Controlling the Cost of Tooling in Your Manufacturing Environment

Large tooling expenses are a significant capital expense for many discrete manufacturers, especially in automotive, industrial equipment and consumer goods. This paper discusses some of the challenges involved in understanding and managing tooling costs and highlights how aPriori’s product cost management platform can help manufacturers gain greater visibility into those investments to reduce costs, streamline decision-making and accelerate time to market.

An aPriori Whitepaper
PROFIT PRESSURES FOR MANUFACTURERS
With increasing regional and global competition and new demands from customers for lower prices and higher service levels, manufacturer profits are under intense pressure everywhere we look. As a result, OEMs and suppliers are looking at every opportunity to reduce product costs without sacrificing quality. There is a strong desire to understand and control product cost variables, especially larger expenses like tooling; i.e., capital investments to support part production. Any company that makes or buys plastic and stamped sheet metal parts is likely spending significant sums on tooling — tens, even hundreds of millions of dollars per year. Some of the largest automotive OEMs may spend $1-$2 billion per year on tooling. Manufacturers see the numbers and know that tooling has a significant impact on their bottom line, especially those in automotive, industrial equipment and consumer goods manufacturing.

THE NEED FOR VISIBILITY AND CONTROL
For years, many manufacturers have put very little scrutiny on tooling budgets — partly because tooling costs were sort of a mystery. Quotes for tooling were, and often still are, very high level, broken down only by material and labor costs. Very little detail is made available and there are few cost standards to compare tooling costs against. Manufacturers just didn’t (and still don’t) have many valid reference points. The information they did have often depends on a few individuals or suppliers with specific tooling expertise. And these benchmarks may even vary quite a bit. All this has made it difficult to compare and assess whether tooling costs are right or not. As a result, most manufacturers simply absorb tooling costs and focus their product cost savings efforts on more predictable and measurable areas.

This is changing though. With the increased pressure on profitability and cost management today, OEMs and suppliers are taking a closer look at their tooling costs. They want to make sure the prices they are being charged are valid and are requesting more detail on tooling estimates from internal costing experts as well as suppliers. With this greater degree of granularity, they hope to understand and compare options and their impact on manufacturing process. But this requires better, easier to use methods to estimate the costs of tooling; systems that can be used by both tooling experts and non-experts.

Manufacturers also want to standardize the tool estimating process to ensure consistency and set cost benchmarks for future reference. At the same time, they don't want to give up control. The costs of manufacturing a product or tool in one factory or region, may be different than another. Machine and process capabilities may be different. If manufacturers are really going to understand their tooling costs, they need to estimate their costs in a way that reflects the unique capabilities of their specific manufacturing environments.

Not surprisingly, the cost pressures make their way downstream in the supply chain as well. Tier 1 and Tier 2 suppliers responding to RFQs from OEMs are also being challenged to provide greater detail for their tooling costs. It’s a time-consuming process that is being done manually today with homegrown, template type solutions developed in MS Excel or similar database applications. Compounding the problem is that an individual must have great expertise in costing and tooling to develop a quote. Usually, a company has a handful
of different individuals generating quotes who may be using different estimation methodologies, creating even more inconsistency. Suppliers are looking to automate and accelerate this process so that they can respond more quickly and accurately to RFQs and ultimately drive increased revenues.

MANAGING TOOLING COSTS WITH APRIOI

aPriori’s product cost management software platform is a flexible and powerful costing engine that is able to quickly and precisely determine the cost of a part or product, and required tooling, from the 3-D CAD part model, based on the manufacturing process, materials to be used and the factory or region where it will be produced. aPriori is used by designers, cost engineers, sourcing professionals and suppliers to get precise, real-time cost assessments. As design changes are made, or new product specs are introduced, aPriori automatically re-assesses and provides an updated product cost estimate quickly and easily. Using this new level of cost knowledge, companies can make more informed design and production decisions and significantly reduce product costs throughout the entire product lifecycle.

To meet the growing market need for better methods to estimate the costs of tooling, aPriori includes capabilities to generate highly detailed and complete tooling cost estimates on components — for both injection molding and stamping processes. The system is designed for use by both tooling experts and non-experts and includes the following capabilities:

- Detailed Tooling Bill of Materials (BoM) with information on:
  - Physical characteristics of the tool (e.g., part size, mold size, material weight, actions, lifters, number of drops, etc.)
  - Materials and purchased items used in the tool (e.g., core & cavity plates, ejector box, actions and inserts, stopPins, EDM carbon, etc.)
  - Labor and machine times (design, machining, assembly, finishing, tryout, labor hours by process, CMM inspection, etc.)

- Automated tooling estimates each time a component is cost. This provides non-tooling experts with quick access to precise estimates in real-time.

- A highly detailed, first-pass tooling estimate is generated without the user requiring any knowledge of, or expertise in tooling. This enables fast, efficient and accurate responses to requests for rough estimates.

- Automated bulk costing support with a wide range of user inputs, or predefined ‘process setup options’ or defaults gives the ability to cost the tooling of many parts very quickly.

- Refinement tools for final adjustments by tooling experts.

- Ability to amortize tooling or account for separately

- Set-up and calibration to your specific company, equipment, rates, manufacturing rules and operations for generating a specific plant’s actual costs.
Figure 1. aPriori - Detailed Tooling BoM

Figure 2. aPriori – Tooling Cost Estimate including Material and Labor
WHITE PAPER
CONTROLLING THE COST OF TOOLING IN YOUR MANUFACTURING ENVIRONMENT

CASE STUDY
Polaris Industries – Maker of Personal Recreational Vehicles

Challenges:
- No visibility to product or tooling costs during product development cycle
- Lack of tools to effectively control costs in highly competitive marketplace
- Accelerate time to market for new product development

Solution:
- Company-wide rollout of aPriori to inform decisions on new and current products including tooling costs

Impact:
- Annual tooling costs reduced by 50%
- Product cost at 20% below cost target launch
- Polaris Razor product development time reduced by 50%

FOR QUOTING
As manufacturers request more detail in quotes from their suppliers, aPriori also provides suppliers with a means to quickly and accurately generate detailed quotes. The system can be quickly set up and calibrated to your specific company requirements including equipment, rates, manufacturing rules and operations for generating your plant’s actual costs. Additionally, users have the control to adjust inputs on an individual component basis when creating a quote.

The impact is more consistent, precise quotes with the incremental detail your customers want, in far less time than it has taken you in the past. This enables you to respond more quickly, and win more business.

EARLIER VISIBILITY TO TOOLING COSTS IN THE NPI PROCESS
From a component CAD model, before tooling is ever designed, manufacturers can get an early estimate of tooling cost to support tooling sign off and budget management. Further into the design cycle, manufacturers can use the system to quickly flag tooling quotes that are outliers and access aPriori to quickly determine the source of the differences so that they can collaborate with the supplier to reduce the cost.

The Benefits of Detailed Tooling Cost Visibility

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<th>Benefits</th>
<th>For OEMs</th>
<th>For Suppliers</th>
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<td>Detailed tooling costs reduce risk of overpaying for expensive plastic and sheetmetal tooling; driving down annual tooling costs.</td>
<td>Ability to respond to RFQ’s and RFP’s quickly with fewer personnel. Generate tooling quotes to OEMs faster than ever before.</td>
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<td>Immediate visibility to cost of tooling, improves margins, reduces risk, increases agility in the product development process.</td>
<td>Level of detail and transparency in the Tooling BOM/Quote drives increased satisfaction and revenues from Tier 1/OEM partners.</td>
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<td>Key knowledge about part and tool estimating is captured so users can take advantage of accumulated company expertise.</td>
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<td>Estimating methods and results become more consistent and reliable, streamlining decision-making and time to market.</td>
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<td>System does not require specialized tooling or cost management expertise; it can be used by anyone in design, engineering, manufacturing, sourcing and procurement.</td>
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Source: aPriori, Inc.
SUMMARY

Tooling costs are a becoming an important area of focus for many discrete manufacturers today as they look for new opportunities to cut product costs without sacrificing product quality. The challenge has been the lack of effective tools to provide the necessary level of detail to truly understand those costs and how to impact them. aPriori offers an easy-to-use system for both OEMs and Tier 1 and 2 suppliers that can calculate a detailed tooling cost estimate directly from a 3-D CAD model. This provides users — expert and non-expert — with immediate visibility into tooling costs so they can collaborate internally and externally to reduce them without impacting product functionality and quality. It also enables manufacturers to capture this valuable knowledge to make their tool cost estimating methods more consistent, further streamlining decision making and accelerating time to market.

ABOUT THE AUTHOR

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Vice President, Strategic Marketing & Product Management
aPriori, Inc.

Julie Driscoll joined aPriori in early 2006, leading the professional services team and working with discrete manufacturers to drive value with aPriori’s product cost management solution. Today she is responsible for the company’s strategic product and marketing direction with a keen eye for identifying new product cost savings opportunities for discrete manufacturers. Julie has over eighteen years of product and service delivery experience, working in a variety of operations and consulting management roles at Oracle, ProfitLogic and State Street Bank. She holds a BS in Industrial Engineering from Worcester Polytechnic Institute and an MBA from Babson College.

ABOUT aPRIORI

aPriori software and services generate hard-dollar product cost savings for discrete manufacturing and product innovation companies. Users include some of the leading manufacturers in Europe and North America. Leveraging aPriori’s real-time product cost assessments, employees in engineering, sourcing and manufacturing make more-informed decisions that drive costs out of products pre- and post-production. As a result, manufacturers launch products at cost targets, maximize savings in re-work projects and never overpay for sourced parts.

To learn more about aPriori and its product cost management solutions and services in the U.K., visit www.apriori.com or call 1.978.371.2006. To see an overview demonstration of aPriori, click here.
CONTROLLING THE COST OF TOOLING IN YOUR MANUFACTURING ENVIRONMENT

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

Learn more by watching the aPriori Business Value Video Series to see how a modern Product Cost Management platform can help your company…

- 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

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