

MRP : Manufacturing Ressources Planification

Introduction

The aim of these practical sessions is to allow you to implement two different methods of Production management, using a Business simulator (ODYSSEY Plant) :

- a traditional method of inventory management : This method will use Excel to calculate the emergency inventory, **item by item**, as a trigger of Manufacturing Orders (MO) and Purchase Orders (PO).
- a MRP method : This method will use a MRP software to automatically calculate the needs of **dependant products**, and the charges for the production plan.

The aim is to compare the results given by each methods in terms of customer service and stock level. For a company to be competitive it must reduce the cost of the products, and reduced inventory level contributes to reducing unnecessary costs. The ambition is not here, to implement the overall method of industrial management MRP2. Indeed the Industrial and Commercial Plan and the Global Expense Plan are not used in this simulation.

ODYSSEY PLANT will allow to simulate operations in a company that manufactures two different finished products (FP1 and FP2) from two subsets manufactured (SF1 and SF2), three purchased components (CO1, CO2, CO3) and a purchased raw material (RM1). The eight items managed by the company are all stored (in a shop).

The simulations will cover 10 weeks (week 1 to 10). For each week the stock level, the customer service rate will be consulted. Each week Manufacturing Orders will be made, and Purchase Orders with suppliers can be past. The software simulates, week after week, the production of manufactured items (sometimes scrap) and receipt of purchased items.

When the software is launched (english configuration) **enter your name, a name of a company, the pass word for the license** (iae montpellier), **accept the mission ... Good luck!**

STEP B : Emergency inventory, using Excel sheet.

This first part will consist in setting implement a traditional production management :

emergency inventory. We are currently at the beginning of Week 1 (see bottom left of the window). **Go to the step B**, read about the factory that you have to manage : the technical data, financial data, the current demand ...

1. Create an Excel sheet. Verify by calculation that the indicated "Lot size" in Odyssey Plant correspond to "Wilson economic quantity". In step B, you will use 100 as safety stock for each item. Calculate emergency stock : Emergency stock = Safety stock + Demand during the delivery time. Then for each item, compare "emergency stock" with the stock level (stock + work in progress) : option "Inventories and WIP". Complete in your table (Yes or No) if orders are necessary or not for this week.

Note : By convention the stock level given for one week is the stock level of the previous weekend. When a Manufacturing Order or a Purchase Order is expected this week it is viewed, and orders arrive still early in the week.

2. In ODYSSEY Plant, use the "**Order Management**" to launch your orders.

3. Ask the simulation, with the option "Simulation : step by step, or continuous. The different phases of the simulation appear in a screen. Then click "Finish".

Note: Manufacturing Orders actually launched by the software depend on the availability of components or raw materials that go into composition of the product concerned.

4. You are now in the following week. If you want to see messages from the last simulation, see them through menu "Simulation" : watch the simulation messages. Read new values stock and WIP. Manage the business for 10 weeks with your Excel sheet.

Perform an assessment of these 10 weeks of simulation. Print all results : Financial value, stock average, customer satisfaction average, annual cost of inventory...

Before changing STEP, save the file (using File / Save)

STEP C : Management production, using MRP software (mini-CAPM).

Start the mini-CAPM, "english configuration". Choose the menu File, to open PeriodeC1.don. You will notice that the technical data are, of course, the same as before. You have sales forecast for the coming weeks with the option "Planning".

1. In technical data "Lot size" comes from Wilson calculation. **Verify the safety stock** that must be provide for each item. Desired customer service rate is 97.72%, then the safety stock SS is calculate for each product : $(SS = 2 \times \text{Standard Deviation}) + \text{scrap rate } 0.05$ (see in ODYSSEY Plant, technical data, items).

3. In mini-CAPM, **UPDATE** the stock levels (Stock Update), see the released ordres and ask for compute needs (**MRP**). See the **CRP** Capacity Requierement Planning : if there is a failure or an overload, suggest a solution using "**Firm Orders**". Check effectiveness of the new solution in CRP . Take the messages.

4. In Odyssey Plant, according to the messages, do the launches that are necessary : option "**Order Management**". Once all of your Orders are launched ask the **simulation**, click "Finish". You are now to the following week.

6. In Mini-CPAM, click **NEXT WEEK** and then **UPDATE** the real **stock levels**.

Restart MRP, CRP, etc.. and that for 10 weeks.

Perform an assessment of these 10 weeks of simulation. Calculate and compare the performance indicators in step B and C: customer satisfaction average, annual cost of inventory. Give your conclusions and remarks.

STEP D, STEP E are the same, but you must try the lot size, in order to reduce the stock levels..... Before changing phase, save the stage (using File / Save) then add Phase C in your review