Production planning by MRP at finite capacity

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Introduction

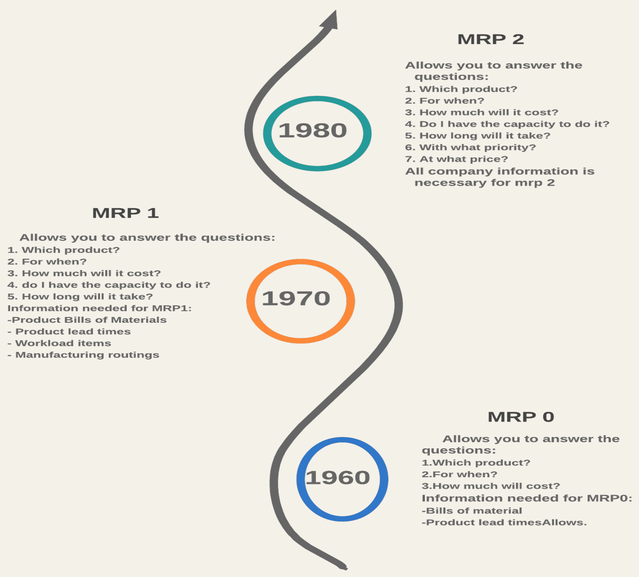
Manufacturers are always required to innovate and take special care on optimizing their company organization and make time critical decisions to keep costs low thus increasing profit margin. Researchers are equivaly playing their part keeping their solutions effective and up to date.

In this context the most common production planning method in the industry is MRP, but it is not flawless. We noticed that the MRP algorithm does have a major flaw that it does not take into account the production capacity we will be suggestion other methods that could be used alongside MRP to fill in its gaps and establish the best production plan

Materials requirements planning

•Materials requirements planning (MRP) is an approach to calculating how many parts or materials of particular types are required and what times they are required.

HISTORY OF MRP



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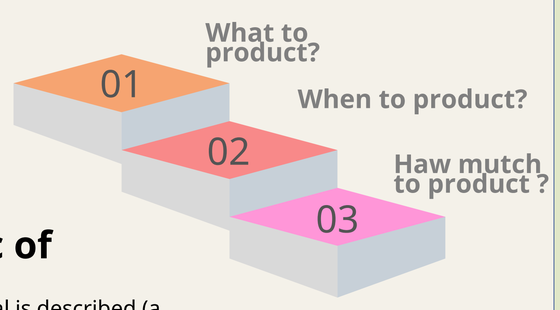
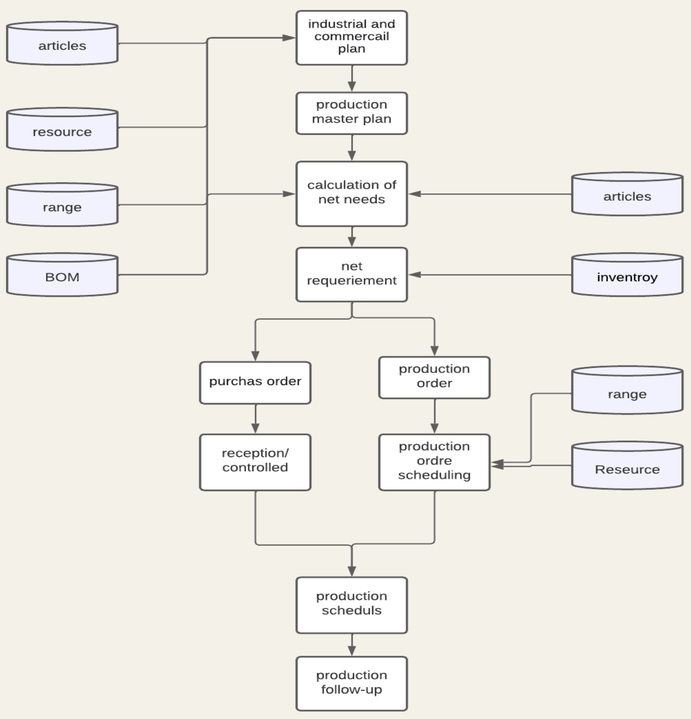


The logic of MRP

the planning goal is described (a production plan for a time scale defined by a planning horizon and a refresh period. A production plan answers the following questions, among others

MRP step

There are different levels of industrial planning which can be broken down into successive stages over time



Production capacity planning:

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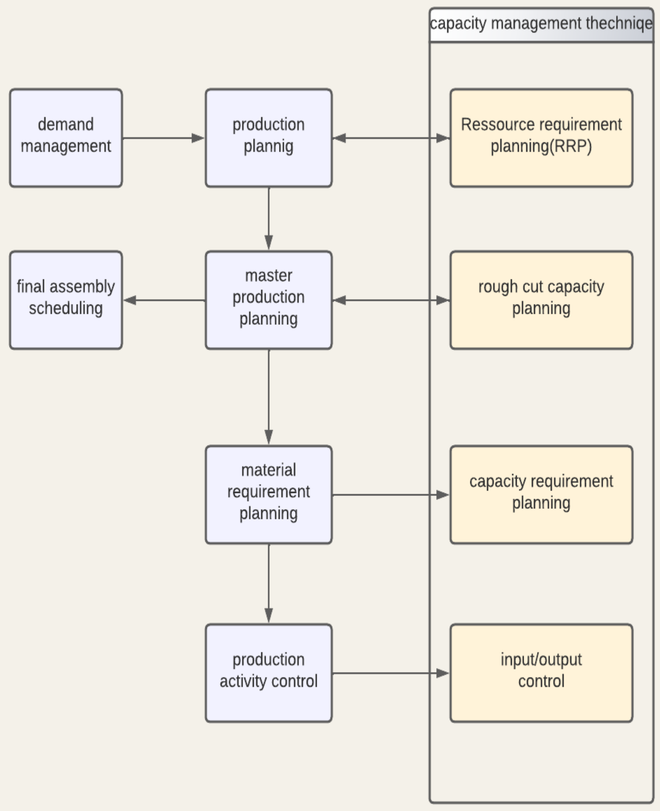

Resource requirements plans (RRPs)

The first phase of capacity management involve looking forward in the long term to predict the requirements for large structural parts of the operation, such as the numbers, locations and sizes of new plants. This process is similar to MRP Except, that instead of planning the needs in components, we planned the needs in human resources, material, and financial necessary to the realization of the production plan (PDP)

Validation of the production master plan

Rough-cut capacity plans (RCCPs) – are used in the medium and short term, to check the master production schedules against known capacity bottlenecks, in case capacity constraints are breached. The feedback loop at this level only checks the MPS and key resources

there are three PDP validation techniques which are grouped under the term Rough Cut Capacity Planning. These techniques differ according to the data required and their complexity

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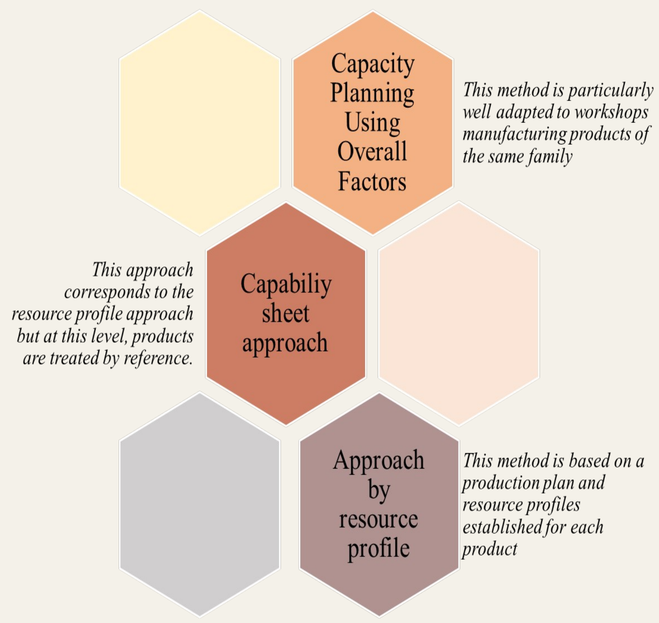
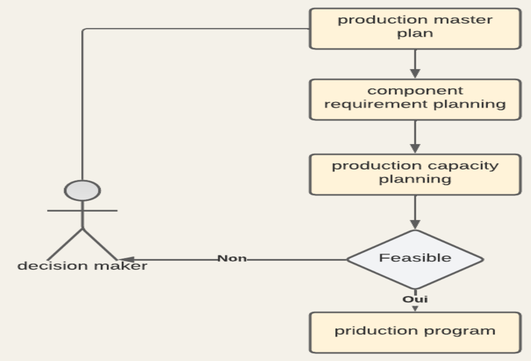
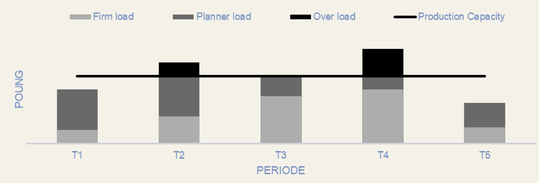


Capability Requirements Plans (CRP)

the CRP is able to calculate the load caused by these orders on the resources of a workshop by simulating their execution. On the snapshot as well for each period of the planning horizon, the load and capacity of each resource.



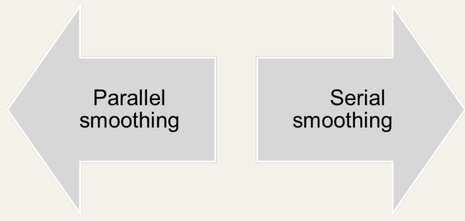
Resulted of CRP



LOAD DIAGRAM GENERATED BY THE CRP

an overload is not always synonymous with redesigning the PDP, there are methods to make it disappear on temporary loads.

Load smoothing techniques



Conclusion

this article made it possible to understand the operation of an MRP and to raise it main shortcoming, namely the failure to take production capacities into account when drawing up planning. However, there are a number of methods for planning production capacity needs at different times in the production management system production. these methods cannot guarantee that there will be no overruns of ability. There are therefore load smoothing techniques that can be applied to results of the MRP to try to eliminate the problems of overflows temporary. This type of process only appeared with type MRP-2

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