Integrated Planning in the Age of the Operations Control Center

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Business Unit Director, Quintiq
Radnor, PA
Data driven decisions

Consumer

Job

Technology Provider
### The changing landscape of rail operations

<table>
<thead>
<tr>
<th>Trend</th>
<th>Effect on Operations</th>
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<tbody>
<tr>
<td>Digitalizing and modernizing customer experience</td>
<td>Increased data availability</td>
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<tr>
<td>New/changing regulations on crew hours of service, fleet</td>
<td>Ripple effects on future schedules</td>
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<td>Increasing customer expectations</td>
<td>Operations are under a magnifying glass</td>
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Most planning processes still look like this...

- **Timetable**
- **Units/Consists**
- **Crew**

Separate systems

Track problem resolved
What’s difficult about the day of operations?

**Beat the clock**
Time is of the essence

**Rubber meets the road**
This is where all planning issues come to light

**Communication**
Changing many schedules quickly would be asking for chaos
Shifting to centralized operations

**Benefits**
- Faster response time to disruptions

**Challenges**
- Need for improved communication, coordination
- Technology has not kept pace with organizational decisions
Quintiq founding vision

Develop a single application capable of solving any type of planning puzzle

- > 1,000 employees
- > 300 customers worldwide
- 12,000 users
- Founded in 1997
- A Dassault Systèmes company since 2014

Used by companies in over 80 countries
Quintiq in Rail

Long term
- Standard week
- Anonymous plan

Short term
- Actual week
- Assigned to resources

Day of operations
- Disruption management
- Best use of available resources

Timetable
- Timetable
- Short term timetable
- Delay and disruptions

Consist
- Unit diagramming
- Unit planning
- Unit swapping

Crew
- Crew diagramming
- Crew roster
- Crew swapping

Maintenance
- Resource diagramming
- Resource schedule
- Resource swapping
Case study: Queensland Rail

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<th>Challenge</th>
<th>Solution</th>
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<td><strong>Improve visibility and reduce ad hoc communication</strong> of decisions between fleet, timetabling planning and execution functions.</td>
<td><strong>A fully integrated platform for planning, scheduling and day-of-operations execution</strong>, including Quintiq’s timetabling and fleet modules.</td>
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<td><strong>Modernize the operations control center</strong>, and replace paper graphing and manual tracking of actual train movements.</td>
<td><strong>Electronic train graphs</strong> that automatically track planned vs. actuals, eliminating the need for paper graphs and manual mark-ups by network controllers.</td>
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<td><strong>Make efficient use of existing rolling stock</strong>, and provide a scalable solution to accommodate large additions of new third-party units (New Generation Rollingstock (NGR)) to the existing fleet.</td>
<td></td>
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<th>Why Quintiq?</th>
<th>Benefits</th>
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<tbody>
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<td>The Quintiq Fleet Planning and Scheduling solution stood out from competitors for its reputation, ease of use and expandability.</td>
<td><strong>Better decision making</strong> and improved quality of plans leading to <strong>reduction of avoidable conflicts</strong> on the day of operations.</td>
</tr>
<tr>
<td>Quintiq was able to develop an <strong>integrated end-to-end planning system</strong> that synchronizes the planning and scheduling of new and existing fleet.</td>
<td><strong>Seamless visibility of decisions across planning horizons and functions leading to higher efficiency and productivity.</strong></td>
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<td><strong>Enhanced visibility leads to better incident management and recovery capabilities on the day of operations.</strong></td>
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<td><strong>Reduced stress in the operations control center due to reduction of ad hoc communications, and high levels of visibility.</strong></td>
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**Fast facts**

- **Industry:** Government, Passenger Rail
- **Annual revenue:** $1.9 billion
- **Number of employees:** 5,800
- **Location:** Queensland, Australia
- **Solution:** Dynamic Timetabling & Fleet Allocation for the Integrated Train Operating Solution (ITOPS) Project
- **Customer since:** February 2016
Benefits of integrated planning

- Allows for scalability of all processes
- Flexibility for changing nature of transit operations
- Improved efficiency and responsiveness across all planning horizons
Integrated planning – what does it look like?
Integrated planning in action

Key Benefits

- Quicker decision making
- Work from the same data
- Better feedback loop
The benefits of continuous optimization

- By the time batch optimization provides an answer, disruptions have already changed the puzzle.
- Tremendous value in the intermediate, good solution.
- Low value in theoretically optimal solution on the day of operation.
Effects on costs, service levels, dispatching

Visibility into real-time data, resource availability

Understand trickle-down effects on future plans

Aligned to strategic goals like cost reduction
### Keys to implementing an integrated planning solution

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<tr>
<td>1. Assess</td>
<td>speed and quality of decision making and optimization</td>
</tr>
<tr>
<td>2. Model</td>
<td>the solution to be 100% fit</td>
</tr>
<tr>
<td>3. Continue</td>
<td>to break down siloes</td>
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Another way of looking at it...

**Past**

- ERP / EAM
  - System of Record
  - What, When, Who, Where?

**Present**

- On-Corridor Control Systems
  - Real-time execution of events
  - Real-time feedback

**Future**

- Advanced Operations Systems
  - System of Differentiation
  - Plan, predict, respond
Integrated Planning in the Age of the Operations Control Center

Join us tonight at the Quintiq Reception

Latrobe Room, 6-8PM

Dr. Edwin Lohmann, Quintiq

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