The presentation will begin at

8:30 am

Pacific Time - US

ILOG Optimization 101

Make Smarter Business Decisions

June 18, 2009

Welcome

ILOG Optimization 101

Make Smarter Business Decisions

June 18, 2009

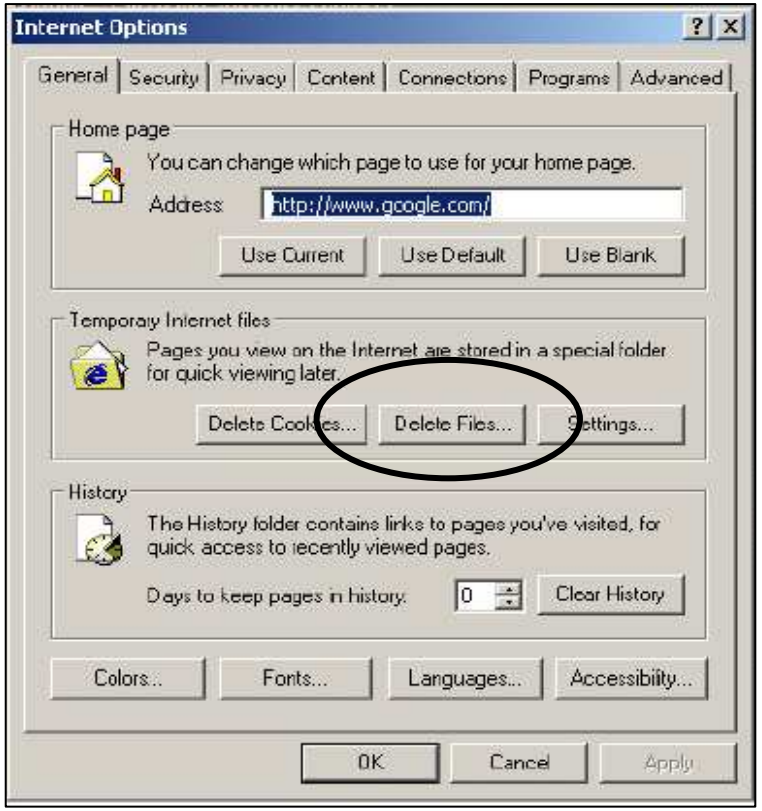
Julie Seltzer Firsty
jfirsty@us.ibm.com

Today's Session

- 45 minute discussion
- Link to replay will be emailed to all attendees
- Attendees will be muted to minimize background noise

Viewing Product Demos: Troubleshooting

- Close all applications that are not in use
- Clear your temporary internet files cache
  - Open a new web browser window
  - From the Tools Menu
  - Select Internet Options
  - Click Delete Files button



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Julie Seltzer Firsty
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Presenters/Panelists

- Jeremy Bloom, Optimization Product Marketing Manager, bloomj@us.ibm.com

- Yianni Gamvros, Technical Account Manager, igamvros@us.ibm.com

Polling Questions

- How familiar are you with Optimization technology?
  - Not at all familiar
  - Somewhat familiar
  - Very familiar
  - Expert
- What is your business focus/ target industry(ies) – pick all that apply
  - Aerospace
  - Cross-industry
  - Defense / Homeland Security
  - Education
  - Financial services
  - Government
  - Health care
  - Manufacturing / Logistics
  - Retail
  - Telecommunications
  - Transportation / Hospitality / Travel
  - Utilities / Natural Resources / Energy
  - Other _____
- How familiar are you with Business Rules?
  - Not at all familiar
  - Somewhat familiar
  - Very familiar
  - Expert

Optimization 101 for IBM Partners

How you can build smarter decision support with Optimization Technology

Dr. Jeremy Bloom
Optimization Product Marketing Manager

Dr. Ioannis Gamvros
Technical Account Manager

June 18, 2009

Agenda

- Introduction
  - What is Optimization?
  - Technology Overview
  - The Value of Optimization
- Case Studies
  - CheckFree
  - Care Systems
  - ClariFI
  - Emptoris
  - Flextrade Systems
  - The Rainmaker Group
  - Quintiq
- Demo
- Conclusions

What is Optimization?

- How can a large drug company determine the monthly product mix at their Indianapolis plant that maximizes corporate profitability?
- What price for Xbox consoles and games will maximize profit from Xbox sales?
- Microsoft would like to undertake 20 strategic initiatives that will tie up money and skilled programmers for the next five years. They do not have enough resources to undertake all 20 projects. Which projects should they undertake?
- How do bookmakers find the best set of "ratings" for NFL teams to set accurate point spreads?
- How should I allocate my retirement portfolio among high-tech stocks, value stocks, bonds, cash, and gold?

Source: *Microsoft Excel Data Analysis and Business Modeling* by Wayne L. Winston.

What is Optimization?

	TYPICAL FREQUENCY	EXAMPLES
LONG-TERM PLANNING	• Annual • Quarterly • Occasional	• Whether to expand a plant or open a new one • How many distribution centers to have • What's the value of additional equipment over time
SHORT-TERM PLANNING	• Monthly • Weekly	• How much should we produce this week • How many shifts should we have • How many resources will we need • Which marketing campaigns will provide the most impact for a set budget
DETAILED SCHEDULING	• Weekly • Daily • Hourly	• Which activity should be done when • Which resource should be assigned when • When can maintenance or any special task be most efficiently scheduled

Industry Applications

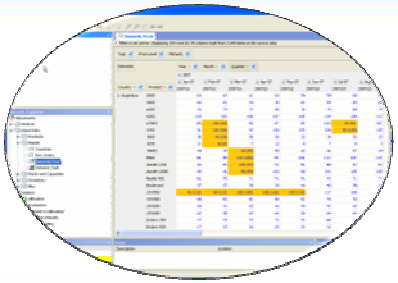
Retail and Healthcare	Financial Services	Transportation & Logistics	Manufacturing	Utilities, Energy & Natural Resources	Telecom
• Product configuration	• Portfolio optimization and rebalancing	• Depot/warehouse location	• Plant location	• Supply portfolio planning	• Network capacity planning
• Space management	• Portfolio in-kinding	• Fleet assignment	• Plant layout	• Power generator scheduling	• Routing
• Pricing & promotions optimization	• Trade crossing	• Network design	• Supply chain management	• Distribution planning	• Adaptive network configuration
• Workforce scheduling	• Loan pooling	• Vehicle routing & scheduling	• Production planning	• Water reservoir management	• Antenna and concentrator location
• Marketing campaign optimization	• Product/price recommendations	• Vehicle & container loading	• Detailed scheduling	• Mine operations	• Equipment and service configuration
		• Crew & driver scheduling	• Combinatorial auctions for procurement	• Timber harvesting	• Field technician dispatching
		• Maintenance scheduling			

From Strategic Planning to Real-Time Detailed Scheduling

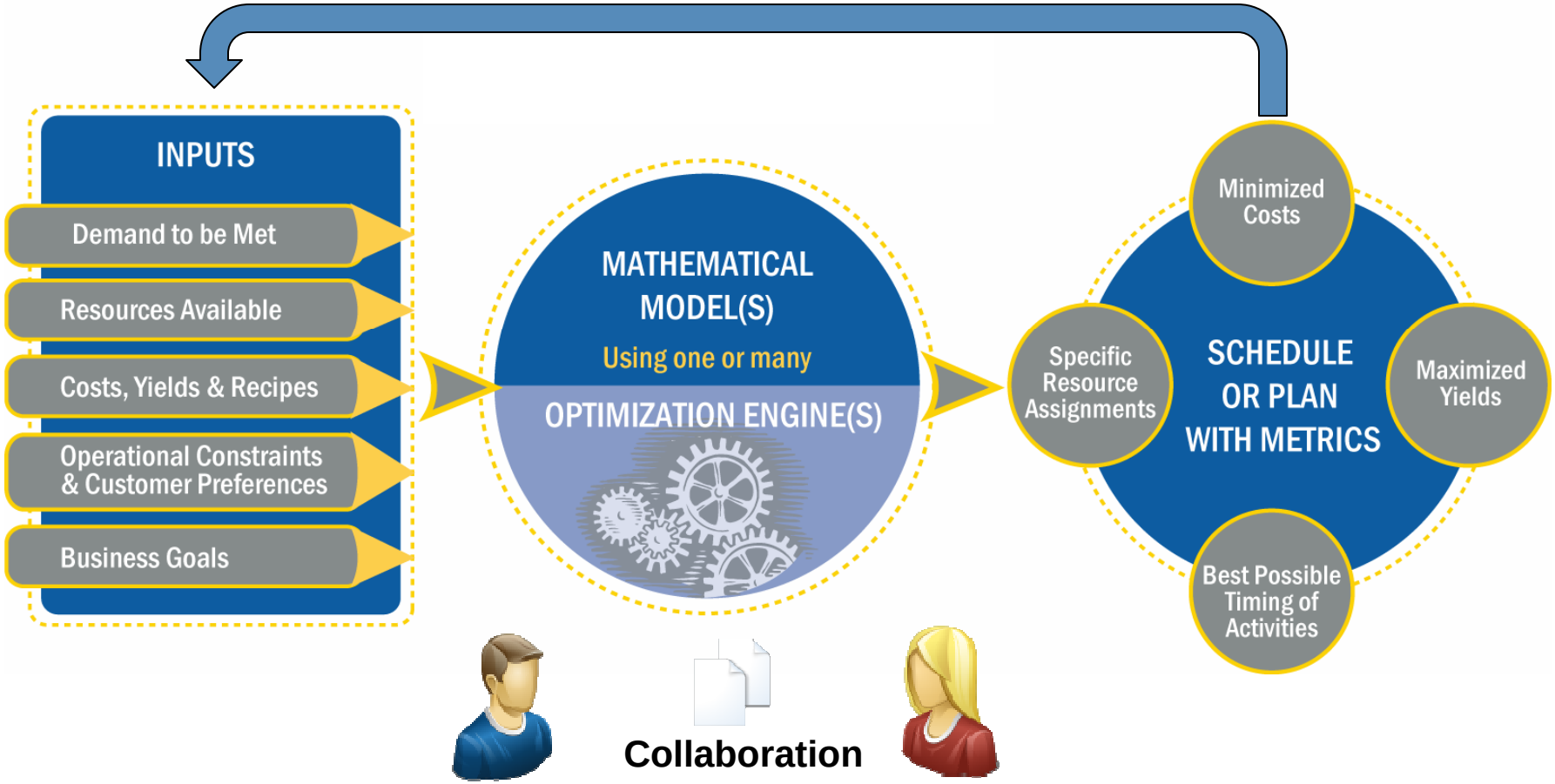
Technology Overview

- Optimization helps businesses make complex decisions and trade-offs about limited resources
  - Discover previously unknown options or approaches
    - Automatically evaluate millions of choices
  - Automate and streamline decisions
    - Compliance with business policies and regulations
    - Free up planners and operations managers so that they can leverage their expertise across a wider set of challenges
  - Explore more scenarios and alternatives
    - Understand trade-offs and sensitivities to various changes
    - Gain insights into input data
    - View results in new ways

How does optimization support decision making?



What-If Analysis



Business Rules vs. Optimization

- Business Rules are about
  - Declarative business logic
  - Business policy
  - Decision-making at the transaction level
  - Modest amounts of data in memory
  - Corporate middleware standards & supporting multiple applications
- Optimization is about
  - Mathematical solutions
  - Objective efficiency and economics
  - Large sets of decisions (plans or schedules)
  - Large amounts of data in memory
  - Individual decision support applications

IBM ILOG Optimization Customers

- Over 1,000 commercial customers under maintenance
  - One third of Global 500 have built custom applications using IBM ILOG Optimization Suite
- Major software companies reach thousands more
  - SAP, Oracle, Infor, JDA, Manhattan Associates, Red Prairie
- Most of our modeling tool competitors are CPLEX resellers, reaching hundreds more…
  - GAMS, Paragon, Maximal
- Over 1000 universities use our products in research

Well-Documented ROI

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

Source: Edelman Finalists, Science of Better, http://www.scienceofbetter.org

Intangible Benefits

- Shrink planning cycles
  - With the automation provided by optimization technology, manual scheduling efforts that could take days can easily be cut down to 5-10 minutes
- Improve employee satisfaction / reduce turnover
  - Optimization models can take personal preferences (both positive and negative) into account
- Improves customer service
  - Optimization is explicitly motivated to determine the right people and equipment at the right time in the right place to deliver the right service as requested

Cash Inventory Management

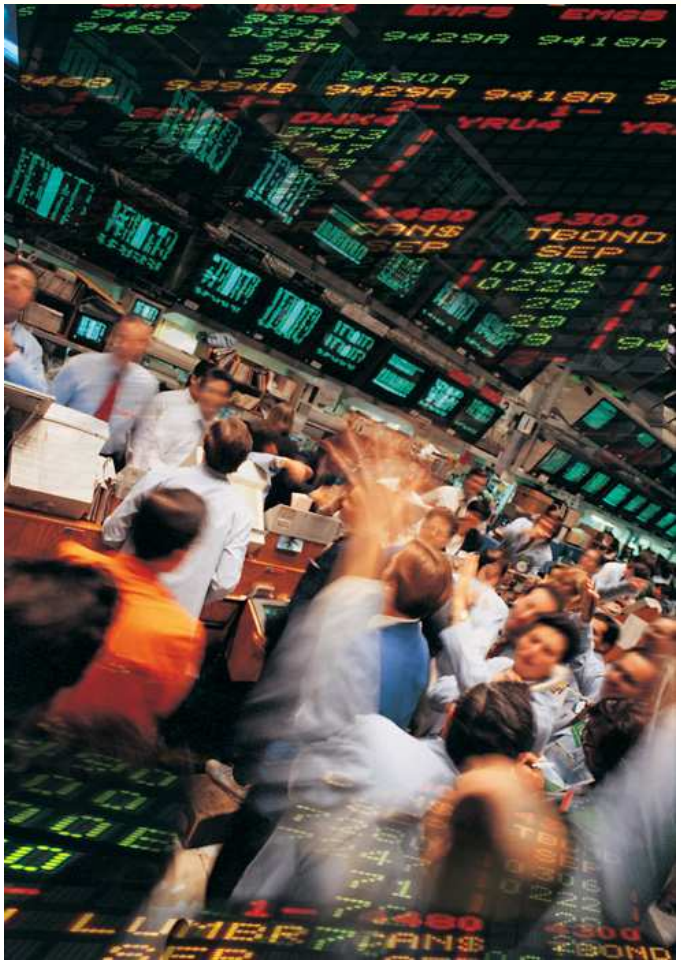
- Partner
  - CheckFree (Fiserv)
  - Provider of financial services technology solutions
  - Compliance, automated clearing house, electronic billing and payment, investment services
- Problem
  - Manage stocking of ATMs
  - Reduce cash inventory carrying costs
  - Reduce delivery costs
  - Reduce cross-shipping penalties at FRB
- Solution
  - IBM ILOG CPLEX used to solve a MILP model
- Benefits
  - Reduce cash inventories by 35% (optimization + better forecasting + better management)
  - Reduce replenishment costs by 55%
  - Decrease cross-shipping fees about 63%
  - Project rated “Highly Successful” by client’s internal Six Sigma Unit

CheckFree is now part of Fiserv

Hospital Staff Scheduling

- Partner
  - Care Systems, division of Planmatics, Inc.
  - Provides suite of solutions to optimize staffing effectiveness and help hospitals achieve better patient and financial outcomes
- Problem
  - Generate an employee roster quickly that ensures shifts are properly staffed with enough personnel and the right skill sets
- Solution
  - IBM ILOG CPLEX handles the complex calculations to generate the schedules
- Benefits
  - Homerton University Hospital (East London) reduced spending on temporary staff by £100,000 per month
  - Employees can better plan personal activities because schedules are produced further in advance
  - New schedules produced in minutes to adjust for mistakes and unexpected events
  - Greater confidence that there are enough nurses with the right skills for the workload.

Portfolio Optimization



Clarifi®

- Partner
  - ClariFI
  - Software and services providing investment managers with research and production workflow solutions
- Problem
  - Deliver portfolio construction and rebalancing functionality for portfolio managers to minimize business risk, increase operational efficiency, and improve strategic investment decision-making
- Solution
  - ClariFI Portfolio Optimizer using IBM ILOG CPLEX
  - State of the art solver with easy to use API
  - CPLEX flexibility allows injecting domain specific insight into the solve process
  - CPLEX at the cutting edge of optimization research
- Benefits
  - Up-sell opportunity with existing client base
  - Has generated interest and new business leads
  - One-stop shop for quant needs

Trade Scheduling

- Partner
  - Flextrade Systems
  - Execution management and algorithmic trading systems for equities, currencies and derivatives
- Problem
  - Minimize average implementation shortfall across portfolio trade list
  - Implementation shortfall: difference between prevailing security price when list sent to trading and execution price
- Solution
  - IBM ILOG CPLEX generates schedule for completing trade list within specified time window
- Benefits
  - Clients – significantly reduced implementation shortfall and dramatically improved performance fluctuation
  - Flextrade – differentiation from competitors, new business for flagship product, increased revenues from Trade Scheduling product

FLEXTRADE Trade your best.

Revenue Management

- Partner
  - The Rainmaker Group
  - Helps travel and hospitality companies forecast consumer demand and optimize product availability
- Problem
  - Maximize earnings for seats, rooms, and revenue from restaurants, casinos, and food and beverages
  - Optimize pricing and determine staffing needs
- Solution
  - Using demand forecast and capacity constraints, IBM ILOG CPLEX makes pricing recommendations
  - Considers about 800 constraints
  - Generates optimal availability restrictions that customers can accept or modify
- Benefits
  - Allows customers to better plan operations and capture incremental revenue
  - Availability recommendations increased customer revenue by more than 10%.
  - One customer estimates an increase of 8% or about $50 million. Another reports 13% increased revenue per available room.
  - Faster and more accurate forecasting enables companies to employ price restrictions during high-demand periods and discounts during slower times
  - Solution speed allows repeating to address new demand or availability conditions

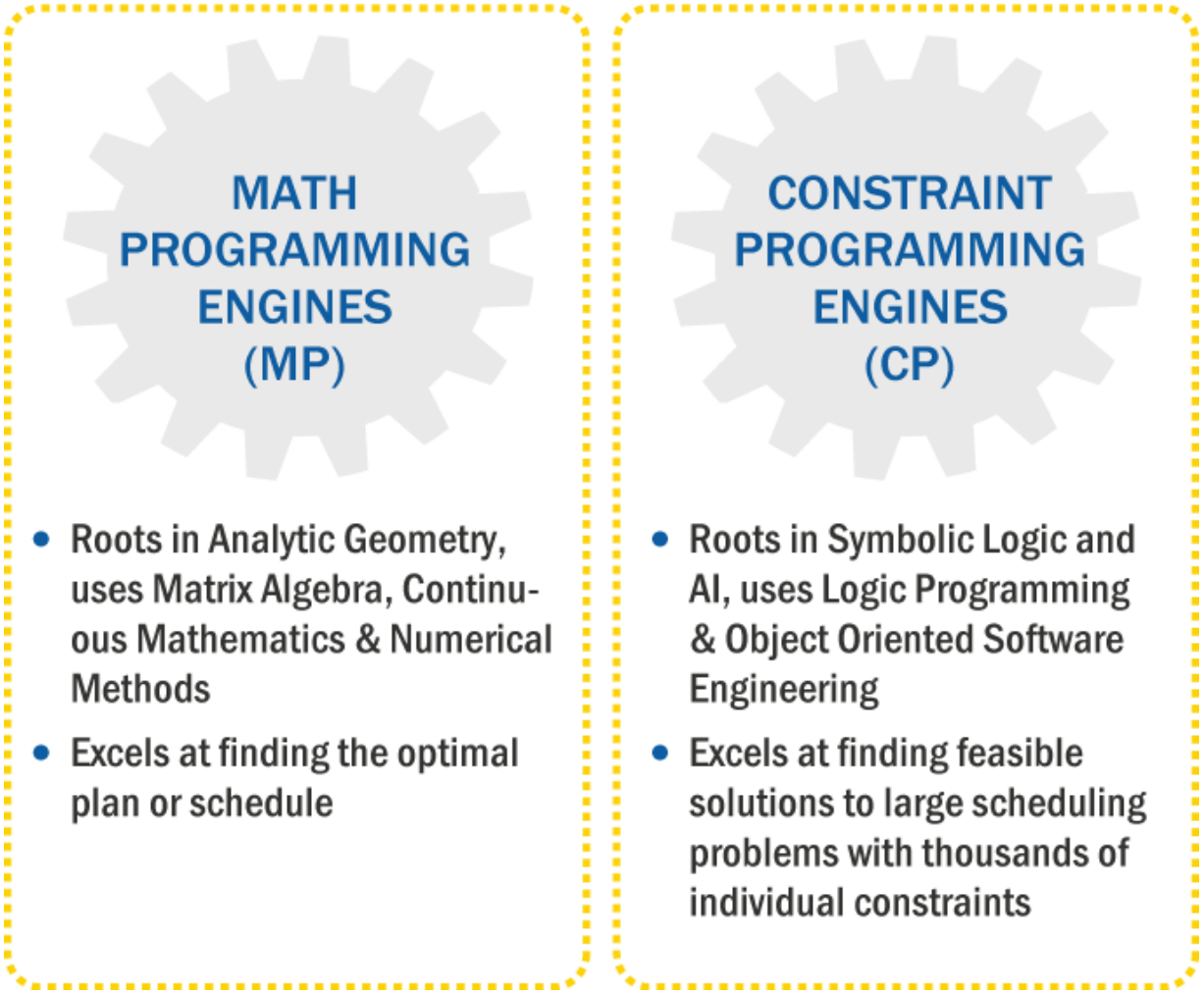
RAINMAKER

Supply Chain Planning

- Partner
  - Quintiq
  - Provides advanced planning, scheduling and supply chain optimization software for
  - Workforce, Logistics, and Production
- Typical Problems
  - Assigning possible shifts to periods to cover demand curve
  - Assigning possible container combinations to create trips based on available import and export containers
  - Assign possible planning combinations to Resource unit and calculate results based on goal function
- Solution
  - Use IBM ILOG OPL-CPLEX Development System to create and solve MILP models
- Benefits
  - A shipping company improved work and off duty cycles and created a long term plan, enabling it to offer its employees more job security, resulting in less staff turnover
  - A steel maker balanced general capacity-utilization along with planning and sequencing based on detailed scheduling controls and derived up-to-date inventory data in real time from the schedule, enabling it to recognize immediately inventory excesses or shortfalls as well as improvements or deteriorations in delivery performance

Two Core Engines

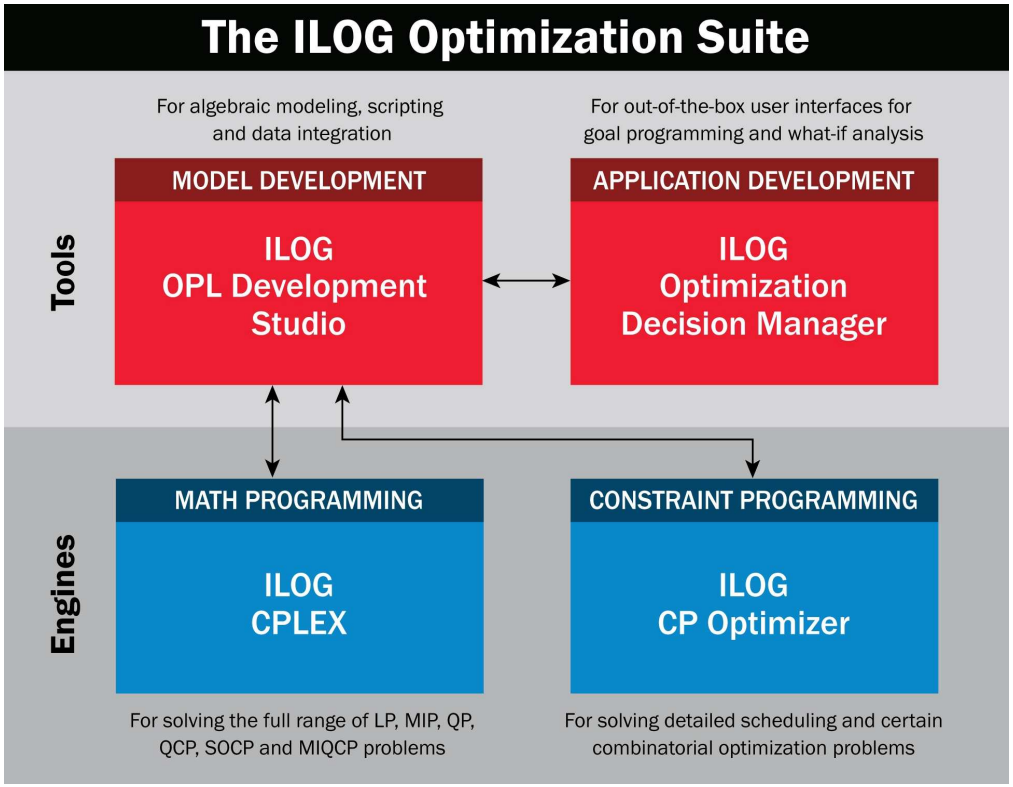
Optimization Technologies



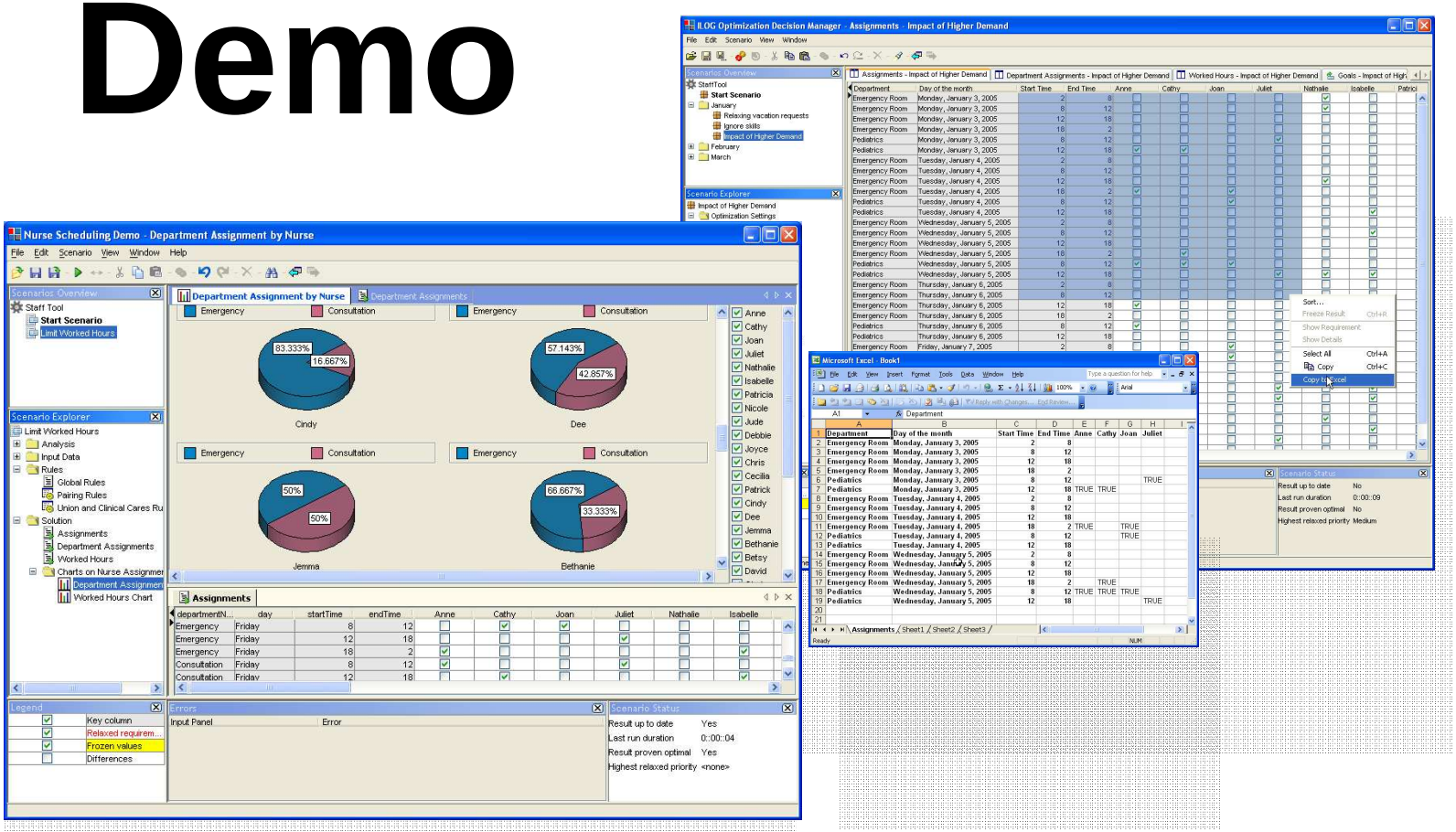
Deliver Optimization Applications Rapidly with Low Risk

IBM ILOG Optimization Suite

- Develop interactive state-of-the-art decision management applications
  - Enforce individual business goals
  - Relax constraints
  - Provide explanations for trade-offs
  - Conduct what-if analysis
  - Edit and override results
- Support project-based analytical services or application prototyping
  - Help OR practitioners explain and present their sophisticated models
- Embed models and engines into existing development frameworks



Demo



ODM and OPL Demonstration

- ODM Nurse Scheduling Application
  - Business User: Nurse manager at a hospital responsible for scheduling nurses over the next week
  - Input Data:
    - Nurse names and attributes
    - Nurse skills
    - Shift requirements (min and max number of nurses)
  - Solution:
    - Nurse assignments
    - Worked hours
- OPL Project for the Nurse Scheduling Application

Benefits of Optimization

- Calculable ROI, paybacks within months, even weeks
  - Capital expense avoidance or deferral
  - Operating expense reductions
  - Total revenue, revenue mix, and margin improvements
- Efficiency
  - Better use of limited resources
- Service
  - More on-time deliveries and responsiveness
- Agility
  - Increased ability to respond to change
- Reduced Risk
  - Robust plans, increased resilience

The Value IBM ILOG Optimization Technology

- Smarter decisions

  Get better performance for lower cost

  True optimization finds non-obvious solutions that maximize your value or minimize your costs while observing the many, complex requirements and limitations of your business

  Optimization produces quantifiable benefits on your bottom line

- Faster decisions

  Automating decision processes increases the speed of your responses in today's accelerating markets and allows your operations managers and planners to focus on critical complexities rather than on routine issues

- Faster, lower cost development and maintenance

  Using the high-level modeling tools in the IBM ILOG Optimization Suite System enables your engineers to code and validate your model with less time and effort than traditional programming languages, and by increasing the transparency of your model, makes maintaining and upgrading your system easier and more reliable

- Turn information into action

  IBM ILOG optimization technology leverages the investment you are making in enterprise information technology

Polling Questions

- Please rate the usefulness of this webinar on a scale of 1-5 …
  - 5 - Very useful
  - 4 - Somewhat useful
  - 3 - Neither positive nor negative
  - 2 - Not what I was looking for
  - 1 - Not useful at all
- Based on this presentation, do you have an interest in Optimization?
  - Yes
  - No
  - Not sure
- Is there anything else you would have liked to have seen covered in this webinar?
  - _____

Question & Answer

Please send follow-up questions to:
ilogopti@us.ibm.com

Thank You!

Please send follow-up questions to:

ilogopti@us.ibm.com

For other questions contact:
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jfirsty@us.ibm.com