Quintiq Solution Presentation: Rich Products

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QUINTIQ

Agenda

- Quintiq overview
- Focus area: detailed scheduling
- Summary of current challenges
- Demonstration
- Optimization in scheduling/references
- Q&A
- Lunch Break
- IT Discussion
- Next steps discussion/wrap up

Quintiq founding vision

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

Company profile

Focus

Quintiq is a leading software company focused on providing supply chain planning and optimization software

Facts

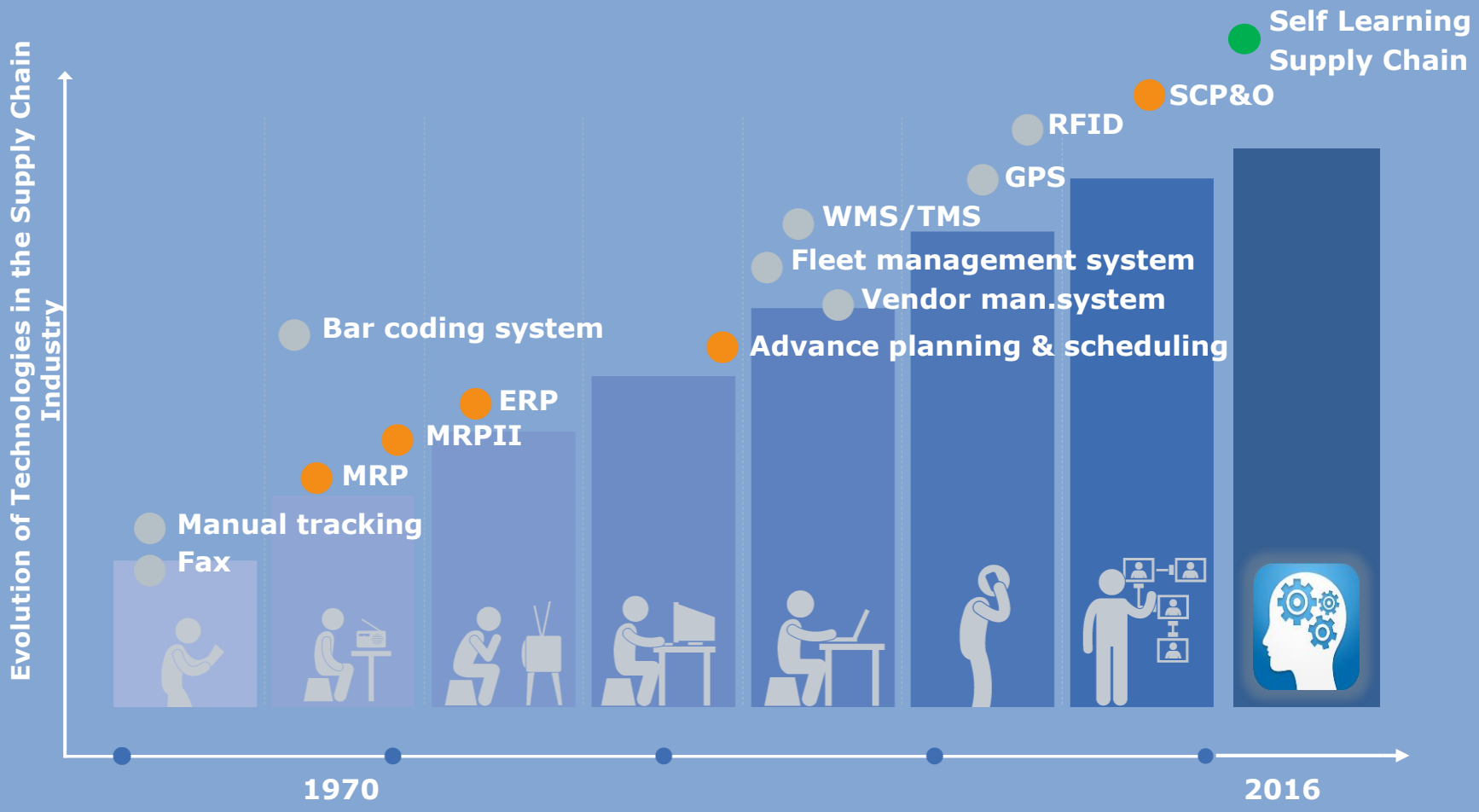
- Founded in 1997
- Over 1,000 employees
- In use in over 80 countries worldwide
- Fastest-growing supply chain planning and optimization company in the world

Partners

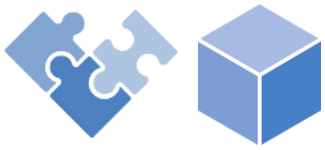
Powerful international implementation partner network

Recognition

Supply chain technology maturation



Quintiq software vision

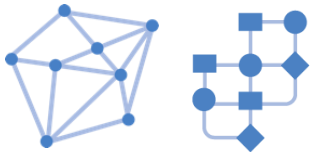


Business model and logic

- Each company is unique
- Having a model that is a **100%-fit** is essential
- Covering all planning levels in appropriate detail

Visualization and interaction

- Individual **visualization** is essential to support the users in making informed decisions
- Interaction must be **direct, fast and intuitive**



Optimization

- Combination of algorithms from the **Quintiq Optimization Suite**
- Taking into account all circumstances
- Developing planning proposals
- The planner defines criteria and makes the decisions
- Generate all necessary information and visualize the planning

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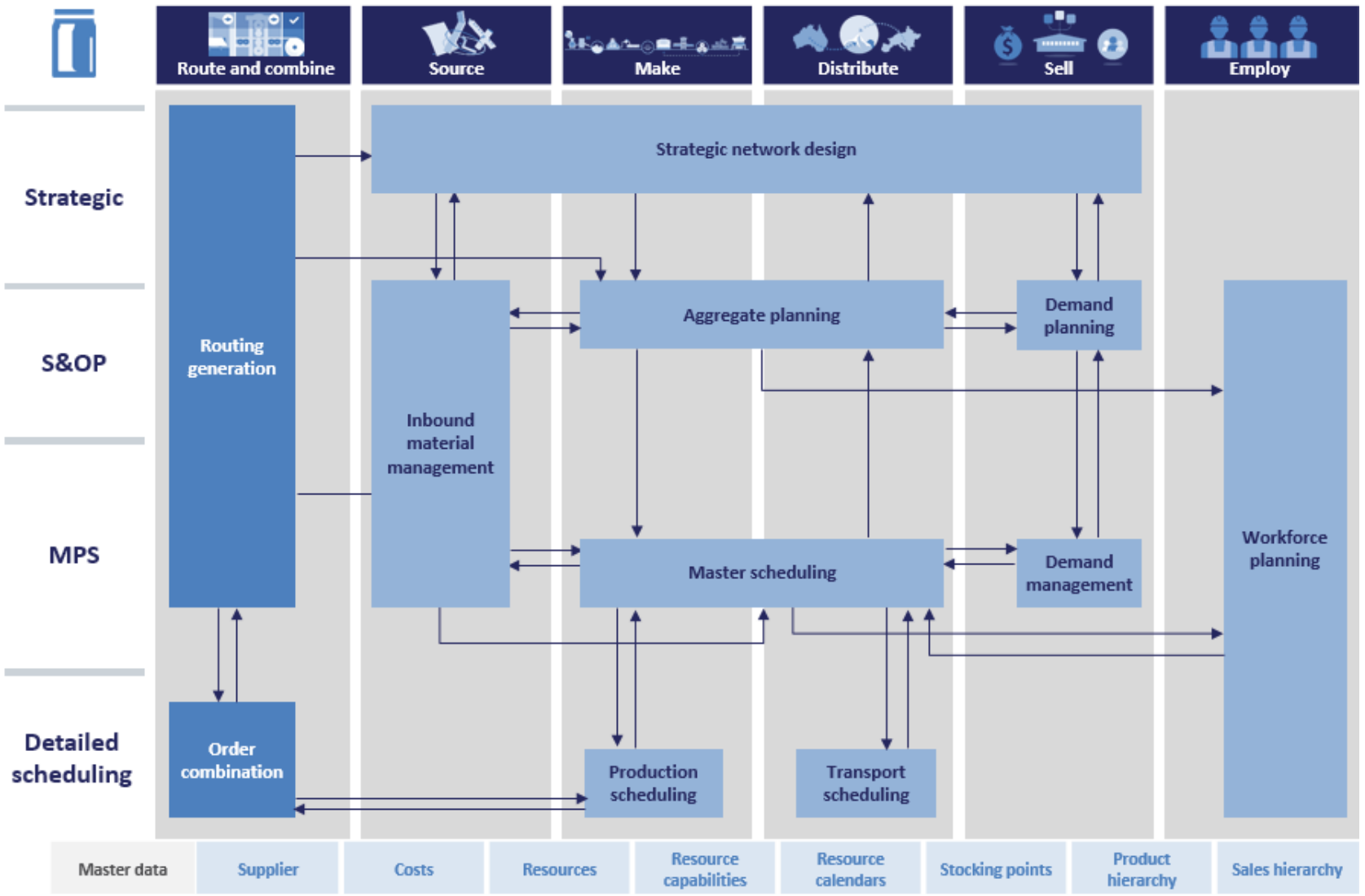
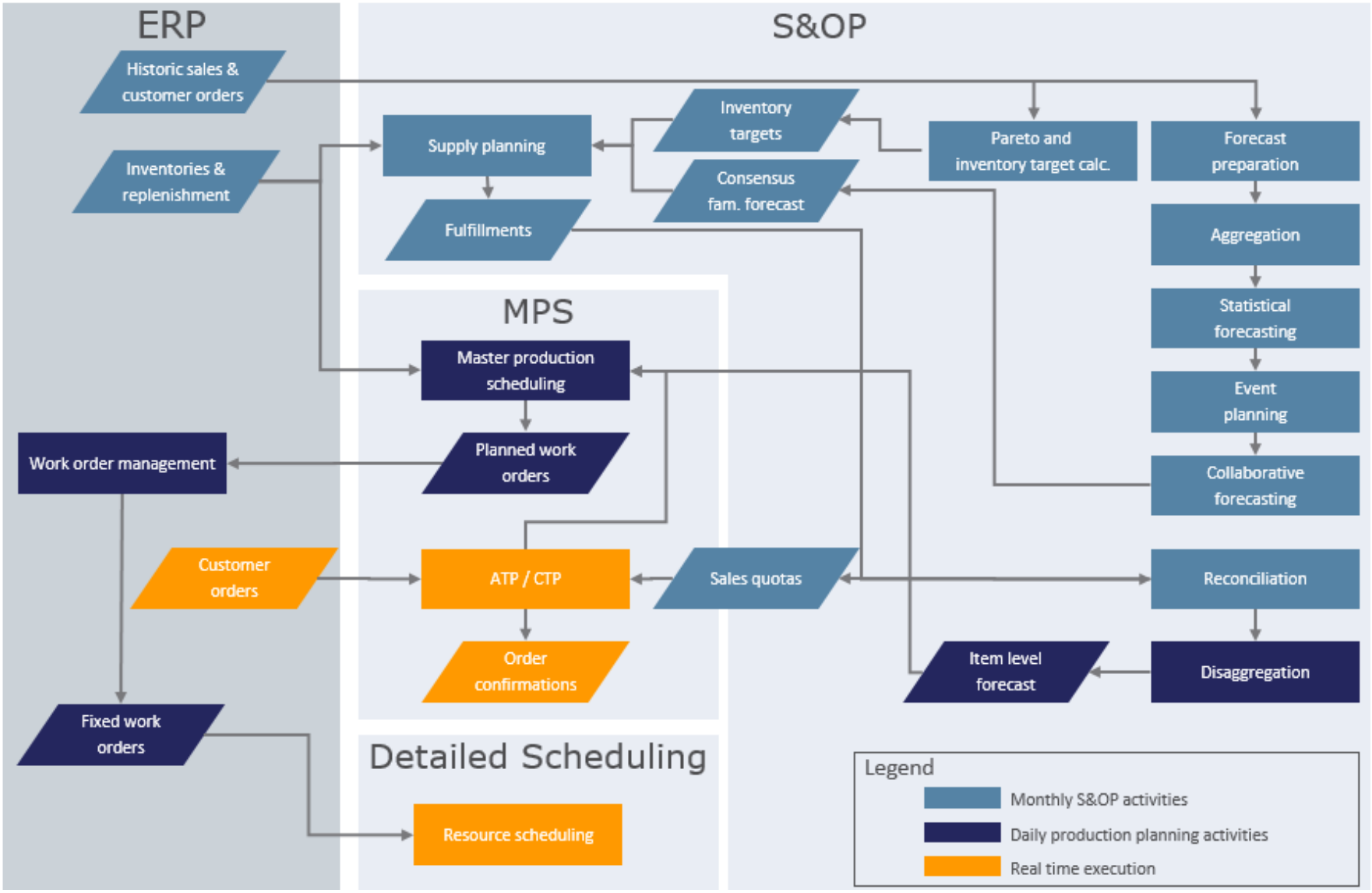
Quintiq capability overview



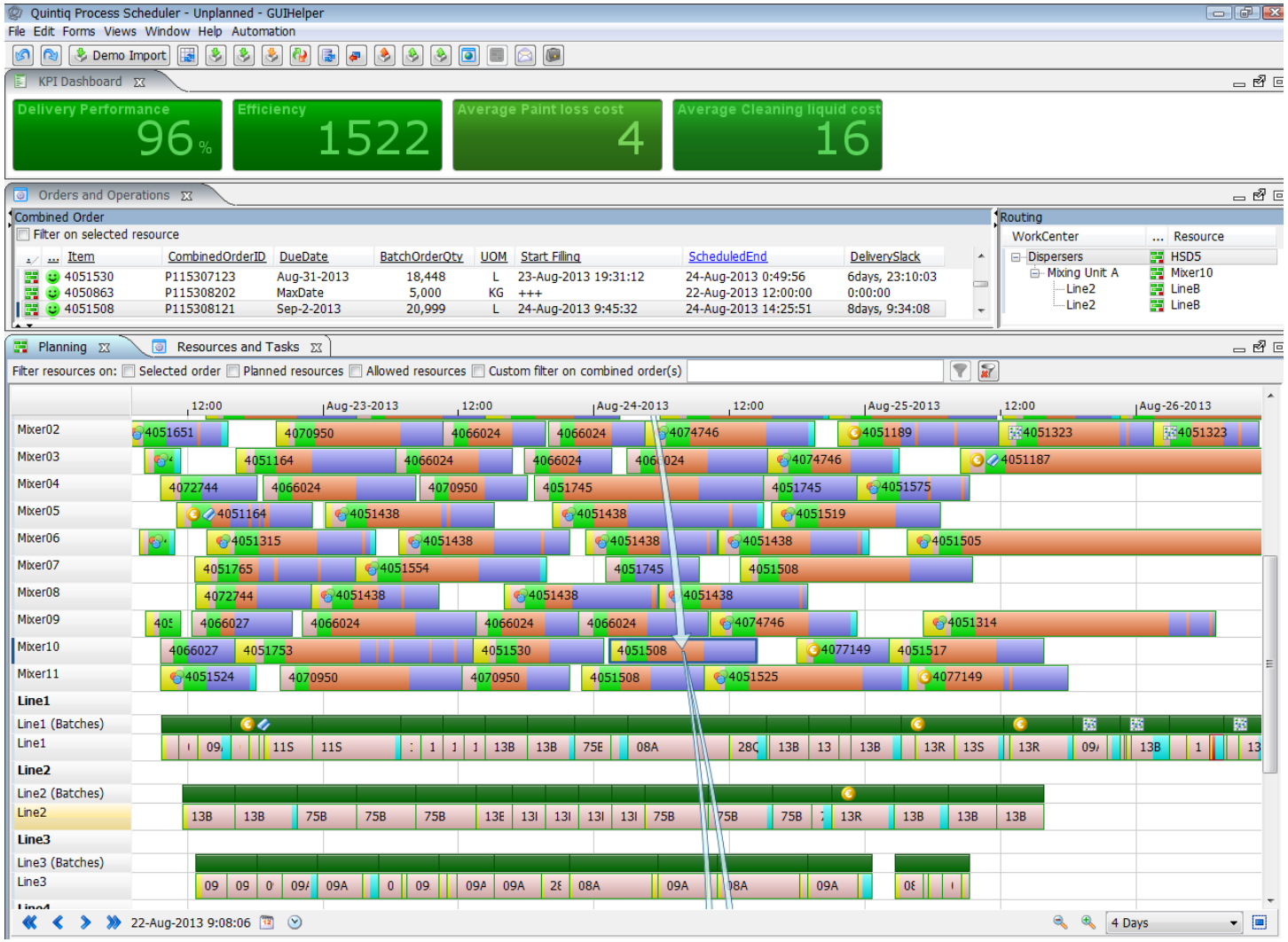
Solution map for Manufacturing

	Source	Make	Distribute	Sell	Employ
Strategic	**Strategic planning** • Supply chain design • Subcontracting				
S&OP	**S&OP** • Assumption based scenario management • Workflow management • (Financial) reporting and analysis				**Workforce planning** • Staffing levels
	Supply planning • Sourcing contracts	• Supply planning • Capacity planning • Campaign management • Product mix optimization	• Inventory planning	**Demand planning** • Statistical forecasting • Collaborative forecasting • Forecast enrichment • Demand sensing and shaping	
MPS	**MRP** • Material replenishment (full) • Purchase order management	**Master production and distribution scheduling** • Material reservation • Material replenishment • Capacity planning • Campaign planning • Inventory replenishment	• Shipment planning	**Demand management** • Order promising (ATP/CTP/PTP) • Forecast consumption	• Shift requirement planning
Detailed scheduling		**Production scheduling** • Sequencing • Campaign scheduling • Batch scheduling • Material reservation	**Transport scheduling** • Finished goods reservation • Route building		• Generate employee schedules • Assign activities

Overview main planning decisions – integrated planning



Why detailed scheduling is critical to Rich Products



You are capacity constrained, with bottlenecks on your mixing resources and filling lines

You have an additional 8 – 10 % revenue potential each year.

Your options are to either invest in capacity or squeeze more out of existing capacity.

Knowing you have 1000 hours of extra capacity, use Quintiq detailed scheduling to increase throughput on existing lines

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Key challenges associated with short term scheduling

Sequencing

What-if scenarios

Alternate routings

Constrained Resources

Feedback Loop

Reliability

Unpredictability

Bottlenecks

Labor planning

Material Planning

Storage tanks

Campaigns

Planned and unplanned downtime

Quality

Adherence

Delivery performance

Cleaning matrix

Liquid and pre-whip

On-time operations

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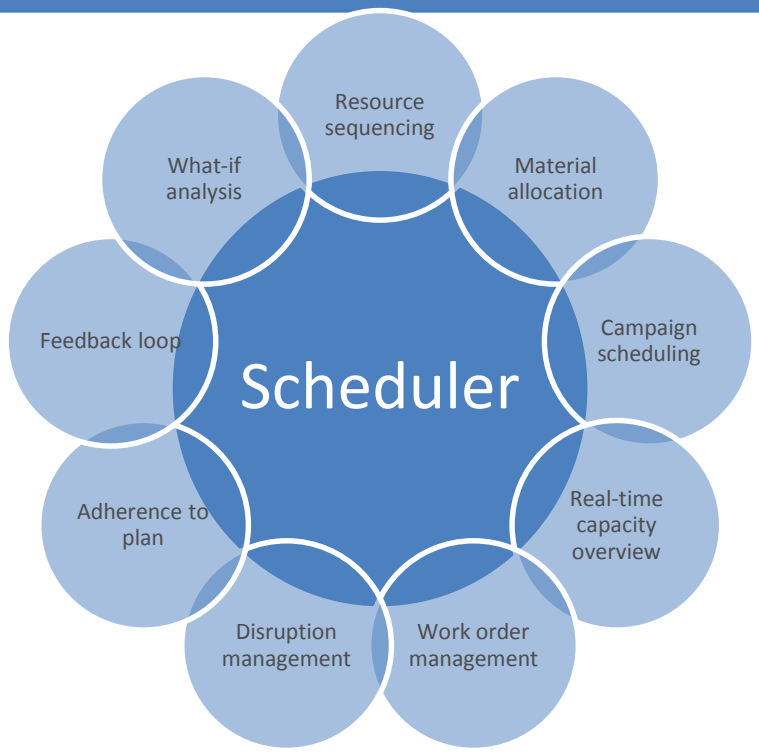
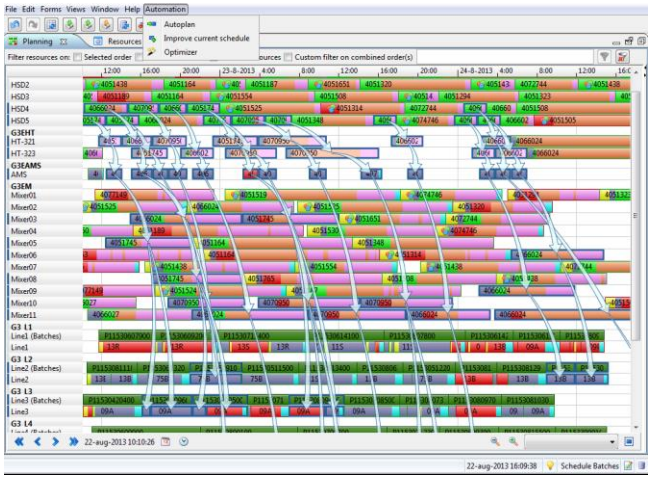
Detailed scheduling





Scheduling work orders in the right sequence taking into account all relevant constraints. Integrated solution ensures visibility across various operations upstream and downstream, assuring that schedules are in sync with each other.

Main impact

- Yield & efficiency
- Manage disruptions
- Delivery performance
- Fulfillment

Key features

- Manual and automatic schedule creation
- Visibility across the supply chain
- Decision support on complex rules
- Immediate display of consequences from Planning decisions

Scheduler objectives

Increase productivity

- Increase resource efficiency, for example by minimizing setups or idle time
- Increase batch utilization

Increase fulfillment and delivery performance

- Make sure orders are produced on time by scheduling operations according to their due dates
- Ensure adherence to MPS plan

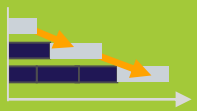
Produce to stock target levels and lower inventory

- Produce to stock target levels
- Decrease inventories by producing the right amount
- Decrease waste by assigning matching material to orders

Overview of main Scheduler concepts

Sequencing

- Determining sequence of production steps on a resource, including mixing systems, tank farms, filling lines, pelletizers, etc.



Material flow

- Sequencing multiple successive production steps of an order, accounting for specified resource connections

Batches

- Combining operations to be processed simultaneously, and allow to feed into continuous flowing resources.

Campaigns

- Grouping similar operations in the sequence to reduce change over times and cleaning times

Material allocation

- Finding the matching piece of material for an order

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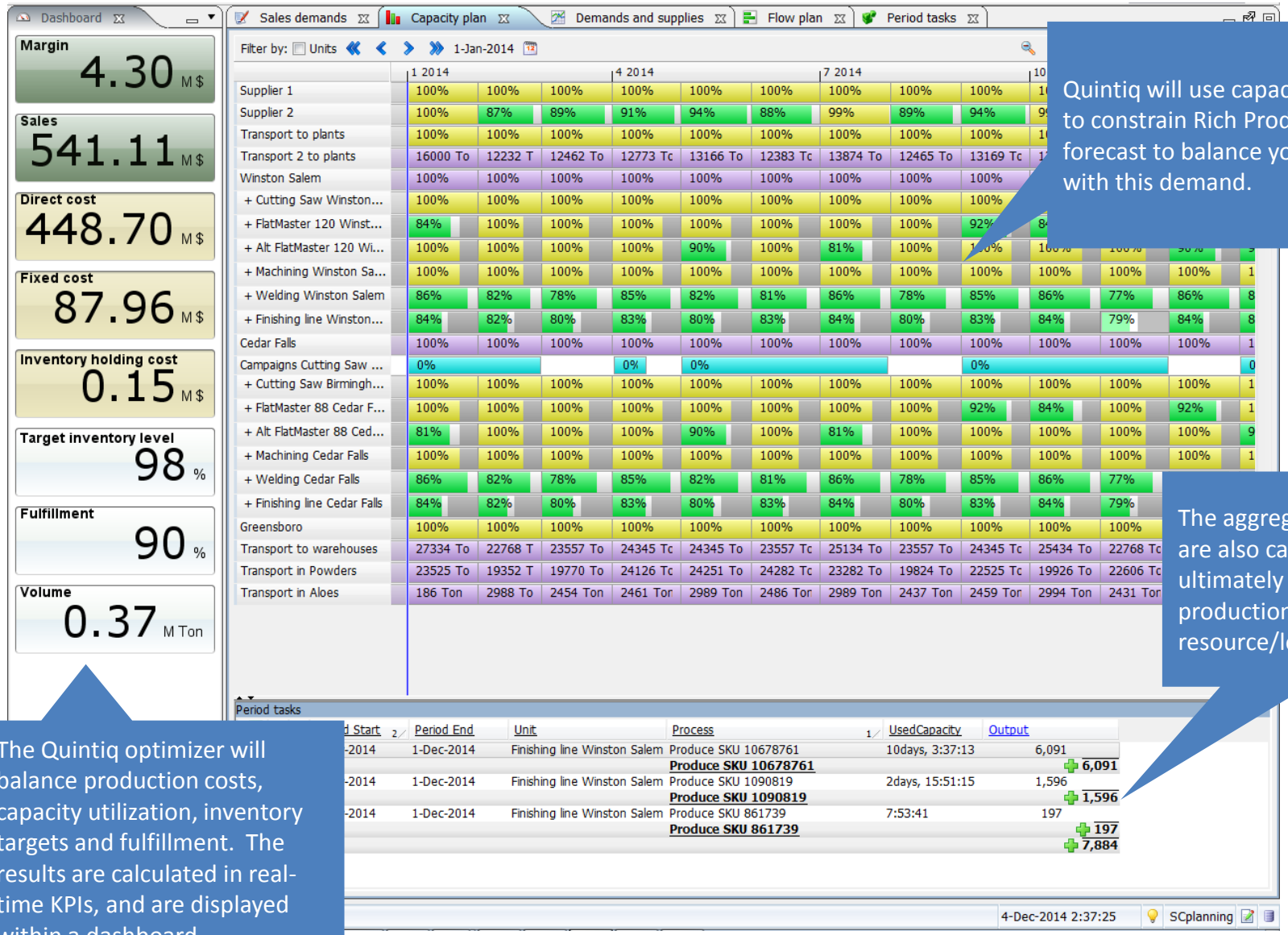
Challenge 1

Challenge: How do I meet increasing demand with the same resources while effectively balancing production costs, capacity utilization, inventory targets and fulfillment?

Example: Rich Products is operating at or near max capacity. You recognize that with better sequencing of operations on the Batching (Mixing) Systems and Filling Lines, you could add an additional 1,000 hours of capacity annually. This is of critical importance because this lost capacity translates to an 8-10% decrease in sales.

The Goal:

Daily capacity planning



Quintiq will use capacity planning to constrain Rich Products' rolling forecast to balance your supply with this demand.

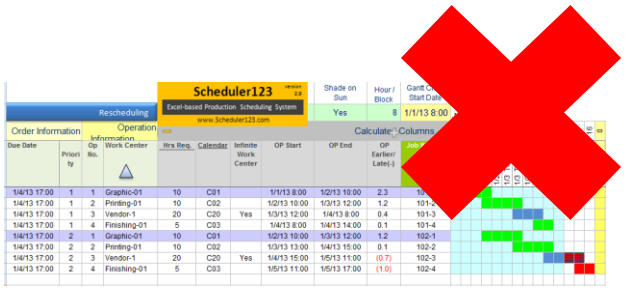
The aggregated period tasks are also calculated, which ultimately drives the detailed production scheduling by resource/location.

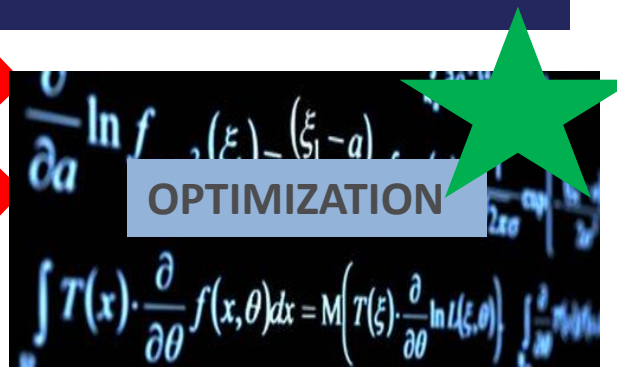
The Quintiq optimizer will balance production costs, capacity utilization, inventory targets and fulfillment. The results are calculated in real-time KPIs, and are displayed within a dashboard.

Challenge 2

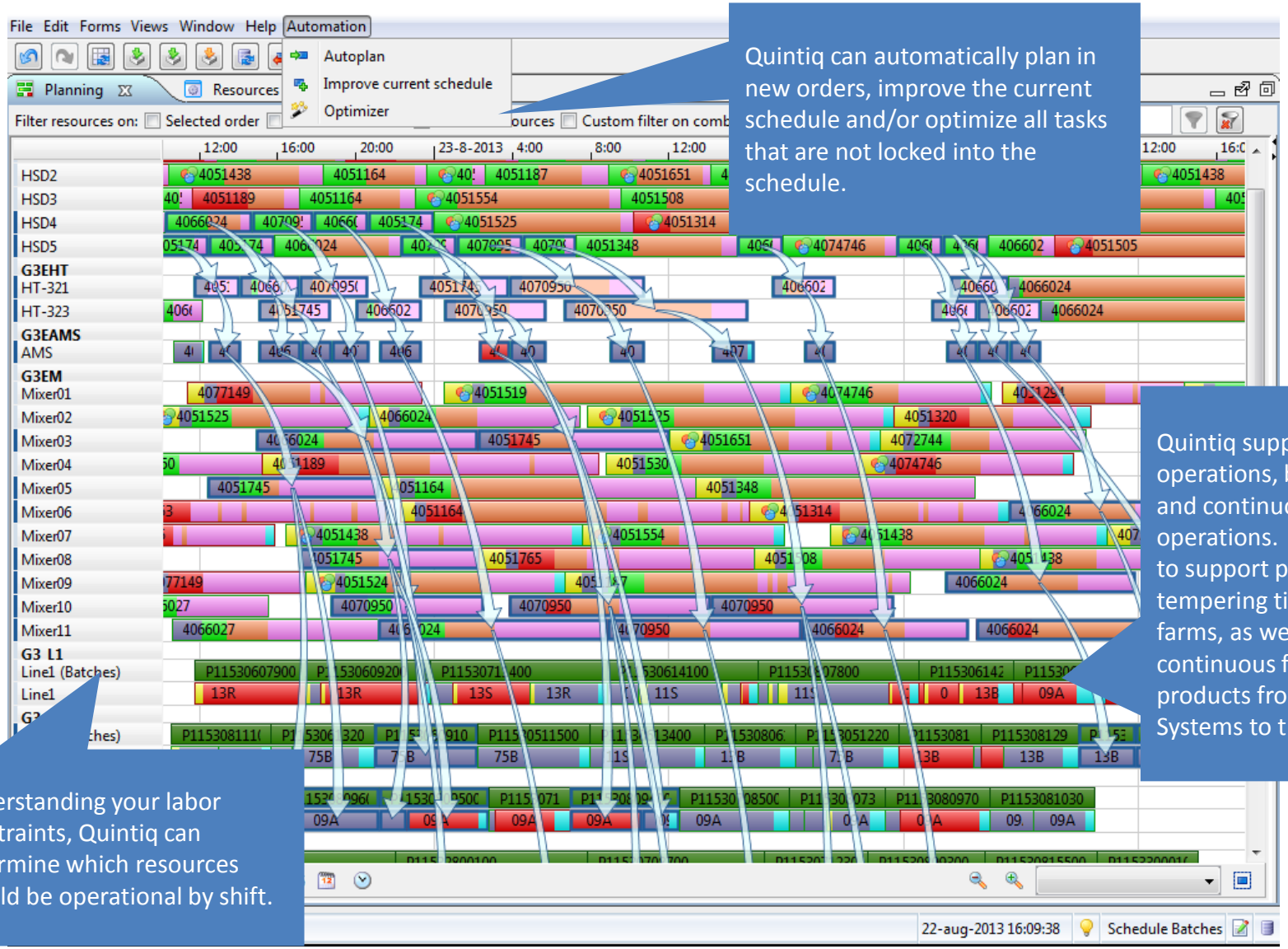
Challenge: How do I consider all of the constraints into my schedule? (ex: labor, changeovers, etc.)?

Example: You have 8 filling lines, but your labor constraints only allow you to run 7 at one time. Which 7 should you run for this shift, next shift, and beyond? You also have changeover rules and other factors that must be considered when generating your detailed schedule.





Constraint based optimization



Quintiq can automatically plan in new orders, improve the current schedule and/or optimize all tasks that are not locked into the schedule.

Quintiq supports single task operations, batch operations, and continuous flow operations. This will allow us to support pre-whip product tempering time in the tank farms, as well as the continuous feed of liquid products from the Batching Systems to the Filling Lines.

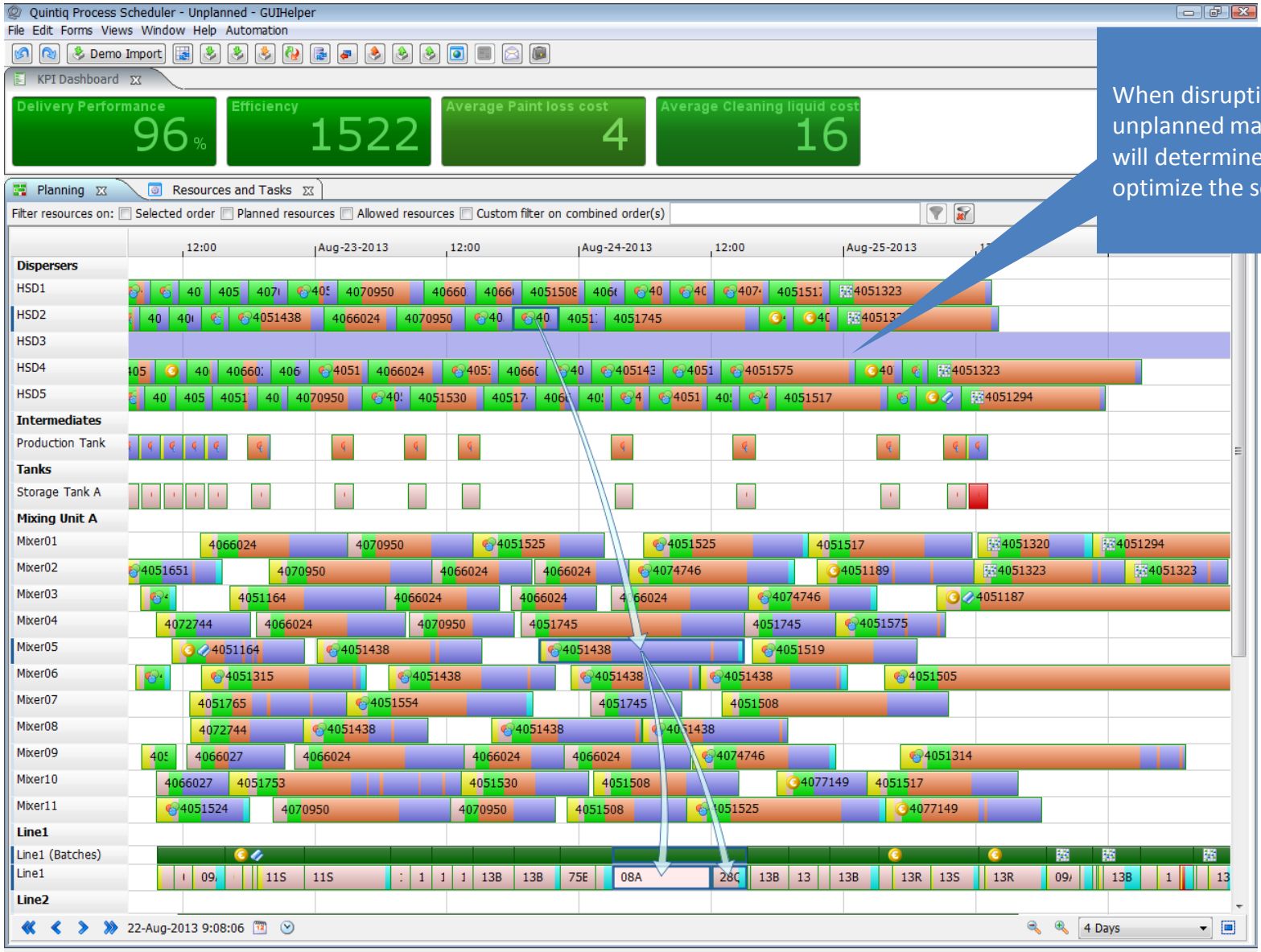
Understanding your labor constraints, Quintiq can determine which resources should be operational by shift.

Challenge 3

Challenge: How do I react to day of operations changes? What is the best way to re-sequence based on occurrences such as unplanned downtime?

Example: Unexpected events and disruptions occur during production. This may include unplanned downtime, operations running late (or early), etc. Today, Rich Products has difficulty re-planning to account for these disruptions.

Re-optimize to manage unplanned down time and disruptions



When disruptions occur, such as unplanned maintenance, Quintiq will determine how to best re-optimize the schedule.

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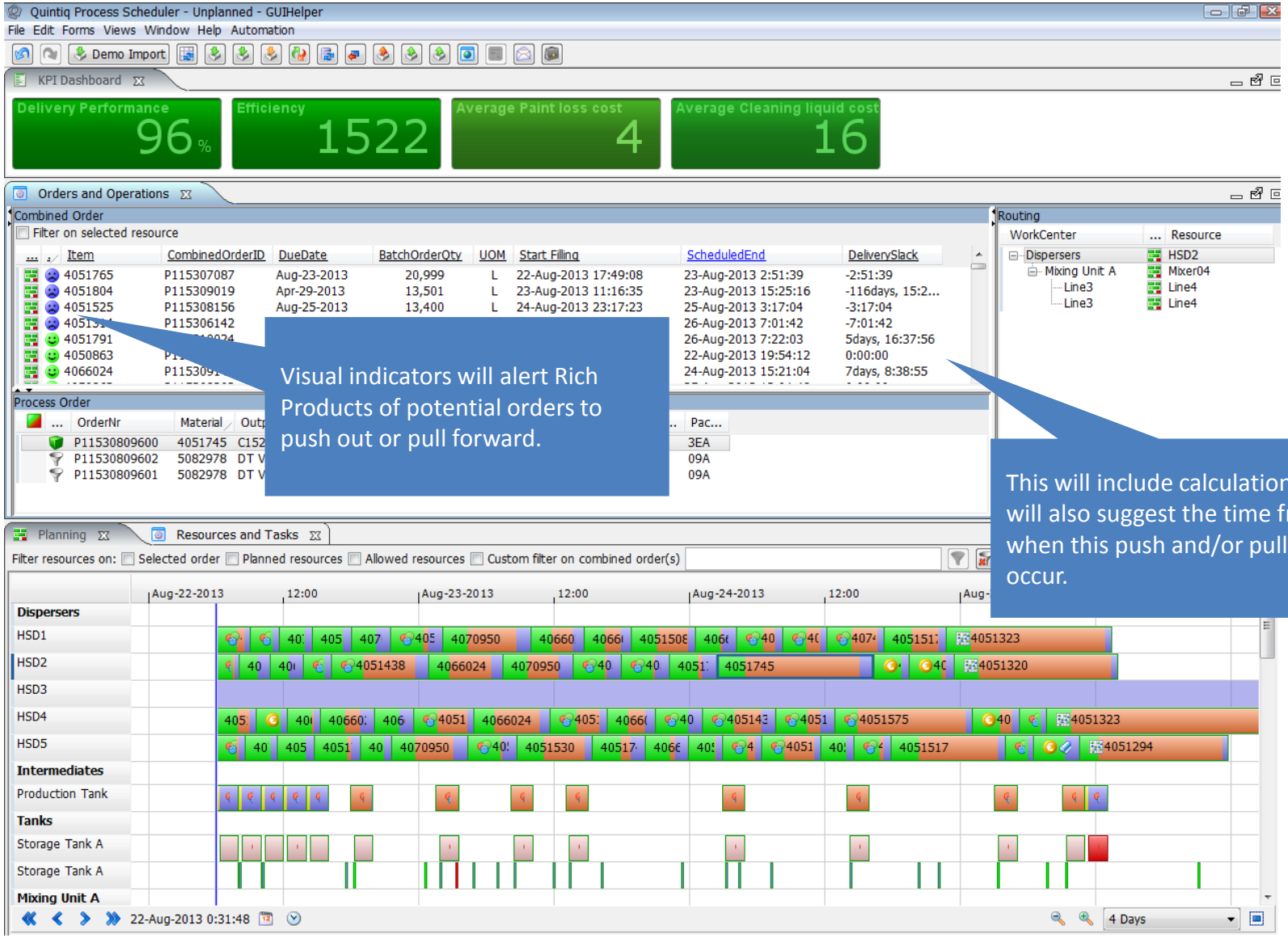
Pushing and pulling orders



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Demonstration overview

Generate capacity plan based upon rolling forecast

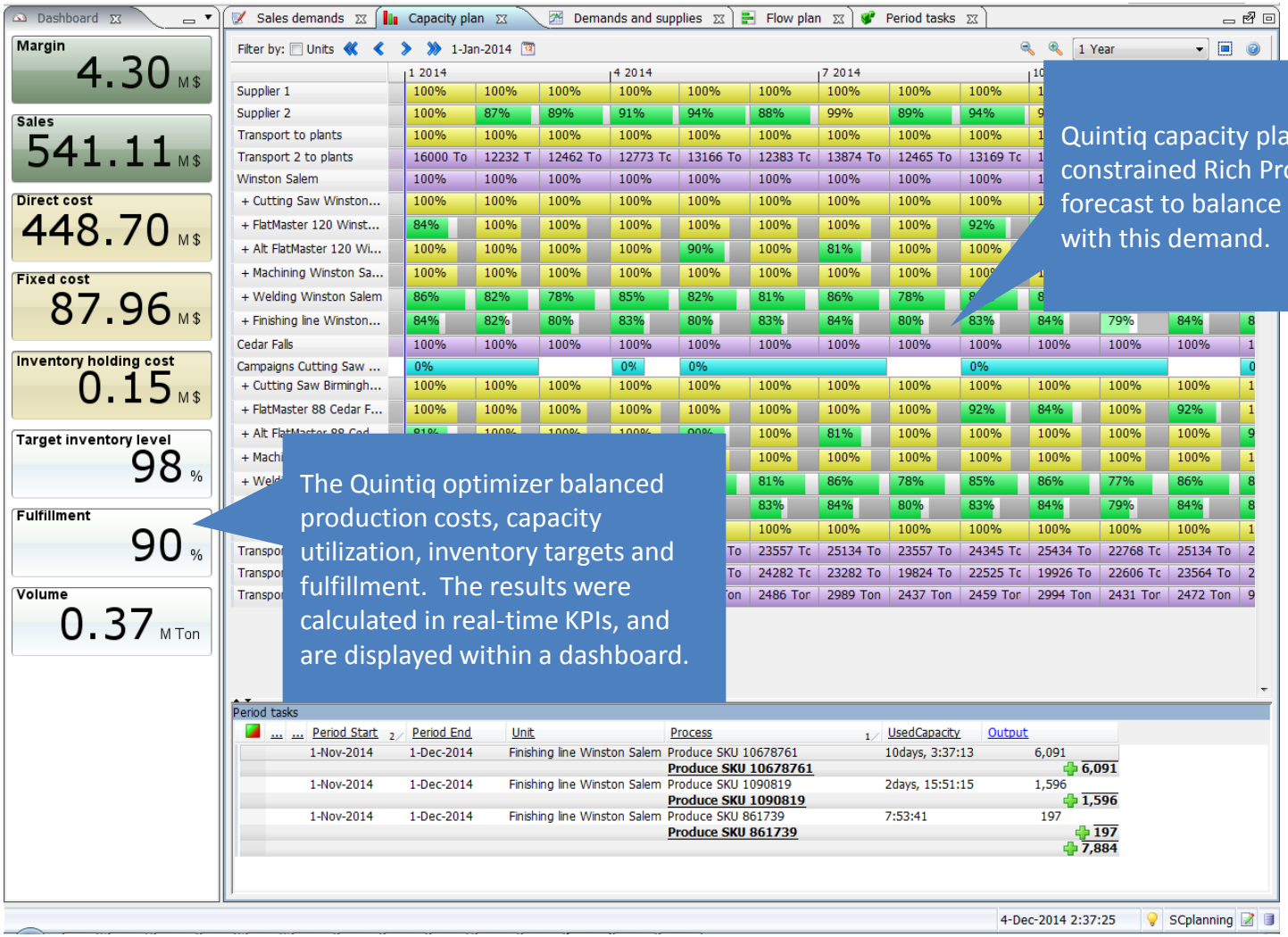
- Show safety stock and inventory targets
- Show optimizer parameters
- Run scenarios
  - Scenario 1 – Optimize fulfillment and inventory
  - Scenario 2 – Optimize profitability
  - Scenario 3 – Optimize with both – fulfillment top priority
  - Scenario 4 - Optimize with both –profitability top priority
- Compare scenarios

Create the detailed schedule and work order sequencing

- Planning control of work orders (manual planning)
- KPI based planning decisions
- Automatic propagation of schedule changes
- Replan late orders
- Bring in new orders
- Auto Assignment
- Unplanned maintenance and resource calendars
- Improve schedule / Optimize sequence across all resources
- Simulation scenarios
- Reporting and Analytics

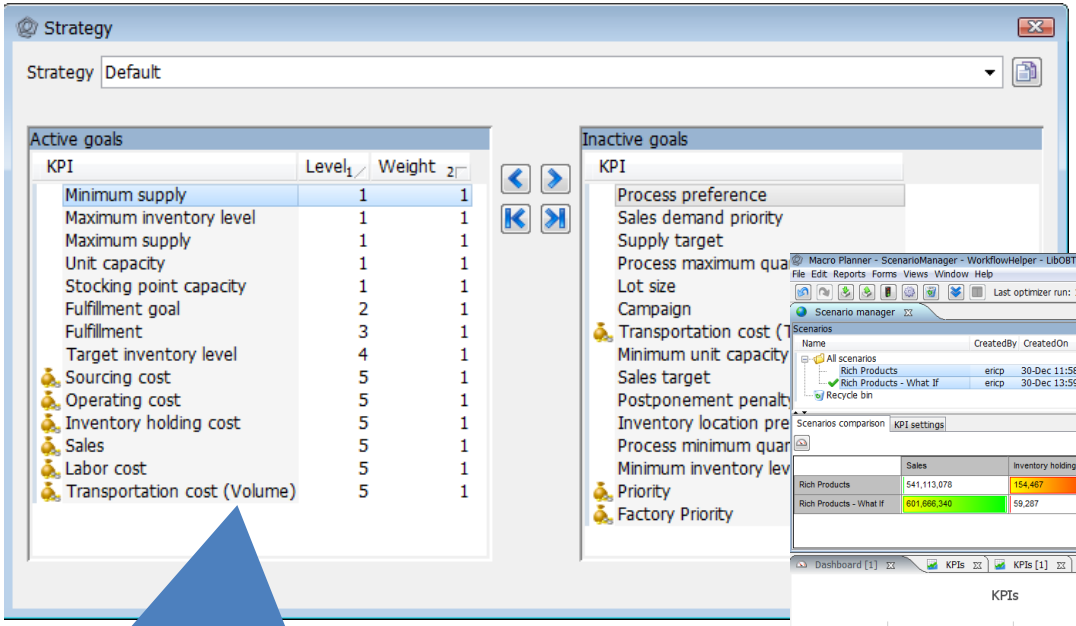
Generate capacity plan based upon rolling forecast

Demo summary: Meet increasing demand with the same resources while effectively balancing production costs, capacity utilization, inventory targets and fulfillment



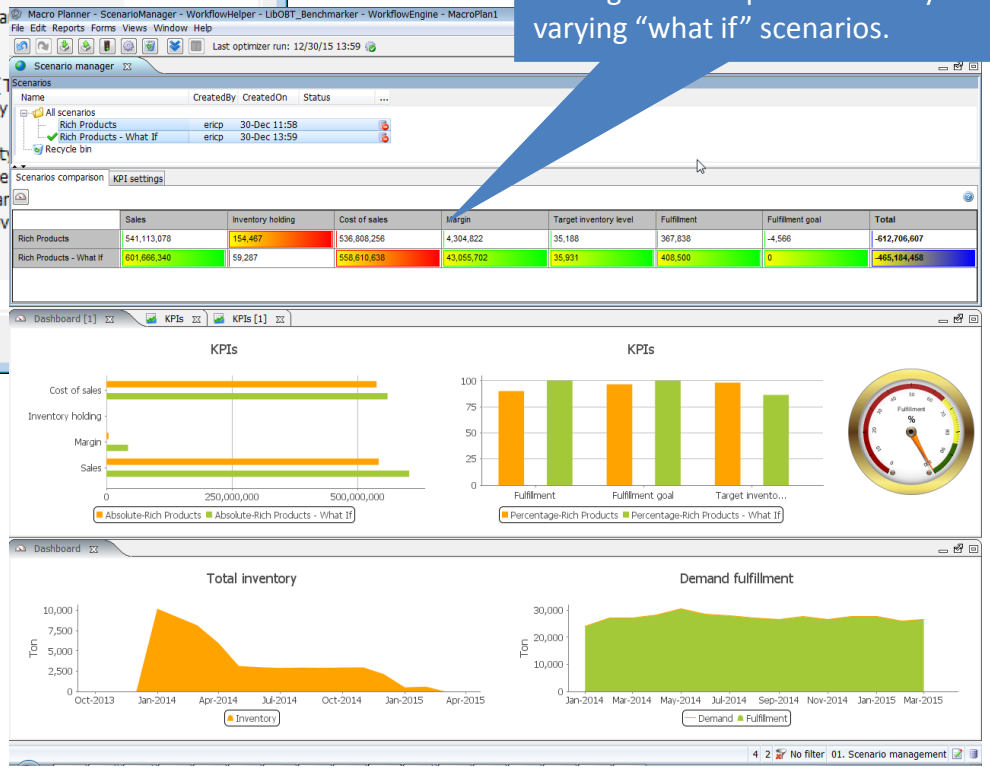
What If analysis and scenario comparison

Demo summary: Adjusted constraints and optimization parameters in varying scenarios and performed what of analysis. Then compared and analyzed the results of these multiple scenarios.



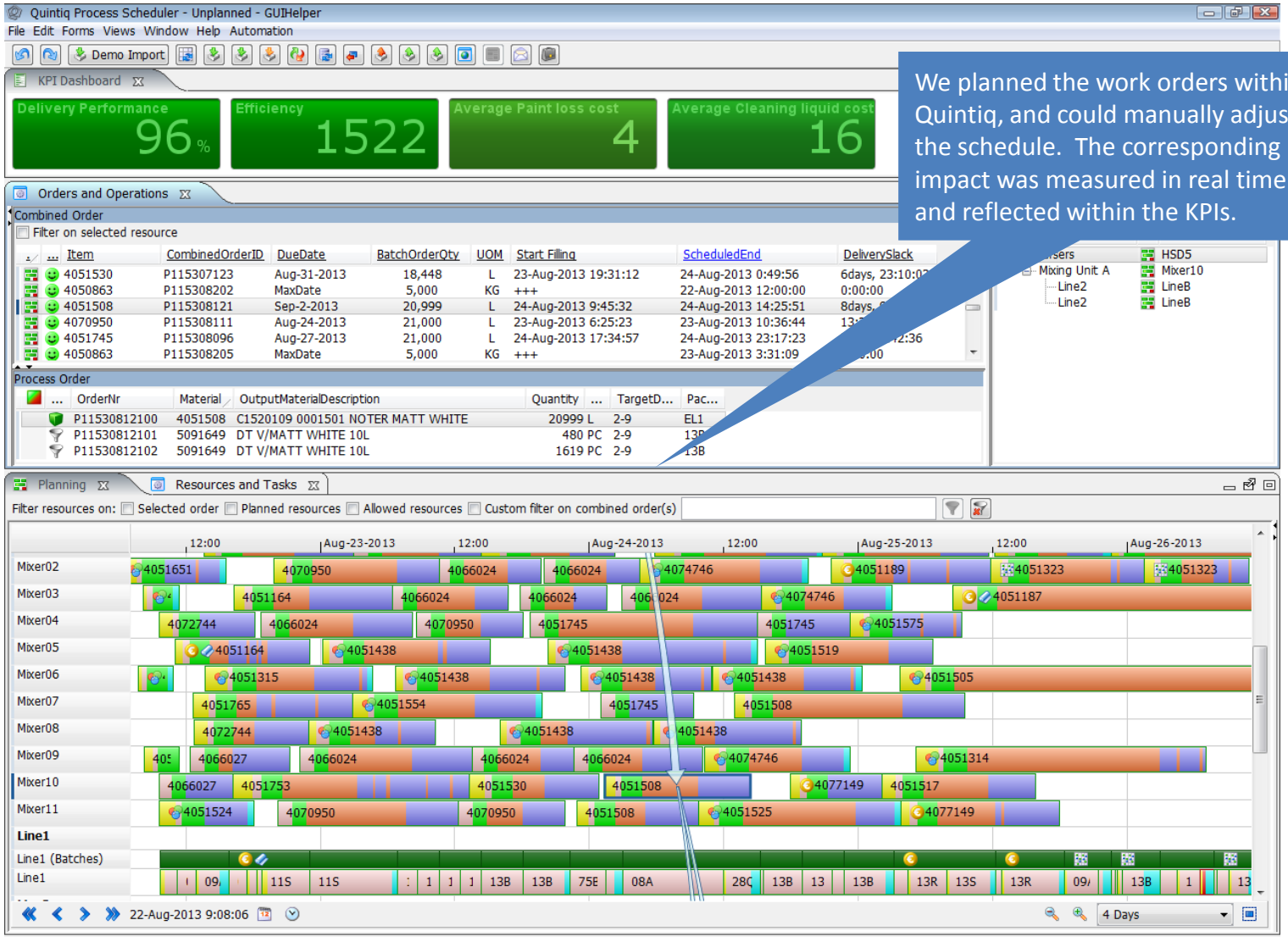
First, specified which KPIs are most critical, including capacity utilization, production costs, inventory costs, inventory targets, fulfillment, etc.

Then used Quintiq's scenario manager to compare and analyze varying "what if" scenarios.



Create a schedule

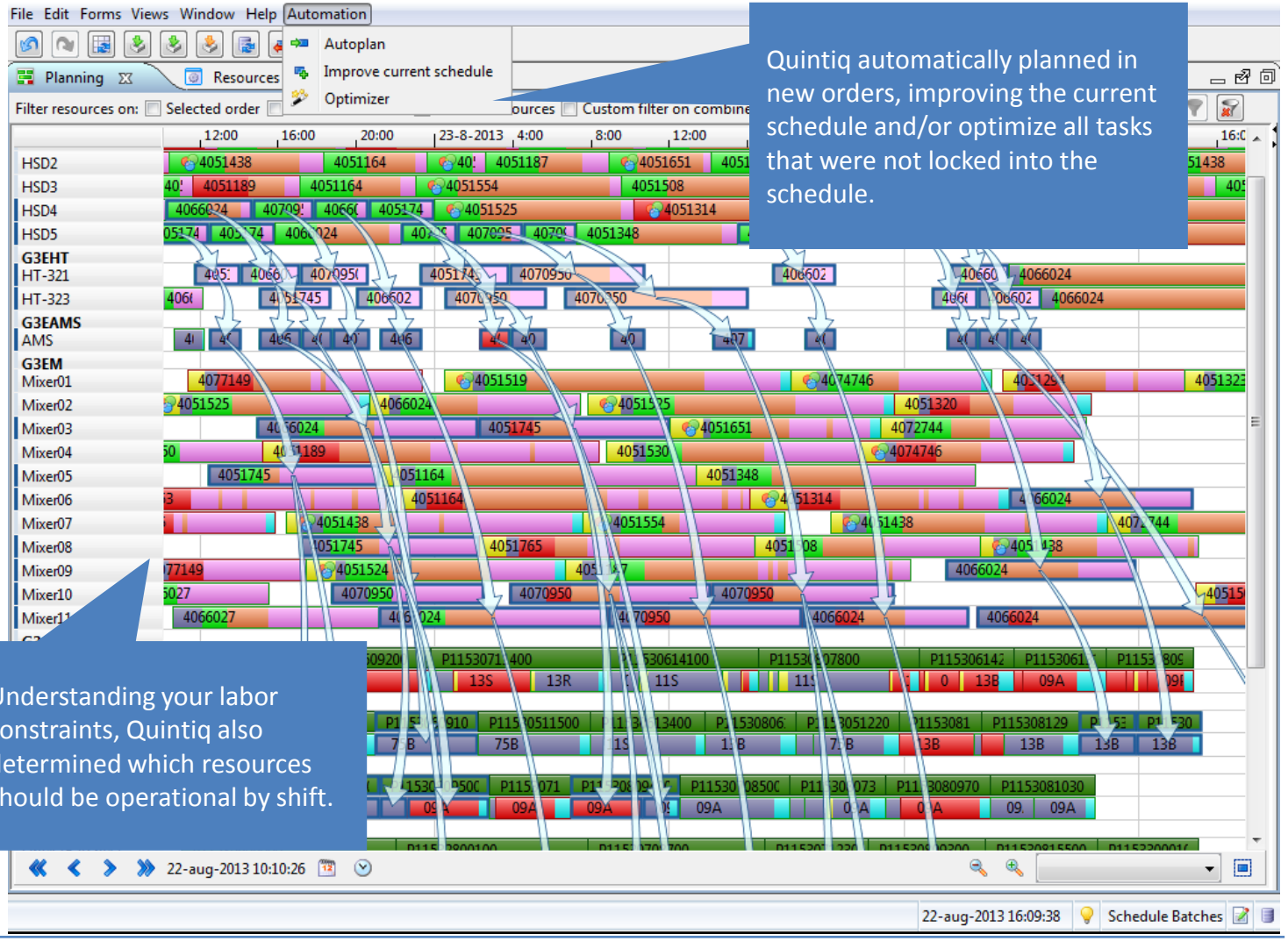
Demo summary: Your demand, in the form of work orders, was scheduled manually and via automatic planning.



We planned the work orders within Quintiq, and could manually adjust the schedule. The corresponding impact was measured in real time and reflected within the KPIs.

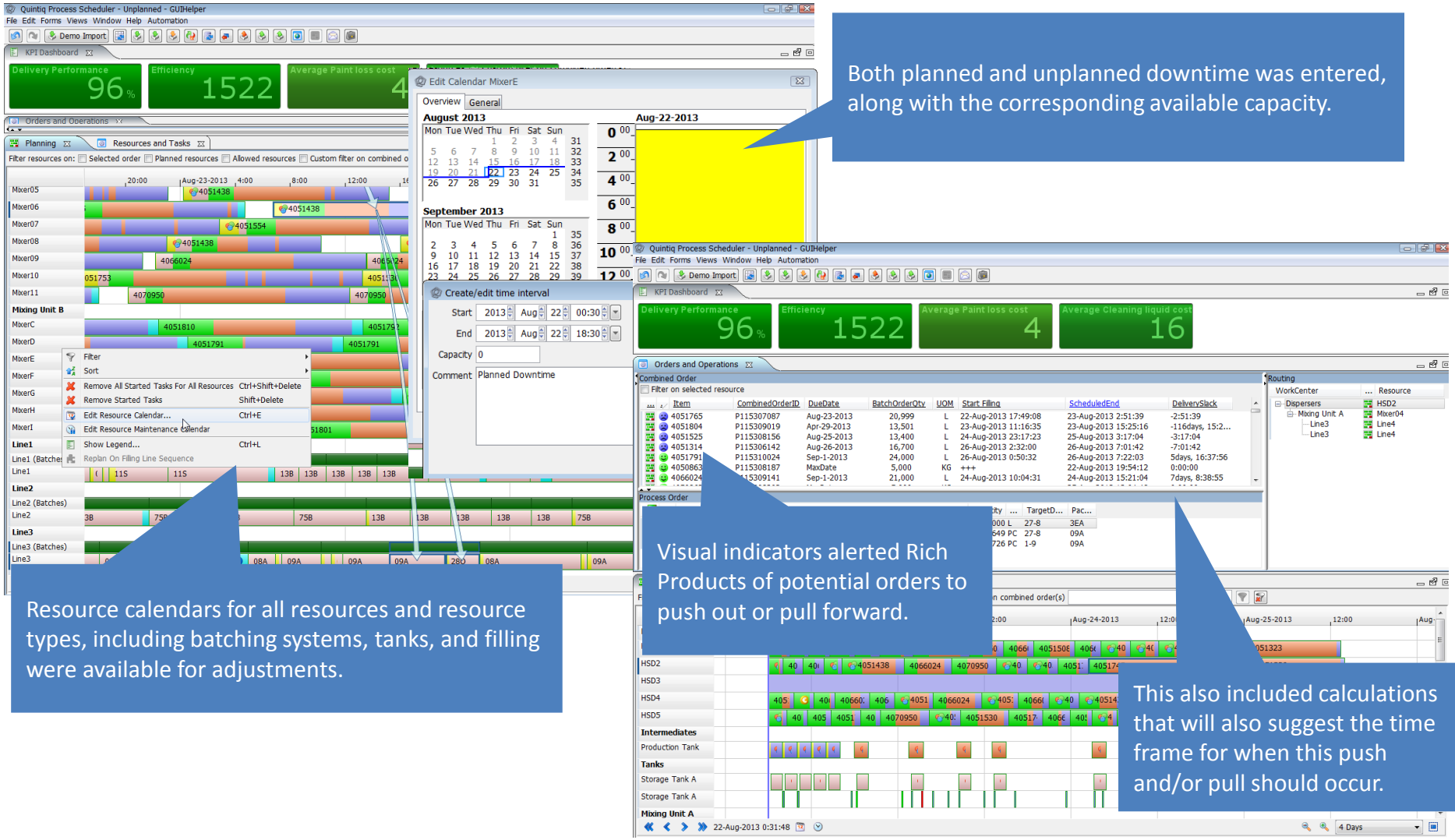
Optimize the plan

Demo summary: Quintiq factored in numerous factors and constraints, including allowed resources, resource connections, production rates, change over times, etc. and generated a plan using our optimization technology



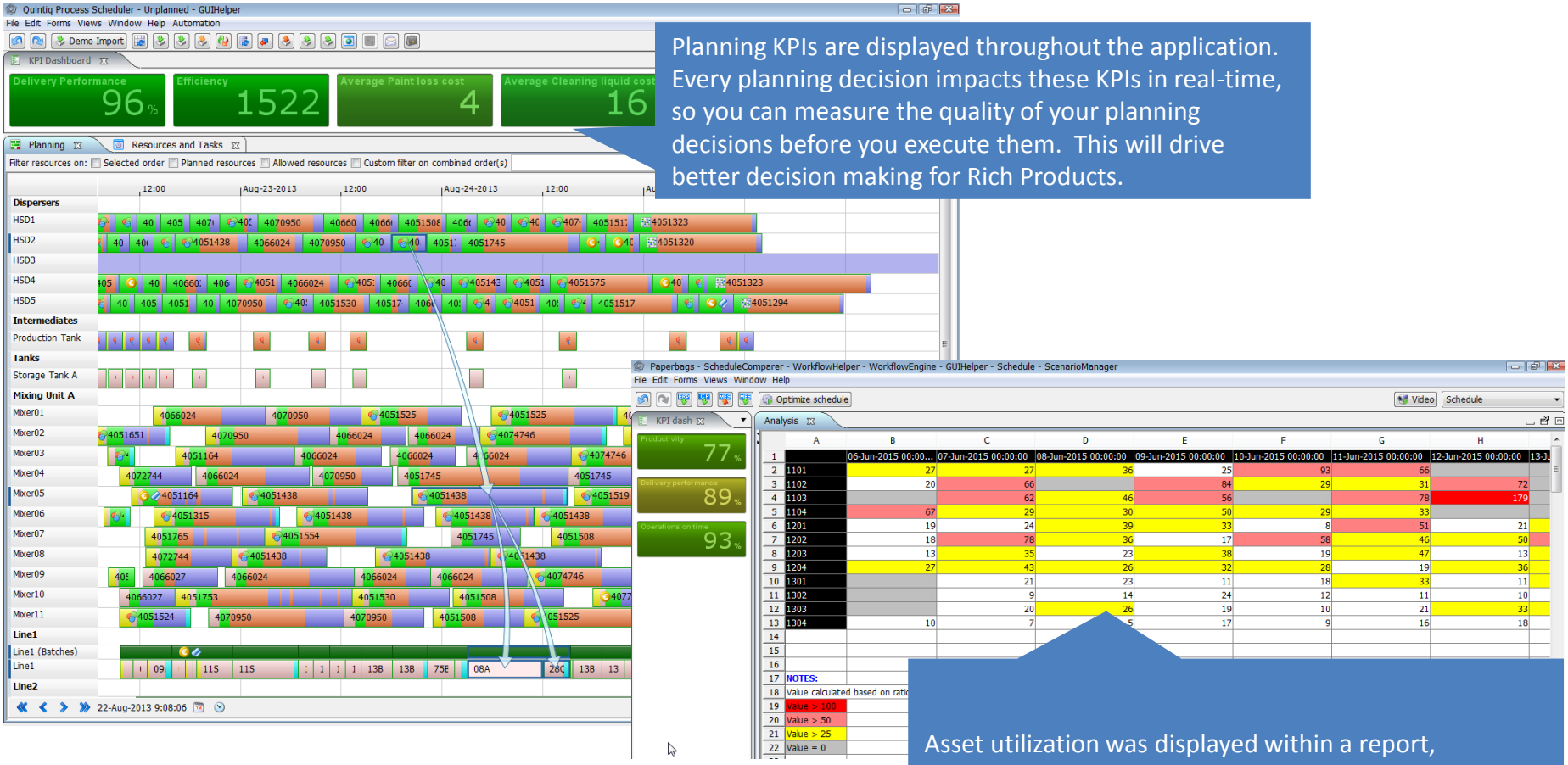
Re-sequence plan

Demo summary: Re-sequence plan based on occurrences such as unplanned downtime and available capacity



Reporting and analytics

Demo summary: Used headlight KPIs to measure the impact of planning decision prior to execution. Then used taillight reports to summarize and detail what occurred within a specified time period.



Planning KPIs are displayed throughout the application. Every planning decision impacts these KPIs in real-time, so you can measure the quality of your planning decisions before you execute them. This will drive better decision making for Rich Products.

Asset utilization was displayed within a report, corresponding to a particular point in time.

Typical benefits after implementing Quintiq

Opportunity	Potential savings and benefits
Increased sales and profitability ✓	• Various challanges in many areas, which cause delays and uncertain situations. That means an unknown amount of lost sales. With a tool that offers transparency and optimized planning, significant impact will be seen over the entire chain.
KPI-driven planning ✓	• Current planning process is not KPI driven. Using the Quintiq platform, KPIs will be used to guide the planning process towards attaining company goals.
OTIF and On-time improvements ✓	• OTIF and On-time delivery figures are typically up for 5-15%.
Transparent and visual system ✓	• The planners and also the persons working in customer service and purchasing will have visibility over details like stocks, orders, raw materials. They will also be able to see the effect of their decisions/actions. Detailed information can be shared with customers as well in order to keep customer service at a high level.
Scenario management ✓	• There are multiple ways to run the business and achieve the desired results. The optimal way is to run different scenarios and pick the best choice in each situation.

Typical benefits after implementing Quintiq (continued)

Opportunity	Potential savings and benefits
Improvement of machine utilization ✓	• The utilization of the production machines improves typically 10-20%. This will also enable more capacity to sell.
Short learning curve ✓	• The learning curve can be made easier with advanced planning system.
A system people can trust ✓	• A 100% fit planning system with easy-to-learn GUI will be a tool they can trust.
Less dependency on key personnel ✓	• Quintiq offers an advanced, common tool with easy-to-learn functionality.
Proactive planning ✓	• A truly interactive system could improve day-to-day operations significantly and enable proactive management.

Customer benefits

"For a long time, our delivery reliability was between 50% and 60%. This has improved to 80% and sometimes 90%."

- Ron van Hout, Planning and Warehouse Manager Vlisco

"Quintiq is an enabler for excellent results. It allows you to measure many KPIs and drive improvements in the critical ones. Quintiq has exceeded our expectations every step of the way."

- Buddy Stemple, VP & GM Novelis

"Quintiq won us over with its platform's integration capabilities and transparent processes. The software's flexibility enables it to be customized to process the many specific requirements of the chemical industry such as the handling of byproducts, alternative raw material input, lot optimization and sequencing."

- Management, Tribotecc

"Full transparency has been achieved through the combination of centralized planning and de-centralized scheduling in seven plants. We have seen results in capacity balancing as well as improvements in scheduling. This has further resulted in improved customer service and optimized productivity."

- Pierre Versailles, Operations Excellence Manager AkzoNobel Powder Coatings

"At SIG, Quintiq is used globally. Everybody can see exactly what is going on everywhere."

- Carmen Zech, Head of Global Resource Management SIG

"We required a SCP&O platform that would accommodate our intricate scheduling requirements, which stems from our unique approach of assembling and cooking products simultaneously. Quintiq has an outstanding track record in the industry and its software platform enables us to maintain the high quality and fulfillment standards our customers have come to expect."

- Andy Berliner, CEO Amy's Kitchen

"Our production processes are highly dynamic, so it is not easy to calculate the precise return on investment that the Quintiq system can perform. However, based on our experience, we can say that our investment in Quintiq has made a substantial contribution to our bottom line."

- Douwe van Dijk, Manager Meneba

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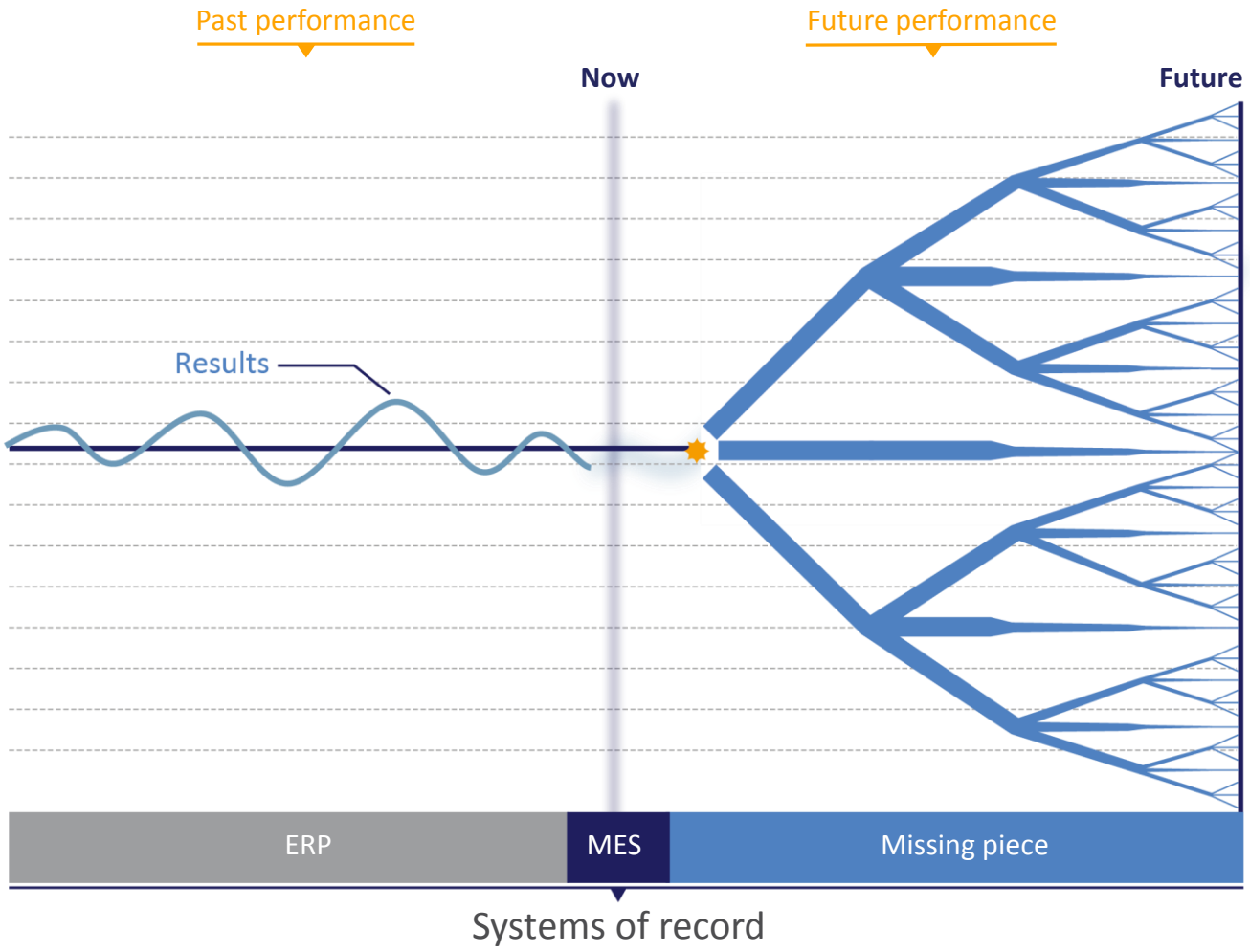
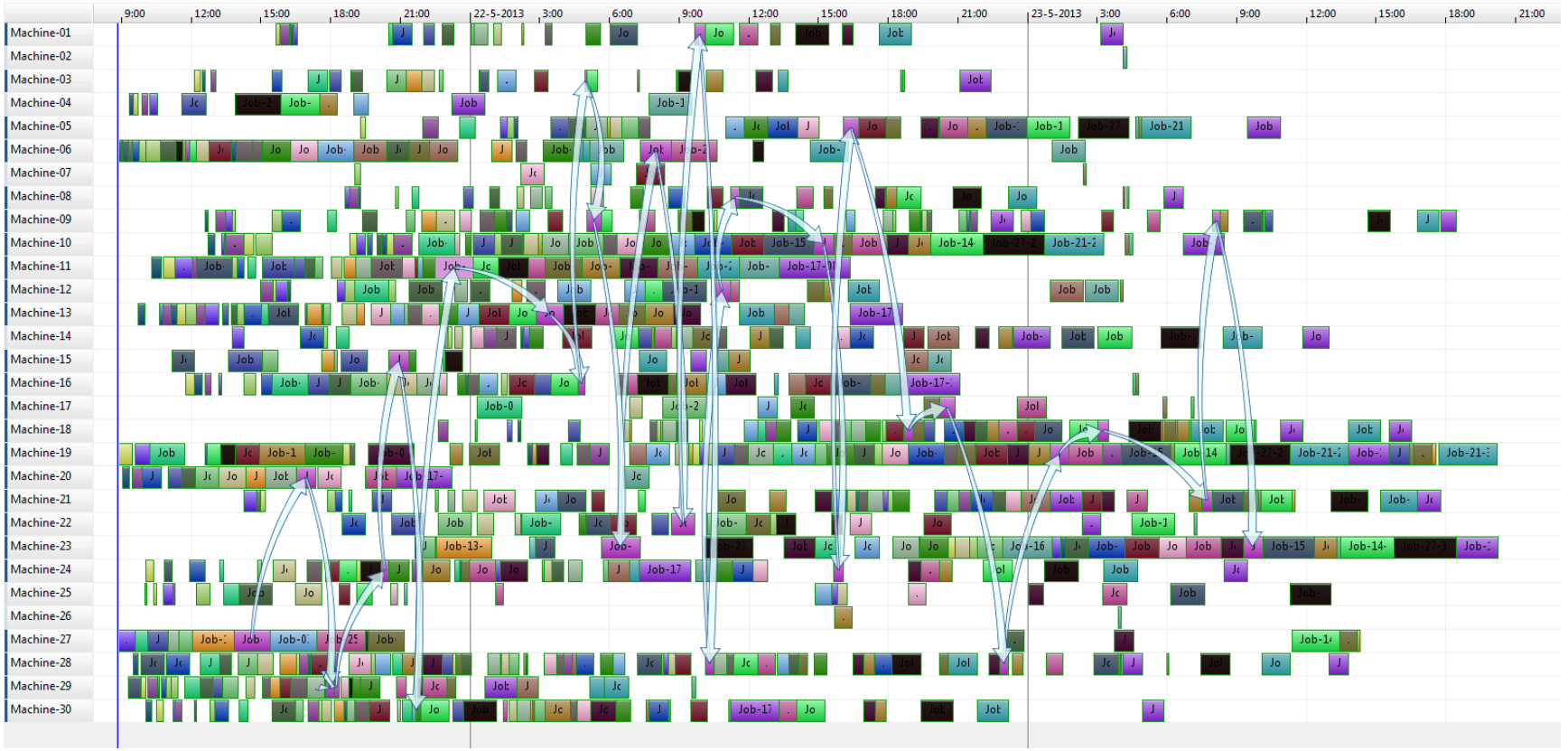
Past performance does not predict future outcomes



A good production plan: The illusion of optimization



100 orders

30 machines

Product options

10^255

Finish time
3,564 minutes

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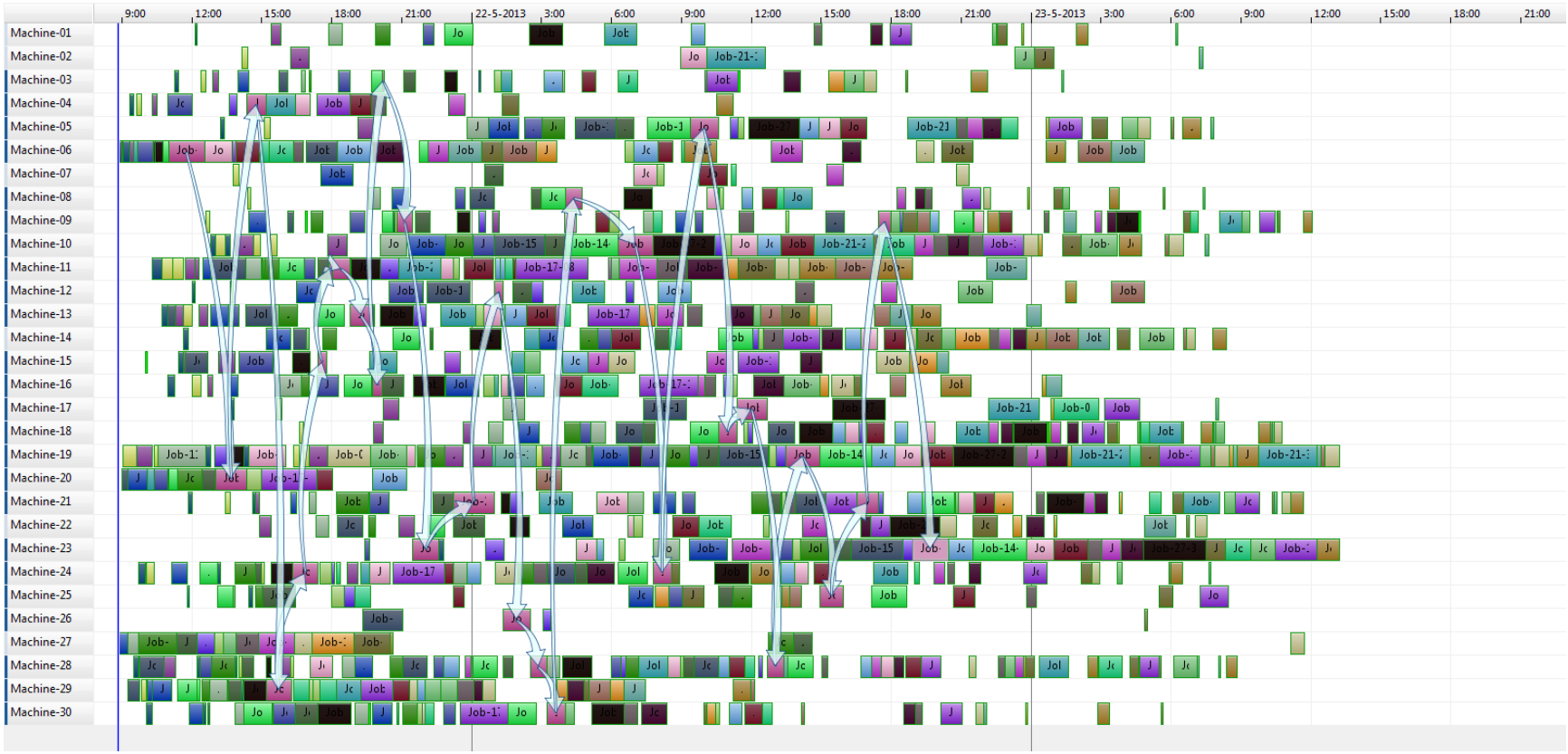
Production plan optimized for profit



12% improvement

100 orders

30 machines

Product options

10^255

Finish time
3,143 minutes

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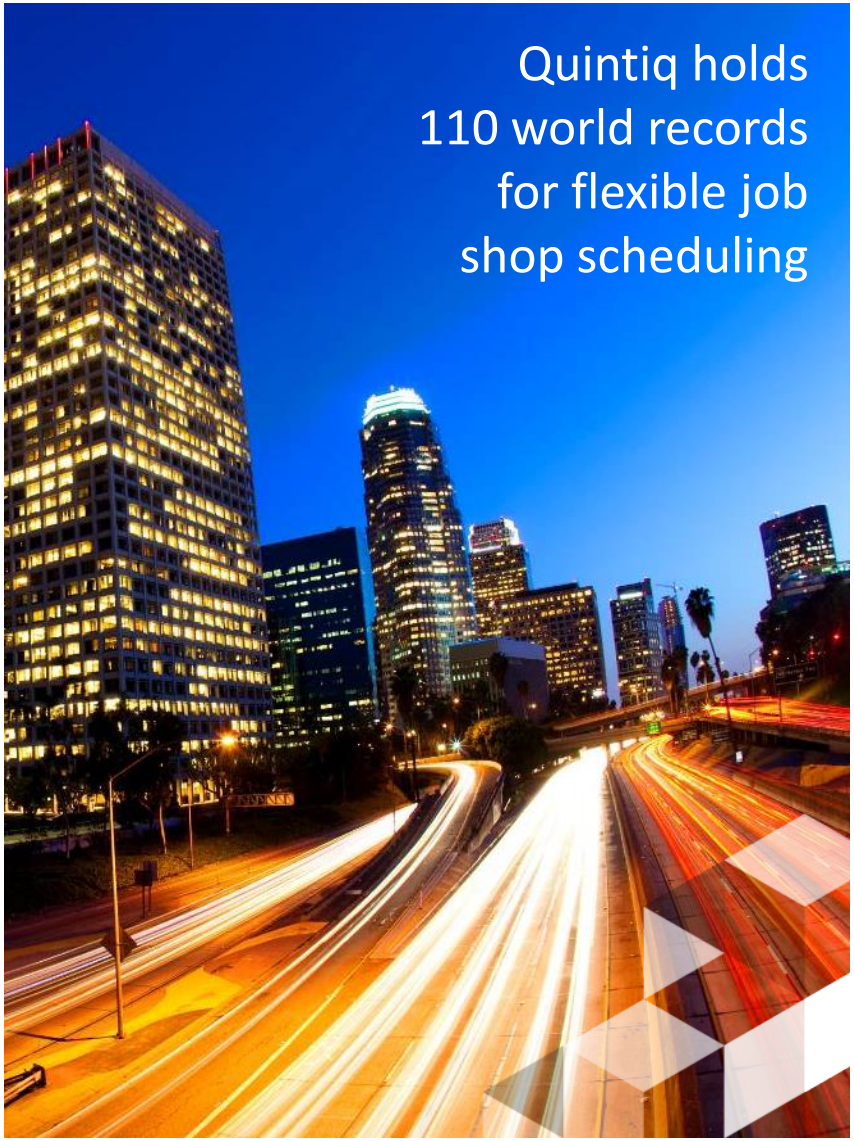
Quintiq is world champion in Job Shop Scheduling



The Flexible Job Shop Scheduling Problem (FJSSP) is an extension of the classic Job Shop Scheduling Problem, which has been studied since the 1960s.

The challenge: **Schedule a set of operations to be processed on a set of machines and order the operations so that total completion time is minimized**.

The FJSSP represents a **production environment** where there is a restricted set of machines capable of processing a particular operation.

There have been 313 documented instances with up to 300 operations.

Quintiq holds 110 world records. For these 110 instances, we were the first to find the best-known solution to date, ahead of any research group. Of these 110 best-known solutions, **90 have been proven to be optimal**.

Quintiq's **commercial optimization technology**, which was used to solve this historic puzzle, powers the software used by our customers in over 80 countries on a daily basis to solve their own unique planning puzzles.

Quintiq's optimization approach

Level	Organization requirements	Benefits	Description
Interactive automated planning 	• Good data/rule quality • Clear optimization goals • Good human planners	• Includes soft goals • Increased impact per planner • Solve larger puzzles and find better solutions	• Compares different scenarios • Adjusts the optimization results • Freezes part of the optimization results • Allows re-optimization (e.g. to handle exceptions)
Fully automatic planning 	• Flawless data/business rules • Exact optimization goals	• Cost reduction • Higher utilization • Higher service level	• Creates plan for day of operations for day x+1 (or x+2, etc.) • After accepting the optimization results, the planner will not re-optimize (will only make local changes)
Semi-automatic planning 	• Good human planners • Great data quality	• Find solutions faster • Unlock "low-hanging fruit" optimization potential	• Typically up to 50% of decisions are made by using semi-automated planning, and the rest by manual decision making
Decision support 	• Good data quality • Great human planners	• Increased impact per planner • Solve larger puzzles and find better solutions	• Global overview of status • Focus on better planning • Tendency towards formalization of data • Pro-active instead of reactive
Manual planning 	• Excellent planners needed • Excel/ERP/TMS	• Plans are archived	• Long learning curve • Constantly searching for the right information • Plans are written on a planboard • No insight into global results of local decisions • Stress

Carlsberg – China

Fast facts

- Industry: **B\Food/Beverage**
- Number of Employees: **500**
- Annual Unit Production: **NA**
- Customer Since: **September 2014**

"The Quintiq solution roll-out will commence in phases, beginning with S&OP, followed by MPS and then Detailed Scheduling across each brewery in China. This approach will enable Carlsberg to have a single, transparent view of all its operations within China"

-Arjen Heeres, Chief Operating Officer, Quintiq

Challenge	• Carlsberg has become the leading brewery group in West China, operating 41 breweries across the country. • Needed an integrated planning solution.
Solution	• Implement Quintiq's Sales & Operations Planning (S&OP), Master Production Scheduling (MPS) and Detailed Scheduling solutions to support Carlsberg China's business across 41 breweries.
Why Quintiq?	• Carlsberg China has chosen its software to provide an integrated business planning solution. • Carlsberg China will rely on the Quintiq system to enable a single, transparent view of all its operations within China.
Benefits	• The new solution will increase visibility and transparency on all planning and scheduling decisions from raw materials, brewing, tanks and filling lines to packaging. • Aided by KPI dashboards, planners will receive support for faster decision making process, to control, reduce risks, analyze and manage change.

AkzoNobel Decorative Paints

Fast facts

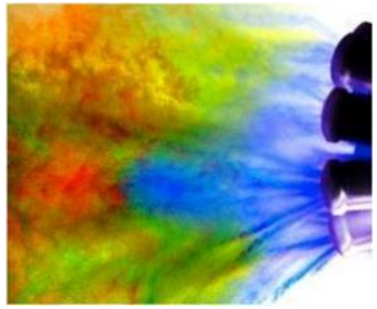
- Industry: **Decorative paint production**
- Annual revenue: **€1.37 million (2013)**
- Number of employees: **Over 5,000**
- Annual production: **1 million tonnes**
- Location: **Gateshead, United Kingdom**
- Solution: **Scheduler**
- Customer since: **2012**

"The functional and the optimization proof of concepts showed us exactly what we needed – that Quintiq could help us optimize our throughput and delivery performance."

Peter Lidstone
European Supply Chain Director,
AkzoNobel Decorative Paints

Challenge	• Improve reaction time on shop floor disturbances • Reduce errors in reactions to shop floor disturbances • Link the SAP MRP output to detailed line schedules to improve customer service levels and maximize productivity
Solution	• Optimizes the throughput of paint at its factories • Validates material availability of planned batches • Creates detailed sequences for dispersing, mixing and filling during paint production process
Benefits	• Optimized throughput and reduced cycle times • Improved delivery performance and productivity • Reduced loss times and cleaning times

AkzoNobel Powder Coatings



Fast facts

- Industry: **Powder coatings**
- Annual revenue: **€934 million (2013)**
- Number of employees: **Over 4,000**
- Location: **Western Europe**
- Solution: **Scheduler**
- Customer since: **2010**

Challenge	• Address the problem of high inventory levels, sub-optimal utilization of plants, inconsistent service levels, a lack of supply chain visibility, and a duplication of planning tasks across the various plants • Link the SAP MRP output to detailed line schedules to improve customer service levels and maximize productivity
Solution	• Foresees the effects of planning decisions on the entire supply chain, enabling more effective decision making • Helps to reduce inventories by creating detailed sequences for dispersing, mixing and filling during the paint production process
Benefits	• Improved capacity utilization and less temps required • Reduced planning effort, inventory by about 5%, and SLOB by 20% • Improved service performance by reducing out-of-stocks and MTO lead time • Increased sales value expected by at least 1%

"Full transparency has been achieved through the combination of centralized planning and de-centralized scheduling in seven plants. We have seen results in capacity balancing as well as improvements in scheduling. This has further resulted in improved customer service and optimized productivity."

Pierre Versailles
Operations Excellence Manager,
AkzoNobel Powder Coatings

Amy's Kitchen – United States

Fast facts

- Industry: **Fruit and vegetable processing**
- Annual revenue: **US$120 million**
- Number of employees: **1,600**
- Annual production: **20 million pre-packaged meals**
- Solution: **Scheduler**
- Location: **Petaluma, CA, USA**
- Customer since: **2013**

"Quintiq has an outstanding track record in the industry and its software platform will enable us to maintain the high quality and fulfillment standards our customers have come to expect."

Andy Berliner
CEO, Amy's Kitchen

Challenge	• Address Amy's Kitchen's intricate scheduling requirements • Accommodate Amy's Kitchen's unique approach of assembling and cooking products simultaneously
Solution	• Accounts for the large number of staff required to cook and assemble each product • Plans the delivery of raw materials, inventory disposition and equipment availability • Optimizes communication and collaboration between sales and inventory forecast planning
Why Quintiq?	• Quintiq had the flexibility to handle the unique constraints found in Amy's Kitchen's intricate scheduling processes • Quintiq is an industry leader in scalable solutions
Benefits	• Maximized resource utilization • Improved decision making and enhanced productivity • Company-wide visibility enabling improved teamwork and communication

SIG Combibloc

Fast facts

- Industry: **Converted paper products manufacturing**
- Annual revenue: **€1,260 million**
- Number of employees: **4,250**
- Location: **Germany (Headquarters)**
- Solutions: **Company Planner, Scheduler**
- Customer since: **2007**

"By deploying the Quintiq solution across all of our planning horizons and sites worldwide, we are setting ourselves up well for the future as we now have a system that can grow with us."

Andreas Haas
Head of Supply Chain Management, SIG

Challenge	• Improve efficiency for overall supply chain performance • Provide delivery reliability • Provide efficient planning
Solution	• Quintiq Company Planner for medium-term planning and Quintiq Scheduler for detailed planning • Improves overall supply chain performance • Integrates with SAP • Administers strategic, tactical and operational planning across all production facilities
Why Quintiq?	• More efficient planning and proved efficiency by improving overall supply chain performance • Complementary to SAP • Quintiq maps entire production process in real time
Benefits	• Transparent order processing across all sites resulting in more objective planning decisions • Increased internal lot sizes by 10% • Improved delivery performance: reduced lead times, reduced working capital requirements, Maximized capacity utilization • Increased productivity and throughput • Optimized inventory levels • Improved customer service

Agenda

- Quintiq overview
- Focus area: detailed scheduling
- Summary of current challenges
- Demonstration
- Optimization in scheduling/references
- **Q&A**
- Lunch Break
- IT Discussion
- Next steps discussion/wrap up

Q & A session

Agenda

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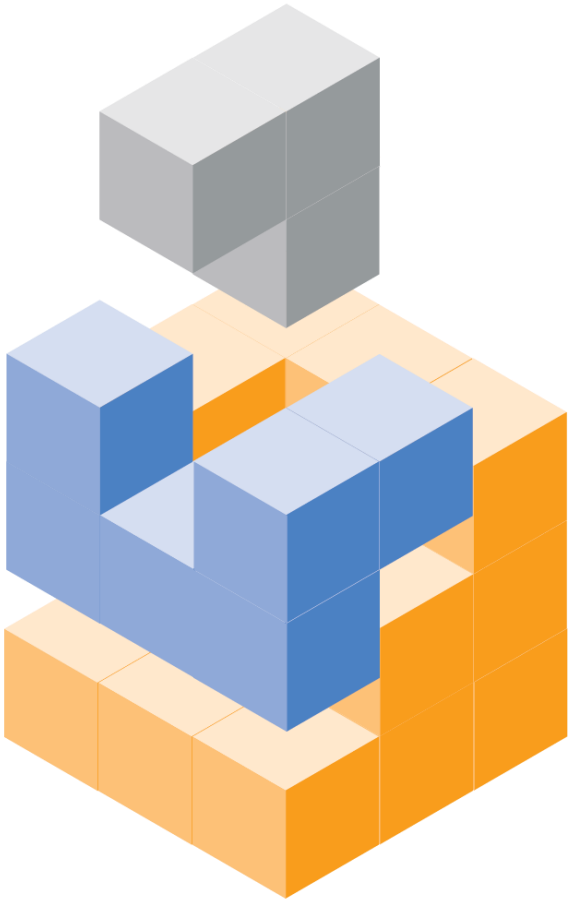
Applications components & technology requirements

Quintiq architecture



Rich Products Solution

Industry Solutions

Quintiq Standard Software

Rich Products Core Business Rules

Demand Planner: Collaborative demand forecast

Macro Planner: Finite Capacity planning

Scheduler: Detailed production scheduling

Logistics planner: Transport planning and execution

… and more

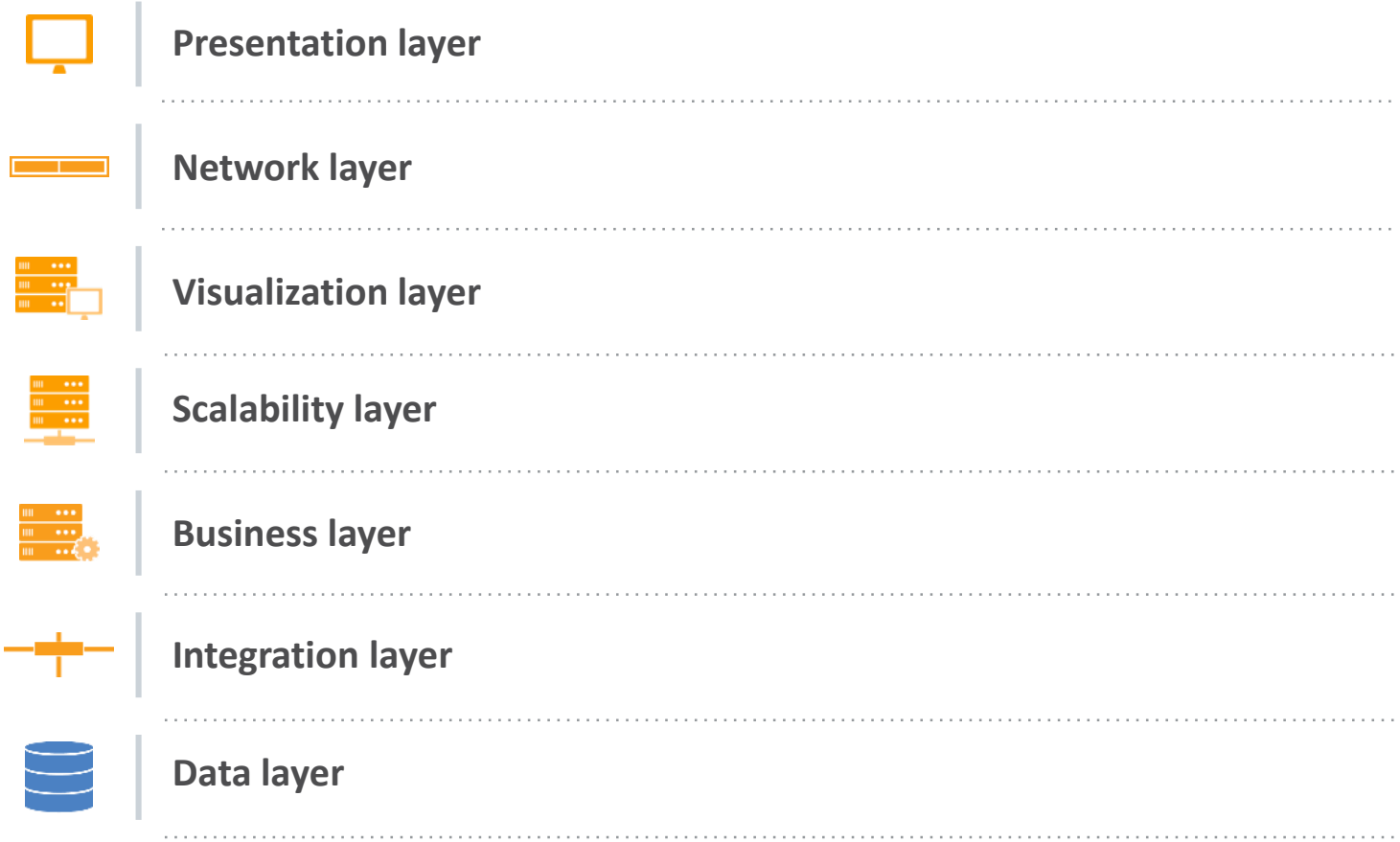
Quintiq Standard Software

Used by all Quintiq Customers

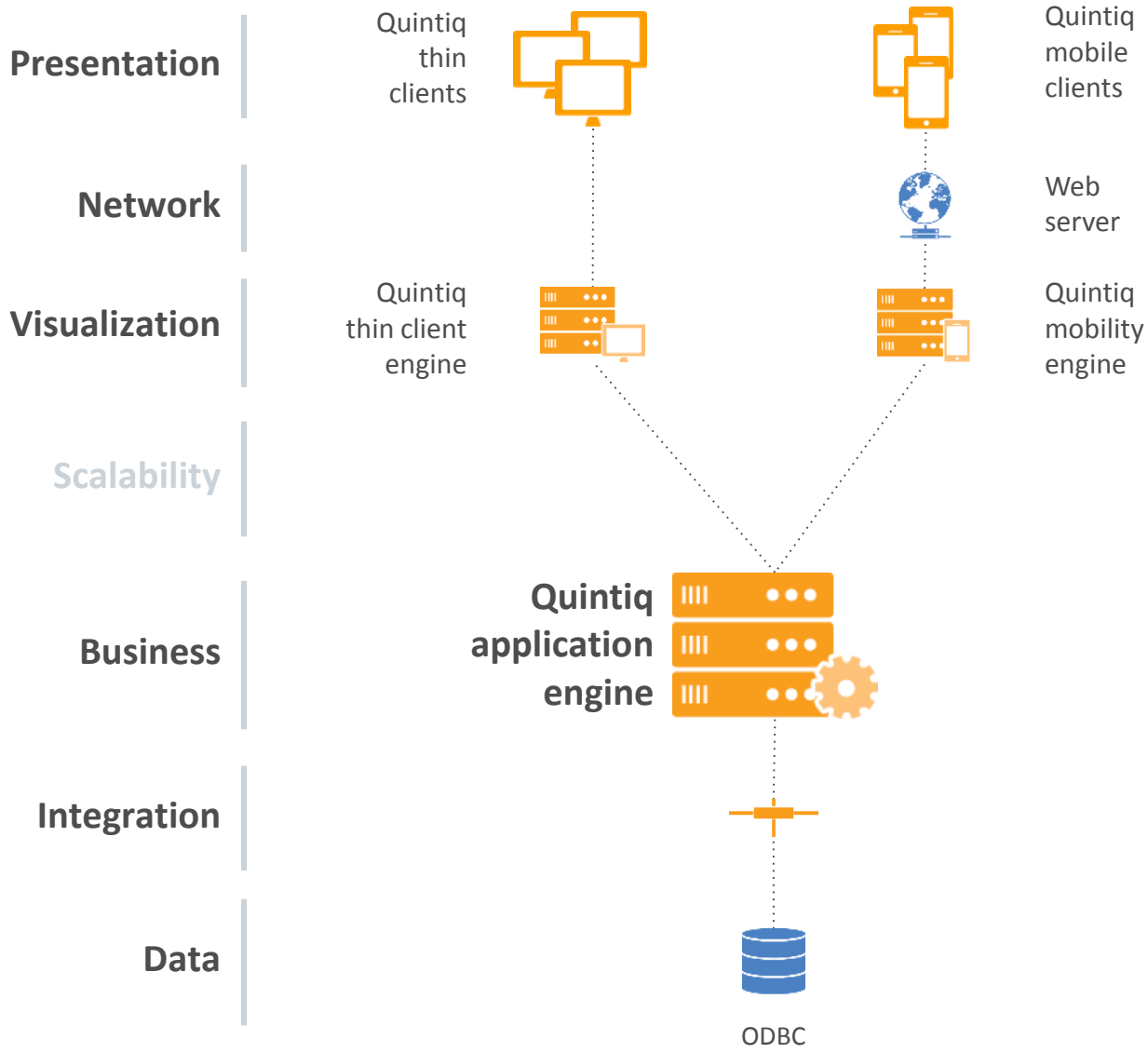
Capacities shared by all planning applications:

- Business Model and Logic
- Visualization and interaction
- Optimization
- Integration

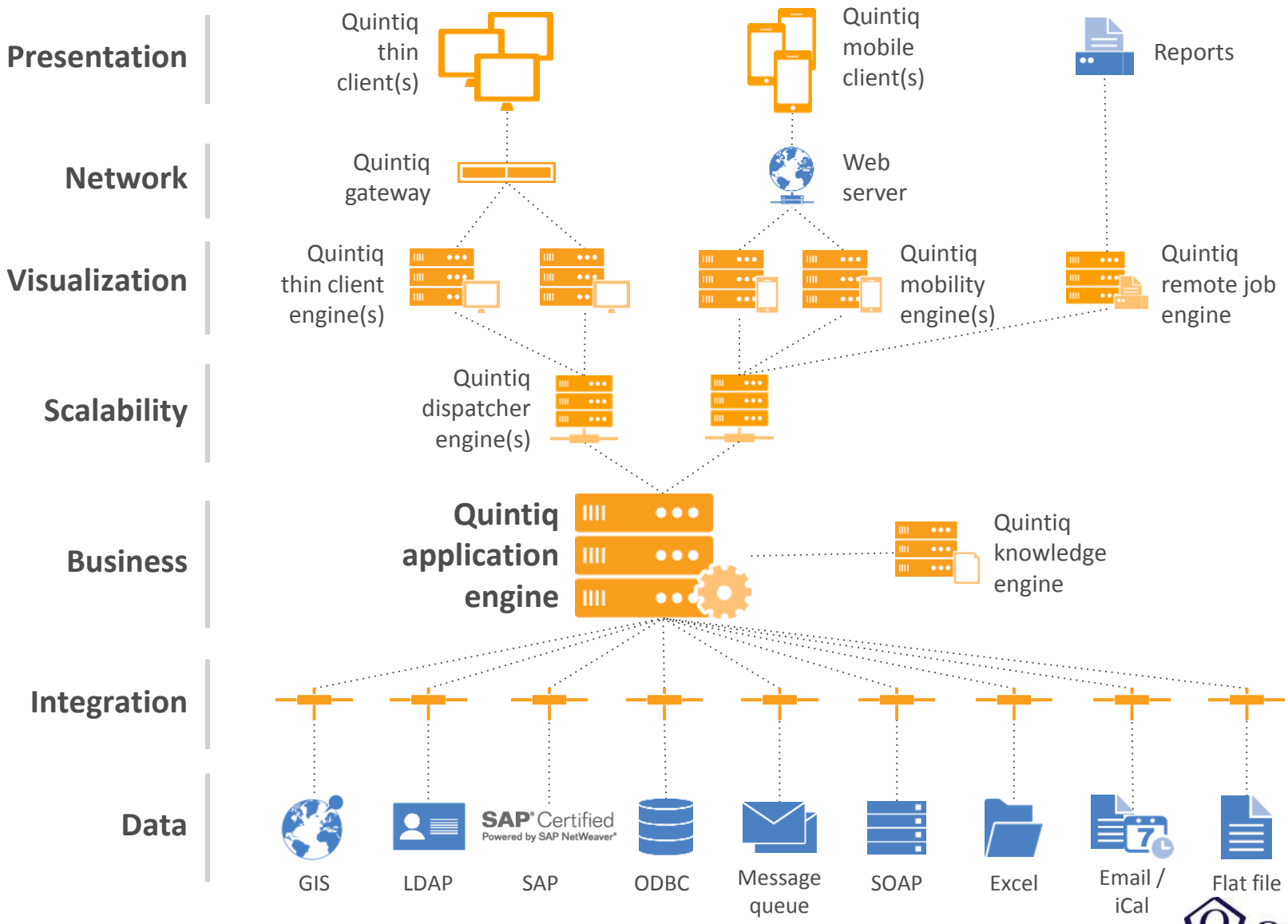
Quintiq: Basic architecture



Overview: Sample basic architecture / no external systems



Overview: Quintiq software components



Scalability solutions

Scaling due to data volume

Datasets and/or multiple Quintiq Application Engines

Scaling due to global businesses

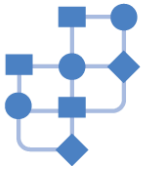
Support for centralized and decentralized installations

Scaling due to complexity of business rules

Quintiq Propagator

Scaling due to user counts

Quintiq Thin Client technology



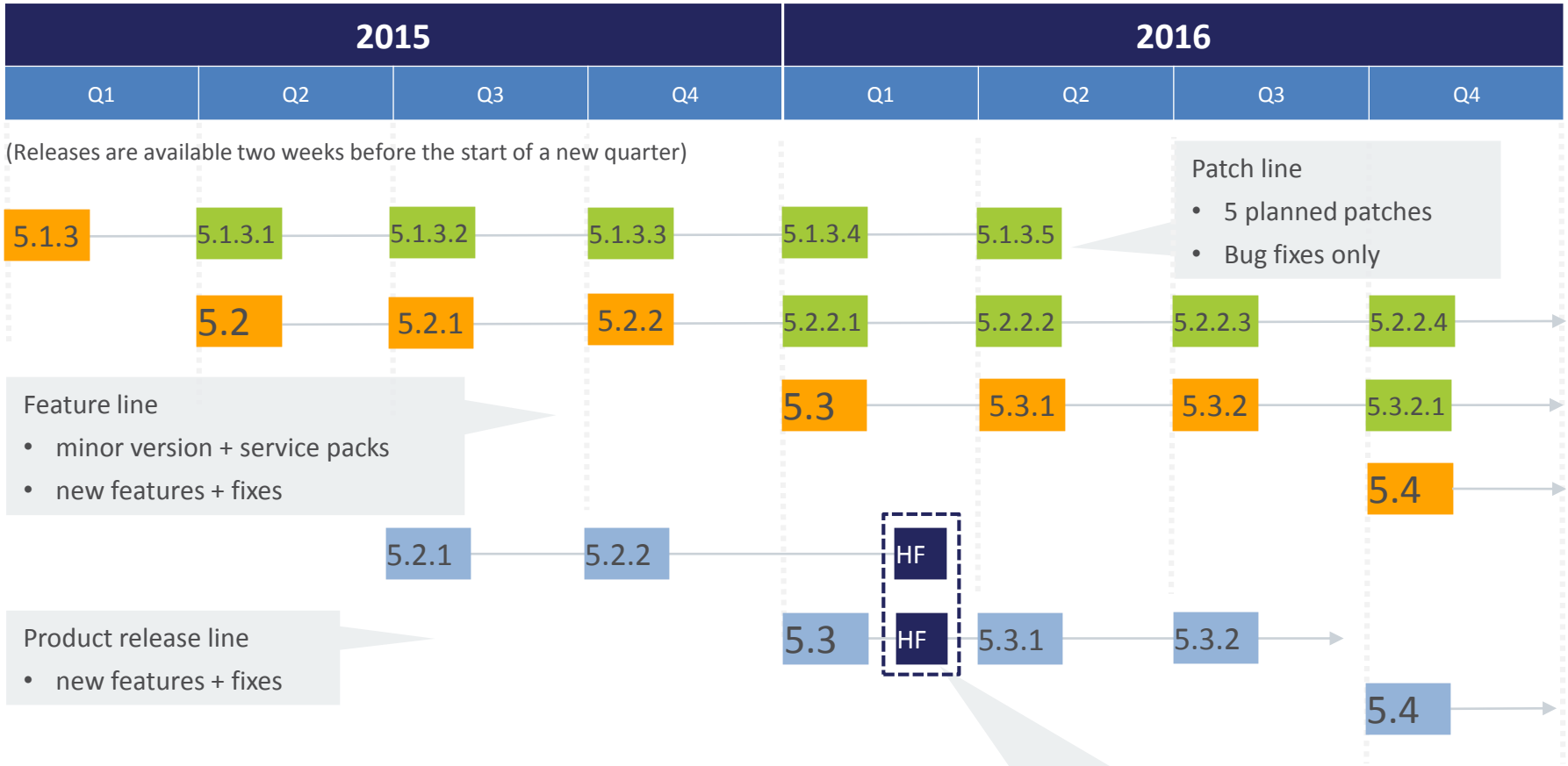
Scaling due to complex optimization

Advanced Optimization Engine

Case overview

	Orders (per day)	Resources	Users	Messages (per hour)	Quintiq Application Engines	Internal interfaces	External interfaces	Parallel optimization
Express operator	>1,000,000	60,000	5,000	120,000	>20	>20	>10	Yes
World-leading retailer	10,000	15,000	200	100,000	1	>10	>5	Yes
Gas company	40,000	28,000	400	15,000	6	>5	>3	Yes
Workforce Planner	10,000	10,000	1,000	20,000	1	>10	>5	No
Air traffic control	30,000	10,000	1,000	2,000	6	>5	>10	No
Passenger rail company	100,000	20,000	2,000	20,000	4	>15	>10	Yes

Release strategy for Quintiq Application Suite and Products



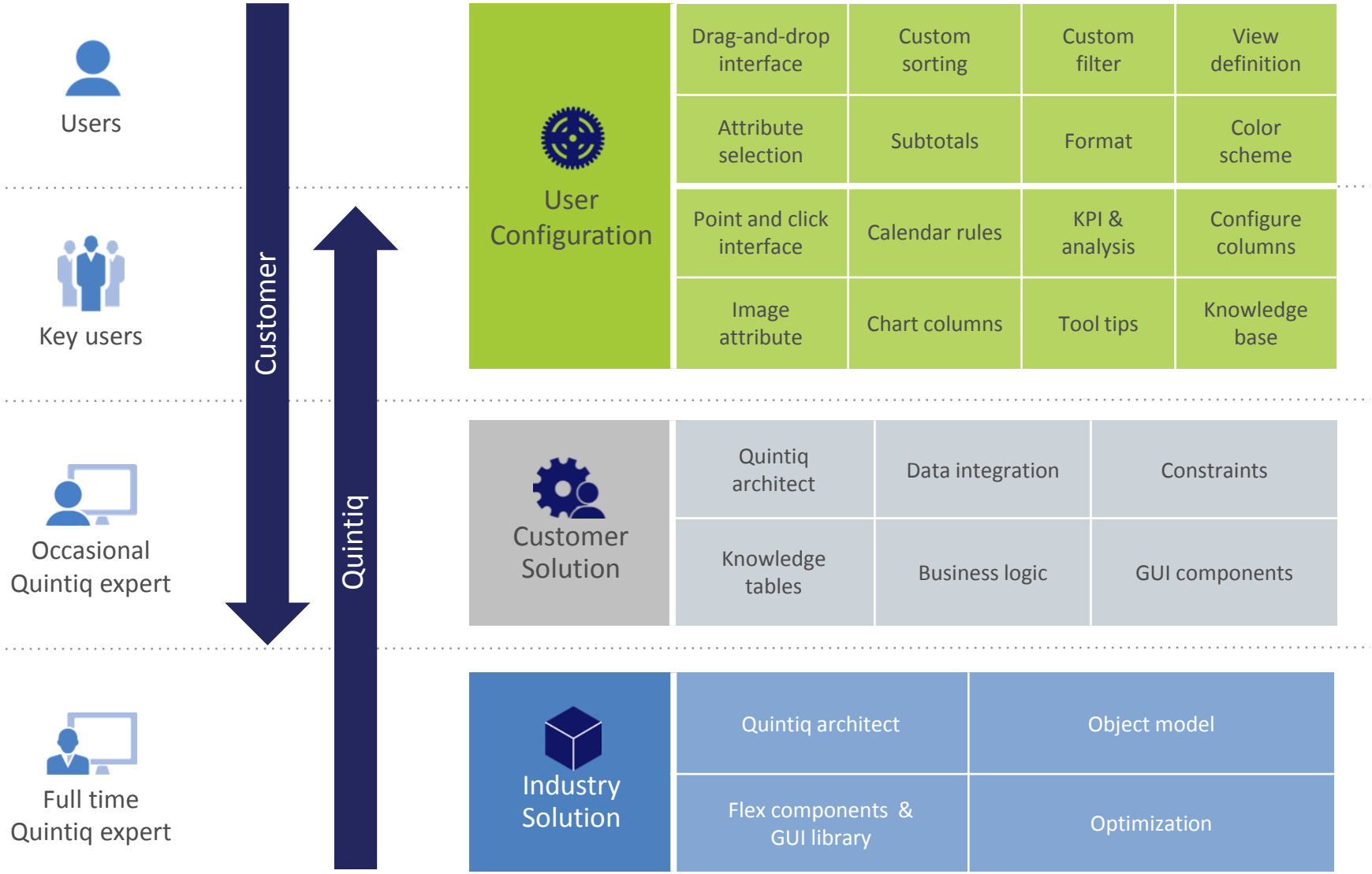
Customer projects go live with:

- patch line for mission-critical systems and upgrades
- feature line for non-mission-critical systems
- product line require corresponding software version

Product release hotfix

- Bug fix for critical bug
- Same request process as used by R&D
- For latest release as well as latest release that can be used for mission-critical systems

Different levels of configuration



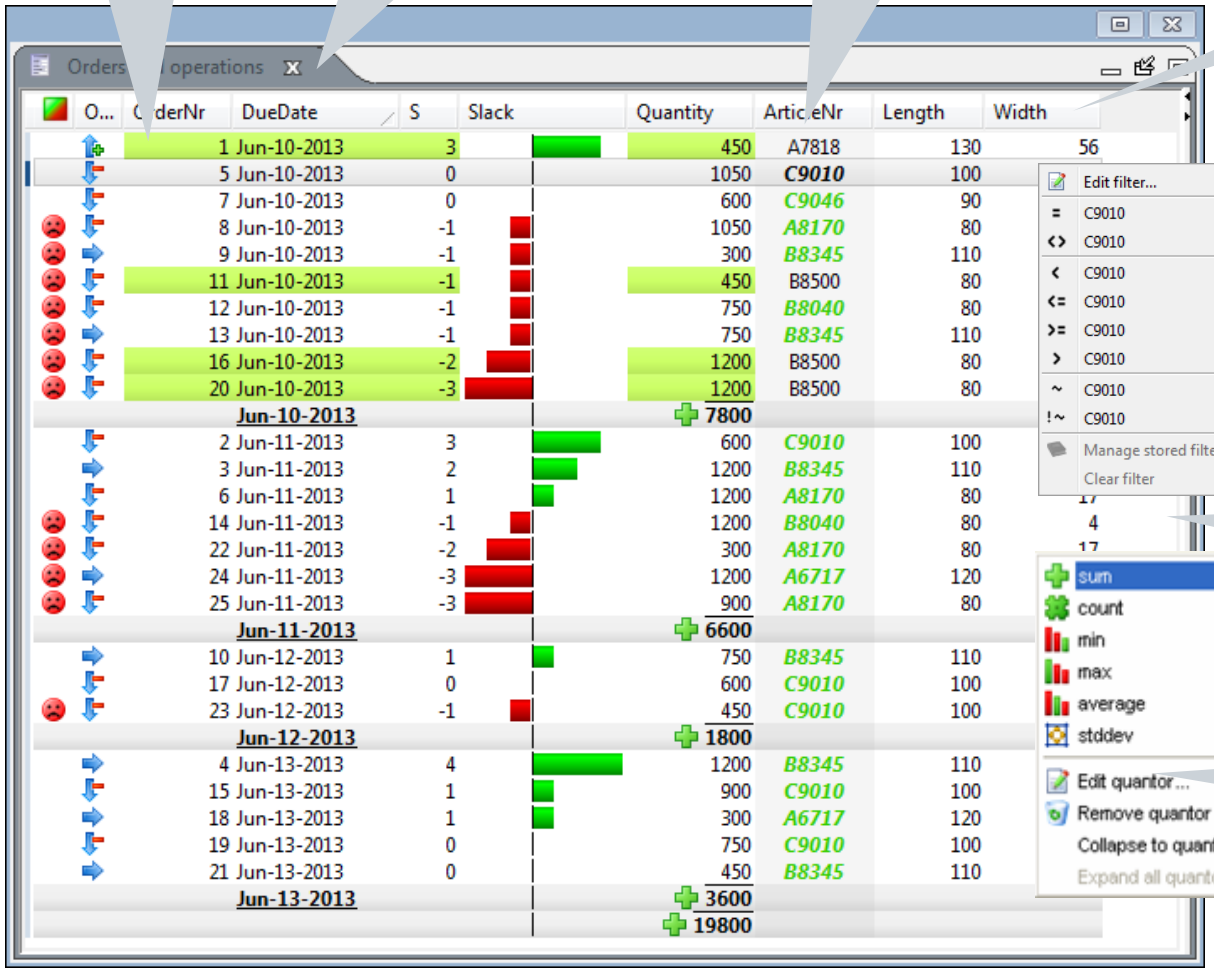
Level 1 – End user

Constraint representation
Use different image/color to represent constraints

Sorting
Sort columns in ascending or descending order

Formatting
Decimals, unit of measure, colors, bold, etc.

Attribute selection
Select attributes to be displayed



Filtering
Filter on the records

View definition
Define view & set it as favorite

Subtotals
Select quantors like sum, count, min, max..

Level 2 – Key user

Dashboard
Visualize real time KPIs using gauges or LCDs

Image attributes
Configure image attribute for better visualization, e.g. Product type

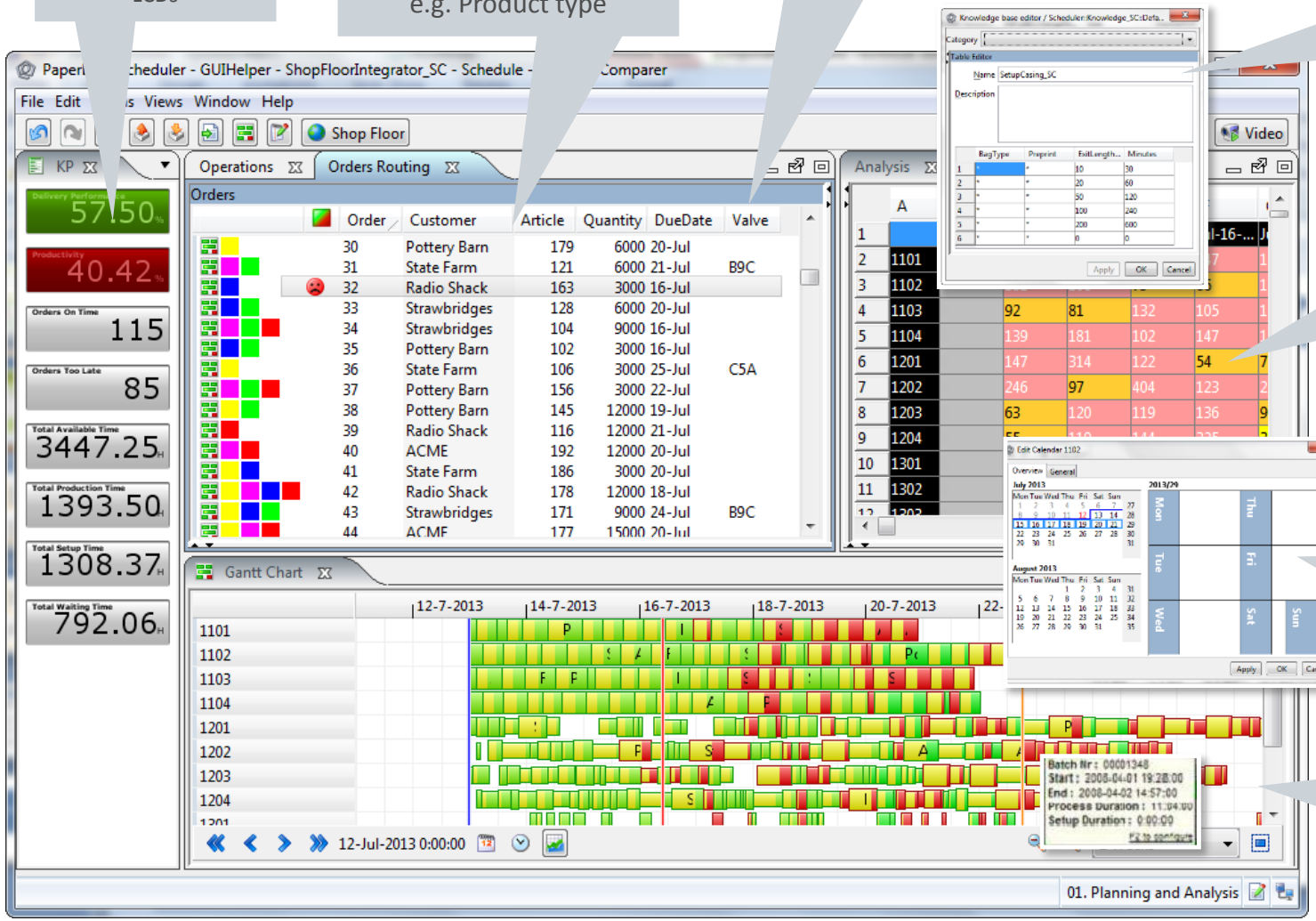
Configurable column
Define own column when it's not made available

Knowledge table
Adapt the software to your new business scenario, e.g. Resources

Analysis component
Analyze the data and define real-time KPIs

Calendar rules
Define calendar rules for each resources, e.g. Shift, down time…

Tool tips
Configure information to be displayed during mouse over



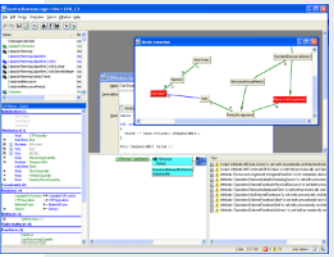
Level 3 - The Occasional Quintiq Expert

Data Integration
Integrate Customer Data with Quintiq Software

Knowledge Table
Create / edit knowledge Table based on customer needs

Business Logic
Model solution to cater for customer specific business logic

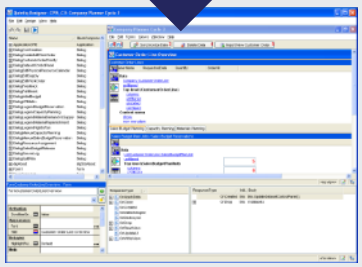
Constraint
Create constraints based on customer business rule



Quintiq Business Logic Editor

GUI Component
Forms, lists, Gantt chart, dialogs, context menus…

Color Schema
Define color schema e.g. Used Capacity, Available Capacity, Overload…



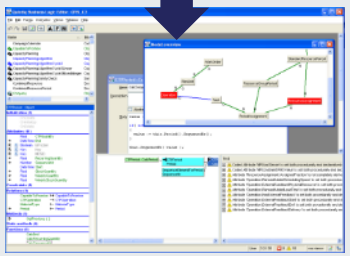
Quintiq GUI Designer

Industry Solution → **The Occasional Quintiq Expert** → **Customized Quintiq Application**

Level 4 – The Full Time Quintiq Expert

Object Models
Model Industry Solution objects

Optimization
Work on optimizer to solve various planning puzzles



Quintiq Business Logic Editor

The Full Time Quintiq Expert

Flex Component Customer Solution

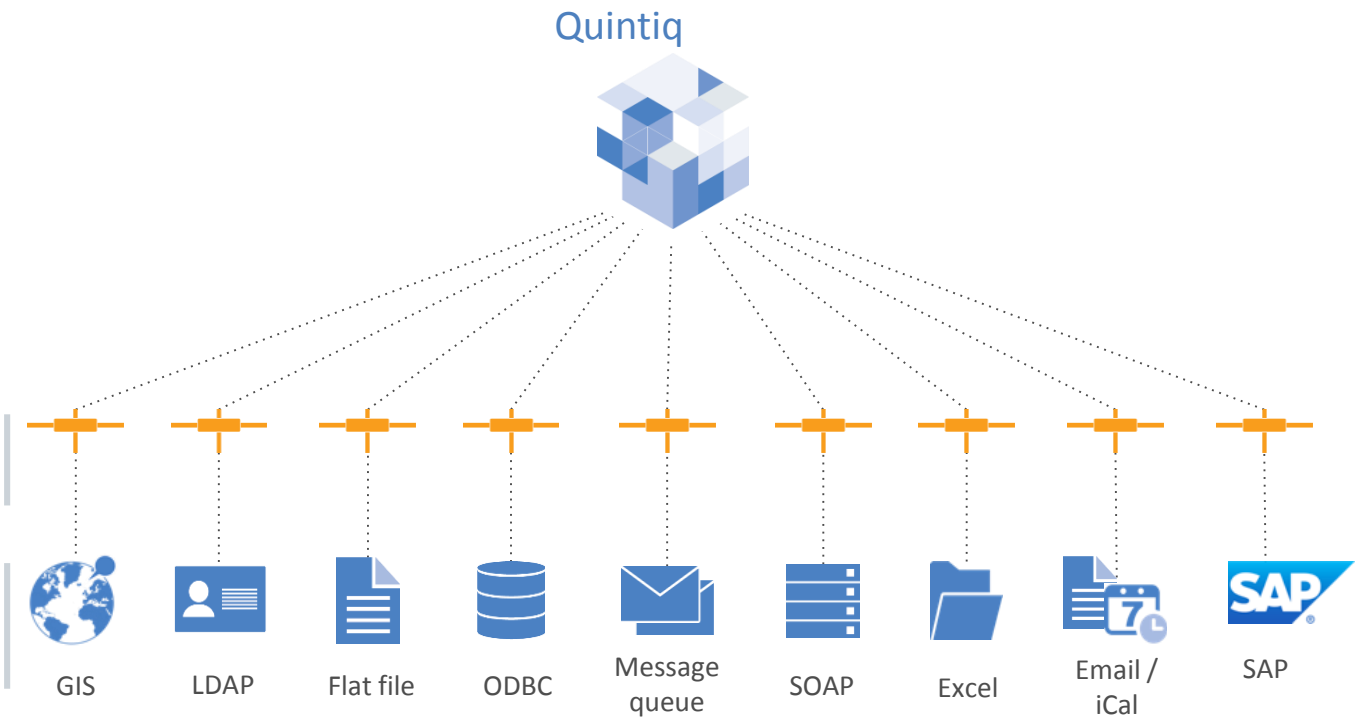
Industry Solution

Data Integration

QUINTIQ

Integration

Integrates seamlessly into your environment



Customer ERP system integrations:

86
SAP

42
Oracle

50+
Other

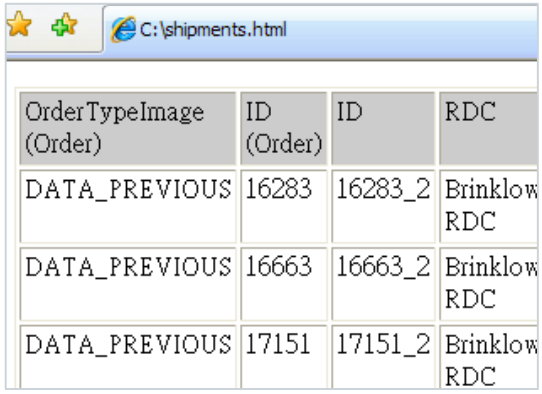
Tribotecc
...more than performance

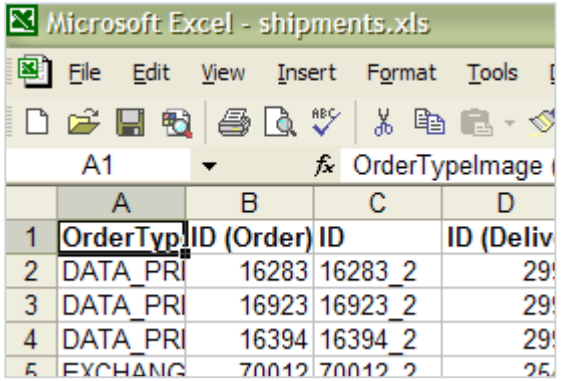
"Quintiq won us over by demonstrating its integration capabilities, transparency as well as the flexibility enabling the software to be tailored to process the many specific requirements of both the chemical industry and Tribotecc."

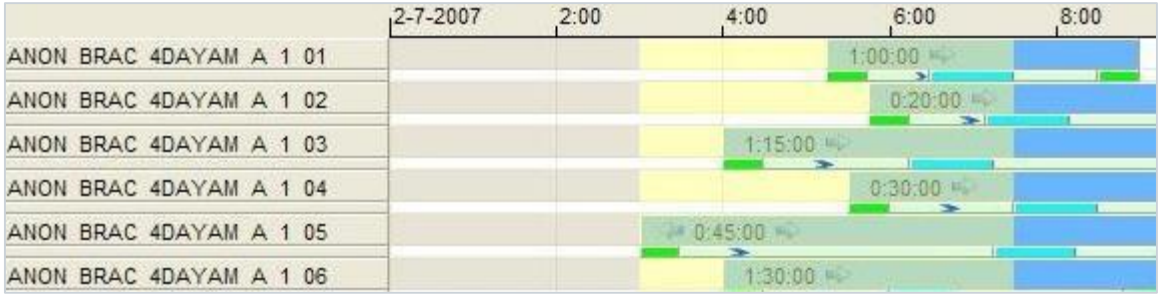
QUINTIQ

Exporting data

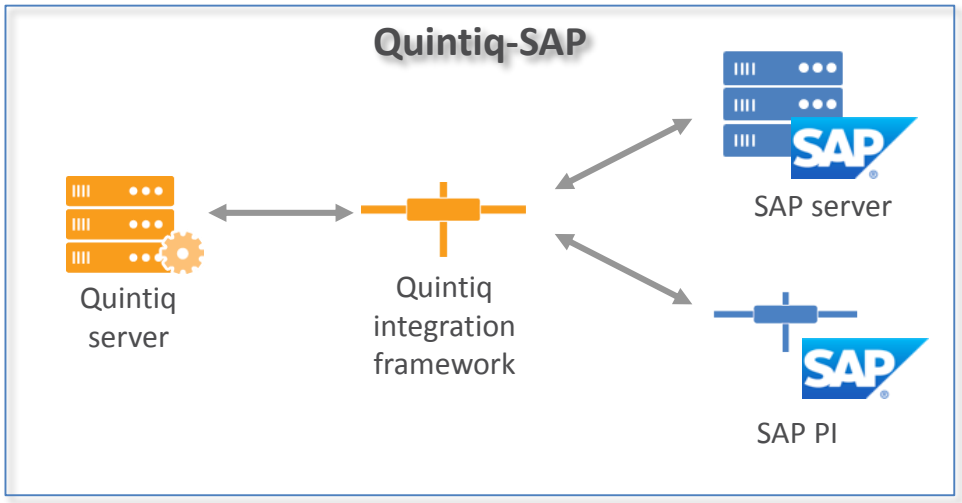
Export any list or Gantt Chart to HTML, Excel, Word, JPEG etc.







Minimizing SAP Integration time, cost and risk



Technical

1. Multiple integration techniques
2. Pre-configured SAP technical integration
3. Simple data mapping tool.
4. Data conversion and control is handled by Quintiq, since data conversion can often be done faster than in SAP.

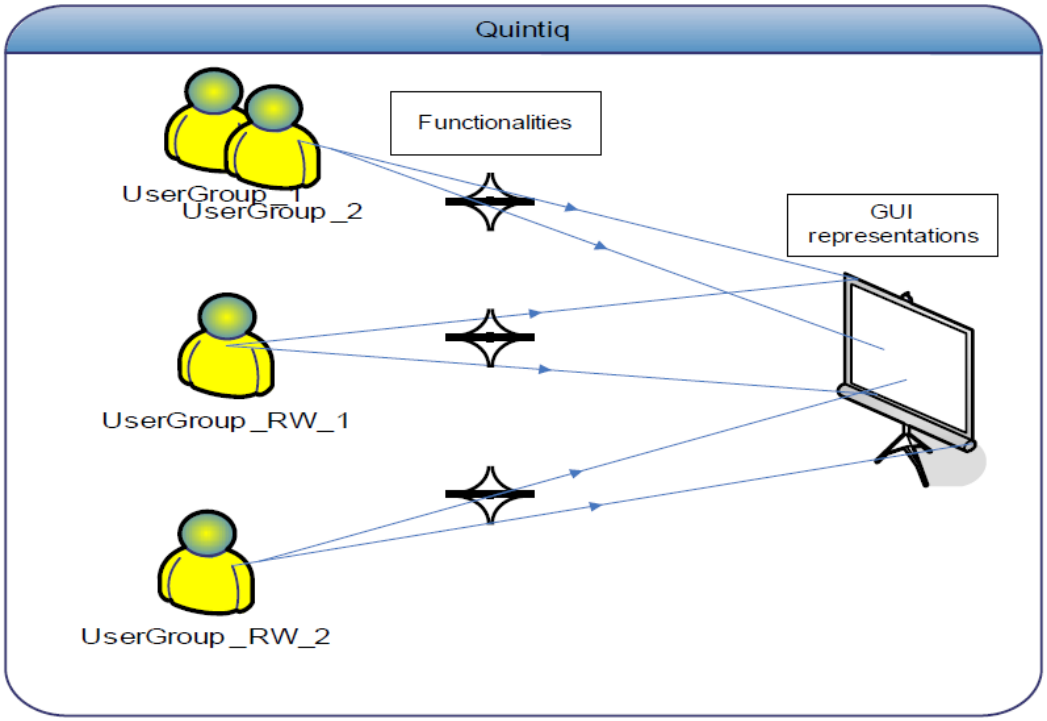
Functional

1. Maximize visibility of source/destination data structures.
2. Maximize visibility of source/destination mappings.
3. Maximize speed of transforms and control
4. Prior knowledge of typical data flows.

Selected Quintiq customers using SAP

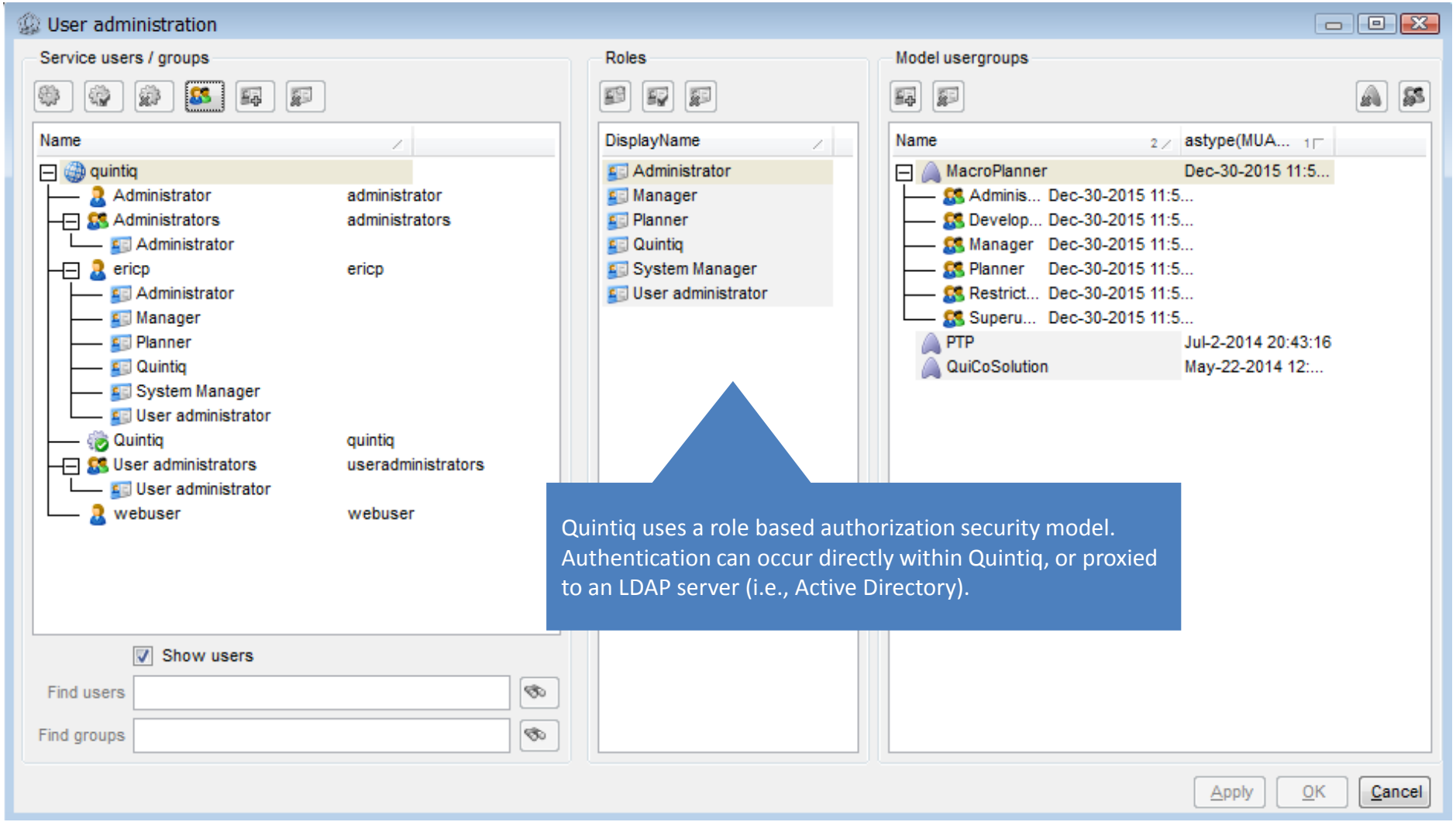
Data/System Security

Security



Recognizing that safeguards preventing disclosure of confidential information is of paramount importance, Quintiq utilizes robust security controls within our applications. Collectively, these security mechanisms ensure that we provide for full data confidentiality and protection, along with granular controlled access to this vital information. Quintiq security controls extend across our entire planning suite, providing user security, application system security, database security, network security, audit logging, and system administration.

System security – user security and RBAC



Quintiq uses a role based authorization security model. Authentication can occur directly within Quintiq, or proxied to an LDAP server (i.e., Active Directory).

Agenda

- Quintiq overview
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Goals of POC

Define scope

Quintiq understands the complexity associated with liquid/semi-process scheduling. We also understand that every company has their own unique challenges. Our proposal is for Rich Products to **challenge** Quintiq with the most complex piece of your detailed scheduling puzzle. The right scope will bridge the gap between the functionality seen in the solution presentation and the “Rich Products” world.

Prove capability

Work with Rich Products team to define the puzzle constraints, rules and KPIs. Then, in a matter of days, give Rich Products **certainty** that they can be incorporated into the Quintiq solution. Additionally, work with Quintiq SMEs to understand the ease of configuration – Rich Products world is modeled without customization and is done through a process which incorporates your team.

Question and answer session

Quintiq Inc.

Melissa Pappas

Account Executive

Melissa.Pappas@quintiq.com

610.517.6150

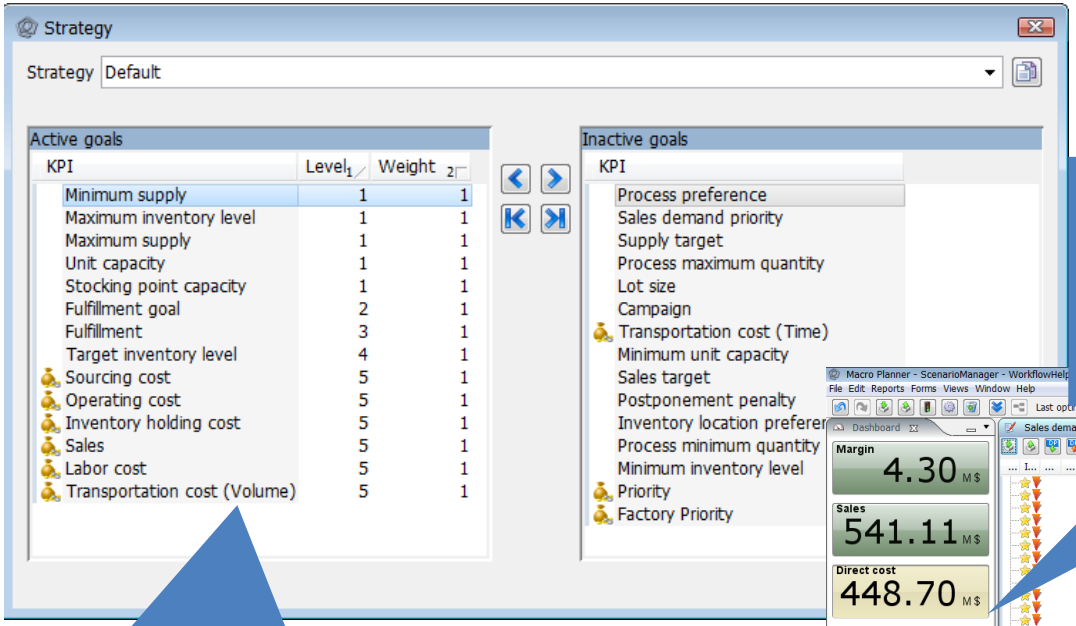
QUINTIQ

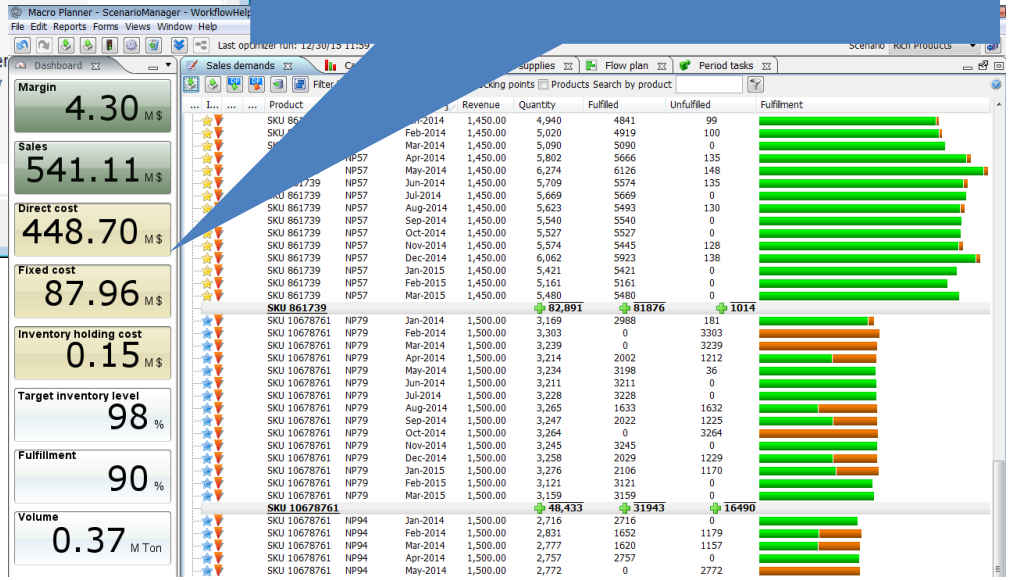
Appendix 1:

Functional Requirements

Functional Requirements

Show how and why the plan produced is optimized to minimize cost and/or improve manufacturing capacity utilization while still maintaining inventory and service targets.



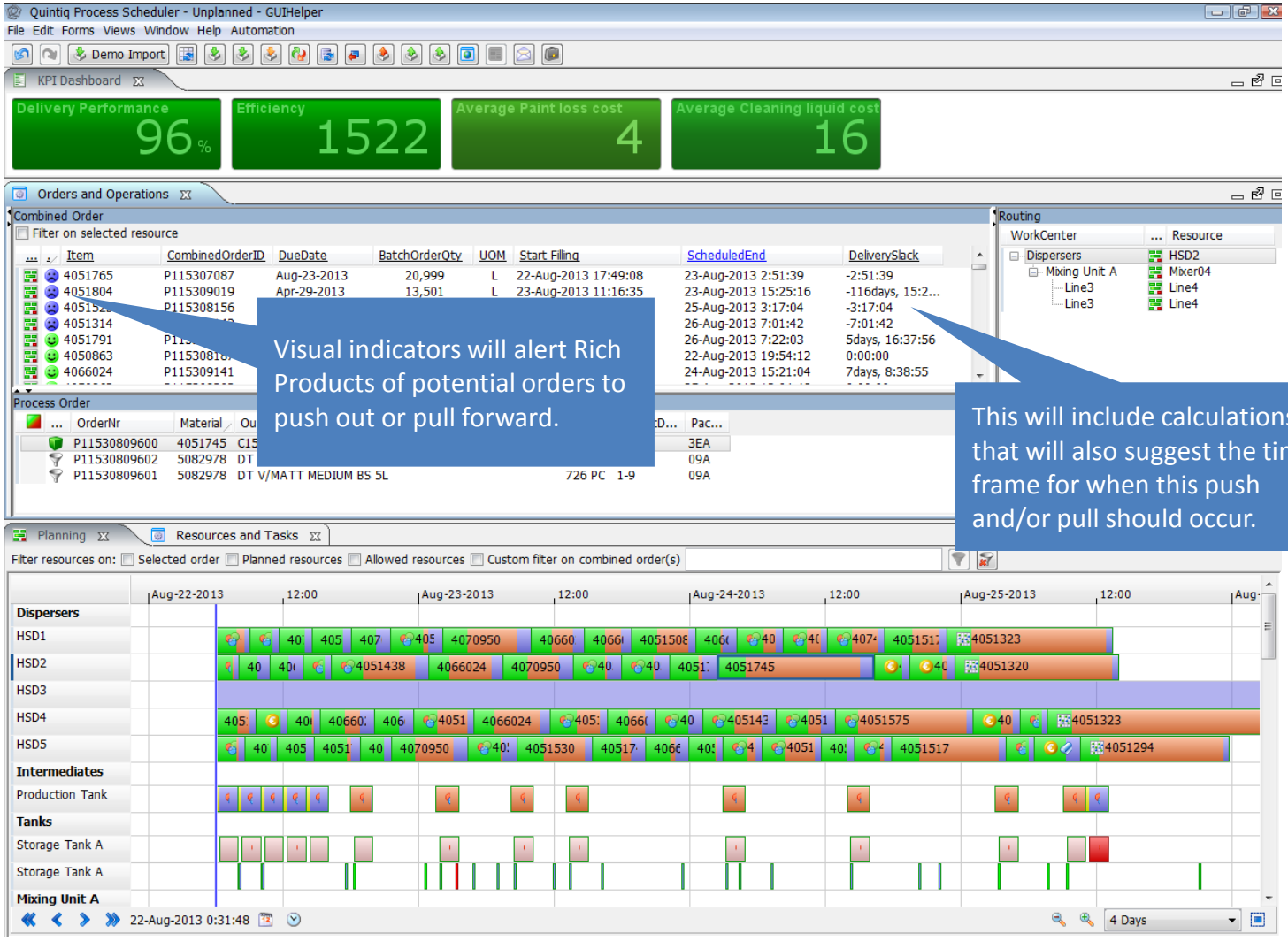


The plan is generated, and the KPIs are updated in real-time to measure the quality of the plan. Furthermore, additional plans can be run, allowing Rich Products to perform What-If analysis.

Quintiq allows you to specify which KPIs are most critical, including capacity utilization, production costs, inventory costs, inventory targets, fulfillment, etc.

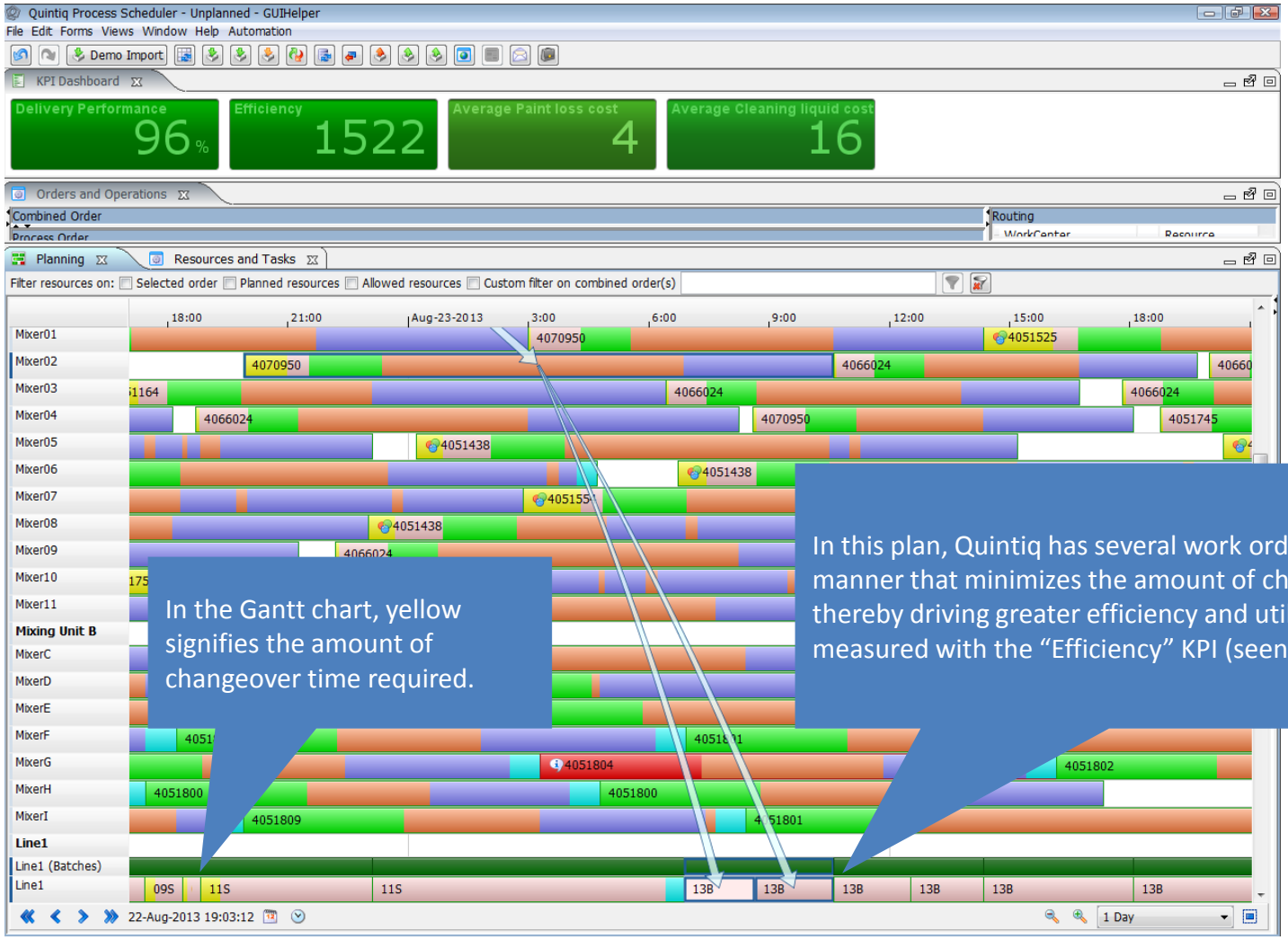
Functional Requirements

Show examples where the solution pulled requirements back from a future week and/or pushed requirements forward to a future week



Functional Requirements

Sequence like formulas to minimize changeovers

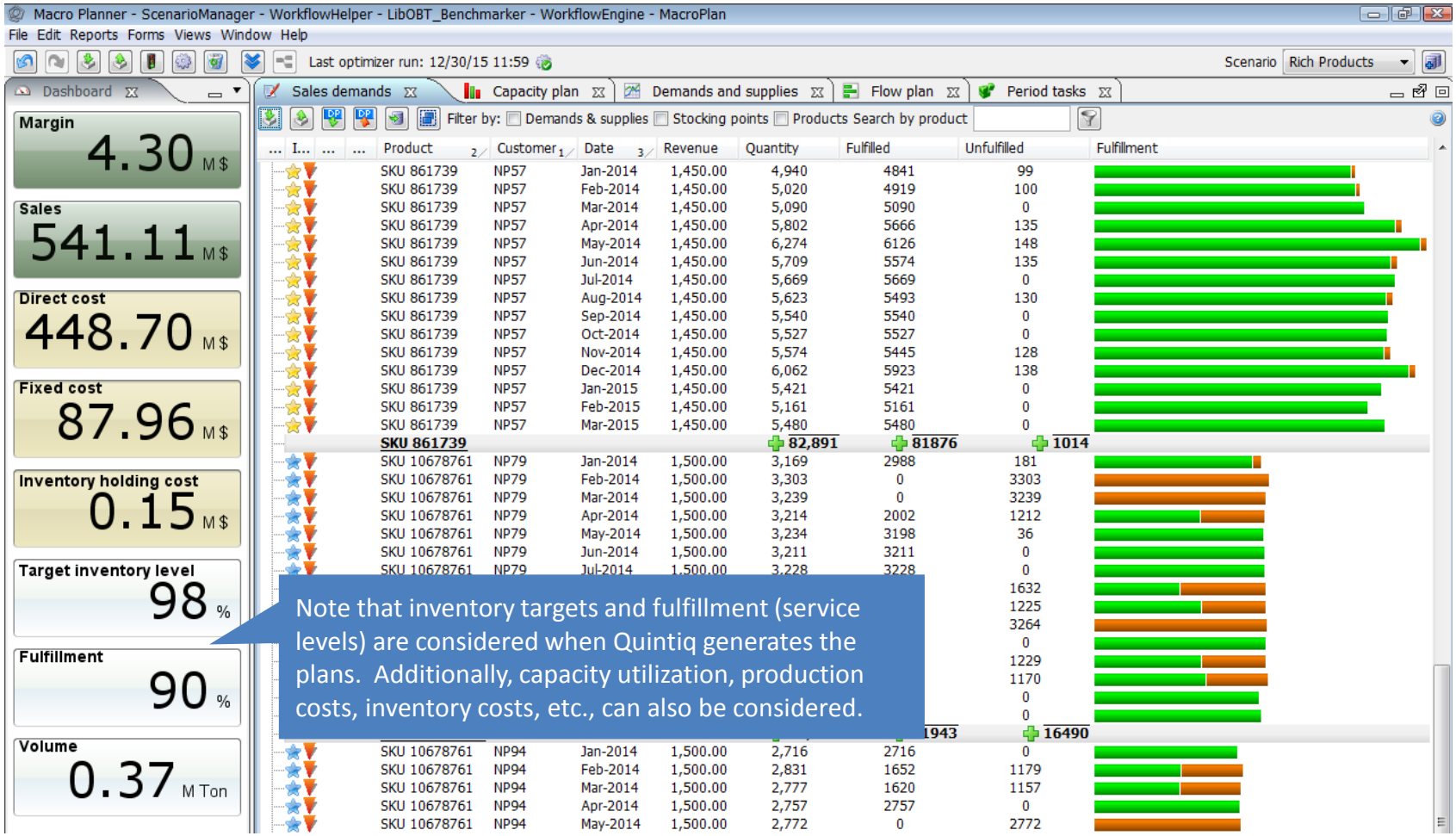


In the Gantt chart, yellow signifies the amount of changeover time required.

In this plan, Quintiq has several work orders sequenced in a manner that minimizes the amount of change over required, thereby driving greater efficiency and utilization. This is also measured with the "Efficiency" KPI (seen above).

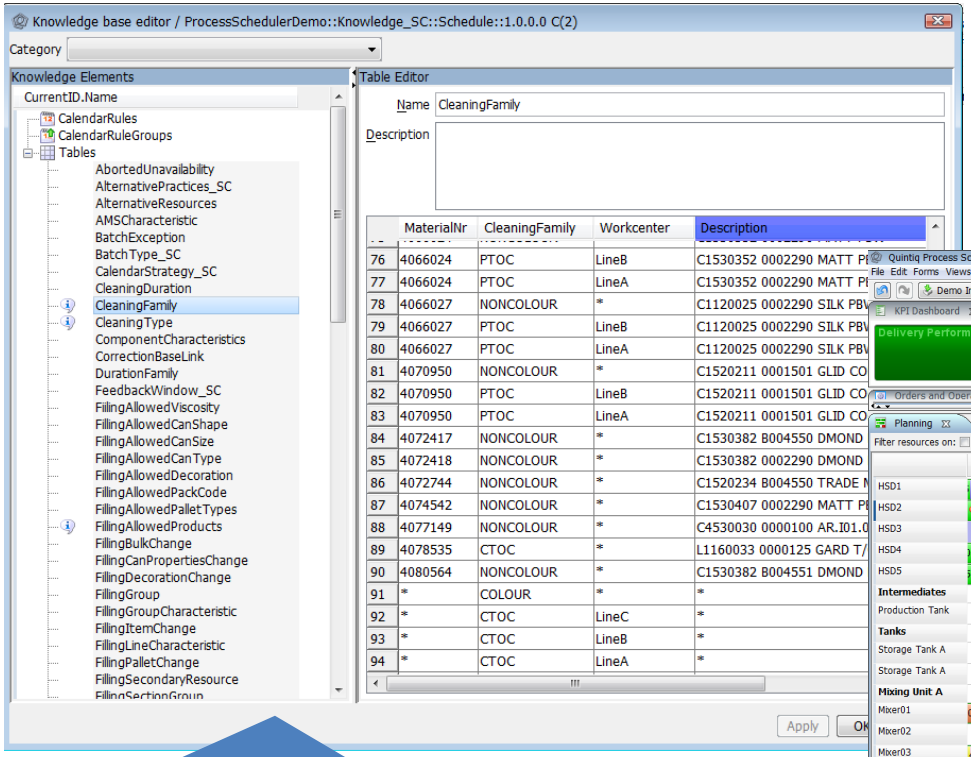
Functional Requirements

Show how inventory and service levels are considered and reflected in the proposed plan

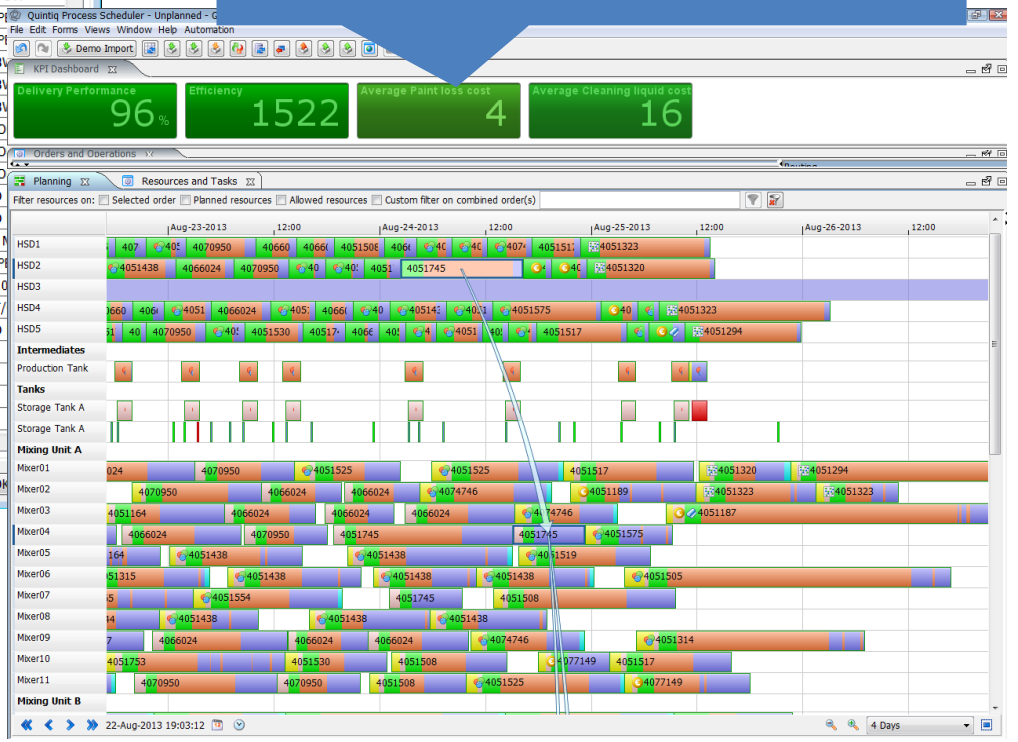


Functional Requirements

Consider formula changeovers related to such things as allergens, colors, and religious/Kosher constraints, and the associated time and cost impact. Show how the production sequence is altered and optimized when considering these factors.



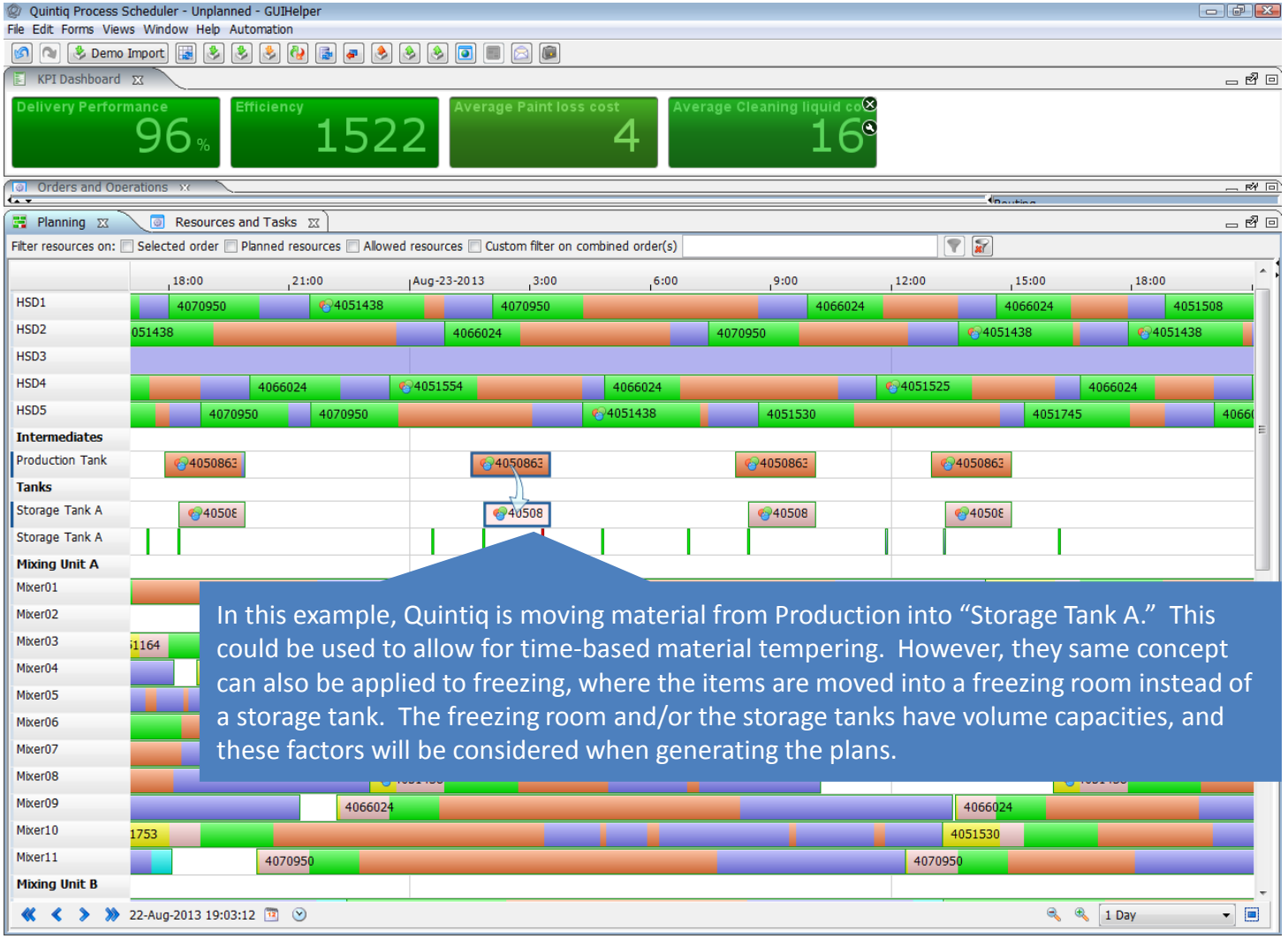
Quintiq will optimize the production sequence while considering these factors. If these rules are altered, the production sequence is also altered and optimized to consider these adjustments.



Quintiq provides a knowledge base, which allows you to store your specific business rules, including formula changeover rules and times.

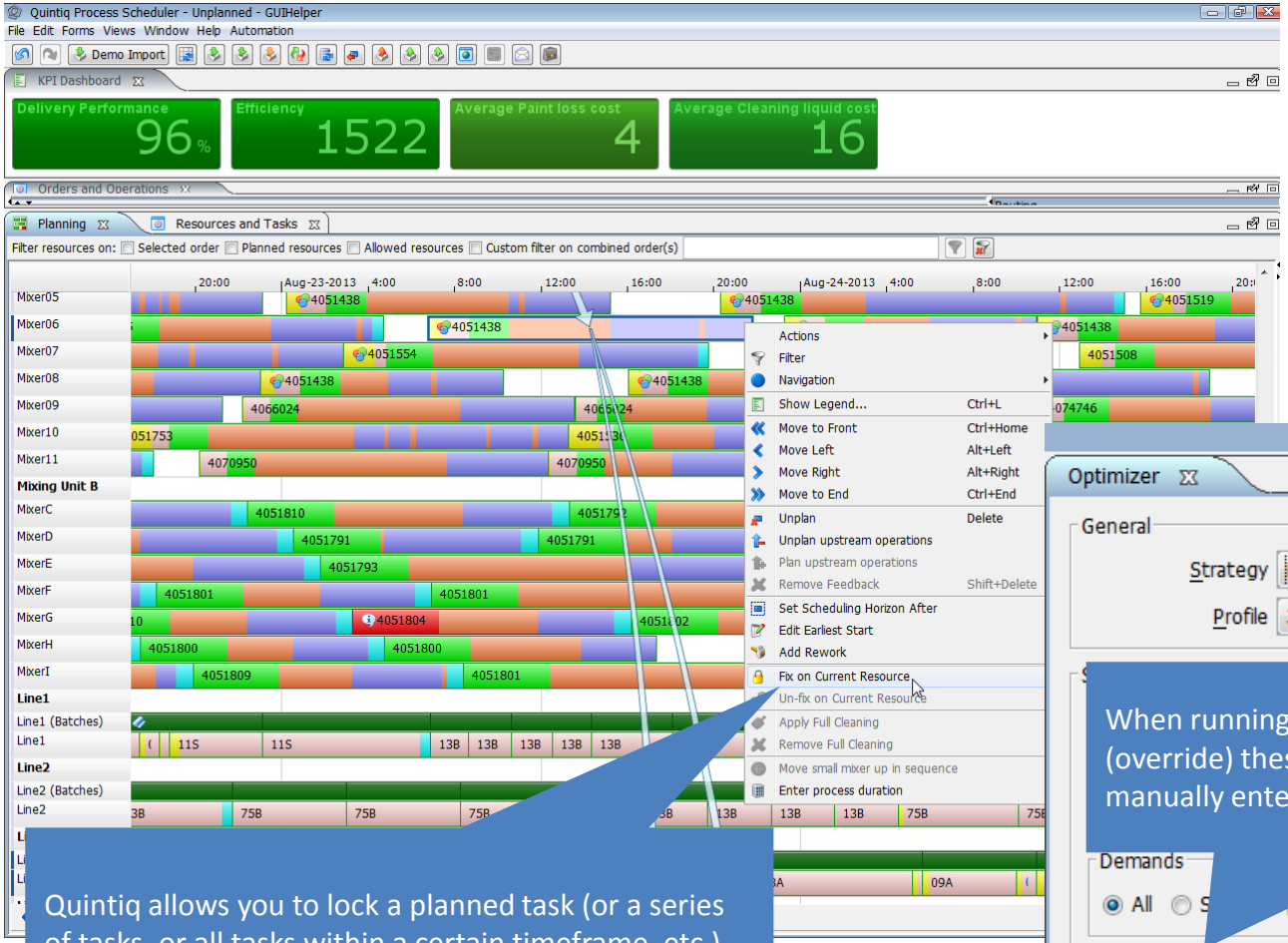
Functional Requirements

Show how product “freeze time” is considered during the scheduling process to ensure material availability requirements are maintained when production is moved between time periods.

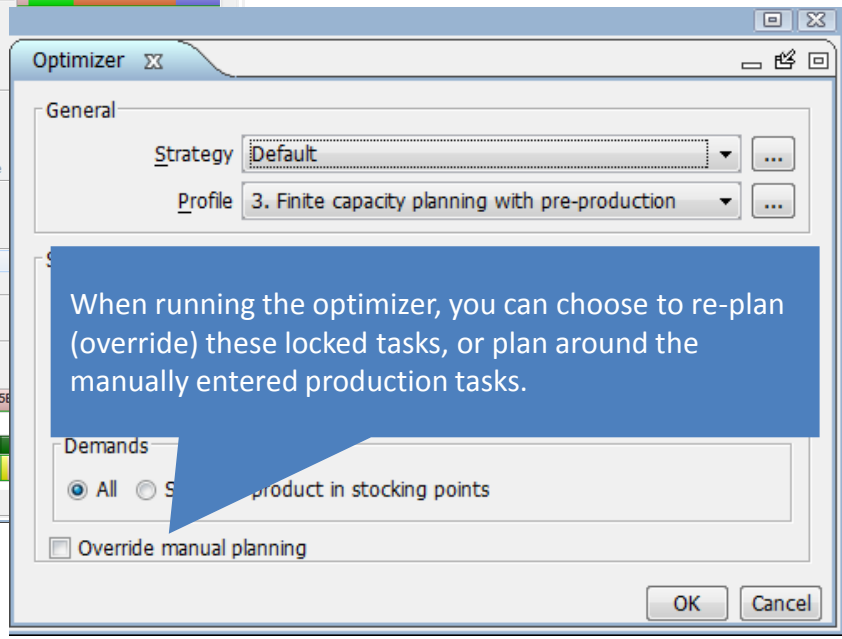


Functional Requirements

Show how your system can re-plan around manually entered (locked-in) production.



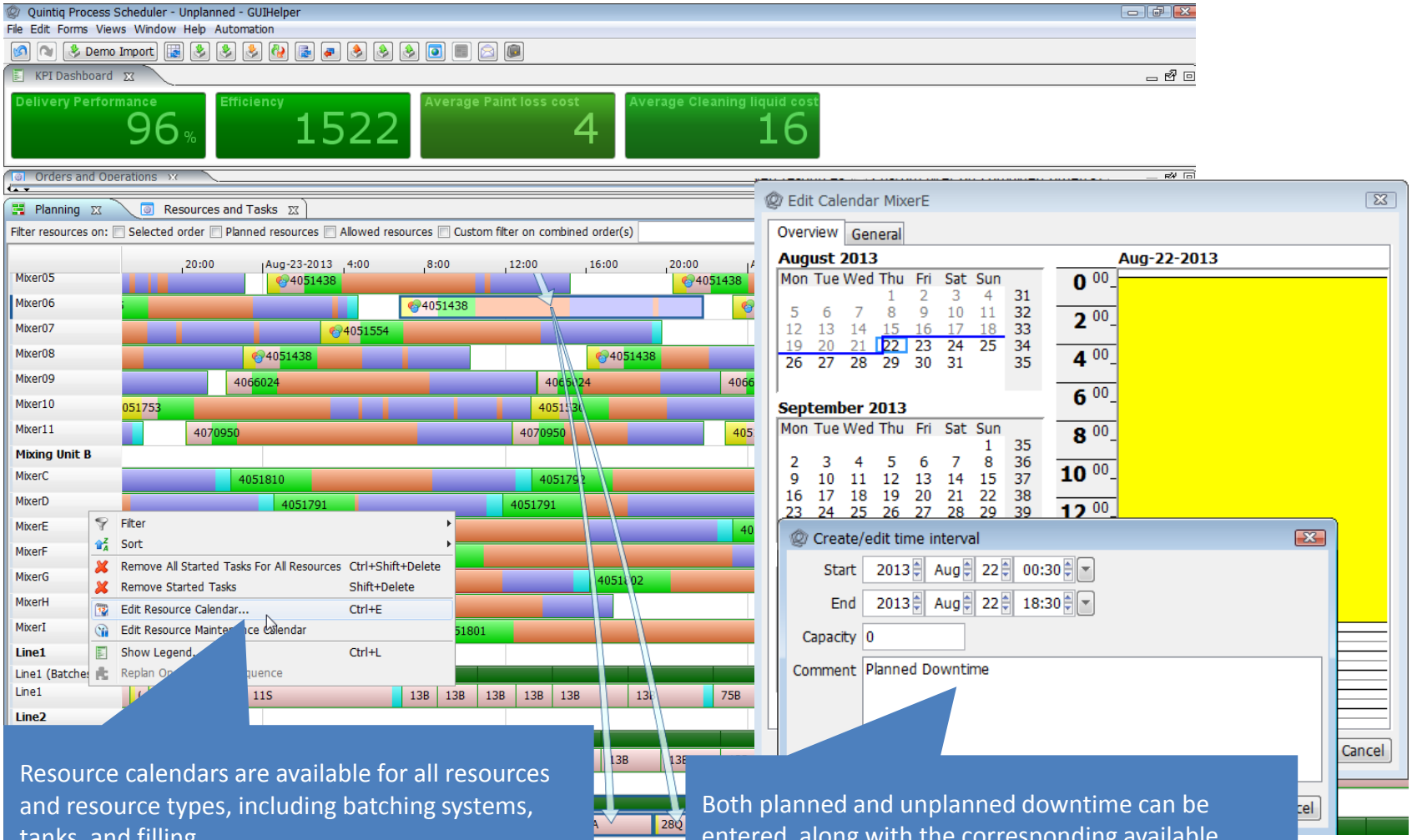
Quintiq allows you to lock a planned task (or a series of tasks, or all tasks within a certain timeframe, etc.).



When running the optimizer, you can choose to re-plan (override) these locked tasks, or plan around the manually entered production tasks.

Functional Requirements

Show how available capacity is updated for planned downtime on any of the manufacturing operations (batching systems, tanks, and filling).

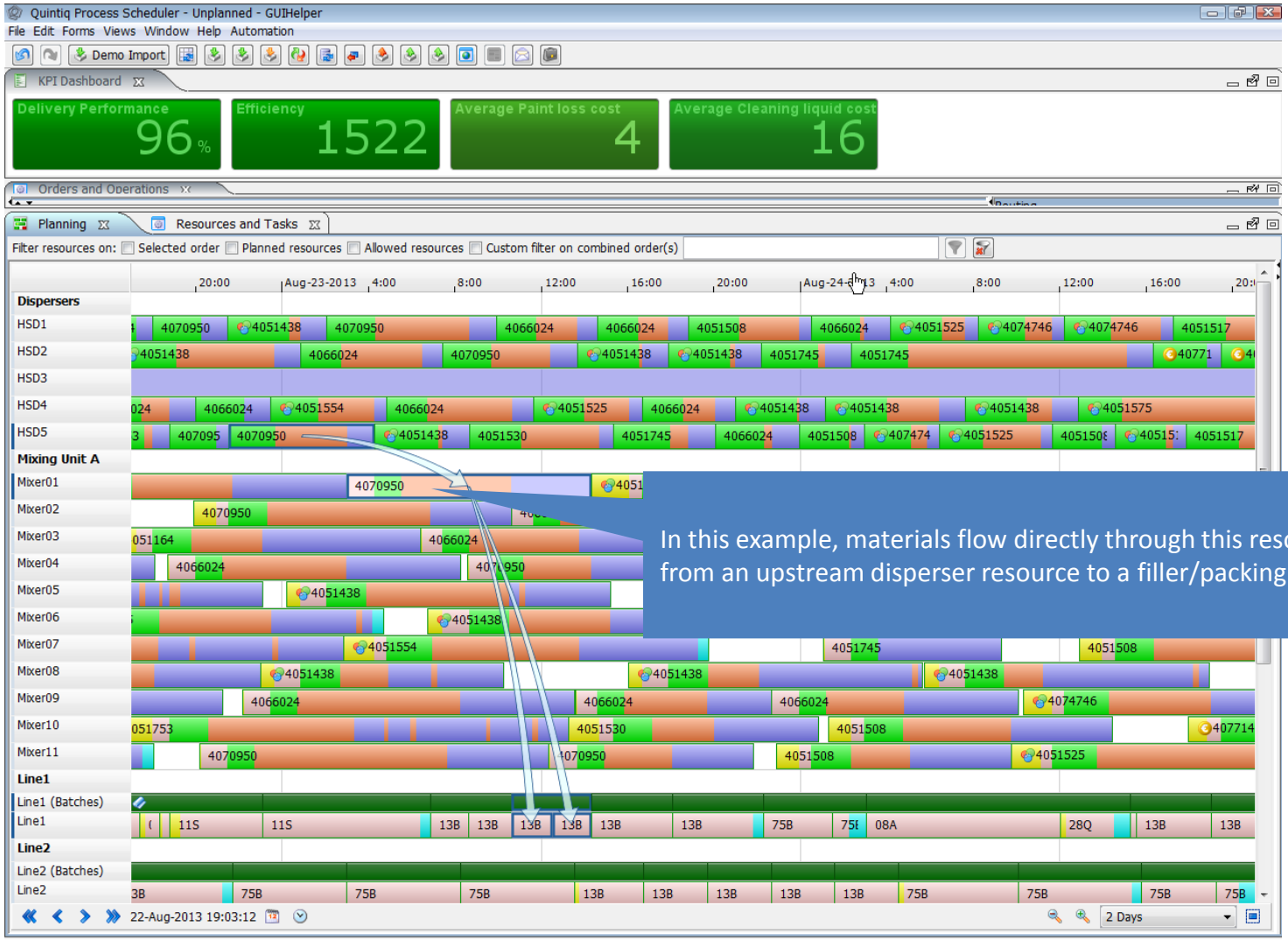


Resource calendars are available for all resources and resource types, including batching systems, tanks, and filling.

Both planned and unplanned downtime can be entered, along with the corresponding available capacity.

Functional Requirements

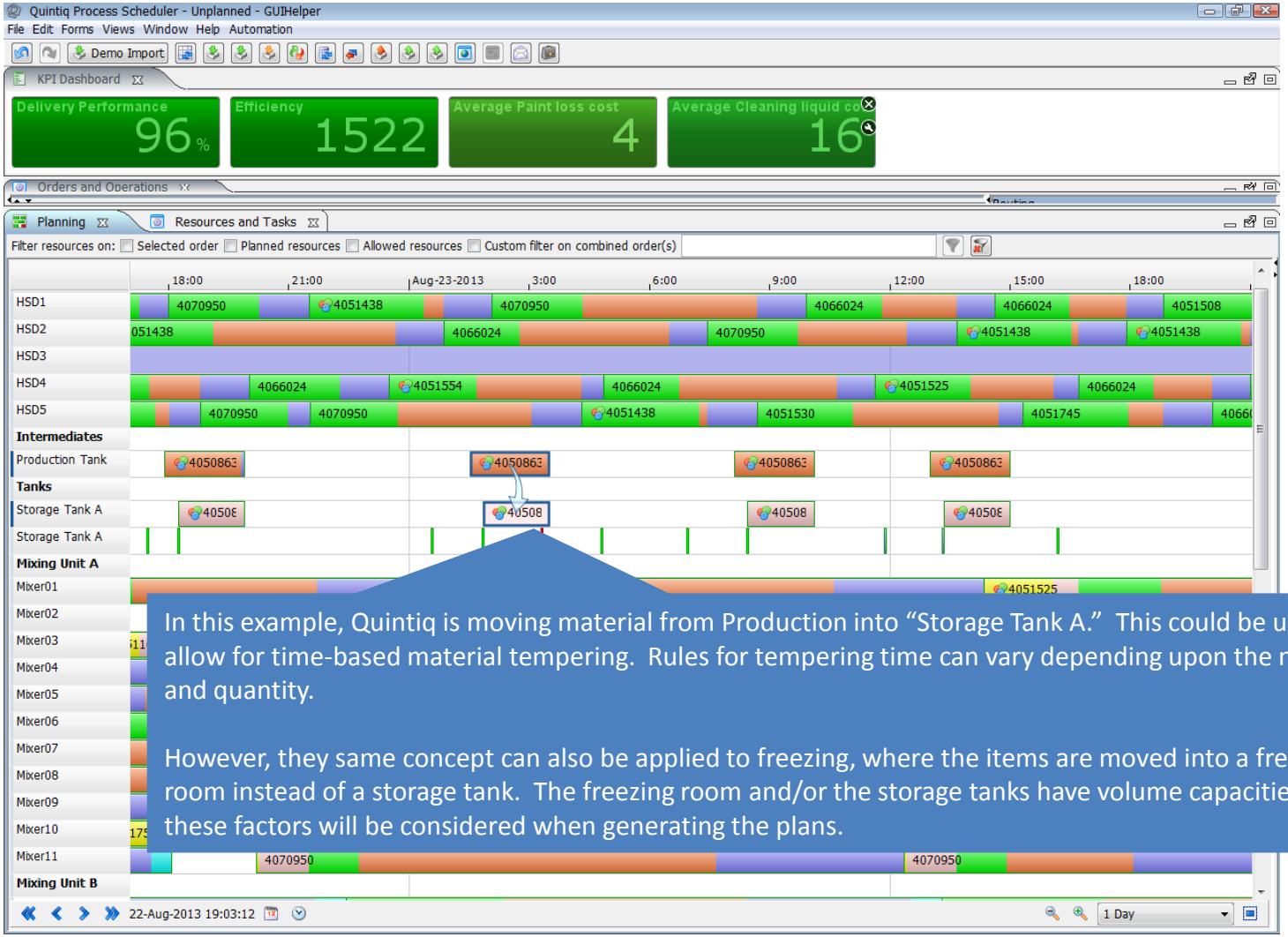
Show how intermediate materials flow through direct processing tanks (tanks that can be filled while they are supplying a filler/packing line).



In this example, materials flow directly through this resource (Mixer 01) from an upstream disperser resource to a filler/packing line.

Functional Requirements

Show how time-based material tempering is modeled (intermediate formulas that are held in a holding tank until the formula cools before it can move to the next process).

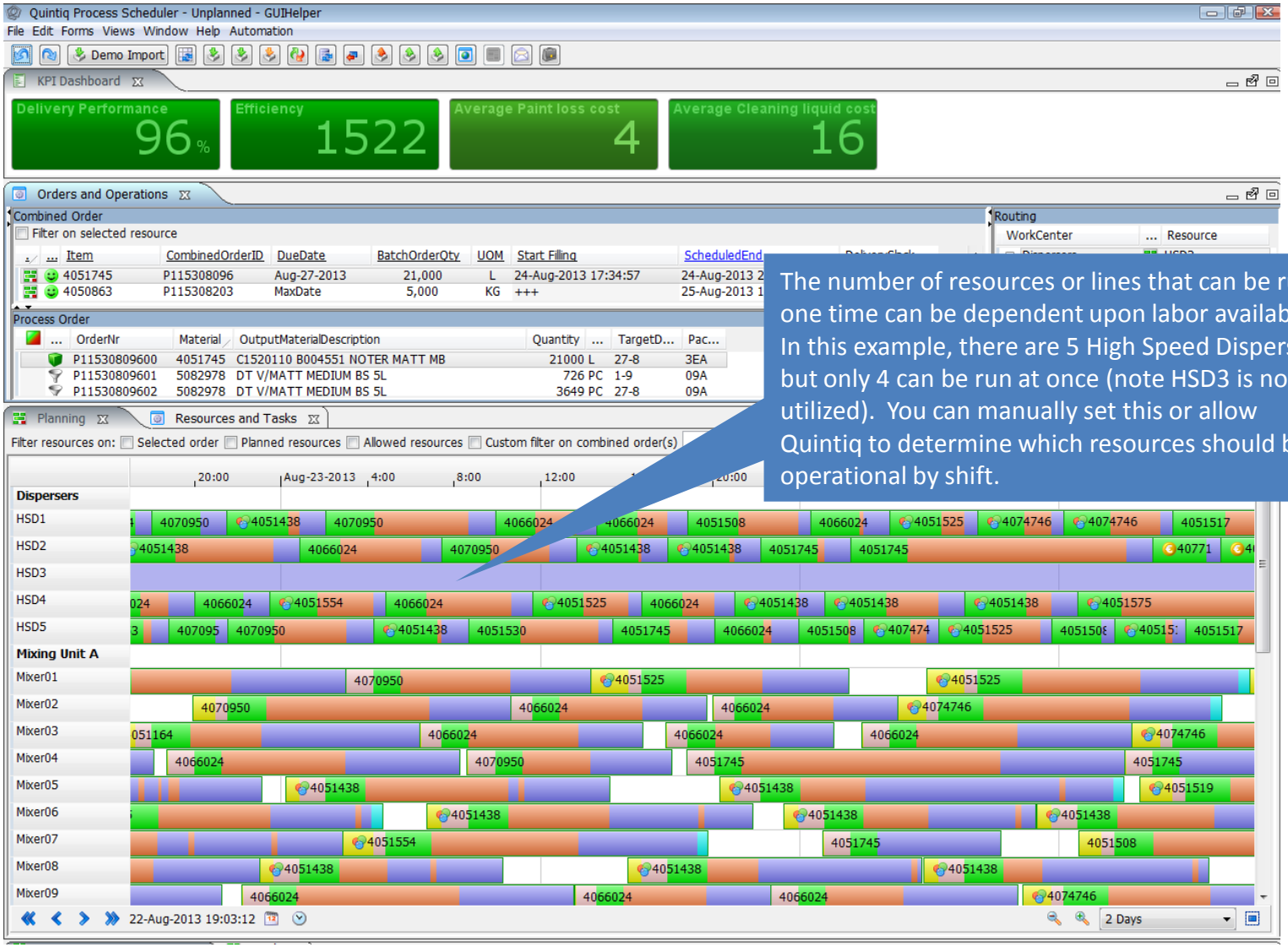


In this example, Quintiq is moving material from Production into "Storage Tank A." This could be used to allow for time-based material tempering. Rules for tempering time can vary depending upon the material and quantity.

However, they same concept can also be applied to freezing, where the items are moved into a freezing room instead of a storage tank. The freezing room and/or the storage tanks have volume capacities, and these factors will be considered when generating the plans.

Functional Requirements

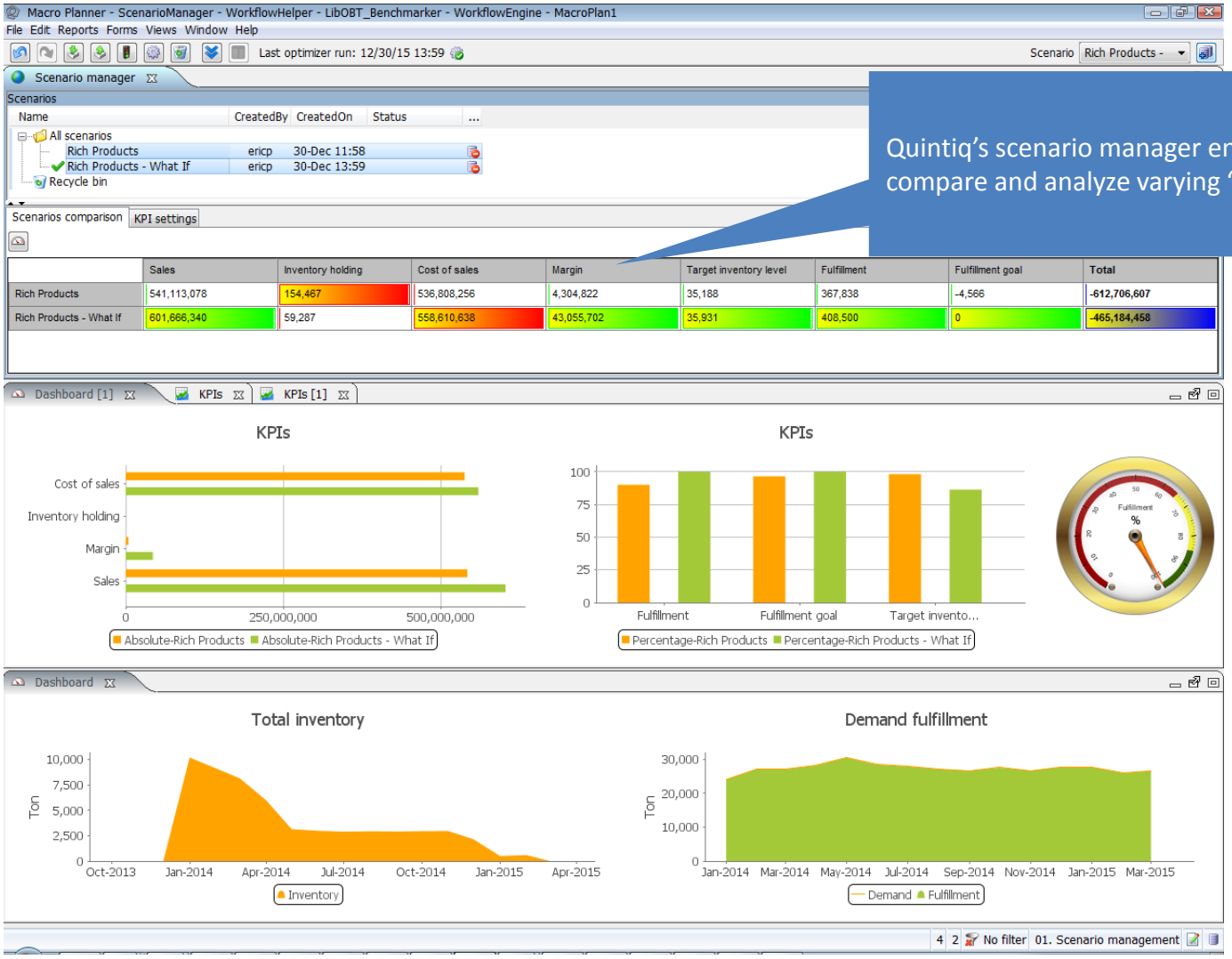
Show how crewing/labor or number of filling lines that can be run at one time is modeled as a constraint.



The number of resources or lines that can be run at one time can be dependent upon labor availability. In this example, there are 5 High Speed Dispersers, but only 4 can be run at once (note HSD3 is not utilized). You can manually set this or allow Quintiq to determine which resources should be operational by shift.

Functional Requirements

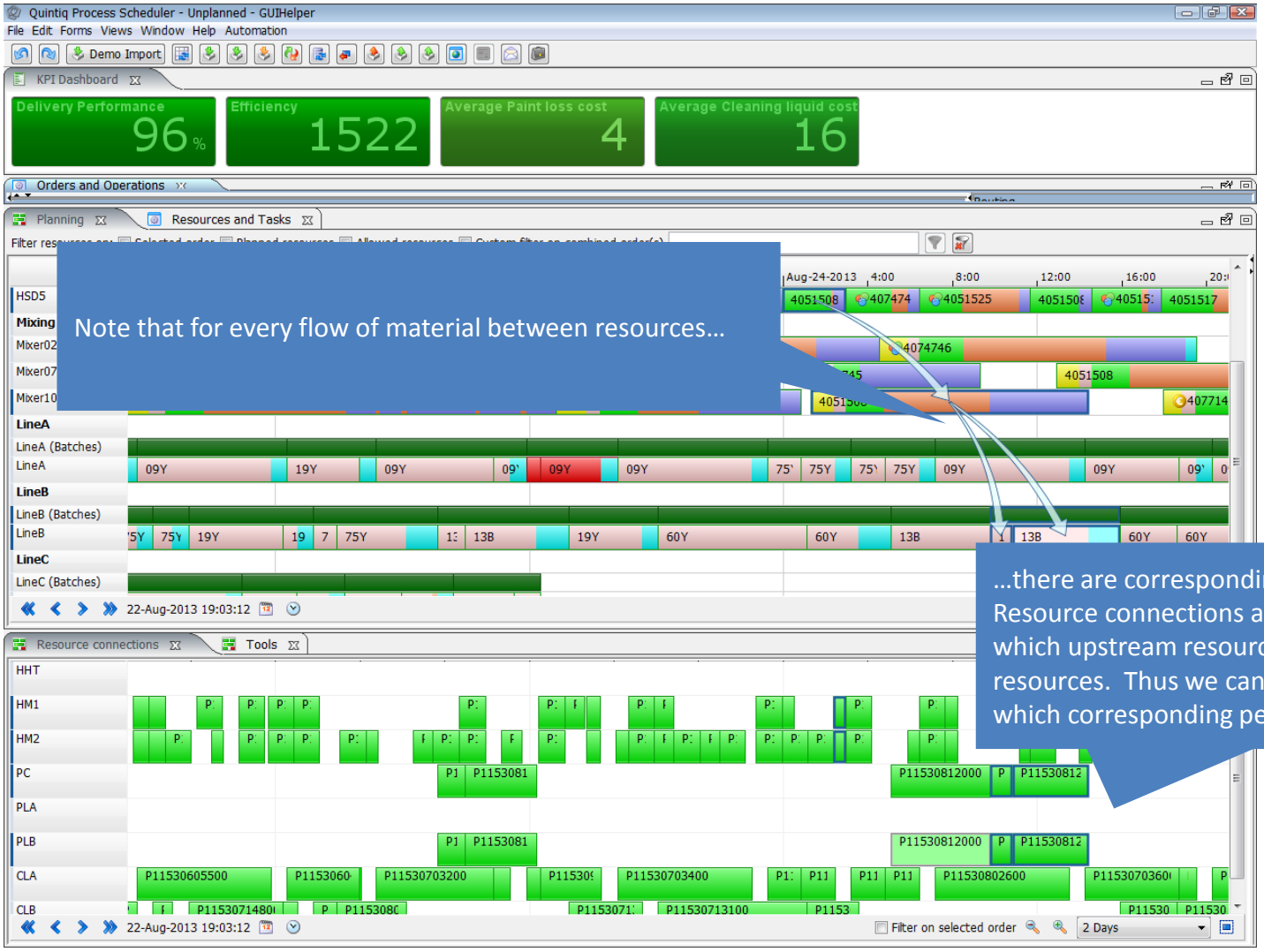
Demonstrate how your solution utilizes “what if” scenario functionality. How are the results of multiple scenarios compared and analyzed?



Quintiq’s scenario manager enables you to compare and analyze varying “what if” scenarios.

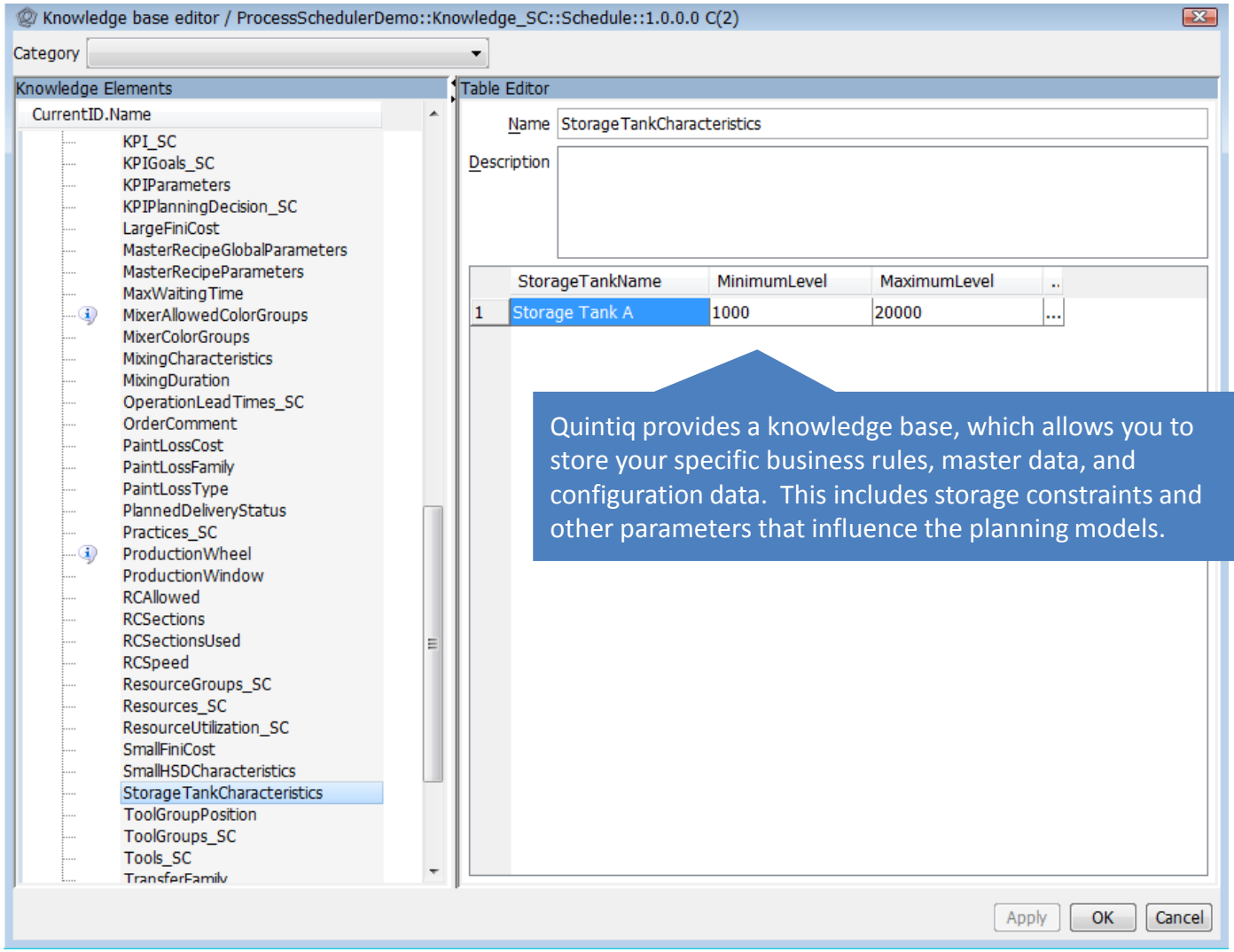
Functional Requirements

Show how palletizing constraints (capacity limited by the number of lines that can be run simultaneously to a given palletizer) are modeled. For example, we can simultaneously run 2 filling lines to a single palletizer but not 3.



Functional Requirements

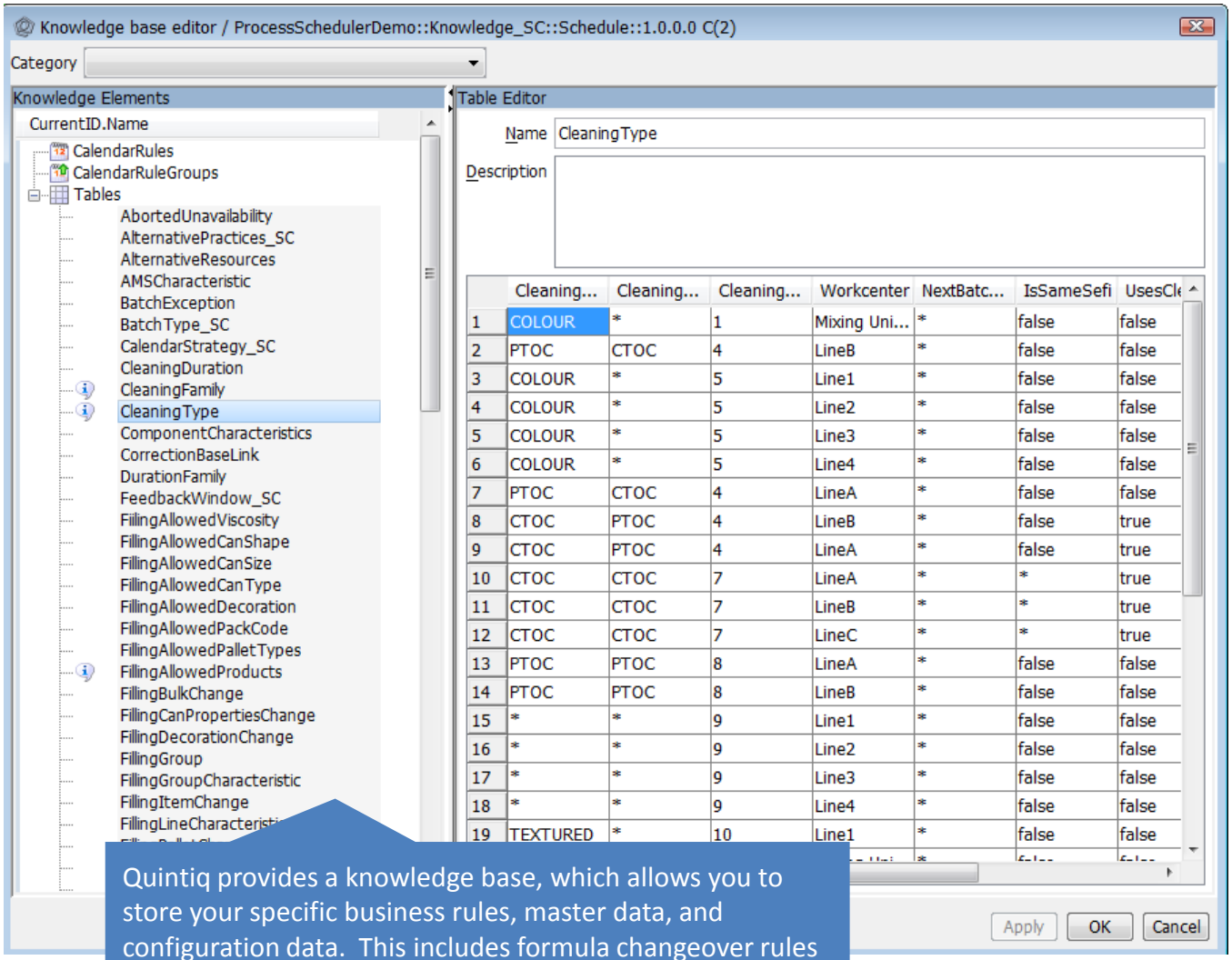
Show how warehousing/storage constraints are modeled.



Quintiq provides a knowledge base, which allows you to store your specific business rules, master data, and configuration data. This includes storage constraints and other parameters that influence the planning models.

Functional Requirements

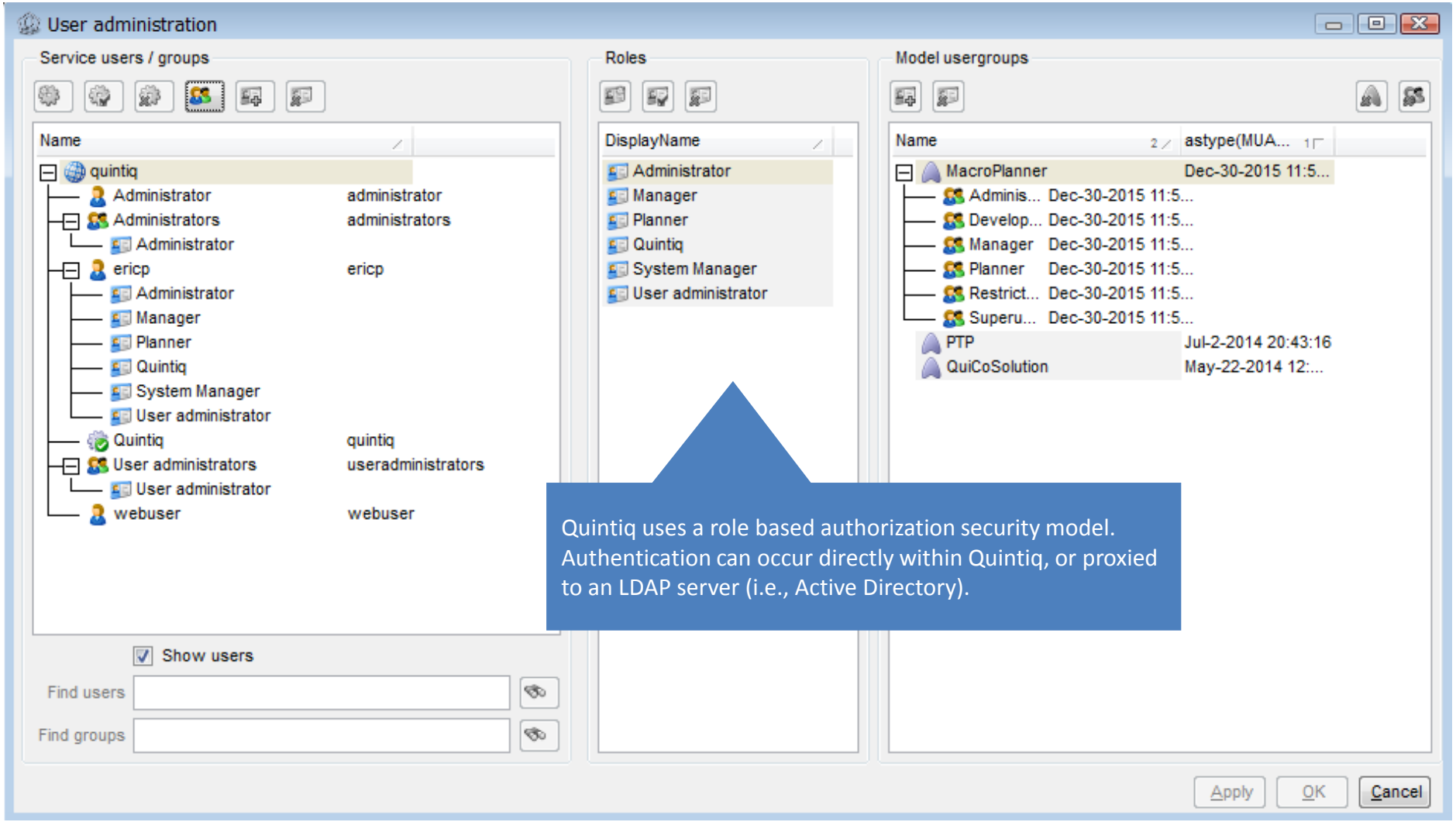
Skills and effort to change system configuration to adjust planning models



Quintiq provides a knowledge base, which allows you to store your specific business rules, master data, and configuration data. This includes formula changeover rules and other parameters that influence the planning models.

Functional Requirements

Setting up new users, changing security



Quintiq uses a role based authorization security model. Authentication can occur directly within Quintiq, or proxied to an LDAP server (i.e., Active Directory).

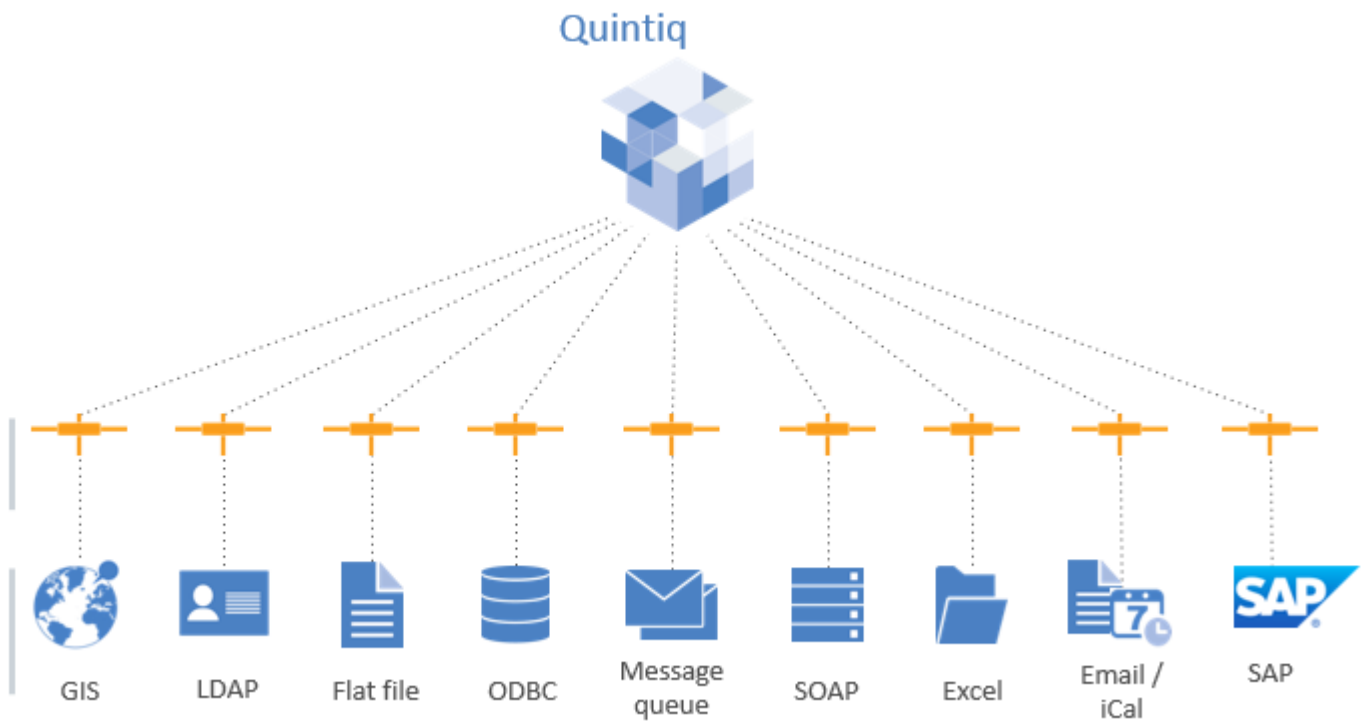
Functional Requirements

Master Data: Required vs. optional

Solution Elements	Detailed Scheduling Finite Scheduling / Sequencing
Unique Finished Goods	X
Product hierarchies	
Demand for each product	X
BOMs	X
Production Routings	X
Material loss per operation, not to be re-used	X
Material loss per operation, that can be recycled/re-used	X
Raw material suppliers	X
Supplier lead times	X
Stocking points (raw material, WIP, finished goods, inbound DC, outbound DC, customer consignment)	X
Transport lead times	X
Transport costs	X
Transport lanes	
Resources	X
Capabilities of resources, which operations can be performed	X
Speed per resource per product group (products/hour)	X
Resource calendars (shift-calendar, maintenance calendar etc)	X
Setup time rules	X
Average utilization of the lines	X
Direct cost per routing step	X
Orders	X
Order priorities	X
Due dates	X
Inventory levels	X
Target inventory levels	X
Safety stock levels	X

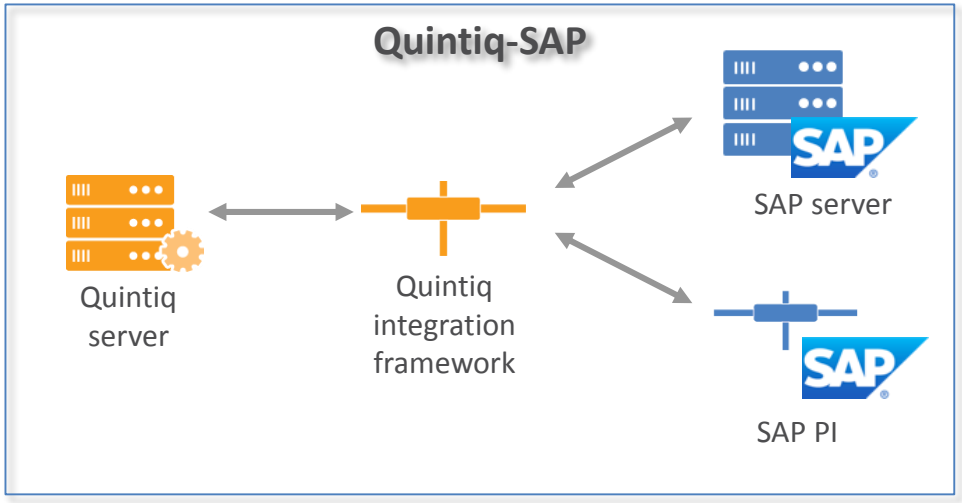
Functional Requirements

Master Data: Sources (external systems, manual)



Functional Requirements

Master Data: Integration points and frequencies



- **Technical**

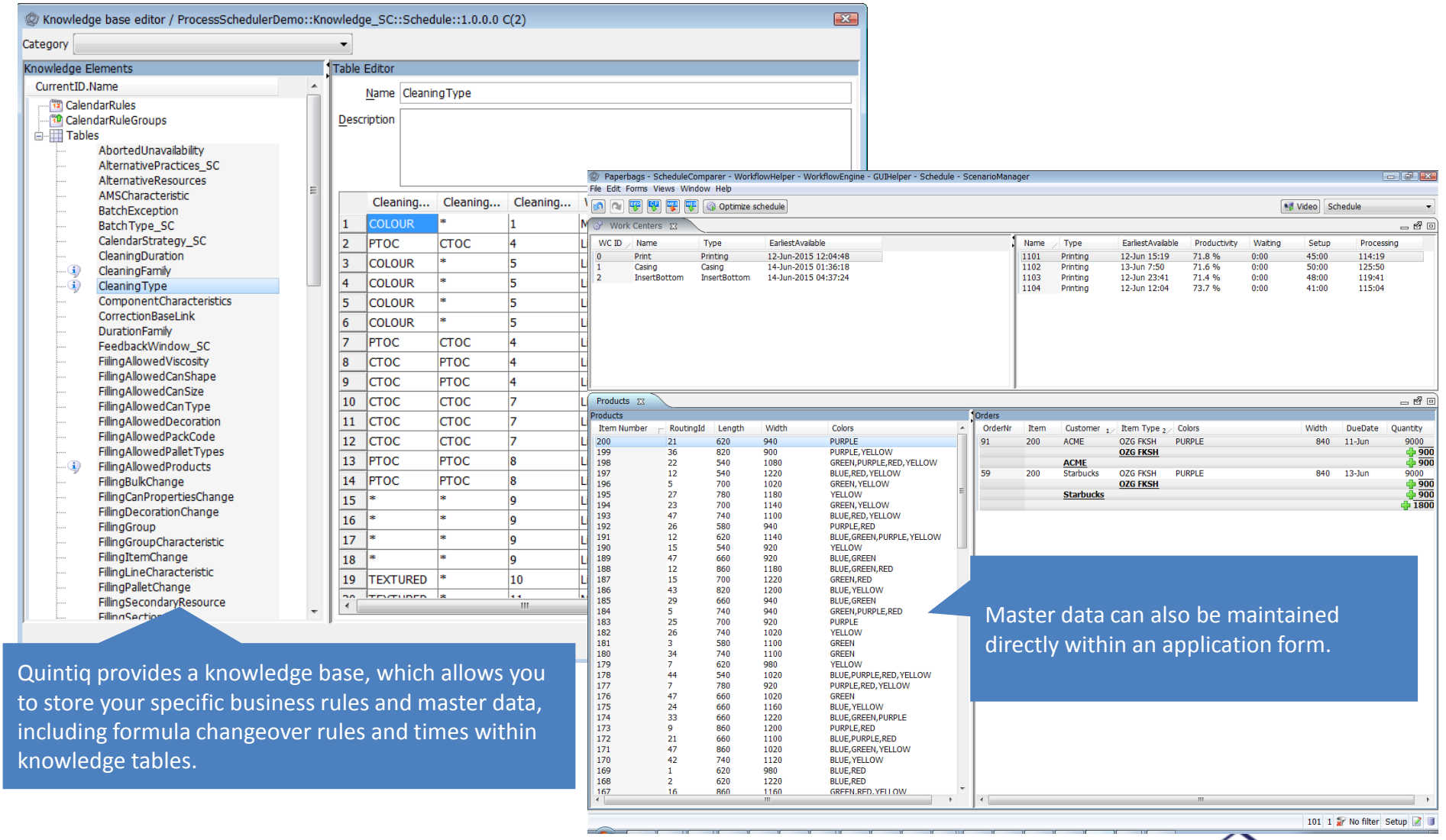
1. Multiple integration techniques
2. Pre-configured SAP technical integration
3. Simple data mapping tool.
4. Data conversion and control is handled by Quintiq, since data conversion can often be done faster than in SAP.

- **Functional**

1. Maximize visibility of source/destination data structures.
2. Maximize visibility of source/destination mappings.
3. Maximize speed of transforms and control
4. Prior knowledge of typical data flows.

Functional Requirements

Master Data: How to maintain



Quintiq provides a knowledge base, which allows you to store your specific business rules and master data, including formula changeover rules and times within knowledge tables.

Master data can also be maintained directly within an application form.

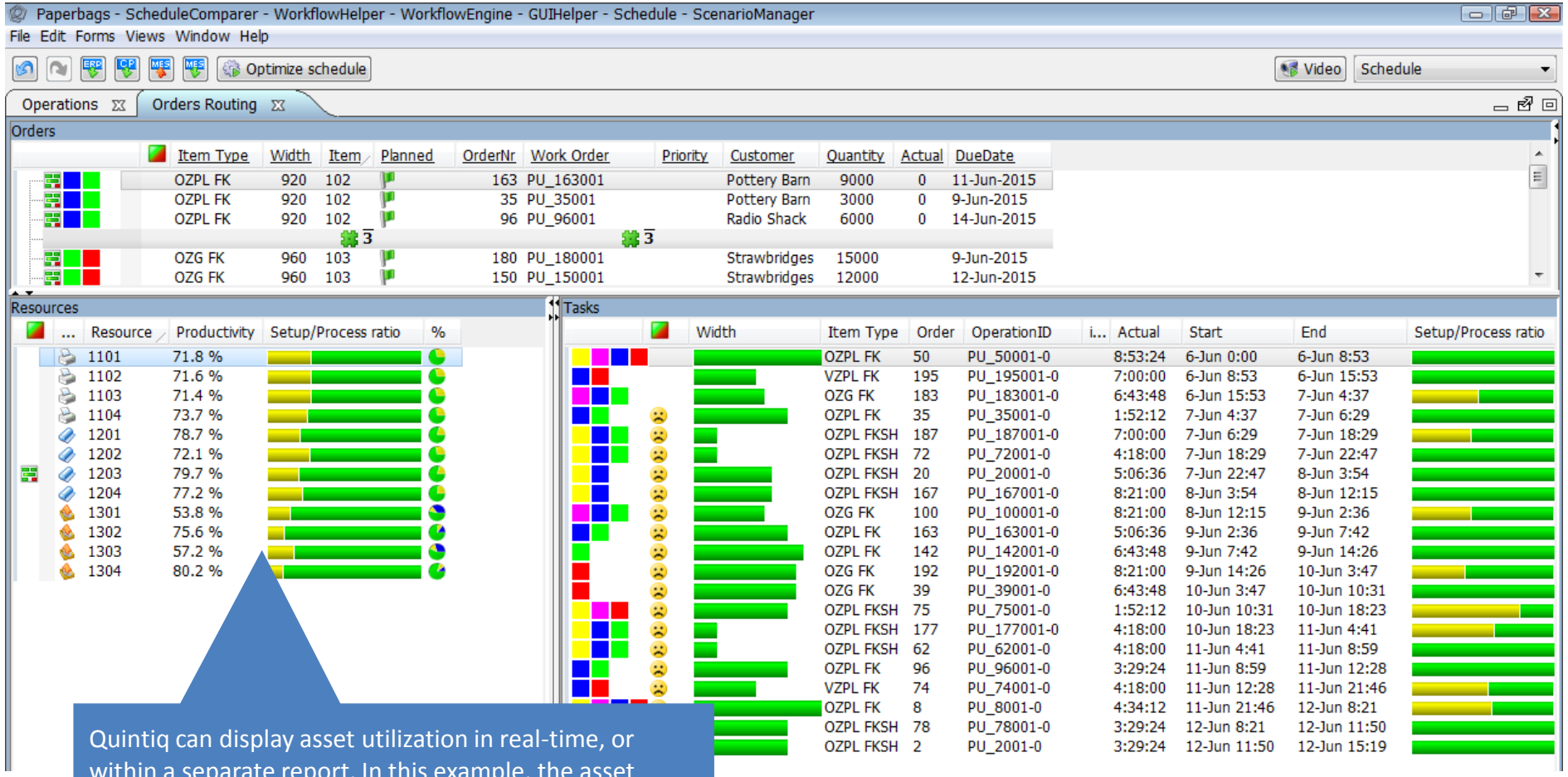
Functional Requirements

Reporting / Analytics

Multiple options are available for reporting. Reports can also be exported or stored.

Functional Requirements

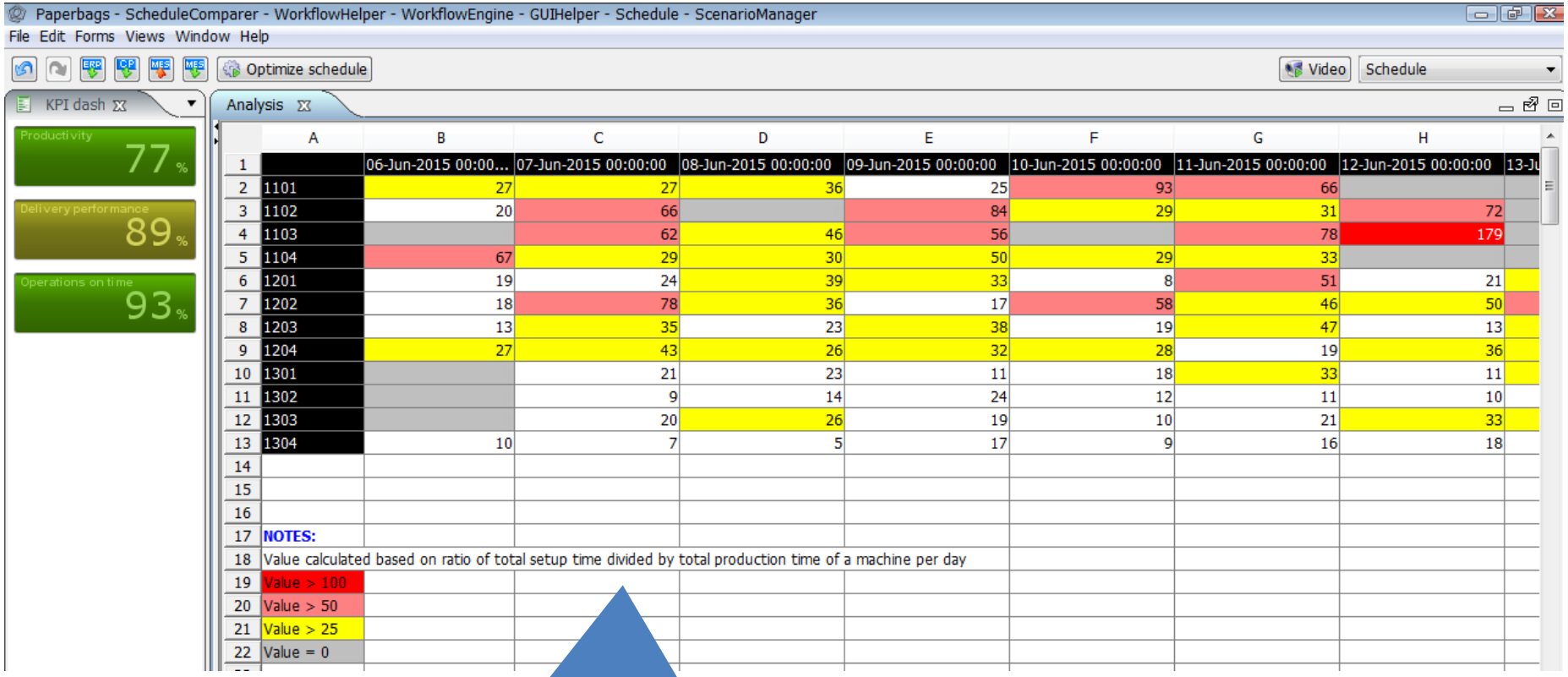
Reporting / Analytics: Asset Utilization



Quintiq can display asset utilization in real-time, or within a separate report. In this example, the asset utilization is displayed as headlight KPIs which are updated in real-time. Each planning decision made will have a corresponding impact on these KPIs.

Functional Requirements

Reporting / Analytics: Asset Utilization



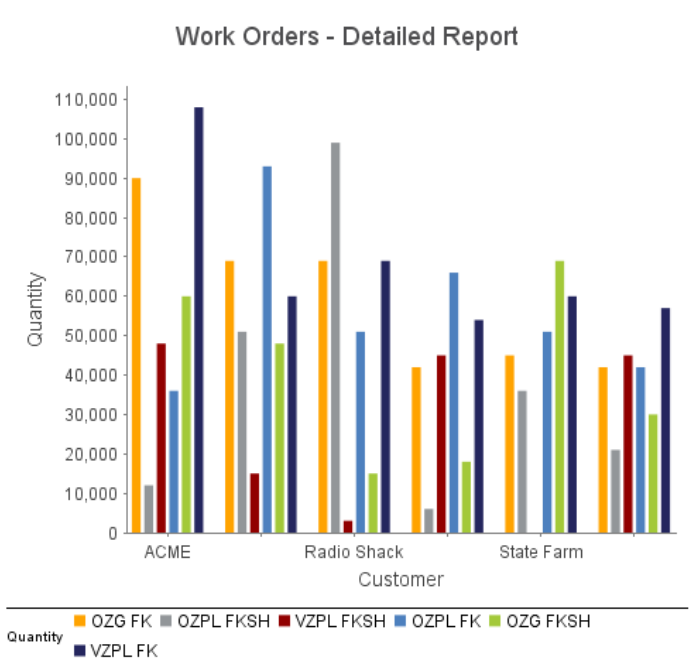
	A	B	C	D	E	F	G	H
1		06-Jun-2015 00:00...	07-Jun-2015 00:00:00	08-Jun-2015 00:00:00	09-Jun-2015 00:00:00	10-Jun-2015 00:00:00	11-Jun-2015 00:00:00	12-Jun-2015 00:00:00
2	1101	27	27	36	25	93	66	
3	1102	20	66		84	29	31	72
4	1103		62	46	56		78	179
5	1104	67	29	30	50	29	33	
6	1201	19	24	39	33	8	51	21
7	1202	18	78	36	17	58	46	50
8	1203	13	35	23	38	19	47	13
9	1204	27	43	26	32	28	19	36
10	1301		21	23	11	18	33	11
11	1302		9	14	24	12	11	10
12	1303		20	26	19	10	21	33
13	1304	10	7	5	17	9	16	18
14								
15								
16								
17	NOTES:							
18	Value calculated based on ratio of total setup time divided by total production time of a machine per day							
19	Value > 100							
20	Value > 50							
21	Value > 25							
22	Value = 0							

Quintiq can display asset utilization in real-time, or within a separate report. In this example, the asset utilization is displayed with a report, corresponding to a particular point in time.

Functional Requirements

Reporting / Analytics: Time spent on changeovers and cleanouts

KPI dashboard



KPI matrix | KPI Analysis

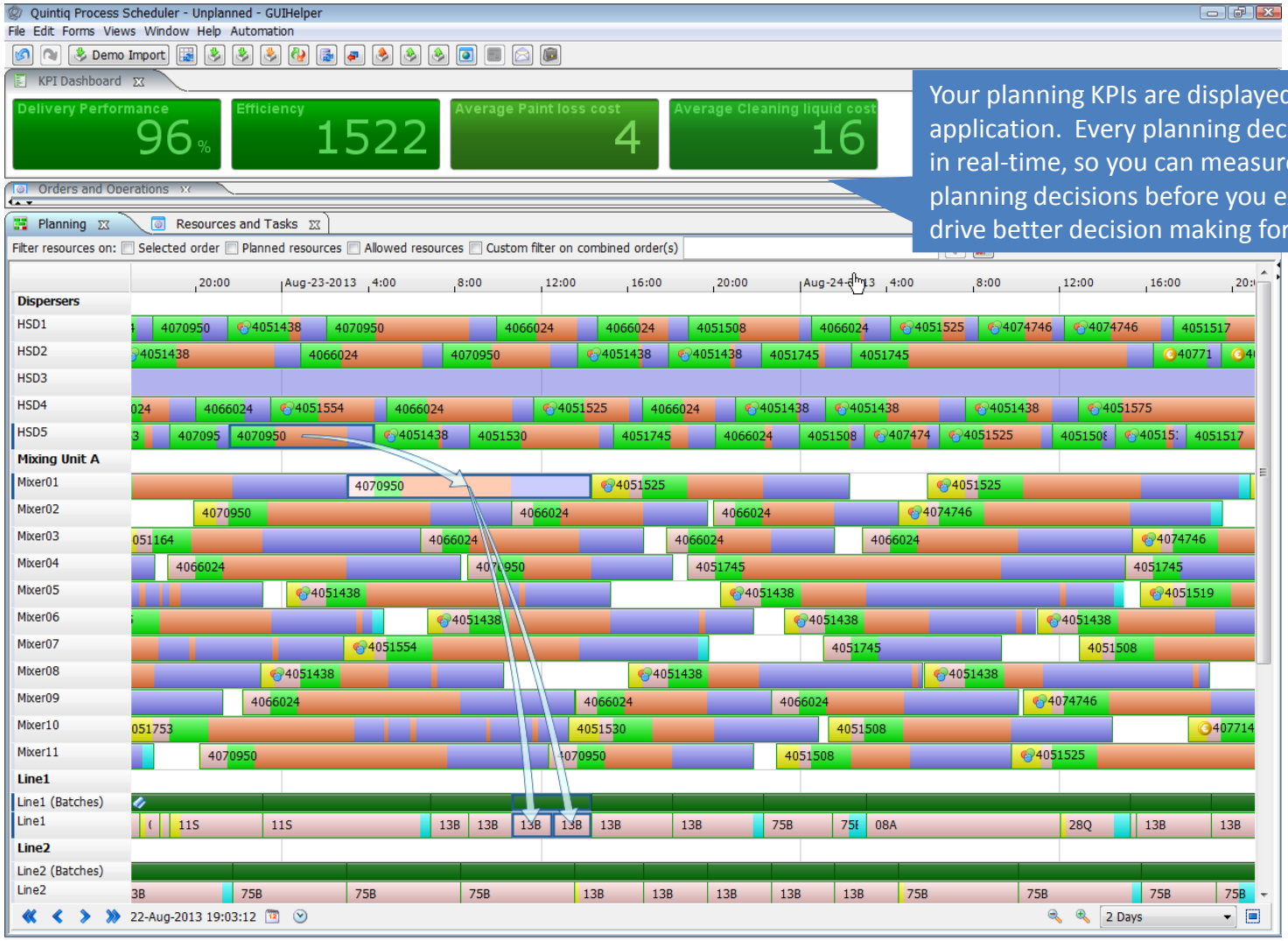
Capture KPI | Refresh KPI

	Productivity	Delivery Performance	Feedback Adherence
Delivery Performance			
Delivery performance		34 %	
Operations On Time			
Operations on time		38 %	
Productivity			
Productivity	52 %		
Production Resource Adherence			
Resource adherence			0 %
Production Sequence Adherence			
Sequence adherence			0 %
Sequencing			
Total available time	2030 H		
Total waiting time	380 H		
Total setup time	635 H		
Total production time	1015 H		

In this example, Quintiq is summarizing the aggregate time in setup, cleanout, waiting, and production for the given time period. We can also create a more granular report that details this information.

Functional Requirements

Planning decisions and impact to KPI's



Your planning KPIs are displayed throughout the application. Every planning decision impacts these KPIs in real-time, so you can measure the quality of your planning decisions before you execute them. This will drive better decision making for Rich Products.