on factory location).



The shift-left approach encourages cross-functional teams to adopt a new way of thinking to achieve transformational savings.

Read how to use bottom-up/zero-based budgeting for product development.



MEDICAL DEVICES BRAND ACHIEVES A 25X ANNUAL ROI WITH APRIORI

A global medical device brand facing cost pressure in printed circuit board (PCB) production adopted aPriori to improve cost estimation accuracy, strengthen supplier negotiations, and make informed build-or-buy decisions.

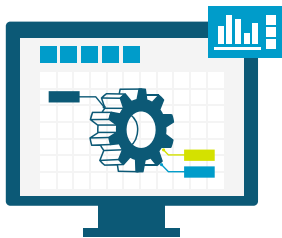
The company is achieving an annual 25x ROI on its aPriori investment while streamlining manufacturing processes and strengthening cost management capabilities across its diverse product lines – without hiring additional staff.

2. Empower Product Designers to Optimize for Profitability

“The design engineer has the biggest impact on everything that happens downstream,” said David Van Och, a Senior Solution Consultant at PTC. During his interview for [aPriori’s podcast](#) he also noted: “When design engineers are using 3D CAD tools, they have the biggest influence on cost, manufacturability, how to assemble it, how to test it, and even sustainability. There’s a whole range of DFM capabilities that design engineers need to consider.”*

A big driver to shift left is for product designers to assume a greater role in tackling cost. The ratio of product designers to cost engineers can be 25:1 (or more). One way to support this effort is to provide product designers with automated cost and DFM guidance to eliminate relatively low-level cost issues. In this scenario, cost engineers will have fewer issues to address, enabling them to focus on critical product cost challenges and broader strategic initiatives.

Product manufacturing simulation software provides designers of all skill levels with insight into the cost, DFM, and sustainability of a specific design and manufacturing option. Product designers can simulate multiple scenarios and then evaluate the trade-offs to determine the most effective path forward.



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*The interview was edited for brevity

To conduct a comprehensive cost analysis, design engineers can use manufacturing simulation solutions from aPriori to evaluate an extensive range of potential cost drivers accurately. And they can see how one design change can impact manufacturing, sustainability, and other considerations. This includes:



Design specifications

A product design team may modify an older, existing part to meet specifications for a new product (e.g., adapt the housing of a current HVAC system to accelerate the design of a new version). However, the older product may have been over-engineered or designed for a specific manufacturing process that won't be used to produce the new product. So, there could be an opportunity to adjust tolerances or other legacy product parameters for the new design without impacting product quality.



Material selection

Procurement decisions regarding raw material and component selection can affect product weight, performance, and manufacturing requirements.



Manufacturability

Requirements for a secondary manufacturing process (such as turning or milling), manual assembly, cooling times, facility availability, and equipment costs can significantly impact cost and time to market.



Carbon footprint

Manufacturers are increasingly including carbon “costs” in new product designs to help evaluate cost and CO₂e trade-offs effectively. This can be especially important for companies working to achieve their net-zero goals.

Managing this level of complexity requires an organizational commitment to integrating cost management into the product engineering culture and investing in solutions for manufacturing cost estimation.

DANA REALIZES 4% SAVINGS ON \$100M IN FIRST YEAR USING APRIORI

Dana's Light Vehicle Drive Systems team is achieving significant savings with aPriori's cost optimization insights. The Dana team ensures that new product designs meet DFM and cost requirements. Dana engineers use aPriori to evaluate the cost impact of design choices, alternative materials, and manufacturing processes.

aPriori's automated analysis also accelerates make vs. buy decisions and regional supplier assessments – ultimately improving profitability and accelerating time to market.

During the first year using aPriori, Dana identified a potential 8% savings on a \$100M spend. Higher sales and larger profit margins thanks to lower product costs.

3. Establish a Holistic View of Manufacturing Costs

Bain estimates that at least 60% of a cost-cutting program's value involves operational changes and coordination among departments and with partners (i.e., preferred suppliers). Companies that connect design engineering and sourcing tend to have a greater advantage than their peers because they have the insights to address shifts in cost and risk quickly.

Executives can use manufacturing simulation insights to evaluate and compare complex scenarios to:



Determine build vs. buy (outsourcing) options



Compare product design options across cost vs. carbon vs. DFM trade-offs



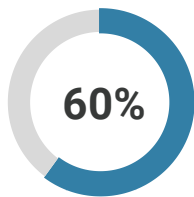
Assess alternative materials or bill of materials (BOMs)



Evaluate manufacturing/production processes



Compare manufacturing costs across regions



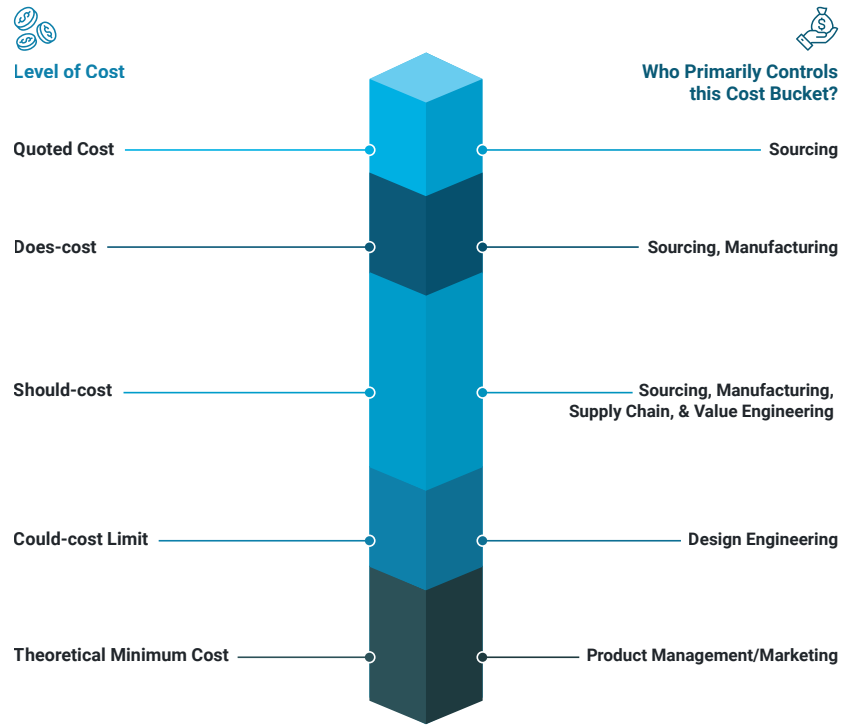
Bain estimates that **at least 60% of a cost-cutting program's value involves operational changes** and coordination among departments and with partners



Learn more about [steps to calculate and compare total manufacturing costs by region.](#)



Gap Between Quoted Cost and Could Cost by Different Functions



Source: [why-does-it-cost-so-much-vf.pdf \(mckinsey.com\)](https://www.mckinsey.com/~/media/mckinsey/industries/manufacturing/our-insights/why-does-it-cost-so-much-vf.pdf)

aPriori

Figure 3. Multiple departments share responsibility for the same cost areas, which underscores the need for enterprise-wide alignment on cost

LIUGONG CUTS COSTS 40% WITH APRIORI'S SHOULD COST INSIGHTS

LiuGong Machinery Co., Ltd. is a \$4 billion provider of hydraulic excavators, road rollers, and other construction machinery.

CHALLENGE

- Actual production costs often exceeded targets by 20%, which were often identified post-launch.
- It was challenging to control expenses during design without real-time cost insights.

SOLUTION

- Using aPriori's Manufacturing Insights Platform, the company created the LiuGong Master Digital Factory to estimate various production expenses quickly – including extensive configurations for sheet metal, stamping/machining, and casting/forging.
- LiuGong applies automated insights to identify cost-saving opportunities, use should cost insights for effective negotiations, and make informed manufacturing business decisions.

IMPACT

- LiuGong's design-stage insights helped reduce production expenses by 40% to increase its profitability, cash flow, and global competitiveness.

4. Include Risk and Sustainability in Your Methodology

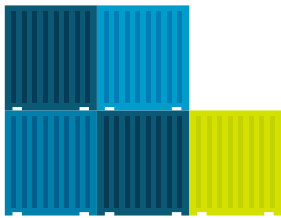
What's the cost of product delays to your organization – including a reduction in cash flow? While there is no standard guide, Accenture reports that supply chain disruptions affect revenue growth between 7%-11%. The report also notes that manufacturers may be willing to pay a 3-5% premium for significantly higher supply chain reliability and resilience. Depending on the size of the sales opportunity and other factors, speed to market can more than offset added supply chain costs.

Trade tariffs, "carbon taxes," transportation costs, and other variables can also impact a product's total unit cost (TUC). For example, the European Union's "carbon tax" – the Carbon Border Adjustment Mechanism (CBAM) – could increase the material costs of imports from carbon-intensive countries by 15%-30%. ([Learn more about the CBAM's impact on manufacturers.](#))

Additionally, a company's sustainability achievements and progress toward reaching its net-zero goals are increasingly important to customers across industries and geographies. To set a financial value of CO₂e during product design, manufacturers are using Internal Carbon Pricing (ICP) to quantify the value of carbon reduction.

By setting a cost per ton of carbon, manufacturers have an "apples-to-apples" comparison to help make effective business and investment decisions, incentivize departments and suppliers effectively, and support low-carbon innovation.

Solutions like aPriori can use a manufacturer's ICP to report on production and carbon "costs" and review how changes to design scenarios can impact cost and carbon.



3-5% is the premium that manufacturers are willing to pay for higher supply chain reliability.

Source: Accenture

[Get aPriori's Guide](#) to Reducing Product Emissions

4

Uncover New Cost Opportunities in Seconds with aPriori

aPriori's AI-Powered Design & Sourcing Insights empower users to reduce costs while improving sustainability, productivity, and manufacturability. aPriori extends manufacturers' digitalization investments, provides new levels of automation, and delivers visibility across the product development lifecycle to make decisions quickly and confidently. Benefits include:

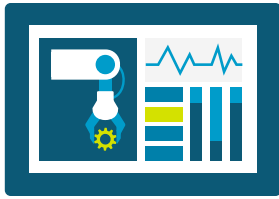
Provide Insights from Design through Production

aPriori's enterprise AI provides product design analysis and recommendations at lightning speed. Importantly, aPriori provides the only solution to simultaneously evaluate product design, cost, and DFM on a single platform to help users quantify the impact of various trade-offs.

This includes running AI-powered "what-if" scenarios for multiple product designs, manufacturing processes, and individual factories or production regions. Additionally, manufacturers are also combining their actual historical product data and aPriori's simulated insights to train generative AI models for game-changing product innovation capabilities.

Analyze Costs at Scale

aPriori empowers sourcing teams and other stakeholders to identify cost outliers across multiple dimensions (e.g., material, component type, etc.). aPriori provides the automated insights to conduct a spend analysis at scale, identify cost outliers, and then use manufacturing insights to establish should cost models to compare current component costs against costs based myriad direct and indirect expenses based on production region. (Read more about [aPriori's should cost capabilities](#).)



aPriori provides the only solution to simultaneously evaluate product design, cost, and DFM on a single platform to help users quantify the impact of various trade-offs.

Integrate and Strengthen Existing Investments

aPriori automatically extracts geometric data from 3D CAD files checked into product lifecycle management (PLM) systems. The solution leverages the 3D data and connects three digital twins—product, process, and factory — to generate precise carbon, cost, and manufacturability breakdowns.

Establish a “Central Source of Truth” for Product Data

aPriori’s [digital thread](#) creates a closed-loop process that provides a single, reliable source of information for stakeholders to make informed decisions. Specifically, aPriori uses the digital thread to connect performance and manufacturing data between the digital twin and downstream applications (e.g., design engineering, sourcing, manufacturing partners, etc.). This enables teams to work faster and more efficiently using updated digital product information.

Connect Teams and their Data

aPriori eliminates departmental silos by connecting teams including design and cost engineering departments, sourcing and procurement teams, sustainability groups, and suppliers. This provides an end-to-end solution to automate product manufacturing cost estimations to increase profitability.

[Learn How](#) Eaton’s Gen AI Cuts Product Design Time by Nearly 90% with aPriori



5



Beyond Cost Reduction: Set the Course for Long-term Value Creation

Cost reduction is the number-one priority this year, according to a BCG global survey of C-level executives. To achieve this goal, a holistic, company-wide approach to cost transformation provides the foundation to establish long-term value creation.

By moving beyond departmental silos and embracing a shift-left mindset, companies can address cost and manufacturability issues early in the product development process, thereby avoiding costly late-stage redesigns and improving overall efficiency. Often overlooked in this process is the opportunity for design engineers to apply automated insights to address cost, carbon footprint, and performance as part of the design optimization process.

Establishing shared incentives across business units is critical to executing effective cost-reduction strategies. Shifting from cost to value also requires manufacturing executives to assign a dollar value to critical business issues such as risk and sustainability – and consider/assess all potential cost variables during product development.

For example, once a manufacturing team pinpoints the most significant cost opportunities, they can take steps to reduce spending in materials and other areas. A cross-functional team could use a value engineering project as an opportunity to expand supplier selection based on scope changes, source less expensive materials, and identify a more efficient manufacturing process – all of which can increase profitability.

By integrating these strategies, manufacturing companies not only reduce costs but also drive growth and innovation, ultimately leading to a stronger market position and increased profitability.



Use the shift-left model to avoid costly late-stage delays, launch products rapidly and at scale, and increase profitability.

6

Keys to Successful Cost Transformation

Strategic cost management in manufacturing requires a holistic approach. Use the following six pillars to implement a zero-based cost transformation across your organization.



1 | ESTABLISH A COST-FOCUSED MINDSET

Make cost management an ongoing strategic activity – led by the CFO.



2 | CONNECT COSTS TO OUTCOMES

View every dollar spent as an investment in creating value, and develop cross-functional capabilities to deliver that value.



3 | ADOPT A PROACTIVE POSTURE

Evaluate the short- and long-term benefits of making operational changes, including often overlooked aspects such as:

- a. The European Union’s “carbon tariff.” ([Read more about the hidden costs of carbon emissions.](#))
- b. “Technical debt” and related costs from older systems. ([Read how to overcome technical debt and optimize operations.](#))



4 | GAIN VISIBILITY ACROSS THE ORGANIZATION

Identify potential redundancies, hurdles, and overlooked costs.



5 | AUTOMATE AND ACCELERATE

Apply technologies such as AI, automation, and real-time insights to streamline the product development life cycle.



6 | RETHINK YOUR SUPPLIER ECOSYSTEM

Recalibrate your supply chain to gain efficiency, address gaps, and increase resiliency.

Why aPriori?

aPriori provides unique AI-Powered Design & Sourcing Insights that unlock and identify new opportunities rapidly for reducing product cost & carbon footprint, optimizing manufacturing & supply chain risk, and improving design engineering & sourcing teams' productivity. According to [Forrester](#), aPriori customers achieve a ~600% ROI within three years and payback within six months of adopting our Enterprise AI software.

Leading manufacturers use our automated Insights Platform to reduce time to market, meet sustainability targets, accelerate revenue growth, and increase profitability, all contributing to creating cash faster. To learn more about aPriori's cloud and on-premise solutions, visit www.apriori.com.

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