SAP xApp
Manufacturing Integration and Intelligence (SAP xMII)

Product Roadmap

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SAP xMII
High Level Objectives

- Extend SAP’s role in manufacturing
  - Comprehensive solution for manufacturing integration/intelligence
  - Foundation for future efforts in other plant floor applications
  - Integrate and extend QM, PM, PP, APO, PLM and SCM

- Enable innovation in our customers’ businesses
  - Evolve both the xMII core and new xMII-based composites
  - Provide a rich set of foundation services for manufacturing composites
  - Work with select manufacturing partners to co-innovate
  - Enable incremental, high-value, rapid-ROI implementation

- Ensure a smooth migration path for existing Lighthammer and SAP xMII customers
  - Protect application/content development investment
  - Ongoing application continuity via migration tools and services

- Provide a convergence strategy for the manufacturing integration/manufacturing analytics solutions in the SAP portfolio
  - Deliver a uniform customer experience
  - Open, standards-based integration between systems
  - Ensure optimal lifecycle TCO
  - Leverage xMII technology in other SAP applications
SAP xMII focus:

- connector framework to integrate with shop floor systems and enterprise data
- flexible, manufacturing-focused UI engine to integrate people with processes
- rich analytic capabilities
- lean, graphical service composition environment

Integration delivered via:

- xMII stand-alone or in combination with NetWeaver XI
- Direct to BAPIs/RFCs or ESA services

Analytics delivered via:

- SAP xMII UI (manufacturing intelligence, power-user apps, plant floor worker apps)
- SAP Visual Composer (dashboards, high level analytics from supply chain view to plant view)
SAP xMII
Parallel Development/Innovation Tracks

**Application Composites**

Packaged, configurable applications with content, processes and functionality in areas such as Six Sigma, plant-floor focused ERP/QM/MM content, manufacturing analytics/integration, others

**Intelligence Content**

Component and application functionality to support manufacturing performance management, including analytics, visualization, alerting/eventing, case management and collaboration

**Integration Content**

Enhancing the plant-to-enterprise integration capabilities of xMII with deeper ERP connectivity, broader standards-based integration scenarios, rich manufacturing services, and user-centric integration for plant workers

**Core**

Ongoing development and investment in the data services infrastructure, logic services, extensibility, unified security, high availability, performance, content management, supportability

**Connectivity**

Significant enhancements to connector “framework”, event-based communications model, publish/subscribe/rules infrastructure, new connectors to meet market needs, expand support for third party connector development, OPC/UA support

*Partner extensibility and value-add opportunity have been “designed in” at every level*
Core Product Evolution

• **The transformation of xMII + NetWeaver to “NetWeaver for Manufacturing”**
  • From .NET (Lighthammer) to pure Java (11.5) to SAP Web AS (12.0)
  • Integration with SAP Analytics (Visual Composer integration)
  • Comprehensive, service-enabled manufacturing framework for SAP and partners
  • Leverage xMII in other SAP applications (RFID, warehouse/plant execution)

• **Lean NetWeaver deployment – optimal TCO and unified architecture**
  • Portal “lite”
  • Unified UI model
  • Unified security, management and administration infrastructure
SAP xMII Integration: High Level Objectives

- Objectives
  - Delivering “core manufacturing services” and best practices for common integration scenarios (over 40 services and nearly 100 integration scenarios have been identified)
  - Creating an adaptive solution to which additional services and standards support packages can be added without a new xMII product release

- Requirements
  - Manageability and business activity monitoring must be built in
  - Reliability is paramount
  - Integration involves both systems and people

- Challenges of standards-based approaches
  - Standards-based approaches are the “best practice” foundation but...each partner/customer implements ERP and “standards” differently
  - The solution must be highly adaptable to user and partner standards extensions and end user configurable without deep IT knowledge
  - The system must accommodate for customizations on both levels of the business process (enterprise and production layers)
SAP xMII Integration Roadmap and Evolution

2005
SAP xMII 11.5
- Support for standards based (S95/B2MML, OAGiS, etc) integration

2006
SAP xMII 11.5 SP1/2
- Visual Composer connector enables xMII data and analytics to be visualized using VC
- JCO Interface to XML-enable any RFC/BAPI for synchronous interfaces
- Integrated with NetWeaver alerting infrastructure

Q1 2007
SAP xMII 12.0
- Expanded JCO and XI capabilities including session support, caching
- Core manufacturing services and scenarios
- Local queuing/monitoring services plus CCMS link for central monitoring
- Unified security model including SAP single-sign-on

2007 and beyond
Future xMII
- Support for multiple integration scenarios leveraging B2MML V4, OAGi and UN/CEFACT
- Direct browsing and consumption of XI/ESA services
- Exposure of xMII business logic as ESA services

xMII Integration Evolution

- Extend and exploit the ESA model at all levels
  - Virtualize the manufacturing enterprise (internal vs contract manufacturing)
  - Abstract plant-specific differences to enable service-based integration
  - Leverage the combined power of XI + xMII for end-to-end integration

- Enhanced business packages for industry standards
  - Industry-specific solutions linked to the highest customer value scenarios
  - Work with partners, customers and standards organizations to prioritize
  - Standards templates layered on “core services”
  - Deeper people integration with manufacturing workflows and plant-focused UI
SAP xMII
Intelligence: High Level Objectives

- Create a common platform for Manufacturing Analytics
  - Common look and feel, consolidated entry point
  - Highly configurable/rapid development environment
  - Broad device support for info delivery (browser, mobile, rich client)

- Enable delivery of “blueprint” composites for vertical/horizontal applications (both internally and via partners)
  - Horizontal applications (Six Sigma, CAPA, OEE, TPM, others)
  - Real-time manufacturing economics (yield, cost, etc.)
  - Industry Vertical Applications

- Convergence of Analytics, Events and Guided Procedures
  - Make analytics actionable
  - Aggregated information for decision support (Knowledge Mgmt)
  - Event response integrated with alerting/monitoring functions
  - Case-based tracking of exceptions/events and corrective actions
  - Operator guidance for process/production troubleshooting

- UI/Task Simplification
  - Crossover area with Integration
  - Deliver SAP manufacturing functionality to the blue collar worker
  - Mobile enablement
### SAP xMII

#### Intelligence: Roadmap and Evolution

<table>
<thead>
<tr>
<th>2005</th>
<th>2006</th>
<th>Q1 2007</th>
<th>2007 and beyond</th>
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</thead>
<tbody>
<tr>
<td><strong>SAP xMII 11.5</strong></td>
<td><strong>SAP xMII 11.5 SP1/2</strong></td>
<td><strong>SAP xMII 12.0</strong></td>
<td><strong>Future xMII</strong></td>
</tr>
<tr>
<td>• Expanded localization capabilities for runtime UI</td>
<td>• mySAP ERP Plant Manager Dashboard actions</td>
<td>• Accessibility and usability enhancements to the design UI</td>
<td>• Update look-and-feel for the xMII applets</td>
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<tr>
<td>• New SPC/SQC engine with additional calculations plus dramatic performance improvements</td>
<td>• New SPC/SQC analysis types</td>
<td>• Unified development workbench for enhanced developer productivity</td>
<td>• Native xMII “kit” and manufacturing UI widgets for Visual Composer</td>
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<td>• PDF output actions for reporting, document creation</td>
<td>• Export to Minitab for advanced numerical analysis</td>
<td>• Consolidated UI architecture for custom application creation</td>
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<td>• Visual Composer connector offers choice for dashboard/analytic apps</td>
<td>• Enhanced Visual Composer connector</td>
<td>• Unified performance management framework for KPIs, alerts, KM, GP</td>
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### Intelligence Evolution

**Functionality:**
- Integrated content management (package/deploy content)
- Enhancements to the UI components
- Integrated Performance Management Framework

**Convergence:**
- Expanded Visual Composer/SAP Analytics integration
- Unified UI model based on Web Dynpro/Visual Composer
- “Portal Lite” for common role/content mapping
SAP xMII
UI Strategy: Proposed Convergence Map

  - xMII data, analytic and web services accessible to Visual Composer
  - xMII charts/dashboard components streamed to Visual Composer

- **Near term** – enhanced integration with Visual Composer (2007)
  - SPC/SQC charts, time series charts, enhanced grid, gauges
  - Native xMII provider/kit for Visual Composer
  - Visual Composer as UI for most manufacturing analytics

- **Long term** – Visual Composer/WebDynpro as xMII UI (2008+)
  - Visual Composer for dashboards and basic analytics
  - WebDynpro for complex analytics, UI simplification, custom apps
SAP xMII
Connectivity: High Level Objectives

- Provide real-time monitoring and notification of events:
  - Automation equipment (SCADA/HMI, PLC, cell controllers, DCS, etc.)
  - Measurement devices (gauges, weigh scales, etc.)
  - AutoID devices (barcode scanners, smart tag readers/writers, etc.)
  - Message-based exchange with cell controllers

- Provide remote monitoring and management capabilities
  - Enable remote diagnostics and configuration

Common Connectivity Infrastructure for “Real-World” Applications
- Leverage xMII connectivity in multiple SAP applications
- Multiple destinations for “events” – xMII, XI, others

- Exploit Standards for Device Integration
  - OPC UA as primary connectivity mechanism for xMII
  - SAP is now an OPC Foundation Member
### SAP xMII Connectivity: Roadmap and Evolution

#### 2005

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<tr>
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<tr>
<td>- Redesigned xMII connector framework</td>
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<td>- OLEDB connector</td>
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#### 2006

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<tr>
<td>- Updated OPC, OPCHDA</td>
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<td>- Expanded capabilities for OSIsoft PI connector</td>
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<td>- Event-based connectors demonstrated at Sapphire</td>
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#### Q1 2007

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<tr>
<td>- First release of the event-based connector framework</td>
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<tr>
<td>- First event-based connectors (gauging devices, barcodes, PLC messages)</td>
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<tr>
<td>- Integrated event filtering/rules engine</td>
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<tr>
<td><strong>Note:</strong> Need not be synced with 12.0 release date</td>
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#### 2007 and beyond

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<tr>
<td>- Broad OPC UA connectivity, possibly as client &amp; server</td>
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<tr>
<td>- Pub/sub infrastructure integrated with XI/NW</td>
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<tr>
<td>- Expanded remote management capabilities</td>
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<tr>
<td>- Partner connector development</td>
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### Connector Evolution

- **Enhanced framework facilitates rapid connector development**
  - Enable 3rd party partners to participate in connector development
  - Focus on standards-based connectivity - SAP to take active role in OPC-UA

- **Event-based and “listener” model**
  - Change-based notification, built-in rules engine for event detection/notification
  - Execute xMII business logic based on events (event-driven execution)
  - Integration with other SAP solutions (AII, Warehouse/Manufacturing Execution)
SAP Manufacturing: 
ERP Roadmap and Evolution

- **mySAP ERP 2005** (unrestricted availability since May 2006)
  - Manufacturing Analytics (with SAP Analytics 1.0 business package)
  - Enhancements to role-based dashboards
    - Plant Manager
    - Production Supervisor
  - Mobile Asset Management
  - New Enterprise Service exposing Manufacturing objects

- **Planned future direction**
  - New task dispatch, collaboration, and confirmation capabilities
  - **Enhanced Visibility**
    - Production planning, material replenishment and other monitors
    - Manufacturing-related analytics in FI, CO and EH&S
    - Batch/product traceability and real time awareness
  - Enhanced collaboration
    - Electronic shift book, shift notes
  - Enhanced Lean Manufacturing capabilities
    - EP and RFID-enabled Kanban board, WIP Kanban, Heijunka box
  - Expanded Service Enablement
SAP Manufacturing: Quality Management (QM) Roadmap and Evolution

- **mySAP ERP 2005**
  - Enriches QM with new LIMS functionality and flexible reporting
  - Offers role-based dashboards (Quality Inspector)
  - Audit Management tool available as part of SAP NetWeaver 2004s
  - Analytical composites (with SAP Analytics 1.0 business package)
  - New Enterprise Services exposing QM business objects

- **Planned future direction**
  - Portal content for Six Sigma Project Lead
  - New tool for failure mode and effect analysis (FMEA)
  - Legal compliance (new digital signature, e.g. for quality notifications)
  - Quality Management in Manufacturing supported by SAP xMII
  - Additional quality-related composites
  - Expanded Service Enablement
**SAP xMII**

**Application Composite Development**

- **NetWeaver + xMII provides foundation services**
  - Connectivity, data transformation, and analytic services
  - Transactional integration services to SAP ERP
  - Event-driven logic execution services
  - Visualization and UI for plant workers
  - Analytics infrastructure for information workers
  - Monitoring, logging, and scheduling services
  - KPI/alert services

- **Lightweight xMII composites for plant workers**
  - Production/Materials Management
  - Quality Data Collection and Analysis
  - Maintenance/Asset Management

- **Partner Integration and Composites**
  - S95/B2MML integration, predictive analytics, RFID/AutoID integration
  - Industry scenarios for chemical, life sciences, CPG
  - Partner-specific integration and analytic templates

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SAP xMII
Roadmap Summary

**Deliver Significant Ongoing Customer Value**
- Continued delivery of new manufacturing functionality
- Focus on enabling innovation
- Enable extended business processes with open services/standards
- Embrace partners as a critical component of our strategy

**Capture Opportunity Resulting From New Supply Network Model**
- Exploit shifts in manufacturing and warehouse execution strategies
- Expand SAP’s capabilities in “real-world awareness”
- Deliver even further on the Adaptive Manufacturing strategy leveraging new SAP applications and technologies

**Leverage NetWeaver to Maximize Customer Value**
- Support high availability, manageability, and supportability
- Enable ESA from top to bottom
- Provide a unified analytics and user interface approach across all products

**Commitment to Customer Investment Protection**
- Application migration as a priority 1 requirement
- Ongoing communications of product strategy

**Market Leadership**
- SAP is the *Largest* Manufacturing Operations Management provider
- A strong, vibrant successful user and partner community