Technology Assessment in Procurement: Methods and Criteria for Investment Decisions

Technology assessment in procurement refers to the systematic examination of technical solutions, processes and supplier capabilities with regard to their suitability for procurement. It combines technical feasibility, economic viability and strategic fit with the requirements of one's own production. For buyers, it is a central instrument for preparing investment and procurement decisions on a sound basis and avoiding misinvestment.

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Key facts at a glance

01 Technology assessment examines technical solutions before procurement for feasibility, economic viability and strategic fit.

02 Typical methods include weighted scoring analysis, TCO analysis, pilot runs and quality audits at the supplier's premises.

03 Key criteria are process maturity, integration capability, maintenance effort and spare parts availability.

04 In practice, decision documents are often structured in stages from first assessment to detailed assessment.

05 Assessment results feed directly into blanket order call-offs, contract renewals and alternative sourcing decisions.

06 Poor data quality in the assessment is one of the most common causes of subsequent cost overruns.

Definition: Technology Assessment in Procurement

Technology assessment in procurement is the structured analysis and evaluation of technical products, manufacturing processes or supplier capabilities prior to a procurement or investment decision.

Distinction from pure price evaluation

Unlike a classic price review, technology assessment considers the entire life cycle of a solution. It covers acquisition costs, commissioning, maintenance, consumables, downtime risks and disposal. In doing so, it shifts the focus from the purchase price to the total cost of ownership. In practice, the purchase price of technical goods typically accounts for only part of the total costs.

Position within the procurement process

Technology assessment sits between demand determination and bid comparison. It provides the technical basis for a process consistent with the requisition cycle time and draws on reference data, specifications and test instructions. Without a robust technical assessment, there is a risk of follow-up costs, amendments and protracted contract adjustments after the order is placed.

Methods and approach of technology assessment

In practice, a multi-stage approach has established itself that scales the effort to the significance of the decision. Low-volume procurements undergo an abbreviated review, while strategic investments receive a full assessment with several committee loops.

First assessment and requirements catalogue

At the outset, an interdisciplinary team from procurement, engineering and production defines the requirements: quantities, tolerances, interfaces, standards such as REACH for substance restrictions, and integration requirements for production control. A first assessment filters the options available on the market and typically reduces the pool of bids to three to five candidates.

- Quantify requirements
- Market screening using reference data
- Condense longlist into shortlist

Weighted scoring analysis and TCO comparison

The weighted scoring analysis assigns weights to technical criteria such as precision, throughput, degree of automation and service concept. In addition, life cycle costs are made comparable through a TCO analysis. Logistics aspects also come into play here: in international procurement, air freight cost components or demurrage charges in the event of delays can significantly impair profitability. A discount structure review completes the cost analysis.

Pilot run and quality audits

Before series release, pilot runs prove the technology under real production conditions. At the supplier, quality audits provide insight into process control, test instructions and the control of nonconforming product. Only once these stages have been successfully completed is approval granted for blanket order call-off or blanket release order.

Key KPIs for the assessment

Technology assessment needs measurable variables to make options objectively comparable. The following metrics have proven themselves in practice and should be defined before the decision is made.

Delivery and quality metrics

On-Time Delivery (OTD) and On-Time In Full (OTIF) show how reliably a technology supplier delivers. Continuity of supply describes whether critical components are available in the required quantity and time. In addition, scrap rates and first-pass yield in the pilot run provide indications of process maturity.

Economic metrics

Payback period, TCO per unit and cash-to-cash cycle provide information on the financial impact. Especially with capital-intensive technologies, the cash-to-cash cycle lengthens, which affects liquidity planning. The requisition cycle time indirectly measures the efficiency of the assessment process itself.

Risks and controls

Technology assessments harbour typical sources of error: overly optimistic specifications, incomplete data or loose promises from suppliers. Control mechanisms significantly minimise these risks.

Single-source risk and alternative sourcing

Committing early to a technology or supplier creates dependencies. Single-source management therefore requires alternative sourcing scenarios and exit strategies from the outset. At contract renewal, it should be examined whether a switch to a second source remains economically viable.

Data quality and documentation

Poor data quality distorts assessments: outdated reference data, incomplete specifications or duplicates in item data lead to incorrect comparisons. Systematic duplicate detection in the item master and well-maintained test instructions create the foundation for sound decisions. For services instead of products, the service contract must be described with technical precision.

Buffer stock and failure scenarios

Assessments should include failure scenarios: How long can buffer stock bridge a supply failure? Which spare parts must be kept in stock? Verifying continuity of supply in the event of disruption is part of a complete technology assessment.

Current developments

Technology assessment is being transformed by digitalisation, sustainability requirements and volatile supply chains. Buyers must continuously adapt their assessment processes.

Data-driven assessment

Digital tools support the assessment through structured supplier data, automated bid comparisons and data quality checks. Reference data from ongoing supply relationships, such as historical OTIF values, is increasingly fed automatically into new assessments.

Sustainability and regulation

Substance-related requirements such as REACH and sustainability criteria are moving to the fore in assessment matrices. Buyers must verify compliance during the technology assessment itself, not only at introduction. Legal questions regarding warranty and liability should always be examined on a case-by-case basis.

Crisis-resilient supply chains

Supply chain disruptions have raised the importance of resilience criteria. Multi-source capability, transport routes and alternative sourcing now carry greater weight in modern assessment criteria than they did just a few years ago.

Typical metrics

Metric	Typical value
On-Time In Full (OTIF)	> 95 % *usual benchmark for reliable technology suppliers*
TCO savings	10–20 % *typical order of magnitude achieved through sound assessment compared with price-only selection*
Requisition Cycle Time	4–8 weeks *usual lead time for structured technology assessments*
First-pass yield in the pilot run	< 5 % *benchmark for the process maturity of a new technology*

Practical example

A medium-sized mechanical engineering company planned to convert a production cell to a new joining process. Procurement moderated an eight-week technology assessment with three suppliers, supported by engineering and quality assurance.

- Weighted scoring analysis with weighted criteria for precision, throughput and service concept
- TCO comparison including consumables and maintenance over five years
- Pilot run with 500 parts followed by a quality audit at the shortlisted supplier

- Agreement of a second source to mitigate the single-source risk

Conclusion

Technology assessment in procurement is more than a technical review: it combines feasibility, economic viability and supply reliability into a sound basis for decision-making. Those who build it systematically with pilot runs, quality audits and TCO analyses reduce misinvestment and supply dependencies. The prerequisite is high data quality in master data and reference data. Assessment results should feed into framework agreements, call-off planning and subsequent contract rounds. In this way, technology assessment becomes a permanent instrument of strategic procurement capability.

Frequently asked questions

? What is technology assessment in procurement?

Technology assessment in procurement is the systematic examination of technical products, processes or supplier capabilities prior to purchase. It evaluates feasibility, life cycle costs and strategic fit. The aim is a well-founded, traceable procurement decision.

? Which methods are part of technology assessment?

Typical methods include weighted scoring analysis, TCO analysis, pilot runs and quality audits at the supplier's premises. In addition, market screening is carried out using reference data, and failure analyses are conducted to verify continuity of supply. The effort involved is usually scaled in stages according to the significance of the decision.

? Which criteria are examined in a technology assessment?

The assessment covers technical performance, integration capability, maintenance effort, spare parts availability, regulatory requirements such as REACH, and the supplier's delivery reliability. Economically, acquisition and life cycle costs are included. Strategically, dependency risks and alternative sourcing options are key factors.

? How does a technology assessment proceed step by step?

First, requirements are defined and a requirements catalogue is created. This is followed by a first assessment for market screening, then a weighted scoring analysis and TCO comparison of the shortlist. Finally, pilot runs and quality audits validate the decision before approval.

? What distinguishes technology assessment from supplier evaluation?

Technology assessment examines the solution or process itself, while supplier evaluation examines the supplier's performance over time. The two complement each other: good technology with a weak supplier carries risks. In practice, both assessment steps are interlinked.

? Why is technology assessment in procurement important?

It prevents misinvestment, reduces risk of follow-up costs and downtime, and creates transparency

about dependencies on suppliers. It also shortens later change loops because requirements are clarified early. As a result, it measurably lowers the total cost of ownership.

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