

Demand Sensing: Detecting Demand Faster and More Precisely

Demand sensing refers to the refinement of demand forecasts using current, often daily-level data from sales, retail and the supply chain. For procurement professionals, the approach reduces forecast errors and ensures more reliable demand notifications to suppliers. The following article explains the methods, key figures and practical risks of demand sensing in industrial procurement.

Key facts

- Demand sensing typically shortens the forecast horizon to a few days or weeks, thereby increasing the accuracy of short-term demand.
- The approach combines order history, point-of-sale and channel data as well as external signals such as weather or market data.
- In practice, short-term forecast errors can often be reduced by 10 to 30 per cent; the extent depends heavily on data quality and product structure.
- Demand sensing is the operational complement to strategic Sales and Operations Planning, not a replacement for it.
- Prerequisites are clean master data, a consolidated order history and clear responsibilities in forecast management.
- For buyers, demand sensing means more stable volume baselines for negotiations, safety stocks and MOQ agreements.

Definition: Demand Sensing

Demand sensing is a demand planning approach that collects short-term demand signals close to the market event and feeds them into the demand forecast. Unlike classical statistical forecasting on a monthly basis, demand sensing works with a shortened horizon and daily or weekly current data. The aim is to close the gap between long-term planning and actual consumption.

Differentiation from classical demand forecasting

The classical forecast relies predominantly on order history and time-series models with horizons of several months. Demand sensing shifts the view forward: current sales and consumption signals, open orders and channel information continuously correct the forecast. The two approaches complement each other sensibly, because without a reliable historical basis, sensing lacks a reference framework.

Differentiation from Sales and Operations Planning

Sales and Operations Planning (S&OP) typically works monthly with horizons of six to eighteen months and coordinates sales, production, procurement and finance. Demand sensing does not attack this level; instead, it delivers short-term, operationally usable corrections below the S&OP horizon. In the maturity model of many companies, demand sensing is therefore positioned as a sensing layer between S&OP and tactical materials planning.

Methods and approach in demand sensing

The approach follows a clearly structured cycle: collect data, cleanse it, evaluate it with models, correct the forecast and pass the result to procurement and materials planning. What matters is less the complexity of the algorithms than the quality and timeliness of the input data, plus a defined escalation process in the event of strong deviations.

Data sources and signal types

Typical sources are current customer orders, point-of-sale or channel inventory data, statements from the sales team, freight data and external signals such as weather, calendar or market events. Consistent integration via interfaces to the e-procurement and ERP environment is important so that signals do not have to be maintained manually. Cleansing raw data before use — duplicates, outliers, incorrect units of measure — prevents the most common source of error.

Forecast models and correction logic

In practice, simple statistical models are combined with machine learning; often a weighted smoothing of the most recent sales signals is sufficient at first. The sensing result is applied as a correction to the base forecast, not as a separate parallel forecast. Short review cycles — frequently weekly or daily for A-items — keep the forecast error visible and controllable.

Integration into forecast management

For sensing results to have an effect, they must be anchored in forecast management: a clear data path into materials planning, defined owners of forecast changes and documented thresholds at which an escalation process is triggered. Demand confirmation towards suppliers should also be based on sensed quantities so that deviations are communicated early.

Key KPIs for steering

Demand sensing can be assessed in measurable terms. The core figures are forecast quality, inventory and delivery performance, and the effort involved in planning. Without clear metrics, the benefit remains invisible and improvements cannot be evidenced.

Forecast quality and bias

The key measures are forecast accuracy and, conversely, the forecast error, measured for example as MAPE or as a weighted deviation. In addition, bias should be captured: systematic over- or under-forecasting reveals structural problems in the model or in the planning process. In practice, short-term accuracy values of 80 to 95 per cent per item class are considered desirable.

Inventory and delivery metrics

Better forecasts have a direct effect on inventory and delivery performance: safety stocks fall and service levels stabilise. Typical targets are a reduction in stock coverage of one to two weeks and customer-facing delivery reliability above 95 per cent. Planning stability — the share of unchanged order proposals per week — also shows whether the sensing is working reliably.

Process effort and value contribution

The planning effort per planning run and the share of automatically generated, unchecked forecasts show whether the process remains lean. For the value contribution, what matters is how much inventory

and procurement cost is avoided; this value should — as is usual in a savings forecast — be plannable and subsequently reconciled against savings leakage. A process cost analysis of the planning process provides the counterpart of the systems and person-hours deployed.

Risks and controls

In practice, demand sensing fails less often because of algorithms than because of organisational and data problems. Those who know the risks and control them in a targeted manner achieve reliable results considerably faster.

Data quality and order history

Incomplete order history, changing material numbers or customer consolidations distort every model. Before building the sensing capability, master data, units of measure and allocations should be checked and cleansed. Particularly for critical materials with a patchy data foundation, the benefit is limited — here contractual and strategic levers are more effective.

Oversteering and signal noise

Reacting too quickly to individual signals creates bullwhip effects: inventories oscillate and suppliers receive erratic call-offs. Controls include thresholds for forecast changes, minimum quantities per correction step and respect for minimum order quantities (MOQ) and acceptance deadlines of suppliers. A defined supplier rating helps to assess the responsiveness of suppliers to changed call-offs realistically.

Responsibility and escalation process

Without clear responsibilities, sales, planning and procurement argue about the “true” demand. A steering role in forecast management with fixed meetings and an escalation process for deviations above defined thresholds has proven effective. Changes to long-term framework agreements — for instance at contract renewal — belong at S&OP level, not in the daily sensing routine.

Current developments and outlook

Technology, sustainability reporting and more volatile markets are changing how demand signals are handled. In this way, demand sensing is evolving from a specialist topic of the consumer goods industry to a cross-cutting capability in mechanical and plant engineering as well.

AI and planning automation

Modern systems automatically identify patterns in large volumes of data and prioritise items with a high forecast error for manual review. This relieves planners and shifts their role from data preparation to decision-making. Transparency remains a prerequisite: planners must be able to understand why a model proposes a correction, otherwise acceptance quickly declines.

Sustainability and reporting

More precise demand forecasts reduce overproduction, scrap and unnecessary transport — directly relevant levers for the sustainability balance sheet. Against the backdrop of the Corporate Sustainability Reporting Directive (CSRD), reliable volume baselines gain additional importance, because material flows and emissions must be documented in a traceable manner. Demand sensing provides one of the data bases for this reporting.

More stable supply chains through sensing

More volatile procurement markets increase the value of early signals: those who detect trend breaks days earlier can react in good time to supplier alternatives, price adjustments or export control cases. Demand sensing is therefore increasingly understood as an early warning system in materials management — closely interlinked with strategic procurement and complexity reduction in the product range.

Implementation: from pilot operation to standard process

A phased introduction avoids the typical false starts. Rather than converting all items and sites at once, a pilot with clear measurement has proven effective before sensing becomes the binding demand source.

Piloting on A-items

A sensible start comprises a manageable group of A-items with a good data foundation and high volume value. Over three to six months, the sensing process is operated in parallel with the existing planning process and evaluated on the basis of forecast error and inventory development. In parallel, it helps to align legal and contractual termination issues for changed call-offs — for example in the context of a termination for convenience — early with procurement.

Scaling and embedding

After a successful pilot, the next step is to extend it to further item groups and sites, including integration into e-procurement systems and automated demand confirmation. Training and a documented escalation process secure implementation quality. It is important that sourcing decisions and volume frameworks for negotiations continue to be fed from the strategic level and that sensing only steers short-term deviations.

Typical metrics

Forecast accuracy (short-term): 80–95%

Per item class; higher values for standard items with stable consumption

Forecast error (MAPE): < 20%

Typical guideline value for short-term sensing horizons for A-items

Reduction in stock coverage: 1–2 weeks

Typical potential after introduction, depending on data quality

Planning stability: > 80%

Share of unchanged order proposals per week; low values indicate signal noise

Practical example: mechanical engineering company stabilises purchased parts

A mid-sized mechanical engineering company with around 8,000 purchased parts suffered from strongly fluctuating customer call-offs and correspondingly high safety stocks for long-running standard components. The company introduced demand sensing for around 600 A-items, linked open customer orders and freight data to the forecast, and defined weekly review meetings between sales and materials planning. Within six months, the forecast deviation for the piloted items fell measurably, stock

coverage reduced noticeably and call-off stability towards suppliers improved significantly.

- Order history cleansed and converted to consistent material master data
- Weekly sensing run for A-items with defined thresholds for forecast corrections
- Escalation process between sales, planning and procurement for deviations above 15 per cent
- Safety stocks gradually adjusted to the new forecast quality

Conclusion

Demand sensing closes the gap between strategic planning and day-to-day demand — with measurable benefits for inventory, delivery reliability and negotiating position. What matters is less sophisticated models than clean data, clear responsibilities and a functioning escalation process. For buyers, this results in more stable volume baselines and an earlier ability to react to market developments. The approach does not replace Sales and Operations Planning but makes its short-term implementation more precise. Those who start in stages with a pilot and measure progress using forecast errors and inventory metrics achieve reliable results quickly in practice.

Frequently asked questions

What is demand sensing in simple terms?

Demand sensing means correcting demand forecasts with current, daily or near-weekly demand signals instead of relying solely on historical data. The company identifies changes in demand earlier and can manage inventory and orders more precisely. It is the short-term complement to the classical demand forecast.

What is the difference between demand sensing and demand planning?

Demand planning covers the entire demand planning process, including long-term forecasts and S&OP processes. Demand sensing is a sub-area that refines short-term forecasts using current signals. Both levels work together: strategic planning sets the framework, while sensing makes short-term corrections.

What data is required for demand sensing?

Typical sources include current customer orders, order history, channel or point-of-sale data, retailer inventory information, and external signals such as calendar or weather data. Data quality is crucial: cleansed master data and consistent units of measure are more important than additional data sources.

Is demand sensing also worthwhile for B2B industrial companies?

Yes, especially in customer-specific manufacturing with fluctuating call-offs. The benefit is concentrated on standard and A-components with regular consumption; for genuine one-off orders, project-specific methods are more suitable. A pilot on selected item groups quickly shows which areas benefit.

How does demand sensing reduce inventory?

More precise short-term forecasts reduce the need for safety stock because uncertainty decreases. In practice, reductions of one to two weeks of stock coverage are common guideline values. In addition, the effort for expedited orders and expensive deviation management measures decreases.

What systems do you need for demand sensing?

The prerequisites are an ERP or planning system with a good inventory and order data foundation as well as interfaces to the signal sources. Specialised forecasting tools help with larger item volumes but

are not essential for a pilot operation. More important than the software are process definitions and data maintenance.