



**August 1, 2007**

## **Lean and Flexible Logistics for the Global Outsourced Economy**

by Bill McBeath

At the end of our very successful 2007 Retail Supply Chain Summit (co-organized by ChainLink Research and Chain Store Age Magazine), we went on a tour of Menlo Worldwide's "Lean Logistics Center" in Fremont, California. The techniques we saw provide valuable lessons on creating the flexibility needed in today's rapidly changing, difficult to predict, global outsourced economy. They also mirror the larger strategy of Menlo to flex overall capacity up and down in response to changes in market conditions.

### Multi-tenant Flexibility

Until about 5 years ago, companies typically leased or sold off their dedicated warehouse space to their 3PL. Since then, sharing of space, assets, and labor across multiple tenants in a single facility or campus has increased. Why? This creates considerably more flexibility in allocating capacity as the needs of various businesses expand and contract at different times, across different geographies and different product or service requirements. Menlo has demonstrated this ability with a variety of clients at the Fremont facility. The facility provides warehousing, distribution and a variety of value-added product management services, and handles a mix of truckload, less-than-truckload, and parcel shipments.



At the Fremont site, there are several anchor tenants (which include AMD, Network Appliance, LAM Research) and nine "boutique" tenants. Each customer occupies their own space, but in most cases these spaces can expand and contract, based on current needs. This takes advantage of the differences in expansion and contraction cycles between different customers.

When Menlo takes on a new client, they generally keep running on the client's own enterprise systems at first, to allow time for optimizing the processes. Once the customer processes are well understood and improved, Menlo transfers these "good processes" to Menlo's own technology platform. This keeps startup costs lower and allows an incremental approach to integration, since in many cases Menlo will continue to support the customer's internal ERP system with status updates on shipping activity and inventory levels. Sometimes these will be live feeds, but in many instances batch downloads one or more times a day provide the necessary data updates required by the client.

Most of the customers serviced out of the Fremont facility are in high tech and have needs for velocity and flexibility, but this capability can really support a variety of needs in many industries today. Lead times for delivering priority orders to nearby plants can be as short as 90 minutes.

Fremont operation is essentially a sophisticated cross dock. Components arrive, are kitted into the customer orders, and sent on to the end customer. If components for an order arrive at different times, they are stored together in the staging area, using visual aids to keep things organized, and indicate when it's ready to ship.

## Value-Add Services

Menlo does a lot of value-add, not just at Fremont but also at other facilities. One example is an interesting value-added project they are doing for iPurity, a provider of clean rooms and clean room equipment for the high-tech manufacturing industry.

What Menlo is doing for iPurity demonstrates the need for delivering Outcomes [link to Bill's Outcome articles and Lean Machine paper], a growing trend in advanced Supply Chain Management services. Most clean rooms use a fair amount of piping. Traditionally, the pipe is cut on-site during construction of the clean room, which creates metal shavings. The pipes and the surrounding environment then have to be thoroughly cleaned to near perfection, a painstaking, time-consuming, and expensive process.

Now Menlo has set up their own clean room (one of several at their Fremont facility), in which they cut and clean the pipes before shipping them to the construction site. iPurity sends Menlo the CAD drawings to assure a precise fit. After cutting, each pipe is cleansed, filled with inert gas (nitrogen), capped, and sealed in plastic, clearly labeled & numbered, and sequenced for rapid construction. Pipes for the whole clean room are configured and sent as an installation kit. Going way beyond the business of just storing and shipping pipes, this saves a tremendous amount of time and expensive skilled onsite labor costs in the clean room construction process.



**Figure 1 - Clean Room Pipe Cutting Operation**

The facility is also used for reverse logistics. For example, when AMD is ramping up a new generation of microprocessors, Menlo handles returns of the older processors, which are sent to other channels.

## Lean Approach / Kaizen Events

In 2004, Menlo and one of their key clients, LAM Research, funded Georgia Tech to score the Fremont facility in 23 performance categories. Even though they came out world class, in 2005 Menlo decided they wanted further improvements, and started implementing Lean methodologies and techniques..

Menlo's first Kaizen event was in March 2005. At that point, they had 27 errors in 120,000 picks (22.5 errors/100K picks). They had two auditors on staff whose full time job was catching those errors. They re-assigned those two individuals (saving about \$250K/year) and instead built quality checks directly into the processes themselves. Within a month, picking errors went down to 9 errors

in 130,000 picks (7.5 errors/100K picks). By adding things like self-checking, visual controls, immediate feedback, and incentive programs, Menlo has continuously improved performance. Picking errors are now reduced to 8 errors in 1,600,000 picks (0.5 errors/100K picks), almost a 50X improvement in picking accuracy over 2 years. At the same time, production speed has improved.

At first, the Lean initiatives were driven primarily by management. Lean aficionados know that employees have to become fully engaged in lean to really make it work. Over the last two years that shift has happened. Now employees feel ownership and are driving continual improvements, constantly coming up with new ideas. Menlo conducts at least one Kaizen event per month, sometimes several. This requires pulling people off the line for a full week, so the commitment has grown as results have been realized.

Another success factor is their rigorous approach to evaluating and documenting the outcomes of these sessions (see Figure 2 - Menlo's Kaizen Event Report ). This includes the overall theme, boundaries, current metrics, action plan, implementation plan, "parking lot" (keeping a record as other improvement ideas are uncovered), and cost saving calculations. This plan is owned by the whole team.

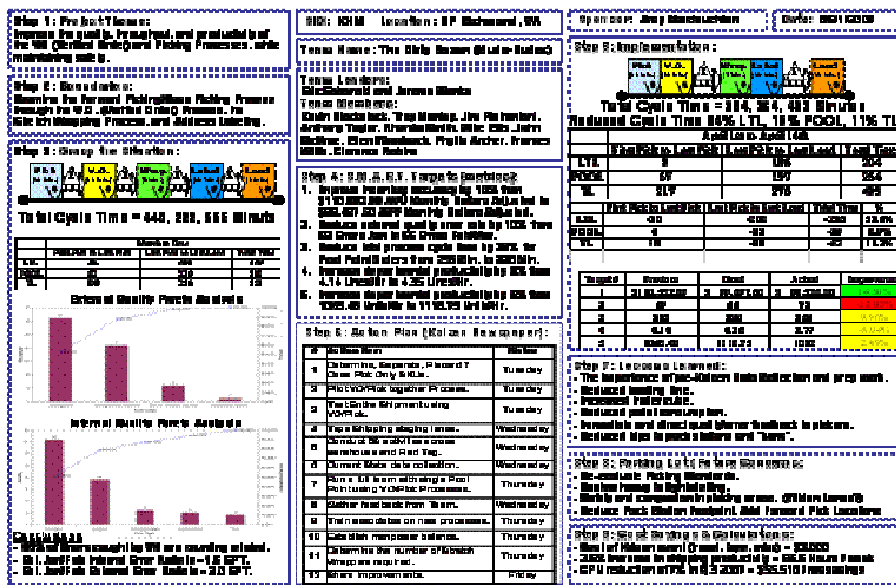


Figure 2 - Menlo's Kaizen Event Report

### Cross Training and Resource Sharing

Much of the flexibility is enabled by cross training, which allows resource load balancing (as well as things like the ability to pull someone offline for a week for a Kaizen event!) Each section of the multi-building campus has a cross-training schedule posted. Resource boards used for ongoing planning show the amount of labor available vs. labor that will be required to perform the work. Every two hours, these resource requirements are re-evaluated and teams rebalanced, moving workers to where they are needed. With this frequent re-evaluation, supervisors are more cooperative because they know they will get their workers back in 2 hours if needed. More importantly, it provides agility—as situations change throughout the day, the labor can be reallocated.



**Figure 3 - Resource Balancing Board and Performance Metrics Prominently Displayed**

In addition, Menlo makes extensive use of visual approaches to reduce errors; for example, color coded "hats" on orders.



**Figure 4 - Color-coded "Hats" per Order/Shipment**

#### RFID and Sensors

Menlo started using RFID on high value products and shipments, such as LAM Research's semiconductor manufacturing equipment. Each crate is build-to-order. Accuracy and timeliness is critical. If the wrong thing is sent, it can cost tens of thousands of dollars. RFID also speeds operations. It used to take two people eight hours to do a physical inventory count. Now it takes one person 45 minutes.



**Figure 5 - Passive RFID Label for Tracking Crates of High Value Product**

Menlo is using passive RFID today and is planning to move to active RFID in late 2007. This will allow continual inventory visibility in the warehouse and trace and track across the supply chain. In addition, Menlo uses sensors to detect if the shipment has been tipped the wrong direction or exposed to excess shock.



**Figure 6 - Tilt Detector on Crate**

#### Smart Docks

At two other facilities, Menlo has what they call "Smart Docks" – one in Woodland (for the port of Oakland) and one in Carson (for the Port of LA/Long Beach). It is kind of a cross dock, except with allocation decisions made just-in-time. Single-SKU containers come into the Smart Dock facility from overseas. From here items are picked and stuffed into multi-SKU containers and sent directly to retail stores.

The inbound containers are unallocated when shipped. This allows the shipper to postpone the decision about where to ship items, until the load has arrived. This defers routing decisions until demand is better understood, adding flexibility to route goods as needs change, without the extra square feet and days required to put-away to a traditional warehouse. Menlo estimates their 100,000 square foot Smart Dock has about the same throughput and capacity (but much lower dwell time) as a 400,000 square foot traditional warehouse.

This is the demand now for many shippers and customers. Get visibility as far back in the chain as you can and the flexibility to ship directly to consumers or consumption points as needed, saving time and handling (reducing potential for product damage, shrinkage and handling costs), and increasing on time delivery, within budget and with good customer satisfaction.



**Figure 7 – Some Docks at Fremont Lean Logistics Center**

#### Staying Lean and Flexible

Menlo illustrates the advantages a third party with advanced supply chain practices can have in providing flexible distribution services. By balancing the space and labor needs of multiple clients, they are able to flex up and down with changes in demand, more gracefully and with less of a capital investment than their clients could do individually on their own. Innovations like Smart Dock provide further flexibility. The disciplined implementation of lean principles is what allows Menlo to control costs while improving performance and is the key to making a flexibility strategy actually succeed. These are great lessons learned for 21st Century Supply Chain managers.

#### Sidebar - How Smart Docks Work

Menlo's yard management system decides where to put away the containers in the yard and notifies their WMS system. The WMS system then treats the yard like a big warehouse, planning and executing picking waves to fill orders placed the day before. The WMS system also decides what to do with items remaining in a container after the needed items have been picked. Depending on several factors— such as how much product is left in the container, product velocity, known orders, etc.—the container may be resealed with remaining product in it, or the remaining items may be moved into the warehouse. Thus items in both the warehouse and containers are included in the picking waves planned by the WMS.