



Best Practices in Improving Container Management and Increasing Supply Chain Efficiencies

A Five Step Plan to Implement Container Management Solutions and Improve Supply Chain Visibility

Challenges in Today’s Environment

Year after year, Supply Chain executives have ranked ‘end-to-end visibility’ as a critical capability for successfully running mature demand-driven supply chain networks. The most effective and efficient way to enable visibility is by tracking the movement of the shipments: from suppliers to the manufacturing facility, within the manufacturing facility, and then as finished goods to the customer via the distribution network.

Currently, the only way available to achieve this visibility is by collecting data from disparate systems of different suppliers, transportation companies, manufacturing locations and customers. This is a time-consuming and expensive process since all these companies have different transaction systems, and each system may have its own data definition and construct. And while obtaining supply chain visibility is difficult for many reasons, the even bigger challenge is to have visibility when there are no transactions recorded in the system. Examples include:

In-transit movement

Typically, there is no information on the in-transit location of the shipment. Usually the last transaction is made when the shipment leaves its last location. From that point onwards, there is no visibility until the shipment reaches the receiving dock of the customer.

Work-in-process (WIP) tracking

For manufacturing companies, WIP tracking is important to monitor material flow and consumption. However, today’s reporting systems do not provide detailed location and consumption information in real-time for WIP goods.

Special processes

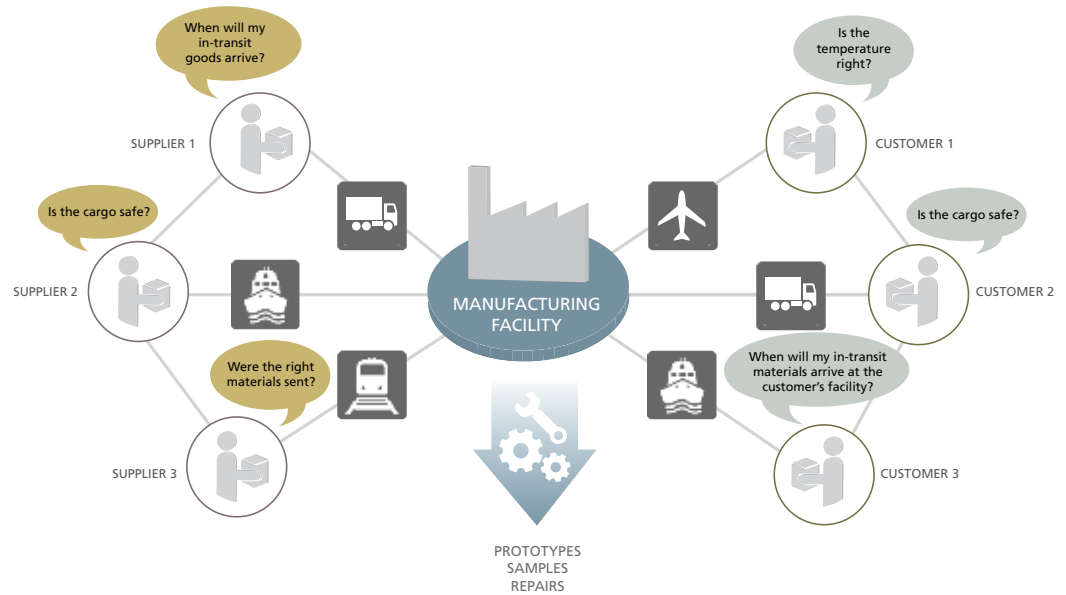
All companies have special or “one-off” processes for things such as container repairs, samples for testing, shipping of prototypes, etc. These special processes cannot be tracked in the existing systems without significant changes (and services costs).

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Sensor information

In addition to goods or assets, organizations frequently need to track details related to them such as temperature and content level. Unfortunately, this type of measurement activity can only be done by manually recording this information.



SUPPLY CHAIN VISIBILITY CHALLENGES

Collectively, these gaps have a substantial impact—or lack thereof, to be more precise—on comprehensive, quality supply chain information. As a result, companies are unable to monitor and control their supply chain costs relative to inventory, sourcing, manufacturing, transportation and distribution. With organizations searching for efficiencies in every nook and corner of their business, plugging these visibility gaps has become a top priority for supply chain leaders.

Plugging the Supply Chain Visibility Gaps via Container Tracking

Shipping platforms, which are used in the transportation and storage of parts, components and finished goods, are ubiquitous in logistics and supply chain networks. Examples of such platforms include large containers, intermediate bulk containers, pallets and totes. For the sake of simplicity, we will refer to all these different examples of the shipping platforms as “containers.” These containers are the backbone of all supply chain processes related to inventory management, sourcing, manufacturing, transportation and distribution. Therefore, the most efficient way to obtain visibility into all of these disparate processes is to monitor the movement and location of the containers.

To understand the value provided by container monitoring, let's first review three specific areas that benefit:

1. Inventory reduction at manufacturing location
2. Improving replenishment efficiency at customer
3. Controlling container management costs

Inventory Reduction at Manufacturing Location

Companies carry inventory in the form of raw materials, WIP and finished goods. Inventory can be a double-edged sword: organizations need enough inventory to ensure smooth production; however, too much inventory can quickly become obsolete and a drag on the balance sheet. With real-time visibility into the location and condition of the containers (as well as the inventory they hold), companies can achieve greater confidence in supplier delivery schedules, inventory consumption patterns, and finished goods production schedules.

Reducing excess inventory has real bottom-line benefits for organizations. According to a LeanLogistics study (LeanLogistics is a top Transportation Management System vendor in the US), a two day reduction in the days of inventory for a company with \$3 billion in annual revenue can have a cumulative balance sheet impact of \$9.59M over three years due to reduced inventory and labor expenses.

Some industry estimates state that between 15-20% of the total container stock is stolen and/or lost each year.

Improving Sales via Replenishment Efficiency at the Customer

In today's business environment, timely replenishment of inventory at the customer location is of critical importance. To illustrate, let's use the example of an automotive lube oil business. The supply chain is comprised of oil companies that ship lube oil in bulk to small (mom & pop) auto service shops using intermediate bulk containers. These service shops have limited storage space and working capital, and they replenish their inventory only when the remaining stock level is approximately 1/5th full. At this point, they make their next purchase decision — which of course is the ideal time for the oil company to contact them.

If the supplier of lube oil had a "level" sensor in the container—basically an alert triggered when the customer inventory falls below 20%— the oil company would know exactly when to contact their customer for a new order. Without a level sensor, the oil company is only "guess-timing" customer need and may lose that order to a competitor. With oil lube costing approximately \$5000 per container and assuming intelligence provided by the sensor translates to a 5% improvement in sell through rate, a 30,000 container/year supplier can see a revenue increase of \$22.5M over three years.

Controlling Container Management Costs

Another benefit of end-to-end supply chain visibility is in the management and control of the reusable containers themselves. Again, let's use a real-world example: automotive manufacturers use specialty racks for shipping automotive parts. Not only are these racks expensive (they cost approximately \$3,000 each), but also they are essential for moving parts and finished goods. If the right container is not available at the right location at the right time, it can lead to expensive last minute transportation (relocation) costs; in extreme circumstances, not having these specialty racks available can even stop the assembly line.

Unfortunately, these assets are also prone to misuse and loss. Some industry estimates state that between 15-20% of the total container stock is stolen and/or lost each year. For a company with 20,000 specialty racks, reducing annual loss from 15% to 5% equates to a \$17M savings over three years.

In addition to reducing loss & theft, another benefit of container monitoring is related to asset utilization. With better visibility of the container stock and their locations, companies can better utilize these assets through faster relocation and fulfillment. This improved asset utilization will help companies 'get more from less,' meaning fewer total assets are required to maintain and run their operations. A 5% increase in asset utilization for a company with 20,000 containers can have a benefit impact of \$18M over a period of three years, driven by reduced container purchases.

The Path Forward: How to Implement a Container Management Solution

Now that we have highlighted benefits of a container management solution including reduced inventory, increased sales and better cost control, you may be thinking "Sounds great – but how do I do it?" Below are five steps to get you up and running, so your organization sees immediate benefits.

Step 1

Understand (map) your container management process

The first step on your journey to end-to-end supply chain visibility is to map out your supply chain processes, highlighting the use of containers in these processes. At a high level, this map will likely include locations of suppliers, transportation partners, warehousing / storage, manufacturing and distribution. The key is to identify different locations where the containers are used and to map the pattern of stock and flow of containers at and between these locations. This map can be as elaborate as a multi-level Visio diagram to a simple, hand-drawn flow chart on a piece of paper.

Step 2

Identify your pain points

Once you've mapped the container management process, the next step is to identify the

current pain points and rank them in terms of severity and frequency. Here are some key issues that frequently arise to help you identify the main causes of supply chain pain:

1. Container utilization:

- a. Do you feel that your company is not appropriately utilizing the containers?
- b. Do the different locations report container availability and requirements?
- c. How accurate are the stock figures at different locations?
- d. How recent is the data related to container location and stock?
- e. Are the containers picked up as soon as they are emptied?

2. Labor efficiencies:

- a. How many people are involved in the container management process?
- b. How do these people locate containers? Is it primarily by calling different suppliers and plant locations?
- c. How much time per day do they spend in this process?
- d. If you have a reporting solution, is the data quality good enough for the container management team to rely on it?

3. Expendable management:

- a. How often do suppliers use expendables to ship to your location?
- b. Who bears the cost of the expendables?
- c. Do you experience higher product damage when shipment takes place in expendables?
- d. How successful are you to date to reducing the expendable use?

4. Container losses:

- a. Do you have a formal process for measuring container losses?
- b. Is there a particular location or a vendor where losses are higher than average?
- c. Do you charge the vendors for the losses?
- d. How often do you purchase new containers? How do you justify the purchase in case the losses are high?

5. Transportation management:

- a. Do you need to make last minute container shipments to ensure smooth delivery of product?
- b. Who bears the incremental cost of last minute shipments? Is it the vendor or your company?
- c. What was your total spending on urgent shipments last year?
- d. How well do you plan the container logistics operation so that your vendors have the right containers at the right time?

6. Warehouse space management:

- a. Do you have to earmark additional space for container management because you have an excess of containers?

- b. Are some locations falling short of storage space, so that containers are left out in the open and are most likely misused or stolen?

While these are issues we hear most often from our customers, it is likely that you will need to adapt this list to your organization depending upon the current state of your business.

The output from this exercise would be a very good understanding of the key pain points, with a reasonable idea of frequency and severity of these pain points. Armed with this information, you should be able to “rank” the areas causing the greatest pain.

A 5% increase in asset utilization for a company with 20,000 containers can have a benefit impact of \$18M over three years, driven by reduced container purchases.

Step 3

Identify and fill in information gaps

Key reasons why the issues mentioned in the previous section occur is the lack of container stock and movement data; or in cases where this data is available, the inability of companies to convert it into actionable information and share it with different partners. For example, you may not be able to calculate end-to-end container utilization since information related to container location and movement is not readily available to all the companies in the supply chain. Similarly, precious labor may be wasted locating containers as no accurate network-wide information is available.

To solve this problem, you need to first identify the information required to generate network-wide container visibility. Primarily, this requires capturing data relative to container and product movement at different points in the manufacturing and distribution process. We have seen that companies generate a majority of this data in their internal enterprise resource planning (ERP) systems. Unfortunately, this valuable data exists in silos and is not shared across all the supply chain partners. For example, a supplier may track the outbound movement of containers (and parts) in their system, yet this data may not be shared with the manufacturer. Likewise, the manufacturer’s plant locations would generate data for shipment receipt, but this remains in the plant IT systems.

The quickest way to get visibility of container movement is to collect the data from these different silos and merge it to generate movement information. In our experience, this first step can help fill many gaps, and provide actionable information to improve container and product visibility.

Once you have collected that information, the next step involves filling the gaps in the currently available information. As mentioned in the beginning of this paper, there are gaps

specific to in-transit movement tracking, WIP tracking, special processes and sensor information. Moreover, the data from the ERP systems is not real-time and in many cases, this may impact the quality of the information presented.

These information gaps can be filled by using different tracking technologies. There are multiple options available today, and depending upon the business, technology and operational requirements, companies can choose from barcode, passive RFID, active RFID, cellular and satellite technologies—or a combination of technologies depending on the specific situation—to provide visibility into the container movement in their supply chain.

Step 4

Monitor key performance indicators (KPIs)

Once all the information has been sourced, it can be organized into actionable reports and alerts that assist business owners in more efficient container management. The KPIs generated from the data can help answer the following questions:

1. How many containers do I have?
2. Where are these containers right now?
3. How long have the containers stayed there? Are they there for more than normal time?
4. Are my containers at the right location they should be?
5. Are there any potential losses?
6. What is my container utilization (cycle time)?
7. What is the average age of my stock?
8. What are my issues?
9. What are my returns?
10. How many of my containers are getting damaged? Who is damaging them? What is the cost per repair?
11. What is the level of the content inside the container?
12. What is the temperature of content inside the container?
13. Has the container been opened? When was it opened? Where was it opened?

Step 5

Data mining and analytics

Over a period of time, the data relative to container stock and flow can be mined to provide precious 'what if' analysis, which can help in better predicting (and controlling) supply chain costs related to inventory management, sourcing, manufacturing process, transportation and distribution. The available information can be enriched by incorporating data feeds from external sources that collect weather, traffic and other real-time information. This is a nascent capability and not many providers have the resources or experience in area.

This five-step approach has been proven to deliver successful solutions and has helped companies make their supply chains more efficient.

Prioritize, Pilot and Scale

While the previous section provides a step-by-step plan to implement a container management solution, in practice, it can be overwhelming to undertake this exercise for your entire business at one time. We suggest that you prioritize this implementation by first targeting the line of business that has the simplest supply chain process with limited vendors and manufacturing locations. In fact, even for this business, you may want to pilot with a specific container type. This way, you will be able to road test the container management methodology, and if required, tweak it as needed for your specific business needs.

By restricting the scope of the pilot implementation, you will be able to demonstrate results quickly, thereby building confidence with the key sponsors and gaining approval for wider implementations of the container management solution. Once you have completed this pilot successfully, you can begin to expand by extending the solution to additional lines of businesses or new container types.

Why Should Companies Start Now?

Logistics and supply chain cost reduction has once again become the focus for companies in the US. As highlighted in a recent Wall Street Journal article¹, companies have already cut labor costs and closed plants in 2008/2009 recession, and now logistics represents the biggest potential opportunity to squeeze new profits from operations.

From a technology perspective, the cost of sensor and tracking hardware has seen a big decrease over the last five years. Much of the cost reduction is due to manufacturing improvements and wider adoption of sensors in the industrial and commercial space. Also, the big data revolution is bringing in advanced techniques to analyze data, with cheaper and faster processing capability. Companies today have better chances of success in predicting process behavior and in controlling costs than ever before.

Savi Technology: Container Management Solutions

Savi Technology offers an end-to-end container monitoring and management solution that helps you improve asset utilization & control, automate & streamline business operations, and increase profits. With the Savi solution, you can:

- Easily access and know container location, quantity, utilization and cycle time, as well as monitor the age and condition of current stock
- Understand cycle and dwell time for specific containers and track the container's path, while having actionable information "pushed" to you when needed through built-in, configurable alerts
- Reduce theft / lost items and cut losses by avoiding write-offs with a comprehensive event management dashboard that notifies you of critical issues or deviations from plan

With Savi, companies witness immediate bottom-line benefits and make smarter decisions in the future by leveraging our "sense-and-respond" and predictive analytics capabilities. Savi offers a complete solution, comprised of software that integrates with hardware from Savi or other providers, delivered through the cloud so there are low to no requirements on your IT department.

¹ GM to open Stamping Plant in Texas, Wall Street Journal, October 14, 2013

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About Savi

Savi Technology provides organizations with operational analytics – the ability to collect and convert operational information into useful knowledge – from physical objects like supplies, equipment and cargo. The Savi Sensor Based Analytics Platform gives enterprises the ability to access, analyze and learn from new data in ways previously impossible, yielding streamlined operations, enhanced security and dramatically improved enterprise decision-making. Savi is headquartered in Alexandria, VA, with operations in Lexington, KY and around the world. Savi was named a 2013 Computerworld Honors Laureate for the economic improvements its technology has provided to several countries in Africa. Savi has more than 100 domestic and foreign issued patents covering a variety of technologies and is an active participant in several industry standards bodies including ISO 18000-7. For more information visit www.savi.com.