Sustain.Ability.

Arjen van den Broecke
Effective Supply Chain Management
Contents

• Supply Chain Management Issues
  \textit{(Where We Are)}
  – Purpose, and typical challenges

• Generic Supply Chain Management Tools
  \textit{(What We Have)}
  – Highlighting some of our standard products for SCM

• Specific Supply Chain Management Industry Solutions
  \textit{(What We Can Do)}
  – Examples of business solutions that we build(d)(t)

• Improving Supply Chain Management through Collaboration
  \textit{(Where We Are Going)}
  – Generic Roadmap; Where is SCM going?
  – Intuition Executive

\textbf{But Perhaps First ...}
How Was Your Evening?
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The Common Issues

• Effective Supply Chain Management is Hampered by

  – Inefficient (or lack of) **Tools**
    • Inefficient planning/scheduling processes
    • Activities mostly based on ‘tribal knowledge’
    • No structured feedback for making continuous improvements
      – No, or only ad-hoc, planned vs. actual comparisons, back-casting, KPIs, ...

  – Inefficient (or lack of) **Communication & Collaboration**
    • Data and People are working in departmental silos
      – No end-to-end view through the supply chain
    • The Plan is not executed as it was planned
The Essence of Planning & Scheduling

Value Example (Refining, Oil & Gas)
- Estimates indicate value of $1 per barrel
- For 100 K BPD Refinery > $35 M per year
- O&G: each tier of opt worth 12-15 M$/year

Opportunities
- Eliminate hidden buffers
- Better reflect plant capability
- Eliminate decisions in silos

Key Vertical Markets
- Oil & Gas, LNG
- Refining
- Petrochemicals
- Mining
- Paper

Disruptions
- Raw material mix, quality
- Product mix
- Order timing
- Equipment capability
- Plan, schedule adherence

Barriers to Improvement
- Inconsistent Models
- Inconsistent Information
- Business Process in Silos

Ideal (Years)
Plan (Months, Weeks)
Schedule (Weeks, Days)
Execution (Days, Hours)
Key Challenge: Right Decisions at the Right Time

People in multiple departments and roles making key decisions.
- Decisions impact people & plans in other departments.
- People need accurate information in context to make informed decisions.

Need to continually track movement of material through the plant. Need to easily compare planned vs. actual and raw vs. reconciled production.
- SUPPLY CHAIN & PRODUCTION MANAGEMENT

Control systems must be optimized for maximum performance. People need smarter tools to enable them to manage the process more efficiently.
- OPERATIONS OPTIMISATION

Many assets across multiple locations must run reliably and at highest capacity, optimized against maintenance costs.
- ASSET EFFECTIVENESS

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End-to-End Visibility is Required to See Impacts!

Your Suppliers

Your Customers
Business Context of Planning & Scheduling

This is unsustainable …

- How do I improve the agility of the plant and the overall supply chain?
- How do I effectively connect the supply chain to the plant?
- How can I measure the production in a timely, accurate way?
- How can I improve my overall forecasting, planning and scheduling capabilities?

This is where we need to go …

- Capture Expertise
- Integrated Remote Operations
- Collaborate
- Automate Workflows
- Enforce Best Practice
- Retain People
- Reduce Complexity
- Functional Silos
- Geographic Challenges
- Regulatory Complexity
- Expertise
- Workforce
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And The Perfect Tool to Solve All This, Is ...
Advantages of Using the Right Tools

• Faster Planning & Scheduling Results
  – Getting results easier and earlier

• Better Planning & Scheduling Results
  – Improved quality and more-up-to-date

• More Consistent Planning & Scheduling Results
  – Standard tools and workflows

• Closing the Loop on Planned vs. Actual
  – Continuous Improvement of both Planning and Execution

• Knowledge Encoded in Planning & Scheduling Solutions
  – Not in a single person’s head!
Our Core Applications

RPMS
Planning tool for strategic, tactical decision support; supports multi plant models

BLEND
An LP-based planning & scheduling tool for gasoline and distillate fuel blending

Capacity and Distribution Planner
Configurable and extensible foundation for broader supply chain integration and visibility

Production Scheduler
State-of-the-art scheduling tool
Generates Logic-Quantity-Quality optimized schedules

Production Analyst
For easy Plan vs. Actual comparisons (incl. back-casting)

SAND
Supply and Distribution optimization. Determine most cost effective transportation

Plan View (Intuition Component)
Light weight tool to view decision support results

Matrikon Production Intelligence
Comprehensive production management and visualization solution

Optivision
Order-to-Cash platform for paper and steel mills (planning, scheduling, trim, roll tracking and shipping)

Intuition Executive
Context, visualization, workflow

Logistics Service Centre (LSC)
Planning loading operations and transport

eTerminal
Automated loading operations
Intuition Plan View

- **Decision Support Results In One Environment**
  - Bring related decision support information together
  - Provide summary, analytics and visibility beyond the planner’s desktop
  - Provide consistent tools for viewing information

- **Manage Plans and Revisions**
  - Import data from various sources
  - Aggregate into appropriate time resolution

- **Broad Visibility**
  - Provide relevant views across the organisation
  - Leverage decision support model

- **Works with Intuition Executive**
  - Built on Intuition
  - Show Plan View web parts in IX
  - Leverage Plan View data in conjunction with other data sources through IX
Capacity & Distribution Planner (CDP)

• Interactive, Structured and Collaborative Environment for Decision Support
  – Create model of production and distribution
  – Provides daily prediction of key values such as production and inventories
  – Enable view of plan and historical values
  – Manage plan revisions and workflow

• Highly Configurable and Extensible
  – Calculations configured similar to Excel
  – Create views for specific users
  – Easy to add plug in capabilities
  – Supports ‘what-if’ capabilities

• Foundation for Broader Solutions
  – Integrates easily with other systems

• ... with Applications in
  – LNG Liquefaction & Regasification
  – Underground Gas Storage
  – Product Terminals
  – ...
Matrikon Production Intelligence (MPI)

- **Actionable, Auditable Production Information at the Desktop**
  - Production Visualization, Balancing, Accounting and Reconciliation
  - Environmental Data Management & Regulatory Reporting
  - Materials Tracking – Movements, Inventories, Batches, Qualities
  - Shift Operations and Handover

- **Industries**
  - Oil and gas, oil sands
  - Midstream supply chain
  - Refining and petrochemicals
Logistics Service Centre (LSC)

- **Reduce Transport Costs**
  - Automate logistics processes
    - Automatic transport plan creation
    - Automatic carrier allocation
  - Optimise transport planning
    - Increase transport capacity per vehicle through weight/volume optimization
  - Centralise transportation planning
    - Ability to plan and view status for multiple loading places

- **Efficiency Improvements**
  - Better communication with carriers
    - Traceability
    - Easier to evaluate carrier performance
  - Offload work to carriers
    - Reduce internal processes
    - Accurate timeslot handling and customer drop-off sequence performed by carrier

- **Carrier Management**
  - Improved on-time delivery
  - Improved customer satisfaction
  - Order and load status views
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Focus on Delivering Solutions (Not ‘Software’!)

**Products**
- Production Scheduler
- SAND
- RPMS
- BLEND
- CDP
- Production Analyst
- PlanView
- OptiVision
- eTerminal
- LSC

**Components**

**Applications**

**Built on Intuition**

**Industry Solutions**

**Partners**
- Microsoft
- WAM Systems
- SAP
- IBM
- Accenture

**Solutions**
- Industry Focused
  - HPI
  - Refining
  - Marketing
  - Chemicals
  - LNG
  - Mining
Industries We Serve

Oil & Gas Solutions
- Pipelines
- Crude
- Refinery
- Naphtha

Refining & Petrochem
- Pipelines
- Products
- Petrochemicals
- PE Plant
- PP Plant
- LNG Solution
- LNG

Imports, Exports
- Products

Primary Distribution
- PE Plant
- PP Plant
- Chemicals Solution

Pulp & Paper

Mining
Oil & Gas Solution

- Planning & scheduling capability to balance well production, processing, inventory and demand
- Solutions for Underground Gas Storage
- Address nominations
- Update the plan and reconcile with plant actuals
- Highly flexible, configurable and extensible
LNG Supply Chain Solution

- Integrated solution for planning and scheduling from well head to re-gas terminal
- 10 year planning model to optimise fleet requirements and predict numbers of cargos
- Addresses both liquefaction, re-gasification
- Partner solutions for berth, ship, harbour scheduling
- Easy to use; provides overall visibility
Refining and Petrochemicals Solution

- Integrated solution supporting tactical and strategic planning
- Proven planning capabilities, state of the art scheduling
- Off-the-shelf refining and petrochemicals models
- Integration with execution systems (Ops Mgmt, APC, OM&S)
- Integration with ERP systems
- Leveraging Intuition to enable improved collaboration
Chemicals Supply Chain Solution

- Integrated solution supporting tactical and strategic planning
- Off-the-shelf, chemical model
- Scalable with plug-in modules
- One planning database with open architecture
- One planning environment used throughout the enterprise
Primary Distribution Solution

- Address refinery, terminal networks for product distribution
- Integrated solution supporting tactical and strategic planning, distribution scheduling and visibility
- Reduce inventory and optimise shipments
- Manage inventory and disruptions
- Track movements
Transport Solution (eLogistics)

- Standard solution for optimised loading of trucks (trains, vessels, …)
- Implements e-Communications with shipping companies
- Reduce cost, increase efficiency
  - Reduce administrative effort/costs, optimise loading-/unloading processes
  - Improved cooperation with carriers beneficial for both parties
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Wider Collaboration (Beyond Planning & Scheduling)

Are we getting maximum throughput?
Are we on track to meet our weekly production targets?
What can I improve? What needs to change?
How do our production figures look against budget?
Where can we improve financial performance, quickly?

Is this sustainable?

Operations Supervisor
GM Operations
Field or Plant Manager
Chief Financial Officer
Chief Executive Officer

Maintenance Manager
Honeywell continues to invest in our Business Performance Solutions portfolio including supply chain, APS and production management.

We have introduced **Intuition®** as a new platform to provide consistent solutions to improve performance and leverage existing investment.

**Intuition Executive** enables improved visualisation and collaboration with an existing application landscape.

We are building components and applications on this platform that will further enable business transformation.
The Intuition® Approach to Operational Excellence

Present
Present and collaborate across functions and COE
SharePoint Portal, Presentation Webparts, KPI Dashboards

Common Navigation
Common Navigation to multiple sources of production and operational data

Configurable User Views and Dashboards

Contextualize
Contextualize via data models

Semantic Model
Federator

Analyze
Analysis, Reporting & Process Data Mining

Calculations
Alarm and Events
Validation

Workflow
Data Services

Orchestrates
Workflow & Integration Services

Measure
Measure your business by capturing events, data, documents through federated approach

PHD/PI Historian
Alarm Manager
Downtime Reporting
Asset Manager
Document Repository
Well Performance
CDP
Production Intelligence
Other
The different views of the same physical equipment

How do we define what a compressor is?

**Historian**
- Tag 32Fl012.PV, showing actual, raw flow rate in cubic meters/hour

**Operations**
- 32-P-012 Drilling Compressor

**Maintenance System**
- Asset 11345-2
- Sullair 1350 cfm 350 psi compressor powered by Detroit Diesel Series 60
- Inspection schedule
- Work Orders
- Schematics
- Northern Field Gas Plant 10

**Engineering System**
- 32-P-012
- Maximum design flow, pump curve
- Technical drawings

**ERP System**
- 825100001234
- Depreciated purchase cost

**CEMS**
- Sample point EF-010
- Maximum permitted flow
Re-Use, Don’t Re-Invent

- Gather data from existing process infrastructure, technology
  - Multiple connectivity options to bring plant data together, protecting current investments
- Protect the integrity of data
  - Leave the data where it is, as-is
- Gather data on-demand, as needed
  - Eliminate the need for another data repository
- Auto discover changes in underlying data sources
All The Overview Info in One Place...
What Federation Means to You

• Anticipate, Collaborate & Act on All Data from All Sources
  – Example: access all data from all sources at a right-click of a mouse
    • Historian data (trends, plots, …)
    • Laboratory data
    • KPI data
    • Application data
    • Maintenance data
    • ERP/Business data
    • Manuals
    • Work Orders

• Use of Templates
  – Build once, deploy anywhere
Key Takeaways

• Intuition Executive is a released software product
• Intuition Executive helps users to
  – See what is going on, across multiple applications
  – Anticipate problems and opportunities
  – Collaborate with other users
  – Act in a structured way
• It is a web portal with many supporting features
• It is the backbone for integration projects
  – Applications provide complementary functions
• Used to deliver solutions to business problems
  – Consulting establishes the needs and solution
• Value comes from business process improvement
Recent Progress

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<th>2011</th>
<th>2012</th>
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<td><strong>Business FLEX</strong></td>
<td>BF 230 Updates for RPMS, BLEN, PS Support for latest platforms</td>
<td>BF 240 Updated for RPMS, PS Support for latest platforms</td>
<td>BF 241 System Console Support for latest platforms</td>
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<td>RPMS 4.9.6 PS Enhancements</td>
<td>RPMS 4.9.6</td>
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<td>CDP 201 Global support Usability improvements</td>
<td>CDP 210 Data Objects (Intuition) Usability Improved performance</td>
<td>CDP 220 Usability Improved performance Hourly data</td>
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<td>Intuition</td>
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<td>Plan View 101 Visualization of planning &amp; scheduling results Intuition based</td>
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<td>Intuition Executive 200 Portal visualization Collaboration &amp; workflow Federation Calculations Event processing</td>
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# Overall Intuition Road Map

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<th>Programs</th>
<th>2012 1H</th>
<th>2012 2H</th>
<th>2013 1H</th>
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- **Limit Repository 100**
- **Field Advisor 200**
- **Asset Manager 410**
- **Plan View 110**
- **CDP 300**
- **Logbook 100**
- **Operations Suite 100**
- **Operations Monitoring 110**
- **Asset Manager 430**
- **Alarm Mgmt 200**

*These are forward looking plans, not commitments. Plans are very likely to change.*
Don’t Miss the Demo Room!

- See it Live! Meet Some Nice People! Provide Feedback & Input!

- Intuition Executive
  (Platform for Visualisation & Collaboration)

- And Perhaps Also of Interest ...
  - Uniformance PHD
  - Uniformance Process Studio (UPS)
Sustain.Ability.

Effective Supply Chain Management
Arjen van den Broecke,
Team Leader Business Performance & Operational Excellence