Master Data Management: The Key to Clean Procurement Processes

Master data management refers to the systematic recording, maintenance and quality assurance of central reference data such as material, supplier and part master data across the entire lifecycle. In industrial procurement, it forms the foundation for requirement reporting, purchase order placement, supplier selection and reporting. Without clean master data, buyers, planners and systems work at cross purposes – with duplicate records, incorrect prices and avoidable misplanning. Structured master data management makes procurement data reliable, comparable and automatable.

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Key facts at a glance

01 Master data are time-stable recurring data (e.g. material number, supplier number, unit of measure, classification) and differ from transactional data such as purchase orders or delivery schedules.

02 Typical core tasks are data capture, deduplication, classification, release workflows and ongoing maintenance.

03 In practice, data quality rates of over 95 per cent per field are a common target in mature organisations.

04 International classification systems such as ECLASS support the uniform description of goods and parts.

05 A data governance model with clearly defined roles (data owner, data steward) is a prerequisite for sustainable data quality.

06 Clean master data are a prerequisite for reliable metrics such as on-time delivery (OTD), spend analyses and the ABC-XYZ analysis.

Definition: master data management

Master data management encompasses all organisations, processes, roles and systems needed to keep central reference data (master data) consistent, up to date and unambiguous across all systems

and departments. It is a cross-functional task spanning IT, procurement, engineering and sales.

Distinguishing master data from transactional data

Master data describe permanently valid objects: materials, parts, suppliers, customers, conditions or work centres. Transactional data, by contrast, arise from processes – for example purchase orders, goods receipts or requirement notifications. The quality of transactional data depends directly on the master data: a purchase order placed with the wrong unit of measure or an outdated supplier status creates follow-on errors all the way into financial accounting.

Types of master data relevant to procurement

For buyers, the focus is above all on material master data (part number, description, classification, dimensions, customs tariff number), supplier master data (number, address, bank details, certificates, notice period, payment and Incoterms arrangements) and source and purchasing info records (source, lead time, price, unit of measure). Drawings and documents such as the initial sample submission (EMPB) are also frequently versioned and assigned via master data management.

Objectives and benefits for technical procurement

Effective master data management aims at unambiguous identification, efficient processes and a sound basis for decision-making. The benefits become apparent in several dimensions – from operational lead times through to strategic spend control.

Avoiding duplicate structures and maverick buying

Duplicate or unclear material master records mean that buyers purchase the same item multiple times or order outside the intended process. Clean master data reduce maverick buying because users find the right item and the right contract via unambiguous search and classification logic. In practice, this often unlocks noticeable bundling leverage, because identical parts can be negotiated jointly across sites.

Robust analyses and strategies

Spend analyses, supplier hierarchies and the ABC-XYZ analysis rely on consistent data. Anyone maintaining suppliers under multiple numbers or classifying categories inconsistently will obtain distorted results and make the wrong sourcing strategy decisions. Uniform master data also enable cross-functional sourcing, because engineering, quality and procurement all work from the same data foundation.

Methods and approach in master data management

Successful master data management follows a structured process: from data capture through release to ongoing maintenance. Central elements are a governance model, defined workflows and uniformly agreed classification standards.

Data governance and role model

A data owner is responsible for the functional definition of a data object, a data steward handles operational maintenance and quality, and requesters submit record creation requests via standardised forms. Organisations often establish a central master data team that reviews, deduplicates and releases requests. Clear escalation paths and service times (typically hours to a few days per record type) prevent master data requests from becoming a bottleneck for requirement reporting.

Classification with standards such as ECLASS

Free-text descriptions lead to search problems and incompatibilities. International standards such as ECLASS offer hierarchical commodity groups with defined characteristics, for example for technical products. In practice, a combination of a classification standard, controlled vocabularies for descriptions (unit, order, abbreviation rules) and search synonyms has proven effective. Harmonisation across ERP systems – for example in international site networks – also benefits from uniform classes and characteristics.

Deduplication and data cleansing

Before every migration or system consolidation comes an inventory: identifying duplicate materials, orphaned records without transaction data and fields with invalid structures. Proven methods include phonetic and rule-based search, matching via manufacturer part numbers and analysing transaction data for prioritisation: active items with high revenue are cleaned up first (usually assessed according to ABC criteria), while archive candidates are blocked or deleted.

Key KPIs in master data management

Data quality can be made measurable. A regular data quality report documents the current state and makes improvements visible. Typical metrics relate to completeness, uniqueness, currency and conformity.

Metrics for completeness and conformity

Commonly measured are the fill rate of central mandatory fields (typically a target of over 95 to 98 per cent per field), the proportion of correctly classified materials, the rate of duplicate records (target usually close to zero) and the response time to master data requests. Currency can be demonstrated via the proportion of records reviewed within a defined review cycle – for example, annual review of active supplier master records.

Performance metrics in procurement

In addition to direct data quality metrics, it is worth considering performance indicators: the share of automated purchase order placement without manual rework, the rate of correct first deliveries after requirement notification, or scrap causes arising from misplanning. Metrics such as on-time delivery (OTD) are only meaningful if supplier and material master data are assigned unambiguously. The same applies to delivery schedule adherence and expediting, which rely on correctly maintained date and

data structures.

Risks and controls in master data management

Poorly maintained master data create operational errors, compliance risks and unnecessary costs. Anyone addressing risks systematically combines technical controls with organisational rules.

Typical risk fields

Incorrect bank details in supplier master data open the door to fraud (for example through targeted manipulation before payment runs). Incomplete certificate and conformity data jeopardise control of nonconforming product and production releases. Outdated notice periods or missing confidentiality notes in contract master data lead to unwanted contract extensions or loss of information. Incorrect units of measure or quantity registers cause excess stock and value-eroding planning decisions.

Controls and the four-eyes principle

Proven controls include the four-eyes principle for sensitive fields (bank details, payment blocks), automatic validation rules in the record creation process (mandatory fields, format validation, duplicate checks), periodic change reports and access and change logs. For supplier master data, regular reconciliation with compliance and risk data is part of good practice – for example on supplier cyber risk or supplier failure risk. Legal requirements, in particular regarding data protection and retention periods, should be reviewed on a case-by-case basis with the relevant legal or compliance department.

Current developments and digitalisation

Master data management is becoming increasingly automated and interconnected. AI-supported duplicate detection, automated classification and real-time interfaces to suppliers are fundamentally changing traditional maintenance work.

Automation and AI support

Machine learning approaches today typically support duplicate detection, the automatic assignment of free-text product descriptions to classification classes and enrichment from manufacturer catalogues. Quality and limitations vary depending on the initial data situation; human release remains standard for critical fields. Automated processes also help maintain currency when enriching with supplier and market data – for example for total cost of ownership (TCO) calculations.

Networking across company boundaries

In the supplier environment, expectations are growing that master data will be synchronised along the supply chain: identical material identification at customer and supplier, structured exchange formats for initial sample submission (EMPB) and uniform classification for data hubs. Topics such as technology radars and carrier performance also require consistent reference data in order to make evaluations comparable across sites and time. The trend is towards central master data platforms that supply ERP,

PLM and e-procurement systems from a single source of truth.

Typical metrics

Metric	Typical value
Mandatory field fill rate	> 95% *typical target value per central field, depending on object type*
Duplicate rate in material master	< 1% *target usually close to zero, checked regularly via data quality report*
Classification rate	> 90% *proportion of materials with valid standard classification, e.g. ECLASS*
Processing time for master data requests	1–3 working days *usual benchmark for standard records; special cases may differ*
Supplier master review cycle	annually *typical review frequency for active supplier master records*

Practical example

A medium-sized mechanical engineering company with several European sites discovered, while preparing a central spend analysis, that the same ball bearing was maintained under more than a dozen material numbers. Prices, descriptions and supplier assignments diverged, meaning bundling potential remained invisible and the ABC-XYZ analysis produced distorted results.

- Introduction of a central master data team with defined service times for record creation requests and a four-eyes principle for critical fields
- Conversion of material descriptions to a controlled vocabulary with classification according to ECLASS
- Clean-up campaign based on ABC criteria: active high-value items first, duplicate records merged and archived
- Monthly data quality report with fill rates, duplicate rates and processing times as a management KPI

Conclusion

Master data management is not purely an IT task, but a core competence of procurement and the supply chain. It determines whether analyses are robust, processes are automatable and negotiations are well founded. In practice, the effort invested in governance, classification and ongoing maintenance often pays for itself through reduced duplicate purchasing, fewer misplanning incidents and better bundling leverage alone. Success comes to those who treat master data as a product with clearly

defined quality characteristics and responsibilities. Companies that get this right create the data foundation for digital procurement, supplier evaluation and strategic steering.

Frequently asked questions

? What is master data management?

Master data management is the systematic recording, maintenance, quality assurance and governance of central reference data such as material, supplier and part master data. The aim is for all departments and systems to work with the same, unambiguous and up-to-date data. It covers processes, roles, tools and controls across the entire data lifecycle.

? Which master data is relevant to procurement?

Central elements are material master data (number, description, classification, unit of measure), supplier master data (address, bank details, certificates, notice period) as well as purchasing info records with source, price and lead time. These are supplemented by contract, condition and document master data. This data foundation drives purchase order placement, requirement reporting and supplier evaluation.

? How is master data quality measured?

Typically via metrics on completeness (mandatory field fill rate), uniqueness (duplicate rate), conformity (compliance with standards and formats) and currency (review cycle). These figures are often summarised in a regular data quality report. In addition, performance indicators such as the share of automated purchase order processes can be used.

? What is the difference between master data and transactional data?

Master data are permanently valid descriptions of objects such as materials or suppliers. Transactional data arise from business processes, for example purchase orders, goods receipts or requirement notifications. Transactional data refer to master data – the quality of the latter therefore directly determines the informative value of all transaction and evaluation data.

? What is ECLASS and what is it used for?

ECLASS is an international standard for the uniform classification and description of products and services, with commodity groups and defined characteristics. In master data management it is used to describe materials in a machine-readable way that is comparable across manufacturers. This improves search, spend analyses and data exchange with suppliers.

? Who should be responsible for master data?

A proven approach is a role model with data owners for functional definition, data stewards for operational maintenance and a central master data team for review and release. In procurement, functional responsibility for supplier and material master data should lie with procurement or engineering, not solely with IT. Clear responsibilities and defined service times are crucial.

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