Advanced Analytics Meets Pulp and Paper
Planning and optimizing your Supply Chain from A to Z

June 22, 2016
Meet the Presenters

Gertjan de Lange
*Connecting Business & Optimization SVP, AIMMS*

Gertjan has 2 decades of experience in Analytics and Operations Research. He works closely with our customers, partners, academia and research organizations like Gartner as well as our sales, client support and R&D team to make sure we capture the business value of optimization for our customers.

Luis Pinto
*Partner, Unisoma*

Luis specializes in the development and deployment of decision support solutions. With extensive experience helping companies in the food and beverage, pulp and paper and steel industries leverage analytics to transform their operations. Luis has a Masters in Applied Mathematics and over 8 years of experience in advanced analytics.
Objectives of this Webinar

We will discuss:

> Common challenges faced by the pulp and paper industry

> The Analytics Advantage - How advanced analytics support different levels of planning: strategic, tactical, operational, scheduling

> Real-world examples how these practices are being applied in the market
How We Help – AIMMS Value

Providing companies with a configurable, scalable technology platform to make *better decisions*, faster and increase operational performance and profitability

- Our disruptive prescriptive analytics and modeling platform *captures the complexity* of decision making

- AIMMS evaluates and offers the *best possible options for key decisions*

- AIMMS Apps can be created to fit across your organization for multiple use cases and fully *align with your business goals*
Some of the Benefits Experienced by Our Customers

Typical ROI in 1-4 months

Increased Innovation & Differentiation

Unparalleled Agility & Speed

“We first investigated the best scenarios for bringing the Papyrus supply chain to the next level. With the adoption of AIMMS PRO, Papyrus will rapidly make the transition from a locally oriented organization to a European supply chain concept.”

Gustavo Martarello, Integrated Planning Manager

“OPTPULP represents an important gain in efficiency and efficacy for the Planning team. Now we can generate the production plan, analyze our internal material flow from Mill to Port and optimize vessel/demand fulfilment in an integrated tool with better quality and reduced timing.”

Bob Woodburn, SVP Supply Chain

“EasyJet embraces optimization by using the AIMMS PRO platform in order to generate significant business value.”

Carolyn McCall, CEO
AIMMS Empowers Business Users Everywhere

**Planning Teams**
- Supply Chain planning
- Capital prj planning
- Demand planning
- Portfolio optimization

**Manufacturing & Production Teams**
- Production planning
- Production scheduling
- Inventory mgmt.
- Warehouse mgmt.

**Pricing Team**
- SKU pricing
- Market pricing
- Promotional planning
- Shelf optimization

**Transportation & Logistics Teams**
- Network design
- Network optimization
- Routing & scheduling
- Optimal fleet sizing

**Sourcing Team**
- Supplier optimization
- Disruption planning
- LT Capacity planning
- Product introductions

- Lower costs
- Increased revenue
- Improved efficiency
- Minimize lost sales
- Increased customer satisfaction
- Maximize profit

- Increased market share
- Increased revenue
- Maximize profit

- Lower cost
- Increased reliability
- Higher efficiency
- Minimized disruption
- Lower cost
- Increased reliability
AIMMS Empowers Business Users Everywhere

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- Demand planning
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- Minimized disruption
- Lower cost
- Increased reliability
Introduction

Typical challenges we hear from customers in Pulp & Paper

• Variability in raw material
• Long term vs. Short term commitments/complexities
• Global Business
• Constrained Production requirements
• How to drive Strategical Decisions throughout the Company on all levels and reap all benefits
Integrated Pulp & Paper Business

Forests
- 7 years
- 6 years
- 5 years
- 4 years
- 3 years
- 2 years
- 1 year

Pulp Mill

Customers

Paper Mill
<table>
<thead>
<tr>
<th></th>
<th>Inbound</th>
<th>Production</th>
<th>Outbound</th>
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</thead>
<tbody>
<tr>
<td><strong>Strategy</strong></td>
<td>• Land Management: Plant, Cut, Reform, etc.</td>
<td>• Capacity Optimization</td>
<td>• Network Analysis</td>
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<td></td>
<td>• Asset Management: Land Purchase, Leasing, Sales</td>
<td>• Investment planning</td>
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<td>• Network Analysis</td>
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<tr>
<td><strong>Tactical</strong></td>
<td>• Fleet sizing</td>
<td>• Production MIX</td>
<td>• Distribution Sourcing</td>
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<td></td>
<td>• Budget Planning</td>
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<td>• Client MIX</td>
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<td>• Cost Minimization</td>
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<td>• Stock Planning</td>
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<td></td>
<td>• MIX Demand</td>
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<td>• Transportation Modes</td>
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<td></td>
<td>• Transport Plan</td>
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<tr>
<td><strong>Operational</strong></td>
<td>• Resource Optimization</td>
<td>• Production Scheduling</td>
<td>• Shipment scheduling</td>
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<td></td>
<td>• Demand fulfillment</td>
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<td>• Cargo loading</td>
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<td>• T.O. generation</td>
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<td>• Shipment declarations</td>
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<td>• Queue minimization</td>
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<td>• Synchronization</td>
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1. **Forest** ➔ **Mill** ➔ **Stock** ➔ **Clients**
Inbound/Supply Strategy

What are the decisions?
- Forest Management
  - Plant, Cut, Fallow, Coppice, etc.
- Asset Management
  - Land Purchase/Sales, Leasing, etc.

What are the challenges?
- Long term Forest Balance
  - Decisions today affect 7 years or more
- Representations of operational issues
- Current unbalanced situation
- Adapting to changes in: production, capacities, demand, etc.
What are the decisions?
- How to manage wood stock
  - From cutting to delivery
  - Forests, yards, mill
- How/when to transport
  - Transportations modes

What are the challenges?
- Balance wood MIX/Quality
- Avoid unnecessary movements/costs
- Fleet sizing
Operational Wood Inbound

What are the decisions?
- Transportation plan
  - Which modes
- Truck allocation
  - T.O. generation

What are the challenges?
- Resource usage
- Queue minimization
- Synchronization of transports
- Real time information
- Quality MIX
- Line supply
How to improve decisions?

Who is BSC?
• Single Latin American producer of specialty cellulose from eucalyptus wood. Annual production capacity of 485,000 tons of specialty cellulose

Business Analytics Solution
• Integrated Solutions
  • Strategic Plans and Tactical Plans
• Different objectives
• Integrated drivers and policies
• Global Optimization
How to improve decisions?

Strategic Drivers
• Long horizon (28 years)
  • Connected to Strategical business drivers
• Representation of decision matrixes
• Maximize company Valuation
• Generalized operational restrictions
How to improve decisions?

Tactical Drivers

- Mid term horizon (12 months)
- More operational details
- Fleet representations
- Trade off analysis
  - 38 different (conflicting) optimization criteria
- Detailed movement tracking
How to improve decisions?

Who is Montes del Plata?
• Montes del Plata is a forestry company founded in Uruguay in 2009 with a 1.9 Billion US$ investment. The Pulp Mill capacity is 1.3 Million tons of Pulp.

Business Analytics Solution
• Connected solutions
  • Tactical Plans and Operational Scheduling
• Same objectives but different goals
  • Cost reduction with service level
How to improve decisions?

**Tactical Drivers**
- Guarantee supply MIX quality
- Minimize transportation costs
- Minimize humidity in wood
- Guarantee feasibility for 8h schedule
- Guarantee line supply
- Crane allocation
- Freight size, crane movements, operational constraints, ...

**Operational Drivers**
- Maximize freight use (avoid idleness)
- Dynamic programming from current conditions to 8hrs in future
- Truck scheduling satisfying supply needs and reducing costs
- Synchronization with boat transports (avoid yard unloading)

1 week
4 weeks + 11 Months
8 h
Production and Distribution

What are the decisions?
• Production MIX/Scheduling
• Distribution Plans
• Ship Scheduling
• Stock Management
• Demand Planning

What are the challenges?
• Operational Constraints
• Complex and Global Distribution
  • Varied transit times
  • Transportation modes
• Pull and Push market
**How to improve decisions?**

**Business Analytics Solution**
- Linked horizon
  - Detailed first 90 days
  - Aggregated 12 months
- Production and Distribution Integration
- Trade offs throughout the Supply Chain
  - Production, Stock, Demand, etc.

<table>
<thead>
<tr>
<th>Data</th>
<th>Operational</th>
<th>Tactical</th>
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<tbody>
<tr>
<td>Production</td>
<td>Availability</td>
<td>Service level</td>
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<td>Certification</td>
<td>Demand level</td>
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<td>Production Batch's</td>
<td>Price Plan</td>
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<td>Machine Capac.</td>
<td>Billing</td>
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<td>Internal Demand</td>
<td>Conditions</td>
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<td>Distribution</td>
<td>Routes</td>
<td>Movement</td>
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<td>Shipments</td>
<td>Definition</td>
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<td>Capacities</td>
<td>Capacity usage</td>
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<td>Demand</td>
<td>Service level</td>
<td>Fulfillment</td>
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<td></td>
<td>Demand level</td>
<td>Delays</td>
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</tbody>
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**Results**
- Campaigns
- Gantt Balancing
- Movement
- Shipment Definition
- Capacity usage
- Stocks
- Fulfillment
- Delays
Benefits

- Agility in planning
- Corporate Governance
- What if analysis
- Change in Team roles
- Integration between different areas

Direct vs. Indirect

- 5% logistic costs reduction
  - Project payback in 2 months
- Short term
  - Transport/truck schedule
  - Wood supply
- Savings of 2,2 Million US$
Awards
The Franz Edelman Second Prize Award (1995)
CAT² Excellence Award (2012, 2014)

120+ implemented projects

Tailormade

client experience +
computational intelligence

Agile methodology
and platform
based development

UNISOMA
- Pulp and Paper
- Consumer goods
- Retail chains
- Steel production
- Manufacture
- Educational
- Agribusiness
- Cement
- Energy
- Pharmaceutical
- Third-party logistics
- Animal production
Questions?
Thank You!

Link to slides and recording will be emailed to you

If you have any questions, please contact us:

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