



## Scheduling Simplified

**"There cannot be a crisis next week. My schedule is already full"**

-Henry Kissinger

In recent times, a number of organizations are focusing on **increasing business performance** by **improving scheduling** like scheduling of delivery vehicles, scheduling of salesman visits to different towns, scheduling of operations on shop floor, scheduling of aircrafts, scheduling of activities for launching a spaceship etc. The concern is assigning a given set of machines and possibly other resources to a set of tasks in order to execute the tasks **optimally subject to certain constraints**, such as deadlines, availability of resources, priorities for some tasks over others or machine capabilities.

Scheduling is simply the allocation of resources over time to perform a set of tasks. Production being an integral part of a company catches a lot of attention and faces major scheduling/rescheduling issues.

There are two basic steps in production scheduling

**Step I: Defining the problem:** It includes understanding of the shop floor layout, machine capacities, routings, alternate resources, processing constraints, various shop floor events and the existing and desired ability to deal with these events (like change in resource, change in material availability, change in demand).

Above all the scheduling objective needs to be spelt out clearly. E.g., Scheduling objectives can be minimization of WIP, due date performance, maximization of throughput, level loading etc.

**Step II: Model building and deployment:** It includes a number of smaller steps to deploy a user-friendly solution. It is

### Airline Fleet Scheduling

Given a flight schedule, an airline's schedule-planning group needs to decide on an itinerary for each



aircraft and each crew member that maximizes total revenue minus total operating costs and, at the same time, satisfies all operational constraints. [Read More...](#)

### More Resources

- [Theory of Constraints](#)
- [Capacity Planning and Scheduling](#)



### About DecisionCraft

DecisionCraft provides decision-making solutions to improve operational efficiency and business responsiveness. Our

important to remember that the solution should help scheduler to

- **Schedule the tasks optimally** at the shop floor
- **Provide activity level visibility** - start time, expected due date, resource utilization
- **Build and evaluate various scheduling scenarios**
- **Reschedule quickly** in the event of late demand, resource overload or unplanned machine breakdown or late material

To build a robust scheduling solution, there are number of approaches/ algorithms like "disjunctive graph model", "polynomial algorithms", "dynamic programming algorithms", "polynomial approximation schemes", "branch and bound methods", "decomposition approaches", "simulated annealing", "heuristics models", "theory of constraints" etc.

The right model framework varies from company to company based upon **shop floor complexities and scheduling objectives**.

Largely, **scheduling issues can be tackled best if the users are involved** in the schedule construction process and they interact with the schedule to input their subjective preferences like sequencing constraints, due date preferences etc., and explore interactively the possible **trade-offs between different schedule criteria**.

Major benefits of a good schedule are

- **Better plant item utilization** - means that plant equipment is less idle and capital invested is performing better.
- **Low unplanned overtime levels** - controlled due to better due-date performance and less of expediting cost for late running orders
- **Low stock levels** - balanced material flow helps in reducing WIP and lowering of storage requirement and associated costs
- **Better due date performance** - improves stock availability, enhances ability to retain customers and reduces costs for servicing demand with decrease in rush dispatches
- **Ability to identify** the impact of changes quickly to the production plan such as additional, high priority orders, and mechanical failure
- **Low cost of labor** by reducing instances of idle-labor

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Previous Issue: [Role of Process Excellence and Quality](#)

consulting services employ our strengths in industry knowledge, conceptual rigor, and information technologies. Developed using concepts from decision theory; our solutions use robust optimization, simulation, and statistical engines adapted to our client's focus areas.

## DecisionCraft Products

### iSchedule™

Helps shop floor managers to plan and schedule jobs, equipment and operators and identify bottlenecks, perform aggregate capacity planning, and schedule work based on a variety of criteria

### Logistics Planner

Highly flexible cost-effective distribution scheduling solution that helps minimizing distribution costs. It synchronizes supply with demand throughout a multi-echelon distribution network and manages inventory at minimum distribution costs while maintaining targeted service levels

### Travel Route Optimizer

Schedules sales force dispatching, automates and streamlines the entire travel planning and travel expense monitoring process of sales and service personnel. It can reduce tour and travel costs significantly by standardizing all travel costs and optimizing tour itineraries to create minimum cost tour plans

[qcCharts™](#)



Enhances process capability of critical processes through interactive data visualization

**dataOrganizer™**

Integrates data from diverse sources on to one destination database

**Supply Chain Simulator**

Determines optimum inventory policy for reorder point, maximum stock and fill rates