

Spend Cube: Visibility of Procurement Volume by Supplier, Category and Time

The spend cube is a three-dimensional analysis model that systematically evaluates procurement volume by supplier, category and time period. It forms the data foundation for spend analytics, category strategies and negotiation management in strategic procurement. For industrial buyers, it is the central instrument for turning distributed ERP and accounting data into a reliable basis for decision-making.

Key facts

- The spend cube structures procurement volume along the three dimensions of supplier, category/commodity group and time period.
- The data basis typically consists of order data, invoice data and master data from ERP and accounting systems.
- The main benefits are savings identification, supplier consolidation, budget control and negotiation preparation.
- The greatest practical challenge is often data quality, in particular duplicates, incorrect supplier assignments and missing categorisation.
- In practice, the spend cube is usually updated quarterly or monthly and evaluated using a business intelligence tool.

Definition: Spend Cube

The spend cube is a multidimensional data model for analysing a company's procurement volume (spend). It assigns each spend line item to three dimensions simultaneously: supplier (who?), category/goods (what?) and time (when?). In visualisation this results in a cube whose axes can be rotated and filtered at will.

Distinction from the classic spend report

A conventional spend report usually delivers static lists, such as the top 20 suppliers by revenue. The spend cube goes further by allowing arbitrary slices through the data: for example, it can be determined which category generated which volume with which suppliers in which quarter. This flexibility is a prerequisite for well-founded category strategies and effective bottleneck analysis, in which critical procurement items are identified.

Legal and data protection considerations

Since the spend cube can contain personal data such as requisitioner or buyer assignments, the requirements of the GDPR apply. In practice, it is advisable to anonymise or pseudonymise personal fields as long as they are not required for the analysis. Whether scorecard data or supplier evaluations may be integrated into the cube should also be clarified contractually with suppliers; this also concerns regulations such as the German Supply Chain Due Diligence Act when sustainability data is

incorporated. Legal review is advisable in individual cases.

Structure and data basis of the spend cube

The quality of a spend cube stands and falls with the data basis. The starting point is usually order data, invoice data and master data from the ERP system, supplemented by data from day-to-day business such as emergency purchases, which often arise outside structured processes.

The three dimensions in detail

The supplier dimension ideally uses a cleansed supplier master list in which corporate group relationships are visible via parent company information. The category dimension is based on a commodity grouping, frequently along standardised classification systems, supplemented by company-specific category definitions. The time dimension is typically structured by months or quarters in order to capture seasonality and purchase price escalation rates.

- Supplier dimension: master data, corporate group assignment, region, supplier portfolio membership
- Category dimension: commodity groups, material numbers, classification codes
- Time dimension: month, quarter, financial year, comparison periods

Data quality and duplicate detection

In practice, raw data frequently contains duplicates, inconsistent spellings of supplier names, missing material assignments and empty category fields. Systematic duplicate detection and standardisation of supplier master data is therefore usually the first project step. Typical metrics are the share of categorised spend and the hit rate of supplier assignment. Initial classification rates are often below 70 per cent, which can be raised to well over 90 per cent through cleansing.

Match-and-merge rules and data enrichment

To consolidate and evaluate order and invoice data, match-and-merge rules are applied, as known from invoice processing. Using these rules, line items are merged, duplicates removed and open orders linked with goods receipt and invoice data. In addition, external data sources such as customs tariff numbers or supplier self-disclosure data can be used for enrichment.

Methods and approach for building a spend cube

Building a spend cube follows a multi-stage procedure in practice: data extraction, cleansing, classification, modelling and evaluation. Depending on the systems landscape and data situation, this process typically takes several weeks to months.

Five-step procedure model

First, all relevant data sources are identified and extracted – alongside ERP systems, frequently also card payments, freight costs or data from bill-of-lading-based import settlements. Cleansing follows, including duplicate detection, and then assignment to consistent categories. The fourth stage is modelling as a cube, and the last is establishing regular reporting.

- 1. Inventory and extract data sources
- 2. Cleanse: duplicates, spellings, empty fields
- 3. Categorise: automated assignment plus expert review
- 4. Model: cube structure with supplier, category, time

- 5. Operationalise: roll-out, training, regular updates

Organisational anchoring: category governance

A spend cube only has an impact if its results are embedded in decision-making processes. As part of effective category governance, owners are defined for each category who derive category strategies based on cube data, prepare tendering processes and monitor contract renewal dates. Without this governance, the cube risks becoming a mere reporting artefact.

Integrated budgeting

The spend cube links sensibly with budgeting: actual volumes from the cube can be compared with planned values, enabling variance analyses at category and supplier level. In this way, procurement recognises early on whether price increases, volume changes or substitute purchases – for example via an emergency purchase – are straining the budget.

Key KPIs and analyses in the spend cube

The spend cube provides the raw material for key procurement metrics. The selection of KPIs should be guided by their use: every metric needs a clear purpose and a designated owner.

Classic spend metrics

Standard analyses include spend by category and supplier, supplier concentration (often expressed as the share of the top 10 suppliers of total volume), price developments as purchase price escalation rates and the development of maverick buying, i.e. spend outside agreed processes. In addition, contract coverage rates can be determined: what share of volume is handled under framework agreements.

- Spend per category and supplier (current vs. prior period)
- Supplier concentration: top-10 share of total volume
- Purchase price escalation rate per commodity group
- Contract coverage: contractually covered volume share
- Share of maverick buying and emergency purchases

Analytical extensions

Beyond description, the cube enables supply chain analytics: merging spend data with supplier risk scores, quality metrics or availability data from the available-to-promise (ATP) check. This allows categories to be identified where high volume meets few suppliers and safety stock planning is critical at the same time. The preparation of tendering processes also benefits: supplier shortlists and volume aggregates can be derived directly from the cube.

Risks and controls

The greatest risks with the spend cube lie in insufficient data quality, lack of acceptance and lack of timeliness. Those who do not address these weaknesses make decisions on a faulty basis or lose acceptance of the results.

Typical pitfalls

Common sources of error are inconsistent supplier master data, multiple category logics running in parallel and incomplete recording of additional costs such as freight or packaging. An overly detailed

category scheme can also be problematic: with hundreds of categories, analyses lose their explanatory power, while with too few they remain superficial. In practice, hierarchies with two to three levels have proven effective.

- Inconsistent supplier identification (corporate group vs. individual site)
- Lack of cost transparency for ancillary services
- Outdated data without a defined update cycle
- Low user acceptance due to complex tools

Controls and quality management

Effective controls include defined data quality metrics, sample checks of categorisation and a clearing process for structural changes. Regular reconciliations with financial accounting ensure that spend analyses and income statement positions are consistent. A documented update process with clear ownership prevents the cube from falling asleep after the initial build.

Risks of misuse and misinterpretation

Spend data can be misinterpreted if volume, price and currency effects are mixed. A sound variance analysis separates these drivers before conclusions are drawn. Cubes should also not be used as a surveillance instrument against individual buyers, as this permanently damages acceptance.

Current developments

The spend cube is evolving from a static analysis model into a dynamic, AI-supported data framework within digital procurement platforms. Increasingly, sustainability and risk data are also being incorporated into the analysis.

Automation and AI

Modern approaches automate categorisation using machine learning and detect supplier duplicates almost fully automatically. Language-based analytics enable buyers to ask ad-hoc questions of the spend data without having to build cube queries themselves. This significantly lowers the entry barrier and broadens the user base across the buying centre.

Extension to sustainability and risk

Increasingly, emissions data, supply chain data and information from supplier self-disclosures are linked with spend data, for example to estimate the CO2 footprint per category or to support compliance requirements such as those arising from the German Supply Chain Due Diligence Act from a data perspective. Certification documents such as the Certificate of Conformity can also be evaluated by supplier. Uniform frameworks such as the GRI Standards serve as orientation for sustainability reporting.

Integration into buying centres and marketplaces

In B2B marketplaces and digital procurement platforms, spend data is increasingly flowing directly into operational processes: from demand identification through the tendering process to supplier development and supplier innovation. The cube thus becomes a steering instrument for the entire procurement life cycle rather than just an analysis tool.

Typical metrics

Categorisation rate: > 95 %

Share of spend with a clear category assignment; below 80 % is considered improvable in practice

Supplier assignment rate: > 98 %

Share of cleanly assigned spend line items after duplicate detection

Top-10 supplier share: 40–70 %

Common benchmark for industrial procurement; high values indicate concentration risks

Contract coverage: > 80 %

Share of spend handled under framework agreements

Share of maverick buying: < 5 %

Spend outside agreed processes; lower is better

Practical example

A mid-sized mechanical engineering company with an annual procurement volume of around €60 million introduced a spend cube after an initial analysis revealed that over 30 per cent of spend was not assigned to any category. After six months of cleansing and categorisation, significant consolidation potential emerged: several sites were sourcing identical standard parts from different suppliers at different prices.

- Consolidation of over 40 micro-suppliers into three strategic suppliers per core category
- Preparation of two tendering processes based on cleanly aggregated cube volumes
- Introduction of a quarterly variance analysis against the budget
- Integration of ATP data to identify critical bottleneck items with high spend

Conclusion

The spend cube is the foundation of data-driven procurement work: it makes visible where volume arises, who handles it and how it develops. Its value depends less on technology than on data quality, clear governance and consistent linkage with decision-making processes. Those who take cleansing and categorisation seriously gain a foundation for negotiations, risk management and sustainability reporting alike. In practice, the effort typically pays for itself through identified savings and consolidation potential. What is decisive is to maintain the cube as a living document rather than treat it as a one-off project.

Frequently asked questions

What is a spend cube?

A spend cube is a three-dimensional data model that analyses a company's procurement volume by supplier, category and time period. It allows arbitrary slice-and-dice analyses, such as which category generated which volume with which supplier in which quarter. It thus forms the foundation for spend analytics and category strategies.

What data is needed for a spend cube?

The basis is typically order data, invoice data and supplier and material master data from ERP and accounting systems. In addition, card payments, freight costs and data from emergency purchases are

often incorporated. Clean duplicate detection and consistent categorisation of the raw data are essential.

How does a spend cube differ from a spend report?

A spend report delivers static analyses with a fixed question, such as a top supplier list. The spend cube is a flexible multidimensional model that allows arbitrary filters and slices. This makes it possible to answer complex questions as well, such as price-volume decompositions or category concentration analyses.

How long does it take to build a spend cube?

Depending on data quality and the systems landscape, the initial build typically takes two to six months. Data cleansing and categorisation usually account for the greatest effort. Afterwards, an automated update cycle, e.g. monthly or quarterly, should be established.

Which KPIs are derived from a spend cube?

Typical metrics are spend per category and supplier, supplier concentration, purchase price escalation rate, contract coverage and the share of maverick buying. In addition, quality and availability data can be drawn upon for extended supply chain analytics. Every KPI should have a clear purpose and a designated owner.

Is a spend cube also worthwhile for mid-sized companies?

Yes, mid-sized companies with a fragmented procurement structure in particular often benefit disproportionately, as they gain a consolidated view of their spend for the first time. The effort can be limited through simple BI tools and external classification services. It is important to start with a manageable data scope and expand iteratively.