Module 3B: Shop Floor ERP Requirements

Below is a list of items to consider when deciding to either install an MRP system ( production planning and inventory control) or a more robust (and expense) ERP System.

Customer Focus: Do you need to know in real time:

* When an order has to ship?
* Where an order is in the process from order entry through shipping?
* What a customer ordered in the past and what he paid for it?
* How to accurately price out a product?
* How to compare actual rolled up costs to quoted costs?
* Are there parts in the warehouse for the order?
* Do we have time in the daily schedule to make the ship date?

Purchasing, Material Control, Stock Room: Do you need to have?

* Inventory locations by part #
* Inventory Locations (Bins, Shelves, etc.)
* Inventory location on pick list so stock room can easily find parts for each work order.
* Inventory Data Entry - quantity in/out, location/ by revision level if needed
* Low Level reorder points (minimum and maximum levels) are established in system based on lead time and usage
* Each work order has the full list of all parts to be produced - parent / child or top level and subassembly.
* Cycle count verification schedule. Trust the system but verify (at least A item parts)
* Visibility to master schedule
	+ Daily *scheduled* list of materials and jobs to be put away or taken out (if taken out, where it goes to)
	+ Job / Material queue list of materials and jobs that are *actually ready* to be put away or taken out (if taken out, where it goes to)
	+ Work orders should be picked one day before schedule to the floor. IF the inventory is not correct for the entire job then it is not sent to the floor and purchasing needs to be notified of the shortage.
* Materials are allocated in the ERP system to all work orders even if not pulled or kitted.

Manufacturing:

* Daily production plan by work order
	+ Job Queue list of jobs that are actually ready to be worked on
* Capacity planning information based on total hours per day needed. Manpower is adjusted based on the build plan
* % orders complete to schedule
* % parts complete per work order.
	+ Short Term: Shortages need to be communicated back to Product Control for immediate rescheduling or notification to sales to ship short / replace missing
* Exploded Bill of Materials so all parts can be seen
* Actual time per part/ work order vs. standard costs. Variance reports are generated
	+ Operators need to be able to "clock in" and "clock out" of jobs
	+ If good standard times are in place, labor can be back flushed against standard costs
	+ Daily / weekly roll of up actual labor by clock hours vs standard clock hours for variance tracking. Need this by work order and in total
* xx day build plan by Work order and when order needs to be completed –
	+ Planned Production Dates.
	+ Note this is not when the order needs to be shipped but can be used till you get current to date
* Need the ability to have view all open orders in system.
	+ Note Master Scheduling MUST schedule the floor. Production simply completes the orders on time and with perfect quality
* Need standard work per operator and per part - not required for ERP but would be nice to have
* Need built-in quality checks / fixtures and tools for each part # - not part of ERP
* Need ability to know what work order is assigned to what team.
	+ Training needs, variance needs, quality inputs etc.
* Provides a defined window of orders scheduled for manpower planning.
	+ Training needs to be scheduled so that minimal interruptions to production can occur but you need visibility to what is planned for each month.
* Engineering Change notices need to immediately visible to Production Control so changes can be made BEFORE Work order hits the floor.
	+ If Work order is on the floor, need to find order and quarantine order so it cannot be shipped until it is evaluated.

Shipping/Receiving:

* List of PO's scheduled to be received
* Receipt Entry (to close out PO's)
* Trigger if Receiving Inspection is required or if it goes directly to stock or to a job
* All work orders are completed 1 to 2 days in advance of when the order needs to be shipped.
	+ Daily *scheduled* list of materials and jobs to be shipped
	+ Job / Material queue list of materials and jobs that are *actually ready* to be put away or taken out
* If Finished Goods are stored as a Kanban, low levels replenishments are established for replacements and work orders are communicated to Production Control for replacement and scheduled as a normal order.
* Shipping labels are printed automatically with correct ship to address based on order from sales. Some companies will issue POs from a central order center with multi ship to locations. Need to make sure that this is correct in the system or you will ship to the wrong location.

Inspection:

* Job Queue list of materials / jobs to be inspected
* Inspection Data Entry - quantity pass, quantity reject, "clock in", "clock out"
* Indication of where the material / job moves next
* If work orders are rejected, notification is sent immediately to sales. Action teams are then used to correct defects if possible. If materials need to be reordered then information needs to go to sales and customer service to reenter or create a new work order so that demand for parts can be seen.

Finance:

* Bill of Laiding is matched to invoice
* Invoice is automatically generated and sent to customer
* Daily reconciliation of actual time to planned time

Specific Questions to answer and to trigger other questions:

1. What additional information would be most valuable for our specific Production floor that is not there now?  This does not have to be ERP related, but it could be.  What don’t they have access to that would be most helpful?  Example: Accurate time estimates
	1. Daily Production report that indicates which jobs are to complete today with a team meeting at the beginning of each shift to go over the whiteboard that is lead by the supervisor
	2. Could also have weekly and monthly targets (i.e., # of jobs to be completed per week or per month)
	3. Also during this team meeting, discuss reasons why yesterday's production goal was not met
2. Best Practices for Implementing ERP.  Example:  Steering Committee, Parallel testing, Which modules to roll out first, second…
	1. Depends on which modules you buy. You should roll out all modules at the same time.  There will be some hiccups
	2. You should run or test mock orders to uncover mistakes, errors in coding etc. You can do a parallel process to an actual order and manually walk it through the entire process and check each step as you go. You may need to do this several times before you "go live" in a test environment to get familiar with the ERP system
		1. The mock runs should be designed for partial quantities, quality problems, etc.
	3. A Steering Committee would be useful so everyone in the Committee can enter in any necessary data into the ERP system beforehand (see #3) as well as becoming the focal point for all the functions that need input or access to information.
3. “Go Live” best practices:  Example:   “Full manual count of inventory” just before Day One of the new system so it will be accurate after that.
	1. You want to enter in all part information, quantity, customer information, bin locations, equipment, personnel, etc. before going live. Do this on a Friday / Saturday / Sunday and then go live on Monday.
	2. If this is not done then your inventory will not be correct and sales / production control will not be able to allocate inventory against customer orders.
	3. Everyone should have a login and password before going live as well
	4. Orders should be entered just like they would be normally in a real environment.
	5. BOMS should be scrubbed before they are entered and verified first - garbage in = garbage out.
	6. Only enter active BOMS or orders. You can enter old orders later and mark them as archived or obsolete.
	7. Set a go live date and enter orders / BOMS that will start on that day, you may be entering orders 30 days out too.
	8. Test all scanners / readers / etc
4. Adaptations that you have seen at other places and their impact.  Example:  Kiosk on shop floor – barcode vs. manual entry
	1. Every station should have a computer and barcode scanner. DO NOT allow operators to key in quantity, etc if possible. Too many errors.
	2. If BOMS and prints were online then there is never an issue about the correct revision or release level for the team to work on. Manual prints always have the potential problem of being out of date or incorrect.
5. How ERP supports Lean and other initiatives…where is there  a direct relationship.
	1. ERP and Lean don't traditionally go hand in hand.  One does not need an ERP system to be Lean.  However, ERP is valuable in that it is a hub for communication for the company and stores all of that data.
	2. Lean stresses visual communication (i.e., a Visual Factory) so that communication flow is streamlined.
	3. ERPs act as a communication hub so it has all of the necessary information, but it doesn't necessarily make things visual
	4. The trick is to make the ERP system visual whether by customizing daily / weekly / monthly reports, posting them on a daily basis and having team meeting directly on the floor to discuss status, expectations and improvements