IBM Software

Impact2010 Comes to You

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

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Kuah Ann Thye IBM-ILOG WebSphere

Agenda







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

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Optimization-based Applications

IndustrialTransportation & LogisticsFinancial Services• Production planning & scheduling• Yield Management • Asset Optimization • Fleet Assignment • Depot & warehouse location • Network design • Vehicle & container loading • Truck loading • Maintenance scheduling• Portfolio optimization • Portfolio in-kinding • Portfolio in-kinding • Portfolio in-kinding • Product/price recommendations	Utilities, Energy & Natural Resources • Unit commitment • Supply portfolio planning • Power generation scheduling • Distribution planning • Water reservoir mgt • Mine operations • Timber Harvesting	Telecom • Network capacity planning • Routing • Adaptive network configuration • Adaptive network configuration • Antenna and concentrator location • Equipment and service configuration	Multiple/Other • Workforce scheduling • Advertising scheduling • Marketing campaign optimization • Revenue/Yield Management • Appointment & Field Service scheduling • Combinatorial Auctions for Procurement
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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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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

Optimization Technologies Evolution



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



Options for Planning & Scheduling Solutions



Impact2010 Comes to You or and a start of the start of

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

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How does optimization support decision making?



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

Scenarios Overview	$z \times$			
🧾 Workspace				
📄 🕞 New Default Scenario				
Adjustments Canada	demand			
Adjustment Prod	Solve	F11		
	Check Data	F7		
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Scenario Explorer 🦓	Cancel Solve Process			
District Adjustment Producti	Cancel Other User's Solve Process			
Analysis	Use as reference			
Requiremen	Duplicate Current Scenario	Ctrl+D		
KPI Compar	Create a modified scenario	•		
🖨 🏢 Input Data	Import or Refresh Data From			
😥 🛄 Products	Update Current Scenario			
🖨 🖽 Market	Devent Connection to be an			
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	Set Permanent Lock			
Demanc	Unlock Scenario			
	Delete	Delete		
	Rename			
Allocation				
Production				
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Displays using Simple Tables and Charts



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Business Goals and Plan Overview w/ Charts

🙆 OPL-ODM Supply Demo - Distributio	n Center Charts			
File Edit Scenario View Window Help	r.			
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Scenarios Overview ×	👫 Map 🔹 🏟 Goals			$\triangleleft \flat \mathbf{X}$
New Default Scenario	Goal Name	Value Active	Importance Facto	r Constrained
	Variable Plant Cost	\$16,603,800		1 🗸
	Inbound Transportation Cost	\$7,105,155.21		1
	Outbound Transportation Cost	\$6,627,748.024		1
Respects Free Lesses	Fixed Distribution Center Cost	\$3,250,000		1
Scenario Explorer ×	Variable Distribution Center Cost	\$2,677,000		1
Goals	Name	Value	Name	Value 👻
Requirements	Constraints	Inbound Transportation Cost	Inbound Transportation Cost	\$7,105,155.21
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Production	Constrain min to		🖨 - SKU 1099	\$2,945,706.373
Distribution	With priority		Los Angeles	\$1,787,476.106
Distribution Centers	Bound Searches		San Francisco	\$786,045.845
DC Variable Cost	Best bound		Dallas	\$372,184.422
	Worst bound	Town out of		\$2,267,102.974
	Ignoring priorities under	Ignored	H→SKU 1299	\$1,038,116.229
🖮 🛄 Customer Data				\$854,229.634
Customers	Distribution Center Chart			4 5 ¥
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DC to Customer chipments				
Distribution Center Costs	266-			
Distribution Center Charts				
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Pivot Tables and Scenario Comparison

SupplyDemand - Demands Pivot										
File Edit Scenario View Window Help										
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Scenarios Overview 🛛 🕹	Demands	Pivot								
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Baseline										
Adjustments	Type 🍸 Pric	te Level 🔽 🛛 Ma	turity 🚩							
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			2007							~
			🖃 Jan-07	E Feb-07	🖃 Mar-07	🖃 Apr-07	🖃 May-07	🖃 Jun-07	🖃 Jul-07	🖃 Aug-07 📃
	Country 🛧 🔽	Product 🛧 🔽	2007Q1	2007Q1	2007Q1	2007Q2	2007Q2	2007Q2	2007Q3	2007Q3
	🖃 Argentina	2005	64	67	61	63	59	5	9 60	51
		3005	46	6 41	44	38	43	3	9 40	36
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🖃 🛄 Input Data		6765	91	102 (94)	97	100	105	5 10	95 (105)	105
Products		9005	35	40 (34)	35	36	33	3 3	3 33	29
🖨 🏢 Market		9295	11	10 (6)	7	12	8	8	7 9	7
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Demands Pivot		Bandit 1200	83	90	100 (93)	91	86	5 8	92	92
Demand Chart		Bandit 12005	90	96	90 (99)	103	98	3 10	L 105	5 105
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Misc		Boulevard	37	37	39	39	44	4	38	42
Solution		CR5550	90 (110)	90 (112)	100 (105)	100 (106)	105 (116)	11	7 108	114
		CRX500	88	8 83	81	86	82	2 7	5 76	5 74
		CRX600	48	8 41	42	42	49	4	2 42	42
		CRX650	62	2 58	63	66	65	5 6	66	69
Inventory Results		Enduro 350	77	70	73	73	72	2 6	3 62	67
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From Scenario Comparison to Sensitivity Analysis

Pair-wise Scenario Comparison

Detailed inputs and outputs,







Extensible with Custom Views



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Optimizing Business Goals

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

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Goal Name		Value	Active		Importance Fact	or	Constrained	
Variable Plant Cost		\$16,603,800	[~		1	\checkmark	
Inbound Transportation Cost		\$7,105,155.21	[Image: A set of the set of the		1		
Outbound Transportation Co	st	\$6,627,748.024	[Image: A set of the set of the		1		
Fixed Distribution Center Cos	it 🛛	\$3,250,000	[Image: A set of the set of the		1		
Variable Distribution Center C	lost	\$2,677,000	[Image: A second s		1		
Name	Va	lue			Name		Value	
Constraints	Var	iable Plant Cost	:	⊡…Varia	ible Plant Cost		\$1	6,603,800
Constrain max to			15,000	÷[Denver		\$	9,040,900
Constrain min to					SKU 1099		\$	5,918,400
With priority	Med	dium 🔽			SKU 1199		\$	1,619,600
Bound Searches	Very	/ Low	^		SKU 1299		\$	1,502,900
Best bound	Low			ėF	Philadelphia		\$	7,562,900
Worst bound	Med	ium Low			SKU 1099		\$	5,659,500
Ignoring priorities under	Med	edium High		SKU 1199			\$782,400	
	High Very High				SKU 1299		\$	1,121,000
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Controlled Relaxations of Constraints

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

Relaxed Requirements			
T Explanation	Relaxation	Priority	Priority
Each shift should get its nurse requirements		High	
Demand for Emergency Room		High	
Between 5 and 7 nurses required on Saturday, January 8, 2005 from 2 to 12	0 nurse(s)	High	
Between 5 and 7 nurses required on Sunday, January 9, 2005 from 2 to 12	2 nurse(s)	High	
Pairing Rules		Medium	
🖃 Teams		Medium	
🕒 Isabelle and Debbie must work in the same team		Medium	
Union and Clinical Care Rules		Medium	
🖃 Skill Rules 🤟		Medium	
Emergency		Medium	
The Emergency Room department requires at least 1 nurse qualified in Cardi	iac	Medium	
nurse on vacation		Medium	
vacation of Jane		Medium	
on Saturday, January 8, 2005		Medium	





Collaborative Planning User View







Optimization Model Development OPL Perspective OPL - oil/oil.mod - Eclipse SDK File Edit Navigate Search Project Run Window Help 📸 • 🖫 🚔 한 🏇 • 🔕 • 🕅 • 💁 • 🐘 • 💁 • 🔛 • 🖓 • 한 🌆 • 🖓 • 한 🌆 • 🖓 • 한 加 • ava 🕹 📳 📢 OPL 🕸 Debug 📄 🔄 🏹 🗖 🗖 🗊 oil.mod 🕺 🗖 🗖 📴 Outline 🖾 🎋 Debug 🐻 OPL Projects 🛛 CSM Selection (Least-cost routing of payments to various clearing channels) using CPLEX forall (o in Oils) 🗄 🔁 Fiber network design (Network flow prob Types (2) ctCapacity: Model your problems Manage projects Hooks dasType : tuple < demand: float</p> sum(g in Gase 🗄 🔁 mulprod odm using objectives and oilType : tuple < capacity: float,</p> Blend[o][g] <= Oil[o]</pre> with models, data E P NurseMultiModel External data (6) ctMaxProd: constraints Nurses java Gas : gasType[Gasolines] sum(o in Oils , g in Gas and parameters O Gasolines : {string} 🗄 🔛 Nurses odm Blend[o][g] <= MaxProdu 🖮 🔁 oil (An oil blending problem, MILP) .0 MaxProduction : float forall(g in Gasolines) Run Configurations ctOctane: Oil : oilTvpe[Oils] 🗄 🔂 Better database reading () Oils : {string} sum(o in Oils) 🗄 🖸 Data from database (Oil[o].octane - Gas[g].octane) * Blend[o][g] >= 0; .º ProdCost : float Data from spreadsheet forall(g in Gasolines) Decision variables (2) 🗄 🖸 Default Configuration a : dvar float+[Gasolines] ctLead: ~ Inspect data/solution Blend : dvar float+[Oils][Gasoli 🗄 🗁 deploy < E X+Y Constraints (5) bom.lio Value for Blend ilDB.mod ** ctMaxProd ilDB2.mod 🖮 📲 g in Gasolines Values ~ 🔲 oil.dat ** ctDemand Value Reduced cost Oils (size 3) Gasolines (size 3) Sen oilDB.dat 🖮 📲 g in Gasolines "Crude 1" "Super" 2088.9 [-∞..2088.888 0 ** ctOctane < > "Crude 1" "Regular" 2111.1 [-∞..2111.111 0 in Gasolines "Crude 1" "Diesel" 800 0 [-00., (×)= Variables 🔍 Breakpoints 📳 Problem br ctLead **Browse Solutions** "Crude2" "Super" 777.78 0 [-co,.777.7777 in Oils Name Value oilDB.dat 🐰 **Navigate your** .º ProdCost 4 ULIS ITOM DEREAG (OD, "SELECI NAME FROM ULIDATA"); Decision variables (2) GasData from DBRe model **Connect to databases** l° a [0 750 0] OilData from DBRead Blend [2088.9 2111.1 800] [777.78 4222... MaxProduction = 1400 X+Y Constraints (5) ProdCost = 4: v DBExecute(db, "drop table Result"); ~ ~ Property Value × < < > Dimensions 2 🖹 Problems 🖽 Solutions 트 Scripting log 🖉 Statistics 🞲 Engine log 🖄 🔀 Relaxations 🗚 Conflicts 🚳 Profiler 🖳 💭 Reduced LP has 12 rows, 12 columns, and 43 nonzeros. Analyze your problem and ~ Presolve time = 0.00 sec. engine performance Iteration log . . . Iteration: Scaled dual infeas = 0.000000 1 Iteration: 2 Dual objective 434000.000000 **■** 14/2010 Writable Insert 49:8 00:0/ 00:02

Application Development (Configuration)

ODME Perspective



ILOG LogicTools Suite







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



 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

Optimal Network For Service



Savings: \$6 million Service: 40% next day Savings: \$3 million Service: 80% next day



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Which is Better?

Direct Shipments to BKK (Orange Lines)



Mattress sourced from Cambodia



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
TOTALCOST	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



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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	Ava Wk	31	11.67	96 41	99.5	7	132.82		39.82	79.65		62.00





Product Suite : ILOG Transport Analyst



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From Network (LNP) to Transport Analysts (TA)





Shipment Routing Evaluation



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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





🧤 yogurt - ILOG Plant PowerOps			
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Problem View 🛛	0000	• • • • • • • • • • • • • • • • • • •	Joans Apx
Scenario 1		and paramet	ers
	Welcome to ILOG Plant Po	werOps	Changing the rules of business
Data Tables Calendars Standard KPI weights	9 5 Optimize		
• •	Parameters Production Planning Batch	ing	
Production Planning Detailed Scheduling	Start time	26 Apr 2005 00:00:00 CEST	ng
Setup Cost			nid_term.csv: continuous production of three finis.
0.002	Production Planning	-	ning
Non Delivery Cost	Time Limit		10 sv: planning and scheduling of continuous product
100 🗢	Horizon	1 May 2005 00:00:00 CE	Internation
Tardiness Cost			v. planning and scheduling of campaigns with large
100 🗘	Batching		
Storage Cost	Algorithm	Heuristic	v eduling
50 🗘	Time Limit		10 ialflow.csv: scheduling with setup times and costs
Stock Deficit Cost	Horizon	1 May 2005 00:00:00 CE	ST
10 2		Netus	iled scheduling
	Detailed Scheduling		ne.csv: scheduling with setup times and costs and
	Time Limit	8	10
	Horizon	1 May 2005 00:00:00 CE	st
	-		Ops, and a reference section.
	Optimi	ze Cancel	

Integrated Planning and Scheduling



Managing Plant Floor Constraints





Rod yogurt - ILOG Plant PowerOps	
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Problem View Shows the Checker	Start Page 📕 yogurt_plan1
G Scenario 1	💭 Resources 🔹 📄 - 🔍 🔍 🐼 N. 🥂 🔍 - 💭 😂 😓 - 🐼 🥒 📞 🖃 🖓 🌰 - 🚑 🖪 - 🚚 - 🍇
E Plans	
Image: Second	Name ID Wed Apr 27, 2005 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23
	All Resourc All Reso
	pasto Production Order
Add a new production ord	er ferment province ferment.
	Bat I tank 4 tank-4 Die 4 die 10 Die
	Bet Line 4 line 4 line 4
	Batch Size Max 60.0
	Bakiner Batch Size 27
	Bat II tan tank-s Batch Size Min 6.0
	Bat II line 5 line-5
	Bat II fer ferment
Violation Panel	Bat II tan tank-9
	Bat II line 9 line-9 vit-limon vit-melon_setup vit-pine vit-pine vit-pine
• Show violations of tank	Bat II fer fermenter-10 cool fermenterment. cool
capacity and batch	Bat II tan tank-10 fill cold-stor. Fix Pegging d-stor. fill fill
	Bat II line line-10 vit-natur_setup vit-natur Scroll To
mixing	Bat III fer fermenter-11 ferment. ferment. ferment.
100 vital-pineapple-ryfdvi_2_1 vital-pineapple-ryfdvi 56	Bat III tan tank-11 tor. fill cold-stor. fill Sort Solit Cold-stor.
101 vital-pineapple-ryfdvi_2_2 vital-pineapple-ryfdvi 56 102 vital-pineapple-ryfdvi_2_3 vital-pineapple-ryfdvi 56	Bat III line Filter Merge bio-muesli
103 vital-pineapple-ryfdvi_2_4 vital-pineapple-ryfdvi 56	Bet In the Colorize Frank Level Display
104 vital-melon-ryfdvi_0_0 vital-melon-ryfdvi 35 105 vital-melon-ryfdvi 1 vital-melon-ryfdvi 44	
106 vital-melon-ryfdvi_1_0 vital-melon-ryfdvi 27	
107 vital-melon-ryfdvi_1_1 vital-melon-ryfdvi 41 108 vital-melon-ryfdvi 3.0 vital-melon-ryfdvi 52	Bat III uncover problems, such
109 vital-melon-ryfdvi_3_1 vital-melon-ryfdvi 52	Bat IV1
110 vital-melon-ryfdvi_3_2 vital-melon-ryfdvi 52 111 vital-melon-ryfdvi_3_2 vital-melon-ryfdvi 52	
111 vital-melon-ry/dvi_3_3 vital-melon-ry/dvi 32 112 vital-melon-ry/dvi_3_4 vital-melon-ry/dvi 52	intermediate products
113 vital-melon-ryfdvi_3_5 vital-melon-ryfdvi 52	
	20,000
Procurements Shipments Production Orders Arcs	10,000
Model Materials Recipes Hesources Customers Demands	
Checker	
Front and	Moseane
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
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Resources - Exect Production Orders have a "brick" pattern
Name III Fri Apr 29, 05
Bat I fer metter-4 fer met
Bat I tark 4 tark-4 Cold-stor. Ordinary changeover with no major cleaning (installing fruit container, rinsing)
Bat I line 4 line-4 bio-soy bio-soy
Bat II fer fermenter-5 . ferment. fe
Bat II tan tank-5 Cold-stor. Cold
Bat II line 5 line-5
Bat II fer fermenter-9 1t. ferment.
Bat II tan tank-9 [cold-stor. cold-stor.
Bat Il line 9 line-9 vit-pine
Bat II fer ferment.
Bat II tan tank-10 cold-stor.
Bat Il line line-10 vit-peach vit-peach vit-peach vit-peach vit-peach Lnforce maximum 36 hours between two cleanings
Bat III ter Terment.
Bat II fer ferment fer
Bat Illine 3 Changeover with Cleaning In Place triggered by allergen transition
ViteLimon Chunk 500
- Coverage Max 300
• These setups textured
Inventory Vital.Pineapple
Vital.Pineapple Chur 450
- Coverage Max - Coverage Min 350
250
Inventory Vital Melon Ch
Vital Meion Chunk 450

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plan2				uncaticfied domand mat	Dio Druno
🖃 <u> </u> Scenario 3	💐 Planning Workload				
Applied Rules Abst If	Decouvers			unsatisfied_demand_mat	_Bio.Soy Red Fruits
Marketing_campaign (58)	Resources			unsatisfied_demand_mat	_Bio.Soy Natural
E Plans	Activities			unsatisfied demand mat	/ Vital Peach Chunk
Es plan4					
Data Tables Calendars Standard KPI weights				unsatisfied_demand_mat	_Vital.Strawberry Chunk
	1,500 -		*	unsatisfied_demand_mat	_Bio.Skim Kiwi
identifier name		*		📕 📕 unsatisfied_demand_mat	_Bio.Skim Prune
bio-strawberry-26 Bio C.Strawberry BF 26/04				unsatisfied demand mat	Vital Limon Chunk
bio-prune-26 Bio C.Prune 26/04 bio-sov-red-fruits-26 Bio Sov Frutos Roios 26/04					
bio-soy-natural-26 Bio Soy Natural 26/04	1,000 -			unsatisfied_demand_mat	_Vital.Pineapple Chunk
vital-peach-fdvi-26 Vital C. Peach RYFDvi 26/04				unsatisfied_demand_mat	_Vital.Melon Chunk
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vital-limon-26 Vital Delic.Sorb.Limon 26/04	500 -				
vital-pineappie-rdvi-26 Vital C.Melon.RYFDvit 26/04				unsatisfied_demand_mat	_Vital.Strawberry
vital-natural-26 Vital C.Nat.Sweet. 26/04				unsatisfied_demand_mat	_Bio.Kiwi Cereals
vital-peach-26 Vital C.Peach 26/04 vital-strawberry 26 Vital C.Strawberry XPD 26/04				unsatisfied demand mat	r Bio Muesli
bio-kiwi-cereals-26 Bio C.Kiwi-Cereals BF 26/04	Tue-26	Wed-27 Thu-28	Fri-29 Sat-30		
bio-muesli-26 Bio C.Muesli BFI 26/04	KPI Comparator Panel				×
bio-strawberry-27 Bio C.Strawberry BF 27/04 bio-prune-27 Bio C.Prune 27/04	Detailed Scheduling Production Pla	anning			
bio-soy-red-fruits-27 Bio Soy Frutos Rojos 27/04	KPIs	plan1	plan2	plan4	
bio-soy-natural-27 Bio Soy Natural 27/04	Operational Efficiency		4,070.00	4,080.00	4,010.00
vital-peach-rdvi-27 Vital C. Strawberry RYFDvi 27/04	Net Utilization		0.57	0.57	0.58
bio-des-kiwi-27 Bio Des.Kiwi 27/04	Production Quantity		8,904.00	8,904.00	9,021.00
bio-des-prune-27	Denel		62.41	36,91	15,560.30
vital-melon-fdvi-27	i Panei				
• Provides an e	asy way to com	nare			
vital-strawberry-2					
scenario solut	ions				
	haniem allowe t				
Shipments A plug-III IIIec					
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.



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.

🕵 Distribution F	Planning 👻	(\$	2 🗐 Fa	mily BRO	Product All Prod	ucts==		Bucket S	548-2006	~		
Time Bucket	Product V	Family	Unit	Quantity From	n Site To Site	• • • • •					and the second sec	
BF	ROWN_BEER_SXB			31.75	Strasbourg ,	`	უ		200.00			
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BL	LOND_BEER_PAR		-	63,42 Lille	Paris		4500.28		- The second of the			
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Multiple Optimisation Profiles

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

🕫 Optimize the scenario 🛛 🛛 🔀	3	
Profile Optimal tradeoff Add Global Optimize Inventory Start tin Optimize Operational Efficiency Long term planning		The different "optimization profiles" can be defined. E
✓ Production Planning Time Limit 30 Horizon 14 Dec 2006 00:00:00		Planners can choose an existing optimization profile or creating a new one.
Advanced options Image: Contraining advanced options Image: Contraining advanced options Image: Contraining advanced options Criterions Constraints Misc For Detailed Scheduling		Each optimization profile defines the goals of the schedule by setting
Time Limit Betup Cost Horizon 11 Dec 2i Post Processing Inventory Deficit Cost Inventory Deficit Cost Total Earliness Inventory Deficit Cost Inventory Cost Inventory Deficit Cost Inventory Deficit Cost Inventory Deficit Cost Inventory Cost Inventory Cost Inventory Cost Inventory Cost Inventory Cost Inventory Cost Inventory Cost </td <td>)</td> <td>the relative importance of different objectives</td>)	the relative importance of different objectives

Impact2010 Comes to You



Editing Planned Production with Automatic Configuration

Demands	Procurements Producti	on Orders Arts Durequied Acti	ivities Planned Productions Planned Deliver
name	recipe	bucket quantity	disp firm start min en
Mag Add a	new 'Planned Produ	ictions' row	2
name			
	wm-bio-fat	~	
	Activity Label	Mode : Primery Recourse	
	wm-bio-fat-milk		Multi-sten Recines
	wm-bio-fat-ferment	pasto1 : pasteurizer 1	
recipe	wm-bio-fat-cooling	pasto2 : pasteurizer 2	Automatic
	wm-bio-fat-fillup	mode : tanks 3 11	configuration of the
	wm-bio-fat-store	mode : tanks 3 11	possible modes
			function of previous
		Reset	choices
huslah	7.0		
DUCKEC	7-Dec		
quantity		100	





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

		matorial	raminy	quantity	disp	firm	fulfilment	enforce fulfilment
bio-strawberry-7 Bio	o.Strawberry 0	Bio.Strawberry	Bio Fat	129.00	pl		100%	
bio-strawberry-8 Bio	o.Strawberry 0	Bio.Strawberry	Bio Fat	75.00	pl		100%	
bio-strawberry-9 <mark>Bi</mark>	o.Strawberry 0	Bio.Strawberry	Bio Fat	75.00	pl		61%	
bio-strawberry-10 Bio	o.Strawberry 1	Bio.Strawberry	Bio Fat	47.00	pl		0%	
bio-strawberry-11 Bio	o.Strawberry 1	Bio.Strawberry	Bio Fat	10.00	pl		0%	
bio-strawberry-12 Bio	o.Strawberry 1	Bio.Strawberry	Bio Fat	120.00	pl		0%	
bio-strawberry-13 Bio	o.Strawberry 1	Bio.Strawberry	Bio Fat	10.00	pl		0%	

20/Rido20/Rid2/20/Ric



Reducing Re-planning nervousness

Fix planned productions in current planning solution

Demands Pro	Scheduled Acti	vities	Plann	ned P	Productions Planned Deliveries			
пате	recipe	bucket	quantity	disp	firm		start min	end max
bio-strawberry_1	bio-strawberry	8-Dec	206.00	d		8 De	: 2006 00:00:00	9 Dec 2006 00:1
bio-strawberry_6	bio-strawberry	13-Dec	60.00	ol	 Image: A set of the set of the	13 D	ec 2006 00:00:00	14 Dec 2006 00
bio-prune_0	bio-prune	7-Dec	102.00	pl	 Image: A set of the set of the	7 De	2006 00:00:00	8 Dec 2006 00:0
bio-prune_1	bio-prune	8-Dec	174.00	pl		8 De	2006 00:00:00	9 Dec 2006 00:0
bio-prune_6	bio-prune	13-Dec	71.00	ł		13 D	ec 2006 00:00:00	14 Dec 2006 00
1	h. 17			1				

Fix planned deliveries in current planning solution

						<u> </u>					
Demands Pro	curements Production C	orders Arcs	ders Arcs Scheduled Activ			nnea P	Productions Planned Deliveries				
name	demand	bucket	quantity	lisp	firm		start min	end max			
Bio.Kiwi Cereals 1	<u>Bio.Kiwi Cereals 12/07</u>	7-Dec	99.00	1		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)l	 Image: A set of the set of the	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	d I		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 p			10 D	c 2006 00:00	11 Dec 2006 00:00:00			
Bio.Kiwi Cereals 1	Bio.Kiwi Cereals 12/12	12-Dec	116.00 p			12 De	c 2006 00:00	13 Dec 2006 00:00:00			





KPI Scenario Comparisons







Available-To-Promise

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



Capable-To-Promise

Comes to You

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

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💯 Transactional Data 👻 🗘 🗇 📄 😰 🖻	ר <mark>X +</mark> [identifier	3235ea71-3d0f-11dd-ab35-001	5c5b1e774	
Demands Procurements Production Orders	A Add new row d Activities	name	СТР		No. of Concession, Name
identifier name <u>mate</u>	<u>erial</u> family qua			1000 achievable ?	
bio-strawberry-7 Bio.Strawberry 0 Bio.Strawber	ry Bio Fat	material	Bio.Strawberry	YU 40111	
bio-strawberry-8 Bio.Strawberry 0 Bio.Strawber	ry Bio Fat			16 23:	
bio-strawberry-9 Bio.Strawberry 0 Bio.Strawber	ry Bio Fat	quantity		1000 06 23:	
bio-strawberry-10 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat			006 23	
bio-strawberry-11 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat	delivery date min	7-Dec	✓ 006 23	
bio-strawberry-12 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat			006 23	
bio-strawberry-13 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat	delivery date max	7-Dec	✓ 006 23	
bio-strawberry-14 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat			06 23	
bio-strawberry-15 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat			100 006 23	
bio-strawberry-16 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat	non delivery unit cost	Highest non-delivey cost	206 23	
bio-strawberry-17 Bio.Strawberry 1 Bio.Strawber	ry Bio Fat			4.0	
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identifier	and r	o-ontimizo	-	-	
	allu l	c-optimize			
IBM Software					
Impact2010					

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Capable-To-Promise



Profitable-To-Promise

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

				Criterions Constraints Misc	
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7 Transactional	Data 🔹 📥 🗌	a Bì 📕 🗙 🔽			
Demands Proc	urements Production O	rders A Add new row d Activities Planned Pro	ductions Plann		
identifier	💵 Add a new 'Dema	ands' row 🛛 🔀	firm	/- Non Delivery Cost	date
bio-strawberry-7 B				100 🗘	
bio-strawberry-8 B	identifier	d5e1e842-3d1b-11dd-ab35-0015c5b1e774		- Processing Cost	
bio-strawberry-9 B					
bio-strawberry-10 B	name	PTP			
bio-strawberry-11 B				Setup Cost	
bio-strawberry-12 B	material	Bio.Strawberry			
bio-strawberry-13 B					
bio-strawberry-14 B	quantity	1000		Total Earliness	
bio-strawberry-15 B				1 🗯	
bio-strawberry-16 B	delivery date min	7-Dec 💙		Total Tardinana	
bio-strawberry-17 B					
	delivery date max	7-Dec 🗸 🗸		1	
				r Inventory Excess Cost	
		0			
	non delivery unit cost	Highest non-delivey cost		<u> </u>	
		4.0	/	☐ Inventory Deficit Cost	
	unit price	100.0	D		
			T	Resource Cost	
				1	
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Planning advanced options

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Asset Utilization

Start Page 🗙 📘	Scenario 1 🗙				
🛃 Workload Table		👔 🖳 Layou		Asset utilization I	oy resource
Resource	Capacity	Renk	Utilization 7-Dec	8-Dec	9-Dec
Resource	Сараску	T VOLTIN	Average load	Average load	Average load
pasteurizer 1		0	36%	38%	14%
pasteurizer 2		1	27%	52 <mark>%</mark>	26%
fermenter 3		2	58%	87%	14%
fermenter 4		3	85%	72%	72%
fermenter 5		4	87%	72%	0%
fermenter 7		5			
fermenter 8		6	0%	86%	29%
fermenter 9		7	0%	87%	72%
fermenter 10		8	72%	58%	29%
fermenter 11	1	9	100%	87%	29%
tank 4	'	11	10%	10%	10%
tank 7		13			
tank 8		14	0%	11%	4%
tanks 3 11		18	10%	12%	3%
tanks 5 9 10		19	7%	10%	5%
line 4		21	80%	81%	83%
line 7		23			
line 8		24	0%	88%	33%
lines 5 9 10		28	61%	() 83% ()	38%
lines 3 11		29	83%	100%	25%

yogurt.csv - ILOG Plant PowerOps File Edit View Tools Window Help

Asset utilization by resource family

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All	: Parameters	ə ب ×	Start Page 🗙 📘	Scenario 2 🗙			
a	Name	Value	Workload Table		Lavo	ut Utiliza 🗸	
S	compute stock with s						
es.(aggregate material		Deserves	Course	Deels	7-Dec	8-Dec
- LL	family type	White Mass	Resource	Сараску	капк	Average load	Average load
eso	laggregate resource		pasteurizer	2	0	51%	67%
1	resource family type	type	fermenter		2	15%	63%
đ	bucket aggregation	Daily	tank	8	10	65%	87%
5			line		18	51%	89%

Impact2010 Comes to You



Asset utilization

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

Start Page 🗙	Scenario 1 🗙														~
🛃 Workload Table		👔 🗏 Layo	ut Defaul	t 💌											
		Default			7-Dec							8-Dec			
Resource	Capacity	Rank	Availar.	. Trutal S	Total pr	Total N	Amount	Free Ti	Averag	Availab	Total s	Total pr	Total N	Amount Free 1	i Averag
pasteurizer 1		0	1 day	0	8 hrs,	0	0	15 hrs,	36%	1 day	0	9 hrs,	0	0 14 hrs	33%
pasteurizer 2		1	1 day	0	6 hrs,	0	0	17 hrs,	27%	1 day	0	12 hrs,	0	0 11 hrs	, <u>52</u> %
fermenter 3	1	2	1 day	0	14 hrs	0	0	10 hrs	<mark>58°</mark> %	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	34 . S S S A	0	0	0	0	0 0	
tank 8	1	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



Inventory alerts in PPO



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

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 | Final | Alert | Initial | Output
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 | Output | t Inpu |
| Bio.Strawberry | | | 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 2 | 237.00 | 237.0
 | J 47.0 | 0 0. |
| Bio.Prune | Bio Fat FP | | bio-prune | 250.00 | 92.00 | 219.25

 | 0.00 | 377.25 | | 377.25
 | /0.00 | 75.25 | 0.00
 | 382.50 | | 382.50 | 98.00
 | 0.00 | 0.00 | 284.50 | 284.5
 | J 99.0 | 0 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 | 267.2
 | 5 122.0 | 0 0.1 |
| 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 -32 | 29.75 158.2
 | 5 123.0 | 0 343. |
| Bio. Soy Red Frui | Bio Sov EP | | 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 | 350.6
 | 7 57.0 | 0 0,1 |
| 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 | 335.0
 | 0 114.0 | 0 60.1 |
| <u>Bio. Skim Kiwi</u> | Bio Skim EP | | 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 | 243.0
 | J 75.0 | 0 0,1 |
| Bio.Skim Prune | | ol | 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 4 | 430.17 | 430.1
 | 7 101.0 | 0 0,1 |
| Light.Peach Chur | <u>nk</u> | <u></u> | 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 -16 | 52.50 204.5
 | 0 127.0 | 0 339. |
| 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 | 201.0
 | 0 81.0 | 0 0. |
| Light.Limon Chur | ik Light 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 | 292.0
 | 0 71.0 | 0 0. |
| Light.Pineapple | <u>FP</u> | | 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 | 180.0
 | 0 72.0 | 0 0. |
| Light Melon Chur | <u>1k</u> | | 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 -11 | 11.50 124.5
 | 0.0 | 0,0,1 |
| Light Nat. Sweet | 211 | | 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 | 236.0
 | 0 73.0 | 0,0,1 |
| Light.Peach | Light Sweet | | 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 | 126.0
 | 27.0 | 0.0. |
| Light.Strawberry | <u>FP</u> | 6 | 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 3 | 391.50 4 | 48.50 391.5
 | 0 114.0 | 0.0. |
| 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 | 30.6
 | 7 30.0 | 0.0 |
| 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 | 0.6
 | 7 0.0 | 0.0 |
| 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 | <u>_</u> | -21.37 | 158.62
 | 150.00 | 0.00 | -30.00 | -30.0
 | 0 171.6 | 3 171. |
| WM-LightChunk | Light Chunk | <u>tn</u> | 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 | 0.0
 | 169.7 | 5 169. |
| 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 | 0.0
 | 0.0 | 0,0,1 |
| Cow Milk | Raw | | milk | 10,000 | 711.75 | 0.00

 | 0.00 | 9,288.25 | 9. | ,288.25
 | 681.50 | 0.00 | 0.00 8
 | 3,606.75 | 8, | 606.75 | 404.25
 | 0.00 | 0.00 8,2 | 202.50 | 8,202.5
 | 341.3 | 8 0.1 |
| Soy Milk | Matoriala | 8 | soy-milk | 3,000.00 | 150.00 | 0.00

 | 0.00 | 2,850.00 | 2 | ,850.00
 | 130.00 | 0.00 | 0.00 2
 | 2,720.00 | 2, | 720.00 | 142.50
 | 0.00 | 0.00 2,5 | 577.50 | 2,577.5
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| Stock Sum Product Bio.Strawberry Bio.Frune Bio.Kwi Cereals Bio.Soy Red Fruits Bio.Soy Natural Bio.Skim Kiwi | Family
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Bio Fat FP
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Unit | 2 B) Showed in Day
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lid. Day
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| Stock Sum Product Bio.Strawberry Bio.Rrune Bio.Muesl Bio.Soy Red Fruits | Family
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Unit | Showed in Day Id. Day Id. Day bio-strawberry bio-rune bio-wiwi-cereals bio-soy-natural bio-soy-natural bio-skim-rune | rs of Supply
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| Fire: Stock Sum Product Bio.Strawberry Bio.Fivi Cercals Bio.Muesi Bio.Swi Cercals Bio.Swi Cercals Bio.Swi Cercals Bio.Swi Cercals Bio.Swi Cercals Bio.Swi Cercals Bio.Swi Kwi Bio.Skim Frune Bio.Skim Prune Light.Peach Chuni | Family
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Unit | Showed in Day do Strawberry bio-strawberry bio-strawberry bio-strawberry bio-strawberry bio-swir-cereals bio-swir-cereals bio-swir-stural bio-skim-kiwi bio-skim-prune light-peach-chunk | rs of Supply
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| Stock Sum Product Bio.Strawberry Bio.Frune Bio.Kwi Cereals Bio.Soy Red Fruite Bio.Soy Natura Bio.Skim Prune Light.Strawberry Light.Strawberry | mary Family Bio Fat FP Bio Sov FP Bio Skim FP |) 🗢 🌩 [
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| Stock Sum Product Bio.Strawberry Bio.Prune Bio.Skin Cereals Bio.Skin Kiwi Bio.Skin Frune Light.Peach Chuni Light.Strawberry Light.Limon.chunk | Family
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bio-skim-kiwi
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bio-skim-prune
light-strawberry-chunk
light-strawberry-chunk | ys of Supply
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s of Supply
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1.90 d.
3.56 d.
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Bio.Kwi Cereals
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Bio.Skim Prune
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Light.Melon Chunh | Family
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Unit | Showed in Day Id. Day Dio-strawberry Dio-strawberry Dio-strawberry Dio-strawberry- Dio-strawberry- Dio-strawberry-chunk light-peach-chunk light-meatural light-mean-chunk light-strawberry wm-bio-skm wm-bio-skm | rs of Supply
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Impact2010 Comes to You



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





