

A Radius Solutions White Paper



Adopting Lean Manufacturing in Packaging and Printing: How an ERP System Can Help

RADIUS SOLUTIONS has incorporated a number of “Lean Manufacturing” principles into its core business application, PECAS Vision. Radius Solutions recognizes the need to promote these principles and has taken a lead role in a number of associations to promote the benefits of “Lean Manufacturing” to the printing and packaging industry.

Introduction

The printing and packaging industry is facing a number of challenges which threaten the very existence of many well-established companies. Historically, the industry has been extremely cost conscious, priced its products based on a cost-plus philosophy, and has been slow to adopt new concepts and technologies such as Lean Manufacturing and ERP applications. The procurement of a new press is often seen as a tangible and logical purchase with a clear “return on investment.” However, this is in stark contrast to alternative investments such as the commissioning of a consulting project to create more integrated business workflow.

Additional challenges are forcing the pace on improved efficiencies, shorter runs and reduced waste. New competitors from emerging markets have entered the industry and are gaining market share based on being a low cost provider. And in boardrooms, owners and managers are working harder than ever to do more with less.

While the concept of Lean Manufacturing has been well established in traditional manufacturing environments, its adoption in the printing and packaging industry has been slow. Many companies have embraced a number of lean techniques, but have yet to fully realize the benefits of a holistic implementation. In order for these companies to survive in the competitive market, it is not a matter of if they streamline their business operations, but when.

What exactly is Lean Manufacturing?

“Lean” is defined as a process to improve manufacturing and service operations, reduce waste, improve quality and drive down costs. Think of Lean as a methodology that cuts the “fat” out of manufacturing costs at every stage of the operation. In fact, many manufacturers have found Lean Manufacturing particularly effective as a weapon against low-cost competitors. Of course, when it comes to Lean, implementing new software such as an integrated business application can help achieve Lean results faster than without it.

Using PECAS Vision to Support Lean

Radius Solutions’ PECAS Vision is a fully-integrated Enterprise Resource Planning (ERP) system that provides specialized solutions to a range of sectors in the printing and packaging industry and can help support a lean environment.



According to a 2004 Gartner, Inc. white paper entitled, *ERP Applications Help Achieve Lean Manufacturing*, there are five areas in which IT can be leveraged as a crucial enabler to a successful Lean Manufacturing operation:

- Product Data Management – the ability to leverage the use of product data
- Forecasting – the ability to forecast in a highly unpredictable environment
- Line Design – using the estimated demand to design production lines
- Line Scheduling – scheduling of the demand on the lines
- Flow Visualization – visualization of the flow of the product through the manufacturing cycle

Product Data Management

ERP systems enable users to maintain the integrity of master data. Radius Solutions’ PECAS Vision application incorporates the use of raw material and finished goods, both of which are integral to the use of the system and in managing data.

As a sales order is booked, the production job can be created immediately, vastly reducing the time to schedule a job. While this occurs, the job is also available to the scheduler. Next, the buyer is notified of the demand for raw materials and the work order instructions are created immediately, thereby eliminating redundant keystrokes.

One of the concepts of Lean Manufacturing is the distinction between “cost-added” versus “value-added.” The reason being is that “cost-added” is a cost incurred that

the customer would not necessarily want to pay for, such as the administration cost for processing a sales order. This is important information to know, especially when a company is looking to drive down costs and run more efficiently.

As mentioned above, the cost of processing can be greatly reduced when utilizing an ERP solution. However, a company can take advantage of further reductions with Intervision, a Web-based module of PECAS Vision that enables customers to place or change sales orders and release them through a Web portal. Intervision also allows customers to view inventory levels and existing sales orders as well as obtain the status of the sales order. This integral functionality greatly reduces the cost added elements and provides ultimate value to the customer.

Demand Forecast

Identifying future demand is critical in a Lean Manufacturing environment. Most users do not have direct lines of communication from the customer order to production. Quantity, mix and variability of demand are what determine the capacity of the Lean line and the amount of resources required to produce that demand.

Traditionally, the printing and packaging industry has been a “jobbing” environment, where each job is unique. (See Example Flow 1)

EXAMPLE FLOW 1 – TYPICAL JOBBING ENVIRONMENT

1. A sales order is created in PECAS Vision
2. PECAS Vision calculates the demand and suggests production
3. The planner converts the suggestion to a production order
4. PECAS Vision notifies the buyer of the demand for raw materials
5. PECAS Vision notifies the scheduler of the demand for time
6. Raw materials are purchased or reserved from available free inventory
7. Tasks are scheduled
8. Finished goods are manufactured
9. Finished goods are shipped to satisfy the sales order

However, for organizations that operate with a percentage of repeat business, PECAS Vision offers the functionality to incorporate sales order forecasts that are able to impact the planning, purchasing and scheduling modules. (See Example Flow 2)

EXAMPLE 2 – BASED ON SALES FORECASTS

1. Sales forecasts are created in PECAS Vision
2. PECAS Vision calculates demand based on the sales forecast, existing inventory levels and existing production orders and suggests an action
3. This action could be to disregard the suggestion or convert to a production order
4. The production order can be created as “Tentative” or “Live” (Tentative allows for reservation of time in scheduling and material demand without committing fully)
5. PECAS Vision notifies the buyer of the demand for raw materials
6. PECAS Vision notifies the scheduler of the demand for time
7. Raw materials are purchased or reserved from available free inventory for live jobs
8. Tasks are scheduled
9. Finished goods are manufactured for live jobs
10. A sales order release is created
11. Finished goods are shipped to satisfy the sales order release

In PECAS Vision, sales orders and releases can be created in the traditional manner, i.e. entered by customer service representatives or automatically, via EDI transactions or Intervision, a customer facing, self-service Web-based module of PECAS Vision.

Additionally, sales forecasts can be created in PECAS Vision electronically; pulled in from external systems with minimum inventory levels, re-order points and demand held against each finished goods item.

Supply

The creation of a production order helps to satisfy demand – this includes generating information for all raw materials required, including substrates, ink and packaging supplies as well as a complete production route with quantities and times for each of the tasks involved.

The raw material demand is then communicated immediately to the buyers, material controllers and scheduler. This is significant information, especially in a rush order or critical situation so everyone is aware and can react in the quickest most efficient manner. Also, resources can be used as needed, saving time, money and unnecessary waste.

PECAS Vision offers a solution that can identify future demand while keeping the lines of communication open from customer orders to production for both a traditional jobbing environment or one that utilizes sales forecasts as the basis for its demand.

Note: Sales forecasts are subject to change, therefore as new or amended sales forecasts are created in PECAS Vision, the calculation will first remove any tentative production orders before suggesting revised action.

Line Design

Line design is the most common area in which users have not had sufficient tools to enable Lean Manufacturing. That's because most users manage this process through spreadsheets or word-processing documents that are disconnected from the primary business system which can lead to costly errors, wasted time and resources.

Radius Solutions' PECAS Vision offers a fully-integrated solution, which means data is entered into the system once and flows through to each area in the production cycle.

Perhaps, one of the most significant features in line design is Radius Solutions' Estimating Module. The estimating feature is integrated with the sales order and planning modules of PECAS Vision, again minimizing redundant entry of data. The Estimating Module also has been designed to specialize in the market sectors of folding cartons, tags and labels, flexible packaging, commercial print and business forms.

There are three ways of estimating that exist within PECAS Vision:

- Sales Estimating – typically used in the creation of estimated costs to convert to a sales price
- Production Estimating – used in the creation of estimated costs with a view to convert to a production job
- Master Estimating – a template design from which both sales and production estimates can be generated

Furthermore, defining the finished product on an estimate, including the substrate, ink and packaging material, permits PECAS Vision to calculate the time necessary for each task and the gross material required.

Additionally, PECAS Vision provides a very powerful and flexible estimating tool. Within an estimate there can be multiple versions, which could vary by quantity, production route and even by plant.

Scheduling

As customer orders are booked, they can be scheduled based on order due date or other criteria.

Radius Solutions' scheduling module receives customer orders as they are booked, thereby allowing early viability to demand on capacity. The scheduling algorithms are flexible and comprehensive, so that organizations can schedule to level production and stabilize spikes in production; sequence jobs to minimize the set up time; and schedule around the availability of resources needed to complete each job. Displayed on a graphical planning board with full "what if" capabilities, the scheduling application is designed around the dynamics of the printing and packaging market sectors in which there are numerous changes to customer orders and short lead times in any given day.

Flow Visualization

Key benefits of Lean Manufacturing include simplicity and visual control. That's where Radius Solutions' Shop Floor Data Collection (SFDC) enters into the mix. This module presents data to the shop floor operators in an easy to access manner. The data includes the current work-to-list, as published by the schedule, an on-line view of the work instructions, and a graphical view of the product being produced along with any special instructions or quality tests.

Consumption can be recorded at press die for high dollar ticket items such as substrates or the application can back flush items, depending on preferences. Substrates can be tracked from consumption through work in progress all the way to finished goods. The use of hand held devices to scan bar codes speeds up this process and also removes the potential for key stroke errors. Recording actual quantity produced can be automatically picked up using Direct Machine Interface, in which the count is picked up from sensors located on the manufacturing equipment, removing the potential for key stroke mistakes.

All of the transactions recorded are visible to authorized users on a real-time basis. This allows customer service representatives the capability to view where a job is, at any given moment, and reduce cost-added activities like having to physically talk to the scheduler.

All of the transactions recorded on the shop floor are transferred to the Job Costing module where comparisons are drawn between the production estimate and actual standard and costs. An automatic variance analysis is generated by job, that includes efficiency variance, material usage variance or scrap variance.

High Velocity Manufacturing

Another concept of Lean Manufacturing is “High Velocity Manufacturing” – a step above Lean, as it follows the same basic principles, i.e. reduction in waste, streamlining business processes, reducing or eliminating cost-added functions and providing value added functions. But it doesn't stop there. High Velocity Manufacturing extends to a company-wide philosophy, which includes a commitment to the continuous pursuit of excellence in all phases of the business.

Typically, a new implementation of PECAS Vision is geared around solving the business issues that are present today. However, PECAS Vision has been designed around best practices in all aspects of printing and packaging organizations worldwide. As such, the application is continually evolving with the needs of the market for which it is designed. Regular releases of the PECAS Vision product allow organizations to re-evaluate existing procedures and implement improvements.

The way printing and packaging organizations interface with their customers is extremely different from the traditional “jobbing” environment. Customers now initiate policies such as Supply Chain or Vendor Managed Inventory, and organizations that try to “shoe horn” these new processes into the “way we have always worked” will most likely fail. A successful and disciplined culture requires adopting revolutionary ideas, new attitudes and technologies like PECAS Vision.

In Conclusion

While many companies have embraced a number of Lean Manufacturing concepts, many have yet to fully realize the benefits of a fully-integrated Lean environment. In a recent survey for the Tag and Label Manufacturers Institute Inc., 57 percent of the companies surveyed said that they were planning to initiate a Lean Manufacturing project in the next three years.

The reality is many of these companies cannot afford to wait to implement a Lean environment.

Using tools that are disconnected from the business systems already in place can lead to inflexibility and errors. The bottom line is utilizing new software, like PECAS Vision that has been specifically developed to support lean manufacturing principles, will not only improve efficiencies, quality and reduce waste, it will enable printing and packaging companies to succeed in today’s very competitive and ever-changing marketplace.



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