Data quality KPIs: metrics for measuring data quality in procurement

Data quality KPIs are measurable indicators that quantify the quality of master data, transaction data and supplier data in the procurement process. They reveal where data gaps, errors or inconsistencies impair procurement and the processes connected to it. For technical buyers and suppliers, they are a central foundation for making decisions based on reliable data and avoiding the downstream costs of poor data quality.

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Key facts at a glance

01 Data quality KPIs quantify characteristics such as the completeness, accuracy, consistency, timeliness and uniqueness of procurement data.

02 In practice, typical target values for completeness or accuracy are frequently above 95 to 98 per cent.

03 Poor data quality causes downstream costs in procurement, materials planning and production, for example through incorrect or duplicate orders.

04 Clear data ownership and defined mandatory fields are prerequisites for reliable KPIs.

05 Data quality KPIs support, among other things, duplicate checks, supplier onboarding and procurement controlling.

06 Measurement should be carried out periodically and automatically so that trends become visible and measures can be proven to be effective.

Definition: data quality KPIs

Data quality KPIs (data quality metrics) are quantitative measures that assess the extent to which data meets the requirements of its intended use. In a procurement context, they concern in particular material master data, supplier master data, order data, price and condition data, as well as quotation and freight data. They translate the abstract goal of 'good data quality' into verifiable, periodically

reportable values.

Distinction from general procurement KPIs

While classic procurement KPIs such as savings, lead times or incoming goods quality measure the results of the procurement process, data quality KPIs look at the quality of the underlying data itself. They are thus comparable to a tool inspection: only once the tool – here, the data situation – functions reliably are the downstream measurements meaningful. A supplier ranking or a cost breakdown lose their value if they are based on incorrect or incomplete master data.

Typical data objects in procurement

The focus is on several data objects whose quality can each be measured using their own KPIs. These include:

- Material master data: material numbers, plant data, purchasing info records, units of measure and the material group hierarchy
- Supplier master data: addresses, bank details, certifications and classifications
- Transaction data: purchase orders, call-off schedules, goods receipts and invoices
- Contract and pricing data: framework agreements from the contract repository, condition records and price master data

Dimensions of data quality as the basis for measurement

Data quality KPIs are derived from recognised quality dimensions. Each dimension can be operationalised through concrete rules and evaluated automatically.

Completeness and accuracy

Completeness measures whether all fields required for the process are filled in, for example GTIN, weight, customs tariff number or buyer group. Accuracy checks whether the content corresponds to reality, for example whether a set of materials is correctly assigned within the material group hierarchy. In practice, target values of above 95 to 98 per cent per field or data record are aimed for; critical mandatory fields should achieve almost 100 per cent.

Consistency, uniqueness and timeliness

Consistency means that the same information matches across different systems and formats, for example supplier addresses in ERP, the portal and contract documentation. Uniqueness is ensured through duplicate checking: multiple entries for the same supplier or item distort analyses and lead to duplicate orders. Timeliness measures how old data is – for example, since the last verification of a supplier condition or a certificate. Outdated data has a direct impact on order proposals, incoming forecasts and materials planning.

Availability and regulatory compliance

Availability describes whether data can be retrieved where it is needed, for example at purchase order approval or in the supplier meeting. Regulatory compliance checks adherence to defined standards: naming conventions, validation lengths, coding systems and compliance requirements. A supplier ESG improvement plan or a long-term supplier declaration (LMD) is only usable if the supporting evidence is filed completely and with version control.

Key data quality KPIs in procurement

Which KPIs are relevant in detail depends on industry, system landscape and maturity. A lean set of KPIs that concentrates on a few high-impact metrics and is evaluated periodically – usually monthly or quarterly – has proven its worth.

Metrics for master data quality

The completeness rate counts the proportion of data records that correctly show all mandatory fields. The duplicate rate indicates what percentage of supplier or material records have been identified as duplicates – good systems frequently achieve less than two per cent in practice. The error rate per field or per data entry clerk helps identify systematic causes such as unclear input rules. The update rate measures how regularly data records are verified, for example during supplier onboarding or annual maintenance.

Metrics for transaction and pricing data

For order data, the KPI rate for error-free purchase orders is central: it measures how many purchase orders go through without manual correction – from order approval through to invoice clearance. The deviation rate between order and invoice data (three-way match rate) uncovers price or quantity errors. For forecast and call-off data, the forecast error and the rate of complete call-off schedules can be used as indicators of data quality: implausible or subsequently amended call-off schedules worsen planning accuracy and increase the backorder rate.

Metrics for supplier and freight data

Data quality is also measurable in supplier management: the completeness of master and compliance data during supplier onboarding, the rate of validated certificates, or the consistency of carrier and freight data. Carrier performance and load carrier management presuppose that shipping and package data are recorded correctly; missing load carrier numbers or incorrect address data lead to returns and complaints. The rate of machine-readable quotation data from tenders – for example in a best and final offer (BAFO) – shows how well structured the quoting side already is.

Methods and approach for introducing data quality KPIs

Data quality KPIs do not come about through the purchase of a tool alone, but through a structured approach: define data profiles, establish quality rules, measure, evaluate and improve.

Step 1: identify critical data elements

At the outset, it is determined which data objects have the greatest influence on procurement and production processes. Prioritisation by criticality and frequency of use has proven effective: master data for A-parts and strategic suppliers – assessed, for example, according to the Kraljic matrix – comes before rarely used fields. Data that is relevant for interfaces should also be included, for example in subcontracting or in the exchange of call-off schedules.

Step 2: define quality rules and thresholds

Rules are defined for each data element: mandatory field status, permitted value ranges, format specifications and reference checks. From these, measurable KPI formulas are derived, for example 'proportion of suppliers with a complete master record (all mandatory fields filled in)'. Each KPI needs a clearly defined data owner who is responsible for data quality in the respective area and addresses deviations.

Step 3: measure, report, improve

Measurement should be automated and periodic, ideally via dashboard reports in procurement controlling. Deriving measures is essential: target value not met, root cause analysis, correction, renewed measurement. A rhythm in which data quality KPIs are regularly reviewed alongside other procurement metrics – such as incoming goods quality or the backorder rate – has proven effective in making interactions visible.

Risks and controls around data quality KPIs

KPIs for data quality are valuable but not risk-free. Misinterpreted or implemented superficially, they create additional work without improving the data situation.

Typical sources of error

Common mistakes are: too many KPIs at once, which loses sight of the overview; lack of connection to real process consequences, so that values are reported but not followed up; unclear responsibilities without defined data owners; and gaming of thresholds, which beautify reported figures instead of improving processes. Mere measurement without duplicate checking or verification of supplier master data also leads to illusory improvements.

Controls and governance

Effective controls are: clear target values per KPI with an escalation path if they are missed; spot checks in the form of manual validation by those responsible for data quality; and linking KPI results to operational consequences, for example approval stops in the event of critical data errors, or the supplier capacity check only being carried out once the master record is complete. A supplier meeting can be used to jointly close data gaps on the supplier side, such as missing certificates or incomplete capacity planning data.

Dependence on interfaces and systems

Data quality KPIs are only as good as the system landscape from which the data originates. Consistency checks across several systems – ERP, supplier portal, contract repository – require clear interfaces and uniform keys. In particular when processing freight and customs data, such as the commercial invoice, or when integrating external freight data for carrier performance, the data flows and their validation rules should be documented.

Current developments in data quality KPIs

The importance of data quality in procurement is growing, driven by automation, AI applications and regulatory requirements. Data quality KPIs are thus evolving from a quality check into a steering instrument.

Automation and AI-supported checking

Many checks can today be automated: format validation, comparison with external reference data, duplicate checking using fuzzy matching or plausibility checks on prices and quantities. AI methods additionally help to identify anomalies in data patterns – for example atypical price deviations in a cost breakdown or inconsistencies at purchase order approval. The prerequisite remains that the underlying rules are defined from a functional perspective.

Regulatory and sustainability-related requirements

Reporting obligations relating to supply chains and sustainability increase the data requirement: certificates, ESG data, proof of origin and declarations must be complete, up to date and auditable. Here, data quality KPIs complement classic compliance metrics, such as the completeness of supplier sustainability data or the rate of completed supplier ESG improvement plans. Legal aspects – such as the currency of terms and conditions or the consistency of contract data – can also be mapped as data quality metrics.

Data quality as an enabler for supply chain collaboration

The more directly suppliers and customers exchange data – via call-off schedules, call-off systems or joint planning platforms – the more important uniform data quality becomes on both sides. Terms such as capacity planning, load carrier management or the sharing of forecast and call-off data presuppose that both sides speak the same data language. Data quality KPIs provide a common, neutral measure for collaboration in the supplier meeting.

Typical metrics

Metric	Typical value

Completeness rate of mandatory fields	> 98% *Benchmark for critical master data fields such as material number, unit of measure or supplier number*
Duplicate rate	< 2% *Proportion of identified duplicates in supplier or material master data*
Error-free purchase order transactions	> 95% *Proportion of purchase orders requiring no manual correction up to invoice clearance*
Order/invoice deviation rate	< 3% *Proportion of invoices with price or quantity deviation in the three-way match*
Update rate of supplier master data	> 90% p.a. *Proportion of supplier master records verified within the last year*

Practical example

A medium-sized mechanical engineering company with around 3,000 active suppliers and 120,000 material master records found that purchase orders frequently had to be corrected retrospectively and that analyses in procurement controlling were unreliable. An analysis revealed duplicates in the supplier master, incomplete material group hierarchies and outdated price master data. Procurement subsequently introduced a lean set of data quality KPIs with clear target values and defined data owners.

- Introduction of a monthly duplicate check for supplier and material master data with a target value below two per cent
- Definition of mandatory field catalogues and data owners for material, supplier and pricing data
- KPI dashboard in procurement controlling covering completeness, error rate and update rate
- Linking KPI results to supplier onboarding and the supplier capacity check

Conclusion

Data quality KPIs reveal how reliable the procurement data foundation actually is. They translate abstract quality dimensions into verifiable values and create the foundation for dependable analyses, well-founded supplier decisions and smooth processes. What matters is a lean set of KPIs, clear data ownership and a periodic improvement cycle. Those who make data quality measurable reduce downstream costs and increase the meaningfulness of all downstream procurement metrics. For technical procurement and the supplier industry, this is not an option but a fundamental prerequisite for professional steering.

Frequently asked questions

? What are data quality KPIs?

Data quality KPIs are measurable indicators that assess the quality of data in the procurement process – for example completeness, accuracy, consistency, uniqueness and timeliness. They reveal where master data, transaction data or supplier data contain errors or gaps. In a procurement context, they frequently concern material master data, supplier master data, and order and pricing data.

? Which data quality KPIs are particularly relevant in procurement?

Key indicators include the completeness rate of mandatory fields, the duplicate rate, the error rate per field or per data entry clerk, and the update rate of master data. Also relevant are the deviation rate between order and invoice data and the rate of error-free purchase order transactions. For call-off and forecast data, the forecast error can also be used as an indicator of data quality.

? How are data quality KPIs measured?

First, critical data elements are identified and quality rules defined – for example mandatory field catalogues, format specifications and reference checks. The rules are then applied automatically to the data stock and the results evaluated in periodic reports. Each KPI should have a defined data owner and a target value so that deviations can be tracked.

? What target values apply to data quality KPIs?

Typical benchmarks in practice are above 95 to 98 per cent for completeness and accuracy; critical mandatory fields should achieve almost 100 per cent. The duplicate rate is frequently below two per cent in well-maintained systems. The specific target values depend on the data object, process criticality and the maturity of the company.

? What does poor data quality cost procurement?

Poor data quality causes downstream costs through incorrect and duplicate orders, manual corrections, complaints and delayed approvals. It also distorts analyses in procurement controlling and in supplier evaluation. Adjacent processes such as materials planning, incoming goods quality and call-off schedules, which rely on accurate master data, are also affected.

? Who is responsible for data quality in procurement?

In practice, responsibility is assigned through defined data owners – usually at the level of data objects such as material, supplier or pricing data. The data owner is responsible for the defined rules, target values and the resolution of deviations. In addition, clear input processes, validation rules and periodic checks are necessary.

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