

## Case Study – Nasik Glass Works

Background: Nasik Glass Works (NGW) is a leading glass bottle-manufacturing plant in India. It is a fully automated plant with one of the largest furnaces (320 metric tons day) in Asia. They manufacture bottles and containers with a capacity from 100 ml to 1200 ml. (Beer, Cosmetics, Drug, Pharmaceuticals, Food, Fruit Juice, Soft Drinks and Spirits).

Objective: To increase utilization of the plant by at least 6%.

Multiple Constraints: The plant was already working at fairly high level of 84 to 85 %. Planning technology has to consider many constraints to ensure practicality and cost effectiveness. Some of the constraints are enumerated below.

- Ensure that furnace works on 24x7 bases continuously,
- ▶ Daily draw (production) is between 240 tons and 320 tons
- ▶ Variation from one day to next day is not more than 20 tons.
- There are four Production lines and each line has minimum and maximum draw constraints.
- ▶ Some types of the bottles can be produced only on certain lines.
- ▶ There can be only one job change in a day. (More than one job change will lead to loss of production.)
- ▶ Some bottles are more profitable than others and 8. Manufacturing efficiency depends on the type of bottles. Further rate of production of bottles is tunable.

### Present Planning Method:

Based on actual Orders and market conditions, (in the last week of every month) Marketing Department in Mumbai prepares a monthly plan for the next month. This plan is send to the Production Department at Nasik plant. Based on the marketing inputs, Production department makes a monthly schedule for the manufacture of bottles. During the month changes take place and adjustments are made to schedule. The entire planning exercises were done manually and Excel spreadsheets were used for monitoring and reporting. The Plant never achieved more than 84% production capacity At the end of every month they felt they could have achieved higher production and better realization. Hence Managers at NGW were looking for a scheduling solution, which could help them to plan to higher efficiencies and realization.

### WIT's Solution:

WIT offered a special version of ExSched, their flagship scheduler, customized to specific needs of NGW.

The scheduler generates six plans using different heuristic rules and satisfying the production constraints. Six scenarios are generated considering various combinations of factors like:

-- Production constraints, Due-dates, efficiency and realization from each Order. These combinations are user defined and Planner is enabled to take informed decision.

The Software program generates schedules, calculates daily draw for the various lines and calculates plant efficiency and realization for the entire plan. Planner at the plant selects one of the generated plans as working plan. He can also fine-tune the generated plan by manual overrides over the month.

WIT has provided a separate Gantt chart component, which displays schedule. By clicking on the chart, user can view what bottles are planned on what day. The scheduler generates requirements of moulds, mould parts and packaging material based on the schedule. This helps in advance planning of manufacture of moulds and procurement of packaging materials.

Results:

The plant efficiency achieved due to use of Scheduler is in the range of 93 to 96 %. Now with WIT scheduling solution, NGW achieves much higher productivity and control production process more efficiently. Moreover since the expert knowledge is captured in the scheduler algorithms and databases, relatively inexperienced planners can generate better working plans.

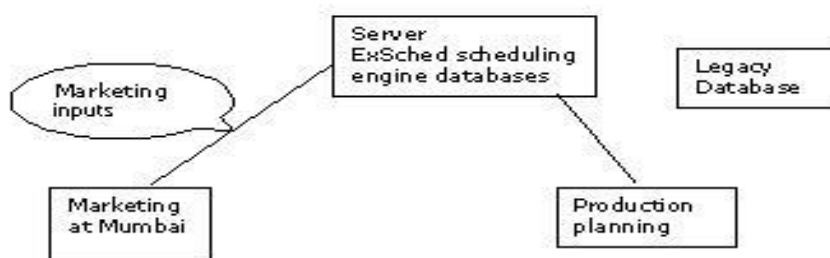
Remote access and networking features:

Since marketing division is at Mumbai and Plant in Nasik is geographically spread, WIT proposed a web-based solution. ASP.NET pages drive the entire application. The scheduling engine is an ActiveX Server component. Gantt chart is also an ActiveX component but resides in client context.

Application uses MS SQL database for storing plans, schedule output and other data. Scheduling engine apart from this primary database, accesses legacy PPC Foxpro database on a different machine maintained by a legacy Foxpro based application.

Marketing department at Mumbai submits monthly requirements via web forms. The production department at Nasik use web pages to interact with scheduling engine. At any time when they run scheduler,

The deployment of the application is schematically shown below:



Roles: Marketing (Mumbai): Submit marketing inputs, view results.

Production (Nasik): Generate plans, make amendments monitor progress.