

# Delivery Date Deviation Analysis: Systematically Measuring and Steering On-Time Delivery

Delivery date deviation analysis is a systematic evaluation of the deviations between agreed and actual delivery dates. It forms part of the core toolkit of supplier performance evaluation and provides buyers with objective data for supplier meetings, escalations and sourcing decisions. In practice, it helps identify weaknesses in the supply chain early and secure the supply reliability of production.

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## Key facts at a glance

- 01 Delivery date deviation is the time difference between the confirmed or agreed delivery date and the actual goods receipt.
- 02 Typically it is measured per purchase order line and then aggregated by supplier, commodity group and plant.
- 03 Common benchmarks for on-time delivery in practice are frequently 95–98%, depending on industry and material classification.
- 04 The foundation is clean master data and consistent date fields in the purchase order, order confirmation and goods receipt.
- 05 The analysis feeds supplier rating models, escalation processes and action plans agreed with the supplier.
- 06 In an era of supply chain disruptions, proactive delivery date monitoring is gaining in importance.

## Definition: delivery date deviation analysis

Delivery date deviation analysis is a supplier management procedure that systematically records, quantifies and evaluates the difference between the agreed and the actual delivery date. It forms part of supplier performance evaluation and provides the data foundation for on-time delivery KPIs, supplier

evaluations and escalation processes.

### **Distinction from on-time delivery**

On-time delivery is a KPI usually expressed as the proportion of punctual deliveries out of all deliveries. Delivery date deviation analysis takes a step back: it examines the individual deviations in detail, for example their direction, duration and causes. Only this detailed view reveals whether a supplier delivers systematically too early, too late or irregularly – and different measures can be derived from this.

- On-time delivery: aggregated KPI (proportion of punctual deliveries)
- Delivery date deviation: individual value per purchase order line in days
- Delivery date deviation analysis: structured root-cause and trend analysis

### **Relevant date references**

In practice, it needs clarifying which date serves as the reference: the confirmed date on the order confirmation, the binding date promised in the supplier progress report, or the requested date on the purchase order. The order confirmation is often treated as authoritative, provided it was issued in good time and is plausible. For long-lead parts with new date confirmations, the last binding date before the actual delivery date may alternatively be used – what matters is a uniform, documented convention.

## **| Methods and approach of delivery date deviation analysis**

A robust approach typically divides into data capture, measurement, root-cause analysis and derivation of measures. The effort should be proportionate to the importance of the material group: for A-parts under the material classification, a detailed analysis is worthwhile; for C-parts, summary KPIs often suffice.

### **Data capture and data basis**

The foundation is the date fields from the ordering system, order confirmation, goods receipt and, ideally, the supplier's shipping notifications. The data is merged and evaluated per purchase order line. Clean master data maintenance is a prerequisite; otherwise deviating date formats or unmaintained confirmation dates distort the result. Many companies consolidate data from multiple systems in a data lake to make it uniformly available for analyses and reporting.

### **Measurement and aggregation**

The individual deviation is typically calculated as the actual goods receipt date minus the agreed delivery date in calendar or working days. At supplier level, on-time delivery is frequently calculated, supplemented by KPIs such as average deviation in days and the proportion of early deliveries. Weighting by order value or by the criticality of the line item prevents numerous very small orders from dominating the picture. Consideration of partial deliveries is also important, and these should be reported separately.

## Root-cause analysis and measures

In the next step, deviations are categorised, for example by supplier, plant, material group or type of disruption. Common cause categories include incorrect information in the ordering process, capacity bottlenecks, material availability at the supplier, transport problems, and date changes by the customer's own demand owner. Depending on the cause, the measures differ: clarifying internal processes, joint capacity planning, safety stocks or contractual arrangements with the supplier.

## | Key KPIs and metrics

Delivery date deviation analysis feeds several KPIs used in supplier evaluations and management reports. Which KPIs make sense in each case depends on the material group, sourcing strategy and maturity of supplier management.

### On-time delivery and OTIF

On-time delivery measures the proportion of punctual deliveries, with practical conventions typically defining a tolerance of zero to a few days. Closely related is OTIF (On Time In Full), which combines punctuality and quantity compliance and thereby gives a more realistic picture of supply quality. In practice, values around 95–98% are considered reasonable in many industries, while significantly higher target values are set for critical production parts.

### Deviation duration and early delivery rate

Besides the compliance rate, the average and maximum delay in days are meaningful, as they reflect the extent of the disruption. The early delivery rate also deserves attention: deliveries made too early tie up capital, consume storage and handling capacity, and can even pose quality risks for time-sensitive parts. For this reason, many companies evaluate early and late deliveries separately.

### Trend and segment KPIs

KPIs only become valuable in the trend and in comparison: on-time delivery by month, by supplier, by plant and by material group. In addition, the relationship with forecast accuracy can be examined, because imprecise call-off forecasts from the customer are a frequent cause of delivery date deviations. This makes it possible to distinguish genuine supplier problems from self-inflicted fluctuations.

## | Integration into procurement and supplier processes

A delivery date deviation analysis only unfolds its effect when the results are fed into ongoing processes – from supplier evaluation through contract negotiations to risk steering.

### Supplier rating model and supplier performance evaluation

In the supplier rating model, on-time delivery feeds into the overall rating alongside quality and price, often with a weighting factor of typically 20–40%. The results of delivery date deviation analysis thereby

provide the factual basis for regular supplier meetings. Poorly rated suppliers receive an action plan; repeated significant deviations can be taken into account in tenders, for example in the award decision following a sourcing process with a Best and Final Offer (BAFO) or an e-auction.

### **Supply risk management and crisis response**

Delivery date deviations are an early indicator of supplier risks. Accumulations at a critical supplier can point to financial difficulties, capacity problems or quality crises, and therefore constitute an input to supply risk management. In acute supply disruptions, for example due to failures or natural events, the analysis provides data for a crisis team assessing the impact on production and prioritising alternative sourcing.

### **Contracts, master data and operational planning**

Contractually, delivery date obligations can be anchored through delivery commitments, penalty clauses and notification obligations in the event of date changes; their concrete design should always be reviewed legally. Operational planning also benefits: findings from the analysis feed into safety stocks, planning parameters and lot-sizing considerations, for example lot sizing according to Andler or lot formation for series orders. In this way, the analysis connects operational procurement and strategic supplier management.

## **| Risks, limitations and controls**

The meaningfulness of a delivery date deviation analysis depends heavily on data quality, conventions and fair interpretation. Without these prerequisites, mis-steering and unnecessary conflicts with suppliers loom.

### **Data quality and system gaps**

Frequent sources of error are missing order confirmations, changed requested dates without communication, incomplete goods receipt bookings and duplicate purchase order lines. Manual retrospective additions of dates also distort the picture. Controls such as plausibility checks, spot checks at goods receipt and clear responsibilities for master data maintenance are therefore indispensable.

### **Fair evaluation and shared responsibility**

Not every delivery date deviation can be attributed to the supplier. Delayed demand changes by the customer, unclear specifications or short-notice call-offs also cause deviations. In practice, it has proven worthwhile to categorise causes by responsibility and to discuss them transparently in supplier meetings. One-sided attribution makes cooperation more difficult and prevents genuine improvement.

### **Overall economic view**

Delivery date deviations are a means to an end: what matters are the costs and risks for production and customer commitments. Optimising the compliance rate in isolation can lead to excessive safety

stocks. A holistic view that brings together inventory costs, procurement costs – for example in interplay with volume scales – and the risk of supply failure is more sensible. Tools such as a spend cube can help make the impact on total procurement volume and commodity groups visible.

## Current developments and digitalisation

Digitalisation is shifting delivery date deviation analysis from reactive evaluation to proactive steering. Modern approaches work with real-time data and automation rather than monthly retrospective evaluations.

### Automated delivery date monitoring and collaboration

Supplier portals and IT interfaces – from classic EDI to formats such as cXML – transfer order confirmations and shipping notifications automatically into the purchasing system. As a result, up-to-date dates are available early, and deviations can be identified before the planned delivery date has passed. In addition, suppliers actively report date changes via progress notifications, which significantly shortens the reaction time in procurement.

### Forecasts and automation in the planning process

Analytical models based on historical deviation patterns and current supplier data are increasingly being used to forecast reliable delivery dates for materials planning. As a consequence, routine processes can be automated to a higher degree – for example approvals without manual review, measured via the touchless rate in the ordering process. The buyer's scope shifts from data preparation towards supplier meetings and strategic topics.

### Resilience and forward-looking sourcing

The experience of recent years with supply chain disruptions has raised the importance of robust supplier management. Delivery date deviation data is increasingly feeding into strategic decisions: selecting second suppliers, regionalising procurement and building buffer capacities. Related topics such as packaging management and load carrier management are also gaining in importance, because they influence physical supply and date reliability in transport.

## Typical metrics

| Metric                  | Typical value                                                                                             |
|-------------------------|-----------------------------------------------------------------------------------------------------------|
| <b>On-Time Delivery</b> | typically 95–98%<br><i>Proportion of punctual deliveries; set higher target values for critical parts</i> |
| <b>OTIF</b>             | typically > 90%<br><i>combines punctuality and complete quantity compliance</i>                           |

|                               |                                                                                                                                   |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| <b>Average Date Deviation</b> | < 2 days<br><i>average delay in days across all deliveries</i>                                                                    |
| <b>Early Delivery Rate</b>    | < 5%<br><i>Proportion of deliveries made too early; ties up capital and storage capacity</i>                                      |
| <b>Touchless Rate</b>         | increase over time<br><i>Proportion of order processes that can be processed automatically, facilitated by reliable date data</i> |

## Practical example

A mid-sized mechanical engineering company with around 8,000 actively ordered line items per month found, when analysing its delivery date deviations, that a significant supplier of machined parts was repeatedly delivering five to ten days late. The root-cause analysis showed that a substantial proportion of the deviations was attributable to call-off quantities changed at short notice by the company's own sales department. On this basis, three measures were implemented.

- Introduction of binding call-off windows with a change freeze of typically two weeks
- Monthly supplier review with the supplier, supported by the standardised delivery date deviation report
- Building a safety stock only for the five most critical parts instead of blanket coverage for the entire commodity group
- Including on-time delivery with defined target values in the supplier rating model and in the annual contract negotiation

## Conclusion

Delivery date deviation analysis turns everyday experience with late deliveries into reliable data. It is a prerequisite for meaningful on-time delivery KPIs, well-founded supplier evaluations and targeted measures instead of sweeping accusations. Decisive for success are clean date references, a fair attribution of causes and the consistent connection to contracts, risk management and materials planning. Those who digitalise the analysis and operate it in real time can identify deviations before they hit production. In this way, a mere reporting tool becomes an effective steering instrument for supply reliability.

## Frequently asked questions

### ? What is delivery date deviation analysis?

Delivery date deviation analysis is the systematic evaluation of deviations between agreed and actual delivery dates. It measures, per purchase order line, how many days early or late the delivery

was made, and aggregates these figures into KPIs such as on-time delivery. It is a core instrument of supplier performance evaluation and provides the factual basis for supplier meetings and escalations.

### ? **How is on-time delivery calculated?**

The usual formula is: on-time deliveries divided by all deliveries within the review period, multiplied by 100. In practice, a tolerance of zero to a few days around the agreed date is often considered on time. It is important to have a documented convention on which date serves as the reference – usually the date of the order confirmation.

### ? **What percentage of on-time delivery is good?**

In practice, values of around 95 to 98 per cent are considered a reasonable level in many industries. For critical production components or in Lean environments, significantly higher target values are set. More important than the absolute figure is the trend and the comparison with the level of the material group and the competition.

### ? **What is the difference between on-time delivery and OTIF?**

On-time delivery typically only considers punctuality, whereas OTIF (On Time In Full) combines punctuality with complete quantity compliance. A timely partial delivery does not count as fully fulfilled under OTIF. OTIF therefore reflects supply quality more realistically, but requires clean data on quantities and arrival dates.

### ? **What causes delivery date deviations from suppliers?**

Common causes include capacity bottlenecks, missing upstream products at the supplier, transport problems, unclear or changed order data, and imprecise call-off forecasts from the customer. A clean separation of root-cause categories by responsibility is important in order to implement targeted measures. Not every deviation can be attributed to the supplier.

### ? **How can supplier on-time delivery be improved?**

Proven measures include regular supplier reviews based on objective data, binding delivery commitments and notification obligations in the contract, joint capacity planning, and appropriate safety stocks for critical parts. For persistent problems, escalation levels help, as does a structured supplier ESG improvement plan for sustainability-related topics, or shifting the volume at the next sourcing decision.

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