

Value Analysis: Optimising Functions Rather Than Parts

Value analysis is a systematic method for fulfilling the functions of a product or component at the lowest total cost level. In strategic procurement, it is used to reduce costs without loss of quality by questioning functions, substituting materials and optimising manufacturing processes. It is typically carried out as a team effort and ranges from the development of new components to the review of existing series parts.

Key facts

- Value analysis does not look at the price of a part, but at the relationship between function and total cost.
- Typically, 5 to 20 percent cost savings are achieved on the analysed component in application.
- The method follows a structured process plan in accordance with VDI 2800 ff., with phases such as information, function, idea and evaluation phases.
- Value analysis requires interdisciplinary teams from procurement, engineering, manufacturing and quality management.
- It differs from value engineering in that it frequently improves existing products, whereas value engineering tends to concern newly developed products.
- The prerequisite for sustainable savings is usually close collaboration with suppliers, for example within the framework of a strategic partnership.

Definition: Value Analysis

Value analysis is a systematic, team-oriented method of cost optimisation that examines products and processes on the basis of their functions. The aim is to achieve the same or better function at the lowest total cost over the lifecycle. In procurement, it is a central instrument of sourcing strategy, particularly where purchasing volumes are high in strategically relevant commodity groups.

Distinction from Cost Reduction and Value Engineering

Value analysis starts earlier and goes deeper than classic cost reduction: the focus is not on prices or margins, but on the purpose of every individual function. In practice, value engineering is often used synonymously, but strictly speaking it refers to the application of the methodology in new development, whereas value analysis in the narrower sense examines existing products in the field. The two approaches complement each other and are both part of an effective cost engineering process.

Legal Framework in Public Procurement

In public procurement law, value analysis is established as a procedure for determining the most economically advantageous tender; lifecycle costs, environmental characteristics and functional value are assessed. This allows public purchasers to go beyond pure price consideration. In the industrial environment, the method is not regulated, but it often follows the same principles.

Methods and Approach in Value Analysis

Value analysis follows a proven phase model that combines the original American method developed by Lawrence Miles with German standardisation according to VDI guidelines. In practice, a seven-phase scheme has become established, ranging from preparation through to implementation. Success depends less on the methodology than on the openness of the team and the quality of the data.

The Role of Procurement and Suppliers

Procurement contributes market and cost knowledge: reference prices, alternative materials, manufacturing processes and supplier capacities. Suppliers involved at an early stage – for example within the framework of joint development manufacturing (JDM) – can implement change proposals constructively rather than merely compensating for them through price concessions. This also protects supplier acceptance and the long-term security of supply.

Key KPIs and Fields of Application

The success of a value analysis can be measured using hard KPIs that go beyond pure unit cost reduction. Meaningful KPIs consider total payback, project target achievement and the shifting of costs into early phases. It is important that savings are not lost at the interface to goods receipt or in quality.

Cost-Related KPIs

Key performance indicators are the absolute cost reduction per analysed component in EUR, the relative saving in percent, the payback period of value analysis projects and the annual capacities released through implementation. The share of implemented ideas out of the proposals generated is also frequently measured; in practice, implementation rates of 20 to 40 percent are a realistic range.

Quality and Process KPIs

Since value analysis changes design and materials, quality audits and, where appropriate, a supplier energy audit are sensible additions in order to control side effects. The first-pass reject rate after changeover and the impact on goods-in processing time are also important. Only those who measure these consequential costs recognise genuine net savings.

Typical Fields of Application in Industrial Procurement

Classic use cases are B and C parts with high purchasing volumes, standard and bought-in parts, castings, plastic components and packaging. Process services and logistics costs can also be examined from a value analysis perspective. For strategic A parts, the method is frequently conducted as a structured workshop with the supplier.

Risks and Controls in Value Analysis

Value analysis changes products – and the associated risks in terms of quality, supply and contracts are frequently underestimated. Without structured control, apparent savings can be wiped out by escalation costs, returns or long-term dependencies. Clear governance and documented approvals are therefore mandatory.

Technical and Quality-Related Risks

Every material substitution, tolerance change or manufacturing changeover requires approval via the engineering change process, including sample testing and updated inspection plans. For safety-relevant

parts, evidence and quality audits of the new manufacturing process are mandatory. Otherwise there is a risk of serial defects that will consume the savings many times over.

Supplier and Procurement Risks

Cost savings through redesign frequently lead to a change of supplier or to new single-source situations. Before the award decision, therefore, a proper pre-qualification, supplier sanctions screening and an assessment of the geopolitical risk of new sources of supply are required. Multiple sourcing can reduce dependencies, but costs unit price advantages.

Contractual and Organisational Controls

Savings should be secured contractually, for example through binding price adjustment clauses, marking of the modified parts and provisions regarding tools and intellectual property. In the procurement organisation, clear responsibilities between procurement, engineering and sales are needed to prevent a conflict of interest between cost targets and customer requirements. An invoice verification subsequently ensures that agreed prices are actually applied.

Current Developments: Value Analysis in the Context of Digital Tools and Price Volatility

Value analysis is changing: digital cost breakdowns, AI-supported alternative searches and stronger consideration of sustainability and supply chain issues are expanding the classic methodological repertoire. At the same time, raw material price fluctuations and geopolitical uncertainties are forcing value analyses to be carried out faster and more frequently.

Digitalisation and AI-Supported Analysis

Modern cost engineering tools automatically break down components into cost blocks and suggest alternative materials or manufacturing processes. This significantly accelerates the idea generation process, but does not replace the creative team discussion. Companies with a mature digital procurement structure – for example integrated source-to-pay (S2P) processes – can prioritise value analysis objects on a data-driven basis.

Raw Material Prices and Supply Chain Pressure

High raw material price volatility and market power make value analysis an ongoing process rather than a one-off project. Material substitutions must be evaluated with a view to availability, supplier sanctions screening and price dynamics. Delivery dates and availability – keyword available to promise (ATP) – are part of the evaluation just as much as the pure material price.

Sustainability as a Value Criterion

CO emissions, recyclability and energy efficiency are increasingly regarded as functions with their own value. Value analysis can thus also reduce the carbon footprint of a component, for example through lightweight design, recyclable materials or more regional sourcing. This extension makes the instrument interesting for sustainability and reporting targets.

Typical metrics

Cost reduction per analysed component: 5–20 %

Common guideline figure in practice; higher in cases of over-engineering

Idea implementation rate: 20–40 %

Share of implemented improvement proposals out of those generated

Project payback period: < 12 months

Typical target value for industrial value analysis projects

First-pass reject rate after changeover: > 98 % i. O.

Quality control after design or material change

Practical Example

A mid-sized mechanical engineering company analysed a hydraulic valve housing together with its supplier; the housing accounted for around 8 percent of the commodity group's annual purchasing volume. The function analysis showed that several bores were over-dimensioned and that the housing was made from an expensive alloy. After a five-month project duration, a redesigned version made from standard steel with an adapted manufacturing process was approved, without any functional restrictions.

- Interdisciplinary workshop with engineering, procurement, manufacturing and the supplier
- Function analysis of all component features with cost allocation per function
- Material substitution and change of manufacturing process with sample approval and quality audits
- Contractual securing of the savings with the supplier over two years

Conclusion

Value analysis is one of the most effective instruments for achieving sustainable cost optimisation in procurement without sacrificing function or quality. Its success depends on a methodically sound function analysis, an interdisciplinary team and the early involvement of suppliers. Those who only negotiate price concessions forgo the greatest potential: changing the product itself. At the same time, price volatility, supply chain pressure and sustainability requirements demand regular, data-driven execution. Companies that embed value analysis as a fixed element of their sourcing strategy secure measurable cost advantages and technological leadership at the same time.

Frequently asked questions

What is value analysis in simple terms?

Value analysis is a method used to examine products in terms of their functions in order to achieve the same performance at lower total cost. Instead of negotiating prices, the team asks: which function is really needed and what does it cost? Savings are thus generated through design, materials or manufacturing – not through pressure on the supplier.

What phases does a value analysis have?

Typically, a value analysis goes through seven phases: preparation, information gathering, function analysis, creative idea generation, idea evaluation, implementation of solutions and presentation of results. The VDI 2800 ff. guideline series describes this process in detail. In practice, a project takes several weeks to months depending on complexity.

How much can you save with value analysis?

In practice, savings of 5 to 20 percent on the analysed component are commonly achieved, sometimes even more in extreme cases. This depends on design freedom, purchasing volume and the market situation. It is important to include ancillary costs such as inspection, change effort and quality risks in the calculation.

What is the difference between value analysis and value engineering?

Both use the same methodology. Value engineering is usually applied in new development, i.e. before a product goes into series production. Value analysis in the narrower sense deals with existing products in series use. In corporate practice, however, the terms are often used synonymously.

Who conducts a value analysis?

A value analysis is carried out by an interdisciplinary team, typically with representatives from engineering, procurement, manufacturing, quality and sales. The project is often led by a certified value specialist. Suppliers or external experts can also be involved, particularly for specialised components.

When is value analysis worthwhile in procurement?

It is particularly worthwhile for parts with high purchasing volumes, high unit costs, long series production runs or recognisable over-engineering. It is also an effective instrument in cases of rising raw material prices, supply problems or sustainability targets. The prerequisite is that design changes are still economically and technically feasible.