BAXTER PLANNING

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Service Parts Planning and Execution Optimization & Automation

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Introduction

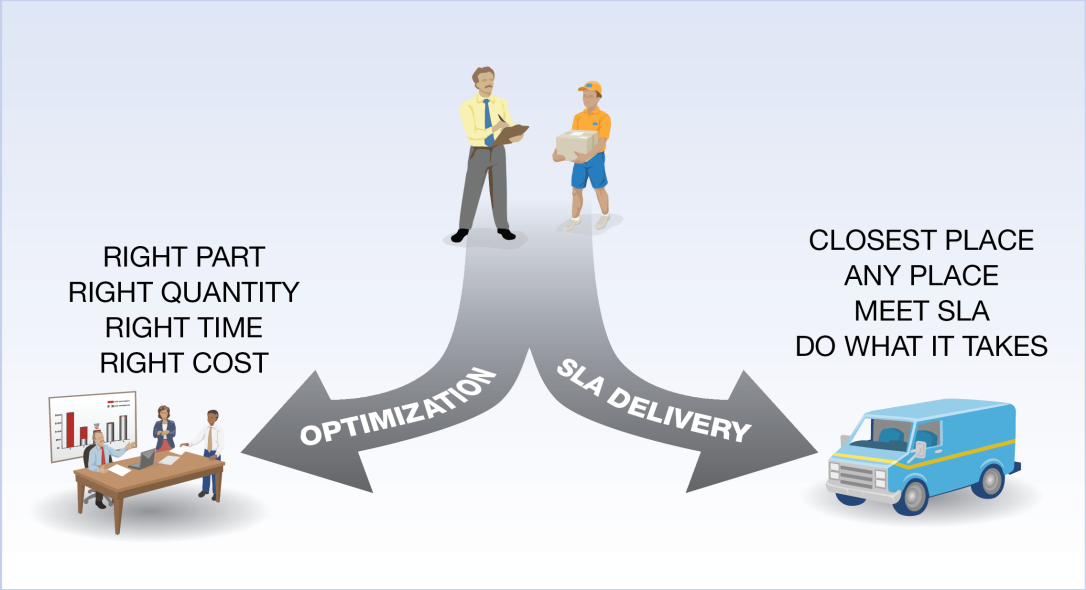
SPP is a forward looking, back office process that ensures the availability of "just in case" inventory to meet customer demand.

Most companies would agree that the lack of synchronization between Service Parts Planning (SPP) and Service Execution (SE) negatively impacts customer service and overall company profitability. This white paper addresses a common pitfall that companies face: having disparate Service Parts Planning and Service Execution logic.

Service Parts Planning is comprised of a four-step process: planning a logistics network, forecasting supply and demand, optimizing inventory, and ultimately generating orders to maintain optimal inventory levels within the network. SPP is a forward looking, back office process that ensures the availability of "just in case" inventory to meet customer demand.

Service Execution is the front office, client facing process that controls the actual delivery of service. It includes the process of selecting the optimal part from the best location to fulfill each service call or request for a service part. SE is a real-time, day-to-day customer facing activity.

SPP and SE begin with a common goal: meet customer service level agreements (SLA) at a reasonable and predictable cost. Unfortunately in most companies, forward looking SPP activities and real-time, day-to-day SE processes do not share a common set of logic that ensures cost and service level goals are met. Instead, the pathway towards the common goal splits, and SPP and SE become sub-optimal operations.



Planning and Execution Pathway Split

… managers feel as if they are playing the business version of "Whac-a-Mole," the arcade game where the mole pops up in different locations no matter how many times it has been whacked with the mallet.

In most cases, the split leads to a never ending, companywide reactive effort that oftentimes defies logic and elevates expediting to a critical business function. Unwittingly, this places a business on the defensive with no strategy in place to stop the endless emergence of SPP and SE problems. As a result, managers feel as if they are playing the business version of "Whac-a-Mole," the arcade game where the mole pops up in different locations no matter how many times it has been whacked with the mallet.

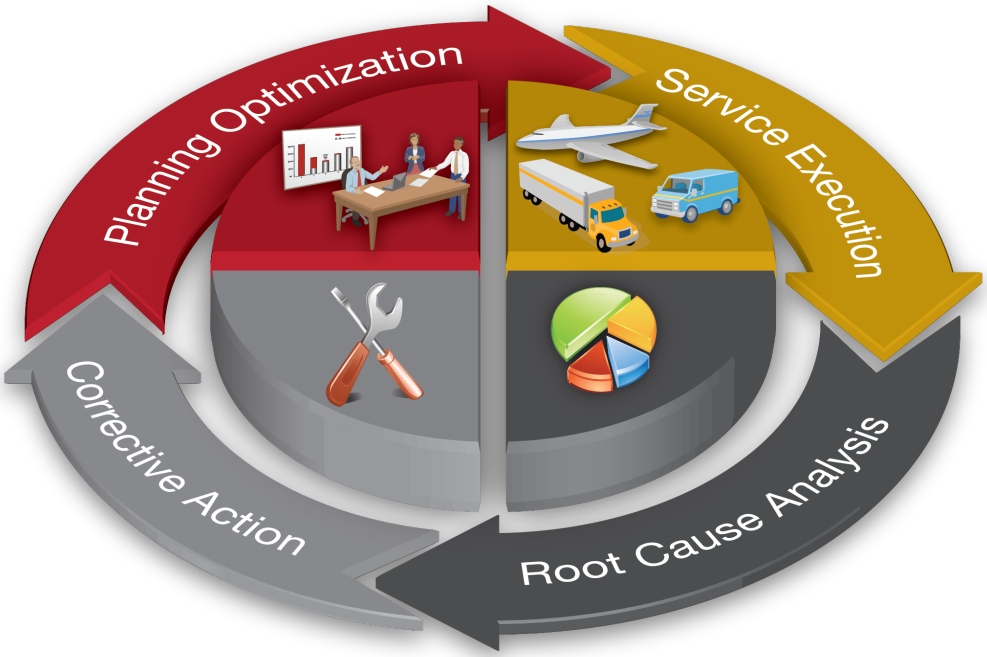
Here is an example:

> A California high-tech company had what can be described as a "disconnect" between its service parts stocking strategy and the operational processes for delivering parts to a service call. The company spent considerable time planning precise stocking quantities by part number in each of their many depots across the region. It was common that new parts revisions were introduced and stocked along with their predecessors.

The company's planning system understood the interchangeability of parts and would only stock enough of the combined quantities of old and new parts to reach the optimal total level, a strategy that seemingly made sense in theory but not in practice. Problems immediately surfaced when many service calls resulted in requests for one version of the part but the operational side did not comprehend that another acceptable version was available locally. The company often expedited the exact part number from another location and paid premium freight charges to meet the contractual commitment. Only when no source for the requested part was found did the process introduce human intervention from a technical expert to re-direct to the alternate part, a prime example of unnecessary expense.

For all the cases where the requested part was successfully sourced (expedited) from another location, the company measured the event as a success or hit. The hit rate for these and parts sourced locally was 93 percent, but that figure was misleading. After learning that its service execution process was broken, the firm began to measure the true hit rate and found it to be much lower —76 percent. This rate reflected only the cases where the part was successfully sourced from the planned local location. After installing tools to help correctly identify alternate parts, the hit rate jumped to 85 percent, but that was not the end of the improvement effort. With the introduction of root-cause reporting of 15 percent of misses, planning and logistics models were fine-tuned to improve the hit rate to 96 percent. The bonus for the company was nearly a 20 percent reduction in logistics costs since the company no longer had to pay unnecessary fees to expedite replacement inventory.

Due in large part to the “ship anywhere anytime” type capabilities that exist today, customer service level expectations are often met, but at the expense of optimal inventory and transportation cost goals. A far better option is to ensure that an integrated SPP and SE process exists and that automated measurement and corrective action plans are in place to drive continuous improvement.



Integrated Planning, Execution, Measurement and Corrective Action

Planning Optimization

Service parts planning complexities vary greatly from one company to another.

- One company may provide direct onsite support and know the exact location where all sold equipment is installed as well as the service level commitment associated with each client or piece of equipment.
- Another company may sell and service products indirectly via a distributor channel and therefore have no visibility to customers or product installation locations.
- Product and parts life cycles and support requirements may range from months to decades.
- Logistics networks may consist of one central warehouse, regional warehouses or a global network consisting of hundreds or thousands of locations.

- Purchase and repair suppliers may be centralized or each region may utilize local sources.

The support model, product life cycles, logistics networks and supplier options referenced above are only a few of the factors the planning organization must address.

A fully optimized planning system must also consider the criticality of location and customer, inventory cost, emergency transportation cost, replenishment cost, and other internal or external costs driven by a service part request failure (collectively known as the "stock-out cost"). "Stock-out cost" examples include the cost of a repeat visit by a technician, a service contract penalty clause or the cost of expedited transportation fees.

Regardless of the level of SPP sophistication employed, the results of the planning system as measured both internally (by management) and externally (by the customer) will suffer if the actual SE parts sourcing process does not match the planning logic described above. In other words, unexpected results that are usually negative in some manner will occur if the execution system is not synchronized with the planning system.

Of course, while SE is measured on its ability to meet customer service level commitments, managing related service execution cost is equally critical.

Service Execution

Service execution typically includes call center, dispatch, parts sourcing, reverse logistics and repair processes. A key goal of SE is to meet customer service level commitments whether the service model is a next-day part shipment from a central warehouse or two-hour support from a 1,000 person field engineer organization.

There are a number of issues that might arise with every service call requiring one or more service parts. These include:

- Contractual or management driven service level commitments
- Part chaining: The process in which one part can be substituted for another.
- Cross border shipping considerations: Must account for each country's rules, regulations and customs requirements.
- Warehouse hours of operation: Need to account for warehouse business hours in each time zone when sourcing parts. Additional costs will be incurred if a warehouse must be reopened after closing for the day.
- Shipping cut off times: SE should incorporate shipping hours of operations and consider adopting a "follow the sun" methodology when selecting a warehouse for end-of-day orders to assure parts delivery to fulfill commitments; e.g. automatic selection of a West Coast warehouse after East Coast business hours.

Of course, while SE is measured on its ability to meet customer service level commitments, managing related service execution cost is equally critical. Everyone is familiar with the phrase "statistics don't lie." At the same time, the measurement and presentation of statistics will influence their validity as will statistics that are measured in a void. Both can be misleading.

Consider the following example:

> A customer has paid for a four-hour service level commitment contract (the failed equipment is to be fixed in four hours) and Part A has just failed. The planned primary location (the only location close enough to meet the four-hour requirement) does not have Part A in stock; however, based on SPP optimization logic, a fully compatible Part B is available. Part A is stocked at a distant stocking location and is available to be shipped next flight out or overnight to the client location.

A service level measurement system that allows "any part in any location" to be used and measured as a "success" without consideration of personnel, transportation and other costs will yield vastly different bottom line results than an integrated service part planning and execution model.

The SE system should automatically recognize that Part B is available and should be used to support this client. If Part A is selected, the customer service level requirement will be missed while additional emergency transportation costs (next flight out or overnight emergency shipment) would be incurred.

This is a simple example that occurs worldwide thousands of times on a daily basis. In general, companies are able to track and measure inventory fill rate/part availability (the part was delivered on time). However in most cases, companies cannot determine if the optimal part was available and the option of "any part" delivered in "any manner" was selected.

A service level measurement system that allows "any part in any location" to be used and measured as a "success" without consideration of personnel, transportation and other costs will yield vastly different bottom line results than an integrated service part planning and execution model. The latter is focused on ensuring that service parts demands are filled from the primary planned stocking location.

Integrated Service Planning and Execution

An integrated SPP and SE model begins with SPP optimization of each tier of inventory, including customer onsite, unmanned, field engineer, third party logistics (3PL) local warehouse, regional and global warehouses. The optimization process should utilize service contracts whenever possible to ensure that the logistics network will support the customer contracts and that the inventory placed in the network will support the forecasted demand. Part/location optimization then determines which parts in what quantity to place in each stocking location.

The SE parts sourcing system should follow the same logic as the planning system by ensuring that each part demand is sourced from the primary stocking location (as selected and optimized by the planning system) for that part and customer. If the part is not available from the primary location, another location should be chosen to fill this demand to ensure the customer service level is maintained. From an external viewpoint, the customer is likely to consider their service delivery a success because the part was provided in the contractually-required time period. However from an internal perspective, service delivery should be considered a failure because of the unnecessary extra costs incurred to meet the commitment.

Measurement and Root Cause Analysis

Operational reporting and the review of parts fill rate, inventory cost and transportation cost metrics are intended to improve overall bottom line results. Limiting review of these items to a macro level only will not drive continuous planning and execution improvement.

A true measure of SPP and SE success is only available after analyzing every demand for a service part. Each failure to source the part from the primary planned location (the optimal location) should be defined as a part sourcing failure (a "part miss"). Given the complexity of the typical service parts operation and the volume of material requests, this can only be managed via an automated solution.

Via detailed parts level analysis, "part misses" may be categorized into various root cause categories (with examples):

- *Planned*: the planning system made the choice not to stock that part at that location.
- *Data Failure*: service parts are missing from product bills of material or demand is captured incorrectly.
- *Execution*: The planning system established a target stocking level at the required location and when the on-hand inventory level fell below the target, the replenishment process ordered more. However the material could not be acquired per the committed lead-time due to issues with the supplier, transportation or the central warehouse.
- *Operational*: the part was available in the correct location, however that part was not used.

Determining the root cause of each "part miss" is the first step toward improving results and lowering costs. The next step is to implement corrective action to ensure that this failure does not occur again.

Corrective Action

Each of these root cause examples leads to different SPP or SE corrective action paths. For example, the identification of:

- A missing part in a service bill of material may alter the optimal target stocking levels for that part number in multiple locations.
- An execution system failure to replenish material on timely basis may identify the need for an alternative supplier for this part number.
- A missing product on a service contract will drive improvement of service level fulfillment for that contract.

Root cause measurement and corrective action plans provide the foundation for continuous SPP and SE improvement.

Summary

An integrated Service Parts Planning and Service Execution system, combined with root cause analysis and a proactive correction plan, will ensure that the service parts supply chain is operating efficiently, the total cost of service is under control and the company's statistical data is accurate.

An integrated Service Parts Planning, Service Execution system, which incorporates meaningful measurements, root cause analysis and corrective actions, will ensure that "Whac-a-Mole" is a game played at the arcade, not within your business.

Service parts execution processes, which are aligned real-time with planning rules, will drive call center productivity, improve fill rates and reduce emergency transportation costs. Customer service level measurements in Germany can be compared to calculations for North America. Root cause and corrective actions taken after a service parts miss in Atlanta will eliminate a similar issue from occurring in Singapore.

An integrated Service Parts Planning and Service Execution system, which incorporates meaningful measurements, root cause analysis and corrective actions, will ensure that "Whac-a-Mole" is a game played at the arcade, not within your business.

Baxter Planning: Prophet by Baxter

Prophet by Baxter consists of service parts planning and execution capabilities that provide the functionality required to optimize and to automate the Service Parts Planning, Service Execution parts sourcing, Measurement and Root Cause Analysis process.

Prophet is an integrated suite of planning tools that determines the optimal logistics network, calculates the optimal target stocking level for every part in each tier of inventory, and recommends purchase, repair, replenishment and redeployment orders required to maintain all locations at their optimal inventory level.

Prophet by Baxter: Global Parts Sourcing is an integrated real-time bridge between Service Parts Planning and Service Execution used to determine the optimal location and part number to fill an external parts request.

Prophet by Baxter: Hit Rate (Root Cause) Reporting will analyze every request for a service part to determine if a part was available or unavailable to fill the demand order. If a part was not available to fill the order, it is categorized as a "part miss". All part misses are then accumulated into specific "part miss" categories. The root cause of each category contains recommended corrective actions to ensure ongoing continuous improvement in the service part supply chain.