LeanCONNECT Design

1. Introduction

LeanCONNECT Design is a complete solution for enterprises of any size for the design and planning of lean manufacturing operations.

For startups and emerging businesses however, sophisticated ERP solutions are often financially out of reach even though their products may equal the complexity of competitive products from much large enterprises. Manufacturing methods and sophistication may likewise rival the complexity found from much larger competitors. Additionally, emerging businesses will often fit a high mix/low volume pattern in terms of rapid engineering change, widely fluctuating demand, and short lead times.

LeanCONNECT Design may be implemented as a standalone execution system for lean manufacturing operations with very straightforward strategies to integrate manufacturing with other functions within the organization. Startups and emerging small businesses may find that LeanCONNECT Design plus very basic financial software, even as basic as QuickBooks, may suffice to effectively manage their growth until a more full-featured integrated ERP solution is required. And then, LeanCONNECT Design can continue to support manufacturing operations throughout a company's long-term growth without concerns that it will be outgrown. The investment in LeanCONNECT Design but more importantly the investment in developing a lean culture and lean operations based on a deep repository of product and process information and rich toolset of lean functions will not be lost since LeanCONNECT Design can be integrated or interfaced to ERP platforms to support the growth of the enterprise.

2. A Complete Solution: Design, Planning, Scheduling, and Execution

Manufacturing operations for an enterprise of any size must be designed first to support specific products up to anticipated business volumes. From lean perspective, design of value streams includes make-to-order vs. make-to-stock strategies and setting planned inventory levels with achievable product lead times. Once the operations or value streams have been designed, planning functions are needed that can ensure that sales, production, and finance are closely aligned, that production capacity is available to support business growth and that long range supplier demand is known in order to secure suppliers capacity and delivery with longer term procurement arrangements. As customer orders are taken, scheduling becomes crucial in order to deliver on customer commitments with high on-time delivery even with short lead times. Manufacturing operations as products are produced is the actual execution, where value is actually created. Lean manufacturing introduces flow through multiple processes, pull signaling with kanbans, and load-leveled schedules or heijunka as techniques to reliably and consistently deliver high quality products through simple and visual management. Continuous improvement efforts through kaizen events allow an organization to continue to improve performance and create a sustainable culture able to respond quickly to changing customer requirements.

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3. Design of Manufacturing Operations

LeanCONNECT Design provides the following functions to support the design of lean value streams:

- Value stream mapping creating a complete model of all operations

- Identification of flow and pull throughout the value stream

- Lean repository of all product and process details including cycle times, changeover times, downtime, rework, etc.

- Calculation of takt time, interval (EPEI), supermarket sizes, and lead times

- Capacity calculations for an unlimited number of demand scenarios
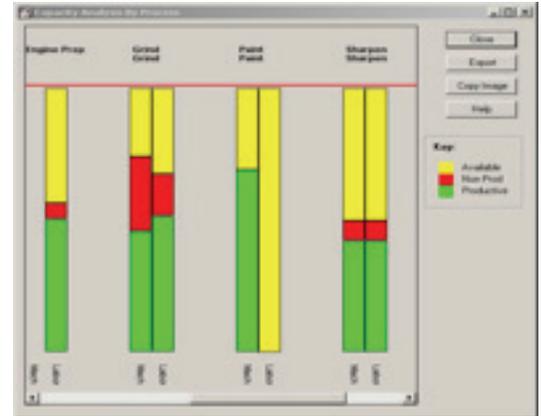
4. Planning

LeanCONNECT Design includes the following:

- Sales and Operations Planning with capacity confirmed using value streams

- Kanban sizing for pull signaling, automatic kanban resizing based on demand changes

- Supply Chain planning for long-range procurement needed to support the S&OP plans

5. Scheduling

Scheduling a lean value stream is done at one point, the pacemaker. Work is launched at the pacemaker with the rest of the value stream responding to the pacemaker dynamically and visually through flow and pull. LeanCONNECT Design supports pacemaker scheduling to create a capacity-constrained or load-leveled schedule with the following features:

- Demand Leveling to produce a heijunka or level loaded schedule at the pacemaker

- Using finished goods supermarket to for make-to-stock or hybrid MTO/MTS
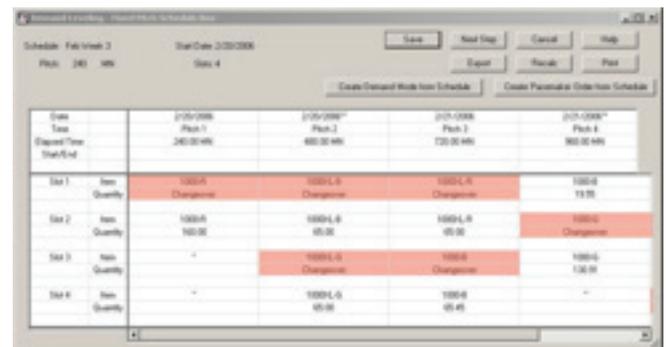
6. Execution

Although designed for planning, LeanCONNECT Design can support some execution activities such as complete electronic tracking of pull signaling including:

- Electronic kanban board
- Design and print kanban cards with bar-code and graphics
- Kanban tracking with full bar-code scanning integration
- One-time and reuse kanbans
- Supplier kanbans as call-offs against blanket purchase orders
- Suppliers update their kanbans via web portal
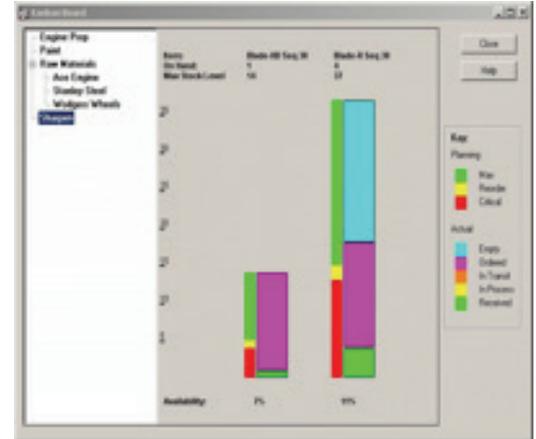
7. Complementary Functions Required for a Complete Business Solution

The following are additional functions needed to complete an application portfolio able to support an entire business:

- **Product Lifecycle Management (PLM)** – Control of design engineering product development is often an early requirement for a smaller business. Engineering drawings and bills of materials with part number assignments may be done in a PLM. Part master information and bills of material may be easily exported from any PLM and imported in standard formats into LeanCONNECT Design. For businesses with less sophisticated product designs, item masters and bills of material may be managed directly in LeanCONNECT itself.

- **Customer and Order Management (CRM)** – Managing customer information and customer orders including pricing and invoicing is essential in any business. A web-based CRM is an excellent option providing sophistication at an affordable price even for small businesses. Orders can be imported into LeanCONNECT Design to drive lean production scheduling.

- **Inventory Management** – Inventory control does not require sophisticated or expensive software. Straightforward solutions require the ability to track inventory receipts and issues and maintain accurate on-hand levels. Inventory on-hand can be imported into LeanCONNECT Design for use in planning and scheduling. Even QuickBooks can provide adequate if simple inventory control. As raw materials are used in operations, they can be issued from inventory. As products are completed, they can be received into finished goods. Intermediate inventory and work in process should be managed visually with LeanCONNECT's lean accounting fully able to support managerial decision-making without the unnecessary complexities of traditional standard cost accounting, overhead absorption, and variance analysis. As a result, no cost accountants are needed.

- **Basic Financials** – Every basic financial system supports the ability to manage suppliers, create purchase orders, record receipts and pay supplier invoices. And every basic financial system provides for invoicing (if not done in CRM), reporting on open receivables, and recording customer payment. Both A/R and A/P flow into a general ledger tied with cash management in even the simplest of financial software. Companies up to $25MM and higher have been known to run their entire business on QuickBooks.