Implementing an Effective Product Cost Management Program

Key Principles & Best Practices

The benefits of a systematic product cost management program are significant, yet many manufacturers struggle to implement these initiatives effectively. This paper discusses some of the obstacles involved and outlines key considerations and best practices for initiating an effective product cost management program. It also provides practical guidelines and examples of how to execute them for maximum impact.

An aPriori Whitepaper
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EXECUTIVE OVERVIEW
If you’re reading this paper, the benefits of reducing product costs are probably obvious to you. Cost of Goods Sold (COGS) impacts every important business measure for a manufacturer — revenues, profits, time-to-market, competitive differentiation and more.

What’s less obvious is why so many manufacturers struggle to do it effectively. Cost management challenges exist at multiple levels and across the entire product lifecycle. Engineering makes design decisions without understanding their true cost impact. Cost engineering decisions come either too late in the development process or even after product launch and take months or more to get into production and create cost benefits. Sourcing professionals typically don’t have accurate enough information to negotiate preferred pricing with suppliers.

The negative impacts of these challenges - reduced profits, delayed time to market, limited product innovation — are well understood, but the solutions to them are not.

Best-in-class companies are overcoming these challenges by taking a different approach to product cost management. They are enabling a systematic set of cost management activities and processes with modern tools that can be applied across their enterprise wherever costs can be impacted. And they are seeing substantial benefits in both hard and soft cost savings as a result.

This paper outlines this new approach and presents key considerations and best practices for initiating an effective product cost management program. It also provides practical guidelines on how to implement them and different examples of how these best practices are being deployed across manufacturing organizations.

If you’d like to learn more about the contents of this paper, please contact aPriori at info@apriori.com.

THE CHALLENGES AND OPPORTUNITIES IN MANAGING PRODUCT COSTS
Do any of these scenarios sound familiar?

- Your **Engineering Managers** are given target product cost guidelines, but no tools to understand the true cost impact of their product design decisions. As a result, new product designs go to manufacturing over their original cost target creating significant additional expense in re-work and re-engineering.

- Your **Value Engineers** are tasked with reducing the cost of products after they are in production. Yet, they have no tools to understand how their ideas truly impact product cost. To validate their ideas, they send their best engineering concepts to their manufacturing team or out to a supplier for a quotation — adding days or weeks to their own process. Then, depending on the product, the recommended changes can take several months or more before they can be put into production and the desired savings realized.
Your Sourcing Professionals are tasked with managing outsourced product costs. However, they have very little insight into what their product should cost before they send new designs out to bid. They have no way to effectively negotiate preferred pricing with suppliers.

These situations are very common in most discrete manufacturing organizations today. At the core of all of them, is the inability to accurately identify, assess and manage detailed product costs early enough in a product’s lifecycle. There are several reasons for this:

- **Fragmented Information** – Critical pieces of a cost estimate are spread across the organization in different functions, resulting in inaccurate, incomplete estimates.
- **Inefficient / Labor-Intensive Processes** – Most cost estimating activity depends on a small group of people with highly specialized skills spending hours manually producing each estimate. This creates a significant bottleneck.
- **Siloed Decision Making** – Most cost estimates are developed independent of the person making the immediate product design decision and require tools and systems that are very difficult for the person making the product decision to use or require knowledge that he does not have.
- **Static Information** – Once a cost estimate is recorded, it does not change or update as new information becomes available or the design changes.
- **Uncontrolled Systems** – Multiple cost estimates from different sources exist with many users of cost information having no idea which estimate is the most current and/or valid.
- **Minimal Re-use of Previous Estimating Work** – As a product matures, different methods are used to re-cost parts and processes that often don’t leverage previous estimate work.

The impact of all these obstacles can often be more significant than most manufacturers realize. Profit margins are reduced due to product cost overruns. Time to market is delayed due to the need to firefight cost “surprises.” And there is often expensive post-production cost reduction rework required. Some products even get discontinued prematurely because of cost of goods issues.

Best-in-class companies are overcoming these challenges by applying effective cost management strategies across their organizations and realizing huge repeatable benefits in both hard and soft cost savings as a result as illustrated in Table 1.
IMPLEMENTING AN EFFECTIVE PRODUCT COST MANAGEMENT PROGRAM

Cost Avoidance during NPI
One of the world’s largest manufacturers of personal off-road vehicles is saving more than $2 million annually based on more informed cost decisions made during new product design.

Reduced Costs for Quoted Parts
A manufacturer of agricultural equipment is saving $80,000 annually simply by reducing the cost on a single quoted part.

| Current Part Cost | $40.00 |
| Should Cost       | $27.50 |
| Savings per Part  | $12.50 |
| Annual Volume     | 6,400  |
| Annual Savings    | $80,000 |

Table 1. Product Cost Management Savings Potential

Hard Cost Savings | Soft Cost Savings
Cost avoidance during new product design | Time savings in cost estimation, reduction in quote response delays
Reduced quoted part and tooling costs | Improved time to market via engineering time savings
Savings from optimizing manufacturing process selection | Reduced post-launch rework
Savings during VAVE or Redesign | Institutionalized manufacturing knowledge among engineering and sourcing

KEY PRINCIPLES OF EFFECTIVE PRODUCT COST MANAGEMENT
Many people and departments within an organization impact product cost. For example:

- An engineering team decides on a specific design, but there are multiple design alternatives that meet the same form, fit, and functional requirements. Each alternative dictates a different cost.
- A sourcing team pays to produce a specific design, but there are multiple potential costs for manufacturing the design. Manufacturing costs are often negotiable and depend on plant cost structure, capabilities, and process control.
- A manufacturing team selects one way to produce a specific design and estimates a ballpark cost, but there may be multiple ways to manufacture the same design that are potentially more cost effective.

Traditionally, product cost management has been performed by cost engineering experts, or by Value Analysis/Value Engineering (VAVE) team members who specialize in cost reduction and/or support core business functions. These resources typically have strong manufacturing backgrounds and may have worked as a supplier quote estimator. Their expertise is unique and their domain knowledge builds over time, but it is extremely difficult to duplicate and scale across all products developed by a large organization.

Effective product cost management requires a set of systematic activities, processes, and tools for use throughout the enterprise to guide the above decisions to the lowest costs or prices available. This enables manufacturing organizations to attack cost at the point of origin and yield the greatest impact on product cost reduction. We break these three areas down further below.
Core Cost Management Activities
There are a number of core activities involved in effective product cost management. Some of the most highly recommended activities include:

- Studying the cost tradeoffs of different concept designs in the R&D stage
- Evaluating multiple design alternatives for lowest cost during NPI
- Evaluating the cost of proposed solutions to an engineering change order
- Evaluating multiple manufacturing and tooling alternatives for lowest cost, including make vs. buy analysis
- Generating a detailed “should cost” to validate supplier quotes and ensure lowest pricing
- Batch analyzing current prices of entire commodity groups to find over-cost outliers
- Evaluating multiple cost down ideas on current products in real-time to identify the highest potential reduction in the shortest amount of time

Cost Management Processes
The core activities above naturally fit into various functions and processes over a product's life cycle and include numerous potential Cost Control Points during the overall product development process. These are measurable, managed checkpoints that dictate where and when people should perform the core cost management activities outlined above. The output and results of these activities continue to build on each other throughout the product development lifecycle. For example, during the introduction of a new product, there are typically design review meetings at regular intervals to ensure that the new product is meeting form, fit, and functional requirements. This is a perfect opportunity to have a discussion about the financial implications of different design alternatives that are being evaluated. An effective product cost management system would include mandatory cost evaluation as part of each design review milestone.

Another example of a Cost Control Point would be as a design reaches the release to manufacturing (RTM) milestone. At this point in the process, there is often a decision to make or buy that product, or key components within that product. The company that has implemented a cost control point at that RTM milestone, would be able to quickly calculate the financial impact of both options, and make an economically-wise decision in a fraction of the time that it would take to create and manage an RFP response from the supply base.

There are numerous opportunities for a company to implement cost control points in their product design, sourcing and manufacturing processes. In the early phases of implementing your product cost management program, rather than labor over identifying every possible cost control point, just pick a few logical opportunities to get started, and then enforce them rigorously. The process of getting started with Cost Control Points is made infinitely easier if the right Cost Management Tool is selected to support the process of generating accurate cost assessments. A tool that is quick and easy to use by everyone minimizes the possibility that team members can complain that generating a cost assessment is slowing them down from their primary responsibilities. More details on critical capabilities in a Cost Management Tool are provided below.
**Cost Management Tools**

Effective product cost management is also enabled by putting the proper tools in the hands of anyone that impacts product cost. These tools help identify and assess true product costs at a detailed level at any stage and enable people to act on the appropriate opportunities to reduce costs. Some of these tools might include:

- Product cost estimation systems that can quickly and consistently generate and manage accurate cost estimates without requiring specialized manufacturing or cost knowledge
- Reporting systems for documenting and tracking cost management results and KPI’s over time
- Analytics systems to search large volumes of data and identify cost outliers and trends
- BOM cost tracking systems to roll-up costs at any point in a product’s life cycle

Without these core activities, processes and tools, product cost management remains a highly manual and decentralized function - of value only to manufacturing or cost engineering experts. It can only be performed one or two times per NPI cycle, severely limiting the windows of opportunity to identify and operationalize product cost savings. It also leads to inconsistent estimation methods with static information that is difficult to update, manage and share.

To truly impact product costs so it drives down the Cost of Goods Sold (COGS) by entire percentage points, manufacturers must look to deploy product cost management further upstream in the development process and across all departments and levels – not just inside manufacturing or cost engineering. Each group must identify its key cost control points and define the activities and processes needed to reduce costs. These groups must also be enabled with the right tools to analyze the cost of trade-off decisions quickly and easily each time they make a decision. The recipes for successfully implementing an effective product cost management system will vary for each group, but the time invested to meet their specific requirements will provide a very high return on investment. Some examples of these implementation recipes are laid out later in this paper. (See Effective Product Cost Management in Action, starting on page 13.)

**Product Cost Management Across the Enterprise**

Organizations that are leading the way in product cost management have made the process a normal course of responsibility and decision making across their enterprise (see Figure 2 below). Cost management is performed at multiple milestones by R&D and Engineering during both New Product Introductions and current product re-design cycles including early concept evaluation and detailed design — where 70% of costs are determined. In later phases of the product development lifecycle, Cost Engineering, Sourcing and Manufacturing perform their own cost management activities beginning with their initial cost estimates and refining it based on knowledge of strategic suppliers or the status of internal manufacturing facilities. These refined cost estimates serve to benchmark and control actual costs during manufacturing planning and quote validation. In all cases, cost information is dynamic and easily shared in a usable format with everyone that impacts product cost.
IMPLEMENTING AN EFFECTIVE PRODUCT COST MANAGEMENT PROGRAM

PCM in Product Design/Engineering
Potential Benefits:
- Avoid cost during new product design.
- Reduce time to market by avoiding last-minute cost surprises.
- Increase engineering knowledge of cost tradeoffs.

PCM in Sourcing
Potential Benefits:
- Reduce quoted part and tooling costs.
- Validate quotes.
- Ensure lowest pricing via fact-based negotiation.

PCM in Manufacturing
Potential Benefits:
- Optimize manufacturing decisions.
- Enable more informed Make vs. Buy decisions.
- Develop more accurate manufacturing standards.

PCM in VAVE
Potential Benefits
- Identify savings during VAVE or redesign.
- Prioritize product cost savings opportunities.
- Collaborate with other departments to pursue additional cost savings.

It’s not uncommon for engineering teams to worry about product cost management activities slowing them down. In fact, effective product cost management activities can drive time efficiencies for these teams. Implemented properly, most cost management activities fit naturally into existing engineering and sourcing activities/processes. The proper cost management tools also complement the tools being used in most engineering and sourcing groups today. These teams often see time efficiency gains because they don’t wait as long for cost estimates to come from suppliers or from over-burdened cost engineers. Sourcing teams also become much more efficient because of their ability to negotiate more effectively through fact-based discussions with suppliers.

Core Capabilities for Success
As mentioned earlier, technology is a key enabler for effective product cost management. Leading manufacturing organizations are taking advantage of the latest systems and tools to speed and standardize cost estimation and centralize cost information across the enterprise. The benefits of these solutions include:

- Speed of Costing — Faster costing feedback available to all business functions greatly expands the potential impact of product cost management and reduces time to market.
- Consistency of Cost — A centralized product cost management platform ensures everyone on the product development team is working with the most up-to-date information, and leveraging previous findings.
- Cost Awareness — The ability to integrate cost awareness as a core competency for all key decision makers uncovers new opportunities to identify potential cost savings that were previously invisible.
There are a number of important considerations when planning for and deploying product cost management technologies in your organization:

- **Ease of Use** – the system should be easily used by all business function impacting cost, regardless of their cost estimating or manufacturing expertise. Training on your new system should take no more than a couple of days, and users should be able to leverage the tool to inform decisions almost immediately.

- **Real-Time Results** – any system deployed should be able to generate a cost estimate, and corresponding manufacturing process details, within seconds or minutes. If the system does not respond with an answer quickly, users will become frustrated, and avoid using the tool.

- **Cost Estimation Capabilities** – it should incorporate all the latest cost estimation trends and technology features; for example:
  - Ability to take advantage of 3D CAD models and automate a feature-based costing approach
  - Require minimal manual inputs to generate initial cost
  - Manufacturing process simulations that model manufacturing floor activities and practices
  - Ability to generate detailed cost breakdowns (in addition to a total cost)
  - Configurable to produce different types of cost estimates – early estimates, should-costs, etc.
  - Centralized costing information repository to foster consistency and reuse of previous work
  - Change inputs/outputs on the fly for ease of use in supplier negotiation
  - Estimate all costs that may be useful in comparisons; e.g., logistics, exchange rates, etc.
  - Clearly show product cost drivers to help educate users on what drives cost and how to lower it
  - Multiple output and reporting formats (Excel, PDF, Custom reports)
  - Easy to update and maintain to handle changing business conditions
  - Ability to integrate with existing IT infrastructure and systems of record

- **Cost Analytics** – it should include detailed capabilities to analyze product costs and help focus design, manufacturing, or sourcing-related activities on the areas which can drive the biggest cost savings. For example, these analytical capabilities would include:
  - By different types of design-related cost drivers
  - By different types of manufacturing process-related cost drivers
  - By supplier-related cost drivers
  - Ability to determine and find cost outlier parts and determine cost trends
IMPLEMENTING AN EFFECTIVE PRODUCT COST MANAGEMENT PROGRAM

- **Reporting Mechanism** – it should include capabilities for reporting of cost results and KPI’s, and disseminating that cost information via reports and cost dashboards.

- **Cost Management** – it should include the ability to track and manage costs throughout the product lifecycle. Those capabilities would include the ability to:
  - Roll-up BOM costs at any point in a product’s life cycle
  - Support costing process workflow needs
  - Track different BOM cost revisions

IMPLEMENTING PRODUCT COST MANAGEMENT IN YOUR ORGANIZATION

**Think Big, Start Small** — Cost management can have a significant and immediate impact across your organization — increasing profitability, accelerating time-to-market and growing revenues. As such, it’s appropriate to think big and aggressively about how to use it with a vision for what is best for your organization. But it’s also best to start small and build your success from there. Taking the right implementation approach is the key to effectively starting and building the foundation to expand your cost management initiative.

**Assembling a Core Implementation Team**

You can’t drive an effective product cost management initiative alone. It’s also difficult to implement from the bottom up, no matter how well-intentioned an individual contributor may be. Assembling the proper team and building support for cost management within the organization are essential. While it is not necessary to build out this entire team on day 1, as success builds, and the deployment expands, having these roles in place will ensure the program is properly supported. Key roles in deploying a product cost management program include:

- **Executive Sponsor** – Someone committed to implementing a cost management program and that recognizes the organizational factors to be considered to make your project goals a reality. He or she can assist by:
  - Assessing his or her organization’s own cost culture and how it naturally fits into their development environment
  - Fostering awareness of the problems cost management can solve
  - Mandating the change and communicating the high priority of the product cost management initiative so that teams appreciate the urgency to support and adopt the new system
  - Identifying champions in key business functions to spearhead focused initiatives in their own functional areas
  - Committing support to sustain implementation resources and activities
  - Funding the initiative properly so it has a strong opportunity to succeed
**Champions** – One or more executives and managers in key business functions whose teams will perform core cost management activities including:
- NPI Engineering
- Current Product Engineering / VAVE
- Manufacturing Engineering
- Cost Engineers to support Sourcing
- Sourcing

Champions work with the Cost Management Manager to adjust/refine the cost management processes and activities so they work within their teams. They are also responsible for evangelizing and enforcing the use of cost management in their groups. These individuals are often incented on cost reduction or profitability goals tied to the cost management initiative, and in turn, will incent their teams.

**Cost Management Manager** – As the momentum from early pilot projects builds, assigning a dedicated program leader that has a clear understanding of cost management activities and how they apply to the organization overall will be critical. This individual also works closely with the Executive Sponsor and Champions to rollout cost management tools and activities to the business teams and is ultimately responsible for guiding the teams in initial project selection and process implementation. The Cost Management Manager should be supported by a technical team on the implementation of a cost management system. And, as above, they are often incented on cost reduction or profitability goals tied to the cost management initiative. Finally, the Cost Management Manager is responsible for documenting results of the deployment, and publicizing successes and lessons learned so awareness grows across the company, and the culture evolves to a higher level of cost management skill.

**Cost Management Processes and Cost Control Points**
It’s also important to identify your cost management processes and at which points costs can be effectively impacted. This might involve:
- Assessing current cost management process and key cost control points (if they exist)
- Mapping out your current product development process
- Identifying new cost control points to introduce into the development process and establishing the cost estimate characteristics required to support each cost control point
- Working with a cost management solution provider to align to the above processes
Results Tracking and Monitoring Mechanisms
“If it can't be measured, it can't be managed” is especially true when it comes to effective product cost management. Key considerations include:

- Identifying metrics to collect at the key cost control points; e.g., percentage of parts in a BOM with cost estimates, the number of design alternatives explored, savings identified, etc.
- Creating a process for measuring and recording results; e.g., at first functional design milestone, first prototype milestone, and final design milestone submitting costs to ERP or PLM system
- Creating a process for monitoring and reviewing results; e.g., every design review includes presentation of anticipated product costs and data
- Creating an incentive system for managers to reinforce these behaviors and activities; e.g., emphasizing that product cost is a priority equal to product launch schedule, quality and functionality

Getting Your Implementation Started
At the start, focus on one core activity and business group. Assemble a small core implementation team, select a specific time-bound project (4-6 weeks), and build early successes. This is the best way to show value (i.e. dollars or time saved) and make incremental adjustments, which will ease the rollout of the program to other groups.

You may choose to initially focus on either:

- One product with multiple functional groups performing cost management activities over the product’s lifecycle
- One functional group performing their function’s cost management activities over a number of products

Initial Implementation Recommendations
1. Define clearly measurable goals for implementing cost management; e.g.; reduce cost of the chassis assembly by 2%, increase speed of generating a detailed cost estimate by 3 days to 3 hours, etc.
2. Identify the core cost management activities that will support your goals:
   a. Identify initial projects, people, and timeframe. Specific selection criteria depend on your organization’s short-term goals and cost management solution.
      i. Executive Sponsor and Champions identify projects/groups that could generate results quickly. The Cost Management Manager will facilitate the selection.
      ii. Implementation team reaches out to the key manager(s) in the group(s) to get buy-in.
      iii. Timeframe for an initial evaluation will be dependent on the scope of the project selected, but can usually be completed in 1-2 weeks if you are well organized. Longer term pilots typically produce “drift” where participants lose interest and return to their primary responsibilities.
3. Identify relevant process changes for the initial groups:
   a. Cost Management Manager outlines initial plan that defines the cost management activities and cost control points.
   b. Cost Management Manager works with the Executive Sponsor and/or Champions to reinforce process adherence and refine the process details.
   c. The implementation team discusses the plan with the business group selected, including an open discussion of concerns or competing priorities; e.g., allocating time to explore design alternatives for cost reduction.

4. Establish the type and characteristics of the cost estimates required to support the projects and work with the cost management solution provider on how to configure the system to achieve these estimates.

5. Train the business group on the cost management processes and tools implemented to support the process.

6. Complete the project, with weekly check-ins with the business group.

7. Review and publish results with the implementation team and discuss process refinements.

Once the starter projects are complete, select another set of projects and manage them in a similar fashion to the first. It is important to manage these first initial projects carefully in order to build momentum for continued expansion of your product cost management initiative.

Expanding Across the Organization

1. Continue to build and refine cost management infrastructure across the organization.
   a. Use the series of starter projects to establish a support network of Executive Sponsors, Business Champions, and Business Participants across different functions and business units.
   b. Roll out standard operating procedures for all cost management activities.
   c. Centralize tracking and reporting of results.

2. Create a funnel of cost reduction activities that will yield dividends across the short, medium, and long term:
   a. Sourcing / re-quoting product cost management projects — realized cost savings in under 6 months
   b. VAVE or Redesign product cost management projects — realized cost savings in 6-12 months
   c. New product launches — cost avoidance / savings in quoting in 24+ months
Critical Success Factors
We've discussed many aspects of planning and implementing effective product cost management here. The following are critical to the success of your initiative:

- Find a dedicated Executive Sponsor who can mandate change and build urgency around cost management needs within your organization and consistently reinforce the need and importance of staying the course with the program over time. He/she should also be looking at the high level results on a regular basis.
- Don't take on the most complicated project on Day 1. Start with something manageable where your likelihood of success is high, then move on to more complex projects.
- Champions need to surround themselves with positive-minded risk takers. Any time you try to change an established process, many people will try to return the system to the status quo by injecting negative feedback.
- Implement an incentive program for managers to drive desirable behaviors and push your implementation forward.
- Define and insist on a formal system for capturing project metrics. Publish these results far and wide across the enterprise.
- Partner with an experienced technology solution provider that can provide you with practical advice based on a well established track record of producing positive results for its customers.

Effective Product Cost Management in Action
The following pages define some of the unique aspects and specific recommendations for implementing an effective product cost management within your Design Engineering, Sourcing, Manufacturing, and VAVE groups. Each department-specific example incorporates the key principles and best practices outlined above. You may find these recommendations useful to educate potential champions within your organization, and build the foundation to implement your first pilot project.
## 1. Implementing Product Cost Management within Design Engineering

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>Goals</strong></td>
<td>Identify opportunities for cost avoidance during new product design. Accelerate time to market by reducing time waiting for quotes and avoiding last-minute cost surprises. Increase engineering knowledge of design and manufacturing cost tradeoffs.</td>
</tr>
<tr>
<td><strong>Core Activity</strong></td>
<td>Evaluate design alternatives for lowest cost. Evaluate engineering change orders for cost impact.</td>
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</table>
| **Implementation Team**               | **Executive Sponsor** – Typically VP or Director of Engineering  
**Champion** – Typically Director or Manager of Engineering  
**Cost Management Manager** – Cross-functional role; may not be within Engineering  
**Business Function(s) Involved** – Engineers working on new product introductions |
| **Cost Estimate Characteristics**     | Typically engineers do not have strong manufacturing backgrounds and may not have much knowledge of costing. The cost estimation system should be able to generate a reasonable cost estimate without this knowledge from the engineer. It may be inexact relative to the final quote, but it should be in the ballpark and generally represent the intended manufacturing approach and location. |
| **Cost Management Process & Cost Control Points** | Engineers present at Management concept signoff / gate review:  
1. Multiple concept alternatives for a design  
2. Cost trade off for each design alternative  
3. Cost estimates submitted for all line items in the preliminary BOM (used to compare to cost targets)  

Engineers present at Management detailed design signoff / gate review:  
1. Multiple design alternatives for a design  
2. Cost trade off for each design alternative  
3. Cost estimates submitted for all line items in the detailed BOM (used to compare to cost targets)  
4. Engineers store cost estimates in a central location (such as the cost management system) for reuse downstream by Manufacturing Engineering and Sourcing.  

At any Engineering Change Order (ECO) approval after detailed design signoff:  
1. Add a cost estimate field that requires signoff to the ECO process. This helps flag/control any unexpected cost overages caused by ECO’s. |
| **Metrics & Results Tracking**        | Metrics / KPIs:  
- $ Cost avoidance = Initial Design Cost – Final Design Cost  
- $ Cost avoidance = savings from ECO’s denied or reworked due to cost  
- Number of design alternatives considered during concept & detailed design  

Engineers are responsible for presenting both metrics as part of the Engineering sign offs. All metrics may be tallied for a given project and recorded in a results tracking system. |
2. Implementing Product Cost Management within Sourcing

<table>
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<th>Category</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Goals</td>
<td>Reduce quoted part and tooling costs.</td>
</tr>
<tr>
<td>Core Activity</td>
<td>Validate quotes to ensure lowest pricing.</td>
</tr>
<tr>
<td></td>
<td>Leverage fact-based negotiation to ensure lowest pricing.</td>
</tr>
<tr>
<td>Implementation Team</td>
<td>Executive Sponsor – Typically VP or Director of Sourcing, Supply Chain, Operations, or Procurement</td>
</tr>
<tr>
<td></td>
<td>Champion – Typically Director or Manager of Sourcing, Supply Chain, Operations, or Procurement</td>
</tr>
<tr>
<td></td>
<td>Cost Management Manager – Cross-functional role; may not be within Sourcing</td>
</tr>
<tr>
<td>Business Function(s) Involved</td>
<td>Sourcing, although commodity managers or buyers are generally more business-oriented than technical and do not usually generate the cost estimates. Often, Cost Engineers play a critical role in Sourcing’s cost management activities.</td>
</tr>
<tr>
<td>Cost Estimate Characteristics</td>
<td>System should generate complete cost estimates that are consistent for a group of suppliers in a manufacturing location with the same general capabilities. It does not need to be supplier-specific as you may compare the estimates to quotes from a number of suppliers, though Sourcing and/or Cost engineers may wish to refine the estimate based on the specific supplier selected to speed up the comparison process.</td>
</tr>
<tr>
<td>Cost Management Process &amp; Cost Control Points</td>
<td>For new products:</td>
</tr>
<tr>
<td></td>
<td>1. Sourcing will frequently begin with cost estimates generated by Design Engineering’s cost management activities.</td>
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<td>2. When new quotes arrive, Sourcing or Cost Engineers compare the lowest quote against the cost estimate. (It is recommended to require suppliers to use a standard quote form to facilitate the comparison process.)</td>
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<td>3. Sourcing requests new quote when initial quote is greater than 5-30% of expected cost estimate. The cost estimate may be provided for guidance and used for fact-based negotiations with supplier.</td>
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<td>4. For existing parts which appear overpriced, Cost Engineers work with Sourcing to engage the supplier in fact-based negotiation. Cost Engineers use the cost estimates to identify where the supplier may be overcharging.</td>
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<tr>
<td>For current products:</td>
<td></td>
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<tr>
<td></td>
<td>1. Each month, Sourcing selects a subset of high volume/spend part numbers within commodities targeted for cost reduction.</td>
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<td></td>
<td>2. Sourcing, Sourcing Engineering, or Cost Engineering creates the cost estimates and does a quick comparison to the historical quotes. Part numbers with the greatest differences are flagged for re-quotes.</td>
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<td></td>
<td>3. Re-quote requests are submitted to suppliers. If necessary, Sourcing will engage in fact-based negotiation to challenge suppliers on identified overcharges.</td>
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<tr>
<td>Metrics &amp; Results Tracking</td>
<td>Metrics / KPIs:</td>
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<tr>
<td></td>
<td>$ Cost savings = Initial Quote – Final Quote</td>
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<tr>
<td></td>
<td>Number of parts costed &amp; compared to quotes (speed &amp; coverage)</td>
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<tr>
<td></td>
<td>Number of parts re-quoted</td>
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<tr>
<td></td>
<td>Number of parts negotiated down from initial quote</td>
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<td></td>
<td>Sourcing is responsible for tallying cost savings in a central project tracking repository. All metrics may be tallied for a given project.</td>
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### 3. Implementing Product Cost Management within Manufacturing

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<th>Description</th>
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<tbody>
<tr>
<td><strong>Goals</strong></td>
<td>Create costs savings by optimizing manufacturing decisions.</td>
</tr>
<tr>
<td><strong>Core Activity</strong></td>
<td>Evaluate <a href="#">manufacturing process and tooling alternatives</a> for lowest cost.</td>
</tr>
<tr>
<td></td>
<td>Evaluate <a href="#">make vs. buy</a> tradeoffs.</td>
</tr>
<tr>
<td><strong>Implementation Team</strong></td>
<td><strong>Executive Sponsor</strong> – Typically VP or Director of Manufacturing Engineering</td>
</tr>
<tr>
<td></td>
<td><strong>Champion</strong> – Typically Director or Manager of Manufacturing Engineering</td>
</tr>
<tr>
<td></td>
<td><strong>Cost Management Manager</strong> – Cross-functional role; may not be within</td>
</tr>
<tr>
<td></td>
<td>Manufacturing Engineering</td>
</tr>
<tr>
<td></td>
<td><strong>Business Function(s) Involved</strong> – Manufacturing Engineers</td>
</tr>
<tr>
<td><strong>Cost Estimate Characteristics</strong></td>
<td>Representative of internal manufacturing process capabilities and practices and</td>
</tr>
<tr>
<td></td>
<td>representative of manufacturing time standards</td>
</tr>
</tbody>
</table>
| **Cost Management Process & Cost Control Points** | 1. Manufacturing Engineering will often collaborate with Design Engineering during Engineering’s cost management activities (i.e., design for manufacture tradeoffs).
|                                 | 2. During manufacturing planning, Manufacturing Engineering uses their cost management system to:
|                                 | a. Refine the Engineering cost estimate to match their internal capabilities and current capacity.
|                                 | b. Evaluate cost tradeoffs of different process alternatives to determine the lowest cost production method.
|                                 | c. Evaluate Make vs. Buy cost tradeoffs.
|                                 | d. Manufacturing Engineering further refines the time/cost estimates into a manufacturing standard.
|                                 | 3. Manufacturing Engineering uses the standard to assess and reduce variation in their control of floor processes to achieve that standard by production ramp up. |
| **Metrics & Results Tracking**  | Metrics / KPIs:                                                            |
|                                 | $ Cost savings = Current Cost or Price – New Cost or Price                  |
|                                 | $ Cost avoidance = Initial routing cost – Final routing cost                |
|                                 | Number of parts evaluated for lowest cost routing                           |
|                                 | Manufacturing Engineers are responsible for tallying cost savings in a central savings tracking system. All metrics may be tallied for a given timeframe or project. |
4. Implementing Product Cost Management within VAVE

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goals</strong></td>
<td>Identify savings during VAVE or Redesign.</td>
</tr>
<tr>
<td><strong>Core Activity</strong></td>
<td>Analyze current prices to find over-cost parts and identify cost reductions. Evaluate ideas on current products to identify highest potential cost reduction. Evaluate Engineering Change Orders (ECOs) for cost impact.</td>
</tr>
</tbody>
</table>
| **Implementation Team**         | **Executive Sponsor** – Typically VP or Director of VAVE or Engineering  
**Champion** – Typically Director or Manager of VAVE or Engineering  
**Cost Management Manager** – Cross-functional role; may not be within VAVE  
**Business Function(s) Involved** – VAVE or Current Product Engineers |
| **Cost Estimate Characteristics** | Cost estimates should be in the ballpark and generally representative of the intended manufacturing location and capabilities.                  |
| **Cost Management Process & Cost Control Points** | Often tasked with significant cost reduction goals, this team has ongoing cost reduction projects. A typical project may include:  
1. Identifying opportunities with maximum cost savings potential:  
   a. Combine all cost management techniques (evaluate design, manufacturing, and sourcing alternatives).  
   b. Use the cost management system’s analytics module.  
2. Brainstorming ideas for cost reduction on the opportunities identified  
3. Estimating cost savings for each idea using the cost management system  
4. Prioritizing the ideas for implementation  
5. Pursuing savings by collaborating with design engineering, sourcing, and/or manufacturing engineering  
   At any Engineering Change Order (ECO) approval:  
   1. Add a cost estimate field that requires signoff to the ECO process. This helps flag/control any unexpected cost overages caused by ECOs. |
| **Metrics & Results Tracking**  | Metrics / KPIs:  
   - $ Cost savings = Current Cost or Price – New Cost or Price  
   - $ Cost avoidance = savings from ECO’s denied or reworked due to cost  
   - Number of parts evaluated  
   - Number of opportunities identified  
   Engineers are responsible for tallying cost savings in a central savings tracking system. All metrics may be tallied for a given project or timeframe. |
SUMMARY
Effective product cost management is critical to the success of discrete manufacturers but challenges abound and their impact can have a domino effect that goes far beyond cost of goods. This includes delays in time to market, compromised product quality, less competitive differentiation, poor customer satisfaction and reduced product revenues.

Best-in-class manufacturers are addressing these challenges and distancing themselves from their competition with a systematic approach to cost management that extends across their enterprise to every function and department that impacts product cost. These companies have made product cost management a normal course of responsibility and decision making inside their organizations. They deploy a core set of cost management activities, processes and tools into their everyday business to identify key cost control points and they equip employees to remove cost at every opportunity.

This paper provides practical guidance and examples of how to implement an effective product cost management program in your organization and gain the significant benefits that come with it including increased profit margins, reduced costs, faster time to market and improved product quality. While you may be tempted to accelerate these benefits with a big bang approach, it’s usually best to start small and build a solid foundation before expanding your cost management initiative across your enterprise.

For more information on the contents of this paper, please contact aPriori at info@apriori.com.

ABOUT THE AUTHORS
John Busa, Vice President, Professional Services, aPriori
Mr. Busa has consulted and advised with hundreds of leading companies worldwide to help reduce their product costs, reduce cycle times and get higher quality products to market faster. He holds a Bachelors Degree in Mechanical Engineering from the Massachusetts Institute of Technology (MIT) and a Master’s Degree in Mechanical Engineering from Boston University.

Jessica Milan, Services Business Development Manager, aPriori
Ms. Milan is responsible for the development and implementation of deployment approaches for aPriori’s Product Cost Management system. She has years of experience introducing and deploying cost management systems to design and manufacturing organizations. She has prior experience at Amazon.com as a Technical Program & Product Manager and holds a B.A. Degree in Computer Science from Wellesley College.
ABOUT APRIORI

APRIORI software and services generate hard-dollar product cost savings for discrete manufacturing organizations. Using aPriori’s real-time product cost assessments, employees in sourcing, manufacturing and design engineering make more-informed decisions that drive costs out of products pre- and post-production. With aPriori, manufacturers launch products at cost targets, maximize savings in re-work projects and avoid overpaying for sourced parts.

DOLLARS & SENSE

Product Cost Management Knowledge Series

Compliments of aPriori

- Creating a Profit-Centric Business Culture
- The Anatomy of Product Cost
- Improving the Quality of Product Cost
- Reducing Cost of Goods Sold with Product Cost Management
- New Product Introductions (NPI) and Target Costs
- What Will My Design Cost to Produce?
- Are You Overpaying for Your Outsourced Parts?
- Controlling the Cost of Tooling in Your Manufacturing Environment
- Implementing an Effective Product Cost Management Program

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- Launch Products at or Below Target Cost
- Maximize Cost Savings on Redesign Projects
- Avoid Overpaying for Outsource Parts
- Increase the Speed & Accuracy of RFQ Responses

At the aPriori corporate website: apriori.com/value_series