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Gartner for R&D Leaders

Optimize Cost in New Product Development Processes

Embedding cost considerations into new product development will improve products' profitability and reduce the likelihood of rework. This research helps R&D leaders to incorporate cost optimization into NPD.

Overview

Key findings

- R&D teams don't always use consistent methods when setting cost targets for their new product development (NPD) projects.
- Cost targets for NPD projects should be defined using cost-focused feature prioritization, which leverages value vs. cost analyses rooted in customer value.
- Cost-focused feature prioritization coupled with benchmarking will help R&D teams identify opportunities to prioritize product design attributes and manufacturing requirements based on their technical complexity, consumer impact and risk.

Recommendations

- Differentiate between product cost drivers and value drivers in NPD scoping.
- Use benchmarking (cost of goods sold [COGS] and performance) to inform prioritization decisions.
- Prioritize product features based on the value they provide versus the cost they generate to define value-driven cost targets prior to scope lock.
- Incorporate cost savings discussions on value vs. cost throughout the NPD process. Ensure the stakeholders included and questions being asked are appropriate to the development stage.

Introduction

As supply chains grow more constrained and markets become more crowded, companies are amplifying their focus on cost optimization. In the latest Gartner State of the R&D Function Survey, R&D leaders ranked increased cost pressure as the risk that will have the biggest impact on their organization.

Although the figures vary based on industry and product, the majority of product costs are fixed by the design parameters. Given the overhead and time horizon associated with modifying existing products, companies can save time and money by embedding cost considerations into their NPD efforts.

Cost optimization can be incorporated into both agile and waterfall product development methodologies. It should be considered during both concept design and development. Regardless of industry and product development methodology, incorporating the best practices described below will ensure opportunities to optimize COGS, whether they're consumer-facing or otherwise, are not overlooked during product development.

Analysis

Distinguish between cost and value when prioritizing features

A foundational concept to cost optimization is the contrast of cost versus value (see Table 1). Cost is the money required to produce a product and is expressed numerically. Value is the worth that a product provides a customer. It is subjective and can vary based on the individual, market and context.

> Companies should analyze the value of product features and compare their value to their costs to strategically lower costs that aren't tied to customer value.

Although cost and value are frequently correlated (for example, higher cost enables the inclusion of premium materials or features), they aren't always. Companies can add product features that increase cost but provide no value or even reduce the value to the customer.

One example of this is overpackaged products in consumer goods. Extra packaging may be perceived as negative or unsustainable to consumers, but increase product costs. Conversely, for electronics, premium packaging can represent a small portion of COGS but drive consumer perception of product value. R&D leaders should therefore analyze the value of product features and compare their value to their costs to strategically lower costs that aren't tied to customer value.

Table 1: Cost vs. value attributes

Cost	Value
Objective	Subjective
Measured quantitatively (e.g., in dollars)	Measured qualitatively (e.g., in customer liking)
Fixed	Varies based on market, person, context
Invisible to customer	Visible to customer

Source: Gartner

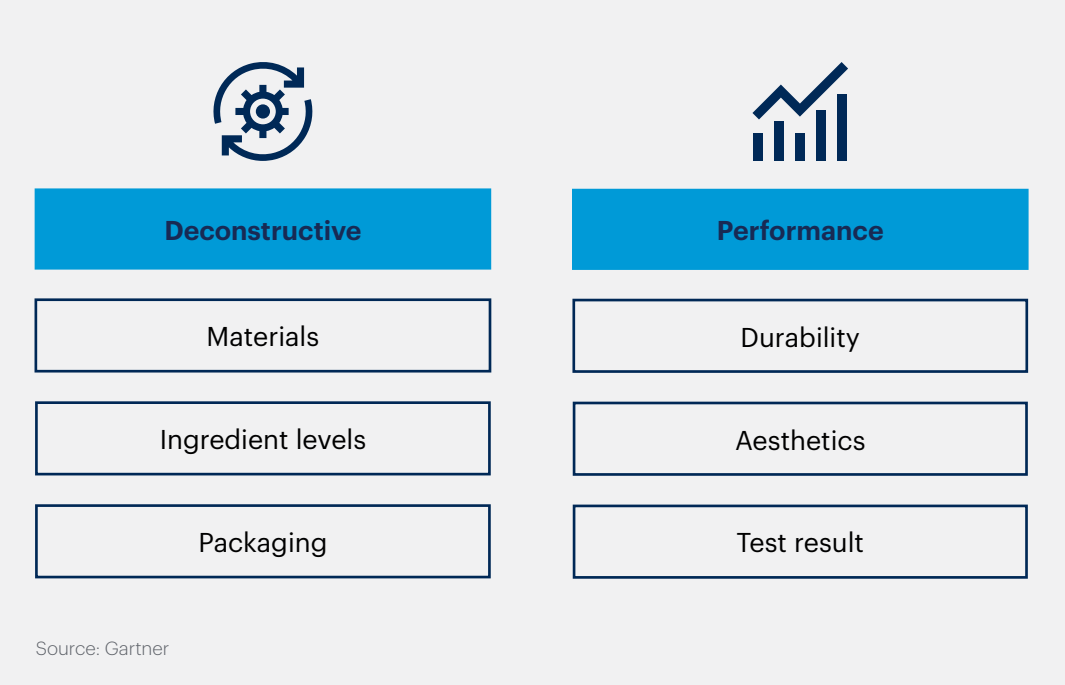
Once R&D leaders have a clear understanding of cost and value contributions of product features, they can then use that concept to guide cost optimization efforts in new product development. Evaluations of cost versus value should begin by examining these aspects in benchmarks.

Use benchmarks to define cogs and profit margin targets

Before project scope is locked, R&D teams should identify similar products — internal products or competitive products — as a basis for a benchmarking exercise. The goal is to collect and analyze the competitive and existing products' attributes and cost structures, including conversion costs, and use them to set targets for product development efforts.

Benchmarking data falls into two categories: deconstructive (related to understanding bills of materials) and product performance. Figure 1 lists key elements that should be evaluated when benchmarking in both of these categories.

Figure 1: Two main elements of product benchmarking



Source: Gartner

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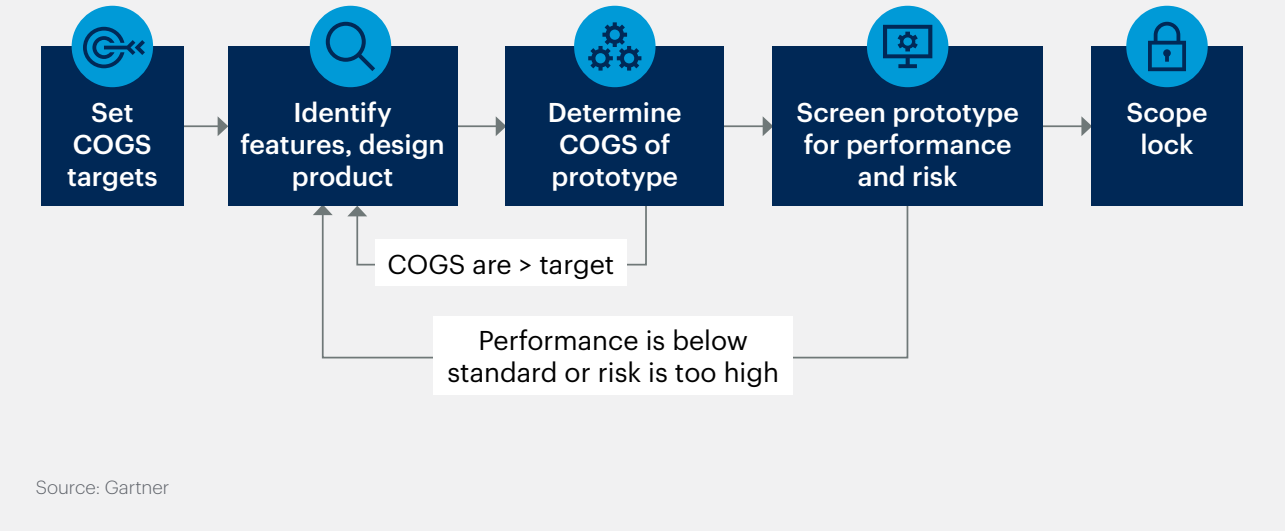
R&D should set two financial targets:

- COGS targets: COGS targets will typically be defined on a per unit basis with set maximum values.
- Profit margin targets: Teams should use whichever profit margin (for example, gross, operating or net) is most accessible to them with minimum values identified. Although COGS targets may be derived in part from profit margin considerations, it's important to distinguish these two targets. Premium products may have higher COGS than budget products, but they may also have healthier profit margins than their less-featurized counterparts due to their higher selling prices. Setting COGS targets could incentivize NPD teams to pursue budget products and scope out premium products, so companies should avoid focusing on COGS only.

These targets should be adjusted based on the product outlook, for example, anticipated market changes in materials or price changes in competitive products. If year-over-year sales are projected to rise or fall significantly, teams should factor this in when calculating the value of opportunities. Product life cycle and strategic segmentation are also factors that impact targets.

If relying only on competitive products to set COGS and profit margin targets, R&D leaders should collaborate with their cross-functional counterparts to define what profit margins are healthy for the products in scope. Then, reverse engineer acceptable COGS based on sales prices.

Figure 2: Cost optimization workflow prior to scope lock



Source: Gartner

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Prioritize features based on their value

R&D leaders should direct working teams to develop prototypes that meet the project's initial scope and financial targets. The teams should ideate within the initial NPD scope on how product features contribute costs and drive value, then determine which ideas to prototype.

These techniques for prototype development are especially relevant to cost optimization initiatives:

- Conduct the minimal amount of development needed to assess performance and risks. The objective of prototyping is to gather enough information to prioritize options, not to eliminate all technical uncertainties of ideas. Too much testing early on will minimize the number of ideas that can be practically explored, possibly causing teams to miss the ones that would drive the lowest COGS. Avoid building physical prototypes if the data that could be generated from them can be obtained from simulation or ideation. Table 2 lists some tools that can streamline cost optimization efforts.
- Avoid defining performance targets for prototypes that aren't anchored to true requirements. Document how removing or changing features would impact performance versus benchmarks.
- Test multiple designs in parallel. Explore the interdependency of features.
- Find the "breaking point" of proposed changes: that is, what extent of change to a variable results in products that are no longer viable?
- Use software and tools that already exist in your R&D organization to aid in cost assessments during prototyping (Table 2 also lists a sampling of such tools).

Table 2: Sample software tools to enable cost optimization prototyping

Tool	Platform	Description
Predictive costing	Business suite, product life cycle management (PLM) and specialty vendors	Algorithms embedded in design platforms enable engineers to evaluate cost implications of design choices. Interconnectivity with ERP and PLM ensures accurate estimates
AI-assisted formulation	Stand-alone software	Emerging AI-assisted formulation platforms, that focus on in-silico design and testing, can incorporate cost targets
Design of experiments	Statistical software	Cost can be included as a response in design of experiments and factors can be manipulated to optimize it

Source: Gartner (December 2024)

Best practices for prioritizing features include:

- For all features in question, consider their value to the consumer, technical complexity, time to develop and cost contribution. Prioritization will depend on organizations' priorities and resources.
- Constantly reference benchmark data of competitive and historical sets. Whether attempting to match performance or differentiate products from the benchmarks, the benchmarks should be kept in the discussion.
- Develop an objective approach to assessing and communicating trade-offs and risks of feature removal. Categorize risks by type (for example, i.e., regulatory, quality, consumer perception) and define what risks the business is unwilling to entertain upfront.
- Use a balanced scorecard to compare the prototypes.

The deliverable from the working team's ideation and prototype development will be scorecards that describe features and trade-offs of the leading prototypes (discussed in the next section).

Select leading prototype based on objective criteria

Stakeholders, including R&D leadership and their cross-functional counterparts, should review scorecards that communicate the trade-offs of feature prioritization. R&D leaders should establish objective criteria for each scorecard item. For example, if red/yellow/green ratings are defined, each needs a printed definition that stakeholders can refer to. At a minimum, the scorecards should communicate the preliminary COGS versus benchmarks and how the proposed set of features impacts consumer value and technical complexity (see Figure 3). Any risks that come from cost optimization decisions should be documented and discussed.

The output of the stakeholder review is the selection of a cost-optimized prototype to proceed with. At that point, R&D development teams should lock COGS and profit margin targets in the project scope.

Figure 3: Cost optimization scorecard template

Product description and picture	COGS of Benchmark ($$ per unit):
	COGS of Prototype:
	Performance vs. Benchmark:
	Consumer value rating vs. Benchmark:
Projected annual sales:	Technical complexity rating:
	#FTEs time to develop:
List of additional risks, considerations, etc., that stakeholders should be aware of (if any):	
Include additional slides, including detailed cost structures, as relevant (if any):	

Source: Gartner
FTEs = full-time equivalents; COGS = Cost of goods sold

Revisit cost optimization throughout the NPD process

R&D leaders should encourage cost optimization discussions to continue throughout the product development process to ensure that development teams are on track and that maximum value and minimum cost are being delivered.

Although the majority of the work in cost optimization efforts occurs during design, teams should continue to pursue cost optimization discussions during development, validation and launch. Table 4 lists a series of questions that R&D development teams should be asking in these three phases to ensure cost optimization is embedded throughout the NPD process.

Table 3: Cost optimization questions for project teams

Phase	Questions
Development	• Can I standardize to create economies of scale? • Are there cost-optimized raw materials that we should be qualifying and setting up as approved like-for-like alternates in our systems? • Are there cost-optimized technically equivalent raw materials to those in the product bill of materials (BOM) that we should be setting up in our systems? • Can I switch to a different packaging material? • Can I reduce or optimize the weight, thickness or size of components or packaging? • Can suppliers support my cost reduction R&D efforts? • Is my manufacturing process streamlined? • Are there minor product changes that would enable me to streamline my manufacturing procedure?
Validation	• Can I reduce or widen quality standards for this product? • Can I streamline my manufacturing or QA/QC processes?
Launch	• Are there inefficiencies that should be documented and engineered out the next time we modify this product?

Source: Gartner (December 2024)

When feasible, R&D teams should collaborate with procurement to identify cost advantaged like-for-like or technical equivalent raw materials and components during product setup to avoid rework after product launch. Materials cost comparisons can be myopic and prone to error since contracts and pricing are negotiated on a regular basis. R&D teams can therefore maximize efficiency and value by seeking to drive harmonization across materials and components.

During product design and development, R&D teams should evaluate manufacturing requirements and identify opportunities to simplify assembly or compounding and reduce cost. If there are product attributes that drive up conversion costs or assembly complexity, teams should determine if It's feasible to change those attributes to drive manufacturing efficiency. For example, if a highly viscous product needs custom-built equipment and blend procedures to achieve the viscosity specification, teams should ask what maximum viscosity could be achieved without the custom equipment and procedures. Teams should work with their marketers to understand how a lower-viscosity product would impact customer value of the product.

The following are some approaches to ensure cost optimizations discussions are ongoing, maximizing product value:

- R&D leaders should assemble cost optimization checklists with questions such as those in Table 4 that are discussed and signed off on as part of gate reviews. They should determine when within their product development frameworks these discussions need to be answered to avoid launch delays.
- R&D leaders should identify who is responsible for cost optimization checklist items (both answering the question and deciding on whether to action activities that are identified).
- Project teams should document any cost optimization opportunities that are identified after scope lock that aren't pursued due to resource constraints. R&D leaders should review those opportunities for inclusion in future product updates.

Figure 4 summarizes the required actions presented in this research for R&D leaders to incorporate cost optimization in new product development processes.

Figure 4: Action steps for cost optimization in NPD

Set COGS and profit margin targets	☐ Benchmark competitive and historical products. ☐ Define COGS and profit margin targets based on benchmarks.
Prioritize features and develop prototypes	☐ Develop prototypes that meet project scope and cost targets. ☐ Define an objective approach to compare the prototypes.
Review and select prototypes	☐ Asemble a cross-functional team to review the prototypes. ☐ Select a cost-optimized protype to commercialize.
Revisit cost optimization throughout the NPD process	☐ Build cost optimization checklists and use them to guide ongoing cost discussions during development, validation and launch.

Source: Gartner

Actionable, objective insight

Position your organization for success. Explore these additional complimentary resources and tools for R&D leaders:

Tool

R&D Cost Optimization Framework

Compare cost initiatives, surface top ideas and drive buy-in for key initiatives.

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Webinar

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Use technology roadmapping to proactively identify and fill technical capability gaps.

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Tool

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