# Data Quality: The Foundation of Reliable Procurement Processes

Data quality describes the degree to which master data and process data in procurement are complete, correct, up-to-date, consistent and unambiguous. For technical buyers and suppliers, data quality determines whether ordering processes, supplier analyses and price analyses deliver reliable results or cause stagnation and rework. Poor data quality is one of the most common causes of inefficient procurement processes in manufacturing companies. It can be systematically measured, assessed and permanently improved through clearly defined processes.

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### Key facts at a glance

01 Data quality typically comprises the dimensions of completeness, correctness, currency, consistency and unambiguity.

02 Incorrect item or supplier master data leads directly to incorrect orders, returns and increased processing effort.

03 In practice, the share of incomplete or duplicate master data in unmaintained systems is frequently in the double-digit percentage range.

04 Data quality is an ongoing task: without a clear master data process and data monitoring, the data stock deteriorates continuously.

05 High data quality is a prerequisite for automation, AI applications and reliable KPIs in procurement.

06 The benefits show in shorter lead times, fewer incorrect postings and reliable decision-making foundations.

## Definition: Data Quality

Data quality describes the extent to which data is fit for its intended purpose. In procurement, this primarily concerns item master data, supplier master data, prices, terms and transaction data from ordering and settlement processes.

### The Classic Quality Dimensions

Usually five to six dimensions are distinguished: completeness (all mandatory fields populated), correctness (data matches reality), currency (data is up to date), consistency (data is consistent across systems) and unambiguity (each record exists only once). For example, an item can be complete yet still incorrectly maintained if the unit

- Completeness: mandatory fields such as unit, plant and material group are populated
- Correctness: details match manufacturer specifications and test reports
- Currency: prices and delivery times are checked regularly
- Unambiguity: every item and supplier exists only once in the system

### Distinction from Data Clean-up and Data Monitoring

Data clean-up refers to the subsequent correction of faulty stocks, for example through duplicate detection or populating missing fields. Data monitoring, by contrast, is the ongoing review and approval of new data. Together, both secure data quality: clean-up remediates existing stocks, monitoring prevents new errors from occurring.

### Importance for Technical Procurement

In technical procurement, data is particularly complex: material numbers, drawing numbers, works standards, customs tariff numbers and certificates must match each other. A single incorrect material entry can trigger a production batch that later becomes unusable. Data quality is therefore not an IT issue but a core component of process reliability.

## Challenges: Why Data Quality in Procurement Is Often Poor

The causes of poor data quality rarely lie in the technology, but predominantly in processes and responsibilities. Anyone who knows the causes can take targeted countermeasures.

### Missing Responsibilities in the Master Data Process

Without a clearly regulated master data process, employees from sales, planning or production create items or suppliers on their own initiative, often with incomplete information. There is no central role that reviews entries, countersigns standards and enforces mandatory fields. In practice, it has proven effective to submit requests via a form or workflow tool in which mandatory information is enforced technically.

- Clear creation request with mandatory fields
- Four-eyes review by a master data role
- Approval levels depending on data type

### Free-Text Orders and Duplicates

When buyers order past the material number and catalogue, duplicates and costly incorrect purchases

arise. Consistent duplicate detection at creation and regular reconciliation of existing stocks prevent the same item from being maintained under five material numbers. This also increases the significance of analyses and lowers the stock value.

### System Breaks and Interfaces

Many companies maintain data in parallel in ERP, PLM and supplier portals. Without coordinated interfaces, inconsistencies arise: one price in the portal, another in the ERP. Consistency checks between systems are therefore part of ongoing data controlling, not one-off projects.

## Methods and Approach for Securing Data Quality

Improving data quality typically follows three steps: analysis, clean-up and preventive monitoring. The sequence matters, because anyone who cleans up without remedying the causes generates the same errors again.

### Data Analysis in Procurement as a Starting Point

The starting point is a systematic data analysis in procurement: how many materials have no unit, no material group or no current price? How many supplier master records are inactive, duplicated or without a bank account verification? Such analyses can be created with standard reports or simple queries and provide a prioritised picture of the error quantities.

- Measure error rates per record type
- Prioritise critical fields (prices, units, certificates)
- Present the results to management as a baseline

### Data Clean-up and Duplicate Detection

During data clean-up, duplicates are merged, incorrect entries corrected and outdated records archived. Duplicate detection should go beyond exact matches and also check similarities in descriptions or manufacturer part numbers. Clean-ups should preferably run in stages: first master data that impedes ongoing processes, then historical data.

- Step-by-step clean-up according to process relevance
- Similarity checks across descriptions and part numbers
- Document the change history

### Prevention Through Data Monitoring and Standards

Lasting data quality is created through prevention: binding naming conventions, enforced mandatory fields, periodic data monitoring and clear approval rules in the master data process. New supplier master data should be checked including identifiers such as the DUNS number, so that credit and risk analyses are based on clean foundations.

## Key KPIs for Measuring Data Quality

Data quality can be made measurable. Typical metrics examine completeness, duplicate share and error development over time. They should be collected regularly, e.g. monthly, and evaluated by area.

### Completeness and Error Rates

The completeness rate indicates what percentage of the relevant records has all mandatory fields correctly populated. In well-managed systems, material master data typically scores above 95 per cent, while unmaintained stocks are significantly lower. In addition, the error rate per field is useful for targeted maintenance.

- Completeness rate per record type
- Error rate per critical field
- Number of open correction orders

### Duplicate and Share Rates

The duplicate rate measures what percentage of material or supplier master records exists in duplicate. In addition, it is often surveyed what percentage of procurement volume is handled via clean, catalogued materials, and what share is spend under management. Both show whether processes and data structure are effective.

### Currency and Process Impact

In the medium term, data quality shows in process metrics: share of automated invoice approvals in the invoice approval workflow, rate of error-free purchase orders, lead time of invoice clearing. If these values rise after a clean-up, this confirms the economic benefit of the effort.

## Risks and Controls Around Data Quality

Poor data quality not only causes friction losses but also compliance and supply risks. Controls must therefore cover the entire life cycle of the data.

### Operational Risks in Day-to-Day Business

Incorrect planning parameters such as safety stock or replenishment lead time lead to excess stock or bottlenecks. A safety capacity can only be agreed sensibly if the underlying consumption and lead time data are correct. An ABC/XYZ classification is likewise only as reliable as the underlying movement data.

### Supplier Risk and Master Data Integrity

Incomplete supplier master data complicates the assessment of supplier risk: missing certificates, outdated addresses or unclear supplier status entries prevent reliable risk analyses. Particularly critical are regulatory evidence such as the long-term supplier declaration (LLE), whose documentation only works with correctly maintained supplier and material assignments.

- Link certificates and evidence to the supplier master
- Keep status and change data up to date
- Use identifiers such as the DUNS number for unambiguous identification

### Controls in the Ordering and Invoicing Process

Automated checks in the ordering process and in the invoice approval workflow act as an early warning system: if invoices frequently go into manual clarification due to price differences or missing order references, this indicates data gaps. Regular evaluations of these clarification cases provide concrete pointers as to which records need to be corrected.

## Current Developments: Automation, AI and Harmonised Data

The importance of data quality increases with the degree of automation. Digital assistance systems and AI applications in procurement are only as good as the data they work on. At the same time, new tools make data maintenance easier.

### AI and Data Analysis in Procurement

Modern tools for data analysis in procurement can automatically normalise descriptions, suggest duplicates and supplement missing classifications. This considerably accelerates clean-up projects but does not replace expert review. Especially for technical items, approval by qualified staff remains indispensable.

- Automatic normalisation of item descriptions
- Suggestion function for classifications
- Human approval remains mandatory

### Linking End-to-End Processes with Suppliers

Data quality becomes even more important when processes are directly interlinked with suppliers, for example in dock-to-stock delivery concepts or consignment stock. Such models require precisely coordinated item and quantity data, as corrections during the material flow are hardly possible. Order process optimisation therefore almost always begins with a clean-up of master data.

### Data Quality as a Building Block of the Procurement Strategy

Strategic instruments such as bottleneck analysis, the assessment of an A-supplier or single-source management presuppose that analyses are reliable. Where data is incomplete, risks are misjudged. Leading procurement organisations therefore treat data quality as a standalone sub-objective of their procurement strategy with a fixed budget and clear responsibility.

## Typical metrics

| Metric | Typical value |
|---|---|
| **Master data completeness rate** | > 95 %<br>*Share of records with fully populated mandatory fields* |
| **Duplicate rate** | < 2 %<br>*Share of duplicate material or supplier records in the total stock* |
| **Price currency rate** | > 90 %<br>*Share of items with a valid, verified price* |
| **Share of automated invoice approvals** | > 60 %<br>*Indirect indicator of clean order and master data* |
| **Error rate per critical field** | < 5 %<br>*Shows which fields need to be specifically maintained* |

## Practical Example

A medium-sized mechanical engineering company with around 15,000 materials discovered during the introduction of a supplier portal that more than 20 per cent of the item master data was incomplete and that more than 2,000 potential duplicates existed. Incorrect orders and manual invoice clarifications cost the procurement department several person-days every week. The company launched a twelve-week data clean-up programme and subsequently established a central master data process with mandatory fields and quarterly data audits.

- Data analysis in procurement to determine error rates as a baseline
- Step-by-step data clean-up with duplicate detection, starting with A-parts
- New master data process with four-eyes review and enforced mandatory fields
- Monthly KPI evaluation of completeness, duplicate rate and clarification cases in the invoice approval workflow

## Conclusion

In technical procurement, data quality is not an end in itself but the prerequisite for fast processes, reliable KPIs and sound supplier decisions. Companies should make data quality measurable, systematically remedy causes and protect against new errors through a clear master data process and ongoing data monitoring. Clean-up projects only unfold their full benefit when they are accompanied by preventive rules. Anyone who keeps master data clean creates the foundation for automation, AI applications and strategic analyses. In practice, the effort usually pays for itself through reduced clarification cases, fewer incorrect orders and shorter lead times.

## Frequently asked questions

### ? What does data quality mean in procurement?

Data quality in procurement describes how complete, correct, up-to-date, consistent and unambiguous item and supplier data as well as transaction data are. High-quality data enables error-free purchase orders, meaningful analyses and automation. Poor data quality leads to incorrect orders, rework and distorted KPIs.

### ? How is data quality measured?

Typical metrics are the completeness rate (share of records with populated mandatory fields), the duplicate rate, the error rate per critical field and the currency of prices and certificates. In addition, process metrics such as the share of automatically approved invoices demonstrate the impact. The metrics should be evaluated regularly and by area.

### ? What are the causes of poor data quality?

Common causes are a missing master data process without clear responsibilities, free-text order creation by various departments, duplicates caused by bypassing the catalogue and system breaks between ERP, PLM and supplier portals. Missing mandatory fields and unclear naming conventions also contribute. The causes must be remedied before any clean-up is carried out.

### ? How can data quality be improved permanently in the ERP system?

Lasting improvement is achieved with a three-step approach: first a data analysis in procurement to set priorities, then a step-by-step data clean-up including duplicate detection, and finally preventive measures such as mandatory fields, naming conventions and regular data monitoring. It is important to have a responsible master data role and ongoing KPI monitoring.

### ? What are the consequences of poor data quality for the supply chain?

Incorrect or incomplete data leads to incorrect orders, wrong planning parameters and supply bottlenecks even though stocks appear to be available. Regulatory evidence such as the long-term supplier declaration (LLE) can only be provided with correct material-supplier assignments. In addition, supplier risks are misjudged when master data is incomplete.

### ? What does a data clean-up in procurement cost?

The effort depends heavily on data volume and error rate. In practice, between a few minutes and one hour is often estimated for the manual review and correction of a complex item record. What matters is weighing the effort against the downstream costs of incorrect orders, clarification cases and distorted analyses, and proceeding in order of priority.

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