

Supply Chain Analytics: Data-Driven Steering of the Entire Supply Chain

Supply Chain Analytics refers to the systematic evaluation of data along the entire supply chain in order to steer procurement, production, warehousing and distribution in measurable terms. Buyers and supply chain managers thereby gain transparency over delivery times, stock levels, costs and supplier performance. In practice, it primarily helps to increase the forecast availability of materials and to reduce delivery time variability. The approach combines classic procurement metrics with modern analytical tools and forms the basis for data-driven decisions from the reorder point to supplier development.

Key facts

- Supply Chain Analytics comprises the data-based analysis of procurement, production and logistics processes across all levels of the supply chain.
- Typical analyses are descriptive (what happened?), diagnostic (why?) and predictive (what will happen?) evaluations.
- Frequently used KPIs include on-time delivery, inventory cover, delivery time variability and forecast accuracy.
- Data sources range from ERP and production planning systems to supplier portals and external market and logistics data.
- Its use requires clean master data, clearly defined metrics and close coordination between procurement, logistics and controlling.
- In practice, the potential typically lies in shorter lead times, lower stock levels and more stable supplier relationships.

Definition: Supply Chain Analytics

Supply Chain Analytics is the umbrella term for methods and tools that capture, link and evaluate data from the entire value chain. The aim is to make weaknesses visible, improve planning processes and objectively justify decisions in procurement and logistics. The term is often used in connection with the overarching concept of the supply chain, i.e. supply chain management.

Distinguishing it from classic metric reporting

While classic reporting usually records individual metrics per department retrospectively, Supply Chain Analytics links data across processes. For example, order dates, goods receipts, complaint notifications and payment data are considered in one connected picture. This makes cause chains traceable, such as why a delay at a supplier led to additional costs in assembly.

Analysis levels: descriptive, diagnostic, predictive, prescriptive

Four levels have become established in practice. Descriptive analyses show what has happened; diagnostic analyses explain the causes; predictive models estimate future developments; prescriptive

approaches provide recommendations for action. Many medium-sized companies start with descriptive dashboards and gradually extend them with predictive elements such as sales or demand forecasts.

Data sources and methods in procurement

The quality of the analyses stands or falls with the available data. In the procurement context, they come predominantly from ERP systems, order and contract management, supplier portals and logistics. External sources such as market analysis, customs or traffic data provide additional indications of price and risk developments.

Internal data sources

Core sources are order histories, price deviation workflow data, master data such as parameter maintenance (MRP), framework agreement maintenance, stock levels and goods receipt postings. Commercial processes also provide valuable information, such as the early payment discount process or the payment run as an indicator of payment flows and liquidity effects in the supplier relationship. Anyone who maintains these data consistently can make statements about supplier performance, price development and inventory structure without elaborate special surveys.

External data and market insights

External signals complement the internal picture: raw material price indices, freight rates, market lead times or news about supply shortages. A structured market analysis helps to compare one's own procurement situations with the general market situation. Particularly for long lead times or prototype procurement, procurement strategies can be derived from this at an early stage.

Methodical approach

Proven steps are: define objectives, establish relevant metrics, consolidate data, automate evaluations and embed insights in processes. A regular review cadence is important, for example monthly for operational topics and quarterly for strategic issues such as renegotiation or framework agreements.

Key KPIs and areas of application

Supply Chain Analytics only unfolds its impact when the metrics relate to concrete decisions. Key areas of application are procurement planning, inventory control, logistics optimisation and supplier management.

Procurement and inventory control

In day-to-day operations, analyses serve to optimise the reorder point, safety stocks and replenishment lead time. Delivery time variability per article or supplier shows where parameter maintenance (MRP) is unrealistic and leads to inventory or bottleneck risks. Palletisation and route planning can also be made more efficient using volume and handling data.

Supplier management and early risk detection

Analyses of on-time delivery, quality rates and responsiveness form the basis for supplier classification and credit checks. Anyone who recognises early that a supplier is increasingly delivering late or triggering complaint notifications more frequently can counteract in good time – through dual sourcing, contractual buffers or a streamlined request for proposal (RFP) for alternative suppliers.

Logistics and contract steering

In logistics, the focus is on freight cost per unit, transit times and ramp-up dates for new parts. On the contract side, analyses of volume utilisation, price deviations and the early payment discount process help in evaluating existing framework agreements and preparing renegotiation meetings.

Risks, controls and compliance

With increasing use of data, requirements for data protection, data security and internal controls also rise. In addition, analyses carry the risk that incorrect conclusions will be drawn automatically from data, for example when metrics are interpreted without context.

Data quality and governance

Common weak points are inconsistent article master data, missing units or incomplete delivery data. Sensible measures include clearly defined responsibilities for master data, a change process for parameter maintenance (MRP) and regular coordination between procurement, logistics and finance.

Financial and legal controls

Payment and cost analyses must be integrated into existing control mechanisms, such as the price deviation workflow or arrangements on the early payment discount process. The payment run can also be streamlined with the help of analytics, for example through prioritisation by discount deadlines or liquidity impact. Legal obligations, for example arising from supply chain laws or documentation requirements, should be reviewed on a case-by-case basis.

Technical risks and cloud usage

The use of analytical tools requires clear rules on access rights, data provenance and model validation. In practice, it has proven worthwhile to initially verify critical metrics using a second method or sampling before they automatically intervene in replenishment or approval processes.

Current developments: AI, resilience and sustainability

Supply Chain Analytics is evolving from pure reporting towards forward-looking, partly automated steering. At the same time, resilience, more regional procurement and sustainability evidence are moving more strongly into focus.

Predictive models and machine learning

Modern approaches forecast delivery times, price developments and demand on the basis of historical data and external signals. In practice, the greatest successes are seen where predictive models are coupled with clear consequences for action – for example automatic alerts when a reorder point falls below a threshold or delivery time variability exceeds a defined level.

Resilience, reshoring and flexible procurement

The shocks of recent years have increased the importance of transparency across tier 2 and tier 3 levels. Strategies such as reshoring or the strategic establishment of dual sources can be objectively evaluated with analyses of supplier dependency, lead times and costs. Data also provides a better negotiating basis for framework agreements with volume flexibility.

Sustainability and emissions data

Growing importance is attached to the evaluation of emissions and circularity data, for example the Product Carbon Footprint (PCF) of individual materials or the recycling rate of the substances used. Supply Chain Analytics here links sustainability reporting with operational procurement decisions, for example when selecting material alternatives or logistics options.

Typical metrics

On-time delivery (OTIF): > 95%

Common benchmark for reliable suppliers in series procurement.

Delivery time variability: < ±15%

Low variability enables smaller safety stocks and stable MRP parameters.

Inventory cover: 30–90 days per class

Target values depend heavily on the article and procurement strategy.

Forecast accuracy: > 80%

Typical target value for demand forecasts at item/family level.

Price deviation rate: < 5%

Shows how strongly purchase prices deviate from the reference or framework agreement price.

Practical example

A medium-sized mechanical engineering company with around 4,000 active articles and more than 200 suppliers experienced repeated assembly stoppages due to late component deliveries. Through a structured Supply Chain Analytics project, order, goods receipt and quality data were centrally consolidated and evaluated monthly.

- Establishment of a supplier dashboard showing on-time delivery, complaint notifications and delivery lead time per supplier.
- Revision of parameter maintenance (MRP) for articles with high delivery time variability, including adjustment of reorder points and safety time.
- Linking price deviation workflow data with order history to prepare renegotiations with three volume suppliers.
- Introduction of a monthly risk overview that makes dependencies on sole suppliers and critical raw materials visible.

Conclusion

Supply Chain Analytics turns distributed data into a reliable basis for decision-making for procurement, logistics and management. The benefit arises not from technology alone, but from clearly defined metrics, cleanly maintained master data and firm anchoring in processes. Companies that consistently work with metrics such as on-time delivery, inventory cover and delivery time variability respond faster to disruptions and negotiate on a better data basis. At the same time, requirements for data quality, compliance and sustainability-related evidence are rising. For technical buyers, building solid analytics capabilities is therefore not an optional side project, but an essential component of a robust procurement strategy.

Frequently asked questions

What does Supply Chain Analytics mean?

Supply Chain Analytics refers to the systematic analysis of data along the entire supply chain – from procurement through production to delivery. The aim is to make processes measurable, identify the root causes of problems and make data-driven decisions. Typical applications include on-time delivery analyses, inventory assessments and early detection of supplier risks.

What data do you need for Supply Chain Analytics?

The foundation is primarily internal data from ERP and production planning systems: order histories, goods receipts, stock levels, delivery times and quality data. These are supplemented by external sources such as market or price indices, freight data and sustainability figures. More important than the volume of data is the quality and consistency of the master data.

Which KPIs are typical in Supply Chain Analytics?

Frequently used metrics include on-time delivery (OTIF), delivery time variability, inventory cover, forecast accuracy, freight cost per unit and procurement lead time. Depending on the focus, quality metrics such as complaint rates or sustainability figures such as the Product Carbon Footprint (PCF) are added. What matters is that every metric is tied to a clear decision.

Is Supply Chain Analytics also worthwhile for small and medium-sized enterprises?

Yes, for small and medium-sized enterprises in particular the effects are often significant, because many processes are still manual and lack transparency. A pragmatic starting point is a simple dashboard with five to eight core metrics based on existing ERP data. The success factor is less expensive software than discipline in data maintenance and regular evaluation.

What is the difference between Supply Chain Analytics and Supply Chain Management?

Supply Chain Management is the overarching steering approach for all planning and execution processes along the supply chain. Supply Chain Analytics provides the data- and fact-based basis for decision-making within it. Analytics can therefore be understood as an analysis and control instrument within supply chain management.

How do you start a Supply Chain Analytics project?

A staged approach has proven effective: first define objectives and problem areas, then review available data sources and define five to ten relevant KPIs. These metrics are then prepared automatically and discussed in regular reviews with procurement and logistics. In practice, first reliable results are usually achieved within a few months.