

# Design-to-Value: shaping costs and value early in the product creation process

Design-to-Value (DtV) is a structured approach to systematically optimising the costs, functionality and competitiveness of products already during the development and design phase. Since the vast majority of later manufacturing costs are typically fixed in this phase, DtV acts where cost savings have the greatest leverage. For buyers and supply chain managers, DtV is the central link between strategy, development and procurement: procurement brings supplier knowledge, market prices and manufacturing expertise into product design at an early stage. This fundamentally distinguishes DtV from retrospective cost reduction programmes in series production.

## Key facts

- Design-to-Value optimises products during the design phase in terms of costs, functionality and value, rather than retrospectively in series production.
- In practice, 70 to 80 per cent of manufacturing costs are typically determined by early decisions on design, materials and manufacturing.
- Core elements include cost breakdown (should-costing), functional analysis, part reduction and use of standard parts, and early supplier involvement.
- Typical savings potential frequently lies in the single to double-digit percentage range of direct product costs, depending on product complexity.
- Procurement contributes significantly to DtV success through market and price knowledge, supplier capabilities and cross-functional teams.
- DtV is ideally applied before or in parallel with the design freeze; afterwards, the design freedom decreases significantly.

## Definition: Design-to-Value

Design-to-Value refers to the systematic design of a product and its bought-in parts such that customer benefit is maximised at the lowest possible lifecycle cost. The approach combines product design, manufacturing design and procurement into an integrated optimisation process, replacing pure cost reduction with a value-oriented perspective.

## Distinction from Design-to-Cost and Value Engineering

Design-to-Cost primarily imposes a cost-related target for the design, whereas Design-to-Value additionally incorporates customer benefit and the product's differentiation capability. Value Engineering, in turn, is closely related as a method and is often used as a sub-tool within DtV programmes. In practice, the terms are sometimes used synonymously; what is decisive is the early anchoring in the development process.

## Significance for technical procurement

For buyers, DtV shifts the point of leverage: instead of pushing prices through negotiation management

and volume bundling, they influence design, material selection, tolerances and manufacturing processes. This turns procurement from a price negotiator into a value shaper, while increasing its strategic relevance within the procurement organisation.

### **Timing in relation to the development process**

DtV unfolds its effect primarily in the concept and detailed design phase. After the design freeze – in supplier management often governed by the freeze fence – changes become expensive and lengthy due to tool release, approvals and supply contracts. Early supplier involvement before this threshold is therefore a key success factor.

## **Methods and approach in the Design-to-Value process**

A DtV initiative typically follows a multi-stage approach: target definition, cost and value analysis, idea generation, evaluation and implementation support. In practice, it only works as a cross-functional team comprising development, procurement, production, quality and, where applicable, sales.

### **Should-costing and cost breakdown**

Should-costing breaks a component down into material, manufacturing, set-up, tooling and overhead cost elements and derives an engineering-based target cost value from these. The deviation analysis between the actual quotation and the should-cost shows where design or process still hold potential. Such analyses also provide objective arguments for later negotiation management with suppliers.

### **Functional analysis and value analysis**

Methods such as functional analysis, following the logic of value analysis, question which functions a component really has to fulfil and what they cost. On this basis, functions can be eliminated, simplified or transferred to cheaper manufacturing processes and materials. Frequently used levers are part reduction, use of standard parts, material substitution and tolerance optimisation.

### **Early supplier involvement**

Suppliers contribute process, material and market knowledge that is often lacking in-house. A structured supplier innovation process, targeted idea workshops or a pilot project with suppliers make this knowledge usable. In advance, a qualification assessment of potential partners regarding technology, capacity and quality should be carried out, so that early involvement does not fail due to unsuitable suppliers.

## **Key KPIs for steering Design-to-Value**

DtV success can only be measured if target costs, idea implementation and result impact are systematically tracked. A small, binding set of KPIs that works equally at project and programme level has proven effective.

### **Cost and value metrics**

Key metrics are target cost achievement, realised cost savings per project and cost forecast accuracy at the milestones. This is supplemented by measuring the value contribution, for example via the margin or contribution margin of new products. It is important that savings are demonstrated against a robust baseline.

## **Process and implementation metrics**

At process level, the number of qualified ideas, the idea implementation rate and the shifting of decisions ahead of the design freeze count. The proportion of components for which a should-cost model exists is also a practical maturity indicator. These metrics can be readily linked to existing metrics from time management and development.

## **Risks and controls in Design-to-Value**

DtV changes proven products and supply relationships – this entails technical, supply-related and organisational risks. Without clear control mechanisms, quality problems, supply bottlenecks or sham savings that have to be expensively corrected in series production loom.

### **Quality and change risks**

Material substitution, tightening tolerances downwards or simplified designs can create failure risks. Countermeasures include systematic test planning, sample testing and a clean deviation analysis at every change step. Changes should only be transferred to series production after completed validation and tool release.

### **Supplier and procurement risks**

New materials or suppliers create new dependencies and vulnerabilities. A bottleneck analysis, effective supply risk management and ongoing supplier rating keep supplier risk in view. For critical changes, a defined escalation process is also recommended in order to resolve problems quickly, along with disaster recovery (DR) planning for monopolistic components in case of emergency.

### **Organisational stumbling blocks**

Common mistakes include missing target agreements between development and procurement, unclear decision paths, and DtV being run as a one-off project rather than a process. Remedy is provided by a binding procurement guideline for the early phase, fixed cross-functional teams and a governance that formally accepts cost steps. Change management is also relevant, as designers often initially perceive cost targets as an interference with their design freedom.

## **Current developments around Design-to-Value**

DtV is not a static topic: digitalisation, sustainability requirements and volatile markets continuously extend the approach. Companies that anchor DtV continuously achieve sustainably better start-up costs and faster development cycles.

### **Digitalisation and data usage**

Digital should-cost models, cost databases and simulations significantly accelerate cost estimation. E-sourcing and e-procurement in procurement provide market and price transparency, which is fed back into design decisions. AI-supported similarity searches in part master data also reduce new parts and promote the reuse of existing components.

### **Sustainability as a value driver**

Design-to-Value is increasingly extending into Design-to-Sustainability: material consumption, energy requirements in manufacturing and recyclability are treated like cost drivers. For buyers, this means integrating CO and circular economy aspects early into supplier selection and material decisions. Legal

requirements on product responsibility must be examined on a case-by-case basis.

## Resilience and global value creation

Supply chain disruptions of recent years have shown that cost optimality alone is not enough. DtV teams today additionally assess lead time variability, customs and preference aspects (such as the EUR.1 preference certificate) and location risks in design decisions. Concepts such as supplier relocation or multi-sourcing strategies thereby become part of early value creation planning.

## Typical metrics

### Target cost achievement: $\geq 95\%$

Proportion of target costs achieved per DtV project; typical rule-of-thumb value in practice

### Realised cost savings: 5–15 % of direct product costs

typical project potential, depending on complexity and starting level

### Idea implementation rate: $> 30\%$

Proportion of qualified ideas implemented through to series production

### Cost forecast accuracy: $\pm 10\%$

Deviation of the cost forecast from actual costs per milestone

### Decisions before design freeze: $> 80\%$

Proportion of cost decisions made before the design freeze

## Practical example

A medium-sized mechanical engineering company set out to manufacture a new device housing typically 15 per cent more cheaply without losing functionality or stability. A cross-functional team from design, procurement and production launched a structured DtV project before the design freeze with two strategic sheet metal and plastics suppliers. Using should-costing, functional analysis and a pilot project with suppliers, the housing architecture, sheet thicknesses and connector concept were revised. Within eight months, the target cost gap was almost closed, with unchanged adherence to deadlines and quality.

- Create should-cost models for the top 20 cost driver components and compare them with quotation prices
- Conduct supplier workshops before the design freeze and prioritise ideas via a structured evaluation board
- Enforce part reduction and use of standard parts; replace screwed connections with quick-release fasteners
- Validate changes via sample testing and tool release before series production starts

## Conclusion

Design-to-Value shifts the cost debate to where it has the greatest impact: the design phase. For technical procurement, the approach means a change of role from price negotiator to early value shaper with a genuine say in development. Prerequisites are robust cost transparency, cross-functional teams and supplier involvement before the design freeze. Those who anchor DtV as a continuous process rather than a one-off project secure sustainably lower manufacturing costs and more competitive products. The investment in methodology and data foundation typically pays off across several product

generations.

## Frequently asked questions

### What does Design-to-Value mean?

Design-to-Value is an approach in which products are designed during development so that customer benefit and costs are optimally aligned with each other. Instead of negotiating prices retrospectively, companies intervene early in design, materials and manufacturing. Procurement contributes market and supplier knowledge to the design phase.

### What is the difference between Design-to-Value and Design-to-Cost?

Design-to-Cost primarily imposes a cost ceiling as the target metric for the design. Design-to-Value goes beyond this by also considering customer benefit, differentiation and lifecycle costs. In practice, Design-to-Cost is often a component of a more comprehensive DtV programme.

### What savings potential is realistic with Design-to-Value?

The potential depends heavily on product complexity and the starting level. In practice, single-digit to low double-digit percentages of direct product costs are frequently cited. What is decisive is that measures are implemented before the design freeze, as the levers diminish significantly thereafter.

### How can procurement actively support Design-to-Value?

Procurement provides market prices, should-cost analyses and knowledge of supplier capabilities and alternative manufacturing processes. Through early supplier involvement, for example within a supplier innovation process, it brings external technology expertise into the team. It also handles the risk assessment of new materials and suppliers, for example via qualification testing and supplier rating.

### Which methods are part of Design-to-Value?

Typical methods include should-costing, functional and value analysis, part reduction and use of standard parts, material substitution, tolerance optimisation and Design for Manufacturing and Assembly. Benchmarking and digital cost simulations are used in addition. The methods are usually combined in cross-functional workshops.

### When is the right time for Design-to-Value?

The biggest lever lies in the concept and detailed design phase, before drawings, tools and supply contracts are fixed. After the design freeze, changes become significantly more expensive and slower due to tool release, approvals and qualification effort. However, DtV can also be applied in series production as value analysis for subsequent generations.