Session 219
Linking the Material Plan with the Shop Floor Execution

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The ERP Process (Inventory Centric)
XA Planning Systems

- Traditional
- Advanced Planning
- Advanced Constraint Planning

- Pull / Kanban / Order Point / “LEAN”
  - Execution, not planning, System

- “OSWO”
  - “Oh S#&t, We’re Out”
  - Shortage Reports / Hot Sheets

- MRP / CRP / MPSP
- Visual Planner
- ThruPut

- Manufacturing Execution System
  - Electronic Kanban
Traditional Planning Prerequisites (5)
“Advanced” Planning Prerequisites (6)

1. 
2. 
3. 
4. 
5. 
6.

1 of 6: Inventory Accuracy

Your pointing at it won’t help …
The computer shows none in stock
2 of 6: Bill of Material Accuracy

Part Numbers: ABC
Quantity Per: 4

3 of 6: Scheduling Accuracy

- A schedule is any open order
  - Customer, Manufacturing, Repetitive, Intersite, Kanban, Purchase
  - Planned, Firm Planned
- Dates on orders represent either inventory requirements or expected receipts
  - Planning will recommend actions for creating and maintaining these orders
  - Release Dates, Start Dates, Due Dates, Routing Operation Dates: all require accuracy
4 of 6: Demand Management

The Production Plan for items you sell to customers. It is the target or goal to which all other planning applications are tied.

Sources of Demand:
- Forecasts
- Customer Orders
- Safety Stock
- Lot Sizing
- ...

5 of 6: Scheduling & Operation Standards

W-I-P

Raw Material Movement | Production Line with Work Stations | Finished Goods Movement
---|---|---
| Work Center | Work Center | Work Center

MO's

Material issued from stockroom

Optional MOVE transactions

Setup on

Run off

Material Receipt with floorstock Backflush

Material consumed on Operations
6 of 6: Planning Parameters

<table>
<thead>
<tr>
<th>Warehouse Number</th>
<th>Master Level Item Code</th>
<th>Days Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planner Number</td>
<td>Order Policy Code</td>
<td>Master Level Forecast Code</td>
</tr>
<tr>
<td>Lead Time Code</td>
<td>MLI Print Code</td>
<td>Number of Periods</td>
</tr>
<tr>
<td>Mfg / Pur Lead Time Fields</td>
<td>Maximum# lines/item</td>
<td>Days per Period</td>
</tr>
<tr>
<td>Order Point</td>
<td>Combine Requirements</td>
<td>Forecast Quantity</td>
</tr>
<tr>
<td>Safety Stock</td>
<td>Shrinkage Factor</td>
<td>Firm Time Fence</td>
</tr>
<tr>
<td>Fixed Order Quantity</td>
<td>Price-Break Conv. Factor</td>
<td>Authorized Time Fence</td>
</tr>
<tr>
<td>Minimum Quantity</td>
<td>Create Plan Order Code</td>
<td>Auto Release Code</td>
</tr>
<tr>
<td>Maximum Quantity</td>
<td>Plan Expected Order Code</td>
<td>Item Reschedule Code</td>
</tr>
<tr>
<td>Multiple Quantity</td>
<td>Include Inventory Balance</td>
<td></td>
</tr>
</tbody>
</table>

Traditional Planning Prerequisites (5)

*“Advanced” Planning Prerequisites (6)*

1. **Inventory Accuracy**
   On hand balances and on order records are used by planning to calculate and project available inventory.

2. **Bill of Material Accuracy**
   Planning uses the Bill of Material to define requirements. Requirements project component usage to fill planned orders for parent items. Planning systems assume the Bill of Material reflects this usage.

3. **Scheduling Accuracy – Start dates / Due dates (Manufacturing, Purchasing & Customer)**
   Planning is a “date driven” function. The manufacturing and purchase order due dates must be accurate statements of inventory availability. Customer orders &/or forecasts must accurately represent demand.

4. **Demand Management (Forecasts / Master Schedules / etc.)**
   Planning processes starts with a Master Production schedule, which should be a realistic statement of what end items will be produced. This consists of planned and open orders for end item products and service parts.

5. **(Advanced Planning) Scheduling Parameters (Work Centers, Routers, Capacity)**
   Capacity standards (routings) to track labor &/or machine requirements, along with the execution system to track the status of Work-in-Process

6. **Planning Parameters (Order Lot Sizing, Order Policies, Lead Times established)**
   The order policy, lot sizing & lead time codes must represent the user input to dictate how much planned order quantities should be when filling a requirement. It also establishes when to START the process.
XA’s Planning Solutions

MPSP / MRP / CRP  Visual Planner  ThruPut  S&OP

- Traditional APICS planning systems
- “Mainframe” process
- Batch oriented, iterative
- Master Schedule Centric

- Advanced Planning Logic
- Memory-resident processes (PC-based)
- Simultaneous Master Schedule, Material Schedule, and Capacity Measurements
- Master Schedule Centric

- Advanced Planning Logic
- Memory-resident processes (PC-based)
- Simultaneous Master Schedule, Material Schedule, and Capacity Measurements
- Restraint Work Center Centric
- Finite scheduling based on capacity

- Infor 10x / ION product
- Demand-supply balancing
- “What if” simulations
- S&OP process support
- Common information repository
- Unit and currency synchronization
- Collaboration network
- Event alerts
- Key performance indicator measurement

Visual Planner

[Graphs and charts showing load vs. capacity for various work centers and time periods, indicating capacity planning and simulation results.]
Results of Planning Systems are Planned Orders

<table>
<thead>
<tr>
<th>Item</th>
<th>Start</th>
<th>Due</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>8/27</td>
<td>8/29</td>
<td>5</td>
</tr>
<tr>
<td>B</td>
<td>8/21</td>
<td>8/27</td>
<td>5</td>
</tr>
<tr>
<td>C</td>
<td>8/24</td>
<td>8/27</td>
<td>5</td>
</tr>
<tr>
<td>D</td>
<td>8/25</td>
<td>8/27</td>
<td>5</td>
</tr>
</tbody>
</table>

Released Orders (MO, CO, PO, XO, SO) are a part of the “Schedule” in MES and under control of the shop (frozen).

Releasing the Orders is the handoff from Planning to Execution.

How well are you using Planning?

- Auto-Release of planned orders?
- Capacity Planning?
- On-Time order delivery?
- Inventory Reductions?
- Improved departmental communication?
- Free up admin time?

- Too many companies take this process to 80% and call it success.
Manufacturing Execution Systems (MES)

Where does VP & MES fit?

VP plans the schedule (material & capacity)

MES manages the shop floor activities

Core transactions of XA

Expanding reach of Infor Xi
Linking the PLAN to EXECUTION

**Planning**

- Material Schedules
- Capacity Managed
- Material Start Dates / Due Dates
- Demand Management
- Inventory Control

**Execution**

- Work Center Schedules
- Labor Tracking
- Machine Tracking (setup/run)
- Production Counts
- Scrap
- Efficiencies
- Payroll
- Quality
- Kanban

Where does MES fit?

MES and planning systems…

**MES with Advanced Planning Systems**

GOAL = feed ERP better data & improve the data flow between the shop floor and decision makers.
Manufacturing Execution Systems

Manufacturing Execution System = MES

- MES solutions allow you to effectively manage the day-to-day activities of all your production operations.

- Specifically, they combine visibility of:
  - real-time production status
  - traceability and genealogy of manufactured product
  - performance analysis of production operations
  - paperless management of the production process and operator instructions in the form of routings, ECNs, BOMs, engineering documentation and assembly drawings.

Sources of Inventory Transactions

- Scan-n-Track
- Barcode
- Green Screen
- MES

MM
MDCC
XA's Paper-Less MES

5 functional areas

Tightly integrated

“Visibly Better Execution”

Paper-Less MES

WIP flow – starting labor on highlighted job (MO or Kanban)
Kanban Analysis – Frequency Chart

KB metrics: see loop performance; other metrics in drop down in upper right. Visibility of kanban status available for easy presentation.

WIP Quality tests

Enter Result: 92
EA (EA Unit of Measure)
- 87.00
- 85.00
- 75.00
- 73.00

Torque Test

Sample Name
1. Torque Test
2. Torque Test

NCR Status
- 1. Leak Test
- 2. Leak Test
Paper-Less MES

System highlights of Paper-Less MES:

- 5 integrated areas of functionality
- Thin client/Browser based application
- SQL database
- “Single source” for shop employees
- “Management by exception” protocol
- Touch-Screen shop interface

Paper-Less MES provides complete “visibility” into shop activity.

Is software required to link the plan to execution?
Successful ERP Customers

- Bottom line results
- Improved efficiencies
- Lower inventory
- On time shipments
- Improved quality

- What do they have in common?
  - Inventory Accuracy
  - Schedule Accuracy
  - On time shipments
  - Empowered employees
  - Transactions at source of transaction at time of transaction

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