THE SUPPLY CHAIN EXECUTIVE'S GUIDE Smarter Management of Exceptions to Plan



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Executive Summary

Supply chain leaders can achieve higher order fill rates and improve on-time, in-full (OTIF) delivery performance by enabling planning teams to resolve supply plan exceptions 65% faster, reduce exceptions by 35%, and reduce recurring exceptions by 50% with TraceLink Supply Chain Issue Management.

Supply plans generate thousands of exceptions due to issues like volatile demand, late shipments, and shortages. But your planning team has never had real-time visibility into these potential disruptions or a way to seamlessly connect with suppliers to resolve exceptions quickly—until now. TraceLink Supply Chain Issue Management:

- Enables supply chain leaders to achieve key metrics like high fill rates, fast cash-to-cash cycle times, improved schedule attainment, and more.
- · Enables real-time communication with suppliers and provides full visibility into shared data, team priorities, unresolved exceptions, and high-priority exceptions.
- Empowers multienterprise teams to rapidly initiate collaboration required to reach agreement on alternative resolutions when exceptions arise.

Best-in-class companies use TraceLink Supply Chain Issue Management along with continuous improvement techniques to boost OTIF service levels by as much as 82%.

Table of Contents

Introduction: Why it's time for a better approach to supp Untapped insights from supply planning exceptions...... How to reduce costs and improve order fill rates..... Empower planning teams with digitalization of the except Supply Chain Issue Management drives immediate and Be prepared for any supply chain challenge.....

Learn more about TraceLink Supply Chain Issue Management

y plan exception management	<u> 4</u>
	12
	10
	<u>10</u>
otion resolution process	20
continuous value	<u> 30</u>
	37





Given today's constant state of supply chain disruptions, it is more difficult than ever for supply chain leaders to develop supply plans to profitably meet unconstrained demand, achieve the highest order fill rates, and meet company operating plan targets. While some may use supply chain disruptions as an excuse to put constraints on filling all customer demand, the most successful supply chain leaders know that the same performance metrics that applied before the pandemic will continue to apply in the future. (see Table 1)

Table 1

Key Supply Chain and Manufacturing Metrics

	_
Forecast accuracy	Forecast demand versus actua
Order fill rates	Number of orders filled comple
Order cycle time	Time between receipt of a cust
Throughput	Number of units produced per
Schedule attainment	The number of units manufactu period of time, as a percentage
Customer satisfaction	Customer satisfaction measure
Inventory turnover	The cost of goods sold divided
Gross contribution margin	Revenue minus Variable Costs
Cash-to-cash cycle time	The period of time between wh receives cash from its custome
Supplier quality index	Purchase price plus non-standa

l demand

- etely divided by total customer orders, as a percentage
- omer order until it is delivered to the customer
- unit of time (hour, day, week)
- ured divided by target production output over a certain
- red via survey
- by the average inventory for the same period
- divided by Revenue (measured per product, per plant)
- en a business pays cash to its suppliers for inventory and ers.
- ard costs divided by purchase price (goal = 1)

To achieve these metrics, successful supply chain leaders know that they need to adjust plans and the planning process to account for key challenges, including:



¹ (e.g. if your customer cannot assemble diagnostic equipment due to the IC chip shortage, they don't need housings, display panels, packaging materials, etc.).

A successful supply plan will meet or exceed key supply chain metrics while addressing these challenges to maximize fulfillment of actual customer demand. With many of these challenges outside the scope of control for most supply chain leaders, it is necessary to develop new strategies to get ahead of these issues before they impact manufacturing and distribution operations. This means using better processes and systems to gain earlier visibility into potential disruptions, and improved capabilities for collaborating with supply chain partners that enable teams to mitigate or eliminate them. While supply chain leaders are still expected to deliver against the same metrics, the processes and supply chain systems used before the pandemic are no longer sufficient.

6



S&OP is critical to aligning the operating and supply plans

A key process that will be the same in the future as it was before the pandemic is the sales and operations planning (S&OP) process because its goal is always relevant: balance demand and supply to meet operating plan targets. While the goal remains the same, the process has never been more difficult. Even in normal times, bottom-up supply plans often will not match a company's operating plan target. Top-down plans developed to achieve the company's operating targets include growth goals that are rarely constrained by supply chain realities. With the sharp increases in supply chain disruptions and global shortages, the mismatch between top-down and bottom-up plans has never been greater.

According to Gartner, closing the gap between S&OP and financial targets requires supply chain planning leaders to analyze the cause of gaps and understand how S&OP changes impact financial plans and metrics. This understanding will enable supply chain planning leaders to intentionally drive decisions aimed at developing bottom-up actions to meet the annual targets¹. S&OP changes include forecast changes, material availability, capacity constraints, accelerated or delayed product launches, and much more. Except for driving the supply plan from a more accurate demand plan, supply chain leaders do not have much control over changes to the sales side of S&OP. This leaves supply chain leaders to focus on decisions that enable an agile supply plan that can close gaps in the operating plan.



The supply plan must not constrain demand fulfillment

Whether the supply plan is calculated in the Material Requirements Planning (MRP) module of the Enterprise Resource Planning (ERP) system or the planning algorithm of a supply chain planning application, it is the baseline support for a supply planning process focused on developing a plan to profitably fulfill all demand. Acquiring and retaining customers to achieve sales goals is hard enough without further hampering the process with an inadequate supply plan.

The MRP logic at the core of the supply plan will consume the forecast (the more accurate, the better), net customer orders, and on-hand inventory to determine gross requirements. With gross requirements determined, the MRP logic will explode product bills of materials to calculate work orders, transfer orders, and purchase orders required to fulfill demand. While the degree of supply plan accuracy will differ between the unconstrained plan from the MRP module and the constrained plan provided from a supply chain planning application, some supply chain variables impact the accuracy plans from either origin.





Unfortunately, even with the best supply planning processes, these variables can force supply chain leaders and their teams into firefighting mode where the objective becomes "just get stuff out the door" at the expense of profitability and customer satisfaction.



Untapped insights from supply planning exceptions

Uncontrollable supply chain variables aside, even the most basic MRP logic will produce an extensive list of plan exceptions (see Table 2). This exceptions list from the weekly or daily planning run identifies supply plan blockers to meet unconstrained demand. This gives supply chain planning leaders and their planners a source of essentially untapped insights into the bottom-up actions needed to improve the supply plan and its contribution to delivering against the goals of the operating plan.

Planning exceptions are an indicator of supply plan accuracy and level of alignment with the demand plan. Exceptions are to be expected because the planning system adjusts the plan to market dynamics. While there will always be exceptions, a higher number of exceptions means lower supply plan accuracy and less alignment with demand plan. The unconstrained demand plan is aimed at meeting the revenue goals in the operating plan. That is why supply plan alignment is essential. Because exceptions are generated by the planning system across planning time horizons, addressing exceptions further out in the time horizon enables more time for resolution before they impact the production schedule and customer delivery.

Table 2

Planning Exception Examples	Description
Items with a Shortage	The item status is negative on-hand. If the expression process generates an exception with the star
Demand at Risk Due to Supplier Capacity Shortage	A demand is pegged to a supply where the s forecast is still planned on time even in the a the end demands that are at risk because of
Late Replenishment for Forecast	The planning process determines that mater the forecast's due date.
Order Sourced from Alternate Supplier	The order is sourced from an alternate suppl capacity constraints.
Orders to be Rescheduled In	The planning process identifies a purchase of later than the suggested due date. The plann • Recommends that you reschedule the purc • Continues to plan lower-level items as if the
Orders with Insufficient Lead Time	The planning process determines that a work less time than its minimum processing time order according to its lead time, it would star
Past Due Orders	The planning process determines purchase of due dates before the plan horizon start date.

nd. If the exception extends over several days, the planning vith the start and end dates to reflect the duration.

where the supplier capacity is constrained. The sales order or ven in the absence of supplier capacity. This exception details because of insufficient supplier capacity.

that material or components for a forecast are due later than

nate supplier (Rank 2 supplier and higher) due to the supplier

purchase order that's not firm with an original due date that's . . The planning process:

Ile the purchase order to an earlier date.

ms as if the recommendation was executed.

that a work order or purchase order must be completed in ssing time to meet demand. If the planning process plans the would start before the planning horizon start date.

purchase orders, transfers, or work orders that have order start date.



No visibility to disruptive exceptions

Unfortunately, supply chain leaders have no aggregate visibility to these exceptions, a stack-ranking of suppliers generating the problems, or a view of the internal plants behind these exceptions-which means no insight to the potential impact on order fill rates. Although planners have access to the detailed exceptions generated as an output of the planning run, planners spend their time firefighting near-term issues to keep production lines running and orders shipped. With thousands of exceptions from every planning run, planners have no time to spend on exceptions outside of the near-term planning horizon. Further complicating exception resolution, planners have little or no visibility to the exceptions that their planning colleagues are working on or the conflicts that recommended resolutions may create for internal plants or suppliers.



Despite large investments in ERP and planning systems, resolving exceptions and conflicts is mostly done in spreadsheets and on whiteboards in the plant manager's office. Much of the agenda of the daily and weekly production meetings is often focused on adjusting production schedules to work around near-term exceptions rather than resolve them -- which means that root causes are rarely determined and eliminated. Adjusting production schedules to accommodate exceptions increases costs including:

- Lower plant and labor utilization
- More changeover costs
- Increased work-process-inventory carrying costs
- Material shortage expediting costs
- Overtime
- Higher material acquisition costs

While increased costs are never good as they will impact gross contribution margin and ultimately cost of goods sold (COGS), planners and manufacturing teams will do their best to keep these exceptions from impacting customer shipments. Unfortunately, many exceptions that are not resolved early enough reach a point where customer deliveries are impacted, and efforts turn to minimizing lateness versus resolving the exception. Often, lack of visibility to accurate material availability data makes it difficult to allocate components to products on the production schedule that can be completed to the ready-to-ship finished good level. This failure leads to partially completed products in work-in-progress (WIP) that have consumed components that could have been used for a ready-to-ship product. In some cases, companies have thousands of partially finished units waiting for a few components. This leads to lower order fill rates, lower inventory turnover, longer order cycle times, longer cash-to-cash cycle times, and lower customer satisfaction.

How to reduce costs and improve order fill rates

Earlier visibility and more complete resolution of supply plan exceptions will reduce costs and improve fill rates. More complete analysis of exceptions across the immediate and long-term planning horizons will provide insights into supply plan risks while there is still time to resolve or mitigate their impact. With this additional visibility, planners will be able to adjust plans to avoid releasing orders that start production for assemblies or finished goods that cannot be completed because they are missing components. With the ever-increasing speed of cloud-based planning systems, it is now more possible to rerun plans to test these adjustments.

Portals provide the basics of the changes being requested of the supplier with little room for more than a confirmation that the supplier can or cannot accommodate the changes. Portals do not support the multiparty collaboration that is often necessary to find the best alternative when the change cannot be accommodated as requested. The need for multi-party collaboration is especially critical when planners must get confirmation that suppliers can get the additional material to accommodate the changes.

While more powerful planning systems enable planners to see the result of plan adjustments quickly, these systems also produce new exception lists equally as fast. Achieving the improvement in the exception resolution process to significantly improve order fill rates and reduce costs requires that planners collaborate with other planning functions, across internal stakeholders, and with suppliers. Supply planners, production planners, and inventory planners do not have the time or the systems to review more exceptions sooner and faster, or collaborate with internal stakeholders or suppliers. At best, communication with suppliers is limited to emails, phone calls, or passive supplier portals. For many organizations, communication with suppliers is required to go through the procurement or supplier management departments which slows resolution and lengthens order cycle times.

Empower planners with digitalization of the resolution process

The weekly planning exception process is the weak link in otherwise high-power planning processes because planners still need to review hundreds of exceptions to identify critical changes that must be followed up on directly with suppliers via email and phone calls. Any exception, even for a small component from a tier 2 supplier, can shut down a production line. For supply chain leaders, the exception resolution process is the biggest blind spot to supply chain visibility and risk management.

Exception messages could be communicated automatically to your network of suppliers on a multienterprise platform that enables real-time collaboration, empowering you to resolve exceptions as quickly as possible directly from your planning system?

Exceptions could be prioritized by supplier, assigned to different members of your planning team to triage, and measured based on timeto-close and frequency per supplier?

ERP exception messages could be integrated with a collaborative multienterprise work management solution that routes exceptions directly to suppliers and updates all stakeholders automatically when resolution occurs?

TraceLink Supply Chain Issue Management provides multienterprise work management digitalization capabilities that connect planners with internal stakeholders and suppliers in real-time to support rapid exception resolution and deliver against these *what-ifs*. TraceLink Supply Chain Issue Management:

- Connects all suppliers to a common digital network platform for real-time communication with visibility into shared data and aligned priorities.
- Provides visibility to managers, planners, and supply chain partners to unresolved exceptions, critical and high-priority exceptions, past due exceptions, and suppliers with open exceptions.
- Addresses supply planning's biggest blind spot: the ability for planners to effectively manage exception follow-up and confirmation with suppliers and feeder plants.
- Provides suppliers with real-time visibility into exceptions in a shared collaborative application using the same data to enable guick confirmation of PO changes or initiate the collaboration required to reach agreement on alternative resolutions.
- Enables better decisions at daily or weekly production meetings based on timely updates from suppliers and feeder plants.

Supply Chain Issue Management digitalization capabilities close the gaps left by other enterprise systems including ERP, supply chain planning, quality management systems, CRM, and warehouse management systems by enabling real-time, multienterprise collaboration to resolve issues and exceptions and execute shared processes with supply chain partners.

Network Exception Management

Connects all suppliers on a common platform: With more than ten years of network experience, the TraceLink Digital Supply Network currently includes more than 285,000 supply chain partners. Whether there are ten or ten thousand supply chain partners, TraceLink handles the trading partner network onboarding and maintenance at no cost to partners.

The TraceLink Digital Supply Network runs on the TraceLink Opus Platform, a powerful Industry 4.0 platform that enables the creation of integrated and interoperable networks of supply chain partners and supports intercompany processes with multienterprise applications and development tools. The unique process network capability enables specific subnetworks of suppliers to be created and served by a specialized set of Supply Chain Issue Management solutions. For example, a process network for contract manufacturers can be established, supported by a specialized issue management solution designed for external manufacturing processes.

Visibility for managers, planners, and supply chain partners: A challenge for all supply chain leaders is effectively managing processes that span across stakeholders from different internal functions as well as stakeholders at supply chain partners. As noted in a recent Gartner report, "Many times, the stakeholders over whom supply chain leaders have no direct organizational 'authority' are often at the core of getting things done."²

Supply Chain Issue Management dashboards enable supply chain leaders to monitor incidents and the resolution process in real time with drill-down capabilities to identify the stakeholder that has ownership of the current step in the workflow. This includes identifying the stakeholders at a supplier where exception follow-up processes may be stalled. The unique process team capability enables crosscompany teams of subject matter experts to be assembled and assigned to a specific network of suppliers (a process network). Continuing the contract manufacturer example, a process team composed of planners, plant managers, manufacturing engineers, and quality leaders can be assembled to ensure the right subject matter experts are assigned to review exceptions related to contract manufacturing operations.

Addresses the planning blind spot: The exception management capabilities of most planning systems treat each exception as a discrete event and do not make it easy to determine aggregate supply plan accuracy. For this reason, many planners download exceptions into a spreadsheet for further analysis. This spreadsheet, however, does not help with supply planning's biggest blind spot: exception follow-up and confirmation with suppliers. To eliminate this blind spot, planners must review exception messages, consolidate exceptions by supplier, email the spreadsheet to the suppliers, and follow up with a phone call. The MRP planning run can produce thousands of exceptions and, as a result, the exception resolution process is very tedious and often consumes the majority of the planner's week. While some manufacturers have deployed supplier portals to communicate these changes, more complex and critical changes still require direct follow-up with the suppliers—a multienterprise supply chain process.

Provide suppliers with real-time visibility to exceptions: Supply Chain Issue Management digitalizes the exceptions output from the planning system to automate follow-up and confirmation or resolution. Based on permissioned set by the operator, suppliers are immediately made aware of changes to open purchase orders and become an active part of the exception resolution process. Using Supply Chain Issue Management real-time dashboards, planners can identify suppliers with the most open exceptions, which is an early indicator of potential supply disruptions. Similarly, the By Due Date panel on the dashboard enables planners and suppliers to identify exceptions that are overdue and may lead to supply disruptions. While suppliers may not always be able to comply with requested purchase order changes, supply plan accuracy will improve as planners get much better visibility into what the supply will be and can adjust the plan accordingly.

Enables better decisions at daily or weekly production meetings: Supply Chain Issue Management real-time dashboards provide managers and planners with the ability to identify critical and high-priority issues and the visibility needed to make better business decisions and process improvements. Given that there may be numerous exceptions that need to be resolved at top suppliers, setting the priority and expected resolution date ensures the planning team and the suppliers' teams are aligned. Internal supply chain management teams can track resolution processes that are falling behind and monitor underperforming internal processes and partners. Internal teams and the management team have the visibility needed to spot planners that may be overloaded and apply additional resources as required. Supply Chain Issue Management users have replaced spreadsheets and whiteboards at production meetings with these dashboards.

TraceLink Supply Chain Issue Management is a workflow-driven, multienterprise collaboration solution for capturing, analyzing, resolving, correcting, and preventing planning exceptions and supply chain issues. Dashboards provide actionable visibility at all levels of the organization and across the end-toend supply chain. Issues can easily be captured, monitored, and grouped by priority, due dates, issue-resolution status, sites, and partners. And, supply chain partners can collaborate more effectively on supply chain issues using a single source of data. This leads to faster issue resolution times and a significant reduction in the total number of incidents.

Supply Chain Issue Management drives immediate and continuous value

Supply Chain Issue Management drives three levels of benefits over time:

Immediate benefits from shorter exception resolution time that frees up planners to address more exceptions with more accurate resolutions based on supplier input:

- Reduce order cycle times.
- Improve order fill rate, throughput, and planner productivity.

Intermediate benefits as more exceptions are resolved include:

- Reduce costs and cash-to-cash cycle times.
- Improve factory schedule attainment and inventory turnover.
- Improve allocation of short materials.

Resolution history and root cause analysis coupled with continuous improvement methodologies produce longerterm benefits from the reduction of recurring exceptions that improve supply plan accuracy enabling better alignment with the operating plan. Benefits include:

- Reduce production of partially completed assemblies and finished products.
- Further reduce order cycle times and cash-to-cash cycle • times.
- Improve supply plan accuracy, gross contribution margin, customer satisfaction, order fill rates, throughput, and inventory turns.

Immediate benefits: exception resolution time reduced by as much as 65%:

Companies that have deployed the Supply Chain Issue Management solution have found that the structured, workflow-driven processes it provides have reduced the time to resolve exceptions by as much as 65%. This productivity improvement is achieved almost immediately as planners, suppliers, and managers begin to use Supply Chain Issue Management, because suppliers are immediately notified about issues and priorities are adjusted, responsible parties assigned, and resolution dates are set. For planners, this delivers immediate value as exceptions are cleared much faster with reduced effort. With more than 30,000 job postings for planners on LinkedIn, it is more critical than ever to maximize planner productivity because hiring more planners will not be easy.

Order cycle time: Over time, the average exception resolution times become part of the order cycle times. Reducing resolution time reduces planning cycle and order cycle times.

Order fill rates: Collaboratively clearing exceptions also improves order fill rates as suppliers are engaged immediately. This is especially important during periods of high growth when open purchase orders are being increased frequently.

Throughput: With better informed planners attending production meetings, fewer incomplete orders will be released to production. This reduces unnecessary changeovers and improves throughput.

Intermediate benefits: number of open exceptions reduced by as much as 35%:

Easter resolution time and collaboration from suppliers has also enabled the total number of open exceptions to be reduced by as much as 35%. By enabling planners and suppliers to see exceptions grouped by supplier, systemic problems-such as incorrect lead times or unit of measuresbecome more apparent and can be addressed en masse. The collaborative dialog history in the exception resolution process also enables suppliers to provide insights not easily communicated via EDI confirmations or portals, such as a product that is being phased out in favor of a new model.

ADDITIONAL METRICS IMPROVED

Cash-to cash-cycle times: As order cycle times are reduced, less buffer inventory is needed for a shorter period of time. As these reductions spread across more components and finished goods, cash-to-cash cycle times will be reduced.

Schedule attainment: Fewer exceptions means fewer surprise shortages, which improves the manufacturing plant's ability to deliver against the schedule.

Inventory turnover: Extra inventory buffers poor performance. The combination of higher order fill rates, shorter order cycle times, better schedule attainment, and more precise exception management will enable safety stocks and WIP inventory to be reduced. Lower inventory improves inventory turnover.

Allocation of short materials: Engaging suppliers in the exception resolution process provides a more precise understanding of when and how many short components will be available. With this information, planners and senior managers can more intelligently allocate scarce components and avoid consuming them in assemblies that are missing other parts and cannot be completed.

All planning exceptions are not the same. Some exceptions are a result of the planning system aligning the plan with changes in the real world. For example, a large, unexpected increase in customer demand will generate exceptions as the planning system adjusts open orders to accommodate the increase in demand. Other exceptions may result from business process defects including bad data, inaccurate forecasts, or insufficient planning processes. Planning applications require accurate data including bills of material, lead times, safety stock, order points, unit of measure, supplier information, and much more. Inaccurate planning data will result in low supply plan accuracy and extra exceptions. Regardless of what causes the exception, Supply Chain Issue Management retains a history of the exception and the resolution process. An exception that results from incorrect data may be

simple to fix and may be done during the resolution process. For exceptions that require more rigorous analysis to identify the root cause or to develop a corrective and preventative action plan (CAPA), Supply Chain Issue Management customers have used continuous process improvement methodologies like Six Sigma DMAIC to eliminate recurring exceptions. In the case of the unexpected increase in demand, this may be a one-time event or an indicator of an inadequate forecasting process. Supply Chain Issue Management guides users through a progression of easy-to-use, configurable drop-down lists that capture a very complete definition of the exception during the resolution process. From this information, a Six Sigma team can determine whether it was a one-time event or a more systemic problem requiring further investigation.

The ability to collaborate with supply chain partners during the resolution processes further enriches the information collected and enables more permanent resolutions. By methodically capturing exceptions, collaboratively resolving them, and executing DMAIC process improvement projects against recurring exceptions, companies have achieved as much as a 96% reduction in defects per million and reduced recurring exceptions by over 50%.

The reduction in business process defects that generate an excessive number of exceptions means more accurate supply plans that enable planners to spend more time responding to market dynamics and unavoidable supply chain disruptions. Better plans are key to achieving all operating plan targets.

Benefits include:

- Reduce order cycle times and cash-to-cash cycle times.
- Improve gross contribution margin, order fill rates, throughput, inventory turns, and customer satisfaction.

Be prepared for any supply chain challenge

TraceLink Supply Chain Issue Management is a quick and easy way to harness the power of your planning team's expertise and that of your suppliers so you can all navigate these difficult times, improve supply accuracy, and get ahead of your competition. This will enable your supply chain planning organization to overcome the current supply chain challenges, help the organization acquire new customers, and grow revenue.

1 Gartner Report: Decoding Finance Targets for Supply Chain Planning – Published 10 February 2021, By Supply Chain Research Team

2 Gartner Report: How Supply Chain Leaders Can Improve Relationships to Win Support and Influence Others – Published 28 October 2021, By Analysts: Caroline Chumakov, John Johnson

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