




# Simio User Group Meeting

## Planning and Scheduling with Simio

*How Enterprise features can generate plans and schedules*

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## Simio Risk based Planning and Scheduling (RPS)

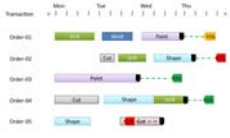
► Design & Analysis

- Visualize and understand the systems.
- Analyze system performance.
- Evaluate alternatives.
- Minimize risk of implementation.




► Planning and Scheduling

- Correctly allocate resources to improve daily operations.
- Deliver services on time and within budget in the presence of uncertainty.
- Add automated Risk Analysis to assess plan feasibility.




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## Agenda

- What is Simio RPS?
- Simio Key Capabilities
- Scheduling Project Approaches
- Building a Simple Scheduling Model
- Summary

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## Simio Key Capabilities

**1** ▶ Accurately captures **Complexity**

- Complex Material Handling and Secondary Resources
  - Cranes, robotic equipment, transporters, workers, etc.
- Specialized Operations / Resource Allocations
  - Changeovers, sequence dependent setups, etc.
- Experience-based Decision Logic and operating rules
  - Order priorities, work selection rules, buffering, etc.

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## Simio Key Capabilities

**3** ▶ Executes **Concurrent** planning and scheduling

- Simultaneous, in memory, solving for:
  - Demand (sales order, stock orders, production orders, etc.)
  - Capacity (workers, machines, transporters, cranes, etc.)
  - Material (raw material, purchased material, intermediate material, etc.)
- The schedule generated through this process will fall within the window of **feasibility**.

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## Simio Key Capabilities

**2** ▶ Effectively deals with **Variability**

- Breakdowns and Unplanned events
- Worker and Resource schedules
- Setup, Processing and Teardown times
- Material and Order arrivals

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## Simio Key Capabilities

**4** ▶ Provides for **Interoperability** between systems

- Manual data entry
- Excel and CSV table binding (Excel)
- Database table binding (SQL/Oracle, etc.)
- XML transformation (ERP/SAP/Oracle, etc.)
- Connecting to Wonderware MES using the standard API.

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## Simio Key Capabilities

**5** Facilitates **Cloud based** results distribution

- Gantt charts
- Reports
- Dashboards
- Experimentation

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## Scheduling - Project Approaches

- A scheduling project can be approached in one of two basic ways (or hybrid) as follows:
  - Model driven approach
  - Data driven approach
- In this presentation we will focus on the model driven approach by developing a simple model to be used for scheduling.
- Typical scenarios where a model driven approach will be appropriate:
  - Simulation design and/or optimization project as the initial phase of the project
  - New facility with no existing data (Greenfield project)
  - Current facility but the MES that will contain the data is still in the implementation phase
  - Current facility with no MES implemented and poor ERP/MRP data.

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## Scheduling – Any Simio Model

- Any Simio model can be used for scheduling.
- All Resource and Transporters (objects) in the Standard Library can be displayed on the Gantt.
- These “objects” have the option to disable and enable the logging of Resource Usage.
- When the Resource Usage logging is enabled, the usage information will be displayed on the Resource Gantt producing the schedule from the simulation run.

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## Model Driven Approach

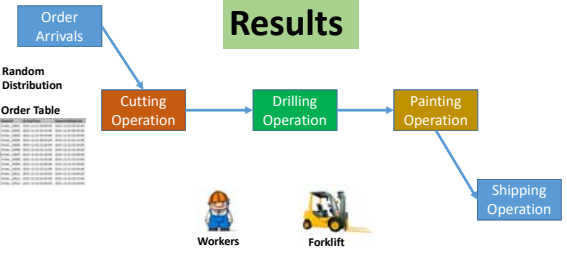
▶ Key points for the Model driven approach:

- Models need to be built in a different style
  - Model needs to address the scheduling constraints and decisions
    - Lookahead for resource availability
    - Upfront process logic to create launch sequence
    - Manual labor (pools, skill based, experience based, specific, etc.)
    - Transporter selection (lookahead to dispatch proactively, etc.)
  - Cannot use probabilistic routing such as 'Link weight', etc.
  - Need to use 'transfer nodes' as decision points in the model to apply decision/selection rules before each server, resource group or decision point in the process.
  - Need to be connected to the actual data sources (orders, resources, priorities, work schedules, etc.)
  - User interactions updating the model must be limited to support ease of use and mostly driven via a parameter table

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## Simple Scheduling Model

▶ To illustrate the process of building a simple scheduling model using a "model driven approach" we are going to build the process shown below in various Steps.



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**Summary** 

- ▶ Simio RPS is unique in its capabilities.
- ▶ Powerful solution in complex environments.
- ▶ Integrate to both ERP and MES systems.
- ▶ Unique value proposition:
  - Design and analysis support.
  - Scheduling and operational support.
- ▶ Can be implemented using a data or model driven approach.
- ▶ Support various operational scheduling workflows

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**Thank you!** 



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