

Coffee Manufacturer

- Facility Planning & Analysis Services**
- Facility Layout Design and Optimization
 - Simulation Modeling

A coffee manufacturer anticipated a growth in demand and was evaluating different operational renovation options to meet this growth. Op2mize personnel develop a simulation model to assist their process design engineers in the analytical evaluation of various design concepts. The model was used to analyze the following concepts:

Roasters

The initial design included 6 older roasters and 2 modern roasters. The simulation was developed with the capacity of up to 12 generic roasters that could be characterized according to the process engineers specifications. The simulation model demonstrated that the roasters were in fact the current source of the system bottleneck and the system needed to be upgraded significantly to meet their future needs. Through model experimentation, the design team was able to evaluate different roasting technologies and options to generate the optimal solution.

Grinders

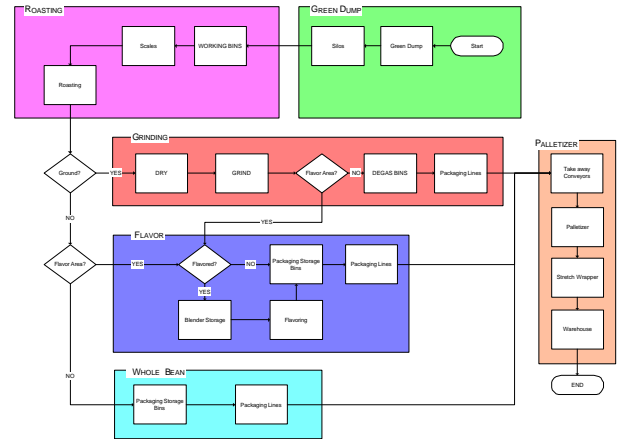
Based on marketing projections and a new corporate strategy to enter the retail ground coffee market, an increase in production through the grinders would be seen in the next two years. Although the coffee producer was not currently experiencing any process limitations due to their grinders, the simulation model predicted that the grinding area would become a bottleneck during this period. Based on this information, the design team was able to develop solutions for this problem before it affected the throughput of the plant.

Packaging Lines

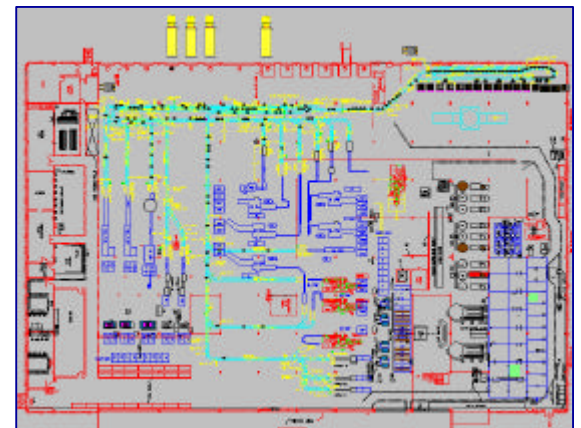
Based on the current throughput and future demand, our client planned to make a large capital investment of additional packaging lines. The simulation model proved that the packaging lines were not the bottleneck of the system. Therefore, an increase in packaging capacity was unnecessary and that capital should be spent elsewhere in the plant.

Palletizing

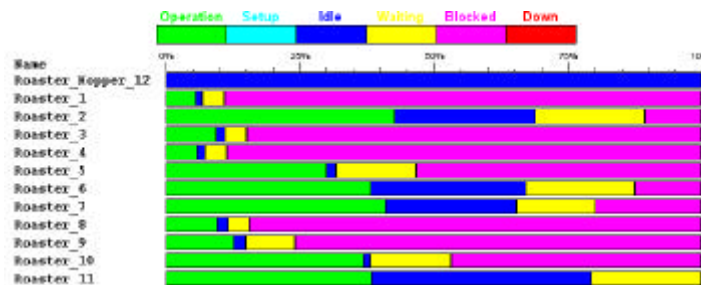
Initially, a manual palletizing system was employed. The simulation model was used to determine the number and type of automated systems required to meet the demands of the new system. Although the palletizing system represented a large capital expenditure, the reduction in cost per pound of coffee justified the expense in as little as three years.



Simulation Flow Diagram



Simulation Model



An Example of the Simulation Output – Roaster Gantt Chart