

# Cleansheet target costing

## Part II: embedding cleansheets into the organization

Embedding target-costing cleansheet into a company's decision-making and organizational processes is a worthwhile investment that opens new windows into savings and risk mitigation

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*Part 1<sup>1</sup> of this series described the cleansheet approach and its power to optimize product costs. Now we look at how companies can make target cost models an integral part of their business planning and decision-making infrastructure*

Bottom-up cleansheet calculations have risen to prominence in recent years as a tool to calculate what a product or a service should cost. Cleansheet cost models help companies in two ways. First, they allow purchasing teams to understand how much room they have for negotiation with suppliers, and provide transparency to product management on whether a proposed design can be sold at an appropriate margin. Second, they quantify the principal sources of product cost; this cleansheet cost transparency in turn helps companies generate ideas for design and process improvements, for example, by adopting a different process flow, production technology or manufacturing footprint.

For all their potential, the usefulness of bottom-up cleansheet cost models depends on their connections with the wider organization. Those connections work in two directions. On one side, a good cleansheet depends on data and expertise from a range of functions: product management to provide specifications and projected sales volumes, manufacturing to provide process data, purchasing to provide insights into supplier capabilities, and engineering to provide material requirements for example. On the other, even the most accurate cost breakdown is of little value if it isn't available to support important design, procurement and manufacturing decisions, or if it isn't used by those functions in their decision-making processes.

### Ownership, infrastructure and organizational links

To operate effectively, cleansheet target cost models require an **owner**, a **supporting infrastructure** and effective, formal **cross-functional integration** into the wider organization across the full product life cycle.

The **cleansheet owner** is responsible for the compilation process, for delivering the finalized and reviewed cost model and for updating the model to include changes in product specification, design or manufacturing scenarios. The cleansheet owner can be the product manager, the project controller, a dedicated cost engineer or a member of the strategic purchasing team.

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<sup>1</sup> [https://operations-extranet.mckinsey.com/content/function/all/view/20120320\\_cleansheet\\_target\\_costing\\_1](https://operations-extranet.mckinsey.com/content/function/all/view/20120320_cleansheet_target_costing_1)

**Supporting infrastructure** provides the resources and tools needed to compile cleansheets. That infrastructure starts with the cleansheet IT tool itself and its associated databases. These should be standardized across the company to maximize re-use, economies of scale and to capture evolving knowledge and best practices.

The actual knowledge used to build and validate a cleansheet cost model for a particular product or component will come from the wider organization via **cross-functional integration**. Purchasing will provide information on the bill-of-materials and supplier capabilities, supply chain will provide the logistics flow, engineering will provide information on parts properties and cost drivers, manufacturing will describe possible production flows, machine and tool information and controlling will provide information on overhead costs.

Cleansheet owners can access this cross-functional expertise in one of two ways. They may coordinate the process themselves, drawing on inputs from other departments as they are required, or they may make use of a full time, dedicated **cost engineering team** staffed by specialists from all the relevant functions. If the resources for it are available, the latter approach is more effective: it improves the accessibility of expertise without competing for resources with individual departments, and a cost engineering team that operates independently from various departments is better positioned to challenge current processes and assumptions.

## Building cleansheets into the business

For organizations to gain the maximum possible benefits from their target costing efforts, they must alter their processes to make cleansheets an integral part of them. This might be done by making cleansheets a standard part of the business case planning for new products, for example, to get a robust cost buildup in the early decision phase, or to set manufacturing and purchasing cost reduction targets based on cleansheet cost transparency.

For example, one manufacturer of air conditioning compressors began the planning process for a new generation product by reverse engineering the detailed cost structure of its existing design. This exercise immediately identified some opportunities to reduce the costs of parts and materials used in its current product portfolio. The company then took the specification of its new product and translated this into potential differences from its existing design in terms of component integration, material selection and manufacturing process.

The company was then able to use the cleansheet approach to conduct high-level cost walks from the original design to the new one in order to estimate the likely cost impact of the changes. This analysis demonstrated sufficient cost advantages to allow the development of detailed CAD models of the new components. From these the company was able to extract the detailed data it needed to compile bottom-up cleansheets of the new design.

The detailed cost buildup allowed further refinements to be made. It revealed, for example, that decisions about the way shafts would be manufactured and rotor coils wound would have a large effect on the final product cost. In particular, the models suggests that adopting new technologies in these areas would significantly reduce the final cost of

the product, but would require significant investment in new production equipment and tooling.

As a result, the company decided to launch the product in two phases. It began with an “in between” generation that captured most of the design and purchasing advantages, but which used existing motor manufacturing methods. In parallel, the company identified strategic suppliers to help it develop the new shaft and rotor technologies, with a particular focus on reducing the required capital investments. When the new technologies were ready, the company altered its design to accept them, with minimal changes to interfacing parts and the overall manufacturing flow.

## Capturing learning

When organizations employ cleansheets for the first time, they typically go through a rapid learning period as they challenge their assumptions, close gaps in their understanding of the true cost drivers of their products and explore new ways to reduce costs. This learning must be captured systematically, through updates and modifications to databases, templates and supporting documentation.

The purchasing department is best positioned to collect material cost data. Initial data is often compiled by reverse engineering parts that have undergone aggressive and effective price negotiations, although information from a number of separate parts is usually required to deliver robust data. The most detailed information is gathered directly on the shop floor based on observation and a systematic documentation of best practices.

The cost breakdowns of purchased parts can be further refined by direct discussions with suppliers. Such discussions typically start on an aggregated cost level to identify gaps between the supplier and customer's costs calculations, and then evolve to more detailed discussion of aspects such as yields and cycle times.

These discussions in themselves can be a powerful way of identifying savings opportunities. One important area is the amortization of any dedicated machinery or tooling investments by the supplier, for example. If the sourcing contract has a risk of early termination, the supplier will try to amortize such investments quickly, pushing up part prices. An open discussion can allow risks to be shared and mitigated in a way that benefits both parties.

## Cleansheet staffing

Cleansheet target costing makes particular demands on individuals too. Dedicated cost engineers need a high degree of specialized knowledge in their own product or process categories. Also, as most cleansheets will involve a combination of many different materials and processes, cost engineers with skills in multiple categories are typically more effective than those with a focus on just one or two. Since building a good cleansheet cost model is an iterative process, the teams charged with their creation need skills that go well beyond their technical domains. They must be accomplished negotiators and problem solvers, able to diplomatically challenge the assumptions of their colleagues and suppliers and to keep their own minds open for the opportunities offered by alternative approaches.

## Getting started

Companies embarking on their first cleansheet compilations can maximize the return on their initial investment by picking their targets systematically. We recommend that companies start with existing products in their portfolios for several reasons. Not only are familiar products and established value chains usually easier and quicker to model, they also provide valuable base data for comparison with cleansheets of future product or process developments. In addition, the savings generated by purchasing changes on existing products typically generate quick wins that help to create enthusiasm and momentum for the cleansheet rollout.

A typical initial approach might be for a company to start with a commodity, such as sheet metal or plastic parts, electric motors, printed circuit boards, to pick two or three examples from their portfolio, and build cleansheets for these parts. Companies can then compile “cost walks” from these analyses for other products within the commodity. Such an approach can trigger an avalanche of cost reduction initiatives. Subsequent waves should cover more commodities until 80 percent of the purchasing portfolio cost base can be modelled. As companies proceed with these efforts, their interaction with suppliers and the internal review, challenge and refinement of the calculations will build their skills, their databases and their confidence in target cost negotiations. Ultimately, this evolution will allow the organization to make use of cleansheets to calculate target costs for products that are still in the early concept phase.

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