



Transforming Data into Dollars

Supply Chain Enhancements to Better Manage Your Customers

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The transformation of data into an actionable insight is becoming easier in today's world thanks to the wide availability of communication options and advancement in sensor and radio transmitter technology. Examples can be found within our own home environment: automatic meter readings by the utility company to determine consumption or usage for billing; automated software update downloads via the internet into your home computer to maintain the security of both your personal information and your computer's operating system. Additionally, telemetry systems are being incorporated into the vehicles that you drive. For example, the OnStar® system, offered by General Motors, combines wireless telemetry and communications to provide a number of services to subscribers. This is a good example as this application demonstrates the breadth of information technology available today. Of note is that these examples are not just about data, but about actionable insight. Examples of services include:

- Vehicle Diagnostics
- Turn-by-Turn Navigation
- Automatic Notification of Air Bag Deployment
- Emergency Services
- Stolen Vehicle Location Assistance

The chemical industry continues to institute initiatives that will drive costs from the supply chain and develop new products to enhance revenue growth. Mergers and acquisitions are accelerating these changes and influencing the way chemical distributors are doing business with both suppliers and customers. At the National Association of Chemical Distributor's 2007 Annual Meeting, Marc Fermont of Districonsult told the attendees that these new owners have created "dynamic" distribution firms, but they have also placed demands on their distributors which include inventory reductions and product price increases.¹

Access to remote information around inventory and logistics is one key to further optimization of the supply chain and enhancement of relationships to both suppliers and customers. Today, information and data retrieved from telemetry systems installed at chemical distribution centers and at customer's storage vessels allow for actionable insights to help managers make the correct decisions concerning the purchase of raw materials and the economical distribution of products to their customers.

Remote monitoring of assets is not new. Some companies, such as Air Products and Chemicals, Inc. have been using these tools for more than 10 years. However, recently the opportunity to leverage this data has become even more cost effective and also easier to implement. For example, trends in wireless technology, advanced sensors and communications costs have lowered the overall costs of using these tools. Further, in the past, many systems were designed to provide data, but not to be user friendly or provide actionable insights. Today's systems allow users to securely access information from any PC with a user friendly interface. Advanced algorithms now also allow forecasting, alerts and more without overwhelming the user with data although additional traditional historical data access is also possible.

Implementing telemetry to obtain information is a small, inexpensive step in revamping your supply chain, the benefits can be enormous and the savings can more than pay for the service provided, plus provide a noticeable

¹ NACD 2008: Distribution Sector Comes to a Crossroads, Chemical Week, http://www.chemweek.com/print/regions/north_america/us/9102.html



improvement in the bottom line of your balance sheet. Managing the replenishment of your products has been proven to be a practical business solution with substantial business benefits. The leadership of Skychain believes automated replenishment is beginning to enter the mainstream of business across the broad chemical and fuels markets.

Chemical Industry Trends

The 1990's witnessed a number of competitive challenges confronting US chemical businesses. Innovation ranks among the key imperatives of the 21st century, according to the American Chemistry Council (ACC). More specifically, ACC reports that the revolution in information technology will significantly alter market and industry structures that have historically defined the nature of competition.

As a whole, the Chemical industry is having an increasingly difficult time in achieving their profitability goals. This is attributable to a number of factors.

- Raw materials, commonly derived from oil and natural gas are increasingly more expensive.
- Distribution costs are up because fuel costs are skyrocketing while regulations on hours and safety have driven carriers to capacity.
- Product lifecycles have shortened. New molecules and formulations are commoditized and imitated.
- Consolidation, both in the industry and customer base, has led to more complex and difficult to manage supply chains.
- Capacity is online from East Asia, dropping market pricing and churning customer bases.
- Customer management is becoming increasingly difficult with shorter lead times, consignment contracts, and emergency production runs for partial fills and rush orders.

Yet within all this adversity, some chemical companies manage to grow and profit. Some embrace these trends and use them as drivers to innovate – not just with new molecules, but with new processes, technologies, and management practices. Managing the replenishment of your chemical products is one such innovation that has proven to be a practical solution that can deliver quantum benefits for all parties involved.

Any new innovative program, especially involving software and Information Technology (IT) spending, should be scrutinized for the expected ROI before making the investment. In the wake of significant Enterprise Requirements Planning (ERP) investments, appetites vary across the industry for solutions like automatic replenishment. Still, there are some process innovations that are so highly accretive that it makes practical business sense for many segments.

What is the typical path to managed customer replenishment?

Automatic product replenishment is the final phase of a typical evolutionary path of automating the supply of chemical products. Many chemical suppliers follow a process involving manual measurements of customer inventories and personnel intensive procedures for ordering, shipping, and planning. As corporations try to gain scale and efficiencies, awareness increases that some form of enhanced visibility and enterprise monitoring is required to remain competitive.

Customer Value Proposition

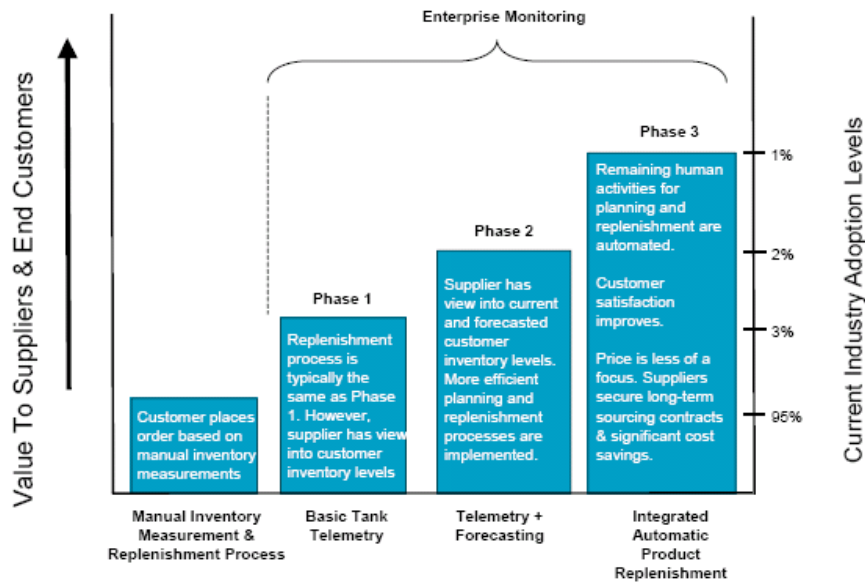


Figure 1

Embarking on an enterprise system is typically a three-phased approach. Phase 1, as noted in Figure 1 above, occurs when suppliers implement automated tank level monitoring technology on their customer tanks and have a view into inventory levels through the Internet or in some cases an ERP system. Phase 1 is accomplished through an internal initiative or outsourcing to a vendor specialized in tank level monitoring. While the replenishment process may not be changed much in Phase 1, the supplier has gained visibility and is in a better position by having access to customer inventory levels at any time. Unfortunately, just this added visibility is not sufficient to manage the replenishment inventory of a customer. Companies who attempt this quickly experience a scaling problem with customer service, where a tremendous amount of manual intervention and calculations must be performed every day.

In order to take the next step towards efficiency and turn the data into insight and action, suppliers enter Phase 2, where the knowledge of forecasted inventory levels at customer locations based on highly accurate and sophisticated forecasting modules is incorporated into the solution. These modules predict future needs based on actual usage patterns and proven mathematical algorithms. Armed with this knowledge, the supplier can now start to more proactively and efficiently manage the replenishment process for its customers. At this point the supplier is well positioned to take its current offering and gain maximum benefits. Skychain subscribers will have immediate access to all of the attributes described for Phase 2 and can apply the increased information toward decreased operating costs.

Through integration with existing ERP systems, a company enters Phase 3 and the bridge between the supplier and buyer is forged providing automation of the remaining human activities for planning and replenishment. At this final phase, the full hard and soft benefits of an automatic replenishment solution are realized.

Managing customer replenishment can be explained as a process that integrates the flow of information and supply chain decisions between the trading partners, in the planning and fulfillment of a customer's demand. This process will help close the gap between monthly Sales and Operating Plan (S&OP) process and short term order execution. This process will allow your company to get early warning signals faster, in order to build the right amount of flexibility into the customer, product and supply chain operation.



To improve flexibility, there appears to be widespread interest in managing capacity at the regional or global level, applying lean manufacturing techniques and getting replenishment signals as quickly as possible.²

One example is OxyChem, which uses telemetry devices in its vendor managed inventory program to continually monitor customer storage tanks and silos. Based upon a variety of criteria, replenishment orders are generated and automatically communicated to the OxyChem ERP system, thereby reducing ordering lead times.³

Another example of successful managed customer replenishment programs can be found at Air Products and Chemicals, Inc. Over fifteen years ago, Air Products was faced with the problem of how to provide the highest level of service (minimize run outs, flawless order and billing execution) while achieving operating productivity (reduce vehicle expenses and customer service costs). Air Products firmly believes in the benefits of vendor managed inventory programs that they implement this service in both their chemical and industrial gas business units. Air Products typically performs over 1500 bulk deliveries every day and these deliveries occur 24 hours per day, 7 days per week and 365 days per year. The magnitude of the daily logistical exercise involves scheduling thousands of drivers and delivery vehicles. Analysis of all the deliveries shows that 44% of the deliveries occur to customers having 24 hours or less of safety stock. This value demonstrates the ability to deliver the most products per mile traveled and still maintain a run out rate of less than 0.5 per 1000 deliveries. (See Figure 2 below) However, the logistics team at Air Products maintains the flexibility to dynamically re-route delivery vehicles to customers when exceptions to the supply chain plan may unexpectedly occur.

The figure below depicts how Air Products has accumulated over \$70 million in distribution productivity gains over the last eight years and has been able to maintain a world class delivery performance. These gains required a multi step approach that Air Products instituted and still maintains today.

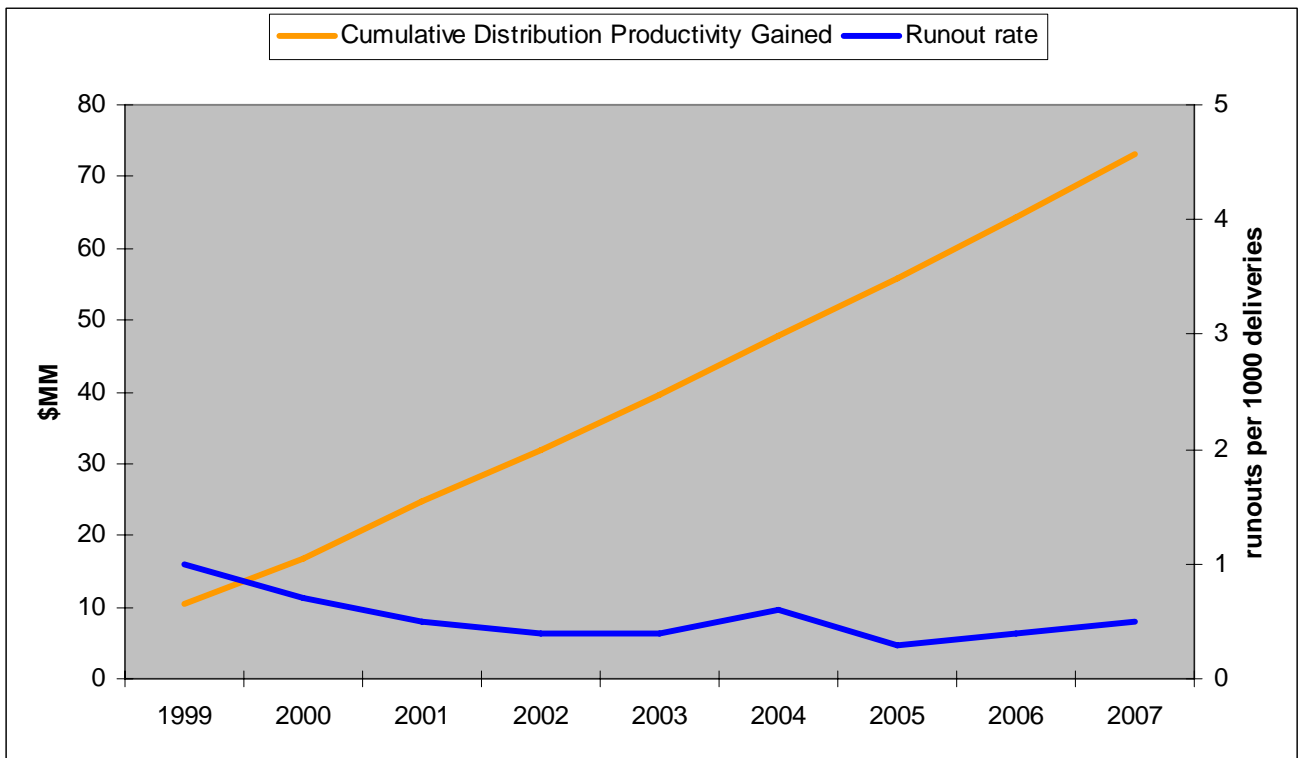


Figure 2

Source: Air Products and Chemicals, Inc.

² Success and the Supply Chain: How Chemical Companies Can Master Complexity, Source: ICB Americas, <http://www.icis.com>, 19 July 2004.

³ OxyChem Corporate Web site (www.oxychem.com), ©2001-2008 Occidental Petroleum Corporation



The approach involves having customers accept an automated inventory replenishment mode; also working with their customers to reduce distribution barriers which may add costs to the distribution process and allow for 24/7 deliveries, which in turn optimizes fleet utilization. Last but not least is the use of information and data to analyze results and to drive performance. Air Products uses real time demand and inventory information to optimize their replenishment operation.

Where automatic replenishment makes sense

There are several characteristics of a supplier and buyer situation where automatic replenishment of chemicals makes the most economic sense. These are:

- ***High distribution costs for bulk supply:*** When truck miles are an important part of either your or your customer's cost stack, there are vast opportunities for scheduling and delivery efficiencies – combining partial bulk loads into milk runs and reducing frequency of full bulk rolls.
- ***Consignment contracts:*** Supplier inventory is stored at the customer site resulting in tremendous opportunity for both balance sheet and operational excellence. This is particularly important in high value specialty chemicals.
- ***High volatility:*** Tough to serve, volatile customers are more prone to stock-outs and emergency shipment, often requiring a higher safety stock. Automated replenishment programs can provide an automated alarm notification on unusual usage and generate replenishment orders if necessary. High volatility can be minimized and with the information surrounding product usage, suppliers can often provide more cost effective supply solutions to their customers that benefit both parties.

Why Manage Customer Replenishment?

The reasons for managing customer replenishment are varied and may represent small incremental savings for any single asset being monitored, but can provide large value in your current overall operation. By taking control of customer orders you can:

- Transform your supply chain in order to synchronize order execution with supply planning. This allows your company to improve customer service and your order fulfillment performance. In addition, increases in your delivery efficiency will automatically increase your fleet capacity and allow for an increase in the radius you currently serve.
- Eliminate the need for customers to manage their inventory and place orders with suppliers. The hours required to manually measure chemical inventories and the hours to generate purchase orders can be reduced or eliminated. Reduction or elimination of these tasks improves productivity and lowers costs to keep all parties competitive.
- Supply reliability to your customers is greatly enhanced through automated replenishment programs, the information provided by the system allows the supplier to greatly improve forecasting; reduce order errors and keep replenishment at an optimal level.
- By monitoring and managing the inventory you can level the order patterns of both your raw materials and your products by reducing the frequency of short term (emergency) customer orders. Telemetry will provide an automated alarm notification on unusual usage and generate replenishment orders if necessary. Managing the replenishment of your products will reduce the amount of production and



distribution schedule changes. Deliveries will automatically adjust to changes in customer demand.

Over the years, automated replenishment has been proven to be a practical business solution with substantial business benefits. A successful program makes a supplier more competitive while also increasing the success of the customer, resulting in long term supply relationships and wins for both parties. Combined with improvements in the economics, advancements in technology, and availability of companies that specialize in this work, the leadership of Skychain believes automated replenishment will enter the mainstream of business across broad chemical and fuels markets over the next few years. Skychain will be one of the leading ambassadors of this new trend.