To Support r

Manufacturing: -

* Configure to Order (CTO)
* Make to Stock (MTS)
* Make to Order (MTO)
* Engineer to Order (ETO)

Project:

1. MPS only figures following items : length of horizon (this is input of start product date to production completed date), how many people are needed, do we need overtime, shift, how much cost for normal, overtime and shift and purchase for every components from top down.
2. It won’t consider to new hire / dismiss extra people
3. Needs to find the algorithm to find best configuration of shift. (no longer needed, show different cost structure for different shift arrangement)
4. Compare cost of normal, overtime and shift – need to add shift rate during operation setup
5. Need to configure period type (day, week, month), how many days available in a given period to handle holiday etc. ( 8 hours, 16 hours etc, 5 dyas or 7 days etc), shift cost

**Regular time** (period day, week, month, year):

((regularTimePerEmployeePerDay\* InitialNumberEmployee) / HoursNeededPerUnitPerEmployeePerDay ) \* period = ProductMakePerPeriod;

Demand/ProductMakePerPeriod = totalRegularPeriodNeeded <= period

Cost: costPerRegularHour\* regularTimePerEmployeePerDay\* InitialNumberEmployee \* period

**Over Time:** (if totalRegularPeriodNeeded > period )

((overimePerEmployeePerDay \* InitialNumberEmployee) / HoursNeededPerUnitPerEmployeePerDay ) \* period = ProductMakeOverTimePerPeriod;

(Demand – totalRegularPeriodNeeded)/ ProductMakeOverTimePerPeriod = totalOvertimePeriosNeeded <= period

Cost: costPerOvertimeHour \* overimePerEmployeePerDay \* InitialNumberEmployee \* period

**Shift:** (if totalOvertimePeriosNeeded > period )

Shift 1:

((regularTimePerEmployeePerDay\* InitialNumberEmployee) / HoursNeededPerUnitPerEmployeePerDay ) \* period = Shift1ProductMakePerPeriod;

Demand/ Shift1ProductMakePerPeriod = totalShift1PeriodNeeded

Cost: shift1CostPerRegularHour\* regularTimePerEmployeePerDay\* InitialNumberEmployee \* period

Shift 2: (totalShift1PeriodNeeded > period)

((regularTimePerEmployeePerDay\* InitialNumberEmployee) / HoursNeededPerUnitPerEmployeePerDay ) \* period = shift2ProductMakePerPeriod;

(Demand - Shift1ProductMakePerPeriod )/ shift2ProductMakePerPeriod = totalShift2PeriodNeeded

Cost: shift2CostPerRegularHour\* regularTimePerEmployeePerDay\* InitialNumberEmployee \* period

Shift 3: (totalShift2PeriodNeeded > period)

((regularTimePerEmployeePerDay\* InitialNumberEmployee) / HoursNeededPerUnitPerEmployeePerDay ) \* period = shift3ProductMakePerPeriod;

(Demand - Shift1ProductMakePerPeriod - Shift2ProductMakePerPeriod)/ shift3ProductMakePerPeriod = totalShift3PeriodNeeded

Cost: shift3CostPerRegularHour\* regularTimePerEmployeePerDay\* InitialNumberEmployee \* period

totalShift3PeriodNeeded > period – new hires / increase employs or delay delivery date

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Demand in Period 1** | **Production in Period 1** | **cost** | **Total labor cost** | **Total cost** |
| **Regular Production** | **xxxxxx** | **nnnn** | **cr** | **cr** | **Labor+other** |
| **Over time production** |  | **mmm** | **co** | **Cr+co** |  |
| **Shfit 1** |  | **yyyyy** | **Cs1** |  |  |
| **Shift 2** |  | **zzzzzz** | **Cs2** |  |  |
| **Shfit 3** |  | **qqqqq** | **Cs3** | **Cs1+cs2+cs3** |  |

Stock:

Product/Project/retail Stok Schedule

Customer:

Customer id: (internal)

End date:[] Forecast Demand:[] (required-quantity, or total order count, may divided into deliverable time periods)

|  |
| --- |
| Customer |
| EndDate-1 Demand-1 |
| EndDate-2 Demand-2 |

~~Period unit: year, month, week, day, hour~~

~~Start time:(operation)~~

~~Procurement Type: in house/purchase/subcontract (inventory/operation)~~

~~Scrape rate: (operation)~~

~~Production Lot Size policy:( inventory)~~

~~Safety Stock (Minimum Ending Inventory level allowed): ( inventory )~~

~~Maximum Ending Inventory level allowed: (inventory)~~

~~Lead time: based on labour time to calculate the periods or one off, or milestone period (operation/inventory)~~

~~Unit cost: (inventory /opeartion?)~~

supplierPartNumber(inventory)

MPS is produced after MRP process



<https://www.youtube.com/watch?v=_uXBwibObwY>

<file:///C:/Users/zhangchar/OneDrive/Documents/ERP/UX/ERP/MRP_Basics/algorithm/Materials%20Requirement%20Planning%20Formulas.pdf>

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| MPS Summary Table | | | | |
| Component Name: | Table | **Approved By:** | **component Image:** |
| Component Number: |  | **Approved Date:** |
| Shift mode: |  | **planning horizon (day/week/month):** |
| Production Starts Date: |  | **Production Due Date:** |
| Inventory on hand | 260 | **Scrape rate (%)** |
| Gross Requirements |  | **Net Requirements (derived quantity) Gross Requirements - Inventory on hand** |
| Lead Time: | 2 time buckets | **Setup Cost / Purchase cost** |
| Lot Method | C:\Users\zhangchar\OneDrive\Documents\ERP\UX\ERP\MRP\_Basics\MRP - Material Requirement Planning -the Process\Material Requirements Planning -J-Beasley.pdf  LFL, FOQ, FPR | **Lot size/Periods/Quantity** |
| Time Buckets: | Day/Week/Month | **Working Days In Time Bucket** |
|  |  |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Time Period** | **Demand (gross requirements)**  **From PDP setup** | **On-hand at the end of Time Bucket** | **Scheduled Receipts or planned order**  **(and receipt date if this purchased from external supplier)**  **From IRF setup**  Planned Product Quantity/Planned Order Receipts, (derived quantity)  These are computed based on the net requirements and the lot sizing method  (1+scrapt\_rate) \* Planned Product Quantity | **Note:**  Need to combine:  Planned Order Releases, (derived quantity)  This row is the same as the planned order receipts except it is offset by the lead time for the part. This row becomes a portion of the Gross Requirements for parts in the BOM. If a number other than 0 appears as the first entry of this row (cell F15 for P-400), the number indicates the planned order receipts cannot be satisfied with the current lead time. The number indicates the total shortage |
| Production Starts Date:  dd-mm-yyyy | 150+70+175 |  |  |  |
| Time Bucket 1  (start to end) | 150 | (260-150) = 110 | 0 |  |
| Time Bucket 2  (start to end ) | 0 | 110 | 0 |  |
| Time Bucket 3 | 70 | 40 | 135 |  |
| Time Bucket 4 | 0 | 40 | 0 |  |
| Time Bucket 5 | 175 | 0 | 0 |  |
| Production  End Date:  dd-mm-yyyy | 150+70+175 or more |  |  |  |

