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Leveraging information for smarter decision-making, resource optimization and supply chain excellence

Kuah Ann Thye
IBM-ILOG WebSphere

Agenda

1. strate Use Case of Optimisation
2. are OC Optimisation Tools
3. are OC Optimisation Platforms
4. are OC Optimisation Packages

What is Optimization? Maximize resource efficiency

Resources	Examples of choices to make
Capital	Allocate
People	Acquire, schedule, assign, train
Time	Allocate
Equipment	Acquire, schedule, locate
Facilities	Locate, schedule
Vehicles	Acquire, route, schedule
Raw Material	Acquire, assign

Used to answer questions starting with *'How many/much?', 'Who?', 'When?', 'Where?', 'Which?'*

Optimization Benefits

Documented ROI of INFORMS Edelman finalists using ILOG Products

2 Chilean Forestry firms	Timber Harvesting	$20 mil/yr + 30% fewer trucks
UPS	Air Network Design	$87m/2yrs + 10% fewer planes
South African Defense	Force/Equip Planning	$1.1 bil/year
Motorola	Procurement Mgmnt	$100-150 mil/year
Samsung Electronics	Semiconductor Mfg	50% reduction in cycle time
SNCF (French RR)	Scheduling & Pricing	$16m/yr rev + 2% lower op ex
Continental Airlines	Crew Re-scheduling	$40 mil in one year
AT&T	Network Recovery	35% reduction spare capacity
Grant Mayo van Otterloo	Portfolio Optimization	$4 mil/year

Optimization-based Applications

Industrial	Transportation & Logistics	Financial Services	Utilities, Energy & Natural Resources	Telecom	Multiple/Other

• Production planning & scheduling
• Inventory optimization
• Supply Chain Network Design
• Shipment planning
• Truck loading
• Maintenance scheduling
	• Yield Management
	• Asset Optimization
	  • Fleet Assignment
	  • Depot & warehouse location
	  • Network design
	  • *Vehicle & container loading*
	  • *Vehicle routing & delivery scheduling*
	  • Yard, Crew, Driver & Maintenance scheduling
		• Portfolio optimization
		• Portfolio in-kinding
		• Trade crossing
		• Loan pooling
		• Product/price recommendations
			• Unit commitment
			• Supply portfolio planning
			• Power generation scheduling
			• Distribution planning
			• Water reservoir mgt
			• Mine operations
			• Timber Harvesting
				• Network capacity planning
				• Routing
				• Adaptive network configuration
				• Antenna and concentrator location
				• Equipment and service configuration
					• Workforce scheduling
					• Advertising scheduling
					• Marketing campaign optimization
					• Revenue/Yield Management
					• Appointment & Field Service scheduling
					• Combinatorial Auctions for Procurement

From long term planning to operational scheduling

Let ILOG Show You How

- Nissan increased productivity at Europe's most efficient car production facility by 30%
- Chile's two largest forest-products companies reduced their truck fleets by 30% and saved $20 million annually
- Samsung Electronics cut wafer-processing cycle time in half, to just 30 days
- Continental Airlines responded to unexpected delays with efficient crew rescheduling, saving $40 million in one year
- UPS cut package delivery costs by $87 million over 2 years and reduced its aircraft fleet by 10%
- A television network increased annual advertising revenue by $50 million
- An investment firm cut transaction costs by $100 million
- A major consumer packaged goods manufacturer dramatically increased the direct loading of trucks off its packaging lines

Benefits is substantial: ROA, OpEx, CapEx, Top Line

Documented ROI

INFORMS Edelman Award Finalists Using ILOG CPLEX

COMPANY	BUSINESS PROCESS	ROI
UPS	Air Network Design	$87m/2yrs + 10% fewer planes
Motorola	Procurement Mgmt	$100-150 mil/year
Samsung Electronics	Semiconductor Mfg	50% reduction in cycle times
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2 Chilean Forestry firms	Timber Harvesting	$20 mil/year + 30% fewer trucks

Top ILOG Optimization Industry Solutions

1.	Industrial	Production Planning & Scheduling
2.	Travel & Transportation	Yield Management & Asset Optimisation
3.	Energy & Utilities	Unit Commitment
4.	Banking & Financial Markets	Portfolio Optimization
5.	Cross Industry	Manpower

Optimisation Market Leadership

“ILOG is the world’s leading provider of software components” 6/99, 6/00

“The leading optimization component vendor is ILOG.”

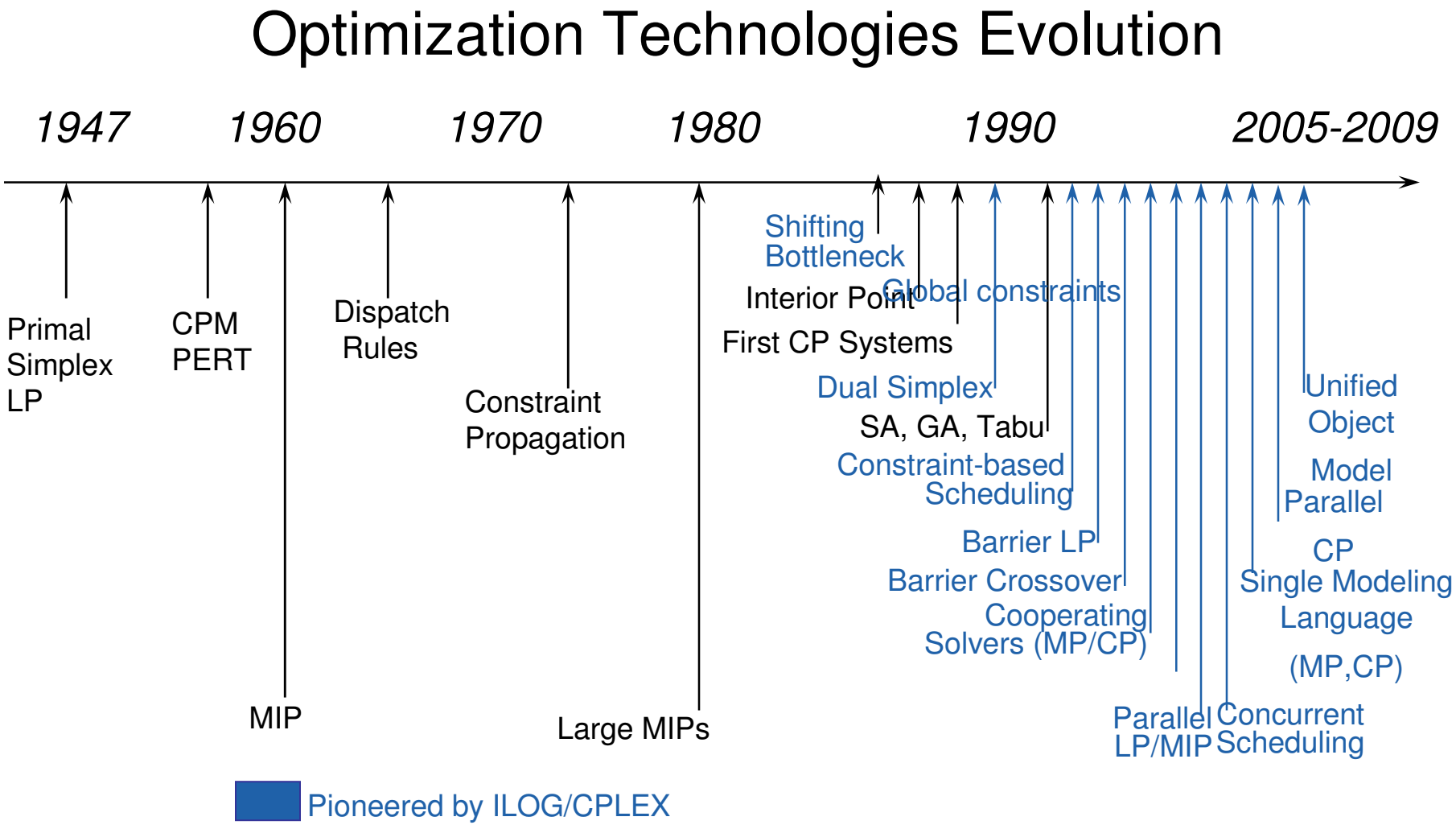
"ILOG is the leading provider of optimization software components."

Larry Lapide, Research Director, AMR Research

"ILOG - The Optimizer Inside."

Byron Miller, Analyst, Giga Group

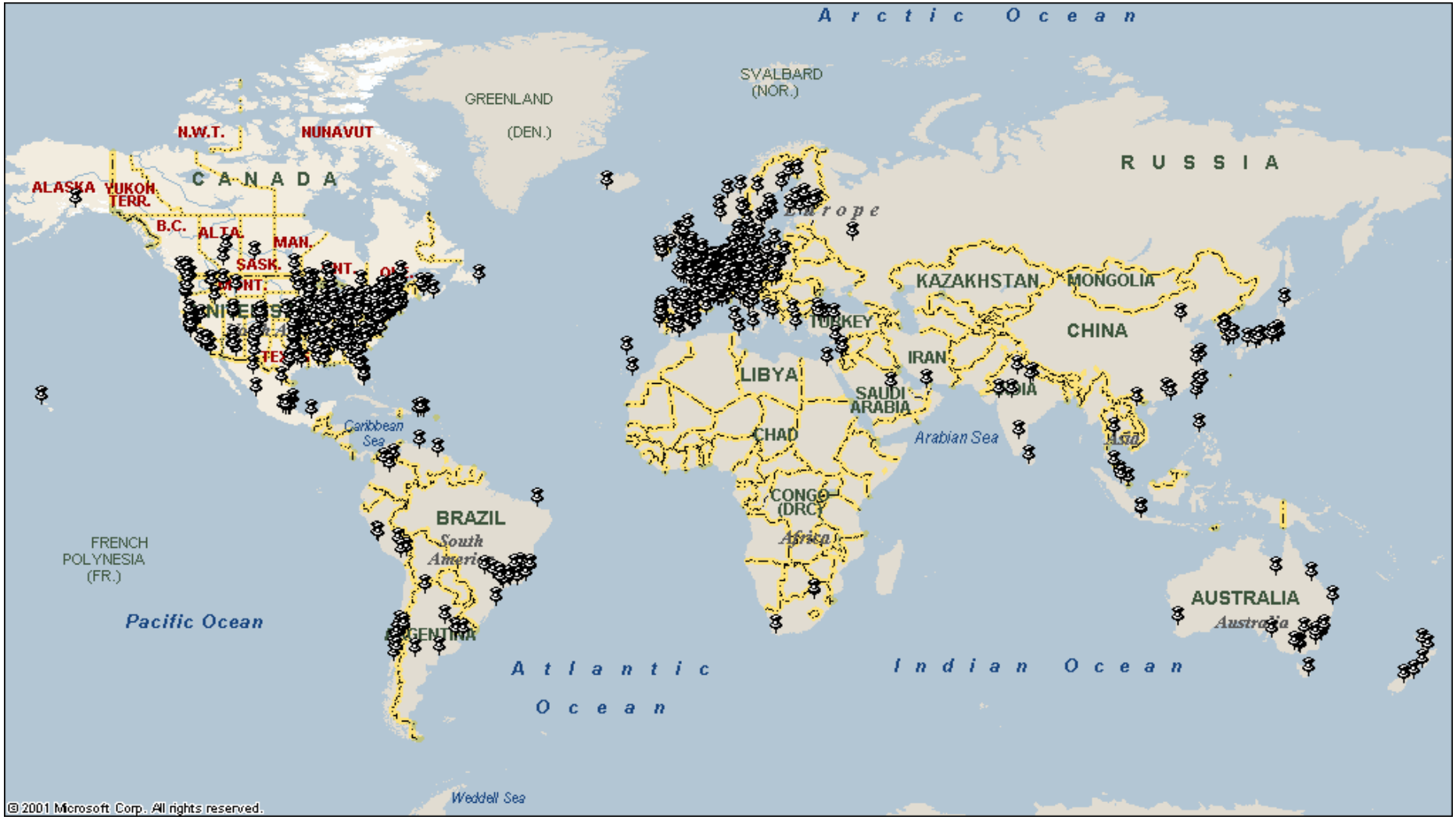
Industry Views …No 1 Optimisation since 80s



ILOG: Leadership in Optimization

- Over 160 of the Global 500 build custom applications using ILOG Optimization engines and tools
  - 65% in Manufacturing, Transportation & Investment Management
  - 80 Manufacturers and 40 Transportation companies in the Global 2000
- Over 1,000 commercial customers under maintenance
- Major ISVs reach thousands of others
  - 8 of top 10 Supply Chain application vendors
  - SAP, Oracle, i2, Manugistics, Manhattan Associates, Infor, SSA Global, Quintiq, Kronos, Logic Tools, DynaSys, Ariba, SmartOps, Cadence Design, Siebel, Tavant, Siemens, Areva, Sabre, PROS, Emptoris, CombineNet, ITG, Eclipsys, SPSS, etc...
- Over 1,000 Universities using our optimization products in their research projects
  - ILOG CPLEX is to Operations Research what SPSS and SAS are to statistics

CPLEX Across the World



1194 Cities – Excluding ISV deployments

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Options for Planning & Scheduling Solutions

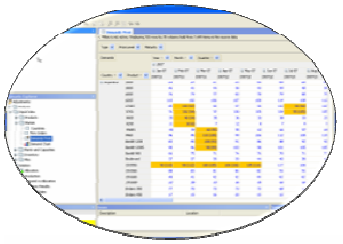
		PROS	CONS
Spreadsheet based applications		*Quickly getting started* *Familiar tool*	*Limited size and complexity* *Hard to maintain* *Cumbersome What-if analysis*
Pre-packaged Applications	SAP, ORACLE, i2, INFOR	*Out-of-the box functionality* *Packaged best practices*	*Difficult to change GUI* *May not integrate* *May not capture all costs, constraints, or goals* *May impose the wrong business process*
Custom Applications	**Component based**	*Tailored to business needs*	*Difficult for Business managers to participate in dev process* *Difficult to build GUI* *Difficult to build data integration* *Difficult to maintain over time* *"Obligation" to maintain custom optimization and data model*
Custom Applications	**Platform based**	*Tailored to business needs* *Easy for Business managers to participate in dev process* *Easy to build GUI* *Easy to build data integration* *Easily maintain integration of optimization model in application*	*"Obligation" to maintain custom optimization and data model*

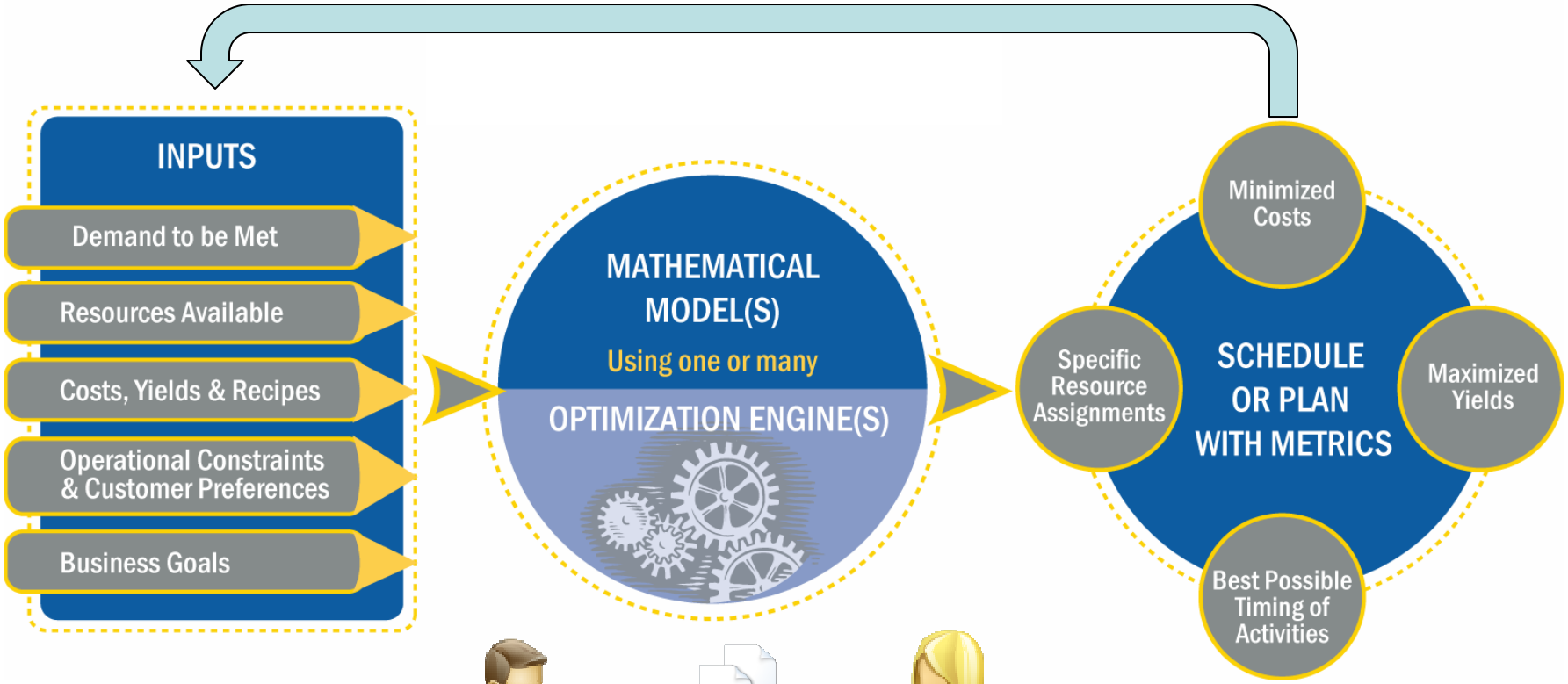
ILOG Optimization Decision Manager (ODM) Enterprise

- A flexible planning platform
  - Highly configurable with low risk and low cost
  - Customizable and extensible for perfect fit
- Planning-centric Functionality
  - Data analysis & Visualization
  - Scenario management & Editing
  - Collaborative planning with Scenario Sharing
  - What-if analysis & Sensitivity analysis
- Powered by Optimization
  - Plan Generation & Checking

How does optimization support decision making?

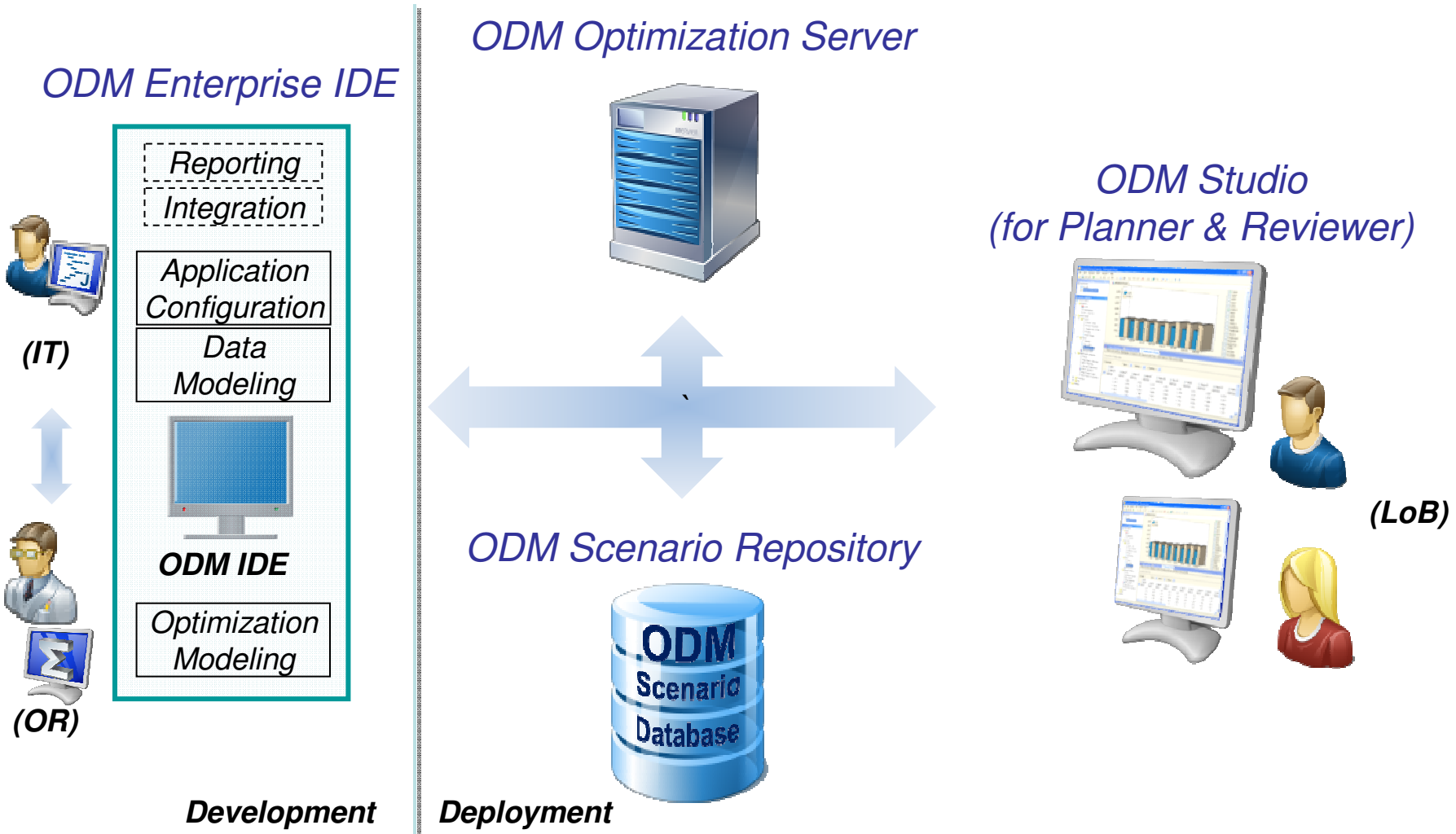
What-If Analysis





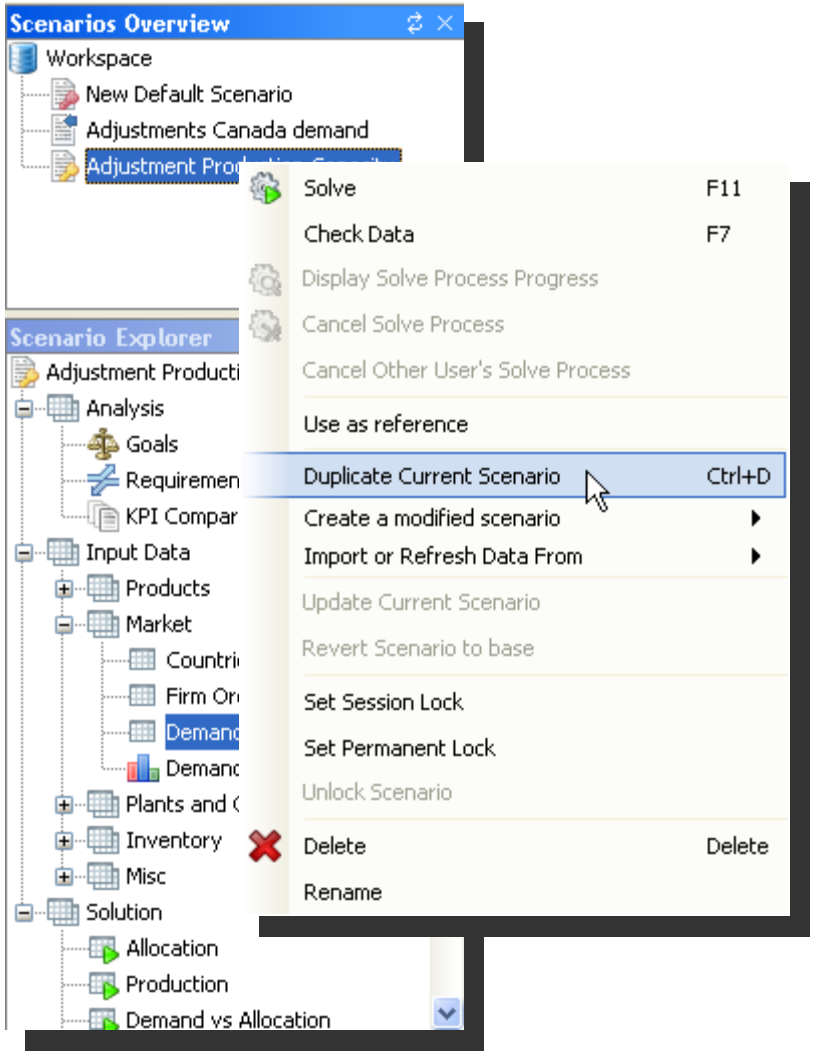
Collaboration

ILOG ODM Enterprise Architecture

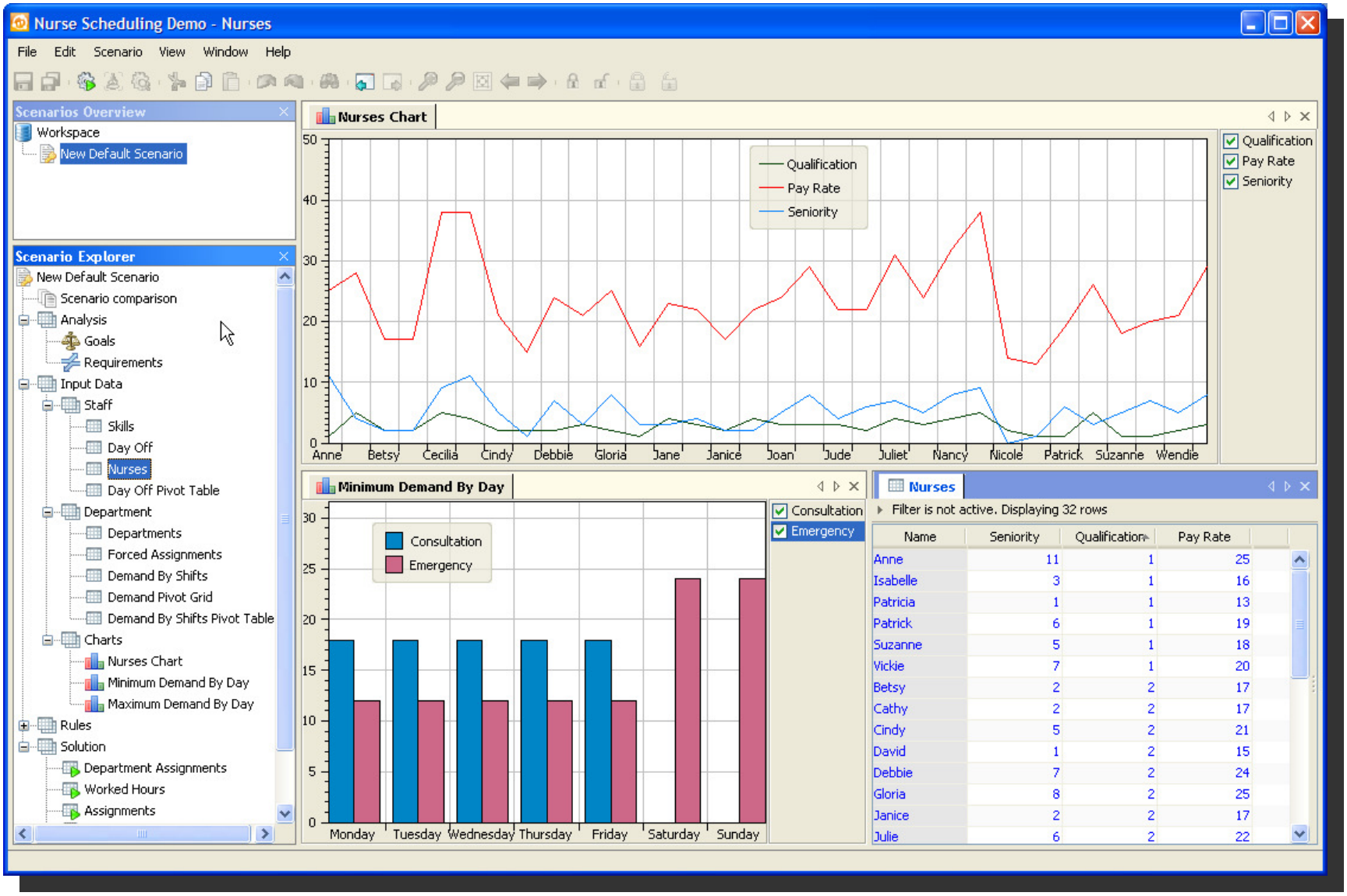


Scenario Management & What-if analysis

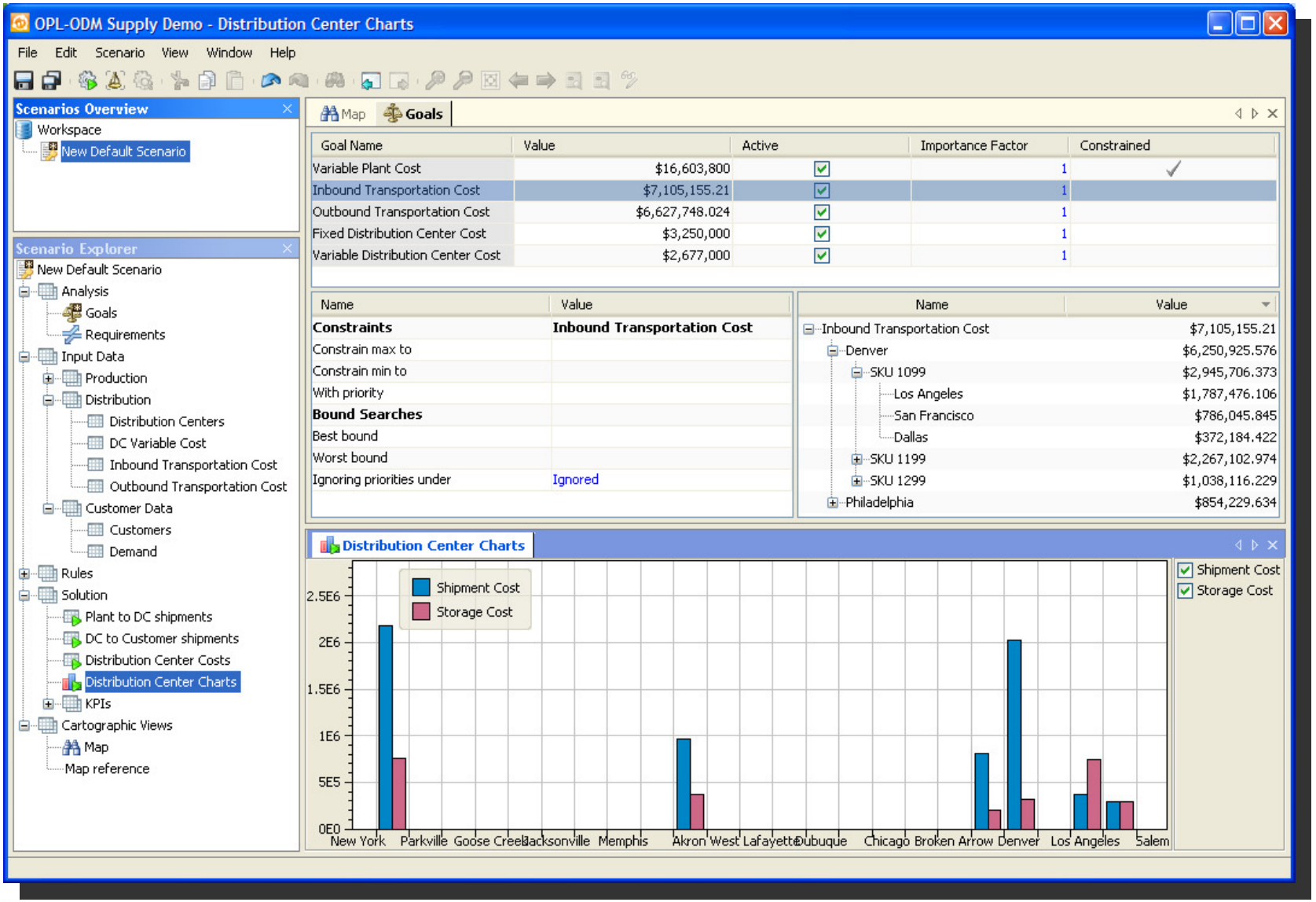
- Scenarios represent
  - Plans for specific periods
  - Alternatives (What-if analysis)
- Scenarios contain
  - *Data, costs,*
  - *Rules, goals,*
  - *Solution set with calculated KPIs*
- Scenario editing
  - Includes change to any element



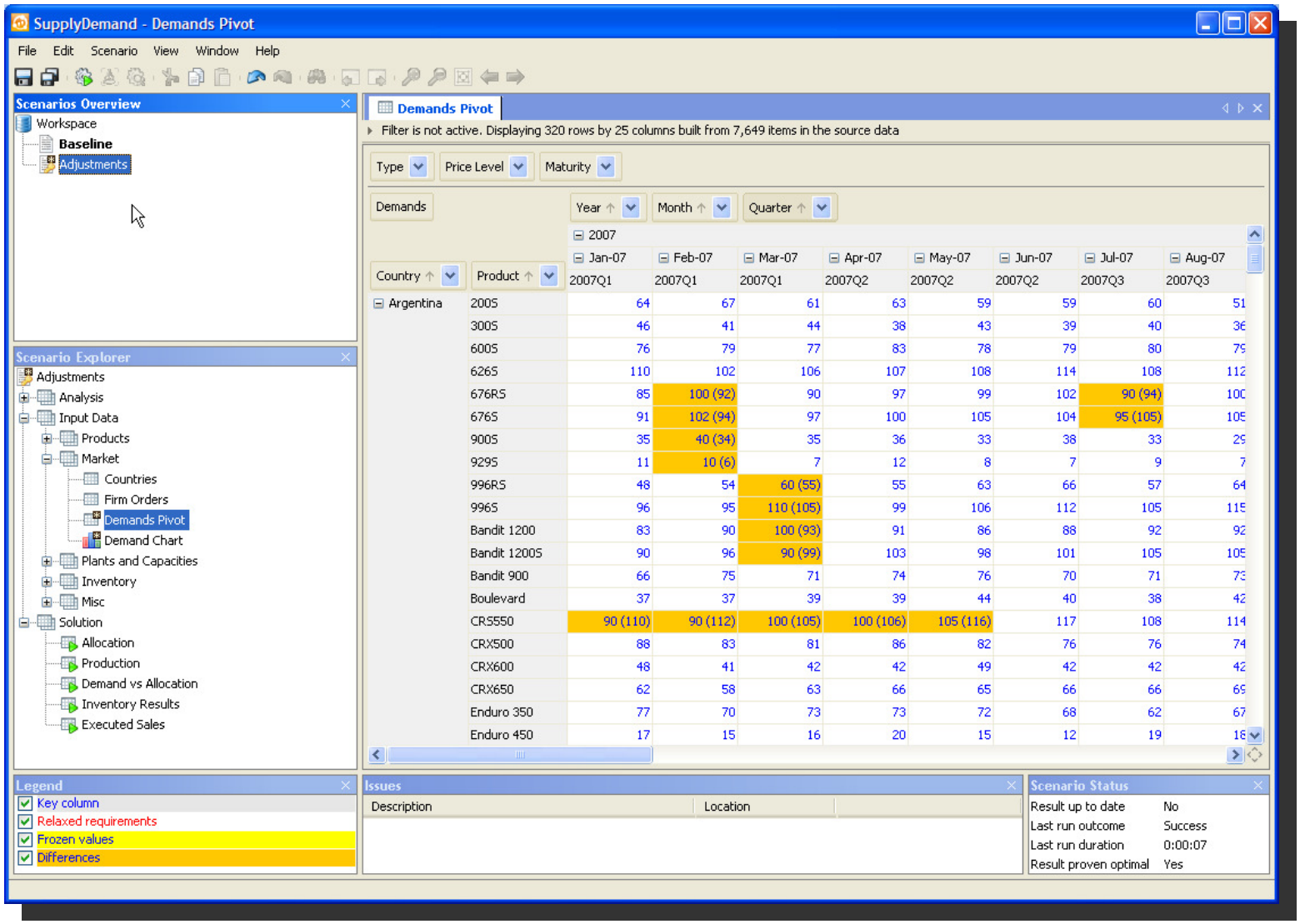
Displays using Simple Tables and Charts



Business Goals and Plan Overview w/ Charts



Pivot Tables and Scenario Comparison



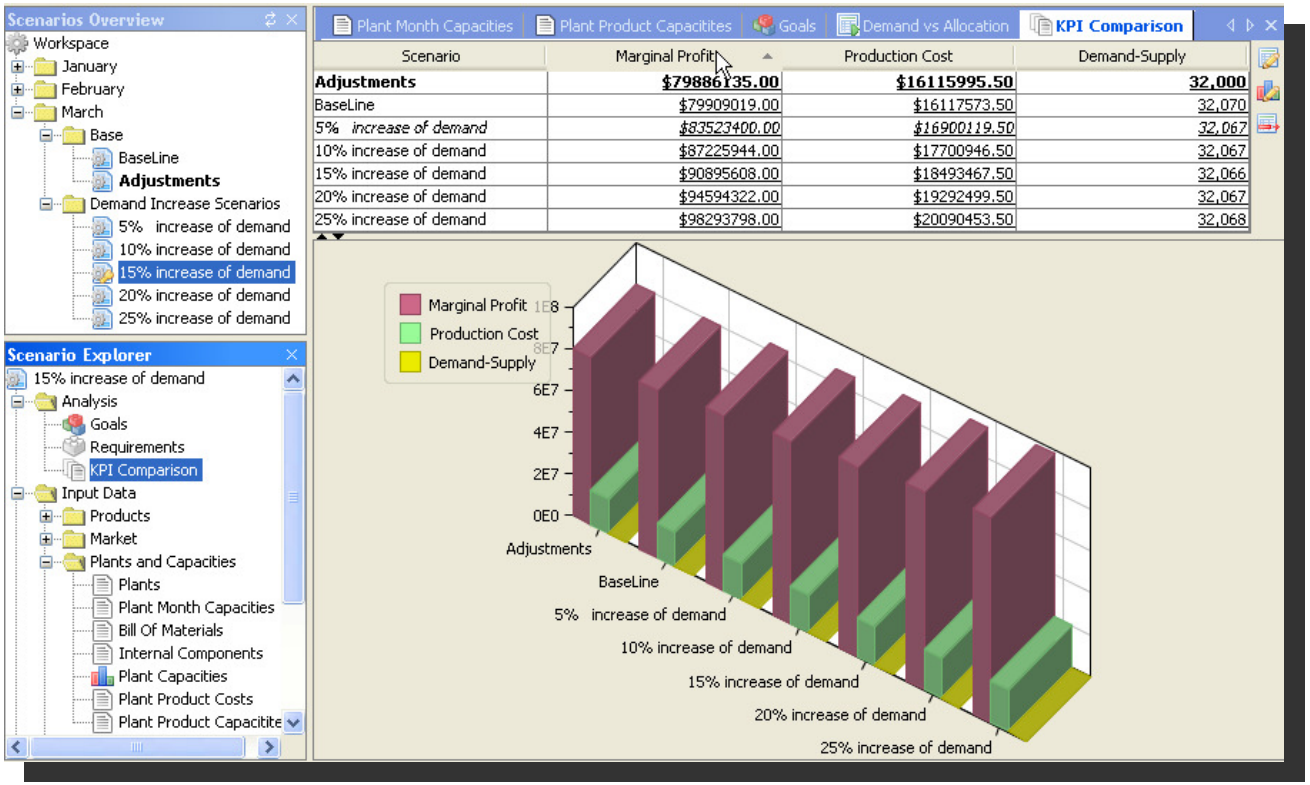
From Scenario Comparison to Sensitivity Analysis

Pair-wise Scenario Comparison

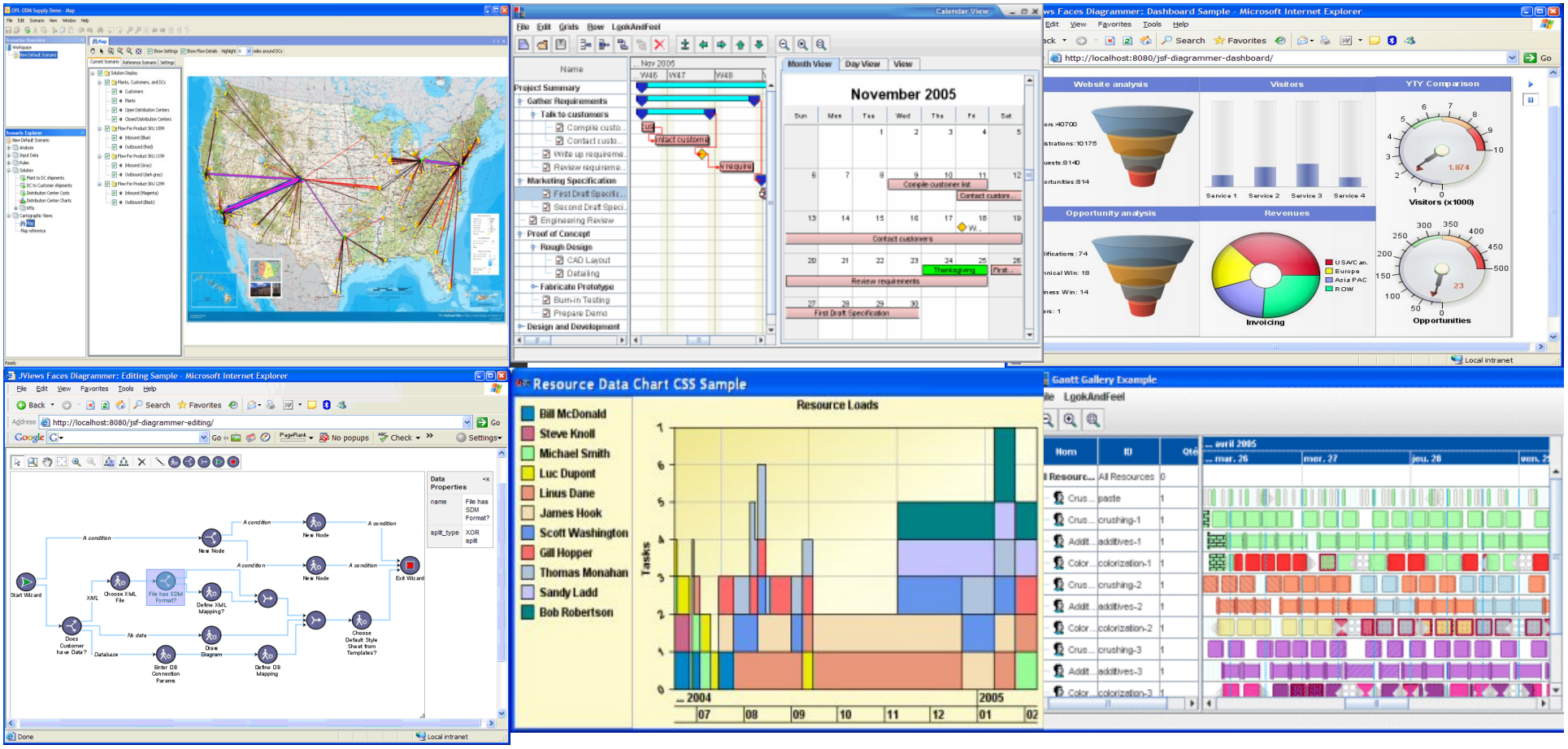
- Detailed inputs and outputs,
- KPIs.

Multi-Scenario Comparison

- Goals,
- KPIs.



Extensible with Custom Views



Optimizing Business Goals

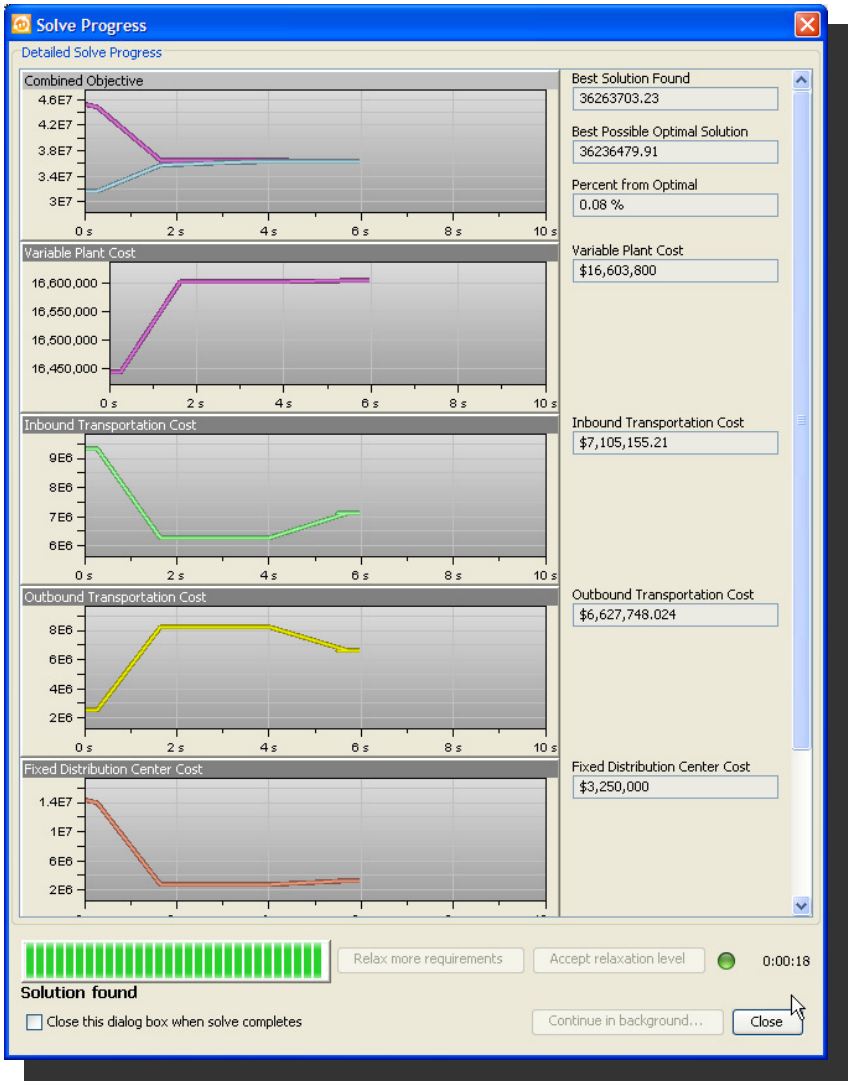
- Manage conflicting business goals
  - Effective trade-offs & goal balancing
  - Upper/lower limits, goal weights
  - Drill-downs for detailed cost analysis

Goal Name	Value	Active	Importance Factor	Constrained
Variable Plant Cost	$16,603,800	☑	1	✓
Inbound Transportation Cost	$7,105,155.21	☑	1	
Outbound Transportation Cost	$6,627,748.024	☑	1	
Fixed Distribution Center Cost	$3,250,000	☑	1	
Variable Distribution Center Cost	$2,677,000	☑	1	

Name	Value
Constraints	**Variable Plant Cost**
Constrain max to	15,000
Constrain min to	
With priority	Medium
Bound Searches	
Best bound	
Worst bound	
Ignoring priorities under	

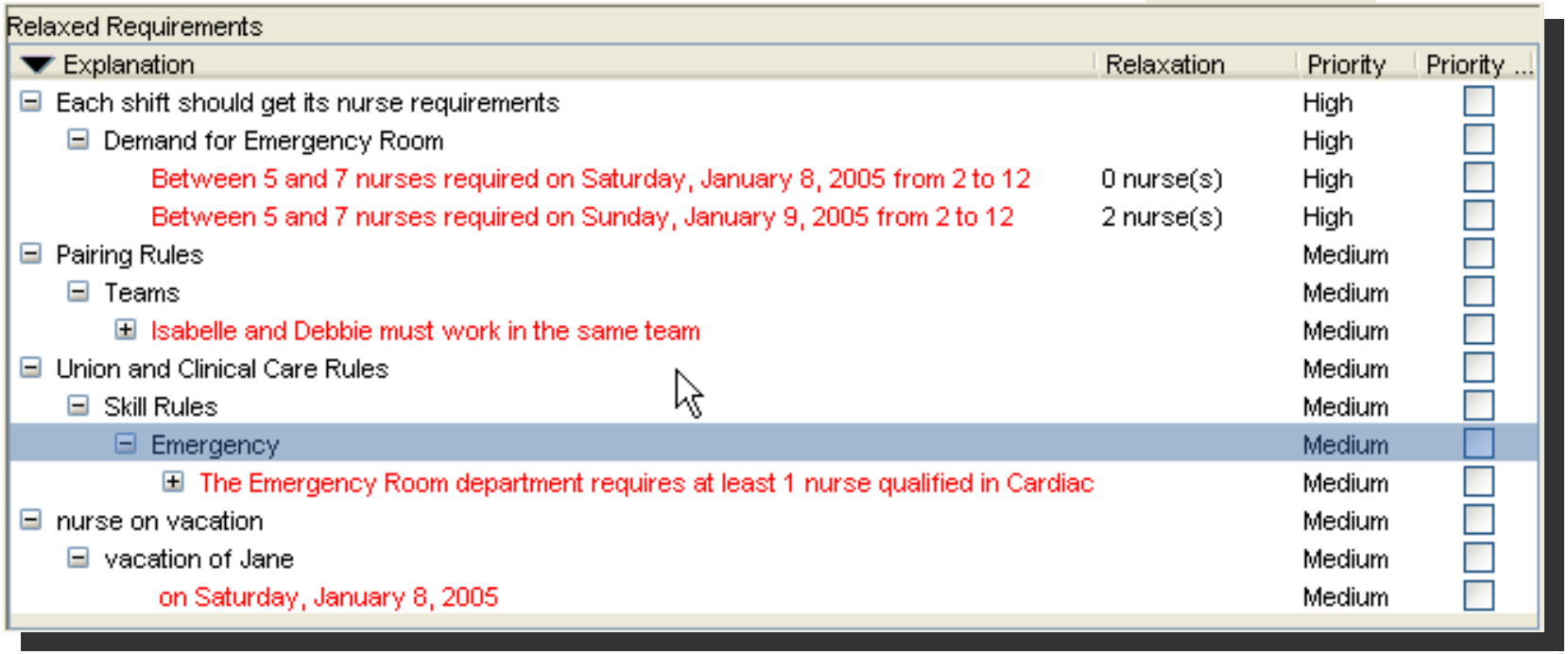
Very Low
Low
Medium Low
Medium
Medium High
High
Very High
Mandatory

Name	Value
Variable Plant Cost	$16,603,800
Denver	$9,040,900
SKU 1099	$5,918,400
SKU 1199	$1,619,600
SKU 1299	$1,502,900
Philadelphia	$7,562,900
SKU 1099	$5,659,500
SKU 1199	$782,400
SKU 1299	$1,121,000

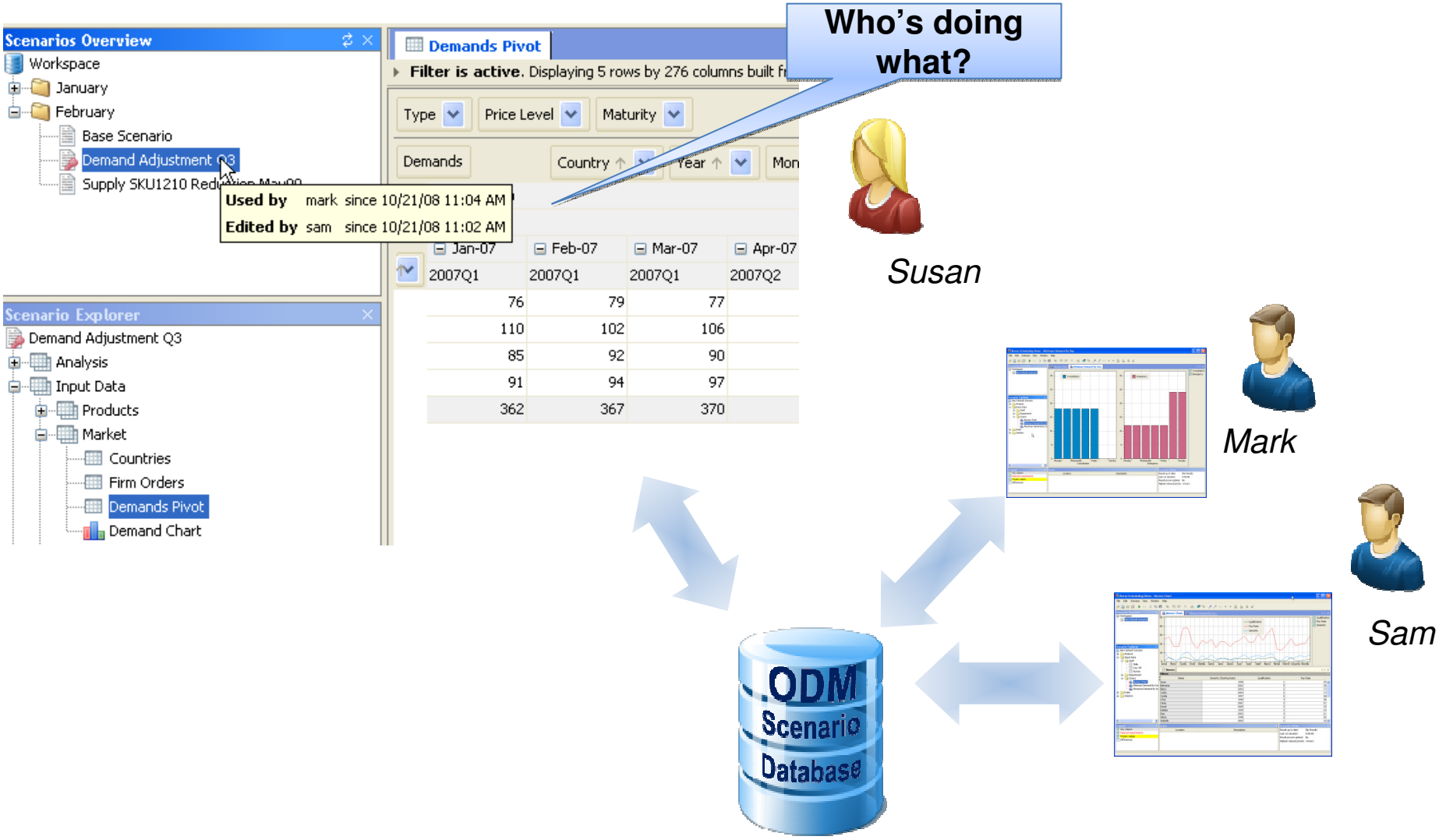


Controlled Relaxations of Constraints

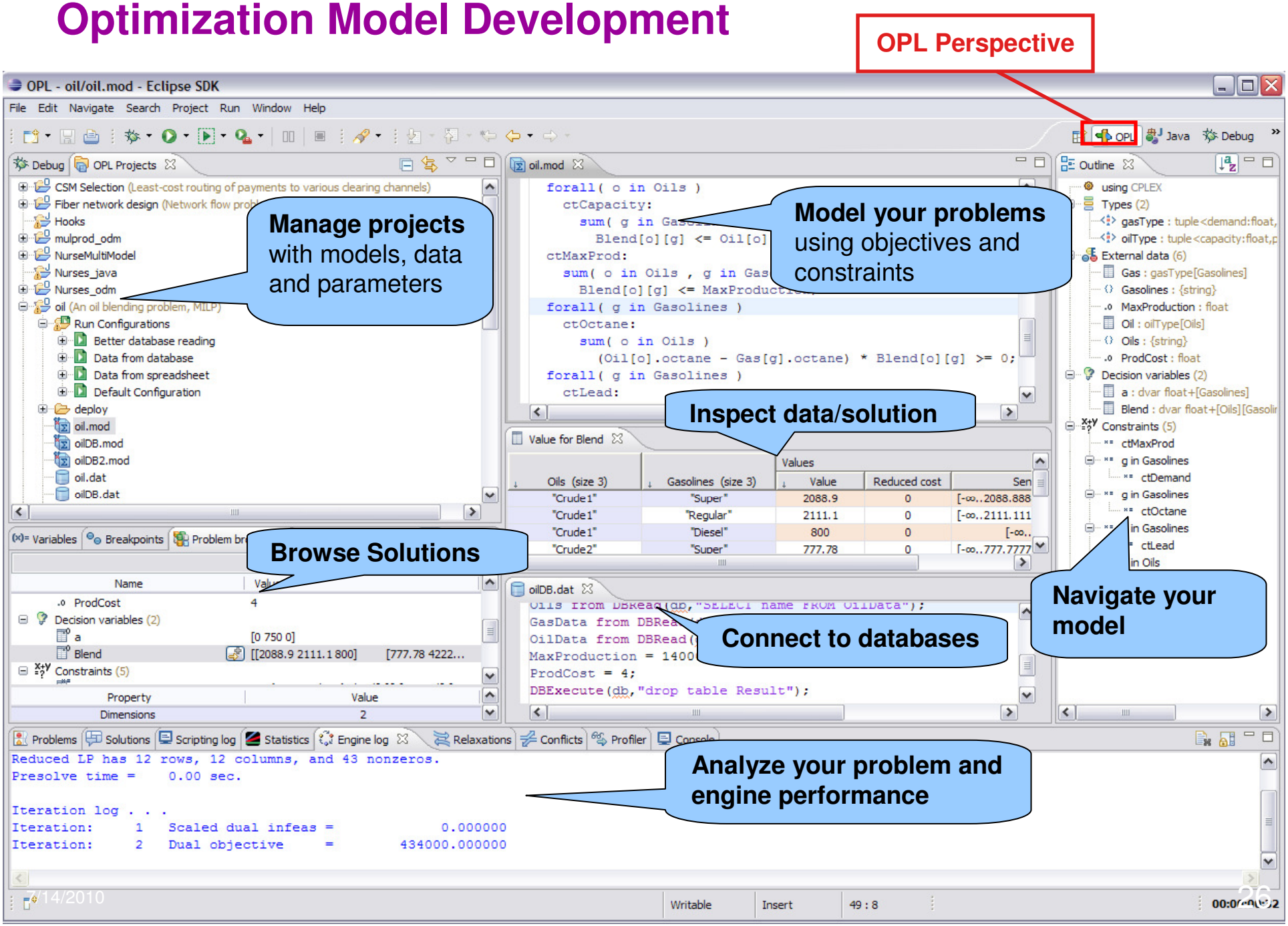
- Automatically relax constraints based on business priority
- Display relaxed constraints in groups and allow trade-offs



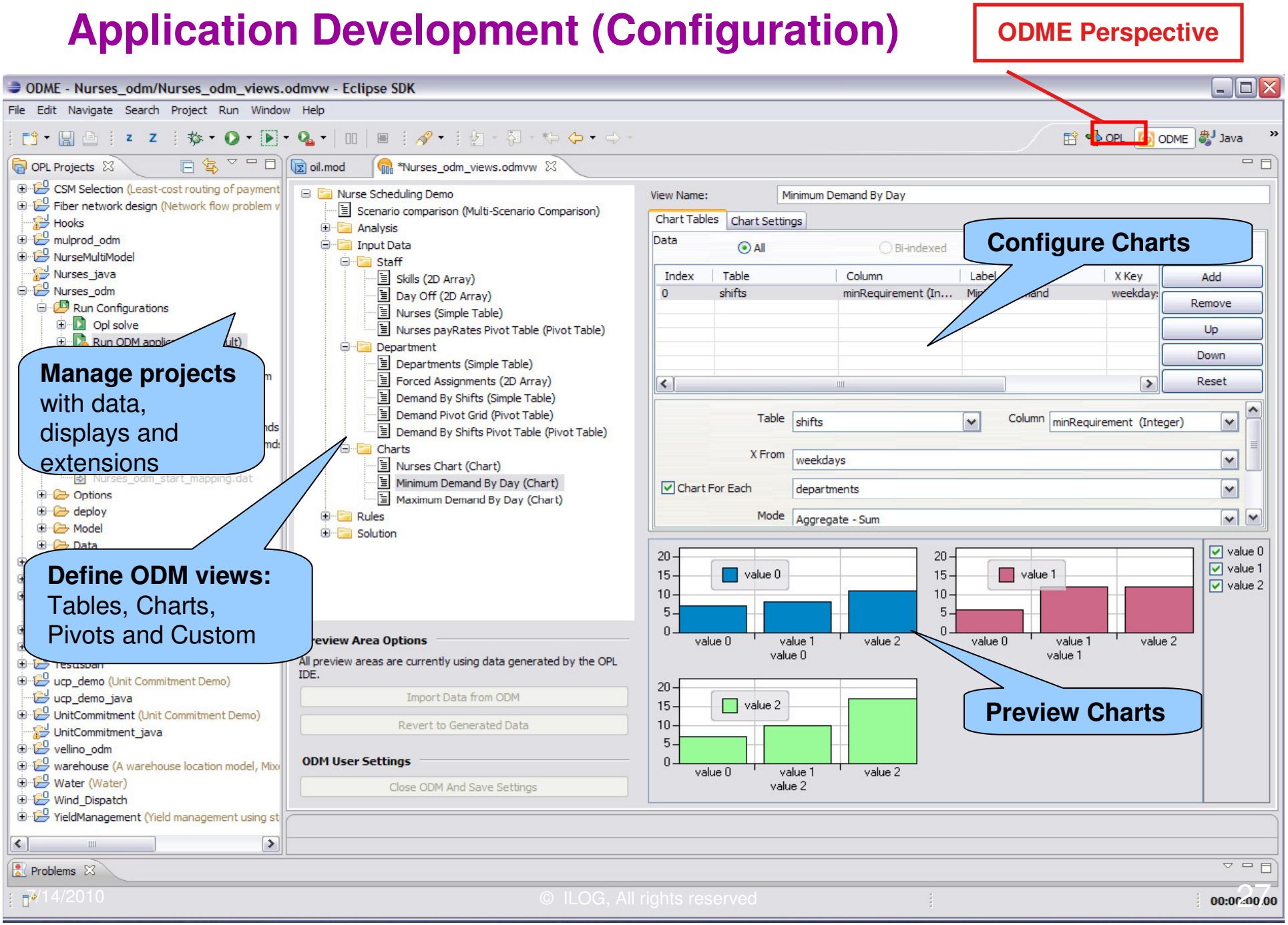
Collaborative Planning User View



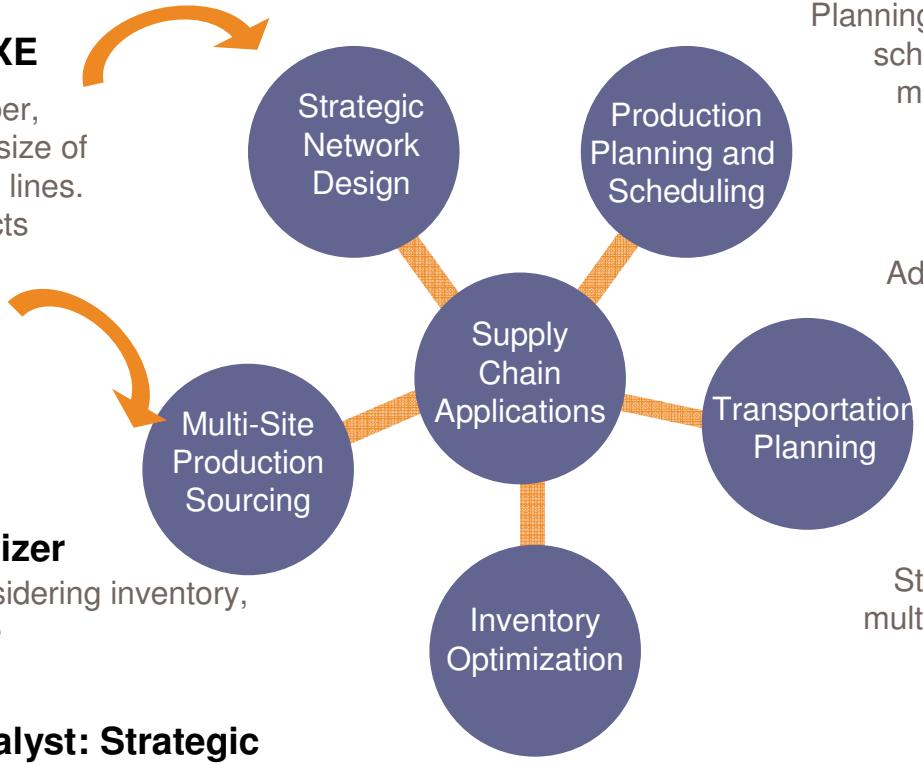
Optimization Model Development



Application Development (Configuration)



ILOG LogicTools Suite



LogicNet Plus XE

Determine optimal number, location, territories, and size of warehouses, plants, and lines. Determine where products should be made.

Plant PowerOps

Planning and detailed finite scheduling for process manufacturing plants

Transport PowerOps

Advanced routing optimization engine for on-going use.

Product Flow Optimizer

Determine best flow considering inventory, transportation, and mode

Transportation Analyst

Strategic routing for fleet sizing, multi-stops, backhauls, and more.

Inventory Analyst: Strategic

Determine push/pull locations, buffer locations, postponement, and policy analysis

Inventory Analyst: Tactical

Maintain the correct inventory levels on an on-going basis

LogicNet Plus and SAP

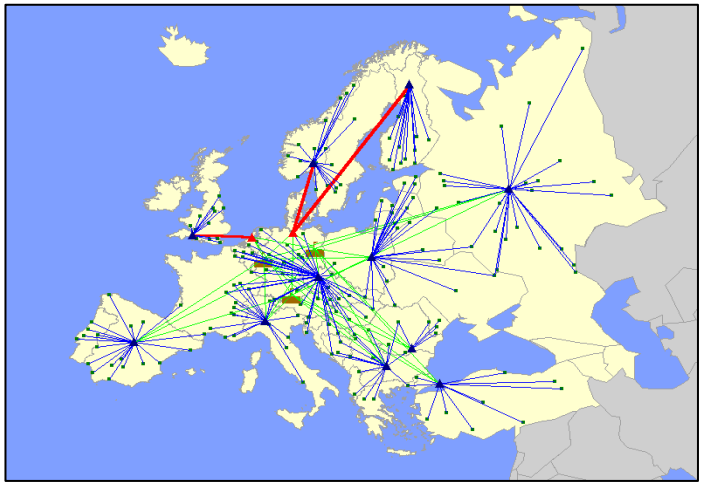
- Recognized as only SAP partner for Network design
  - LogicNet Plus integration with SAP APO is certified in November 2003
  - SAP software partner since January 2004
- Inventory Analyst™ is Powered by SAP NetWeaver
  - Certified in April 2005
  - "Safety Stock Optimizer 1.0" xApp certified in April 2007
- Joint Marketing:
  - Exhibited as part of the SAP SCM booth at Sapphire 2004, 2005
  - GM presented for LogicTools on Inventory Optimization Panel
- Thought Leadership:
  - Chapter in Claus Heinrich book “RFID and beyond”
  - Article with Claus Heinrich in SCMR “Do IT investments pay off?”
- Complementary Products
  - *LogicNet Plus* provides SAP users with the ability to determine the optimal structure of the supply chain (number and locations of plants, lines, warehouses, and information on what the territories should be for each)
  - *Inventory Analyst* provides SAP users with strategic multi-echelon inventory calculations to determine where inventory should be positioned. It is also a nice complement to network design

Product Suite Overview

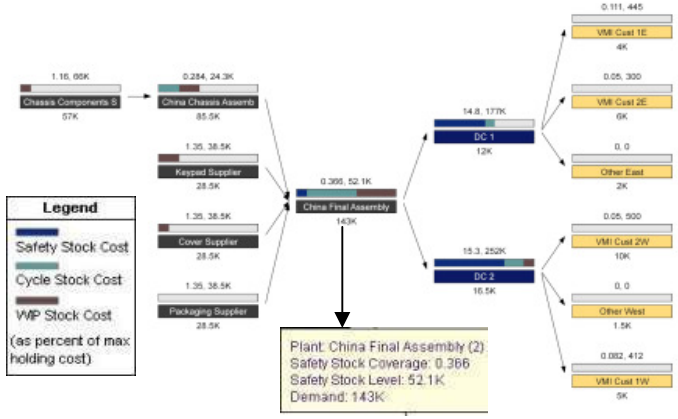
LogicNet PlusXe®

Inventory Analyst™
Global Inventory Optimization

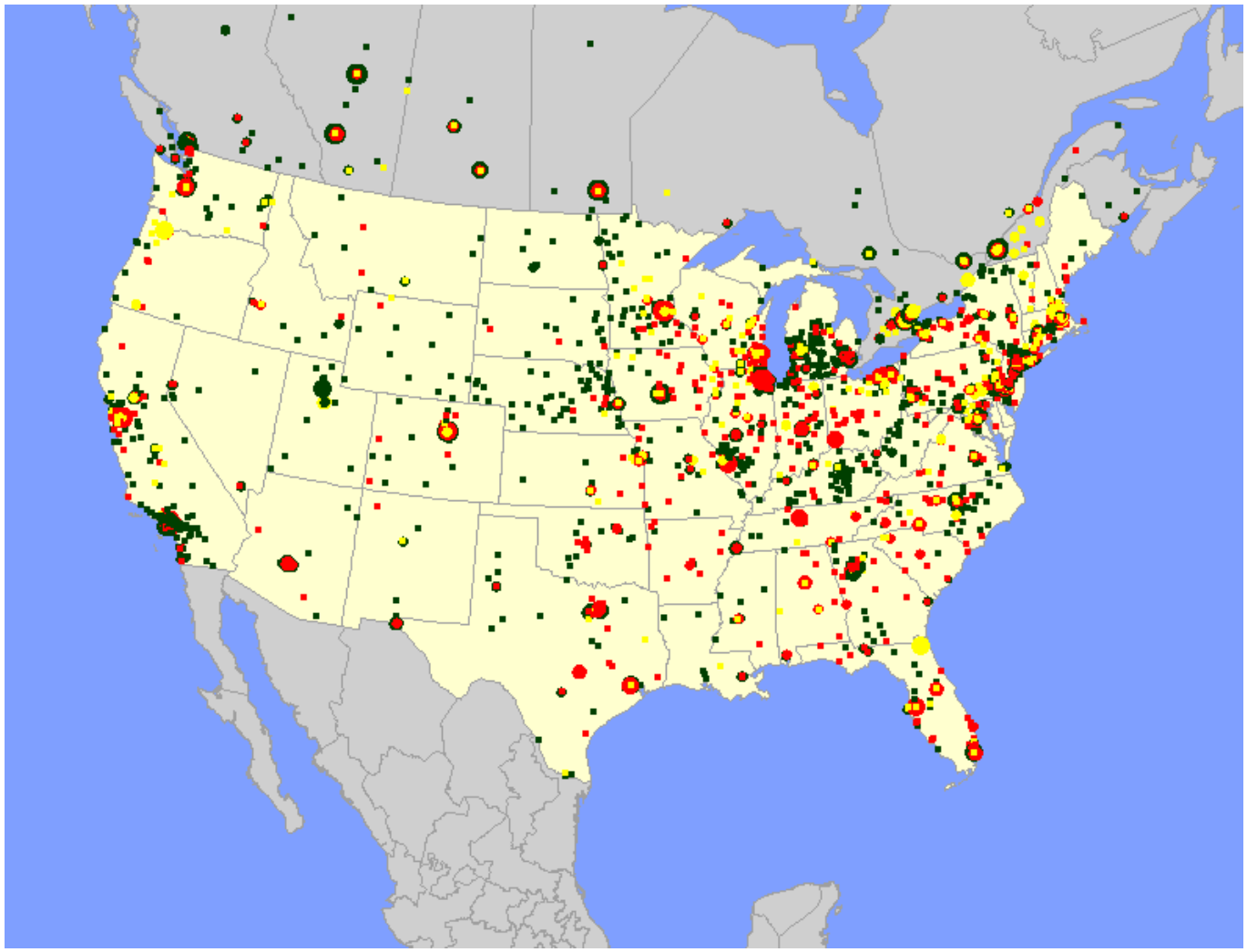
- Strategic Network Design: Helps companies optimize their physical supply chain



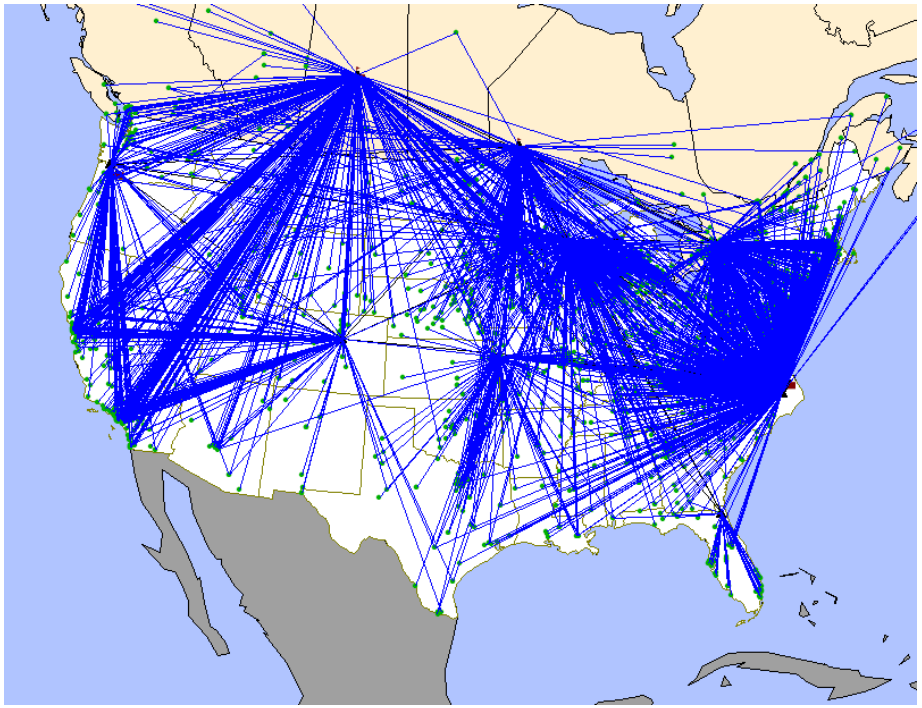
- *Multi-Echelon Inventory Optimization: Helps companies optimize their inventory levels throughout their supply chain*

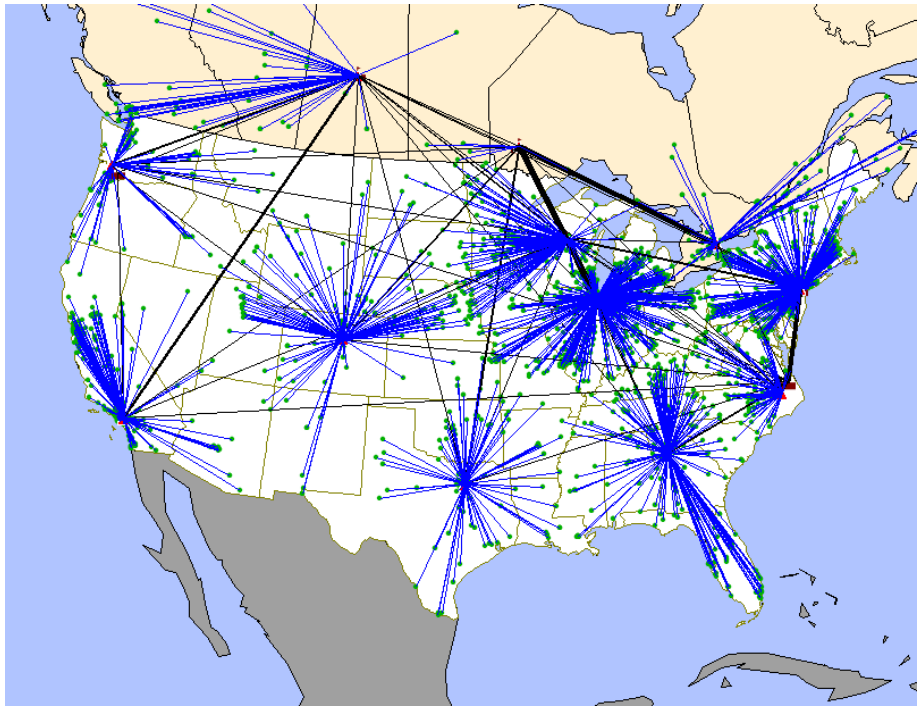


Visualize the Supply Chain



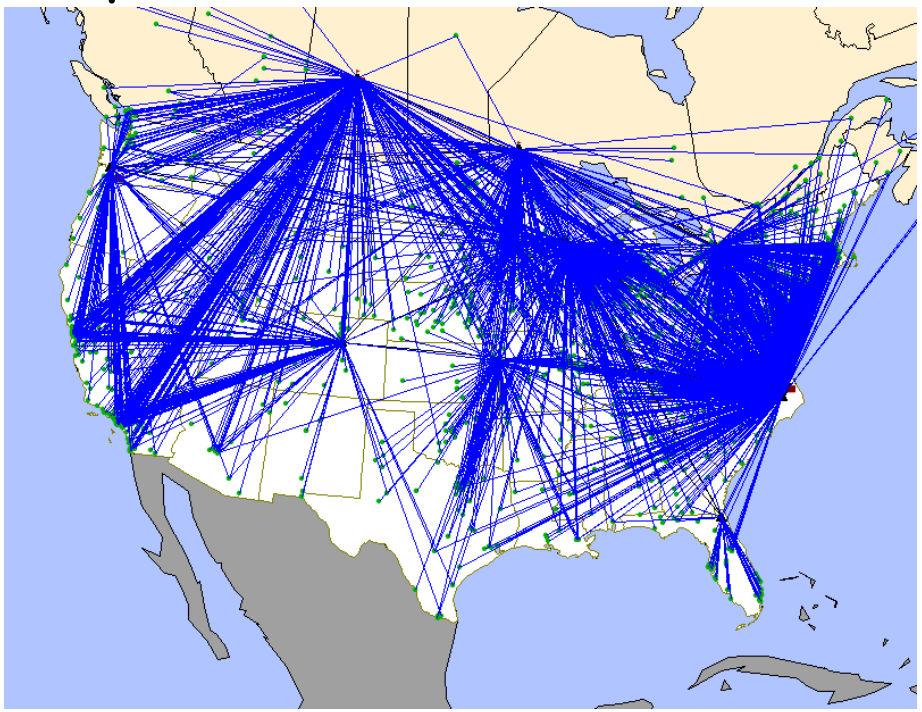
Compare Scenarios





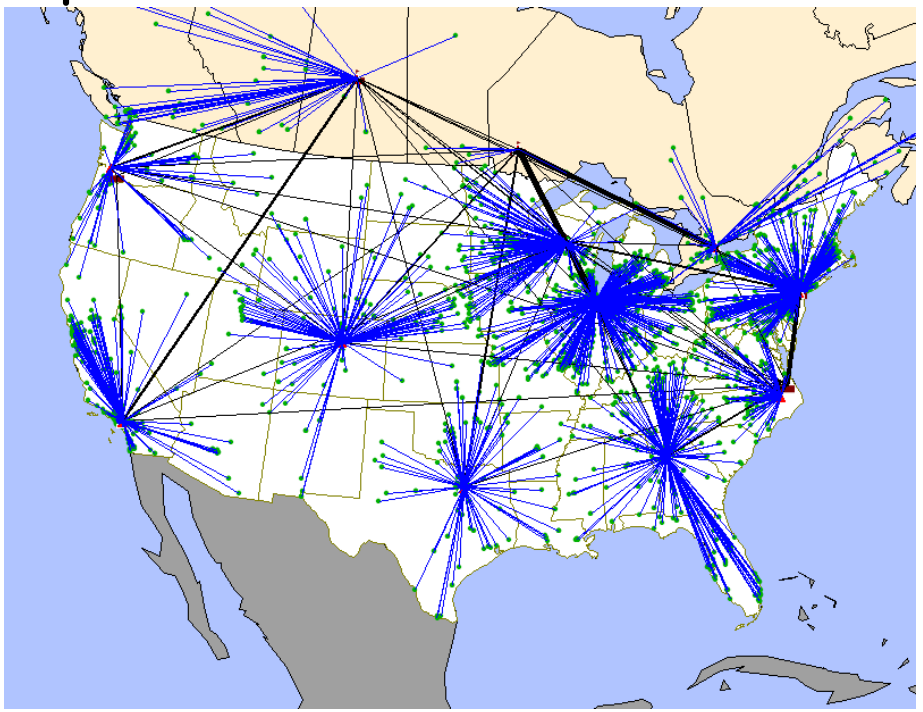
Making the Trade-Off Between Service and Cost

Optimal Network For Cost



Savings: $6 million
Service: 40% next day

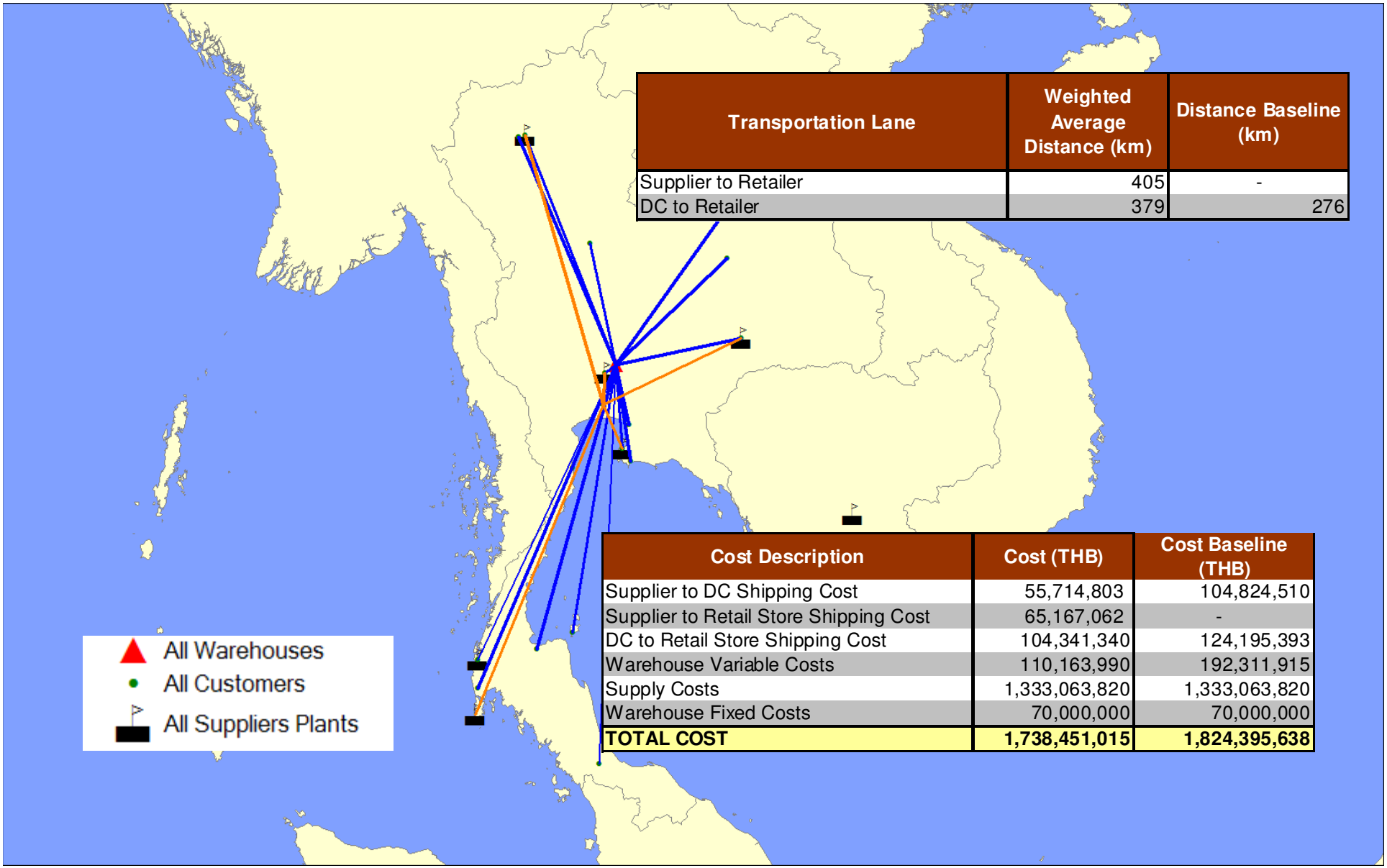
Optimal Network For Service



Savings: $3 million
Service: 80% next day

Which is Better?

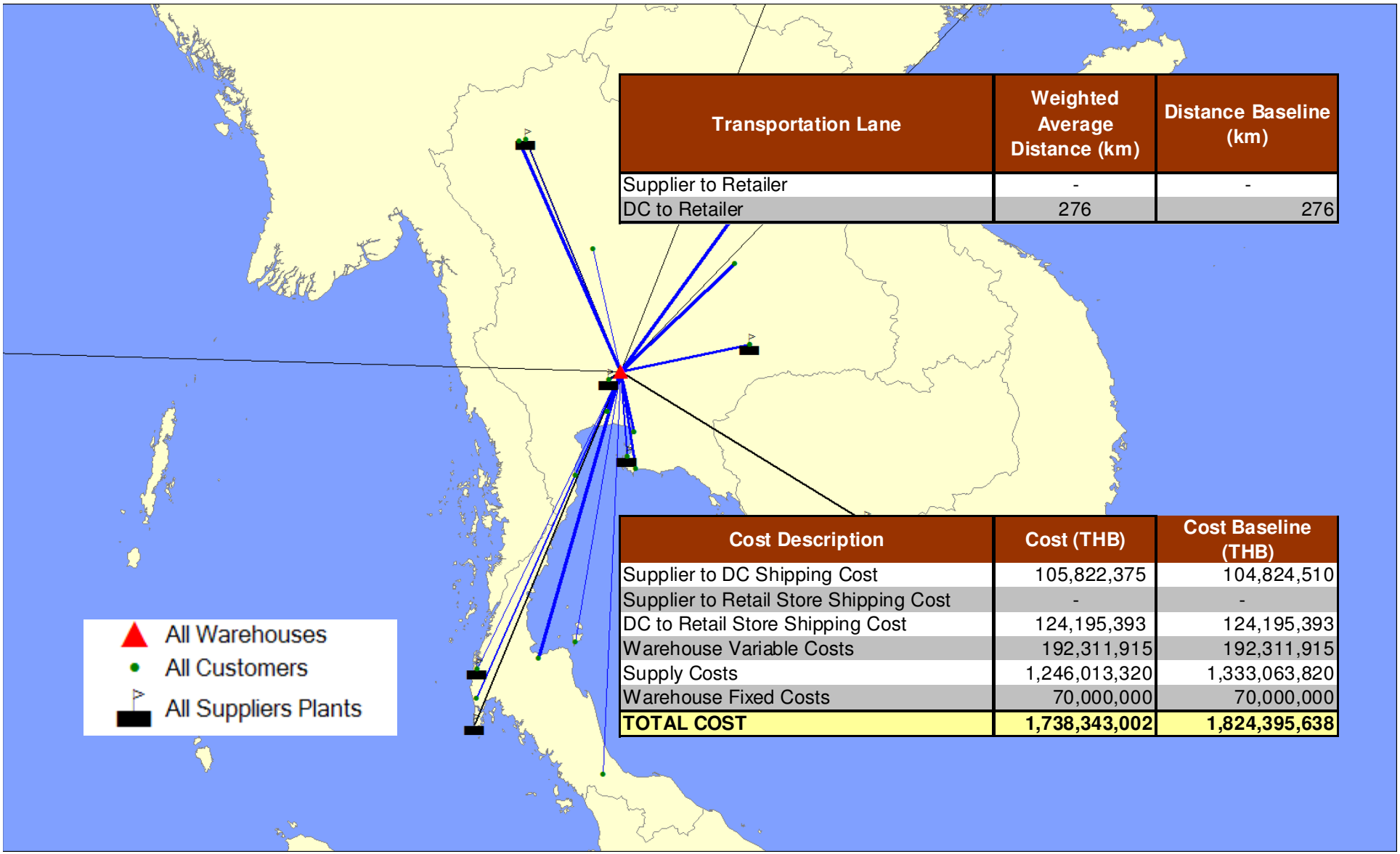
Direct Shipments to BKK (Orange Lines)



Transportation Lane	Weighted Average Distance (km)	Distance Baseline (km)
Supplier to Retailer	405	-
DC to Retailer	379	276

Cost Description	Cost (THB)	Cost Baseline (THB)
Supplier to DC Shipping Cost	55,714,803	104,824,510
Supplier to Retail Store Shipping Cost	65,167,062	-
DC to Retail Store Shipping Cost	104,341,340	124,195,393
Warehouse Variable Costs	110,163,990	192,311,915
Supply Costs	1,333,063,820	1,333,063,820
Warehouse Fixed Costs	70,000,000	70,000,000
TOTAL COST	**1,738,451,015**	**1,824,395,638**

Mattress sourced from Cambodia



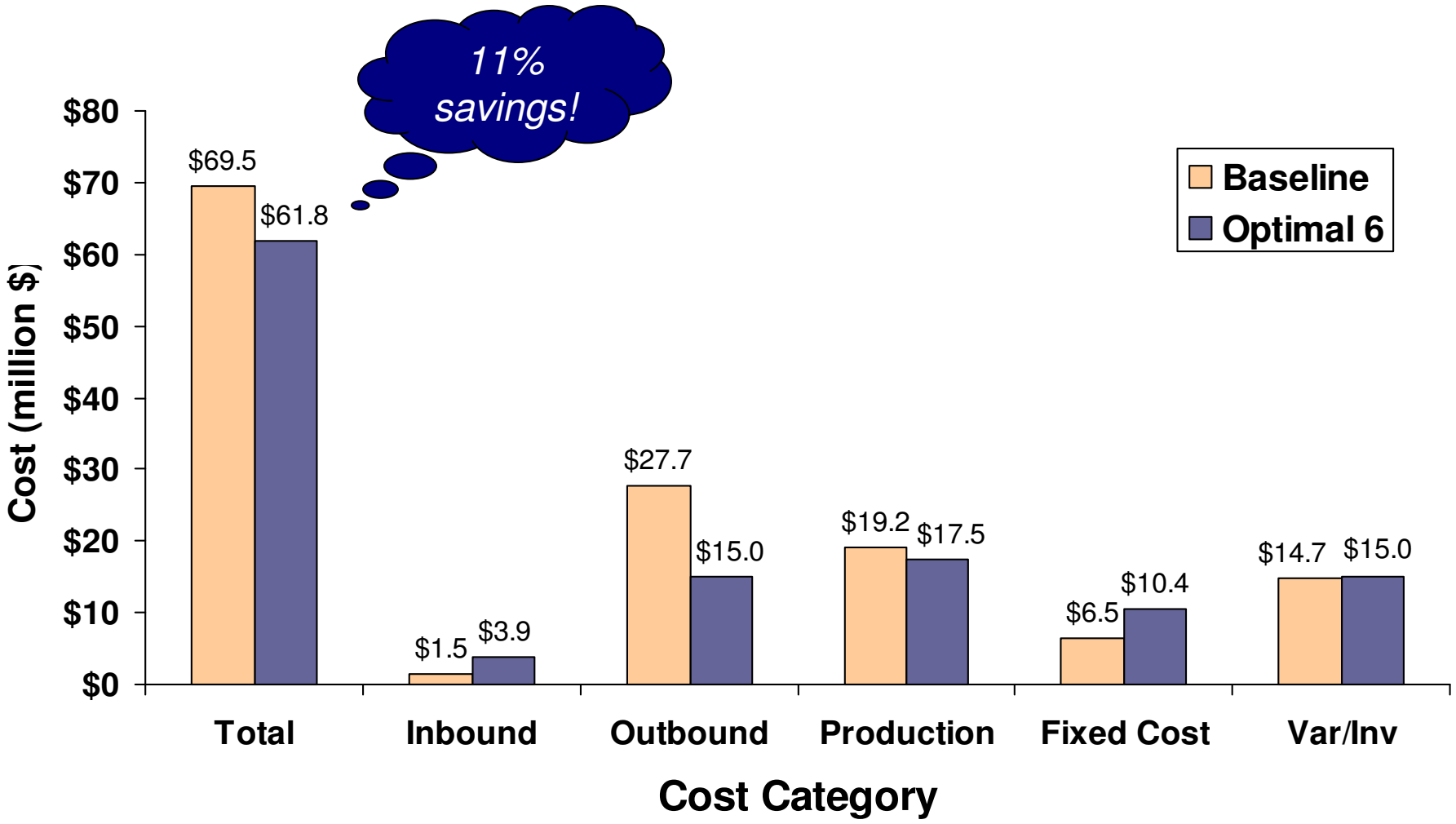
Transportation Lane	Weighted Average Distance (km)	Distance Baseline (km)
Supplier to Retailer	-	-
DC to Retailer	276	276

Cost Description	Cost (THB)	Cost Baseline (THB)
Supplier to DC Shipping Cost	105,822,375	104,824,510
Supplier to Retail Store Shipping Cost	-	-
DC to Retail Store Shipping Cost	124,195,393	124,195,393
Warehouse Variable Costs	192,311,915	192,311,915
Supply Costs	1,246,013,320	1,333,063,820
Warehouse Fixed Costs	70,000,000	70,000,000
TOTAL COST	**1,738,343,002**	**1,824,395,638**

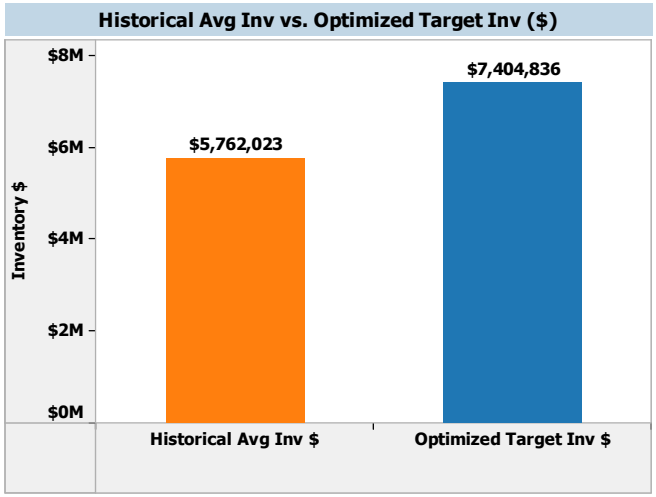
Overall Comparison

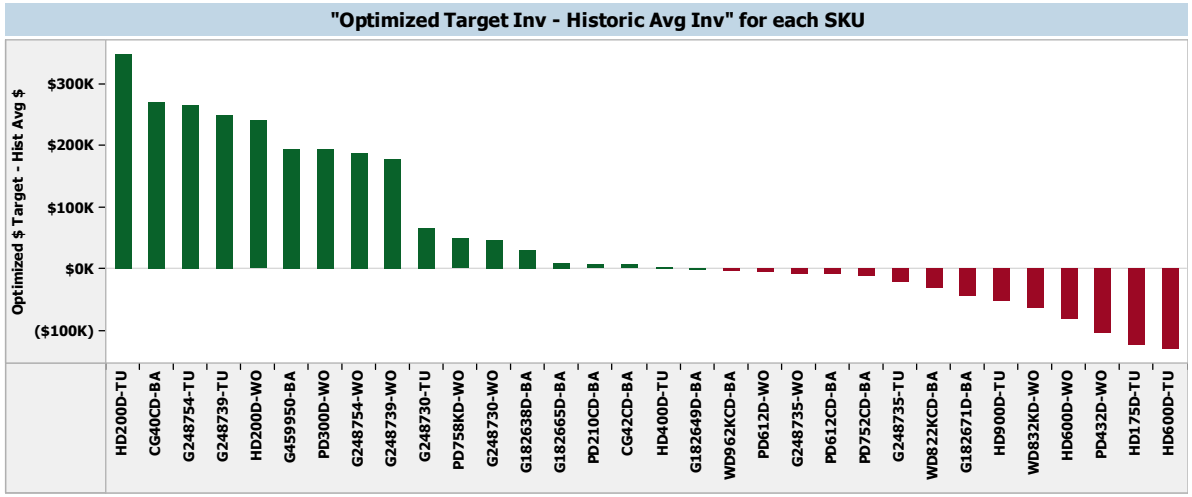
Cost	Baseline	Direct Shipment to BKK	Second DC in South	Mattress From Cambodia
Sourcing Costs	1,333,063,820	1,333,063,820	1,333,063,820	1,246,013,320
Transportation Cost	229,019,903	225,223,205	214,796,834	230,017,768
Warehouse Cost	262,311,915	180,163,990	245,914,872	262,311,915
TOTAL COST	**1,824,395,638**	**1,738,451,015**	**1,793,775,526**	**1,738,343,002**
Percent Reduction		**4.94%**	**1.71%**	**4.95%**

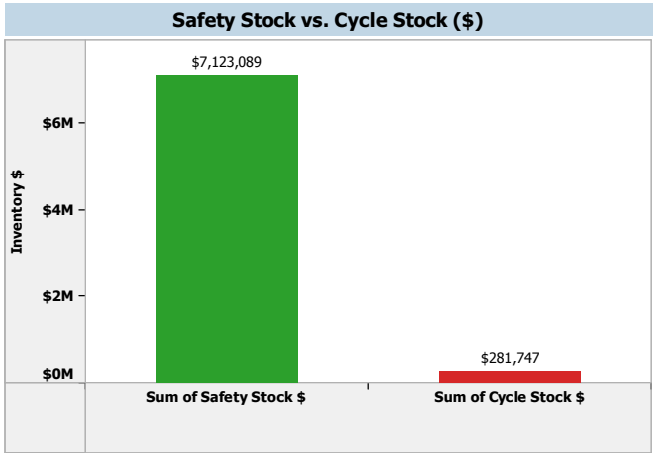
Example of Cost Breakdown

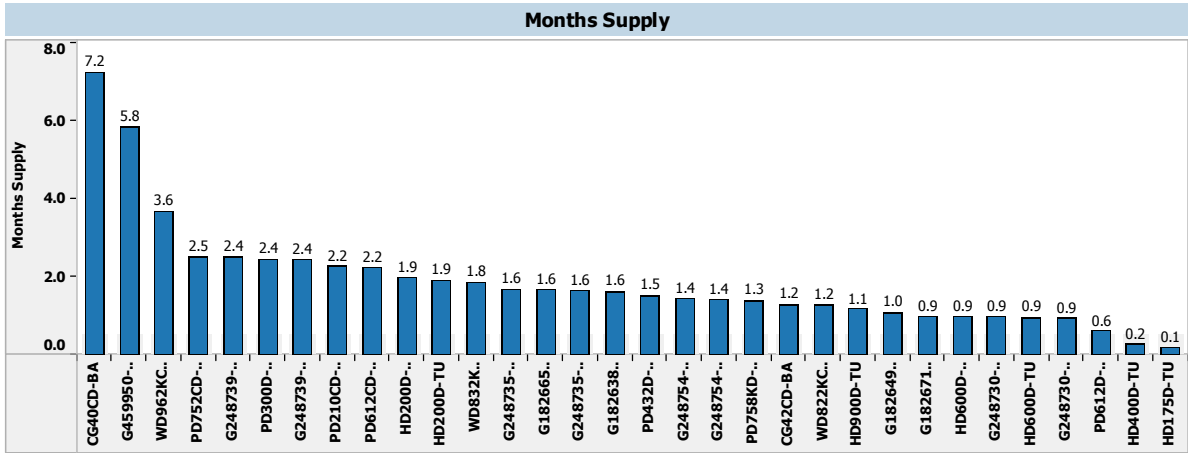


Current Inventory Levels vs. Optimized Inventory Levels









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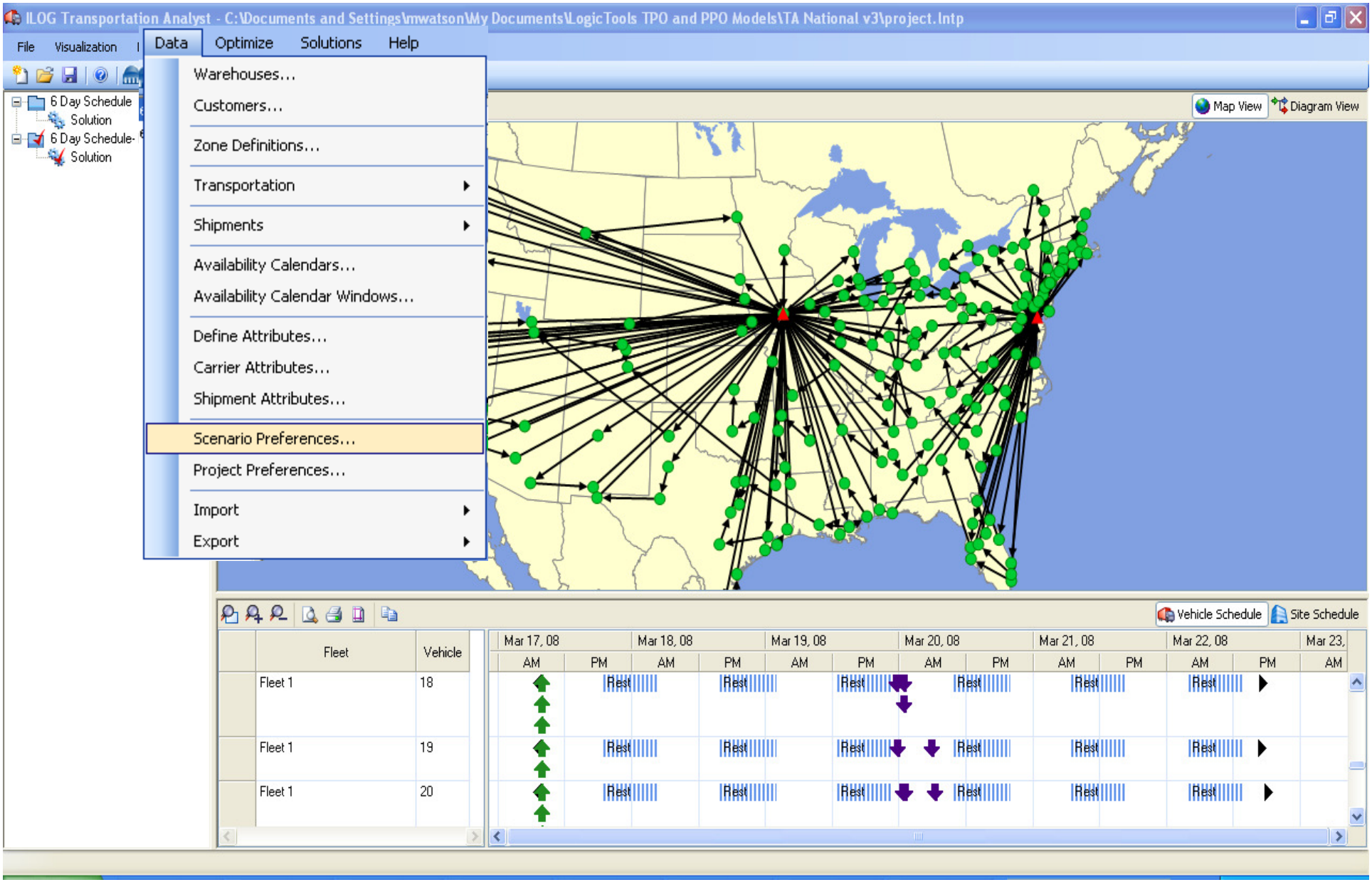
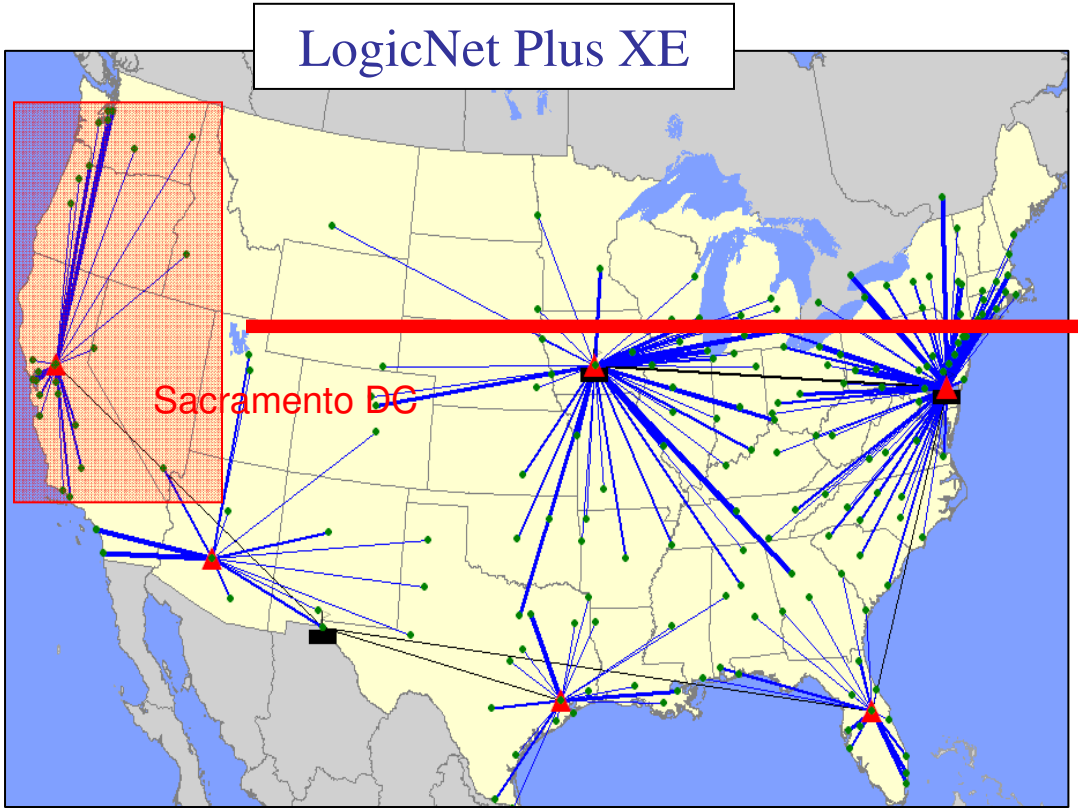
Detailed Output Showing Safety Stock by Product

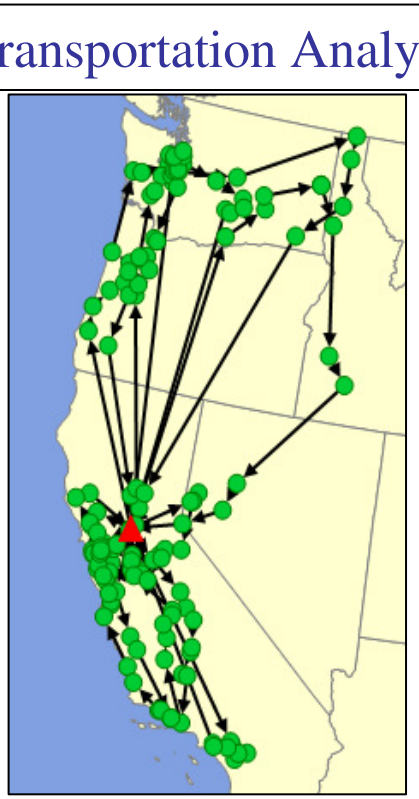
Warehou...	Product	Planning Period	Demand	Forecast Error	Cycle Service Level	Fill Rate (%)	Incoming Service Time	Base Stock Level	Reorder Point	Safety Stock Level	Safety Stock Holding Cost	Cycle Stock Level	Cycle Stock Holding Cost
APRDC	A111	Avg Wk	696	407.29	97.5	99.5	7	3,522.93		1,434.93	2,870.09	696	1,392.11
APRDC	A112	Avg Wk	79.75	30.69	96.49	99.5	7	344.12		104.87	209.75	79.75	159.51
APRDC	A113	Avg Wk	187	76.62	96.64	99.5	7	823.35		262.35	524.75	187	374.03
APRDC	A114	Avg Wk	198.5	84.03	96.79	99.5	7	883.86		288.36	576.76	198.5	397.03
APRDC	A115	Avg Wk	861.75	345.47	96.64	99.5	7	3,768.04		1,182.78	2,365.75	861.75	1,723.63
APRDC	A116	Avg Wk	227.75	79.26	96.25	99.5	7	953.72		270.47	540.98	227.75	455.54
APRDC	A117	Avg Wk	2,357.75	919	96.56	99.5	7	10,217.59		3,144.34	6,289.17	2,357.75	4,715.86
APRDC	A118	Avg Wk	645.75	252.46	96.56	99.5	7	2,800.63		863.38	1,726.90	645.75	1,291.60
APRDC	A119	Avg Wk	549.5	193.46	96.25	99.5	7	2,308.24		659.74	1,319.59	549.5	1,099.08
APRDC	B120	Avg Wk	291.25	103.7	96.33	99.5	7	1,227.75		354	708.06	291.25	582.54
APRDC	B121	Avg Wk	344	113.25	96.08	99.5	7	1,418.59		386.59	773.24	344	688.05
APRDC	B122	Avg Wk	15,948.75	4,852.4	95.91	99.5	7	64,453.01		16,606.76	33,216.08	15,948.75	31,899.95
APRDC	B123	Avg Wk	336	110.06	96.08	99.5	7	1,384.08		376.08	752.22	336	672.05
APRDC	B124	Avg Wk	1,697.5	546.64	96	99.5	7	6,958.78		1,866.28	3,732.84	1,697.5	3,395.26
APRDC	B125	Avg Wk	2,468.75	730.11	95.82	99.5	7	9,907.55		2,501.3	5,002.99	2,468.75	4,937.88
APRDC	B126	Avg Wk	419	184.48	96.86	99.5	7	1,891.19		634.19	1,268.48	419	838.06
APRDC	B127	Avg Wk	207.5	61.16	95.82	99.5	7	832.19		209.69	419.42	207.5	415.03
APRDC	B128	Avg Wk	322	83.59	95.45	99.5	7	1,255.66		289.66	579.36	322	644.05
APRDC	B129	Avg Wk	556.75	216.27	96.56	99.5	7	2,409.41		739.16	1,478.44	556.75	1,113.59
APRDC	B130	Avg Wk	27.5	11.71	96.79	99.5	7	122.73		40.23	80.47	27.5	55.00
APRDC	B131	Avg Wk	174.75	67.98	96.56	99.5	7	756.54		232.29	464.61	174.75	349.53
APRDC	B132	Avg Wk	103	34.62	96.17	99.5	7	427.21		118.21	236.44	103	206.02
APRDC	B133	Avg Wk	16.25	5.97	96.41	99.5	7	69.15		20.4	40.80	16.25	32.50
APRDC	B134	Avg Wk	27	9.42	96.25	99.5	7	113.13		32.13	64.26	27	54.00
APRDC	B135	Avg Wk	31	11.67	96.41	99.5	7	132.82		39.82	79.65	31	62.00

Product Suite : ILOG Transport Analyst



From Network (LNP) to Transport Analysts (TA)

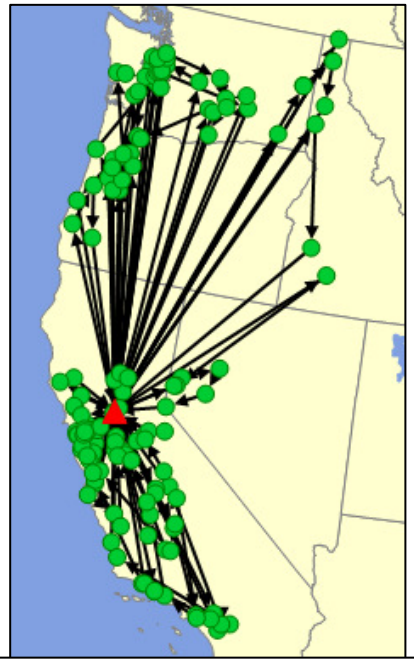




Annual Snapshot
Total Weight Delivered = 19MM lbs
- Avg. Week 375K lbs
Total Transportation Cost = $1.5MM
- Avg Week $28.6K per week

Typical Week
Total Weight Delivered = 380K lbs
Total Transportation Cost = $29.4K
- Within 3% of LNP Weekly Avg

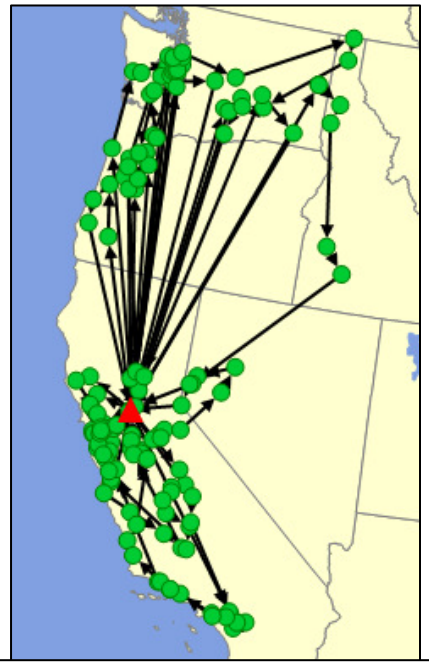
Shipment Routing Evaluation



Each Customer is promised delivery on a specific day (5 Time Windows)

	Value
Number of Vehicles	21
Total Distance	34,386
Deadhead Distance	11,621
TOTAL COST	$88,301

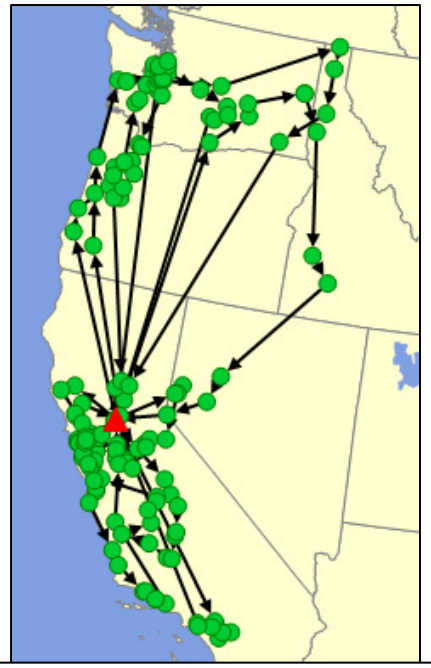
37% Savings



Each customer is promised delivery during a portion of the week (2 Time Windows)

	Value
Number of Vehicles	13
Total Distance	21,320
Deadhead Distance	5,595
TOTAL COST	$55,877

+ 30% Savings



Deliveries can be made at any point throughout the week (1 Time Window)

	Value
Number of Vehicles	6
Total Distance	11,001
Deadhead Distance	1,489
TOTAL COST	$29,369

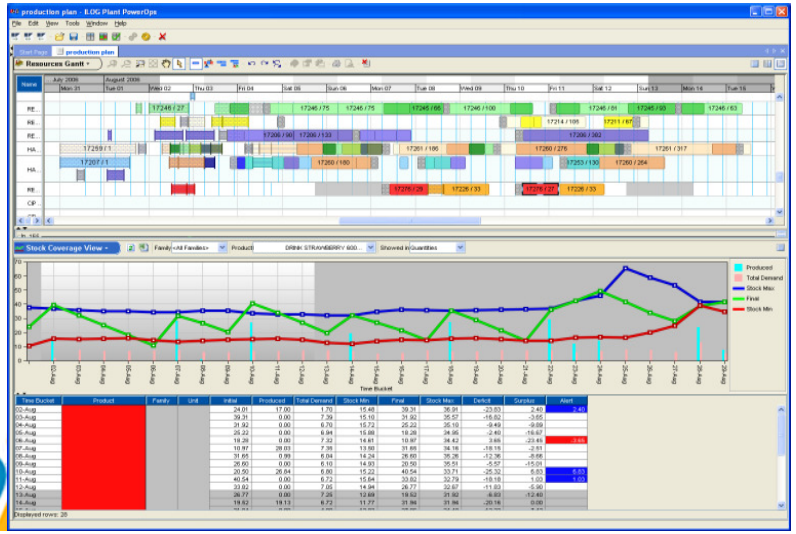
ILOG Plant PowerOps

Integrated planning and scheduling solution for the process industry

- **FMCG**
  - **Fresh dairy**
  - **Tobacco**
  - **Chocolate, Candies**
  - **Biscuits**
  - **Baby food**
  - **Beer, Soda**
- **Pharmaceutical**
  - **Biotech**
  - **Pharmaceutical**
- **Chemicals**
  - **Consumer chemicals**
  - **Cosmetics**
  - **Industrial chemicals**
- **Electronics**
  - **Media/Semiconductor**

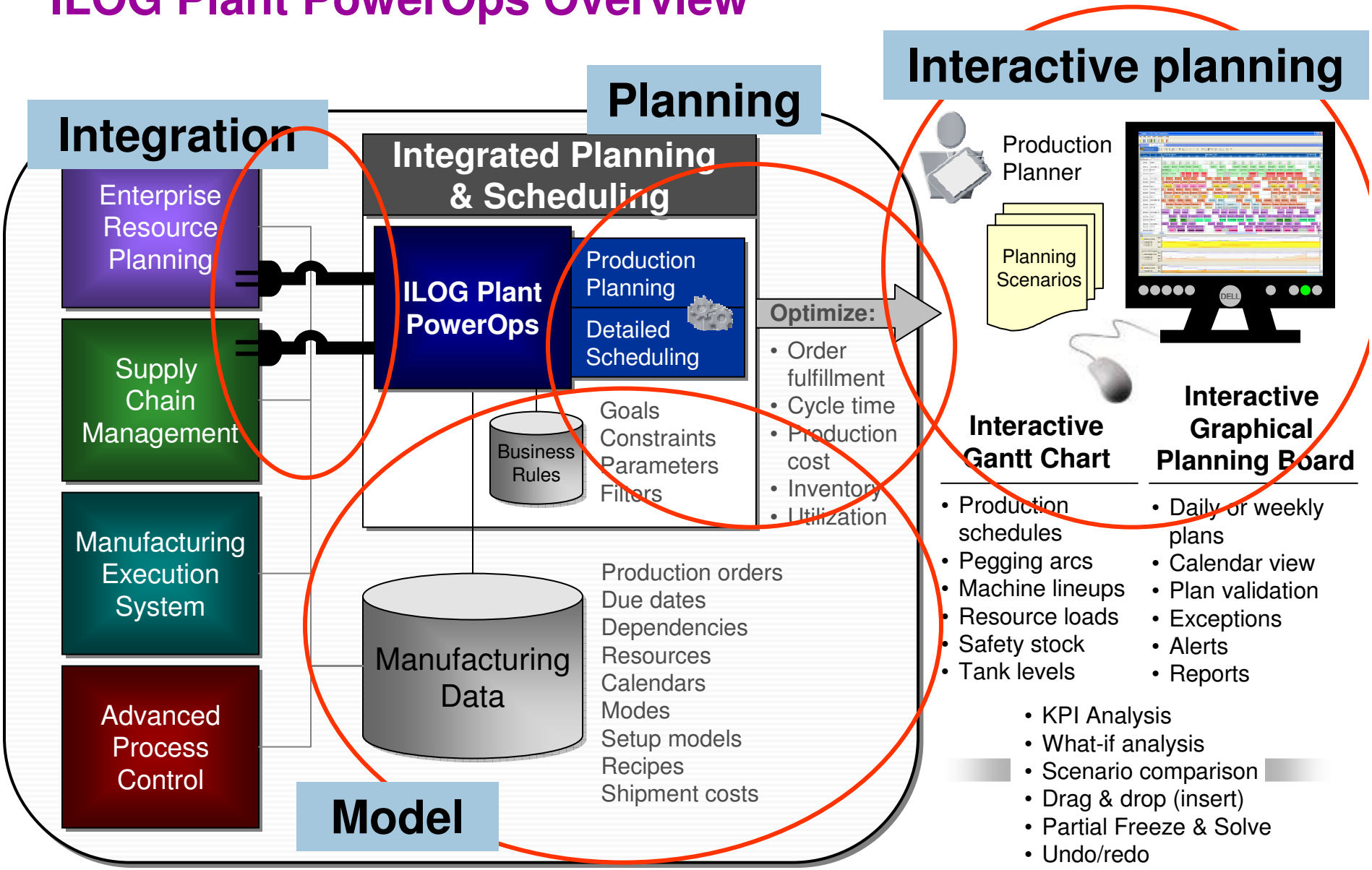
- High demand variability
- Complex manufacturing process
- Focus on performance management and cost control
- Product mix changes, new product introduction, phase out
- Complex product quality issues

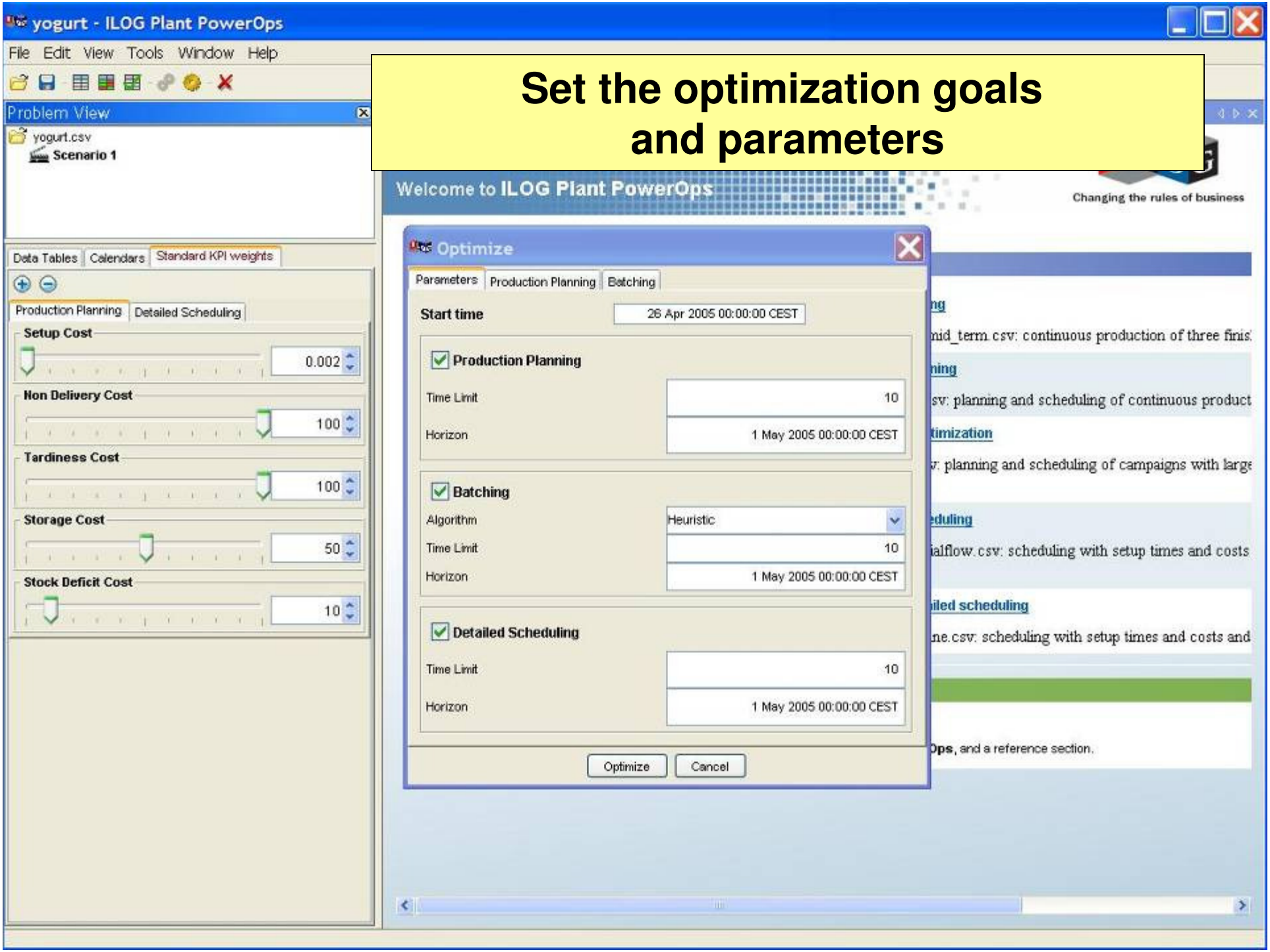
- Models key manufacturing constraints
- Designed as a decision support system
- Strength on optimization and performance analysis
- Integration in IT landscape



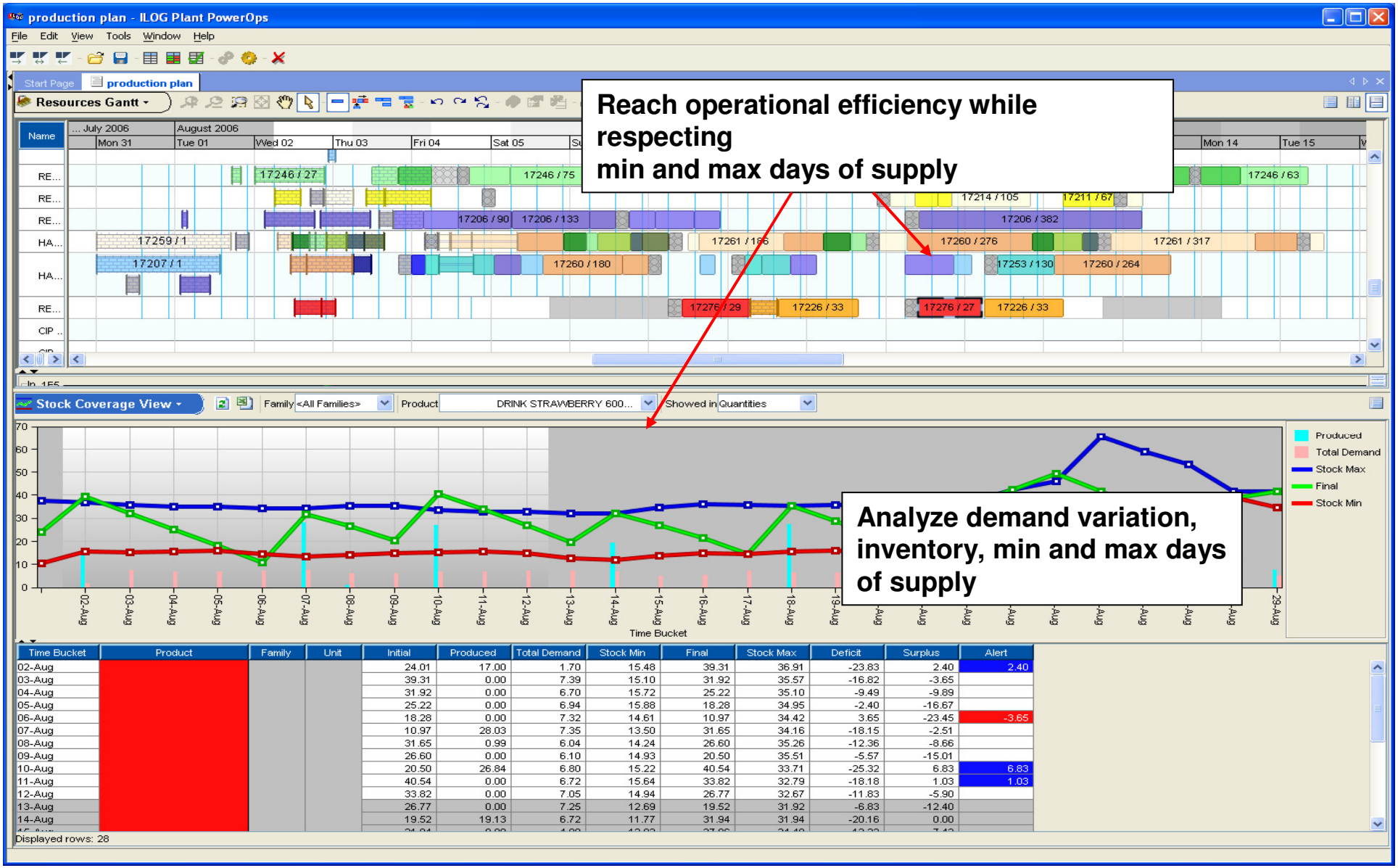
IBM Software
Impact2010
Comes to You

ILOG Plant PowerOps Overview



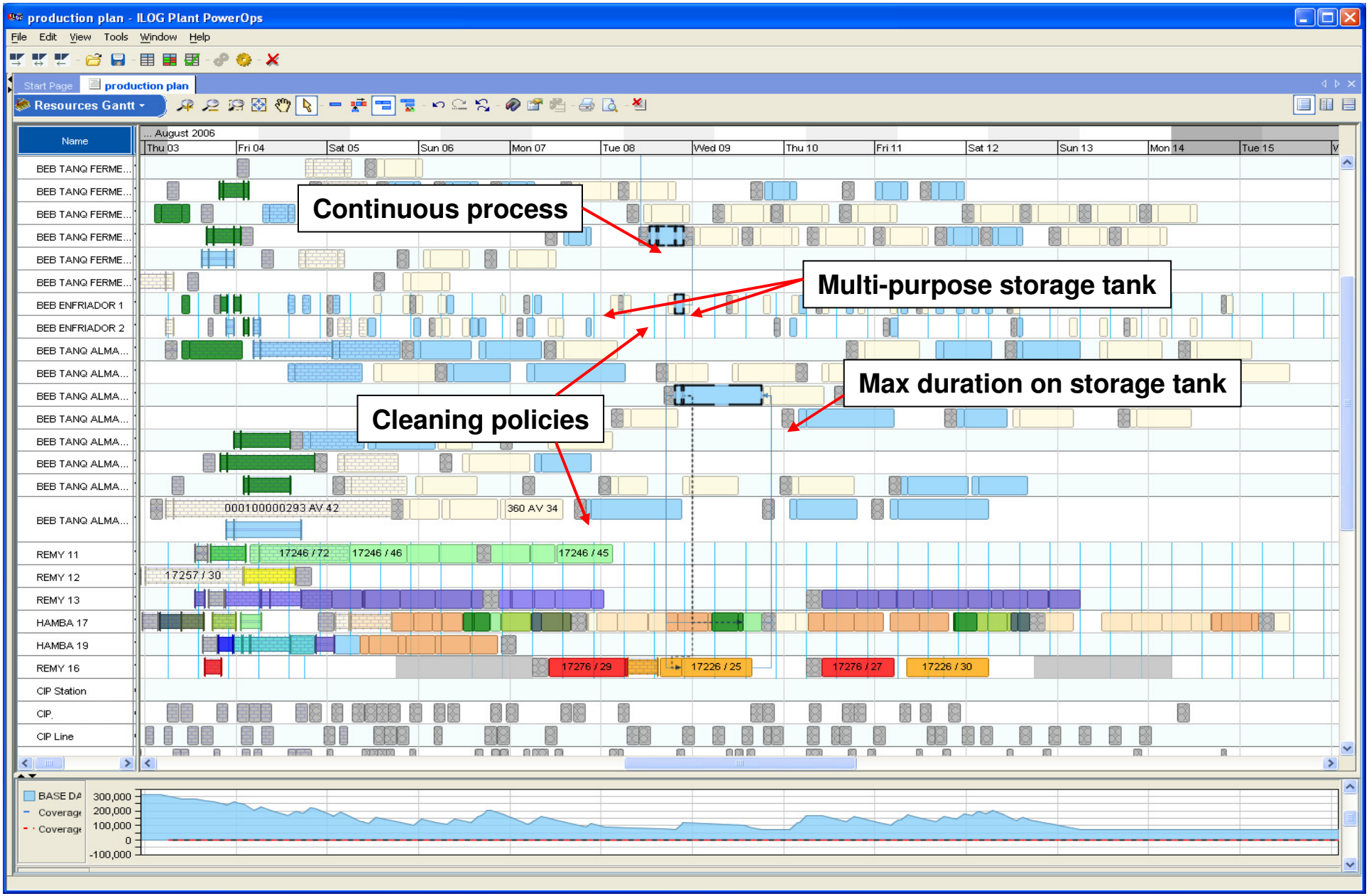

yogurt - ILOG Plant PowerOps
File Edit View Tools Window Help
Problem View
yogurt.csv
Scenario 1
Data Tables
Calendars
Standard KPI weights
Production Planning
Detailed Scheduling
Setup Cost
0.002
Non Delivery Cost
100
Tardiness Cost
100
Storage Cost
50
Stock Deficit Cost
10
Set the optimization goals and parameters
Welcome to ILOG Plant PowerOps
Changing the rules of business
Optimize
Parameters
Production Planning
Batching
Start time
26 Apr 2005 00:00:00 CEST
Production Planning
Time Limit
10
Horizon
1 May 2005 00:00:00 CEST
Batching
Algorithm
Heuristic
Time Limit
10
Horizon
1 May 2005 00:00:00 CEST
Detailed Scheduling
Time Limit
10
Horizon
1 May 2005 00:00:00 CEST
Optimize
Cancel

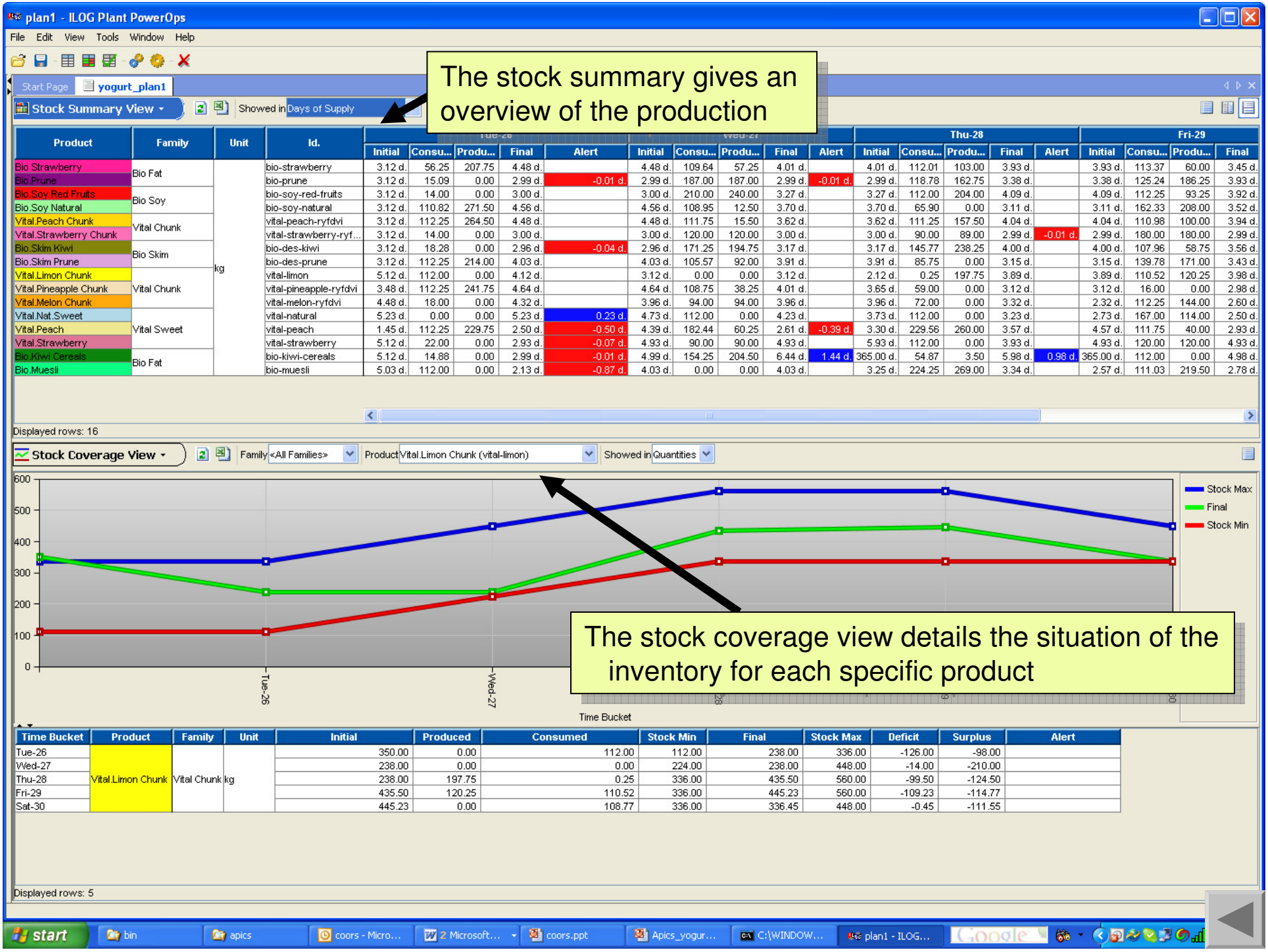
Integrated Planning and Scheduling



Time Bucket	Product	Family	Unit	Initial	Produced	Total Demand	Stock Min	Final	Stock Max	Deficit	Surplus	Alert
02-Aug				24.01	17.00	1.70	15.48	39.31	36.91	-23.83	2.40	2.40
03-Aug				39.31	0.00	7.39	15.10	31.92	35.57	-16.82	-3.65	
04-Aug				31.92	0.00	6.70	15.72	25.22	35.10	-9.49	-9.89	
05-Aug				25.22	0.00	6.94	15.88	18.28	34.95	-2.40	-16.67	
06-Aug				18.28	0.00	7.32	14.61	10.97	34.42	3.65	-23.45	-3.65
07-Aug				10.97	28.03	7.35	13.50	31.65	34.16	-18.15	-2.51	
08-Aug				31.65	0.99	6.04	14.24	26.60	35.26	-12.36	-8.66	
09-Aug				26.60	0.00	6.10	14.93	20.50	35.51	-5.57	-15.01	
10-Aug				20.50	26.84	6.80	15.22	40.54	33.71	-25.32	6.83	6.83
11-Aug				40.54	0.00	6.72	15.64	33.82	32.79	-18.18	1.03	1.03
12-Aug				33.82	0.00	7.05	14.94	26.77	32.67	-11.83	-5.90	
13-Aug				26.77	0.00	7.25	12.69	19.52	31.92	-6.83	-12.40	
14-Aug				19.52	19.13	6.72	11.77	31.94	31.94	-20.16	0.00	

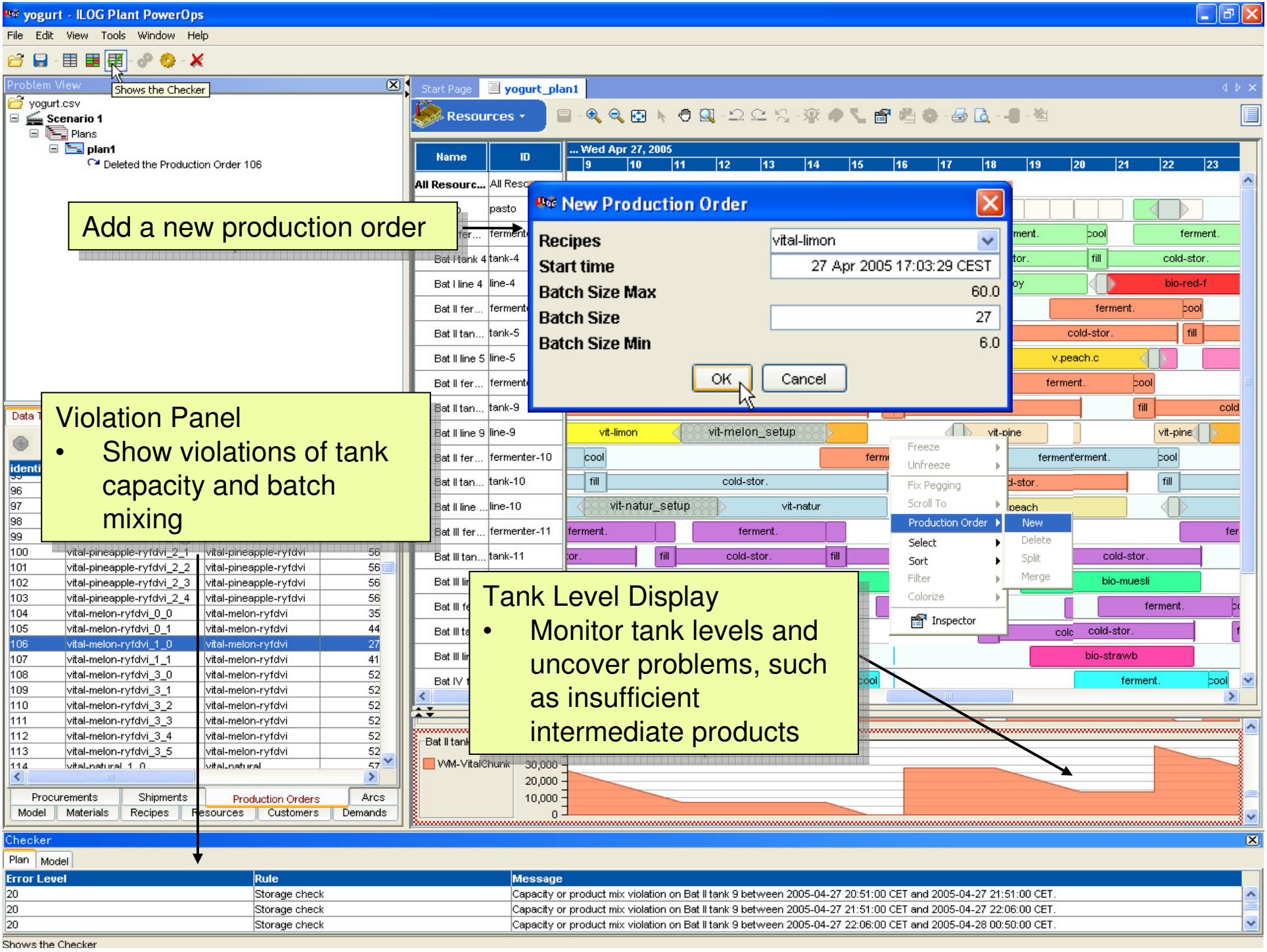
Managing Plant Floor Constraints

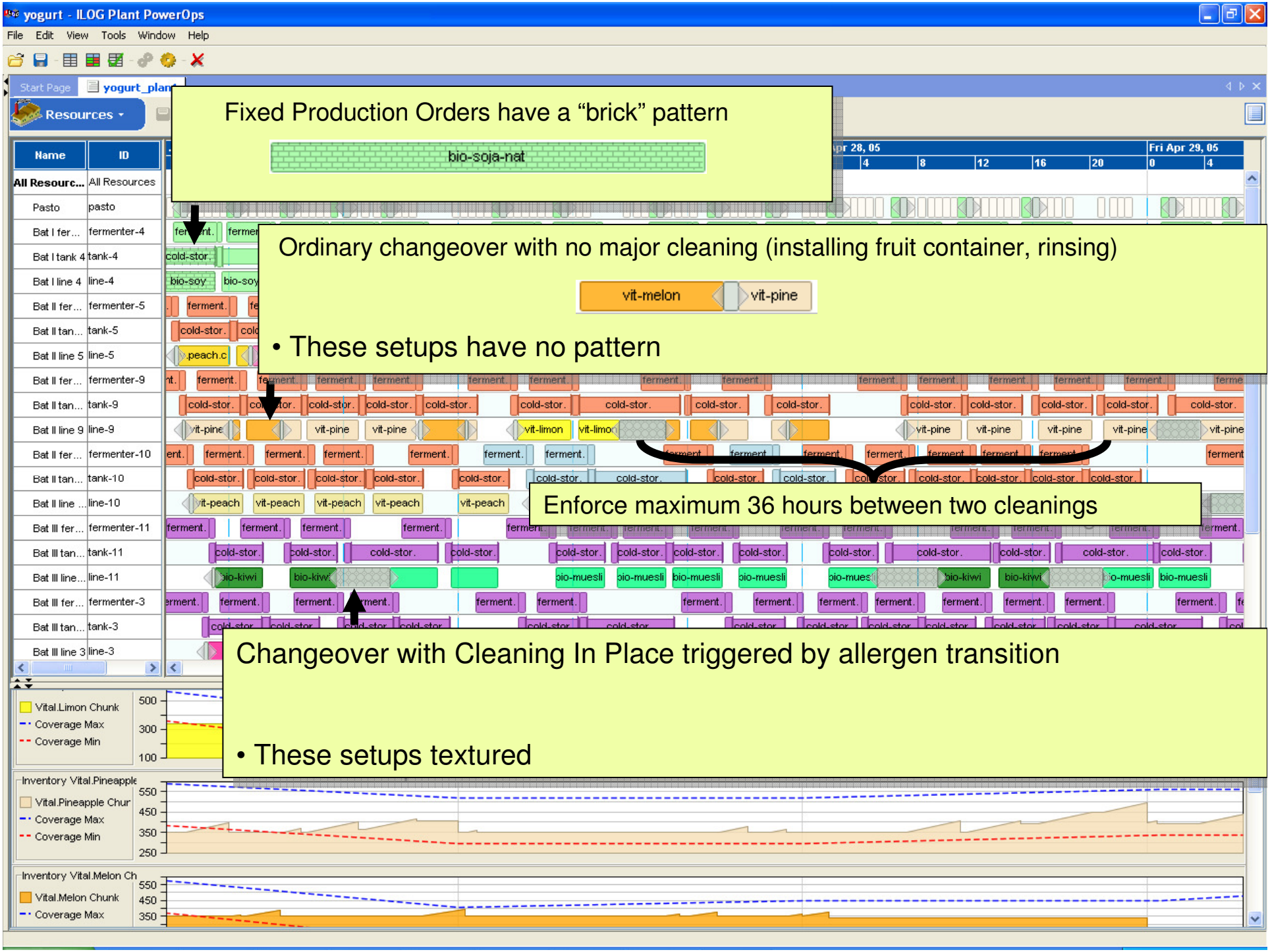


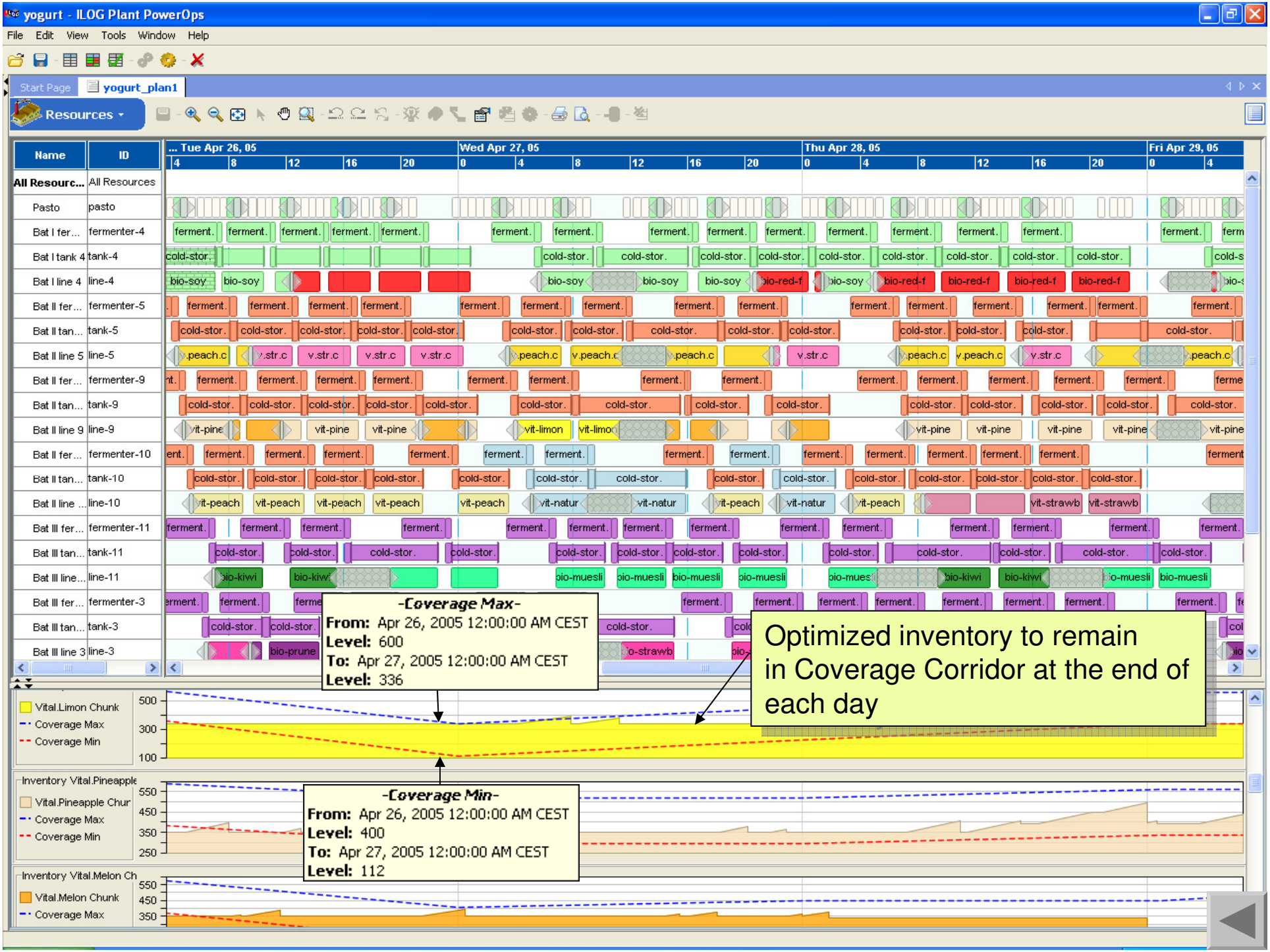


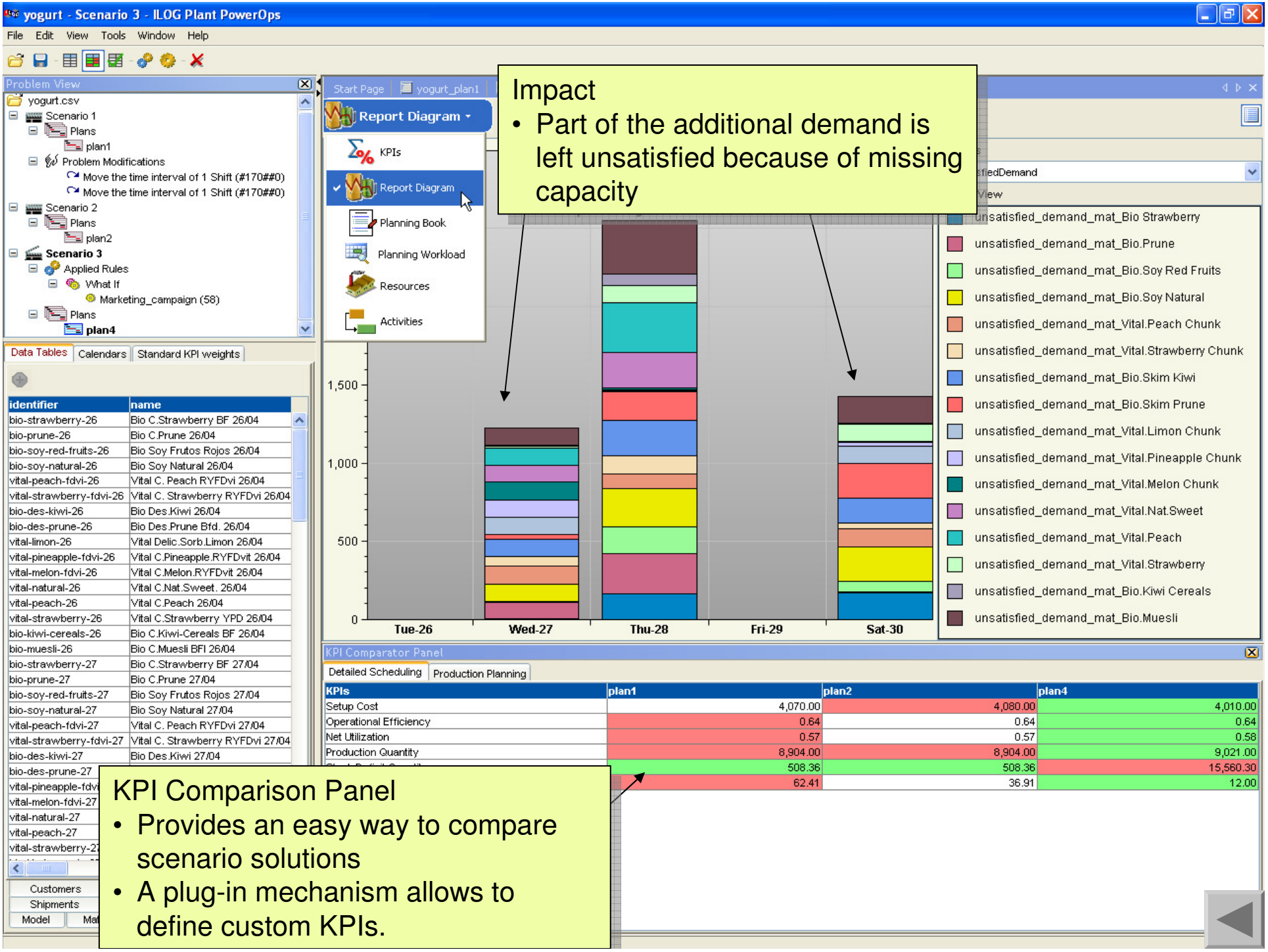
Product	Family	Unit	Id.	Tue-26 Initial	Tue-26 Consu...	Tue-26 Produ...	Tue-26 Final	Tue-26 Alert	Wed-27 Initial	Wed-27 Consu...	Wed-27 Produ...	Wed-27 Final	Wed-27 Alert	Thu-28 Initial	Thu-28 Consu...	Thu-28 Produ...	Thu-28 Final	Thu-28 Alert	Fri-29 Initial	Fri-29 Consu...	Fri-29 Produ...	Fri-29 Final
Bio.Strawberry	Bio Fat	kg	bio-strawberry	3.12 d.	56.25	207.75	4.48 d.		4.48 d.	109.64	57.25	4.01 d.		4.01 d.	112.01	103.00	3.93 d.		3.93 d.	113.37	60.00	3.45 d.
Bio.Prune			bio-prune	3.12 d.	15.09	0.00	2.99 d.	-0.01 d.	2.99 d.	187.00	187.00	2.99 d.	-0.01 d.	2.99 d.	118.78	162.75	3.38 d.		3.38 d.	125.24	186.25	3.93 d.
Bio.Soy Red Fruits	Bio Soy		bio-soy-red-fruits	3.12 d.	14.00	0.00	3.00 d.		3.00 d.	210.00	240.00	3.27 d.		3.27 d.	112.00	204.00	4.09 d.		4.09 d.	112.25	93.25	3.92 d.
Bio.Soy Natural			bio-soy-natural	3.12 d.	110.82	271.50	4.56 d.		4.56 d.	108.95	12.50	3.70 d.		3.70 d.	65.90	0.00	3.11 d.		3.11 d.	162.33	208.00	3.52 d.
Vital.Peach Chunk	Vital Chunk		vital-peach-ryfdvi	3.12 d.	112.25	264.50	4.48 d.		4.48 d.	111.75	15.50	3.62 d.		3.62 d.	111.25	157.50	4.04 d.		4.04 d.	110.98	100.00	3.94 d.
Vital.Strawberry Chunk			vital-strawberry-ryf...	3.12 d.	14.00	0.00	3.00 d.		3.00 d.	120.00	120.00	3.00 d.		3.00 d.	90.00	89.00	2.99 d.	-0.01 d.	2.99 d.	180.00	180.00	2.99 d.
Bio.Skim Kiwi	Bio Skim		bio-des-kiwi	3.12 d.	18.28	0.00	2.96 d.	-0.04 d.	2.96 d.	171.25	194.75	3.17 d.		3.17 d.	145.77	238.25	4.00 d.		4.00 d.	107.96	58.75	3.56 d.
Bio.Skim Prune			bio-des-prune	3.12 d.	112.25	214.00	4.03 d.		4.03 d.	105.57	92.00	3.91 d.		3.91 d.	85.75	0.00	3.15 d.		3.15 d.	139.78	171.00	3.43 d.
Vital.Limon Chunk	Vital Chunk		vital-limon	5.12 d.	112.00	0.00	4.12 d.		3.12 d.	0.00	0.00	3.12 d.		2.12 d.	0.25	197.75	3.89 d.		3.89 d.	110.52	120.25	3.98 d.
Vital.Pineapple Chunk			vital-pineapple-ryfdvi	3.48 d.	112.25	241.75	4.64 d.		4.64 d.	108.75	38.25	4.01 d.		3.65 d.	59.00	0.00	3.12 d.		3.12 d.	16.00	0.00	2.98 d.
Vital.Melon Chunk			vital-melon-ryfdvi	4.48 d.	18.00	0.00	4.32 d.		3.96 d.	94.00	94.00	3.96 d.		3.96 d.	72.00	0.00	3.32 d.		2.32 d.	112.25	144.00	2.60 d.
Vital.Nat.Sweet	Vital Sweet		vital-natural	5.23 d.	0.00	0.00	5.23 d.	0.23 d.	4.73 d.	112.00	0.00	4.23 d.		3.73 d.	112.00	0.00	3.23 d.		2.73 d.	167.00	114.00	2.50 d.
Vital.Peach			vital-peach	1.45 d.	112.25	229.75	2.50 d.	-0.50 d.	4.39 d.	182.44	60.25	2.61 d.	-0.39 d.	3.30 d.	229.56	260.00	3.57 d.		4.57 d.	111.75	40.00	2.93 d.
Vital.Strawberry			vital-strawberry	5.12 d.	22.00	0.00	2.93 d.	-0.07 d.	4.93 d.	90.00	90.00	4.93 d.		5.93 d.	112.00	0.00	3.93 d.		4.93 d.	120.00	120.00	4.93 d.
Bio.Kiwi Cereals	Bio Fat		bio-kiwi-cereals	5.12 d.	14.88	0.00	2.99 d.	-0.01 d.	4.99 d.	154.25	204.50	6.44 d.	1.44 d.	365.00 d.	54.87	3.50	5.98 d.	0.98 d.	365.00 d.	112.00	0.00	4.98 d.
Bio.Muesli			bio-muesli	5.03 d.	112.00	0.00	2.13 d.	-0.87 d.	4.03 d.	0.00	0.00	4.03 d.		3.25 d.	224.25	269.00	3.34 d.		2.57 d.	111.03	219.50	2.78 d.

Time Bucket	Product	Family	Unit	Initial	Produced	Consumed	Stock Min	Final	Stock Max	Deficit	Surplus	Alert
Tue-26	Vital.Limon Chunk	Vital Chunk	kg	350.00	0.00	112.00	112.00	238.00	336.00	-126.00	-98.00	
Wed-27				238.00	0.00	0.00	224.00	238.00	448.00	-14.00	-210.00	
Thu-28				238.00	197.75	0.25	336.00	435.50	560.00	-99.50	-124.50	
Fri-29				435.50	120.25	110.52	336.00	445.23	560.00	-109.23	-114.77	
Sat-30				445.23	0.00	108.77	336.00	336.45	448.00	-0.45	-111.55	


yogurt - ILOG Plant PowerOps
File Edit View Tools Window Help
Shows the Checker
Problem View
yogurt.csv
Scenario 1
Plans
plan1
Deleted the Production Order 106
Start Page
yogurt_plan1
Resources
Add a new production order
New Production Order
Recipes
vital-limon
Start time
27 Apr 2005 17:03:29 CEST
Batch Size Max
60.0
Batch Size
27
Batch Size Min
6.0
OK
Cancel
Violation Panel
• Show violations of tank capacity and batch mixing
Tank Level Display
• Monitor tank levels and uncover problems, such as insufficient intermediate products
Procurements
Shipments
Production Orders
Arcs
Model
Materials
Recipes
Resources
Customers
Demands
Checker
Plan
Model
Error Level
Rule
Message
20
Storage check
Capacity or product mix violation on Bat II tank 9 between 2005-04-27 20:51:00 CET and 2005-04-27 21:51:00 CET.
20
Storage check
Capacity or product mix violation on Bat II tank 9 between 2005-04-27 21:51:00 CET and 2005-04-27 22:06:00 CET.
20
Storage check
Capacity or product mix violation on Bat II tank 9 between 2005-04-27 22:06:00 CET and 2005-04-28 00:50:00 CET.
Shows the Checker


yogurt - ILOG Plant PowerOps
File Edit View Tools Window Help
Start Page
yogurt_plant
Resources
Fixed Production Orders have a “brick” pattern
bio-soja-nat
Ordinary changeover with no major cleaning (installing fruit container, rinsing)
vit-melon
vit-pine
• These setups have no pattern
Enforce maximum 36 hours between two cleanings
Changeover with Cleaning In Place triggered by allergen transition
• These setups textured
Name
ID
Vital.Limon Chunk
Coverage Max
Coverage Min
Inventory Vital.Pineapple
Vital.Pineapple Chur
Inventory Vital.Melon Ch
Vital.Melon Chunk


yogurt - ILOG Plant PowerOps
File Edit View Tools Window Help
Start Page
yogurt_plan1
Resources
Name
ID
... Tue Apr 26, 05
Wed Apr 27, 05
Thu Apr 28, 05
Fri Apr 29, 05
All Resourc... All Resources
Pasto pasto
Bat I fer... fermenter-4
Bat I tank 4 tank-4
Bat I line 4 line-4
Bat II fer... fermenter-5
Bat II tan... tank-5
Bat II line 5 line-5
Bat II fer... fermenter-9
Bat II tan... tank-9
Bat II line 9 line-9
Bat II fer... fermenter-10
Bat II tan... tank-10
Bat II line ... line-10
Bat III fer... fermenter-11
Bat III tan... tank-11
Bat III line... line-11
Bat III fer... fermenter-3
Bat III tan... tank-3
Bat III line 3 line-3
-Coverage Max-
From: Apr 26, 2005 12:00:00 AM CEST
Level: 600
To: Apr 27, 2005 12:00:00 AM CEST
Level: 336
Optimized inventory to remain in Coverage Corridor at the end of each day
Vital.Limon Chunk
Coverage Max
Coverage Min
500
300
100
Inventory Vital.Pineapple
Vital.Pineapple Chur
Coverage Max
Coverage Min
550
450
350
250
-Coverage Min-
From: Apr 26, 2005 12:00:00 AM CEST
Level: 400
To: Apr 27, 2005 12:00:00 AM CEST
Level: 112
Inventory Vital.Melon Ch
Vital.Melon Chunk
Coverage Max
550
450
350


yogurt - Scenario 3 - ILOG Plant PowerOps
File Edit View Tools Window Help
Problem View
yogurt.csv
Scenario 1
Plans
plan1
Problem Modifications
Move the time interval of 1 Shift (#170##0)
Move the time interval of 1 Shift (#170##0)
Scenario 2
Plans
plan2
Scenario 3
Applied Rules
What If
Marketing_campaign (58)
Plans
plan4
Start Page
yogurt_plan1
Report Diagram
KPIs
Report Diagram
Planning Book
Planning Workload
Resources
Activities
Impact
• Part of the additional demand is left unsatisfied because of missing capacity
1,500
1,000
500
0
Tue-26
Wed-27
Thu-28
Fri-29
Sat-30
unsatisfied_demand_mat_Bio Strawberry
unsatisfied_demand_mat_Bio.Prune
unsatisfied_demand_mat_Bio.Soy Red Fruits
unsatisfied_demand_mat_Bio.Soy Natural
unsatisfied_demand_mat_Vital.Peach Chunk
unsatisfied_demand_mat_Vital.Strawberry Chunk
unsatisfied_demand_mat_Bio.Skim Kiwi
unsatisfied_demand_mat_Bio.Skim Prune
unsatisfied_demand_mat_Vital.Limon Chunk
unsatisfied_demand_mat_Vital.Pineapple Chunk
unsatisfied_demand_mat_Vital.Melon Chunk
unsatisfied_demand_mat_Vital.Nat.Sweet
unsatisfied_demand_mat_Vital.Peach
unsatisfied_demand_mat_Vital.Strawberry
unsatisfied_demand_mat_Bio.Kiwi Cereals
unsatisfied_demand_mat_Bio.Muesli
Data Tables
Calendars
Standard KPI weights
identifier
name
bio-strawberry-26
Bio C.Strawberry BF 26/04
bio-prune-26
Bio C.Prune 26/04
bio-soy-red-fruits-26
Bio Soy Frutos Rojos 26/04
bio-soy-natural-26
Bio Soy Natural 26/04
vital-peach-fdvi-26
Vital C. Peach RYFDvi 26/04
vital-strawberry-fdvi-26
Vital C. Strawberry RYFDvi 26/04
bio-des-kiwi-26
Bio Des.Kiwi 26/04
bio-des-prune-26
Bio Des.Prune Bfd. 26/04
vital-limon-26
Vital Delic.Sorb.Limon 26/04
vital-pineapple-fdvi-26
Vital C.Pineapple.RYFDvit 26/04
vital-melon-fdvi-26
Vital C.Melon.RYFDvit 26/04
vital-natural-26
Vital C.Nat.Sweet. 26/04
vital-peach-26
Vital C.Peach 26/04
vital-strawberry-26
Vital C.Strawberry YPD 26/04
bio-kiwi-cereals-26
Bio C.Kiwi-Cereals BF 26/04
bio-muesli-26
Bio C.Muesli BFI 26/04
bio-strawberry-27
Bio C.Strawberry BF 27/04
bio-prune-27
Bio C.Prune 27/04
bio-soy-red-fruits-27
Bio Soy Frutos Rojos 27/04
bio-soy-natural-27
Bio Soy Natural 27/04
vital-peach-fdvi-27
Vital C. Peach RYFDvi 27/04
vital-strawberry-fdvi-27
Vital C. Strawberry RYFDvi 27/04
bio-des-kiwi-27
Bio Des.Kiwi 27/04
bio-des-prune-27
vital-pineapple-fdvi
vital-melon-fdvi-27
vital-natural-27
vital-peach-27
vital-strawberry-27
Customers
Shipments
Model
KPI Comparator Panel
Detailed Scheduling
Production Planning
KPIs
plan1
plan2
plan4
Setup Cost
4,070.00
4,080.00
4,010.00
Operational Efficiency
0.64
0.64
0.64
Net Utilization
0.57
0.57
0.58
Production Quantity
8,904.00
8,904.00
9,021.00
508.36
508.36
15,560.30
62.41
36.91
12.00
KPI Comparison Panel
• Provides an easy way to compare scenario solutions
• A plug-in mechanism allows to define custom KPIs.

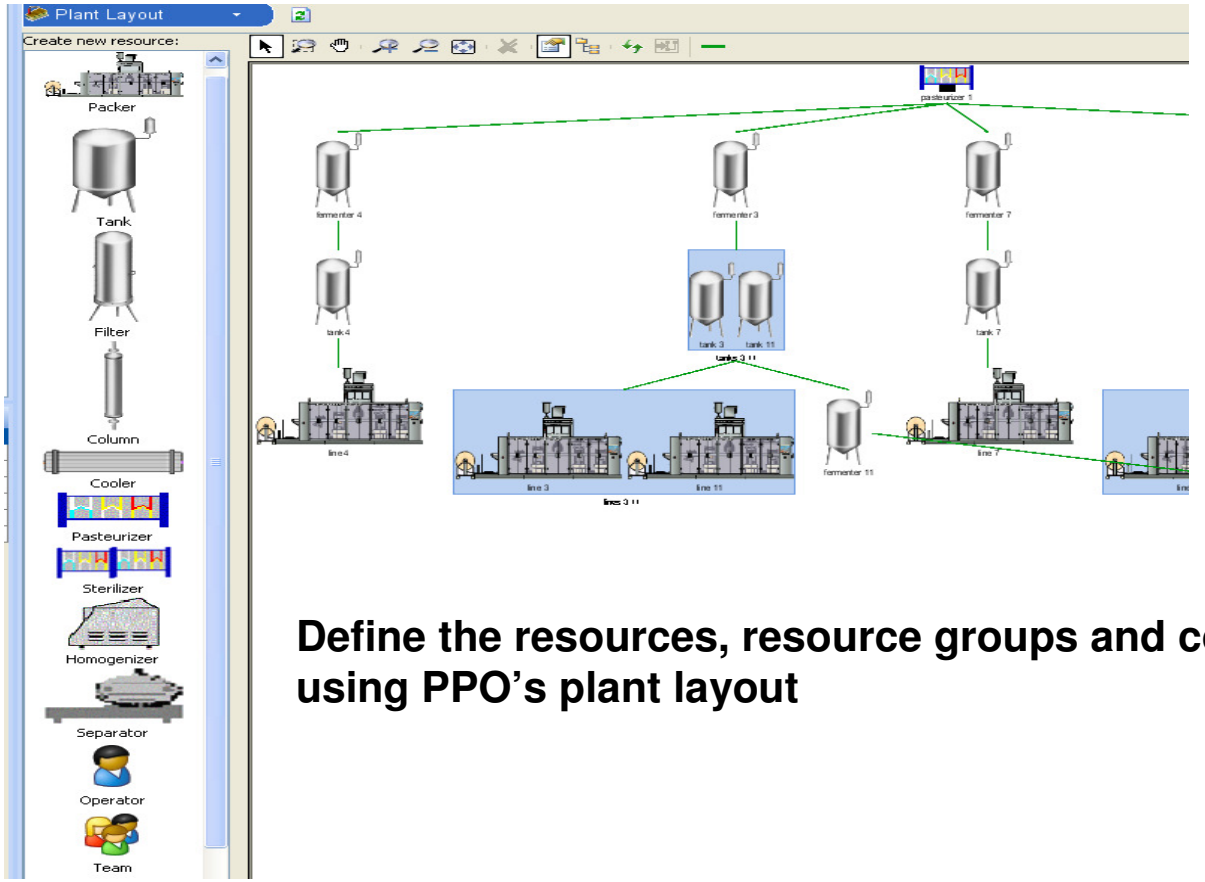
Scenario Creation and Comparison

What-if analysis with precise KPIs

- Create and manage scenarios
- Copy scenarios
- Test different planning strategies
- Define and apply business policies
- Define and compare custom KPIs
- Compare Gantt charts and solutions side by side

Inside the plant : Network Structure

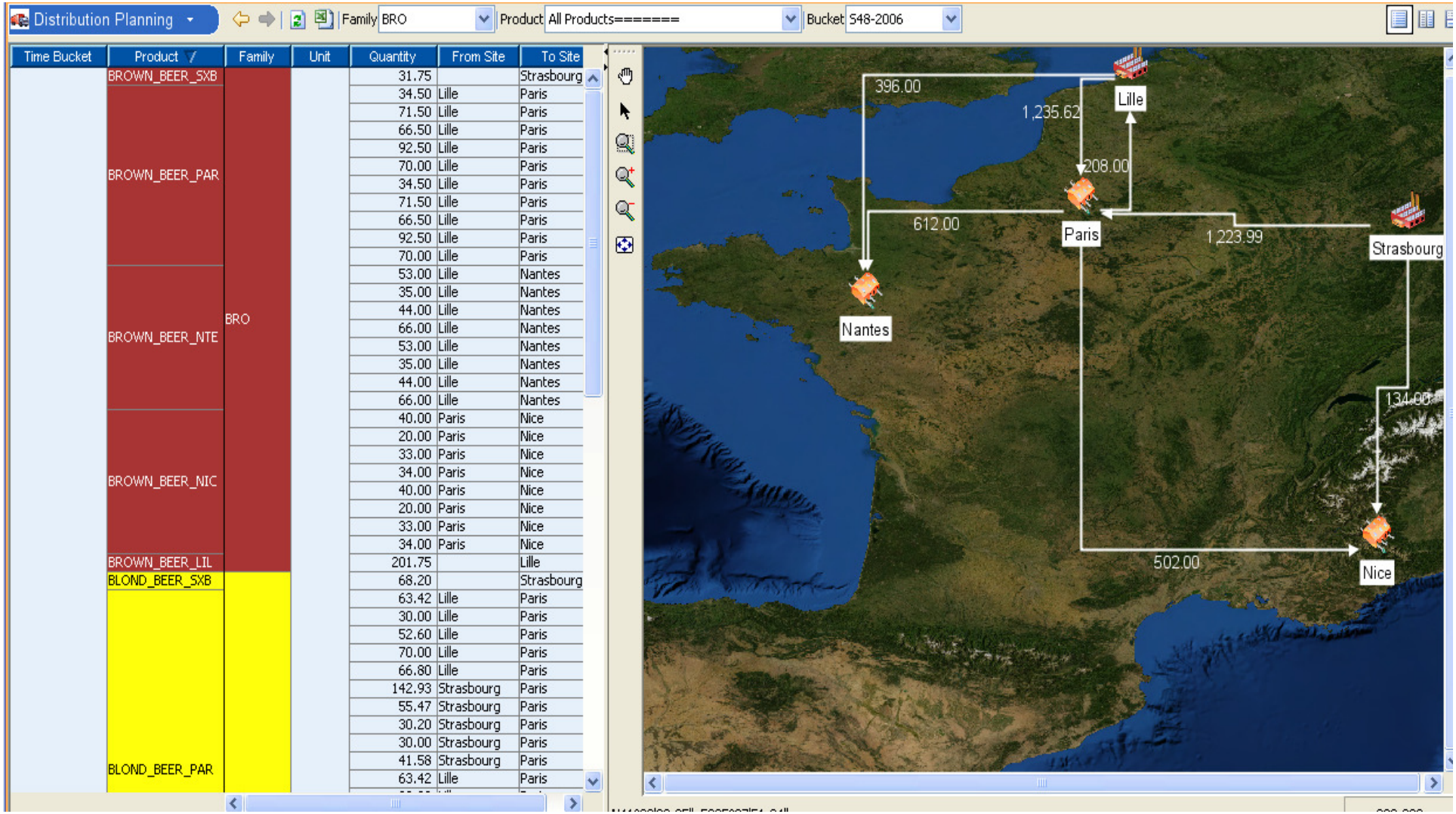
Capability to configure a model to reflect the current manufacturing network structure at a macro level with only bottleneck resources identified. The gross capacity on the bottleneck resource should be modeled.



Define the resources, resource groups and connections using PPO's plant layout

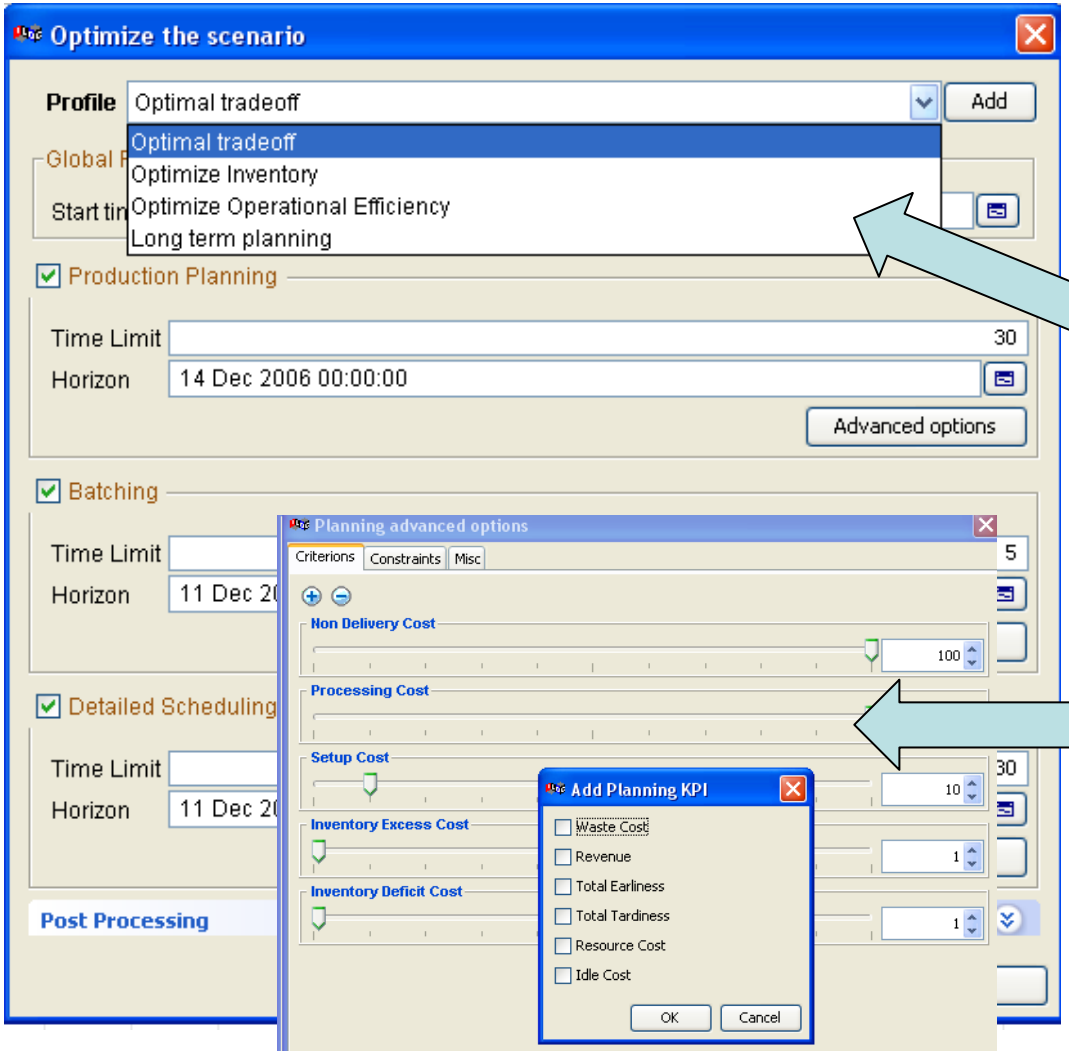
Outside the plant : Network Structure

Capability to configure a model to reflect the current manufacturing network structure at a macro level with only bottleneck resources identified. The gross capacity on the bottleneck resource should be modeled.



Multiple Optimisation Profiles

Generate the supply plans based on forecast, sales orders and inventory requirements.

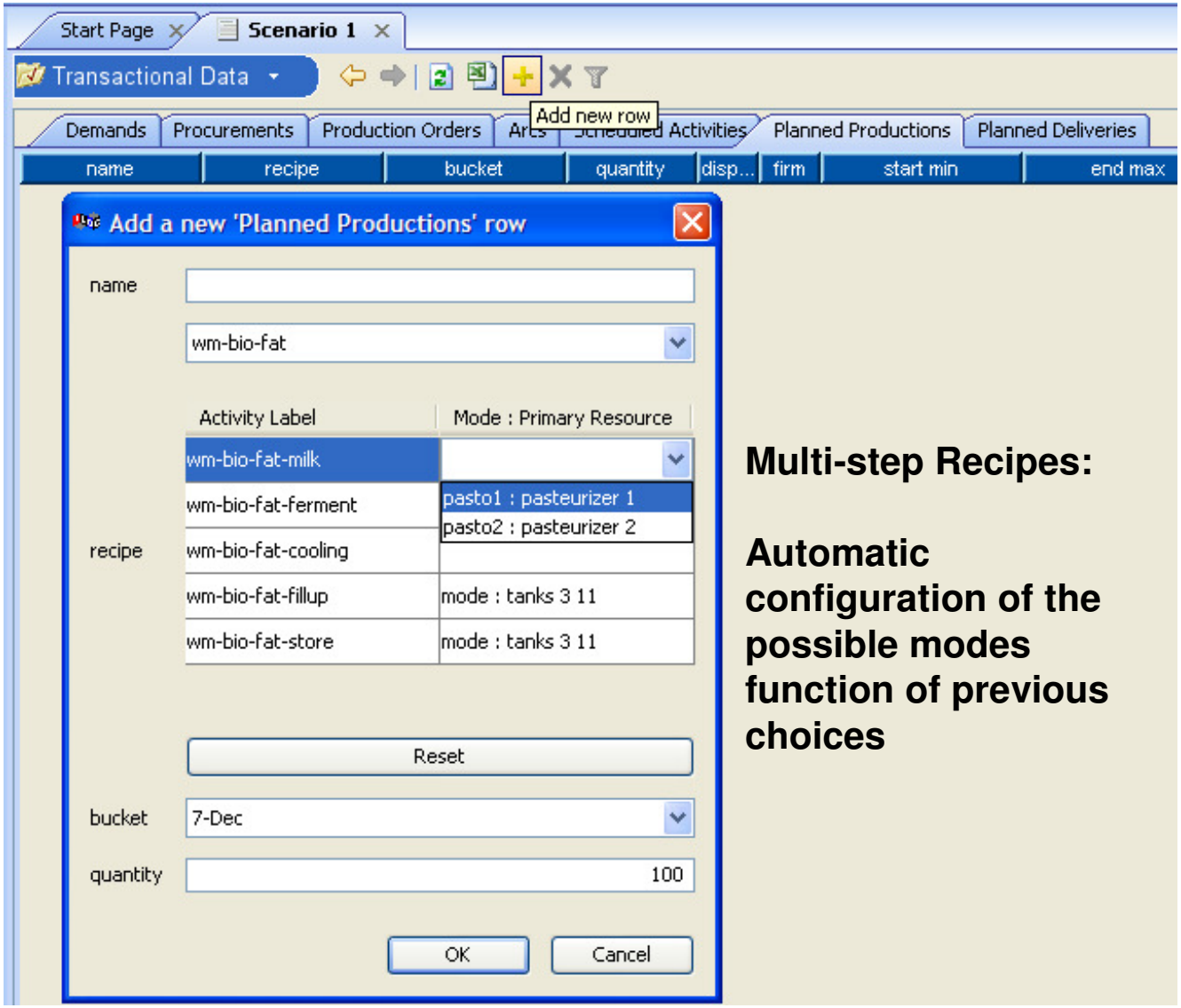


The different "optimization profiles" can be defined. E

Planners can choose an existing optimization profile or creating a new one.

Each optimization profile defines the goals of the schedule by setting the relative importance of different objectives

Editing Planned Production with Automatic Configuration



Multi-step Recipes:

Automatic configuration of the possible modes function of previous choices

Re-planning: Reducing System Nervousness

Enforce Fulfillment in Next Production Run

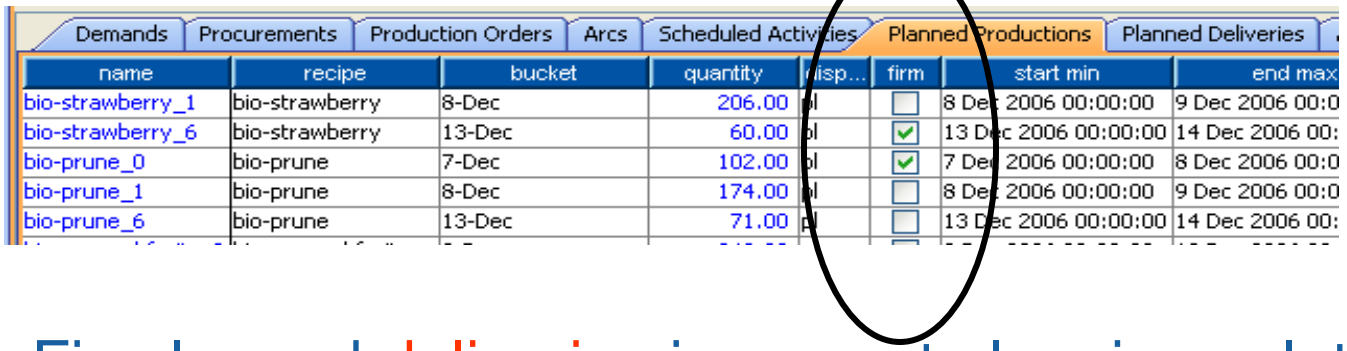
- Enforce that next run of planning engine fulfill at least the same percentage of a demand as in the current planning solution
- If the delivery window is larger than the time bucket then the planned delivery may be occur later

Demands

identifier	name	material	family	quantity	disp...	firm	fulfilment	enforce fulfilment
bio-strawberry-7	Bio.Strawberry 0...	Bio.Strawberry	Bio Fat...	129.00	pl	☐	100%	☐
bio-strawberry-8	Bio.Strawberry 0...	Bio.Strawberry	Bio Fat...	75.00	pl	☐	100%	☑
bio-strawberry-9	Bio.Strawberry 0...	Bio.Strawberry	Bio Fat...	75.00	pl	☐	61%	☑
bio-strawberry-10	Bio.Strawberry 1...	Bio.Strawberry	Bio Fat...	47.00	pl	☐	0%	☐
bio-strawberry-11	Bio.Strawberry 1...	Bio.Strawberry	Bio Fat...	10.00	pl	☐	0%	☐
bio-strawberry-12	Bio.Strawberry 1...	Bio.Strawberry	Bio Fat...	120.00	pl	☐	0%	☐
bio-strawberry-13	Bio.Strawberry 1...	Bio.Strawberry	Bio Fat...	10.00	pl	☐	0%	☐

Reducing Re-planning nervousness

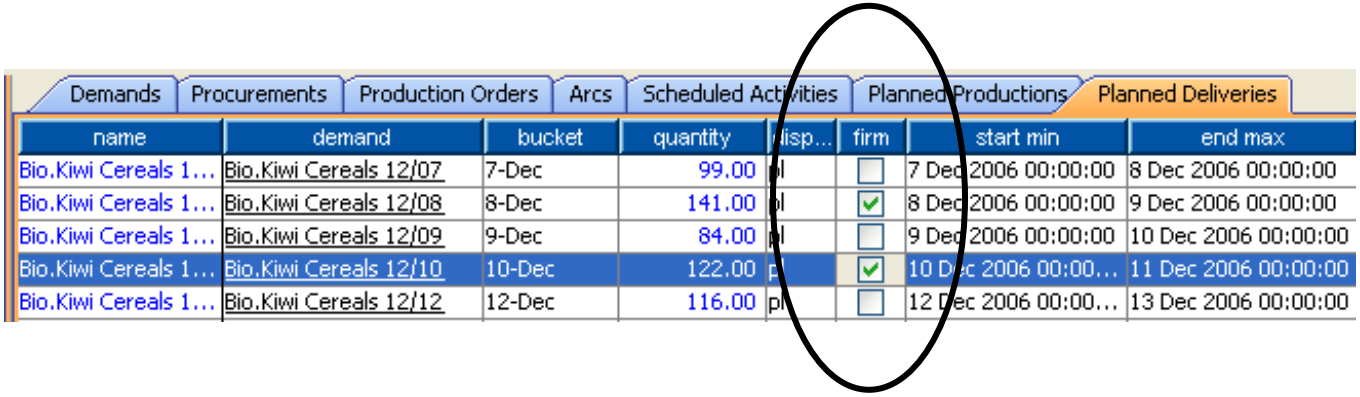
- Fix planned productions in current planning solution



Demands | Procurements | Production Orders | Arcs | Scheduled Activities | Planned Productions | Planned Deliveries

name	recipe	bucket	quantity	disp...	firm	start min	end max
bio-strawberry_1	bio-strawberry	8-Dec	206.00	pl	☐	8 Dec 2006 00:00:00	9 Dec 2006 00:0
bio-strawberry_6	bio-strawberry	13-Dec	60.00	pl	☑	13 Dec 2006 00:00:00	14 Dec 2006 00:
bio-prune_0	bio-prune	7-Dec	102.00	pl	☑	7 Dec 2006 00:00:00	8 Dec 2006 00:0
bio-prune_1	bio-prune	8-Dec	174.00	pl	☐	8 Dec 2006 00:00:00	9 Dec 2006 00:0
bio-prune_6	bio-prune	13-Dec	71.00	pl	☐	13 Dec 2006 00:00:00	14 Dec 2006 00:

- Fix planned deliveries in current planning solution



Demands | Procurements | Production Orders | Arcs | Scheduled Activities | Planned Productions | Planned Deliveries

name	demand	bucket	quantity	disp...	firm	start min	end max
Bio.Kiwi Cereals 1...	Bio.Kiwi Cereals 12/07	7-Dec	99.00	pl	☐	7 Dec 2006 00:00:00	8 Dec 2006 00:00:00
Bio.Kiwi Cereals 1...	Bio.Kiwi Cereals 12/08	8-Dec	141.00	pl	☑	8 Dec 2006 00:00:00	9 Dec 2006 00:00:00
Bio.Kiwi Cereals 1...	Bio.Kiwi Cereals 12/09	9-Dec	84.00	pl	☐	9 Dec 2006 00:00:00	10 Dec 2006 00:00:00
Bio.Kiwi Cereals 1...	Bio.Kiwi Cereals 12/10	10-Dec	122.00	pl	☑	10 Dec 2006 00:00...	11 Dec 2006 00:00:00
Bio.Kiwi Cereals 1...	Bio.Kiwi Cereals 12/12	12-Dec	116.00	pl	☐	12 Dec 2006 00:00...	13 Dec 2006 00:00:00

KPI Scenario Comparisons

New Scenario Revision

Standard Baseline

Overall Supply Chain Cost

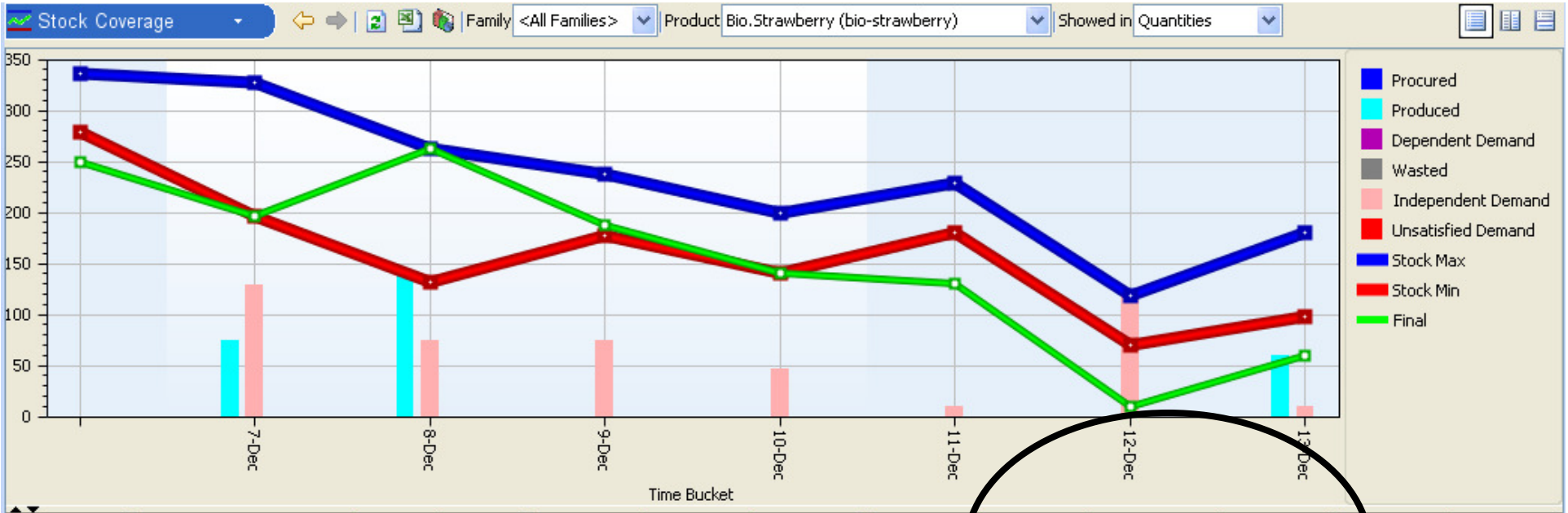
Factory Throughput

KPI Comparison Panel

KPIs	Initial	Standard	SupplyChain	Factory
Inventory Excess (t)	1,136.65	513.81	453.78	579.74
Inventory Deficit (t)	22,021.54	17,768.21	16,049.80	19,003.19
Daily Inventory Excess Incidents	60.00	35.00	32.00	41.00
Daily Inventory Deficit Incidents	195.00	179.00	170.00	177.00
Operational Efficiency (%)	62.92	63.18	63.28	63.72
Operational Utilization (%)	73.91	86.48	90.75	83.92
Average Cycle Time (h)	50.71	45.55	41.10	47.31
Total Cleaning Time (h)	134.65	178.65	192.92	164.65
Total Setup Time (h)	0.00	0.00	0.00	0.00
Average Compactness (%)	99.87	98.64	94.93	97.48
White Mass Waste Cost ($)	0.00	0.00	0.00	0.00
Fruit Change Waste Cost ($)	0.00	0.00	0.00	0.00
Packaging Change Waste Cost ($)	0.00	0.00	0.00	0.00
Max Direct Labor (people)	0.00	0.00	0.00	0.00
Manpower (man.hours)	0.00	0.00	0.00	0.00

Available-To-Promise

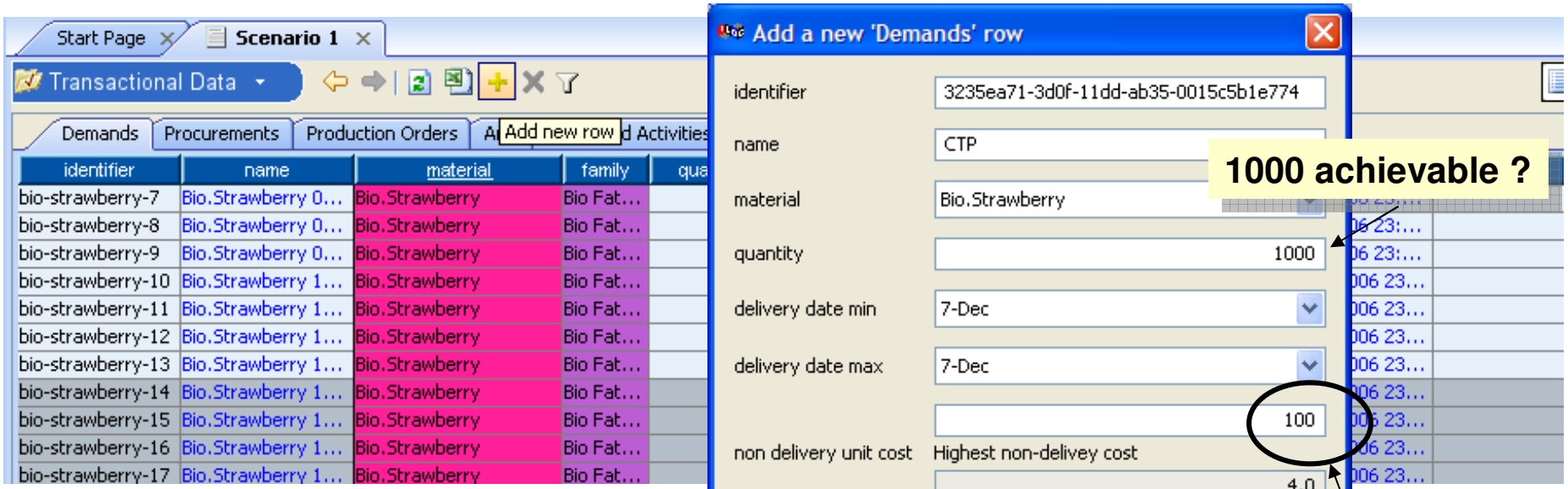
- Without changing the planning solution we can promise 187 pallets Dec 7th



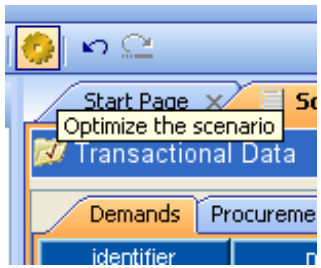
Time Bucket	Product	Family	Unit	Initial	Input	Produced	Procured	ATP	Cumulative ATP	Promised	Output	Independent ...
7-Dec	Bio.Strawberry	Bio Fat FP	pl	250.00	75.00	75.00	0.00	187.00	187.00	129.00	129.00	129.00
8-Dec				196.00	141.00	141.00	0.00	0.00	187.00	75.00	75.00	75.00
9-Dec				262.00	0.00	0.00	0.00	0.00	187.00	75.00	75.00	75.00
10-Dec				187.00	0.00	0.00	0.00	0.00	187.00	0.00	47.00	47.00
11-Dec				140.00	0.00	0.00	0.00	0.00	187.00	0.00	10.00	10.00
12-Dec				130.00	0.00	0.00	0.00	0.00	187.00	0.00	120.00	120.00
13-Dec				10.00	60.00	60.00	0.00	60.00	247.00	0.00	10.00	10.00

Capable-To-Promise

- Could we produce more bio-strawberry on December 7th with a different trade-off?

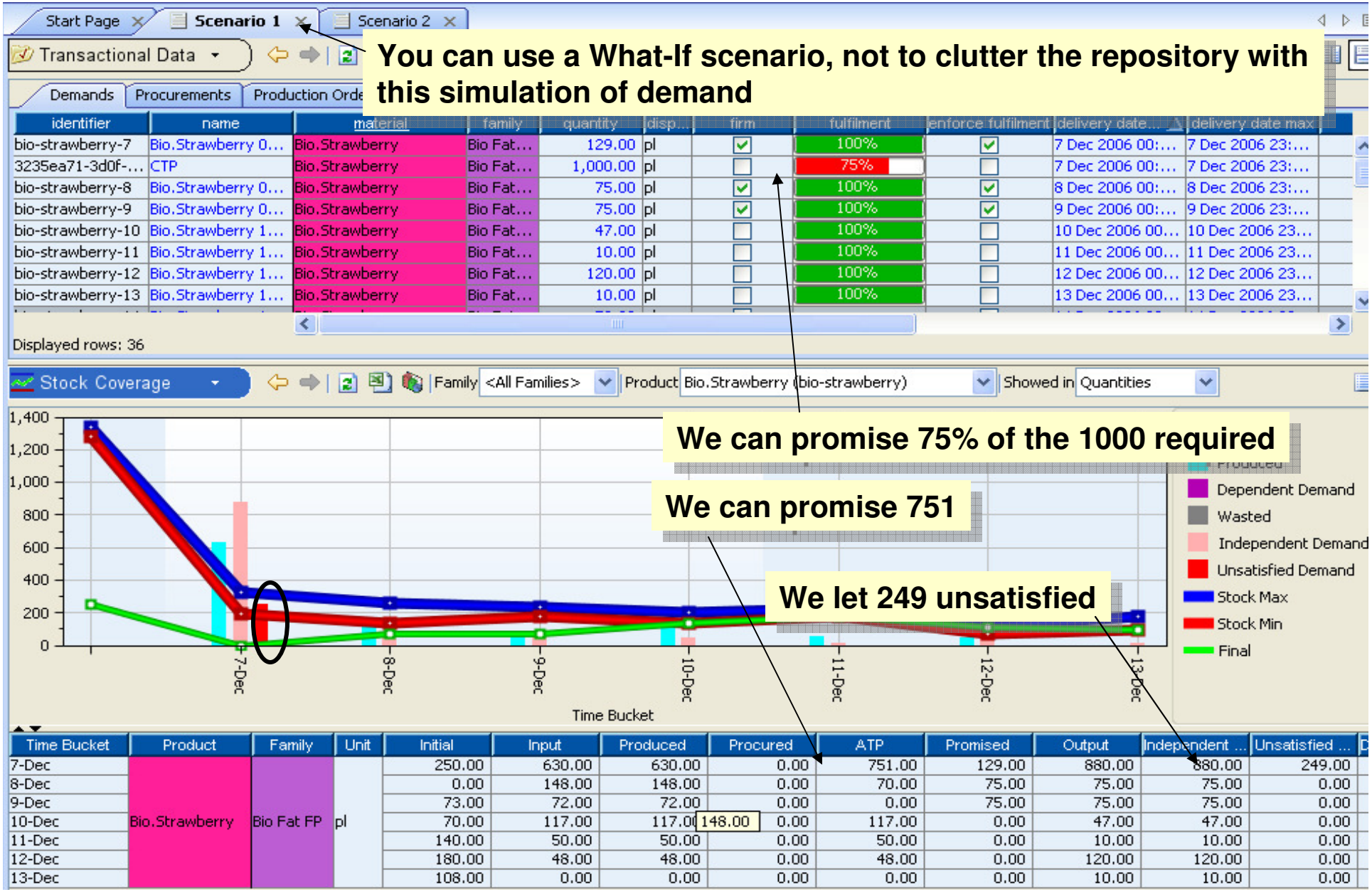


1000 achievable ?



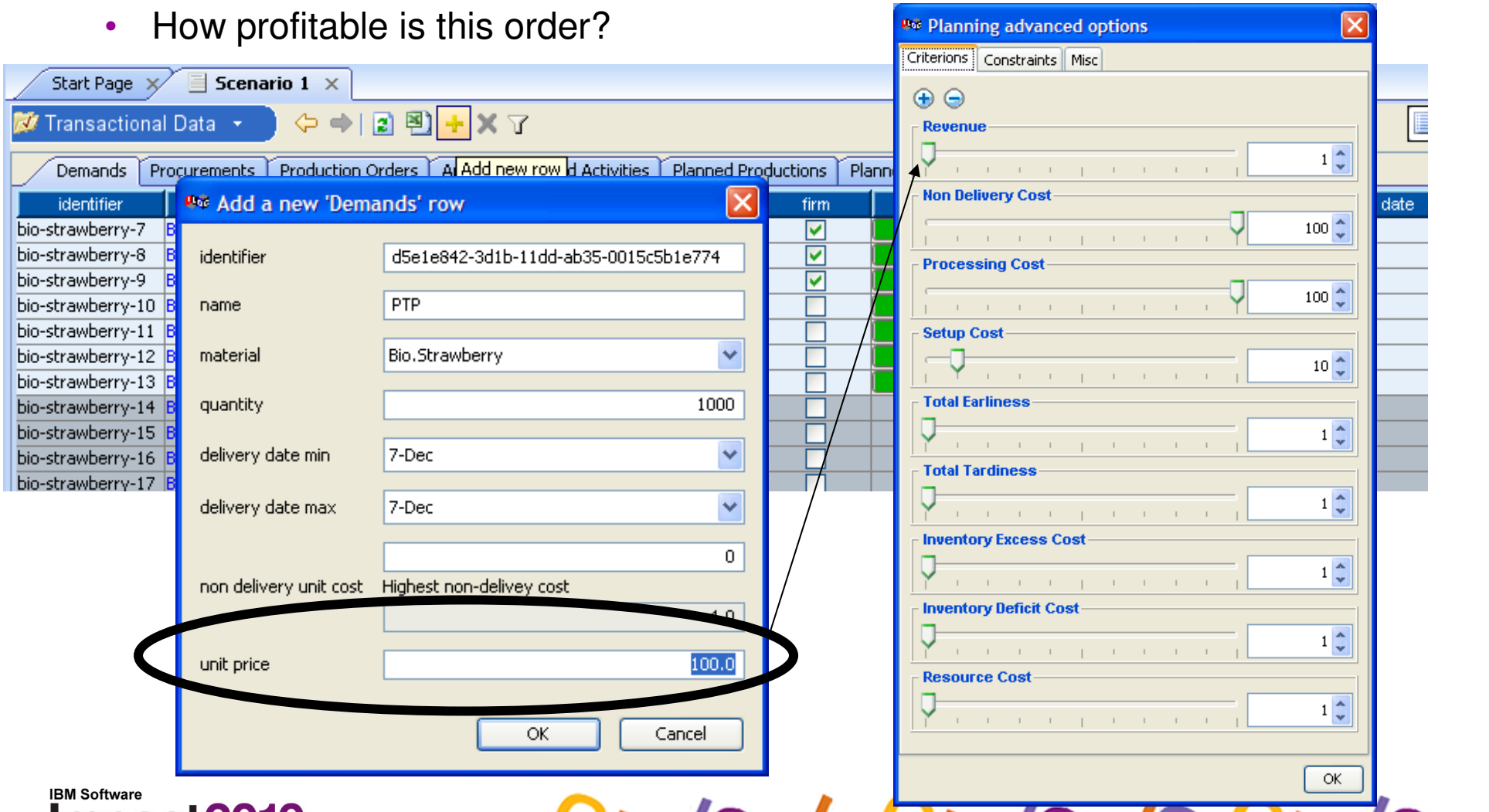
Prioritize the customers using non-delivery costs and re-optimize

Capable-To-Promise

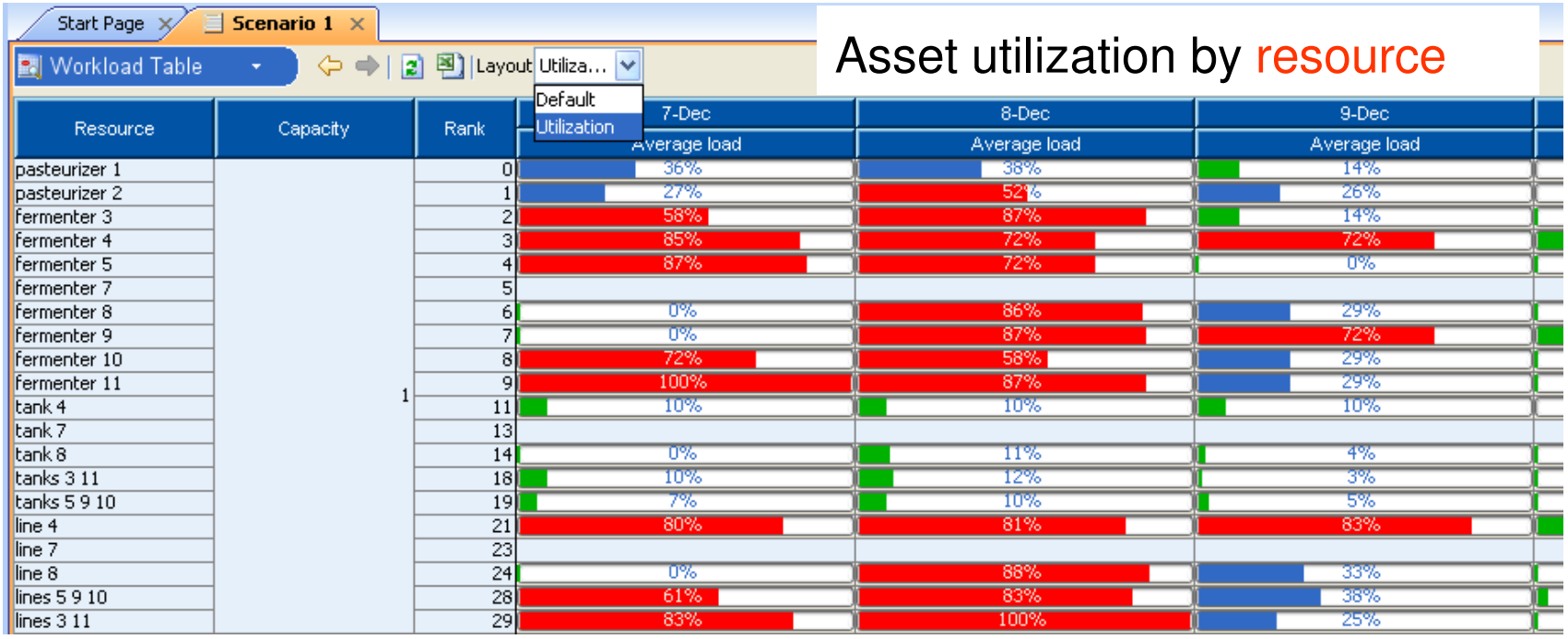


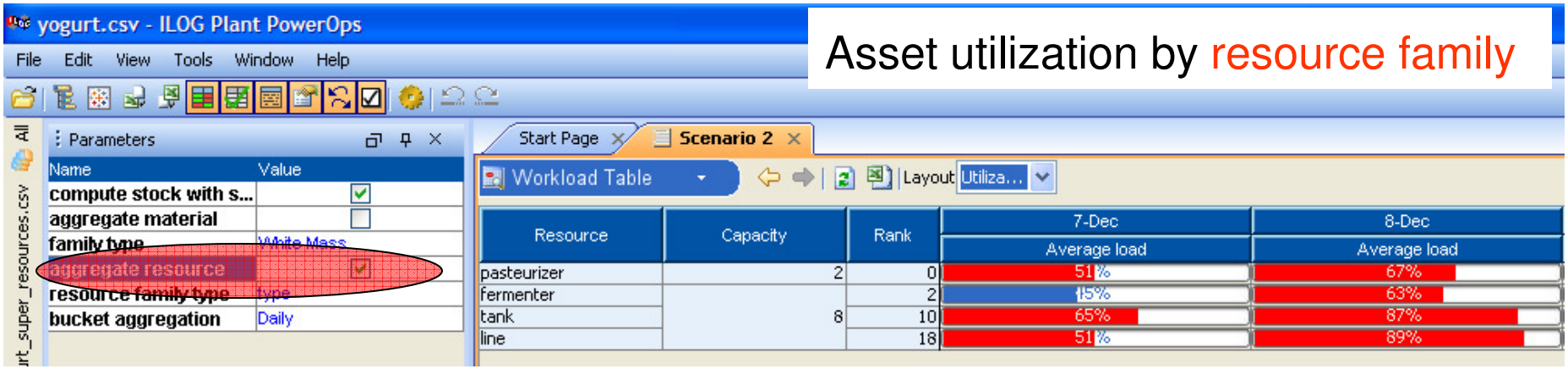
Profitable-To-Promise

- Should we meet this customer's requirements?
- How profitable is this order?



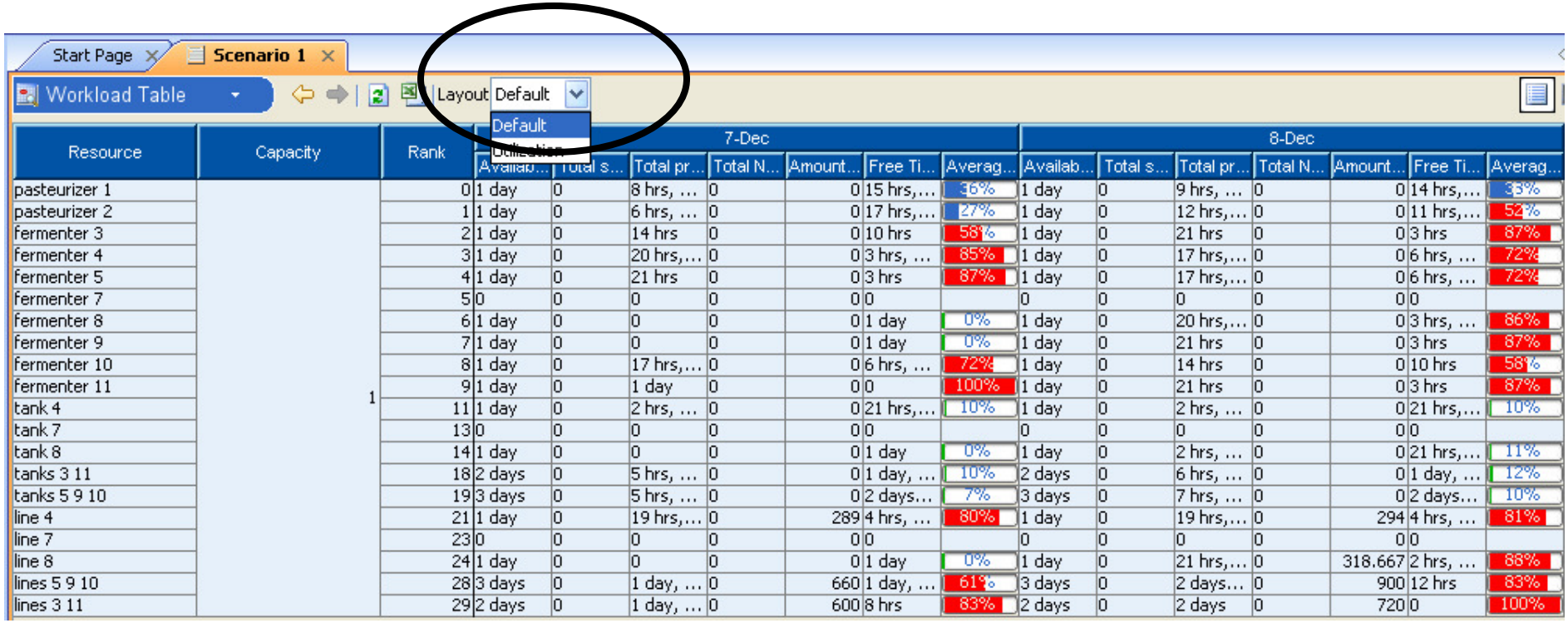
Asset Utilization





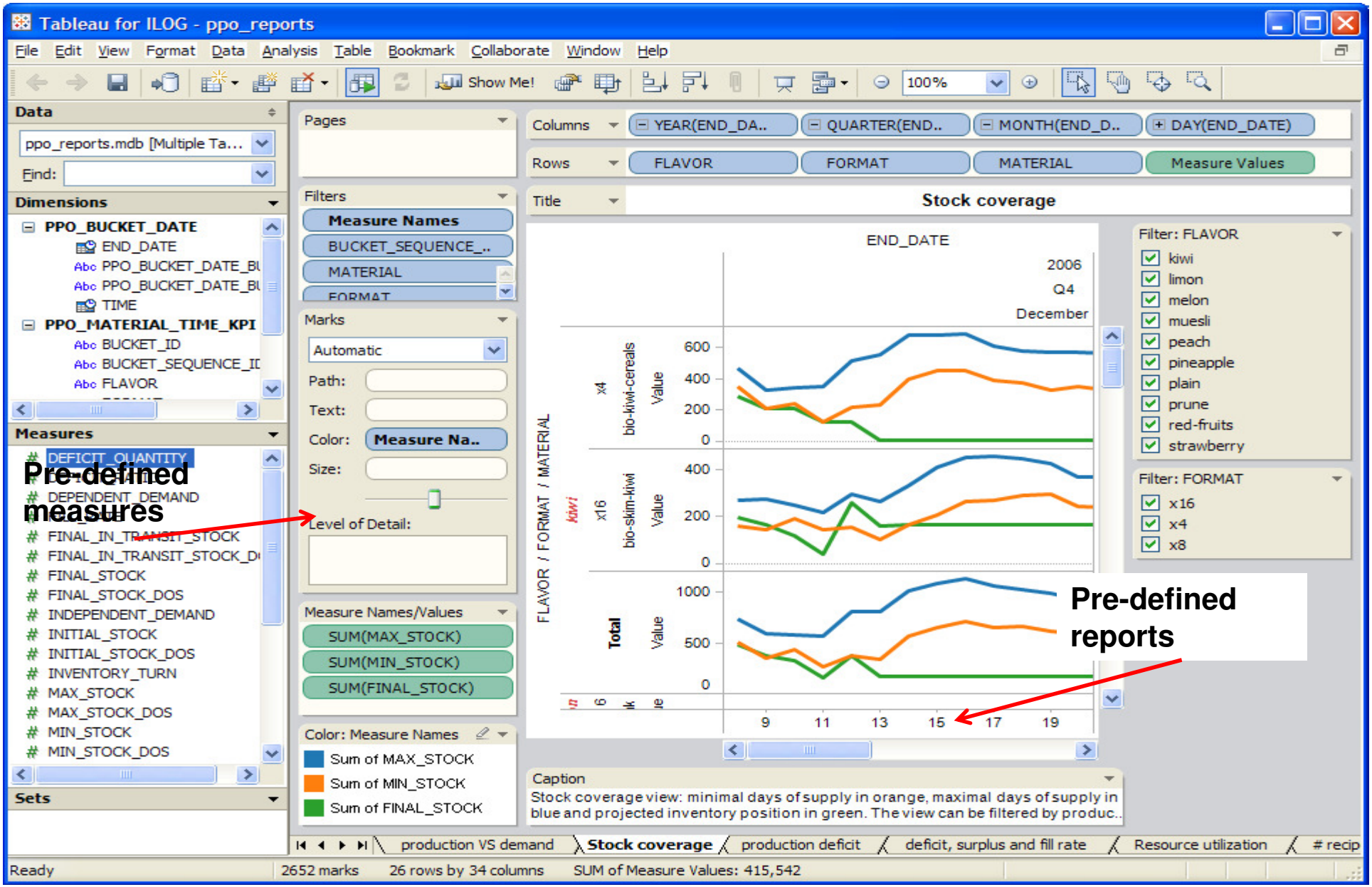
Asset utilization

- Detailed workload table including total changeover time, total productive time etc. by resource or by resource family

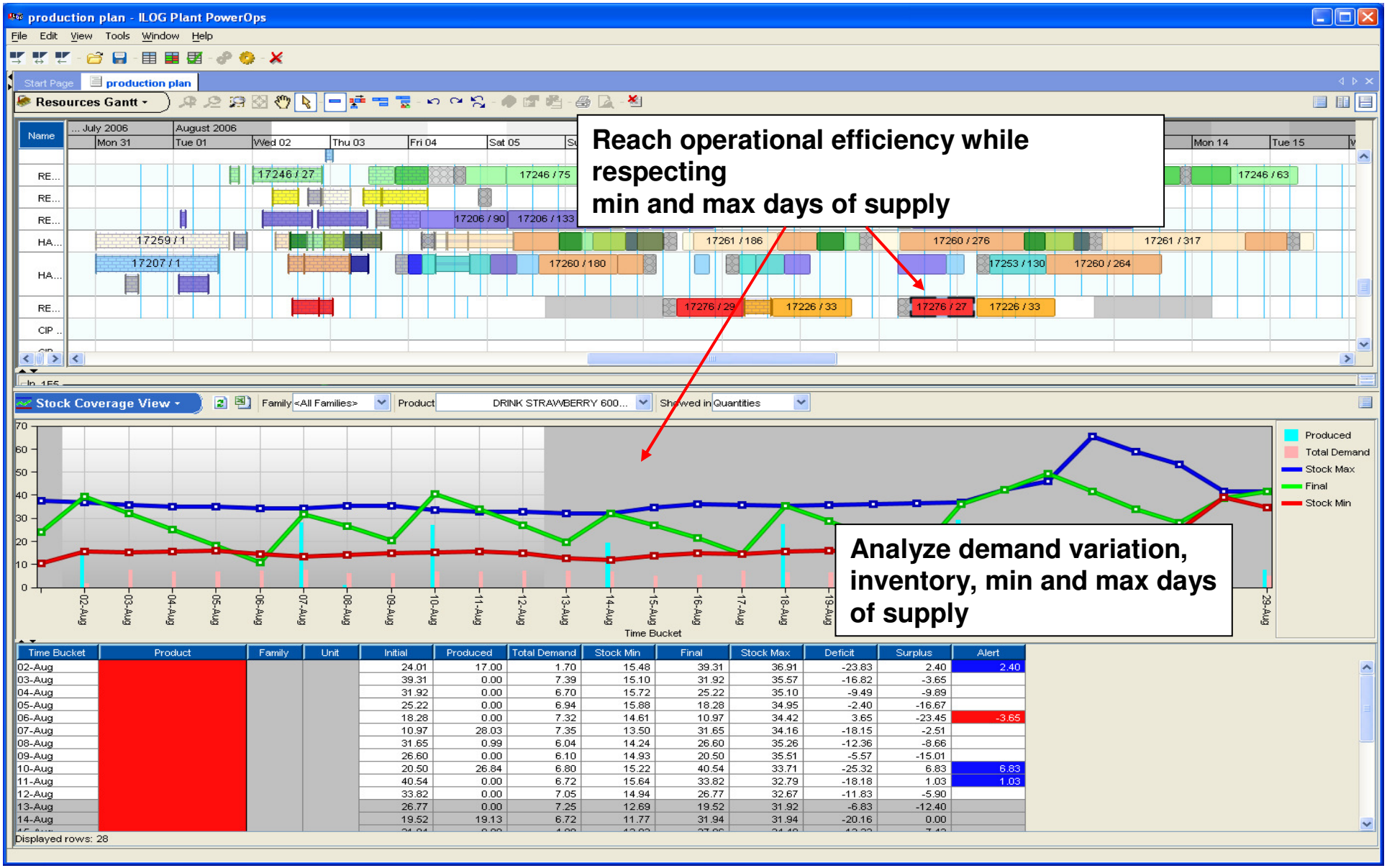


Resource	Capacity	Rank	7-Dec							8-Dec						
			Availab...	Total s...	Total pr...	Total N...	Amount...	Free Ti...	Averag...	Availab...	Total s...	Total pr...	Total N...	Amount...	Free Ti...	Averag...
pasteurizer 1	1	0	1 day	0	8 hrs, ...	0	0	15 hrs,...	6%	1 day	0	9 hrs, ...	0	0	14 hrs,...	3%
pasteurizer 2		1	1 day	0	6 hrs, ...	0	0	17 hrs,...	27%	1 day	0	12 hrs,...	0	0	11 hrs,...	52%
fermenter 3		2	1 day	0	14 hrs	0	0	10 hrs	58%	1 day	0	21 hrs	0	0	3 hrs	87%
fermenter 4		3	1 day	0	20 hrs,...	0	0	3 hrs, ...	85%	1 day	0	17 hrs,...	0	0	6 hrs, ...	72%
fermenter 5		4	1 day	0	21 hrs	0	0	3 hrs	87%	1 day	0	17 hrs,...	0	0	6 hrs, ...	72%
fermenter 7		5	0	0	0	0	0	0		0	0	0	0	0	0	
fermenter 8		6	1 day	0	0	0	0	1 day	0%	1 day	0	20 hrs,...	0	0	3 hrs, ...	86%
fermenter 9		7	1 day	0	0	0	0	1 day	0%	1 day	0	21 hrs	0	0	3 hrs	87%
fermenter 10		8	1 day	0	17 hrs,...	0	0	6 hrs, ...	72%	1 day	0	14 hrs	0	0	10 hrs	58%
fermenter 11		9	1 day	0	1 day	0	0	0	100%	1 day	0	21 hrs	0	0	3 hrs	87%
tank 4		11	1 day	0	2 hrs, ...	0	0	21 hrs,...	10%	1 day	0	2 hrs, ...	0	0	21 hrs,...	10%
tank 7		13	0	0	0	0	0	0		0	0	0	0	0	0	
tank 8		14	1 day	0	0	0	0	1 day	0%	1 day	0	2 hrs, ...	0	0	21 hrs,...	11%
tanks 3 11		18	2 days	0	5 hrs, ...	0	0	1 day, ...	10%	2 days	0	6 hrs, ...	0	0	1 day, ...	12%
tanks 5 9 10		19	3 days	0	5 hrs, ...	0	0	2 days...	7%	3 days	0	7 hrs, ...	0	0	2 days...	10%
line 4		21	1 day	0	19 hrs,...	0	289	4 hrs, ...	80%	1 day	0	19 hrs,...	0	294	4 hrs, ...	81%
line 7		23	0	0	0	0	0	0		0	0	0	0	0	0	
line 8		24	1 day	0	0	0	0	1 day	0%	1 day	0	21 hrs,...	0	318.667	2 hrs, ...	88%
lines 5 9 10		28	3 days	0	1 day, ...	0	660	1 day, ...	61%	3 days	0	2 days...	0	900	12 hrs	83%
lines 3 11		29	2 days	0	1 day, ...	0	600	8 hrs	83%	2 days	0	2 days	0	720	0	100%

PPO provides Fully Configurable Reporting Capabilities

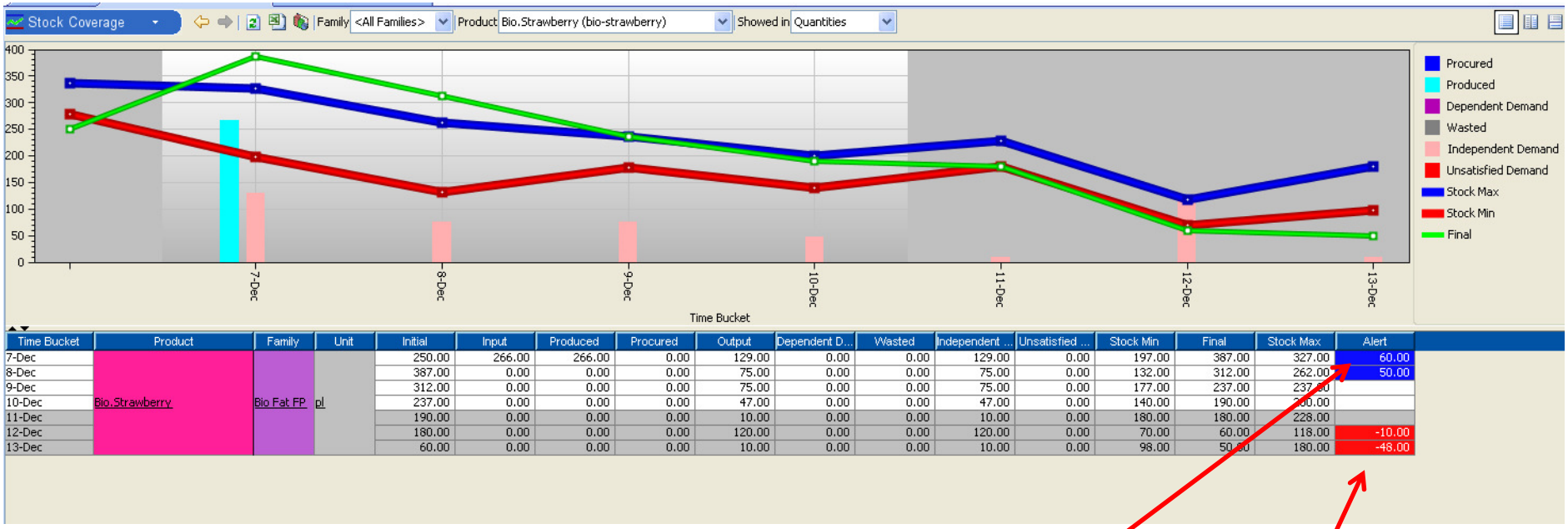


Integrated Planning and Scheduling



Time Bucket	Product	Family	Unit	Initial	Produced	Total Demand	Stock Min	Final	Stock Max	Deficit	Surplus	Alert
02-Aug				24.01	17.00	1.70	15.48	39.31	36.91	-23.83	2.40	2.40
03-Aug				39.31	0.00	7.39	15.10	31.92	35.57	-16.82	-3.65	
04-Aug				31.92	0.00	6.70	15.72	25.22	35.10	-9.49	-9.89	
05-Aug				25.22	0.00	6.94	15.88	18.28	34.95	-2.40	-16.67	
06-Aug				18.28	0.00	7.32	14.61	10.97	34.42	3.65	-23.45	-3.65
07-Aug				10.97	28.03	7.35	13.50	31.65	34.16	-18.15	-2.51	
08-Aug				31.65	0.99	6.04	14.24	26.60	35.26	-12.36	-8.66	
09-Aug				26.60	0.00	6.10	14.93	20.50	35.51	-5.57	-15.01	
10-Aug				20.50	26.84	6.80	15.22	40.54	33.71	-25.32	6.83	6.83
11-Aug				40.54	0.00	6.72	15.64	33.82	32.79	-18.18	1.03	1.03
12-Aug				33.82	0.00	7.05	14.94	26.77	32.67	-11.83	-5.90	
13-Aug				26.77	0.00	7.25	12.69	19.52	31.92	-6.83	-12.40	
14-Aug				19.52	19.13	6.72	11.77	31.94	31.94	-20.16	0.00	

Inventory alerts in PPO



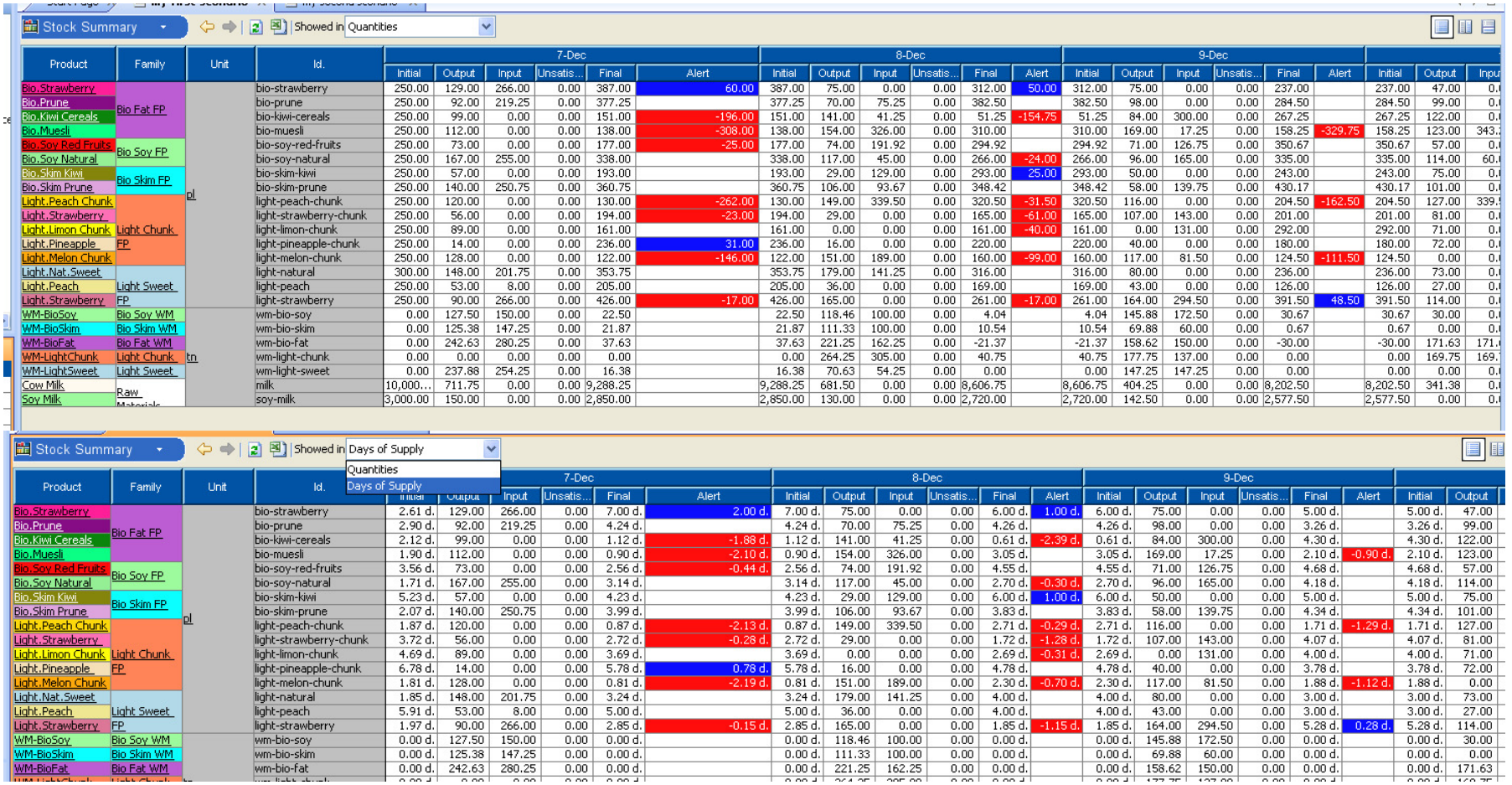
Time Bucket	Product	Family	Unit	Initial	Input	Produced	Procured	Output	Dependent D...	Wasted	Independent ...	Unsatisfied ...	Stock Min	Final	Stock Max	Alert
7-Dec	Bio.Strawberry	Bio Fat FP	pl	250.00	266.00	266.00	0.00	129.00	0.00	0.00	129.00	0.00	197.00	387.00	327.00	60.00
8-Dec				387.00	0.00	0.00	0.00	75.00	0.00	0.00	75.00	0.00	132.00	312.00	262.00	50.00
9-Dec				312.00	0.00	0.00	0.00	75.00	0.00	0.00	75.00	0.00	177.00	237.00	237.00	
10-Dec				237.00	0.00	0.00	0.00	47.00	0.00	0.00	47.00	0.00	140.00	190.00	190.00	
11-Dec				190.00	0.00	0.00	0.00	10.00	0.00	0.00	10.00	0.00	180.00	180.00	228.00	
12-Dec				180.00	0.00	0.00	0.00	120.00	0.00	0.00	120.00	0.00	70.00	60.00	118.00	-10.00
13-Dec				60.00	0.00	0.00	0.00	10.00	0.00	0.00	10.00	0.00	98.00	50.00	180.00	-48.00

Inventory excess with respect to max days of supply

Inventory deficit with respect to min days of supply

Stock Summary View

Summary of inventory levels for intermediates and finished goods expressed in quantity and days of supply



Stock Summary — Showed in: Quantities

Product	Family	Unit	Id.	7-Dec Initial	7-Dec Output	7-Dec Input	7-Dec Unsatis...	7-Dec Final	7-Dec Alert	8-Dec Initial	8-Dec Output	8-Dec Input	8-Dec Unsatis...	8-Dec Final	8-Dec Alert	9-Dec Initial	9-Dec Output	9-Dec Input	9-Dec Unsatis...	9-Dec Final	9-Dec Alert	Initial	Output	Inpu
Bio.Strawberry	Bio Fat FP	pl	bio-strawberry	250.00	129.00	266.00	0.00	387.00	60.00	387.00	75.00	0.00	0.00	312.00	50.00	312.00	75.00	0.00	0.00	237.00		237.00	47.00	0.
Bio.Prune			bio-prune	250.00	92.00	219.25	0.00	377.25		377.25	70.00	75.25	0.00	382.50		382.50	98.00	0.00	0.00	284.50		284.50	99.00	0.
Bio.Kiwi Cereals			bio-kiwi-cereals	250.00	99.00	0.00	0.00	151.00	-196.00	151.00	141.00	41.25	0.00	51.25	-154.75	51.25	84.00	300.00	0.00	267.25		267.25	122.00	0.
Bio.Muesli			bio-muesli	250.00	112.00	0.00	0.00	138.00	-308.00	138.00	154.00	326.00	0.00	310.00		310.00	169.00	17.25	0.00	158.25	-329.75	158.25	123.00	343.
Bio.Soy Red Fruits	Bio Soy FP		bio-soy-red-fruits	250.00	73.00	0.00	0.00	177.00	-25.00	177.00	74.00	191.92	0.00	294.92		294.92	71.00	126.75	0.00	350.67		350.67	57.00	0.
Bio.Soy Natural			bio-soy-natural	250.00	167.00	255.00	0.00	338.00		338.00	117.00	45.00	0.00	266.00	-24.00	266.00	96.00	165.00	0.00	335.00		335.00	114.00	60.
Bio.Skim Kiwi	Bio Skim FP		bio-skim-kiwi	250.00	57.00	0.00	0.00	193.00		193.00	29.00	129.00	0.00	293.00	25.00	293.00	50.00	0.00	0.00	243.00		243.00	75.00	0.
Bio.Skim Prune			bio-skim-prune	250.00	140.00	250.75	0.00	360.75		360.75	106.00	93.67	0.00	348.42		348.42	58.00	139.75	0.00	430.17		430.17	101.00	0.
Light.Peach Chunk	Light Chunk FP		light-peach-chunk	250.00	120.00	0.00	0.00	130.00	-262.00	130.00	149.00	339.50	0.00	320.50	-31.50	320.50	116.00	0.00	0.00	204.50	-162.50	204.50	127.00	339.
Light.Strawberry			light-strawberry-chunk	250.00	56.00	0.00	0.00	194.00	-23.00	194.00	29.00	0.00	0.00	165.00	-61.00	165.00	107.00	143.00	0.00	201.00		201.00	81.00	0.
Light.Limon Chunk			light-limon-chunk	250.00	89.00	0.00	0.00	161.00		161.00	0.00	0.00	0.00	161.00	-40.00	161.00	0.00	131.00	0.00	292.00		292.00	71.00	0.
Light.Pineapple			light-pineapple-chunk	250.00	14.00	0.00	0.00	236.00	31.00	236.00	16.00	0.00	0.00	220.00		220.00	40.00	0.00	0.00	180.00		180.00	72.00	0.
Light.Melon Chunk			light-melon-chunk	250.00	128.00	0.00	0.00	122.00	-146.00	122.00	151.00	189.00	0.00	160.00	-99.00	160.00	117.00	81.50	0.00	124.50	-111.50	124.50	0.00	0.
Light.Nat.Sweet	Light Sweet FP		light-natural	300.00	148.00	201.75	0.00	353.75		353.75	179.00	141.25	0.00	316.00		316.00	80.00	0.00	0.00	236.00		236.00	73.00	0.
Light.Peach			light-peach	250.00	53.00	8.00	0.00	205.00		205.00	36.00	0.00	0.00	169.00		169.00	43.00	0.00	0.00	126.00		126.00	27.00	0.
Light.Strawberry			light-strawberry	250.00	90.00	266.00	0.00	426.00	-17.00	426.00	165.00	0.00	0.00	261.00	-17.00	261.00	164.00	294.50	0.00	391.50	48.50	391.50	114.00	0.
WM-BioSoy	Bio Soy WM		wm-bio-soy	0.00	127.50	150.00	0.00	22.50		22.50	118.46	100.00	0.00	4.04		4.04	145.88	172.50	0.00	30.67		30.67	30.00	0.
WM-BioSkim	Bio Skim WM		wm-bio-skim	0.00	125.38	147.25	0.00	21.87		21.87	111.33	100.00	0.00	10.54		10.54	69.88	60.00	0.00	0.67		0.67	0.00	0.
WM-BioFat	Bio Fat WM		wm-bio-fat	0.00	242.63	280.25	0.00	37.63		37.63	221.25	162.25	0.00	-21.37		-21.37	158.62	150.00	0.00	-30.00		-30.00	171.63	171.
WM-LightChunk	Light Chunk	tn	wm-light-chunk	0.00	0.00	0.00	0.00	0.00		0.00	264.25	305.00	0.00	40.75		40.75	177.75	137.00	0.00	0.00		0.00	169.75	169.
WM-LightSweet	Light Sweet		wm-light-sweet	0.00	237.88	254.25	0.00	16.38		16.38	70.63	54.25	0.00	0.00		0.00	147.25	147.25	0.00	0.00		0.00	0.00	0.
Cow Milk	Raw Materials		milk	10,000...	711.75	0.00	0.00	9,288.25		9,288.25	681.50	0.00	0.00	8,606.75		8,606.75	404.25	0.00	0.00	8,202.50		8,202.50	341.38	0.
Soy Milk			soy-milk	3,000.00	150.00	0.00	0.00	2,850.00		2,850.00	130.00	0.00	0.00	2,720.00		2,720.00	142.50	0.00	0.00	2,577.50		2,577.50	0.00	0.

Stock Summary — Showed in: Days of Supply (Quantities / Days of Supply)

Product	Family	Unit	Id.	7-Dec Initial	7-Dec Output	7-Dec Input	7-Dec Unsatis...	7-Dec Final	7-Dec Alert	8-Dec Initial	8-Dec Output	8-Dec Input	8-Dec Unsatis...	8-Dec Final	8-Dec Alert	9-Dec Initial	9-Dec Output	9-Dec Input	9-Dec Unsatis...	9-Dec Final	9-Dec Alert	Initial	Output
Bio.Strawberry	Bio Fat FP	pl	bio-strawberry	2.61 d.	129.00	266.00	0.00	7.00 d.	2.00 d.	7.00 d.	75.00	0.00	0.00	6.00 d.	1.00 d.	6.00 d.	75.00	0.00	0.00	5.00 d.		5.00 d.	47.00
Bio.Prune			bio-prune	2.90 d.	92.00	219.25	0.00	4.24 d.		4.24 d.	70.00	75.25	0.00	4.26 d.		4.26 d.	98.00	0.00	0.00	3.26 d.		3.26 d.	99.00
Bio.Kiwi Cereals			bio-kiwi-cereals	2.12 d.	99.00	0.00	0.00	1.12 d.	-1.88 d.	1.12 d.	141.00	41.25	0.00	0.61 d.	-2.39 d.	0.61 d.	84.00	300.00	0.00	4.30 d.		4.30 d.	122.00
Bio.Muesli			bio-muesli	1.90 d.	112.00	0.00	0.00	0.90 d.	-2.10 d.	0.90 d.	154.00	326.00	0.00	3.05 d.		3.05 d.	169.00	17.25	0.00	2.10 d.	-0.90 d.	2.10 d.	123.00
Bio.Soy Red Fruits	Bio Soy FP		bio-soy-red-fruits	3.56 d.	73.00	0.00	0.00	2.56 d.	-0.44 d.	2.56 d.	74.00	191.92	0.00	4.55 d.		4.55 d.	71.00	126.75	0.00	4.68 d.		4.68 d.	57.00
Bio.Soy Natural			bio-soy-natural	1.71 d.	167.00	255.00	0.00	3.14 d.		3.14 d.	117.00	45.00	0.00	2.70 d.	-0.30 d.	2.70 d.	96.00	165.00	0.00	4.18 d.		4.18 d.	114.00
Bio.Skim Kiwi	Bio Skim FP		bio-skim-kiwi	5.23 d.	57.00	0.00	0.00	4.23 d.		4.23 d.	29.00	129.00	0.00	6.00 d.	1.00 d.	6.00 d.	50.00	0.00	0.00	5.00 d.		5.00 d.	75.00
Bio.Skim Prune			bio-skim-prune	2.07 d.	140.00	250.75	0.00	3.99 d.		3.99 d.	106.00	93.67	0.00	3.83 d.		3.83 d.	58.00	139.75	0.00	4.34 d.		4.34 d.	101.00
Light.Peach Chunk	Light Chunk FP		light-peach-chunk	1.87 d.	120.00	0.00	0.00	0.87 d.	-2.13 d.	0.87 d.	149.00	339.50	0.00	2.71 d.	-0.29 d.	2.71 d.	116.00	0.00	0.00	1.71 d.	-1.29 d.	1.71 d.	127.00
Light.Strawberry			light-strawberry-chunk	3.72 d.	56.00	0.00	0.00	2.72 d.	-0.28 d.	2.72 d.	29.00	0.00	0.00	1.72 d.	-1.28 d.	1.72 d.	107.00	143.00	0.00	4.07 d.		4.07 d.	81.00
Light.Limon Chunk			light-limon-chunk	4.69 d.	89.00	0.00	0.00	3.69 d.		3.69 d.	0.00	0.00	0.00	2.69 d.	-0.31 d.	2.69 d.	0.00	131.00	0.00	4.00 d.		4.00 d.	71.00
Light.Pineapple			light-pineapple-chunk	6.78 d.	14.00	0.00	0.00	5.78 d.	0.78 d.	5.78 d.	16.00	0.00	0.00	4.78 d.		4.78 d.	40.00	0.00	0.00	3.78 d.		3.78 d.	72.00
Light.Melon Chunk			light-melon-chunk	1.81 d.	128.00	0.00	0.00	0.81 d.	-2.19 d.	0.81 d.	151.00	189.00	0.00	2.30 d.	-0.70 d.	2.30 d.	117.00	81.50	0.00	1.88 d.	-1.12 d.	1.88 d.	0.00
Light.Nat.Sweet	Light Sweet FP		light-natural	1.85 d.	148.00	201.75	0.00	3.24 d.		3.24 d.	179.00	141.25	0.00	4.00 d.		4.00 d.	80.00	0.00	0.00	3.00 d.		3.00 d.	73.00
Light.Peach			light-peach	5.91 d.	53.00	8.00	0.00	5.00 d.		5.00 d.	36.00	0.00	0.00	4.00 d.		4.00 d.	43.00	0.00	0.00	3.00 d.		3.00 d.	27.00
Light.Strawberry			light-strawberry	1.97 d.	90.00	266.00	0.00	2.85 d.	-0.15 d.	2.85 d.	165.00	0.00	0.00	1.85 d.	-1.15 d.	1.85 d.	164.00	294.50	0.00	5.28 d.	0.28 d.	5.28 d.	114.00
WM-BioSoy	Bio Soy WM		wm-bio-soy	0.00 d.	127.50	150.00	0.00	0.00 d.		0.00 d.	118.46	100.00	0.00	0.00 d.		0.00 d.	145.88	172.50	0.00	0.00 d.		0.00 d.	30.00
WM-BioSkim	Bio Skim WM		wm-bio-skim	0.00 d.	125.38	147.25	0.00	0.00 d.		0.00 d.	111.33	100.00	0.00	0.00 d.		0.00 d.	69.88	60.00	0.00	0.00 d.		0.00 d.	0.00
WM-BioFat	Bio Fat WM		wm-bio-fat	0.00 d.	242.63	280.25	0.00	0.00 d.		0.00 d.	221.25	162.25	0.00	0.00 d.		0.00 d.	158.62	150.00	0.00	0.00 d.		0.00 d.	171.63

Conclusion: Benefits

- Reduce waste, work-in-process inventory and cycle time
- Increase throughput via improved resource utilization
- Generate realistic schedules by taking into accounts true manufacturing constraints
- Improve the synchronization between intermediate products and finished goods
- Align manufacturing execution with demand sensing
- Reduce planning and scheduling cycle time
- Improve production smoothing by generating plans with stable production frequency and low production variability
- Quickly align manufacturing strategies to changing market conditions

धन्यवाद

Hindi

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Vietnamese

спасибо

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Arabic

Obrigado

Brazilian Portuguese

Grazie

Italian

Merci

French

Danke

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谢谢你

Simplified Chinese

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