Simio User Group Meeting

Data Driven Modeling and Scheduling

Learn how to replace complex custom models with data-driven modeling

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Agenda

- **Simio Key Capabilities**
- Scheduling Project Approaches
- Simio Scheduling Data Tables
- Building a Data Driven Model
  - Develop the model
  - View the Results
  - Changing the model
- Summary

Simio Key Capabilities

1. Accurately captures ***Complexity***
2. Effectively deals with ***Variability***
3. Executes ***Concurrent*** planning and scheduling
4. Provides for ***Interoperability*** between systems
5. Facilitates ***Cloud based*** results distribution

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Scheduling - Project Approaches

- A scheduling project can be approached in two basic ways (or hybrid) of:
  - A Model driven approach or
  - A Data driven approach
- This presentation will focus on using data tables describing the process, material and resources to develop a model.
- These data tables can originate from ERP, MES or Excel data.
- Typical scenarios where a data driven approach will be appropriate are:
  - Current facility with MES installed and operational (rich data)
  - Current facility and Simio will integrate to the ERP/MRP system
  - Current facility with all process, material and resource data in Excel data tables
  - Complex systems with many process steps, parts, routings and final products.

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Data Driven Approach

- Key points for the Data driven approach:
  - Models can be built based on just the data using 'Add-ins'
    - The 'Add-in' creates all the tables, objects and references from the data to include:
      - Resources
      - Routings
      - Task sequences
      - Timing, sizing, schedules, etc. (parameters/properties)
      - Etc.
    - ***Model behavior can almost fully be controlled via data with limited to no human interaction (once a week/month/etc.)***
    - Data can be provided directly from other systems or via human input in an external configuration/properties table(s)
    - Add specific process logic where required for specific decision making/logic to improve schedule quality and feasibility.
    - Out of the box results, reports and dashboards for rapid usability
    - Results exported to other systems (MES, ERP, etc.) or Excel or as printed reports

Simio Scheduling Data Tables

- Simio provides built in Add-ins to import data from;
  - B2MML (Business to Manufacturing Markup Language) data tables
  - Wonderware MES data
  - Wonderware InBatch data
- Simio B2MML compliant tables include:
  - Resources table
  - Materials table
  - Material Lots table
  - Manufacturing Orders table
  - Routings table
  - Bill Of Material table
  - Work In Process table
  - Manufacturing Orders Output table

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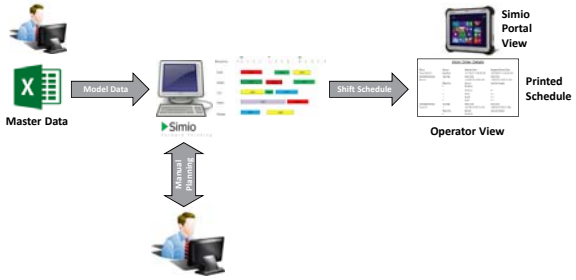
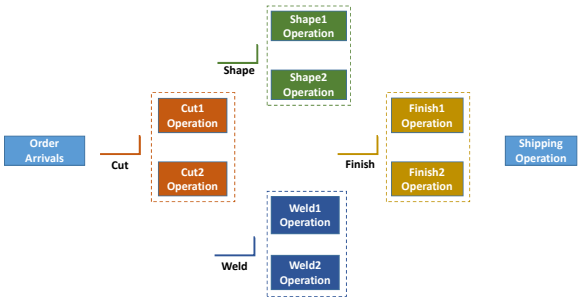
Data Driven Model

- Model data is managed and updated in Excel



Data Driven Model

- We will build a scheduling model in Simio for the process shown in the figure below using a data driven approach.



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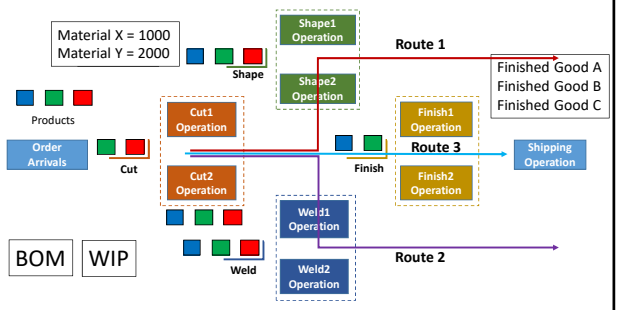

Generating & Viewing Results

- Generate a schedule
- View the Gantt charts
- Import and view the Dashboards
- Import and view the Reports

Changing the Model

- Add a Cutting resource.
- Import the new resource file and reconfigure the model.
- Change the processing time (increase).
- Import the new Routing file and generate a new schedule.
- Change the scheduling rules and view the impact on the schedule.

Model Enhancements

- Although a default model can be rapidly built using the available add-ins, it's sometimes desirable to edit this default model to add additional logic or detail to the Facility model.
- Examples of possible enhancements include adding moving operators (using Worker objects) that travel between Servers, complex material handling devices such as AGVs or conveyor systems, as well as custom decision logic for selecting between orders or Servers.
- Note that the full modeling power of Simio is available to us to customize the model as needed.

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- Simio contains various data binding features to support easy data import and management.
- Simio has special data Add-ins to create the required B2MML compliant data tables to easily import the process data.
- Simio can generate a scheduling model by just importing the standard data tables using the provided configuration Add-in.
- Standard reports can quickly be included to a project by importing the report and dashboard config files.
- Once the model has been created using the data driven approach it can easily be modified or enhanced to add process detail and decision logic if required.

Thank you!