Requirements Determination: The Foundation of Efficient Procurement

Requirements determination is the systematic process by which a company establishes which materials, services or deliverables are needed in what quantity, quality and at what point in time. It forms the starting point of every procurement decision and has a decisive influence on inventory costs, delivery capability and liquidity. In practice, the quality of requirements determination determines whether procurement volumes can be bundled, suppliers can be planned reliably and shortages can be avoided.

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Key facts at a glance

01 Requirements determination covers the type, quantity, timing and quality of a company's entire procurement demand.

02 A fundamental distinction is made between deterministic, heuristic and stochastic requirements determination.

03 It is a prerequisite for economic order quantities, framework volumes and functional sourcing.

04 Errors in requirements determination directly affect capital tied up, shortage costs and availability.

05 Digital systems such as ERP, MRP and demand planning tools are increasingly automating requirements determination.

Definition: Requirements Determination

Requirements determination (German: Bedarfsermittlung) refers to the structured determination of future demand for goods and services that a company needs to maintain its business operations and fulfil orders. It answers the core questions: what is needed, in what quantity, when, in what quality and with what budget. As the first step in the procurement logic, it feeds ordering policy, planning and

procurement strategy with reliable data.

Primary, Secondary and Tertiary Requirements

The primary requirement covers the products the company sells to customers, typically derived from the production programme and customer orders. From this results the secondary requirement for components, raw materials and semi-finished goods, which is often calculated using bills of materials and BOM explosion. The tertiary requirement covers auxiliary and operating supplies, tools, spare parts and consumables, whose link to production is only weakly coupled and which is therefore usually planned on a consumption basis.

Gross Requirement and Net Requirement

The gross requirement describes the total quantity that is theoretically required. The net requirement results by deducting existing stock, open purchase orders and blocked stock from the gross requirement. This distinction is relevant in practice because it prevents available stock from being procured twice and thus avoids unnecessary capital being tied up.

Individual Demand versus Aggregate Demand

Individual demand arises from a specific order, project or manufacturing order and is directly allocated to a specific purpose. Aggregate demand consolidates recurring requirements from several departments and enables volume bundling, discount negotiations and framework agreements. In practice, a mixed form is often used, in which project-related requirements run within aggregate planning, provided the scheduling logic allows this.

Methods of Requirements Determination

The choice of method depends on the type of demand, its plannability and data availability. Production-related requirements can be derived deterministically, while consumption-based requirements require forecasting methods or heuristic approaches. In many companies, several methods run in parallel.

Deterministic Requirements Determination

With deterministic determination, demand is derived from higher-level specifications: customer orders, production plans or bills of materials form the starting basis. Material requirements planning (MRP) explodes the primary requirement into secondary requirement via bills of materials and offsets it with lead times. This method delivers very precise results in stable order situations, but depends entirely on the currency of master data and bills of materials.

Consumption-Based and Stochastic Methods

Without a secured order situation, historical consumption figures are used. Statistical methods such as moving average, exponential smoothing or seasonal analysis forecast future demand. In practice, forecast quality is typically reviewed regularly and methods readjusted when deviations are high, as

model errors would otherwise compound over several planning periods.

- Moving average for stable base consumption
- Exponential smoothing for slight trends
- Seasonal models for temperature- or season-dependent items

Heuristic Methods and Estimation Techniques

For spare parts, capital goods or one-off project requirements, reliable histories are lacking. Here heuristic methods apply: expert interviews, analogies from comparable projects or the GFM method for new products. In addition, structured market observation provides indications of which materials will become scarcer or more readily available in future, allowing demand to be secured proactively or alternatives to be qualified.

Process and Interfaces of Requirements Determination

Requirements determination is not an isolated planning step but a process with clearly defined interfaces to sales, production, engineering and procurement. How the process is designed determines whether demand notifications reach procurement reliably and in good time.

Notification Channels and Approval Levels

Requirements are captured via demand notifications, travel expense claims, purchase requisitions or direct system planning. Approval levels based on order values are frequently configured, ensuring that budget owners confirm the requirement. Clear thresholds and a defined escalation route prevent unconfirmed requirements from disappearing into waiting loops and later emerging as rush orders with surcharges.

Reconciliation with Production and Sales

Regular reconciliation between the sales forecast, production programme and material planning is essential. In practice, a fixed scheduling cycle has proven effective, in which changes in demand are jointly assessed and prioritised. This identifies phantom requirements resulting from outdated bills of materials or orders that were never cancelled.

From Requirement to Procurement Decision

Once the net requirement is established, the make-or-buy decision follows, weighing internal production depth against external sourcing. Requirements are then bundled, transferred into the tender management process or called off via existing framework agreements and scheduling agreements. A clean handover with unambiguous specifications prevents queries and subsequent claims.

Key KPIs for Evaluating Requirements Determination

The quality of requirements determination can be measured using a few, meaningful KPIs. What is crucial is that these KPIs are evaluated regularly and fed back to the departments responsible.

Forecast and Inventory Quality

Forecast accuracy measures the deviation between determined and actual demand, typically as MAPE or mean absolute deviation. Inventory coverage and inventory turnover show whether the determined requirements have led to realistic procurement quantities. In practice, turnover targets range between four and twelve turns per year depending on the industry and item.

Service Level and Rush Orders

The service level shows what percentage of requirements could be covered on time from stock or purchase orders; guideline values of over 95 to 98 per cent are frequently targeted. The number of rush orders is an early indicator of planning errors, as every expedited procurement deviating from the ordering policy incurs additional premiums and freight costs. A rising rush order rate often indicates systematic errors in the derivation of demand.

Cost Impact and Loss Events

Shortage costs, downtime and scrap from outdated stock quantify the financial consequences of poor demand planning. Obsolete items procured without real consumption should also be recorded. In addition, process costing can reveal how much effort is tied up in demand notification, approval and correction loops, thus providing starting points for process automation.

Risks and Controls in Requirements Determination

Typical sources of error are outdated master data, uncoordinated forecasting methods, politically inflated safety surcharges and unclear responsibilities. Countermeasures can be achieved through organisational rules, data quality measures and ongoing monitoring.

Data Quality and Responsibilities

Requirements determination stands or falls with the quality of material master data, bills of materials and consumption histories. A clearly defined procurement data model with defined fields and continuous supplier master data maintenance ensure that planning systems work with reliable foundations. The data owner role should be assigned by name for each data object so that anomalies are corrected promptly.

Safety Stock and Inflation of Requirements

In practice, business departments tend to inflate requirements to hedge against supply risks. Such hidden buffer stock distorts real demand and ties up capital, much like an uncontrolled buffer warehouse. This can be countered with transparent safety stock rules, regular requirements reviews

and a culture in which excessive notifications are critically questioned.

Risk Consideration for Critical Requirements

For single-sourcing items or materials with long lead times, pure quantity determination is not sufficient. A risk register or risk heatmap for critical procurement items helps to link requirements early with hedging strategies such as dual sourcing, safety stock or long-term contracts. Compliance requirements, such as FSC/PEFC certification for wood products, must also be considered at the requirements definition stage so that qualified suppliers are not lacking later.

Current Developments and Digitalisation of Requirements Determination

Requirements determination is increasingly automated and refined by digital systems and new data sources. At the same time, expectations are rising that requirements will be assessed not only quantitatively but also economically and on a risk basis.

Automation and AI-Supported Forecasts

Modern ERP and planning systems generate planning proposals automatically and carry out requirements determination largely without manual intervention. Machine learning methods complement classical statistical models by incorporating influencing factors such as order patterns, supplier fluctuations or product phase-outs. In practice, human validation of critical items remains common, particularly for A-items and long-running components.

Life Cycle Perspective and Total Cost Orientation

Increasingly, demand is considered not only in terms of quantity but across the entire life cycle. Life cycle costing for capital goods and long-lived components shows that the purchase price is only part of the total cost. This perspective changes requirements determination: what is required is not the lowest purchase quantity but the economically optimal configuration over lifetime and maintenance.

Demand-Oriented Sourcing and Supplier Development

For strategic requirements, early supplier involvement is gaining in importance: instead of handing over fully specified requirements, technical alternatives are developed jointly, often initiated through a structured proof-of-concept procurement before series qualification. A maintained sourcing pipeline ensures that suitable suppliers are in development for every relevant requirement and that supply remains secured even in the event of demand surges.

Typical metrics

Metric	Typical value

Forecast accuracy	> 85% *typical guideline as 1 minus MAPE; A-items should be higher*
Service level	> 95% *common target level; 98% and above for critical items*
Rush order rate	< 5% *proportion of orders outside the regular ordering policy*
Inventory turnover	4–12 per year *industry-dependent; C-items are typically lower*
Proportion of obsolete stock	< 5% *proportion of inventory value with no planned consumption*

Practical Example

A medium-sized mechanical engineering company with around 400 employees discovered during a stocktake that more than 30 per cent of its inventory consisted of items with no relevant consumption movement. At the same time, rush orders for standard components were accumulating; their requirements were maintained in decentralised Excel lists in individual foreman areas. The company introduced a uniform requirements determination process and linked it to centralised material planning.

- Switching all C-items to statistical replenishment with automatic demand preview in the ERP system
- Introduction of monthly requirements reviews between sales, engineering and procurement to validate project dependencies
- Definition of clear approval thresholds and abolition of informal ordering channels in favour of the documented ordering policy
- Establishment of a risk register for critical long-lead items with defined safety strategies

Conclusion

Requirements determination is the foundation on which every further procurement decision is built. Those who determine requirements systematically and on the basis of data reduce capital tied up, avoid shortages and give procurement negotiating strength through bundled volumes. The choice of the right method results from the type of demand, not from a one-size-fits-all approach. Continuous KPI evaluation and clear responsibilities for data quality are just as important as the software used. Companies that professionalise their requirements determination benefit from more stable processes and sustainably lower total costs along the entire procurement chain.

Frequently asked questions

? What is meant by requirements determination?

Requirements determination is the systematic process of establishing which goods and services a company needs, in what quantity, quality and at what point in time. It encompasses the differentiation into primary, secondary and tertiary requirements as well as the derivation of net requirements from gross requirements and available stock. It is the starting point of every procurement decision.

? What methods of requirements determination are there?

A basic distinction is made between deterministic, heuristic and stochastic methods. Deterministic methods derive demand from customer orders and bills of materials, while stochastic methods use statistical forecasts based on historical consumption figures. Heuristic approaches such as expert interviews are used when no reliable data is available, for example with new items or spare parts.

? What is the difference between gross requirement and net requirement?

Gross requirement refers to the total quantity of an item that is theoretically required for production or operations. The net requirement results when existing stock, open purchase orders and quantities already reserved are deducted from the gross requirement. Only the net requirement triggers concrete procurement activities and prevents duplicate purchases.

? Why is requirements determination important for procurement?

Procurement can only bundle volumes, plan reliably with suppliers and negotiate favourable terms if requirements are known early and in reliable quality. Inaccurate requirements determination leads to rush orders, high stock levels or shortages resulting in production downtime. It therefore directly influences procurement costs, delivery capability and liquidity.

? Which KPIs measure the quality of requirements determination?

Key metrics are forecast accuracy, the service level, inventory turnover and the number of rush orders. In addition, shortage costs and the proportion of obsolete stock provide indications of planning errors. These figures should be evaluated regularly and fed back to the departments responsible.

? What role does the ERP system play in requirements determination?

ERP systems automate requirements determination through material requirements planning by exploding customer orders and production plans into material requirements via bills of materials. In doing so, they take account of stock levels, lead times and planning rules. However, the meaningfulness of the results depends largely on the quality of master data, bills of materials and consumption histories.

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