The Nine Basic Rules of a Successful Supply Chain

By Will Scott and Chas Oldfield
About this document:

The Nine Basic Rules of a Successful Supply Chain is the first in a three-part series created by Waer Systems. The series is designed to help OEMs and Tier I/II manufacturers – especially those involved in the procurement and inbound supply of high volume low cost parts – better appreciate the value of maintaining a world-class supply chain.

The other two parts in the series, Supply Chain Alignment Assessment: A Road Map and A World-Class Approach To C-Class Components, provide a deeper understanding of the methodologies behind developing a more efficient and effective supply chain. They are also available at no charge to qualified individuals.

Part I: Supply Chain: A Definition

The Supply Chain is the process through which a company creates and distributes its products and services to the end user. It includes a number of specific elements; production planning, material sourcing, transportation management, warehouse management and demand management. These functions are tightly integrated to provide the products and services to the end user in an efficient, timely and profitable manner.

In addition to internal functions, the supply chain also encompasses the activities of external entities, including materials and parts suppliers, manufacturers, distributors, and transportation providers. The supply chain comprises not only the movement of goods between supply chain participants, but also the flow of information and funds. Supply Chain execution begins at the point a demand is created and is about the efficiency and efficacy with which that demand is fulfilled.

Part II: The Scope of this Document

Anyone who has spent any time working with and around any supply chain should have a good idea of the underlying principles. Most supply chains are built with the standard supply chain principles in mind and, in their infancy, typically function to a satisfactorily level.

However, the problems arise when supply chains mature and are asked to meet an ever-increasing list of tasks and strategies. The business, the suppliers, the processes and even the people change. The actual supply chain can also change as the Supply Chain Management (SCM) process is evolutionary by nature. As this happens, supply chains can start losing hold of the critical basics that make them work and, as importantly, that help the companies using the supply chain meet their own objectives.

It is important, therefore, to keep a list of “Supply Chain Basics” handy and continually monitor your supply chain with these underlying principles in mind.
Part III: The Basic Rules of a Successful Supply Chain

Rule #1: Demand triggers must be identified as quickly as possible.

Speed is often the primary concern of anyone who manages a supply chain. The faster stock moves, the better the chain is perceived to be.

There is no doubt that getting the right part to the right place at the right time – as quickly as possible – is the #1 priority of a supply chain.

This requires that, at any given time, you have enough of the right parts in your supply chain. In order to assure this occurs, many supply chains err on the side of having too many of every part. In many cases, far too many.

To understand why, we must look at how stock arrives in a supply chain in the first place.

Stock exists in a supply chain for any or all of these three reasons:

1) It is the most economical way to move materials from point A to point B (and points C and D and E…)
2) The variable nature of supply, in terms of late delivery, quality failure rates, etc.
3) The variable nature of demand, both in timing and quantities

The variable nature of demand is what many people believe is the primary culprit to having too many or too little of any given part in a supply chain. This belief has driven many system providers to focus on improving their forecast models.

An improvement in the response time of the supply chain is as valuable as an improved forecast. The more quickly you can transfer information about actual usage back to the supply chain, the more quickly you can adjust to increases and decreases in demand, thus assuring the right numbers of each part arrive into your supply chain before they are needed. Having more time to react also provides you with the ability to ship and store parts more efficiently, further decreasing your overall costs.

This requires visibility of the entire materials flow, not just within your own plants and warehouses, but also on the actual assembly floors, even if this is two or three tiers removed from what your company might consider to be your supply chain.

Just as the presence of static inventory in the supply chain should be challenged and if possible removed, any delay in information transfer should also be eliminated.
Rule #2: Make sure the person who is supposed to take action acknowledges and confirms this requirement.

Information about demand changes and the requested actions should always be targeted directly to the person who can use it and is expected to take the appropriate action. Optimally, this should be the same person. As importantly, these details should be translated into a format that is easy for that person to understand and use.

To assure that the request has made its way to the responsible person, there need to be checks in the system that avoid information being lost. Verification checks and read receipts are one way of doing this. Visibility of the response status to other people in the supply chain can then be used as backup if the primary response process fails.

Our goal here is as follows: Everyone in the direct line from supply to usage should know that the triggered event has a) taken place and b) been acknowledged by the person responsible for making sure that any next steps are set in motion.

Let’s look at a real-life example: When you send someone a critical e-mail or order a product online, you expect to receive, nearly instantaneously, a return e-mail indicating that your submission was received and that the transaction has been, at least, logged. While you might not expect any action to take place quite yet, this acknowledgement allows you to rest assured that any necessary wheels are set in motion.

Rule #3: Everything needs to remain in context.

Each time a trigger occurs – or data is collected – your supply chain should include a mechanism for answering the following question: Is this a ‘normal’ event, an ‘extraordinary’ one, or something in between?

To do this we must first define ‘Normal’ for that part and supply process.

For example: Say you order a monthly magazine to be mailed to your house. First, you receive a ‘thank you’ note from the publication. Then you expect to start receiving the publication itself.

You will view it as ‘normal’ if, at the beginning of the next month, you receive the publication in your mailbox. You will also view it as normal if you do not receive the publication that first month. You might be disappointed, but you understand that sometimes the publication does not arrive that first month.

What would make you surprised? If on that first month you received two copies of the publication. Or, if after having received the publication every month for seven months, it does not arrive on the eighth month.

This is because our past experience of events also contributes to our view of normal.

A forecast that has been confirmed consistently by actual usage, or has been compared to usages of similar parts, is much more powerful than either piece of information alone.
It is this normality and previously validated future prediction that allows us to detect when an event is out of the ordinary and is important. It is this that triggers us to seek a context: Has demand increased or decreased? Is this a single event in one area or are we about to see dramatically abnormal demand throughout the chain? This is the context a supply chain needs to be able to see and provide in order to lessen the likelihood of overstocks and shortages.

In other words, the supply chain reporting system should provide more than data, it should also provide information. It needs to show not simply numbers, but changes.

*But before we move to the next rule, there is another real-life example that comes into play: asking for directions.* If you ask two people for directions and both of them independently agree on the correct path, you are both more confident and more certain that you have received good instructions. Imagine being able to ask someone at both the departure point and the arrival point about the best route to pursue. If they match, you are even more confident in the directions.

Bing able to compare forecast models against usage data can provide this perspective … and increased confidence.

**Rule #4: Mechanisms for clarification are critical.**

Let us assume we have seen an extraordinary trigger that is, for sake of this example, fifteen days earlier than expected. That is, fifteen days earlier than both the forecast and the historical data have led us to believe is ‘normal.’

The supplier has seen this, sent their recognition of the trigger, and understood that this was abnormally early. By itself, this early demand is manageable. But we must make sure to ask the following question: Is it an early indication of something more major?

This question leads us to another key basic need of a supply chain: a mechanism for clarification.

There needs to exist a way for the supplier to ask the direct line customer and their customer(s) to explain, as in the above case, the unusually early trigger.

This can be as simple as an e-mail from the supplier or as robust as a shared portal.

Without the opportunity for clarification, most suppliers will err on the side of ‘just in case.’ Meaning they will select the possibility that results in extra stock ‘just in case’, which puts us back where we started.
**Rule #5: Task individuals, not committees.**

In the rules above, you have seen a number of places where we have said ‘person’ and not ‘team.’ This is not by accident.

A supplier has queried its customer about an abnormally early order for a small batch of parts. How? The supplier sent an e-mail. So far so good? Not quite.

The e-mail was sent to all five people in charge of that portion of the supply chain. Each assumed someone else would respond and, well, with so many other things going on, the clarification request was lost in the shuffle. The supplier assumed that no additional effort was required. Unfortunately, the abnormally early order was the first trigger for an increase in production. More ‘abnormal’ triggers start coming in and shortages appear throughout the chain.

The solution here is to make sure that one person, not a committee, is tasked with replying to a discreet list of suppliers and/or portions of the chain. Others can and should be included for technical assistance, input, backup, etc., but no more than one person should be accountable for assuring that replies are sent within a predetermined period of time, dependant on the priority level of the request and/or component.

**Rule #6: Group similar tasks, not just similar priorities.**

Once parts are manufactured, we need to find the best combination of…

1) the *fastest* way to move the parts
2) the *lowest cost* way to move the parts
3) the lowest cost way to *store* the parts

The second and third variables combine to provide the following: *It is sometimes better to let parts sit on a warehouse shelf for a while.*

This might sound like an admission of failure. That we admit we cannot always be as efficient as possible. In some cases, this might be true. But in many other cases, it is actually a best practice. A best-practice that finds many real-life examples to support it.

*Let us look at two: Screwdrivers and shopping lists:*

1) You are *installing an electric socket – which is a critical need – and the last step is to screw the new socket and plate in place.* So you get a screwdriver and, in seconds, you’re finished. *But before you put the screwdriver away, you look to see what other jobs might be completed with this screwdriver.* This makes the most your effort, even though you might be fixing items that have a lower priority.
2) Another example is when you create a shopping list before you go to the store, even though you only need some milk for your next meal. You think: “Since I am going to the store anyway, I might as well solve all my known shopping needs.” As you appreciate intuitively, this will save you time and energy, even though it means you will have to ‘ship’ some items earlier than needed and, once back home, ‘warehouse’ items for longer than previously anticipated.

Both of these are examples of smart supply chain management.

So now that we are ready to start shipping in batches and putting items on shelves, we need to start thinking of ways to increase the value of the transportation and storage.

The obvious answer here is to group by priority and due dates. As we can see above in the ‘screwdriver’ example though, it is not always the most efficient. The most efficient way is to group by any of the following:

1) similar items,
2) items going to similar locations, and/or
3) items with similar manufacturing and handling requirements.

This same decision-making process should be used when assigning tasks to personnel, from the pickers in the warehouse to front office managers. Obviously we need to make sure any high priority and/or rush needs are met, but once those are completed, let’s also see if we can’t conserve our efforts for known future needs.

Rule #7: Evaluate risk in threes: the forecast, the demand data, and the understanding that forecasts are skewed by previous bad events.

A stock out can be a very expensive event. With this in mind, it’s always important to err on the side of having a few too many of a needed item instead of cutting the need too close. But how many is too many? And how close is too close?

The best way to evaluate this, of course, is by evaluating the risk of the possible downside. If you are putting together a sub assembly for a future order and the shortage requires you to expedite a packet of items from the nearby warehouse to the line – for a total cost of $35.00 – then you certainly wouldn’t make sure all eight stations (for example) had an extra $100 worth of parts sitting nearby just in case. But if the same stock out meant a $100,000 penalty, then the additional $800.00 ‘insurance’ costs (eight lines needing an additional $100 worth of parts) might be a good value.

We all know this. What is less obvious is how we can best assess the likelihood of the stock out or shortage and find a level of confidence that balances the risk.

For this we will need to see both sides of the equation:

The forecast data – showing how many of each item we anticipate needing and any mitigating future factors, such as ramped up or decreased orders.

The historical (pull) data – showing how fast we are using the supplied parts and how closely the actual usage matches the forecasted usage.
We will also need to understand one other thing: *once bitten, twice shy.*

Forecasters, no matter how diligent and bold, will nearly always err on the side of lower risk, especially when there has been a history of pain.

*For an example of this phenomenon, we turn to weather forecasters: There have been some classic cases when a weather forecaster has predicted a light to moderate snowfall only to see a blizzard arrive, causing them great embarrassment and, possibly, the loss of their job.*

*As there is far less consequence to predicting too much snow, they will skew their forecasts upwards. Often dramatically so. A predicted one to three-inch snowfall becomes one to nine inches. A predicted three to six-inch snowfall could be televised as three inches to three feet! Even when the snowfall is only two inches – or fails to arrive at all – the weathercaster will arrive to work the next day expecting no dire consequences.*

This three-inch to three-feet forecast, though valueless to those of us watching the weather, has a parallel to those who forecast and procure materials and parts.

Fortunately, a supply chain is far more reliable than the weather, so long as you can accurately compare the forecast data to the pull data.

**Rule #8a: Motivation should be a foundation, not an afterthought.**

Before we implement any change – whether it’s an upgrade, a new technology, or even the elimination of a step in the process – we must keep in mind that people, not technology or spreadsheets, make up the backbone of every supply chain.

People, unlike machines and materials, require motivation to function at their best.

How can you help make sure that the ‘human wheels’ are always well primed? There is no one method, nor is there a one time fix.

The reason for this is that motivation is a moving target. Additionally, morale rises and falls in unpredictable ways for unpredictable reasons.

*Before we provide any advice, let’s start with an example: On one assembly line, we noticed that operators were hoarding parts, which was costing the company money, hurting their ability to predict usage, and slowing production. (It is not within the scope of this document to explain why this might be the case.)*

*We collected all the hoarded parts (the company’s management was surprised at just how many we found!) and implemented a more controlled and traceable flow to each station. Then we sat back and waited to see the increase in productivity. It didn’t come.*

*It seems that each time the line workers saw a decrease in the number of parts coming to their station, they knew redundancies and cutbacks were also soon to follow.*
While the plant had a record number of orders, the line workers could only judge the amount of future work by the parts they had near their station. The more parts they had, the less they were afraid of losing their jobs. The fewer the parts, the higher the perceived risk to their job securities. The more they were afraid of job losses, the slower they worked to help stave off the day when they would have nothing to do.

What did we do? We called an all-hands meeting and outlined the entire situation. The operations manager explained that the increased efficiencies – leading to a more controlled number of parts to each station – were due to the higher levels of orders. She showed the stocks of open orders to make her point. After that meeting, we saw the expected increase in productivity.

There are two lessons to be learned here.

One: The more transparent you make the process to every member of the team, the more they can see how their part in the process is critical.

Two: That people are the most important part of any supply chain and we should never take their efforts for granted.

Rule #8b: Don’t reward bad suppliers with increased orders.

No discussion on motivation within the supply chain can be complete without one of the classic examples of negative motivation: buying more stock from suppliers with poor delivery histories.

The reason for this is clear. To buffer yourself against their unreliable supply you add more stock, thus rewarding the supplier’s poor performance with larger orders. Conversely, the good suppliers are punished for their reliable performance with smaller orders, shorter lead times, and, most likely, smaller profits.

Eventually, you believe, this will come back to haunt the bad supplier. In the meantime, however, you are sending out precisely the wrong message to your supplier base.

This is one of the main reasons to consider consignment warehousing. While there is certainly a cash flow benefit for the procurer, there is possibly a larger benefit: it corrects this issue of motivation and allows good suppliers (that is, those who can maintain consistent supply with less stock) to beat the bad suppliers out of the supply chain.
Rule #9: The more things change, the more things need to be able to change.

A successful supply chain should not be static but always adapting to the changes in the business. A supply chain should be a source of opportunity, not a constraint.

Any changes – whether due to increased productivity, an improved process, the addition of new suppliers, etc. – will probably require changes to the supply chain.

Additionally, the industry continues to shorten deadlines and tighten the acceptability of excess inventory. This creates the need for supply chains that are far leaner than any that existed in the past. These supply chains will have very different features from the original supply chain that was designed.

When designing or modifying your supply chain, you need to keep this idea of change in mind:

1) *Any technology or process improvement must be adaptable for future needs.* These future requirements can be predicted by seeing the needs of other companies that are considered to be industry leaders and world-class manufacturers, both within and outside your industry.

2) *Adding and altering parts and supply points are as much a part of the supply process as the movement of stock.* In many systems this 'maintenance' mechanism is not designed to the same degree as the part movement area of the system. This causes delay in the response of the system to new demand and means that stock levels are often higher initially than needed.

3) *Your people must have time to work on this.* We have, for many years, told our customers that our goal is to help them automate the norm, so they can spend more time adding value. If your personnel are constantly expediting or chasing parts, they do not have time to improve the robustness and performance of the whole supply chain.

A manufacturer is only as efficient as its supply chain allows it to be. A supply chain is only as efficient as its weakest link. It is important, therefore, that there are people in the process that have not only the expertise but also the time to continually monitor and improve the supply chain.
PART IV: About Waer Systems and How We Can Help

Two Decades of Supply Chain Innovation and Leadership

Since the early 1980s, Waer Systems has been helping leading aerospace OEMs (e.g. Airbus, Bombardier, etc.), 3PLs (e.g. Satair, GE Supply) and Tier I/II manufacturers gain optimal profitability from their supply chains, as well as increasing the overall control and visibility they have over their warehouses and materials flow.

Waer Systems provides lean techniques and innovative software solutions for Vendor Managed Inventory (VMI) and Replenishment Management Systems (RMS) in order to help increase the ready availability of parts while decreasing the reliance on safety stocks and excess inventory.

To learn more about our capabilities and how we can help provide a cost-effective and detailed Supply Chain Alignment Assessment visit [www.waersystems.com](http://www.waersystems.com) or contact one of our main sales offices:

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