Advanced Planning & Scheduling

Generates individual resource schedules and enforces processing sequences optimizing production KPI's using multiple optimization criteria

Overview

The shop floor is a very complex environment. There is a big variety of equipment with different capabilities and characteristics (different processing speeds, different product setup times, different maintenance plans). There is also a set of orders for different products with different due dates. Furthermore, the shop-floor environment is also very fluid and unpredictable – new orders can arrive; orders can be cancelled or have their due dates and priorities changed; orders can be put on hold or require rework; and equipment can breakdown. Determining the best processing sequence for each resource is quite demanding and challenging and it can significantly impact the performance of the factory as well as the bottom line.

The Advanced Planning & Scheduling module generates resource processing sequences that optimize some key performance indicators, such as equipment utilization or order fulfillment. While dispatching provides only a local optimization considering the current state at a Step or a Resource, Scheduling considers multiple Steps and multiple Resources, as well as a more comprehensive set of constraints and a bigger time horizon. If required, the system is also capable of sequencing personnel or tools. Being a fully integrated module, it has access to all the master data as well as the current WIP and equipment state, and it can also ensure that the generated resource processing sequences are followed.

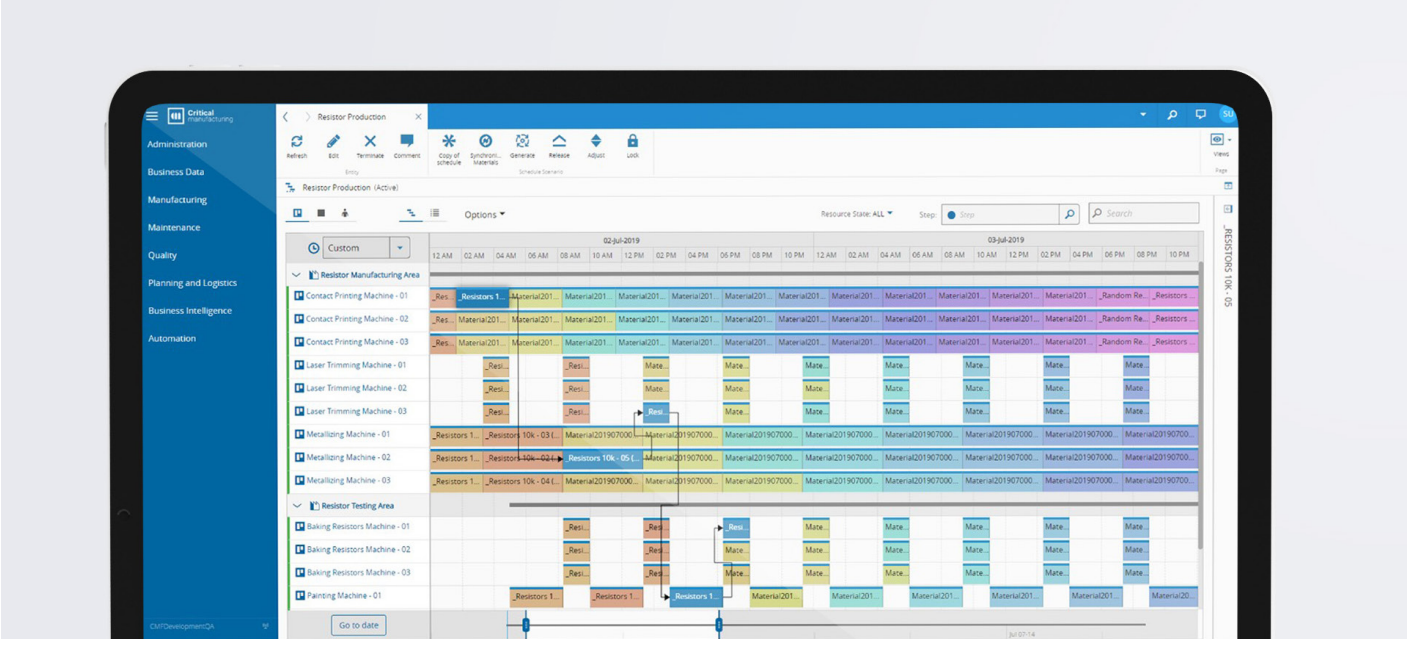

Figure 1 Scheduling example

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Key Features

- Support for multiple optimization criteria that can be combined using different weights:
  - Minimize Setup Times
  - Maximize Resource Utilization
  - Minimize Deviation from Delivery Dates
  - Minimize Total Cycle Time
- Support for the generation of multiple schedule scenarios.
- Support for manual schedule adjustments.
- Provision of multiple KPIs to assess the quality of the different schedule scenarios:
  - Production Time Percentage
  - Setup Time Percentage
  - Average Cycle Time
  - Priority Client Satisfaction
- Support for the following types of equipment:
  - Machine (normal)
  - Tunnel (conveyor type)
  - Batch
- Being fully integrated, it leverages all the existing MES master data (Product, Flows, Resources, Maintenance and so forth) as well as MES material and equipment state information.
- Support for the following type of constraints:
  - Maximum and minimum times between process steps
  - Material dependencies
  - Planned maintenance
  - Setup matrixes
  - Work calendar – including shifts and non-working times
- Support for scheduling of individual employees, considering their work calendar and certifications (skills).
- Support for scheduling of individual tools.
- Provision of multiple scheduling modes
- Native pre-integration with Material Tracking, Resource Tracking and Order Management.
- Support for scheduling at the Material level or Production Order level
- Support for configuring automatic schedule generation based on user-defined time intervals

Benefits

- Improved equipment utilization
- Improved order fulfillment
- Reduced WIP and shorter cycle times
- Fast and automatic schedule generation
- Enforcement of processing sequence
- Quick response to unforeseen events
- Increased visibility, predictability, and reliability
- Early visibility about problems and bottlenecks
- Ability to test and analyze different scenarios

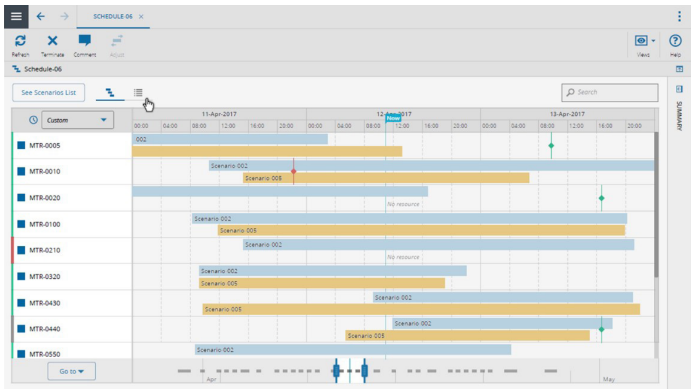

Figure 2 Schedule Scenario completion date comparison

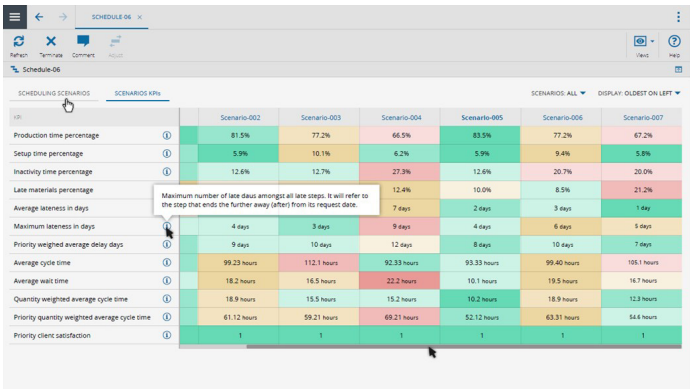

Figure 3 Scheduling Scenario KPIs comparison

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