

Should Costing

Identify should cost elements early in the design phase, and enable cost down initiatives

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Abstract

Competition and the need to improve margins require organizations to constantly review product costs and identify opportunities for cost reduction. Since a major component of product cost comprises material and processing costs, this area requires specific focus.

Zero based costing has been around for quite some time, but the availability of digital engineering models and specialized costing software have significantly enhanced the effectiveness of should costing and analysis. Organizations are able to realize benefits through the use of should cost models, and through collaborative interactions with their vendor base.

A well managed should costing and analysis initiative has the potential to provide multiple returns on the investment, while setting the stage for consistent cost reduction that leads to increase in profitability and stakeholder returns.

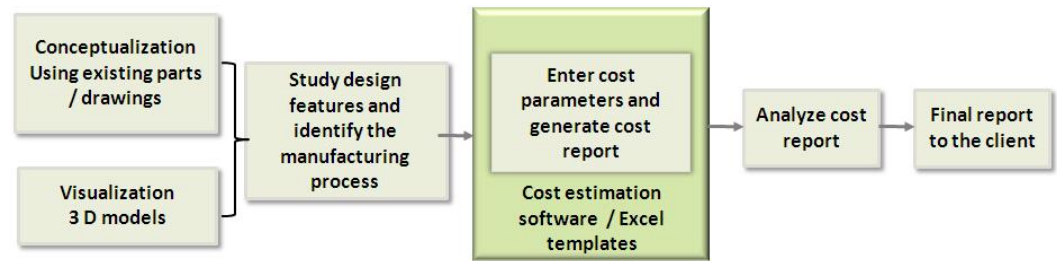
What is should costing?

Should costing is a process, whereby one can determine the cost of the part or product, based on the raw materials used, manufacturing costs and overhead production costs. This can be achieved by analyzing the engineering models to understand the raw material required, defining the manufacturing processes required to deliver the required form features, and calculating the total costs through the use of rate data related to material costs and processing costs. The ultimate goal of any should cost analysis initiative is to provide enough information as to enable (depending on the stage) designers to modify raw material or form feature requirements, or enable suppliers to modify manufacturing processes with a view to reduce costs.

Should costing, thus, provides a framework that enables a systematic focus on opportunities to reduce costs right from the conceptualization stage through the production life of the product.

The should cost estimation process

Should costing relies on product data and expertise that allows the definition of appropriate manufacturing processes. The job begins by first reviewing inputs such as the part numbers, drawings, 3D models, and the estimated annual usage. The drawings are then carefully studied, and the manufacturing requirements and specifications are noted along with associate definition parameters such as fits and tolerances. This leads to the mapping of appropriate processes required to manufacture the part and achieve the engineering specifications. Thereafter, suitable work centers are established for each defined operation. The should cost model is a summation of the raw material costs as well as the costs for usage of machines and labor to deliver the defined manufacturing processes and any intermediate handling and transport. There are certain COTS software available that can simplify the should cost modeling process; these software tools rely on a large back-end database containing material and machine costs.



Steady State Execution Flow of Should Cost Estimation

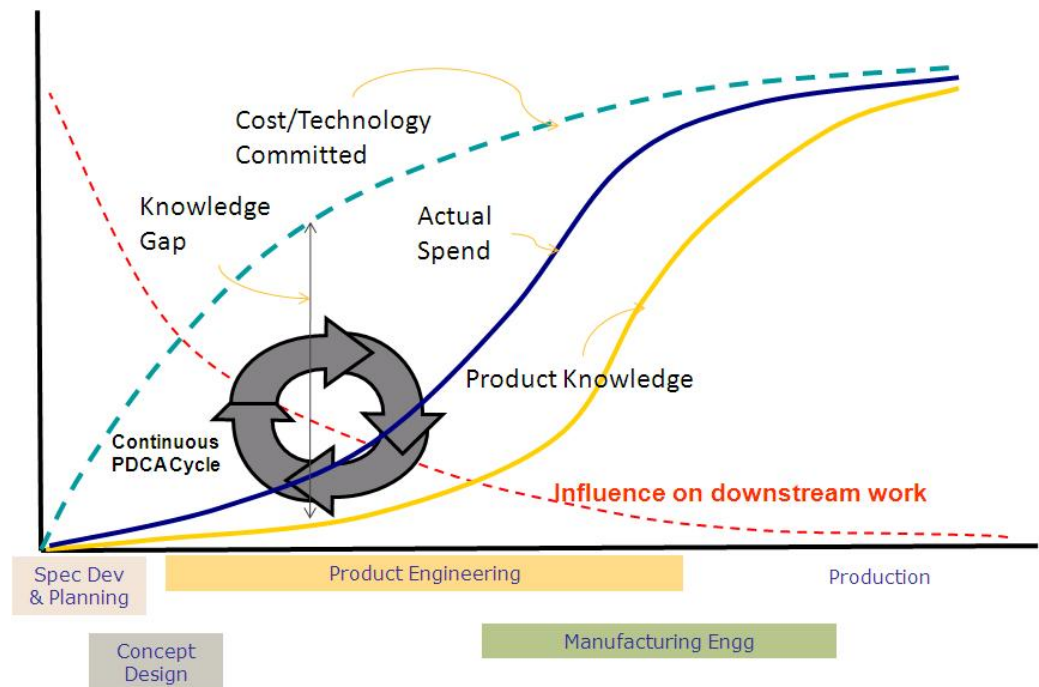
Factors that influence should costing

Multiple factors influence the cost of any component. These range from factors that are inherent in the engineering design to factors that are dependent on the supply chain designed to deliver the product.

- Raw material
- The number of features that need to be incorporated, and the complexity of those features
- Tolerance requirements
- Finish requirements
- Lot/ batch size and Estimated Annual Usage (EAU)
- Constraints in availability of manufacturing facilities
- Location of the manufacturing plants

Moving should costing up the product realization cycle

Component costs have the potential of derailing the profitability and viability of a project or product. It is, therefore, essential that should cost modeling and analyses are carried out early in the product realization cycle. Traditionally, the non-availability of adequate product information and the costs of carrying out iterative cost analysis (which are inherently resource intensive), led to such exercises being carried out after the product engineering cycle was completed and the product released for manufacture. This would really be too late and most of the product cost would have by then been committed due to choices related to materials and features that the designers would have made. The effect any cost analysis at this stage can have is limited to (though the scope there too is huge) reduction of costs through the availability of detailed cost build up information that enhanced the ability to negotiate with vendors and reduce procurement costs.



Parameters that could influence should cost modeling

It is, therefore, very important to have a fairly thorough knowledge of the product, its build up in terms of material, the manufacturing processes that are used, and associated costs in the very early stages of product development. Should costing provides a platform to track cost at every gate, from the conceptualization stage to the launch of the product.

Should costing —Identifying cost drivers to improve product margins

It is recommended that a should cost estimate be carried out in the initial phases of a product development exercise so that one gets a fair idea of the budget and the approximate costs that will go into the manufacture or sourcing of the product, leading to the build-up of the cost of the product. This will also assist better project management by ensuring that prices have been checked and corroborated early on.

Conducting should cost analysis later in the cycle enables the organization to compare between the actual procurement/ manufacturing cost and the cost model, and reconcile differences. Identifying parts that present considerable savings opportunities is particularly important while discussing cost improvements through various manufacturing process trade-offs.

Knowing what the product should cost empowers the organization with the power to improve negotiations with suppliers and to ensure that these negotiations are based on analytical information. In other words, opportunities for savings will become apparent once an accurate cost estimation is carried out.

Products and technologies that aid the should costing process

Use of digital engineering models as a basis for communication of the engineering specification of a product has enabled greater accuracy and reliability of should cost analysis initiatives. Digital information also allows iterative analysis and a logical cost build up. Use of productivity tools can enhance the ability to create cost models through automation of annual and iterative process steps. For example, a product that identifies manufacturability issues at the design stage, ensures reduction in the set up cost as well as the time to manufacture the product; or a product that helps in material utilization can significantly impact the cost of raw materials.

Services for should costing

Quite often, organizations execute the should costing process in-house, tasking the impacted stakeholders themselves with the responsibility of evaluating and optimizing cost models. What this means is that designers are expected to create cost models for each of their designs, and then optimize the design through the analysis of these cost models. The purchase department is then expected to create cost models and use those for supplier negotiations. The fact of the matter is that effective cost modeling requires skill sets and competencies that neither product designers nor purchase executives possess. The ability to understand an engineering specification and translate that into manufacturing processes is a specialized competency that is also industry and commodity specific. Further, vested interests (my design is the best or my negotiated price is the best) hinder the desire to perform the intensive tasks that are required to create an accurate cost model.

The model that has succeeded is to assign this activity to an independent team either inside or outside the organization. This team forms a collaborative bridge between engineering and procurement, providing services on a proactive initiative basis or on call.

Conclusion

Should costing provides the basis for continuous cost reduction and waste elimination. This also leverages the ability to formulate the best economies of scale from a cost view point, which can be used to leverage a 'best price' in the negotiation process.

An effective should cost model eventually arms the organization with the information required to make the right decisions earlier in the design cycle, where such decisions can potentially have a greater impact.

About the Author

Nilesh Kauthekar is the Project Lead for a should cost estimation project at Geometric. He has been with Geometric since June 2009, and has over 12 years of experience in Vendor Development/Cost Estimation.

About Geometric

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