



Optimum Production Planning

Preparing the production plan for industries with production lines where multiple tasks/products and/or more than one machines are involved can be a tedious and time-consuming process when approached with empirical methods. Detecting the optimum sequence for assigning tasks to machines is in the most cases infeasible without the use of optimisation methods.

PRIMARY implements optimisation technology for the purpose of Production Planning through the development of the respective mathematical model and the detection of the optimum plan through the application of appropriate mathematical optimisation algorithms.

Objectives

- Minimisation of the operational cost for production and storage
- Calculation of the minimum required volume of raw material (Material Requirement Planning) Short- and medium-term production planning

Data entered to the mathematical model

- Total production cost per unit
- Required times per production phase
- Wages of involved personnel (normal working hours, overtime, etc.)
- Storage cost per unit
- Maximum allowed working time for involved personnel
- Maximum allowed operation time of machines
- Total storage capacity of warehouses
- Demand (given or estimated through forecasting model)
- Cost for modifying production process
- Required down-time for involved machines (maintenance, replenishment, etc.)

Mathematical modeling - Optimisation

- Preparation of appropriate mathematical model
- Definition of objective function (operational cost / profit)
- Modeling of all involved parameters and constraints

- Application of appropriate optimisation algorithms
- Detection of the optimum vector of parameters that result to the global maximum/minimum of the objective function

Results

- Significant reduction of operational cost for production lines and warehouses
- Smooth operation and minimization of unnecessary idle time for production lines
- Increased reliability and timely satisfaction of production business goals

Complementary functionality

- Link to ERP systems for automatic data input
- Application of the mathematical model for investigating the efficiency of alternative designs of the production system
- Manual override of production plan in case of unexpected requirements (e.g. unexpected machine down-time, etc.)

Extensions

- Link to demand forecasting system for estimating production requirements
- Link to decision support systems for optimum Supply Chain Management