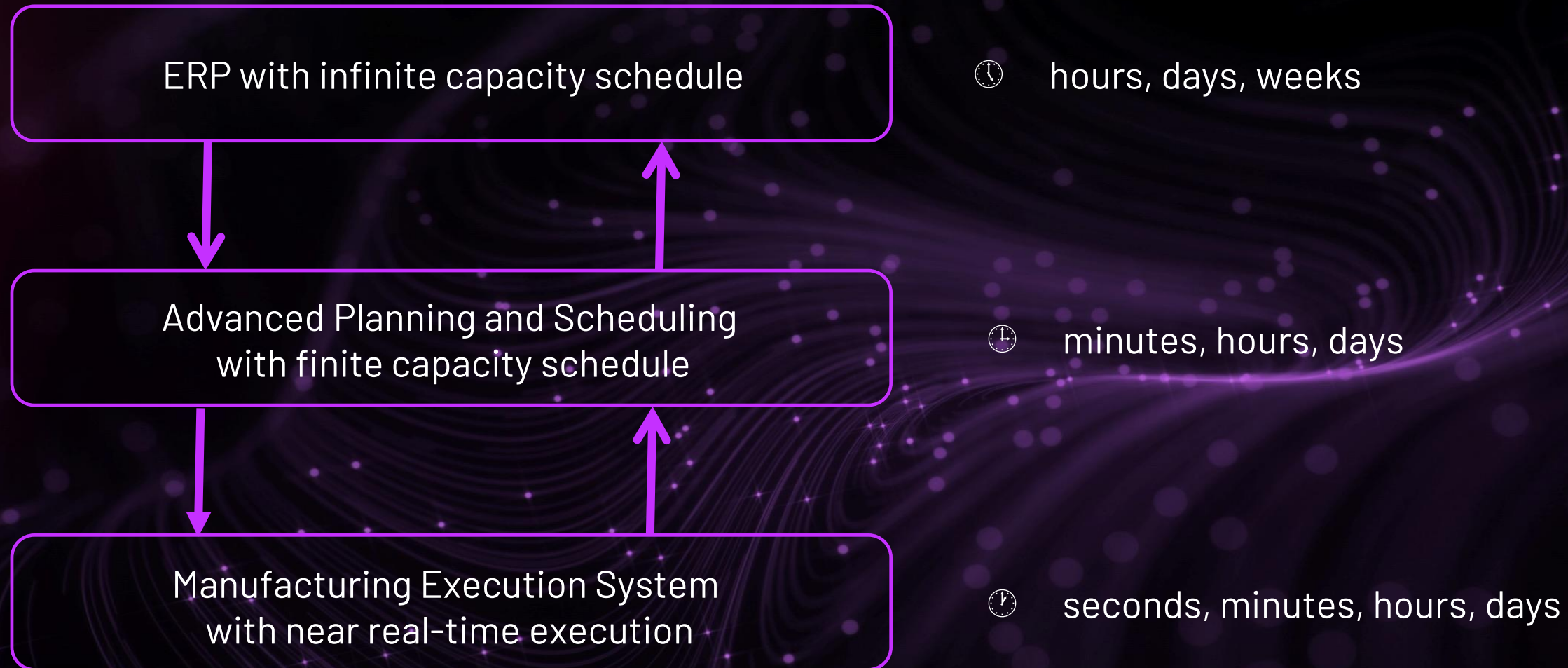# Advanced Planning and Scheduling

1. Advanced Planning and Scheduling Overview
2. APS Value Proposition
3. APS Industry Vertical Fit
4. AVEVA Planning and Scheduling Offering
5. Scheduling Project Approach

Advanced Planning and Scheduling, ERP and MES

ERP with infinite capacity schedule — hours, days, weeks

Advanced Planning and Scheduling with finite capacity schedule — minutes, hours, days

Manufacturing Execution System with near real-time execution — seconds, minutes, hours, days

What is Advanced Planning & Scheduling

How can Manufacturers benefit?

- **Advanced Planning and Scheduling**: A production planning process by which raw materials and production capacity are optimally allocated to meet demand.

- **Challenge**: Traditional MRP systems plan Materials and Capacity separately, do not adjust for capacity or material constraints, and don't create detailed work sequences that take setup time into account -- leading to infeasible and inefficient plans.

- **Solution**: Advanced Planning and Scheduling from PlanetTogether simultaneously plans based on available materials, labor and machine capacity, and automates the optimization of sequence-dependent production schedules.

- **Result**:
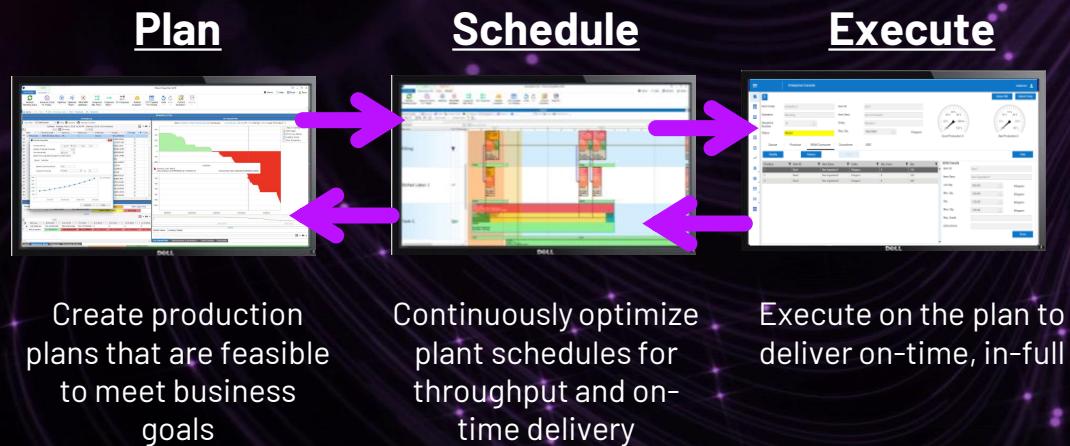 Optimized feasible plans, created in seconds
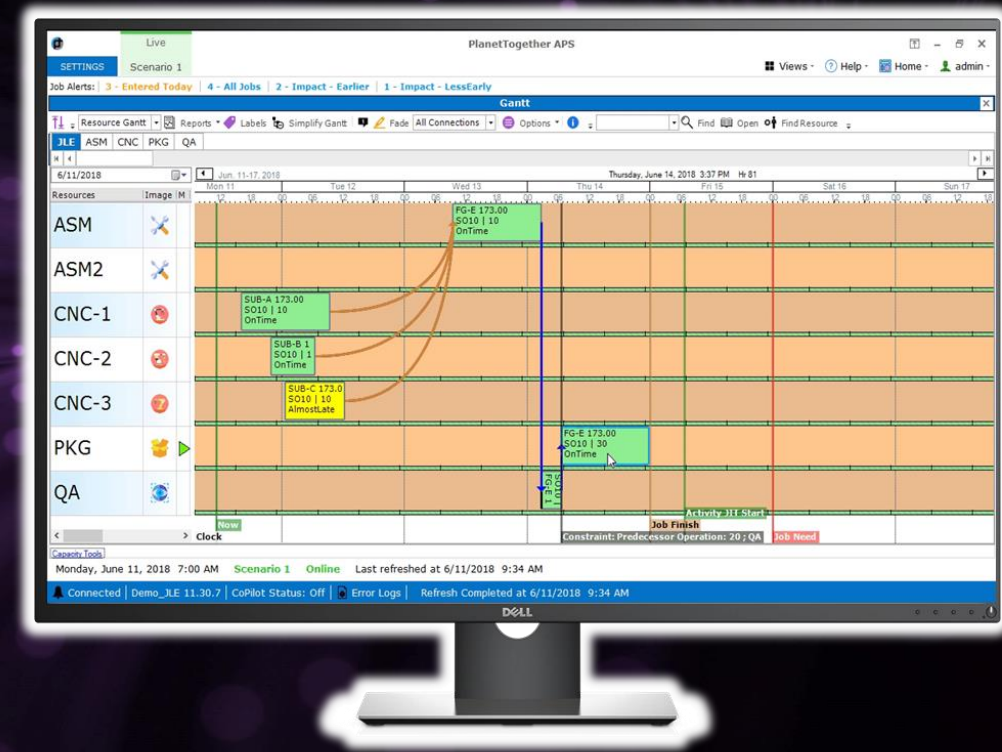
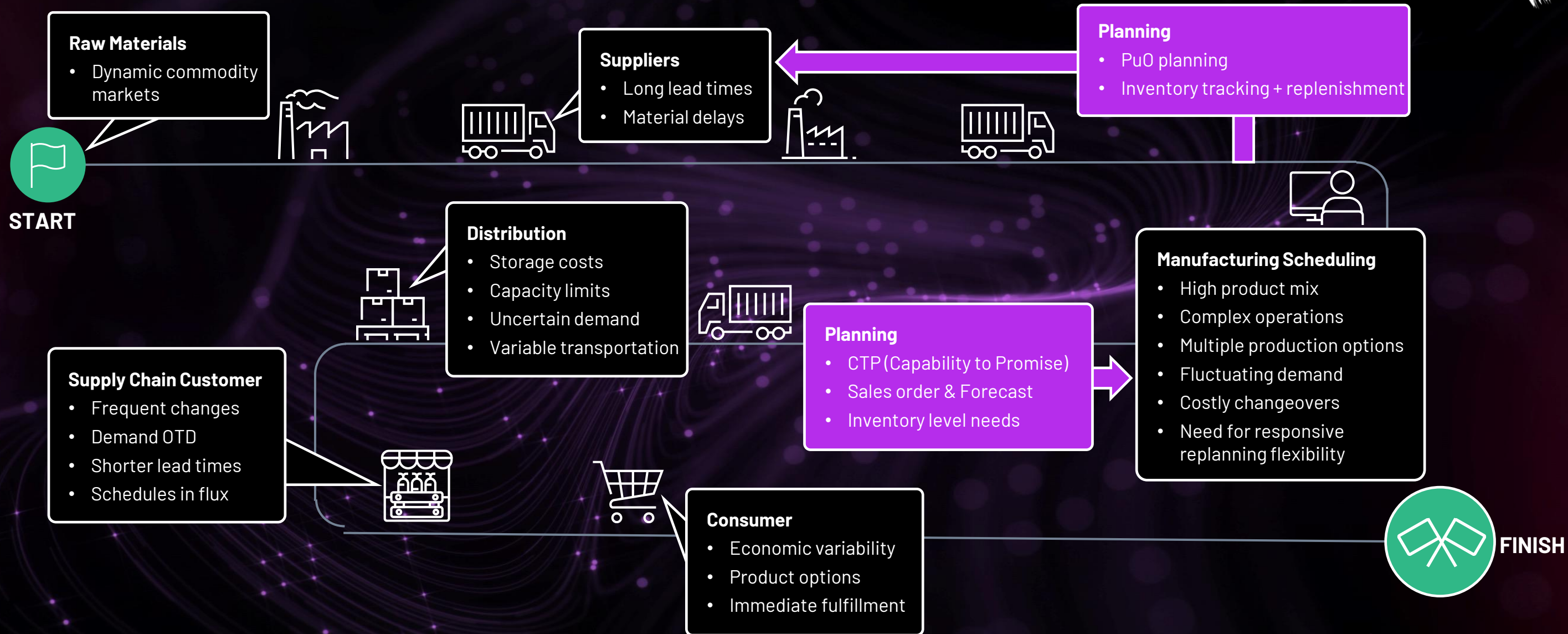# Integrated Manufacturing Planning and Execution

At a Glance:

- In today's markets manufacturing operations need to be dynamically optimized to ensure the maximum business returns that operational constraints allow. Within the plants, manufacturing operations must be continuously optimized to minimize losses and to deliver on time in full.

Plan

Schedule

Execute

Create production plans that are feasible to meet business goals

Continuously optimize plant schedules for throughput and on-time delivery

Execute on the plan to deliver on-time, in-full

- Integration of Advanced Planning and Scheduling software from PlanetTogether with AVEVA Manufacturing Execution System allows for feasible production plans based on actual plant conditions and a continuously optimized production schedule that balances business KPI's with operational constraints.

- The AVEVA Manufacturing Execution System aligns people, equipment and operational processes for reliable, sustainable and compliant work delivery on the plan, in full and at lowest cost.

- Up to date schedule and plan execution visibility enables operational teams to reschedule production orders in response to unplanned events and profitable business opportunities

Manufacturing Value Chain Challenges

ASK X CONFERENCE

Raw Materials
- Dynamic commodity markets

Suppliers
- Long lead times
- Material delays

Planning
- PuO planning
- Inventory tracking + replenishment

START

Distribution
- Storage costs
- Capacity limits
- Uncertain demand
- Variable transportation

Manufacturing Scheduling
- High product mix
- Complex operations
- Multiple production options
- Fluctuating demand
- Costly changeovers
- Need for responsive replanning flexibility

Supply Chain Customer
- Frequent changes
- Demand OTD
- Shorter lead times
- Schedules in flux

Planning
- CTP (Capability to Promise)
- Sales order & Forecast
- Inventory level needs

Consumer
- Economic variability
- Product options
- Immediate fulfillment

FINISH

AVEVA | SELECT BENELUX

Visual Planning & Scheduling

## Ultra-flexible Gantt Display

Enterprise-wide visibility has never been this clear!
See everything you need on one configurable screen.
You're in complete control.

Auto-adjusting Drag-&-Drop Constraint-based Scheduling

You'll feel confident knowing your schedules are 100% realistic. No more push back from the shop floor because of unrealistic schedules.

Job & Process Dispatch Lists

Easily publish schedules to the floor on demand or in real-time. One version of reality for the entire company.
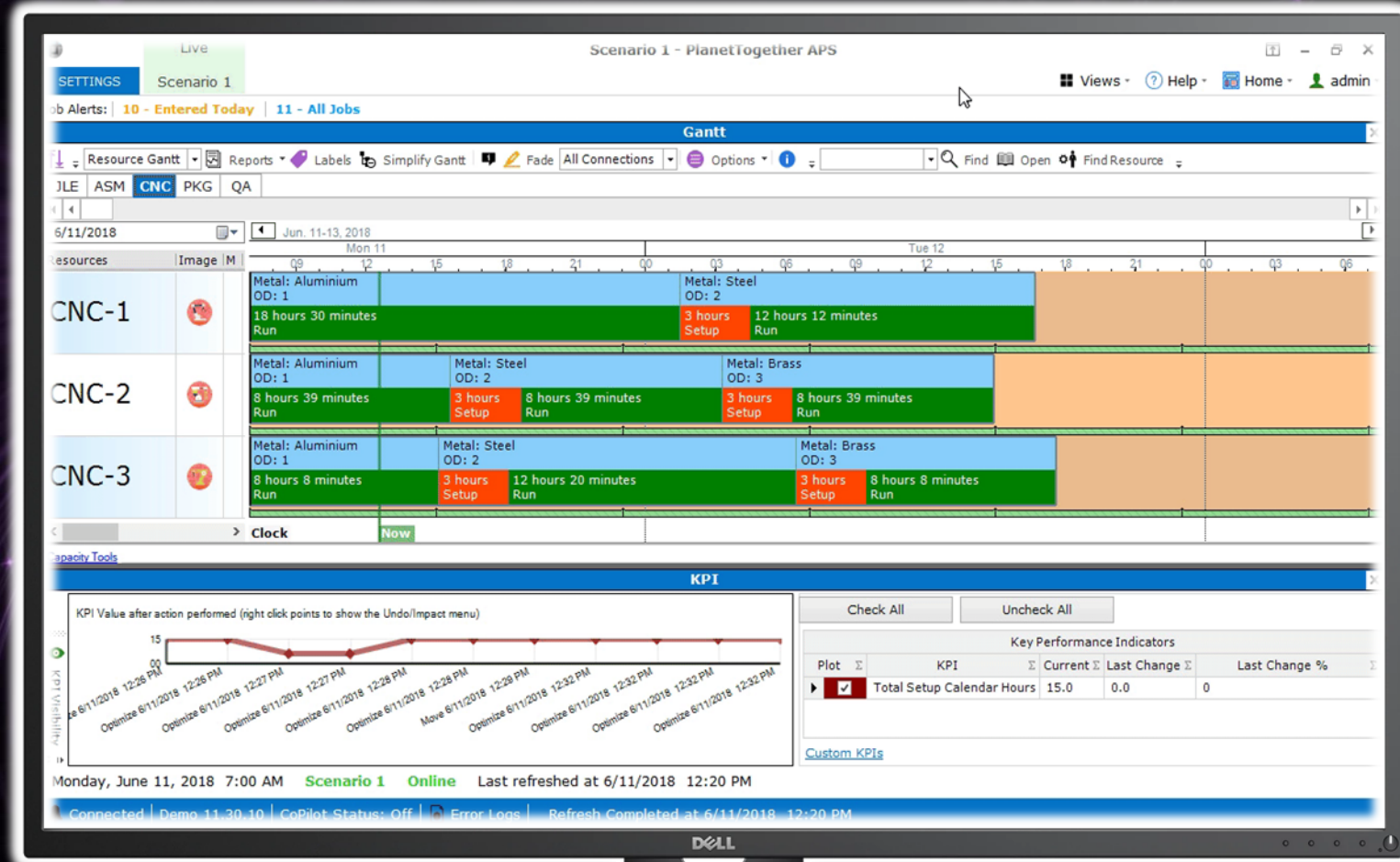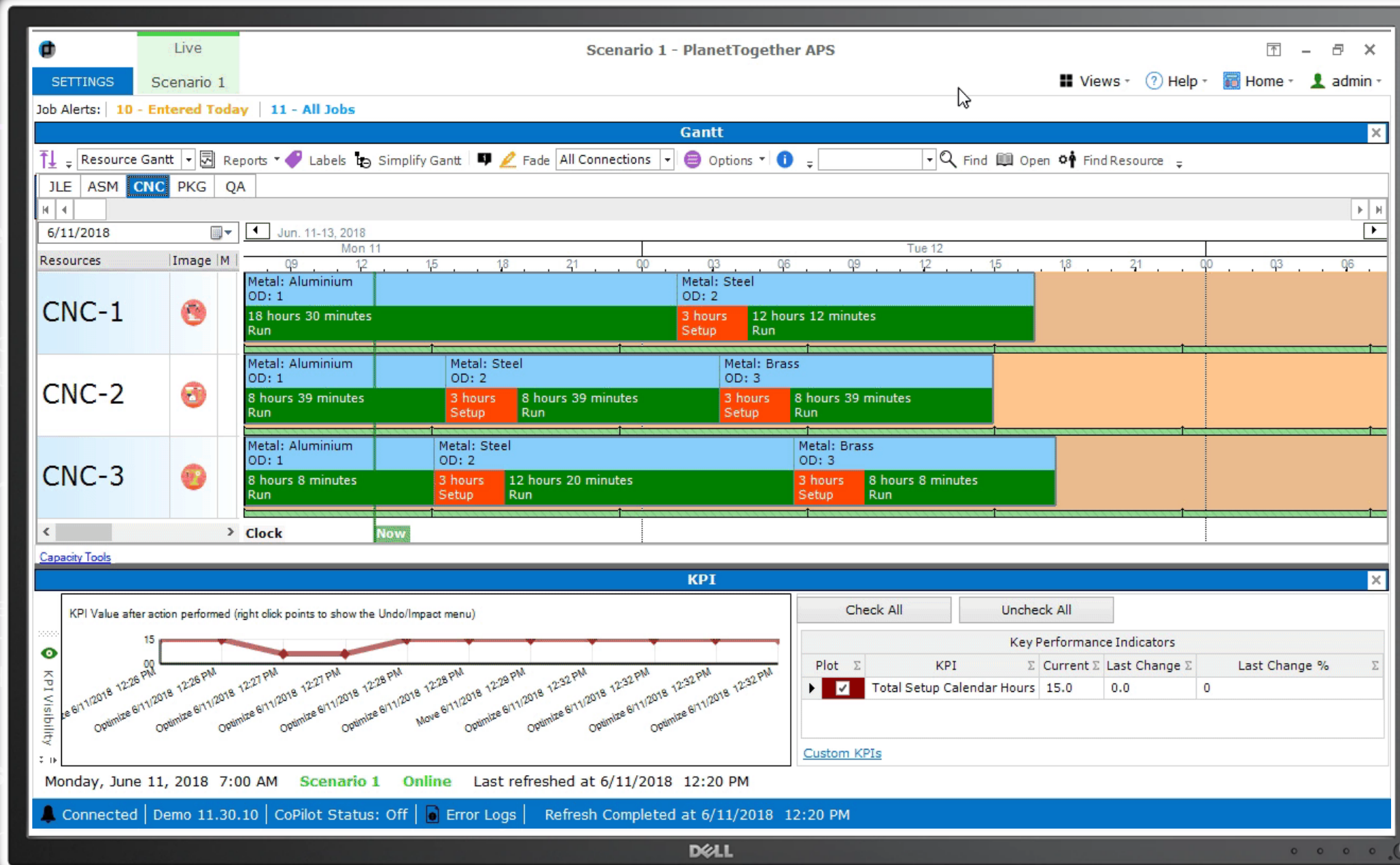
Visual P...

Ultra-flexible

Enterprise-wide
See everything y...
You're in complet...

Auto-adjusting
Scheduling

You'll feel confide...
realistic. No mor...
unrealistic sched...

Job & Proces...

Easily publish sc...
time. One version...

Scenario 1 - PlanetTogether APS

Live
SETTINGS   Scenario 1

Views ▾   ? Help ▾   🏠 Home ▾   👤 admin ▾

Job Alerts: 10 - Entered Today | 11 - All Jobs

Gantt

Resource Gantt ▾   Reports ▾   Labels   Simplify Gantt   Fade   All Connections ▾   Options ▾   ℹ️   🔍 Find   Open   Find Resource

JLE   ASM   **CNC**   PKG   QA

6/11/2018   ◄ Jun. 11-13, 2018

Resources	Image	M

Mon 11   Tue 12
09   12   15   18   21   00   03   06   09   12   15   18   21   00   03   06

CNC-1
Metal: Aluminium OD: 1 | Metal: Steel OD: 2
18 hours 30 minutes Run | 3 hours Setup | 12 hours 12 minutes Run

CNC-2
Metal: Aluminium OD: 1 | Metal: Steel OD: 2 | Metal: Brass OD: 3
8 hours 39 minutes Run | 3 hours Setup | 8 hours 39 minutes Run | 3 hours Setup | 8 hours 39 minutes Run

CNC-3
Metal: Aluminium OD: 1 | Metal: Steel OD: 2 | Metal: Brass OD: 3
8 hours 8 minutes Run | 3 hours Setup | 12 hours 20 minutes Run | 3 hours Setup | 8 hours 8 minutes Run

Clock   Now

Capacity Tools

KPI

KPI Value after action performed (right click points to show the Undo/Impact menu)

15

0

Optimize 6/11/2018 12:26 PM
Optimize 6/11/2018 12:26 PM
Optimize 6/11/2018 12:27 PM
Optimize 6/11/2018 12:27 PM
Optimize 6/11/2018 12:28 PM
Optimize 6/11/2018 12:28 PM
Move 6/11/2018 12:29 PM
Optimize 6/11/2018 12:32 PM
Optimize 6/11/2018 12:32 PM
Optimize 6/11/2018 12:32 PM
Optimize 6/11/2018 12:32 PM

KPI Visibility

Check All   Uncheck All

Key Performance Indicators

Plot Σ	KPI Σ	Current Σ	Last Change Σ	Last Change % Σ
☑	Total Setup Calendar Hours	15.0	0.0	0

Custom KPIs

Monday, June 11, 2018 7:00 AM   Scenario 1   Online   Last refreshed at 6/11/2018 12:20 PM

🔔 Connected | Demo 11.30.10 | CoPilot Status: Off | 🖥 Error Logs   Refresh Completed at 6/11/2018 12:20 PM

ASK X CONFERENCE

AVEVA | SELECT BENELUX

Best-in-class Optimization (Sequencing)
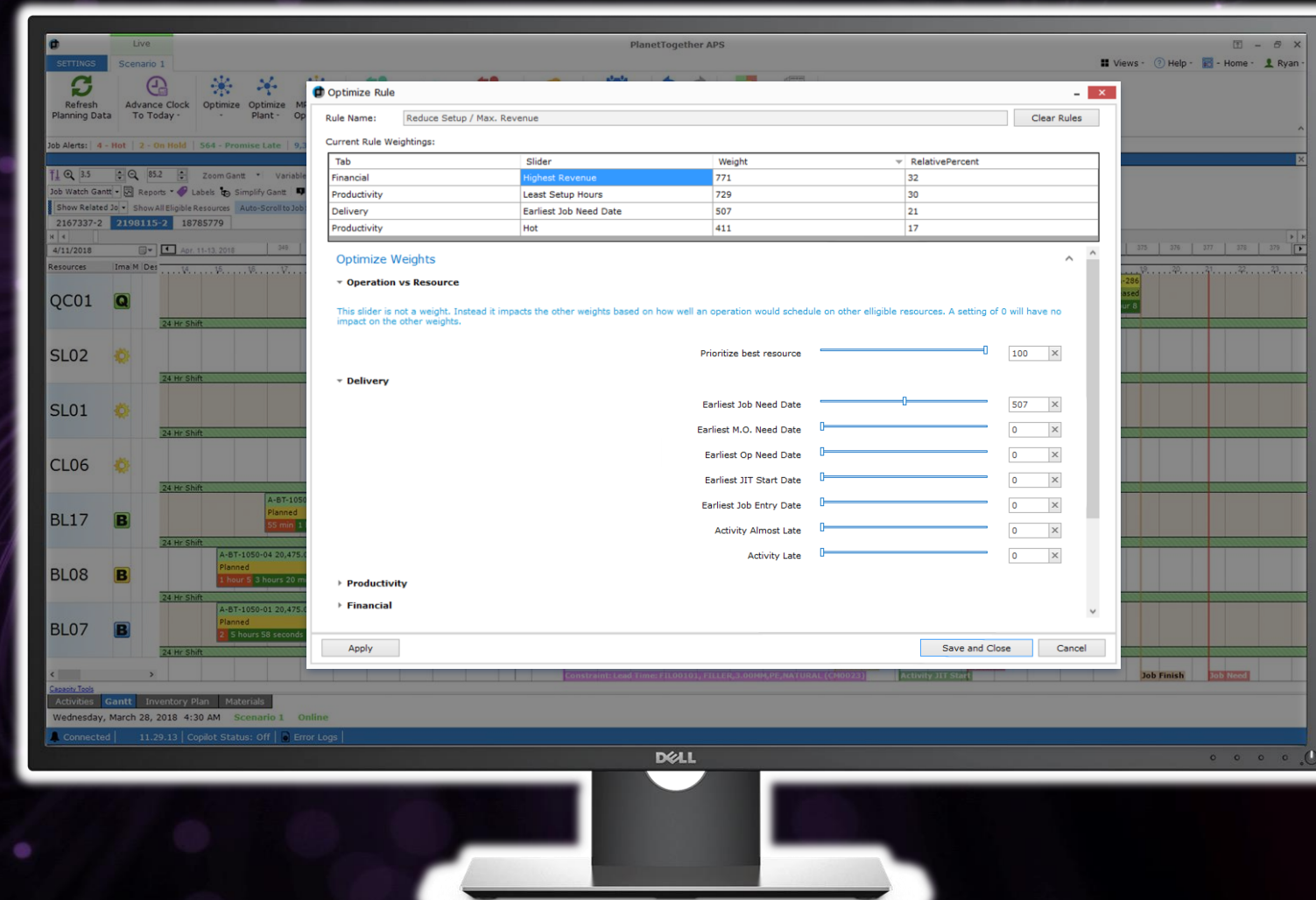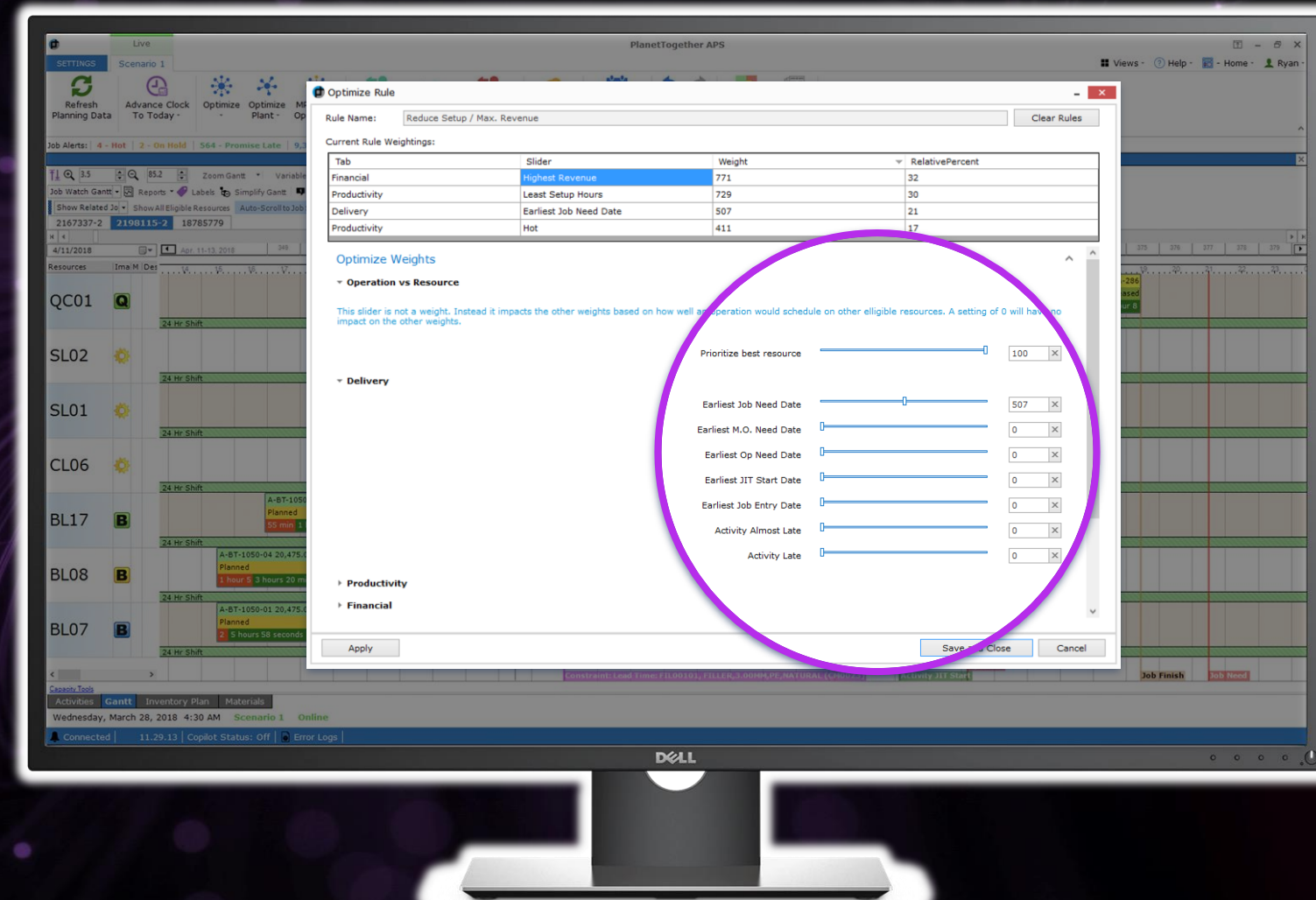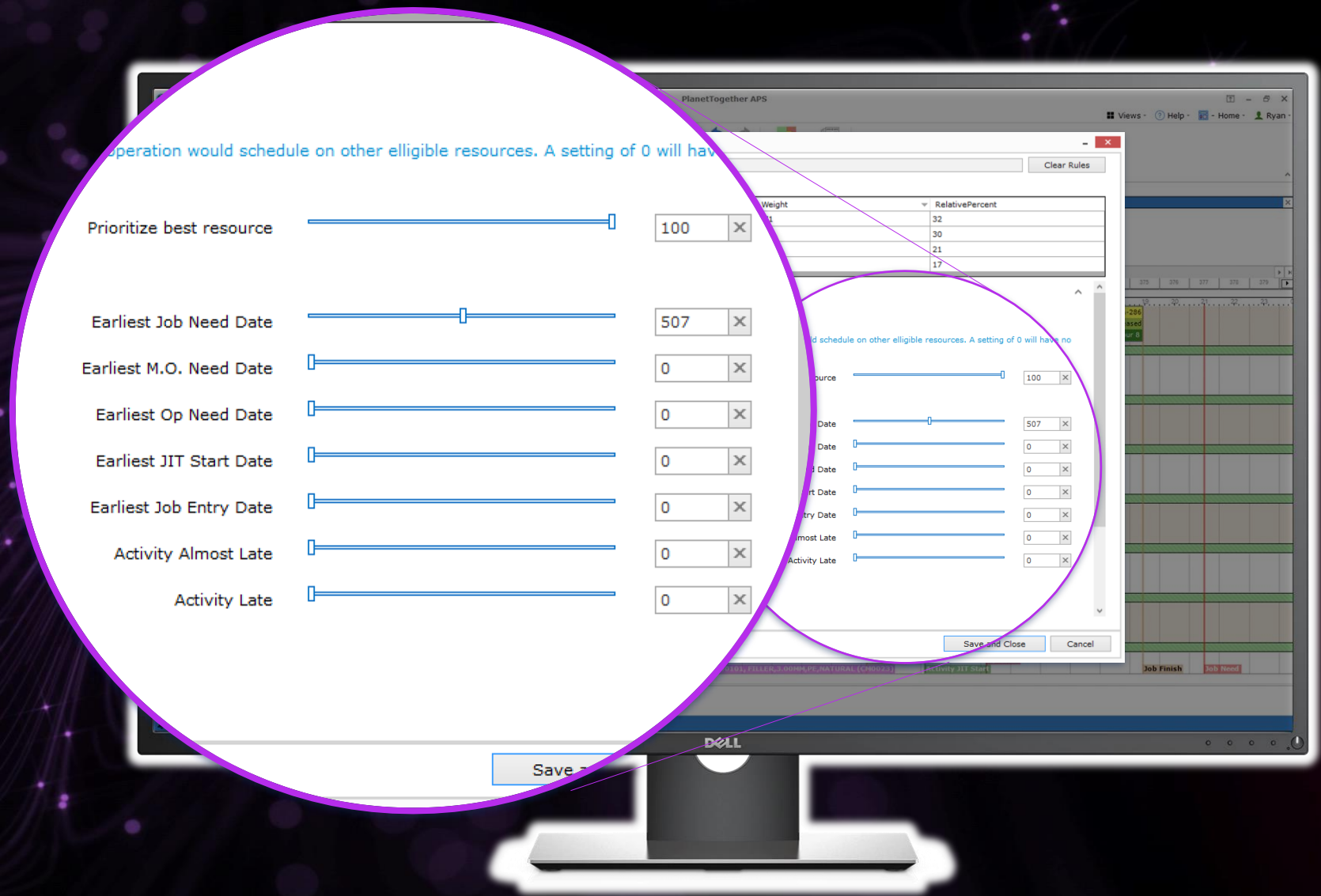
A GPS for your Factory

Factory GPS
Just like your GPS guides you around traffic, Advanced Planning and Scheduling from PlanetTogether keeps you on the optimized path as life happens. Machine down? New order drop-in? Material shortage? Rest assured you always have the best plan for the situation.

Buffered Release Control
Apply Theory of Constraints (TOC) methodologies and take control over procurement and production variability to maximize throughput and on-time delivery.

Flexible Optimization Rules
As business conditions and goals change, easily change your optimization formula. Simply adjust the sliders to fine tune the sequencing.
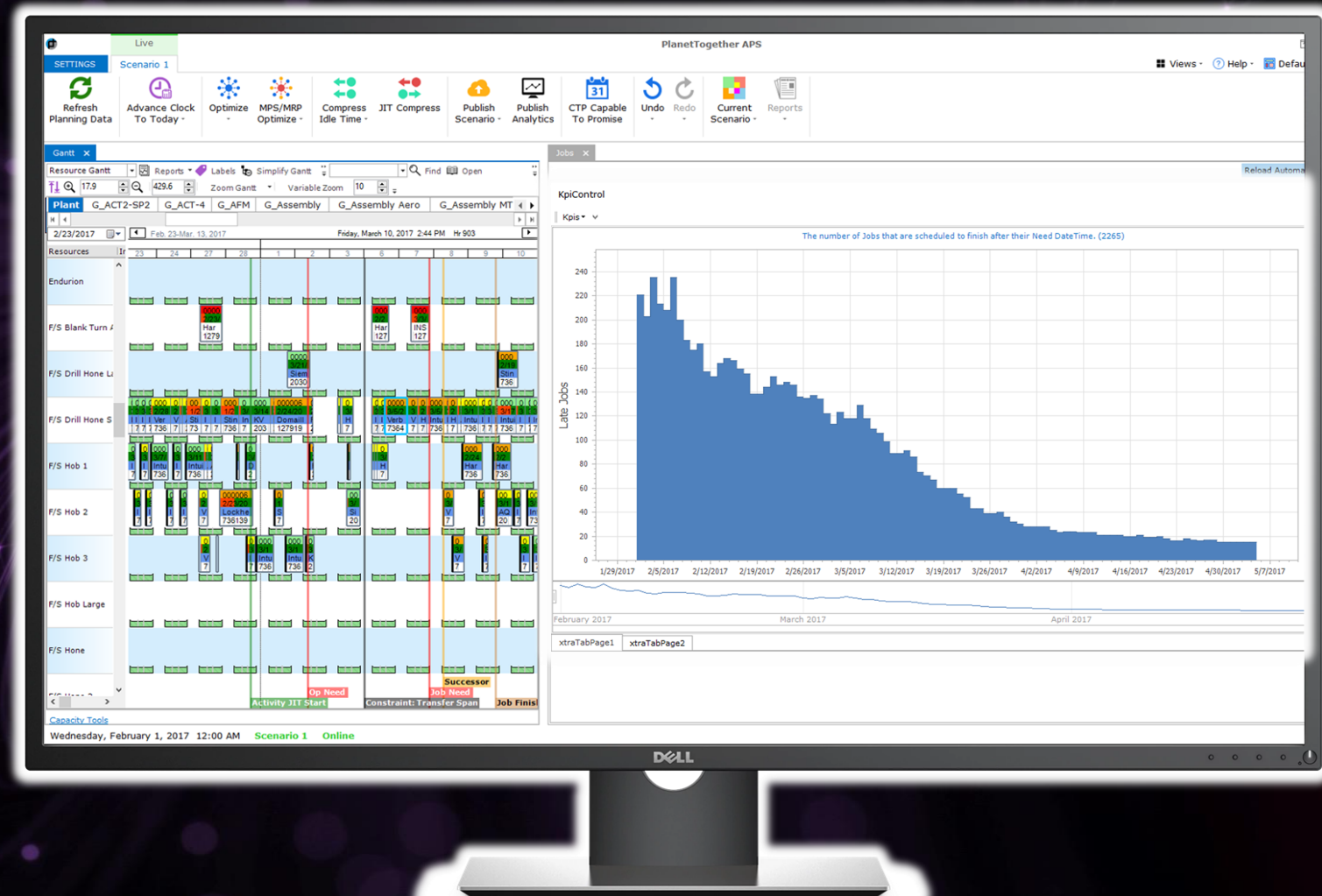
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Business-Driving KPIs

Real-time Impact Analysis

Tired of guessing the impact of changing or expediting orders? Planet Together will instantly show how proposed scheduling changes affect customer orders and forecasts.

Customizable KPIs

How can you improve your plans if you can't measure them? Schedule against business-driven metrics and achieve your performance goals. Share realistic, up-to-date plans and scenarios with your team so everyone knows what to expect.
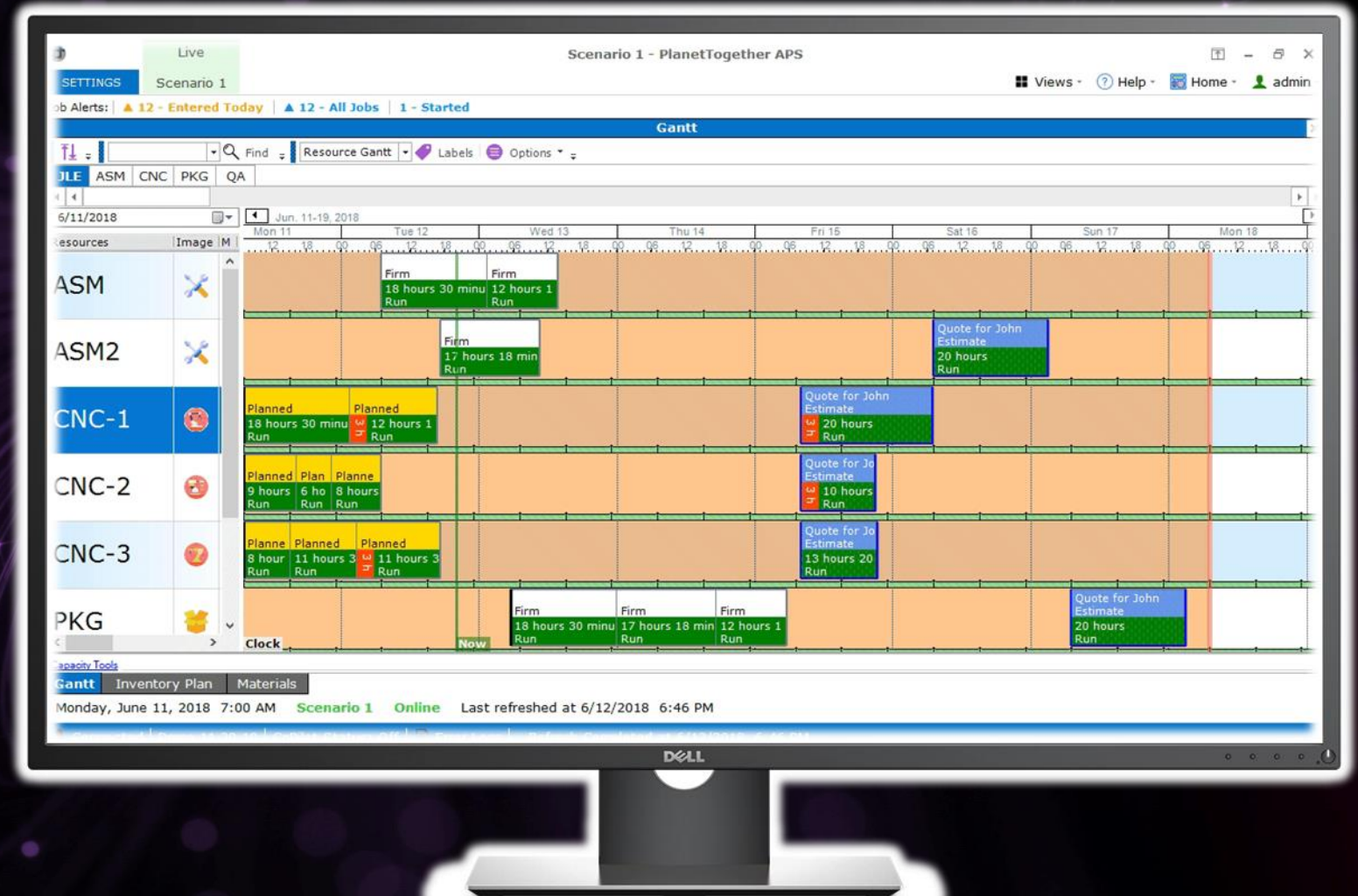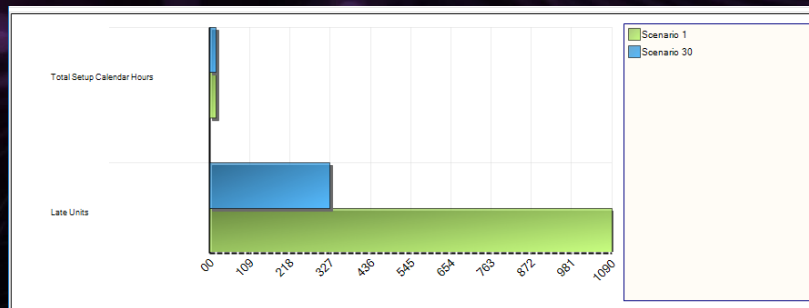
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What-if Scenarios ?

Unlimited Planning Scenarios

With Advanced Planning and Scheduling from Planet Together
you get an unlimited number of planning scenarios. Add
capacity, load up the forecasts for next year and see the result.
All without affecting your live planning and scheduling scenario
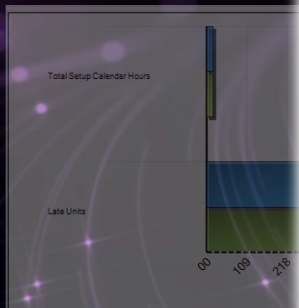or master data.

Compare your results

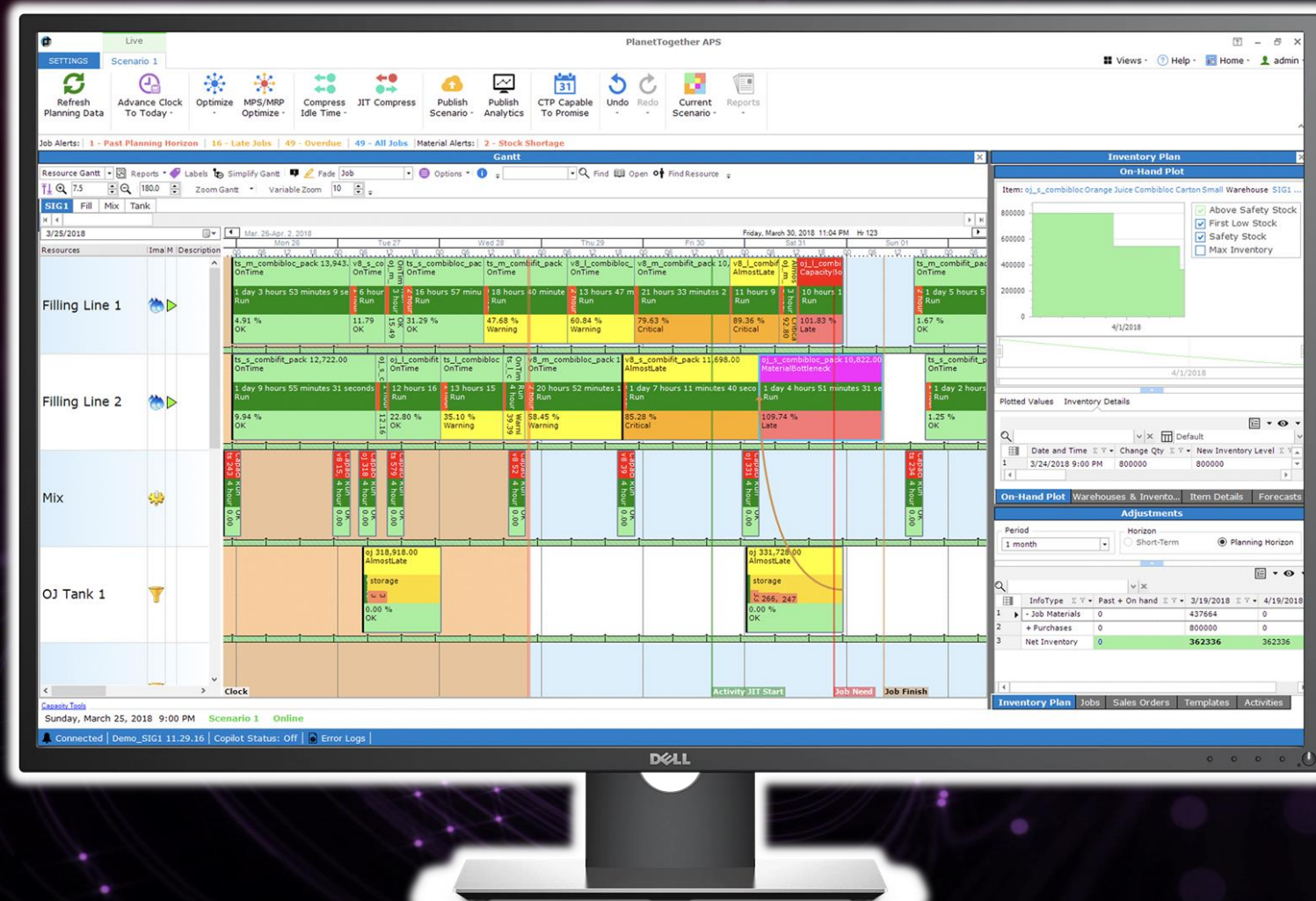Which scenario is best? Compare your KPIs and find out.
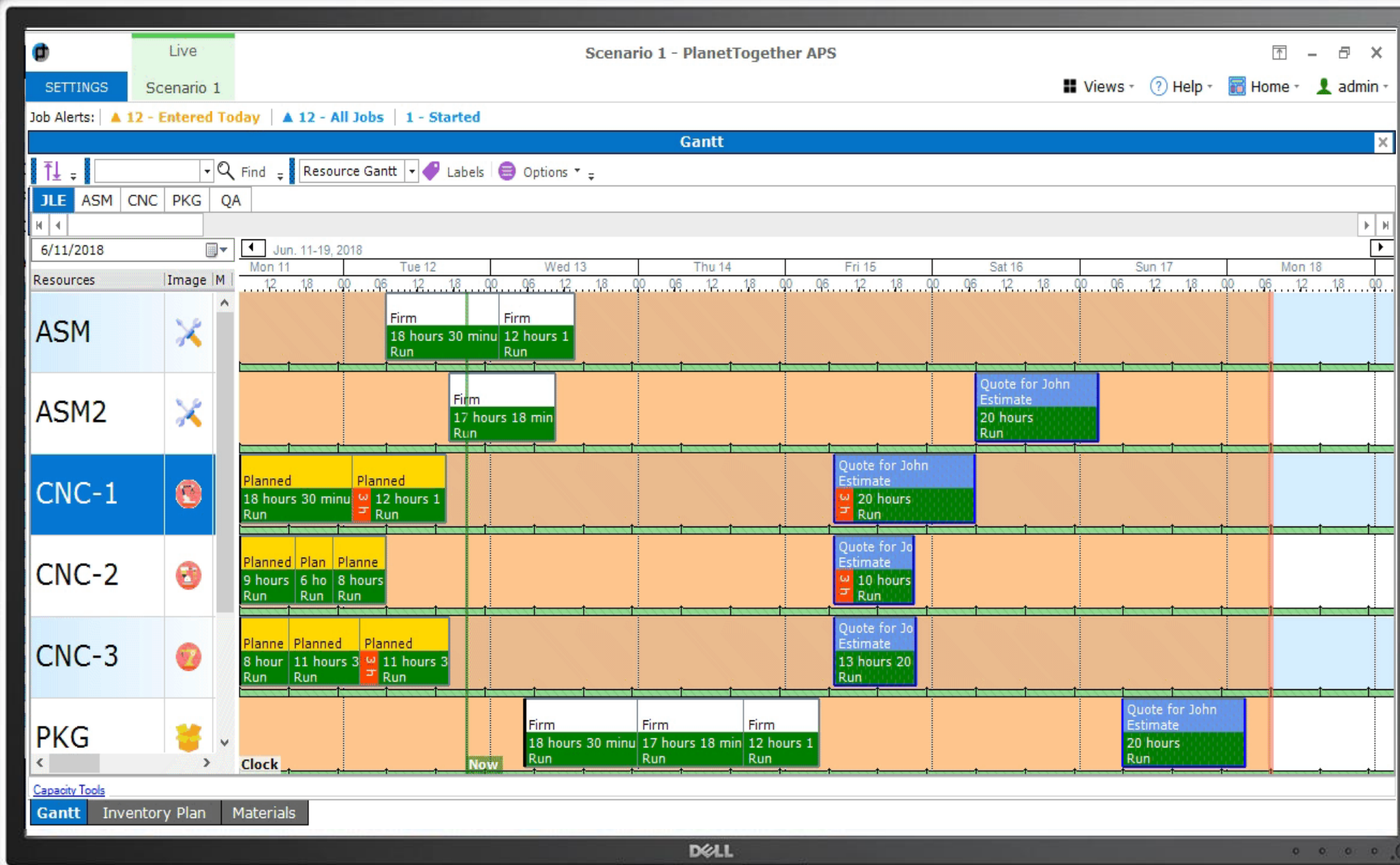
Bottleneck Management

Automatic Bottleneck Avoidance
Advanced Planning and Scheduling from PlanetTogether will automatically shift work to the most readily capable and available resource. That translates to faster flow and lower inventories.

Bottleneck Identification
Easily spot and drill into unavoidable bottlenecks. Dynamic Gantt labeling makes it easy to tell which step in your process is causing the delay, the first step to resolution

Bottleneck Resolution Tools
Using tools like our Buffer Management Workbench or Overtime Intervals, you'll be able to anticipate future constraints and make the changes needed before it's too late.

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Multi-Plant Production Planning

Rapid Demand Planning

Whether it regards sales orders, forecasts, estimates or safety stock, Advanced Planning and Scheduling from PlanetTogether aligns your supply to customer demand by planning the right production jobs and purchase orders -- in seconds.

Alleviate Shortages

With alerts you know exactly when there is a material issue and what's impacted. Quickly spot, drill into the data and resolve the issue weeks or months ahead of impacting customers.

Capable-to-Promise (CTP)

Want to give your customers faster delivery quotes, based on real-life capacity, on-hand quantity, and incoming material purchases? With the Capable-to-Promise functionality, you can provide an accurate quote in seconds.
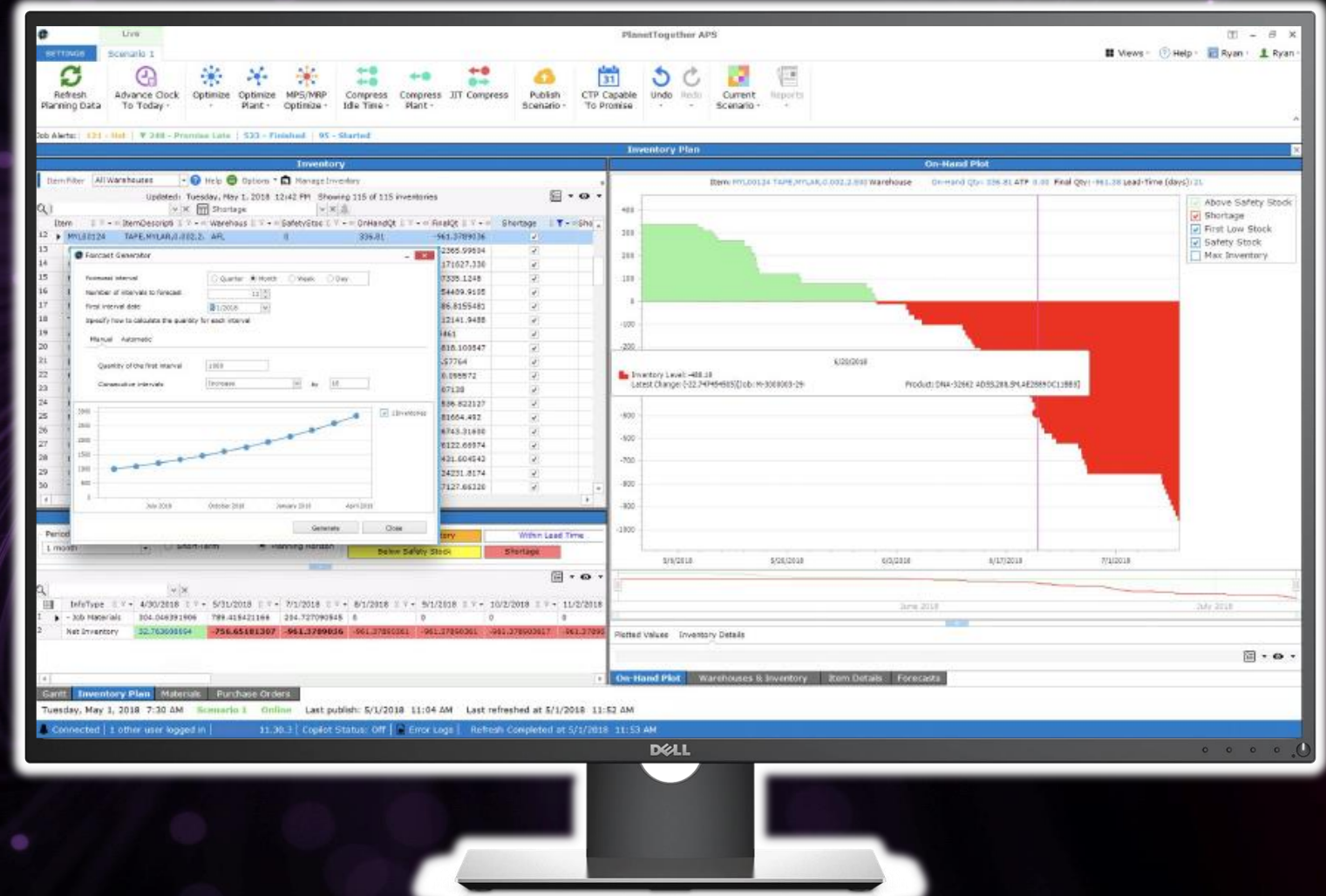
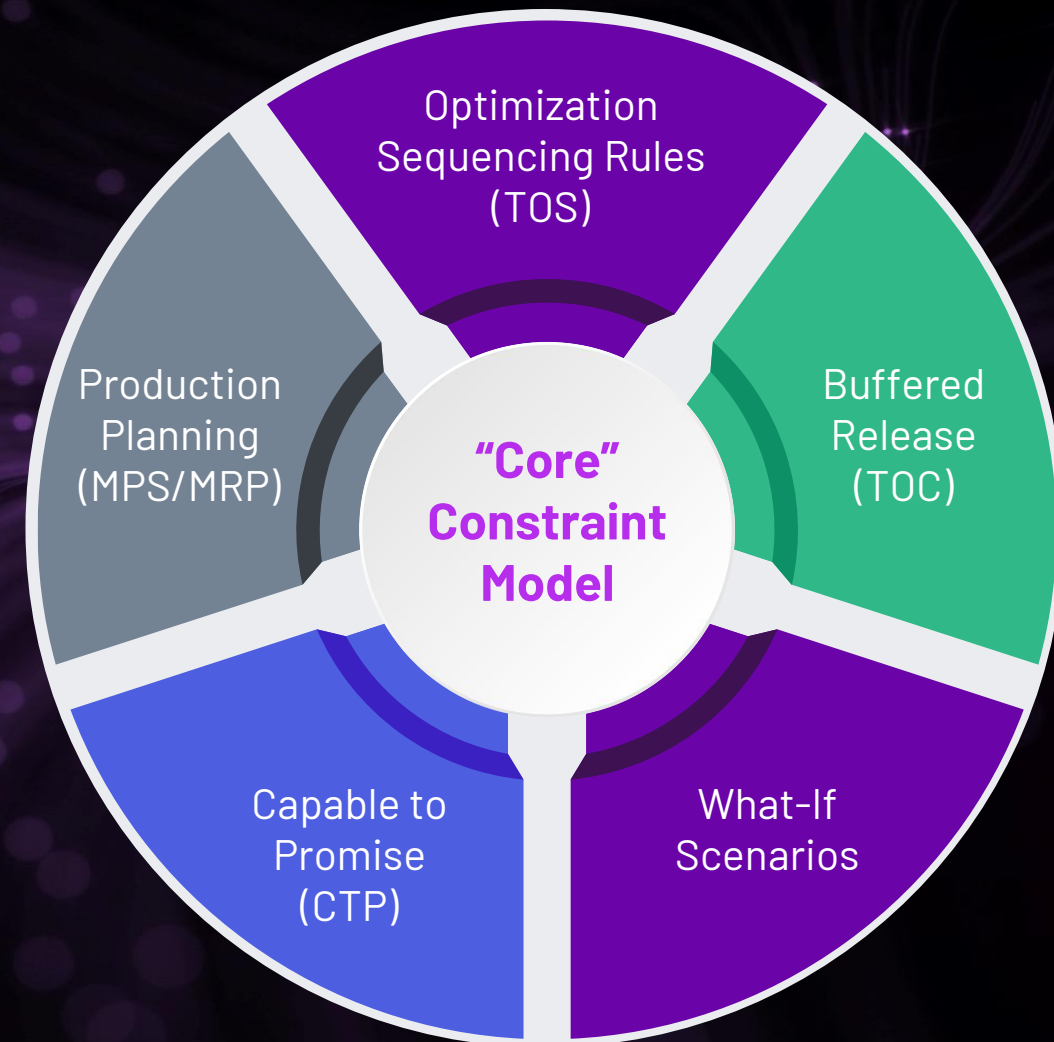# Advanced Planning & Scheduling (more than a Scheduling tool)

A Realistic Capacity & Material Constraint Model

Since 2004 PlanetTogether has developing new ways and refining software capabilities to model manufacturing facilities down to the most finite detail. Resources, Capabilities, Attributes, Tanks, Labor, Queue Times, Transfer Times, Purchases, BOMs, Routes, Successor Relationships, Overlapping... to name a few...

Why is this important?

Advanced Planning and Scheduling from PlanetTogether strength is the ability to provide tactical and strategic insights into your production and to generate accurate schedules.
A realistic model is the foundation for an accurate production schedule, otherwise everything you're trying to accomplish is based on false information.

- Optimization Sequencing Rules (TOS)
- Buffered Release (TOC)
- What-If Scenarios
- Capable to Promise (CTP)
- Production Planning (MPS/MRP)
- "Core" Constraint Model

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Advanced Planning and Scheduling References*

| Food, CPG, Life Science | Manufacturing | Discrete |

Graphic Packaging International

One of the world's largest packaging manufacturers

" Scheduling and Planning is one of the most overlooked opportunities in the manufacturing industry today. The impact go well beyond the ability to drive results you can see in your P&L, but into your culture and how work gets done. - Dean Dietrich, VP Operations, Graphic Packaging International"

Challenges

Lack of Changeover Visibility

Scheduling Errors

Reliance on Tribal Knowledge

Lack of forward-looking capacity utilization
 to be able to commit capacity to customers

Solution

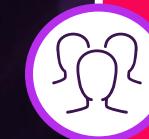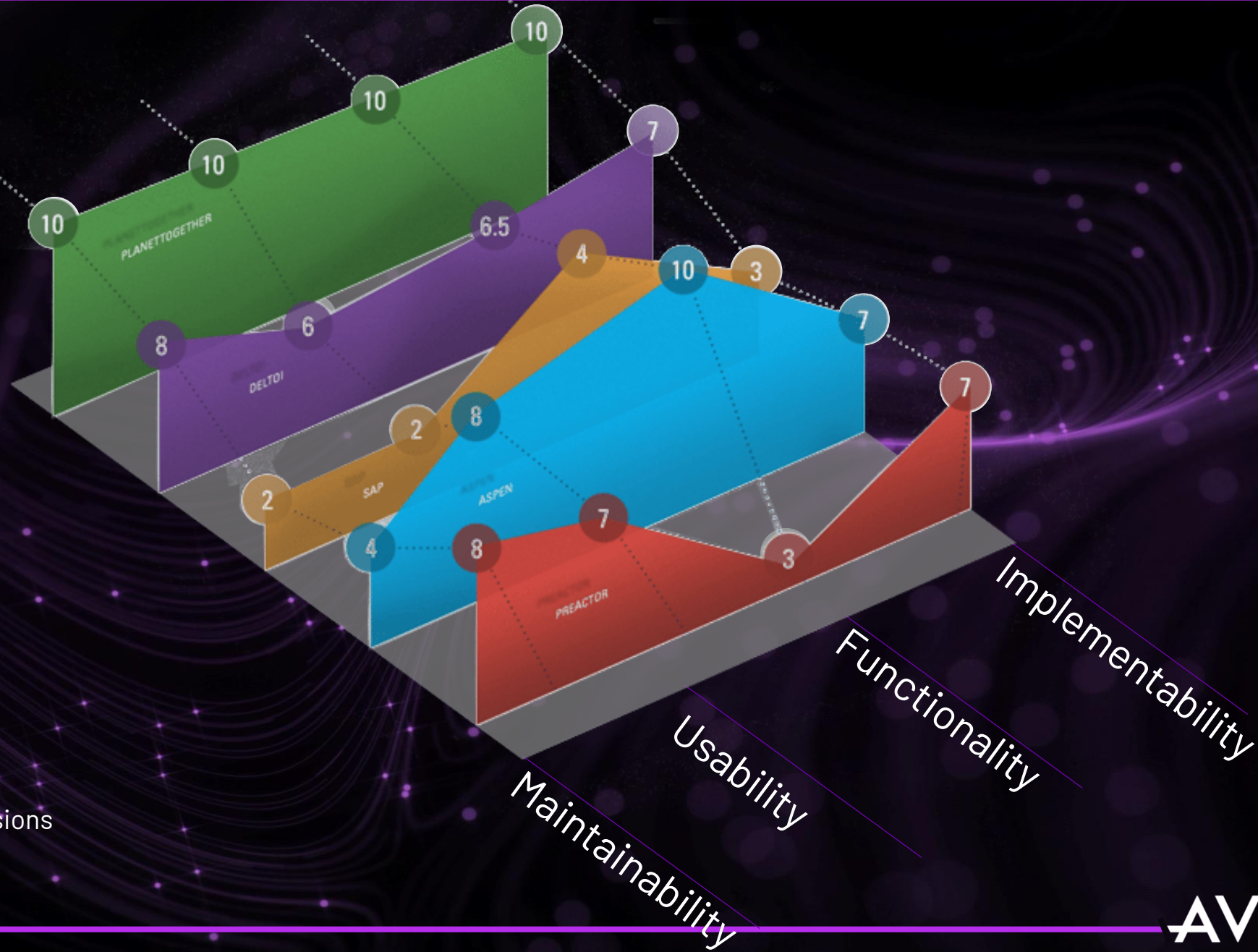Planet Together Advanced Planning and Scheduling (APS) software

Results

6% reduction in unit costs due to increased Overall Equipment Effectiveness (OEE)

$16M in annual saving

Scheduling decisions are based on automation and company KPIs rather than intuition

$16 million
Annual savings

30 Plants
in USA, Canada, Mexico

**6% reduced
Unit cost**

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Production Planning Software Scorecard

PlanetTogether Offering Scheduling vs Planning

| Refresh Planning Data | Advance Cloud To Today | Optimize | MPS/MRP Optimize | Compress Idle Time | JIT Compress | Publish Scenario | CTP Capable To Promise | Undo | Redo | Current Scenario | Reports |

Scheduling | **Planning**
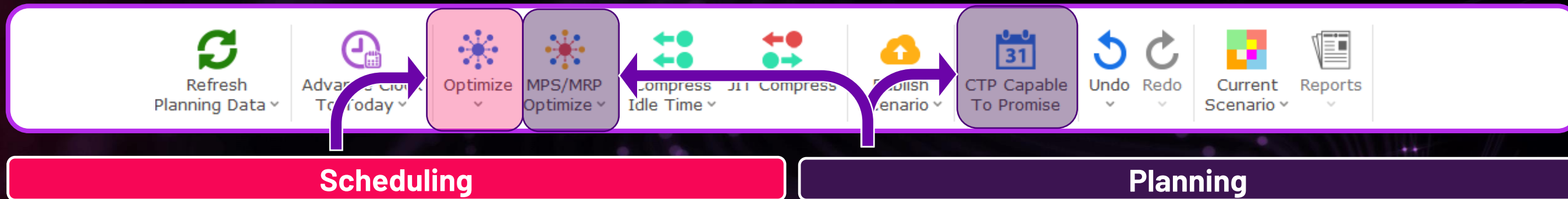
Scheduling

Create detailed production schedules optimized around material constraints, capacity constraints, and business objectives.

Scheduling Tools
- Platform Tools
- Capacity Constraints & Tools
- Material Constraints & Tools
- Web and Mobile Dashboards, Reports, and email Alerts
- Integration API and Templates

Others: Multi-Scheduler Collaboration, Extensibility, Multi-Plant Synchronized Scheduling, Shop Floor Dispatch, High Order Volume, Additional Instance

Planning

Create production plans optimized around material constraints, capacity constraints, and business objectives.

Planning Tools
- Platform Tools
- Capacity Constraints Tools
- Material Constraints Tools
- Web and Mobile Dashboards, Reports, and email Alerts
- Integration API and Templates
- Multi-Planner Collaboration

Capable to Promise (CTP)
- Extensibility
- Unlimited number of Plants
- High Order Volume

AVEVA | SELECT BENELUX

AVEVA Scheduling offering

Scheduling

Scheduling Standard Edition	Scheduling Professional Edition	Scheduling Stand Alone
• All the PlanetTogether scheduling functionality	• All the PlanetTogether scheduling functionality	• All the PlanetTogether scheduling functionality
• Offered for use in combination and integrated with AVEVA MES only	• Offered for use in combination and integrated with AVEVA MES and other complementary systems	• Allows for use without AVEVA MES
• Does NOT include PlanetTogether customization and extensibility features	• Does include PlanetTogether customization and extensibility features	• Does include customization and extensibility of Planet Together

Typical Scheduling Pilot

Pilot = Workable, in production , out of the box scheduling functionality

1. The Duration of the project is roughly 3 to 5 months

2. Asses/Analyse: Typically, 1 month duration
   o Review and Understand APS Goals (Reason of APS and Business goal to achieve)
   o Requirements gathering
   o Required data and functional gaps
   o Solution Design

3. Connect /Implement: Typically, 2-3 months duration
   o System Installation
   o Configuration and Data Import
   o Unit testing

4. Transform/deploy: Typically, 1 month duration
   o Training and education
   o Conference room demo and Go-live preparation
   o Go-Live and support