Driving Innovative Business Practices with Composite Applications
Business Models Are Changing …

INTEGRATED LINES OF BUSINESS

FLEXIBLE LINES OF BUSINESS

ADAPTIVE BUSINESS NETWORKS

Core Principles of Adaptive Business

- Distributed decision making and action
- Fast re-combination of business processes
- Co-evolution of eco-system
Differentiation through new business processes is key, but …

The stumbling blocks of change

- Corporate culture: 56%
- Underlying IT systems: 42%
- Org. structure: 42%
- Business process: 33%

Source: Gartner/IDC/Forbes.com
Enlightened IT Use Survey, August 2003
ESA and SAP NetWeaver as a Business Process Platform

Turn IT into an enabler of business flexibility

- Custom built or composed
  - “Next practice” processes
- Business innovation
- Business integrity
- “Best practice” processes
- Packaged solutions
SAP Roadmap to ESA

- **Enterprise Services Architecture roadmap completed**
- Complete suite on Business Process Platform
- Business Process Platform for industries

- Business Process Platform is available
- Broad access for ISVs
- More composites by SAP and partners using the BPP
- "Suite in a box" **All-In-One**

- **Complete suite** on SAP NetWeaver (all Industries)
- SAP and ISVs build Composite Applications leveraging SAP NetWeaver and the mySAP Business Suite
- First ISVs access to Business Process Platform
- mySAP ERP successor of SAP R/3
Business Flexibility and IT

Composite Applications

SAP Composite Application Framework

Status and Next Steps
Composite Applications are user centric applications supporting highly collaborative and dynamic business processes which span several functional areas across and beyond organizations.

Examples
- Product Innovation in CPG
- Cost and Quotation Management in High Tech
- New Hiring and Provisioning

From an end-user perspective Composite Applications …
- Provide a rich user experience serving also new user groups
- Leverage existing multi-source content
- Make functional and system boundaries invisible
- Provide process context and overall process visibility
- Enable enterprise-wide collaboration
- Can be installed and adapted in a very short time
Composite Applications make use of data and functions provided as services by platforms and applications, combining these into user-centric processes and views, supported by own business logic and specific user interfaces.

From a technical perspective Composite Applications are …

- **User centric**: Manage user driven business processes which use different underlying, often data-centric applications and components
- **Based on services**: Built and deployed on top of service operations of underlying components, combining these with new application logic and user interfaces
- **Loosely coupled to backend systems**: Have their own lifecycle
- **Abstracting from backend systems**: Run in heterogeneous system landscapes
- **Dependent on service enabling** of underlying applications or components
We start by thinking about a new user-centric process reusing functionality of existing systems.
Anatomy of a Composite Application

The systems have to be “service enabled” to provide their functionality in an unified way.
Anatomy of a Composite Application

The “Exchange Infrastructure” acts as the messaging middleware for service communication, connectivity, transformation and portability.
The unified business object model provides the flexibility to make transparent usage of business objects with local or remote persistency.
The unified service model provides service abstraction and shields higher layers from service implementation details making them replaceable.
Anatomy of a Composite Application

New user interfaces can be created on top of the provided services.
Actions decouple process steps from services and user interfaces to allow business experts to model processes on a non-technical level.
SAP Composite Application Framework

Status and Next Steps

Business Flexibility and IT

Composite Applications
The SAP Composite Application Framework integrates capabilities of SAP NetWeaver to facilitate the creation of Composite Applications

- **People Integration**: Multi channel access, Portal, Collaboration
- **Information Integration**: Bus. Intelligence, Knowledge Mgmt, Master Data Mgmt
- **Process Integration**: Integration Broker, Business Process Mgmt
- **Application Platform**: J2EE, ABAP, DB and OS Abstraction

**Key Value Drivers**

- **Service Composition & Orchestration**: Leverage existing data and information
- **User Experience**: Integrate SAP NetWeaver capabilities into a collaborative process environment
- **Agility**: Modify and enhance through non-invasive service extensions or process adaptations
- **Efficiency**: Follow a model driven and pattern based architecture paradigm
Example: SAP xApp Product Definition (SAP xPD)

Value Drivers of Composites for the SAP xApp Product Definition

SAP xPD: Identify valuable ideas and translate them into new innovative products

Service Composition & Orchestration
- Customer feedback from CRM
- Trend research from a Data Warehouse
- Product data & specifications from PLM

User Experience
- Intuitive UI for casual users from e.g. Marketing
- Document management and collaboration
- Excel integration for initial financial estimates

Agility
- Out- or in-sourcing of Market Research or R&D
- New product categories
- Regulatory changes

Efficiency
- Modeling and generation of objects and services for product idea or product concept
- WebDynpro UI patterns to search and list ideas
- Process templates for request and approval
SAP CAF is a methodology and toolset to build and manage Composite Applications, leveraging SAP NetWeaver capabilities.

SAP CAF combines SAP NetWeaver components and tools to drive throughout the whole application stack:

- **Process**: Creation and execution of cross component workflows with Guided Procedures
- **UI**: Use of WebDynpro patterns and freestyle components, as well as Interactive Forms
- **Service**: Definition and implementation of business objects and services, including services from SAP NetWeaver components
Service and UI – Key Features

SAP Composite Application Framework - Service and User Interface Layer

- Import of external services like RFCs or Web Services at design or configuration time
- Generation of EJB proxies for external services
- Mapping of external services to entity and application services
- Composition of application services using entity and external services
## Service and UI – Key Features

### SAP Composite Application Framework - Service and User Interface Layer

<table>
<thead>
<tr>
<th>Composition</th>
<th>User Experience</th>
<th>Agility</th>
<th>Efficiency</th>
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<tbody>
<tr>
<td>- Integration with SAP NetWeaver Knowledge Management and Collaboration for content management, search capabilities, and discussion services</td>
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<td>- Extraction of data from entity and application services to SAP Business Intelligence</td>
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<td>- Notification service triggered by changes of entity instances</td>
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<td>- Excel import &amp; export, document generation</td>
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<td>- Standard WebDynpro patterns and controls for common user interface elements</td>
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SAP xPD: Attach documents to ideas
Example: Idea Management in SAP xPD

Document Management
- Entity service for documents
- CRUD operations
- Versioning, locking, clean-up
- UI pattern to attach and relate

Search
- Search over entities
- Search over attached documents
- Search over hierarchical classifications
- Search over entity relations
- Attribute and free text search
Service and UI – Key Features

SAP Composite Application Framework - Service and User Interface Layer

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<td>■ Extension of entity services through custom fields at configuration time</td>
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<tr>
<td>■ Non-invasive extension of application services (planned)</td>
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<td>■ Re-configuration of external service mapping</td>
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<tr>
<td>■ Connection with custom extensions through WebServices and JMS based events</td>
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<tr>
<td>■ Re-configuration and re-combination of UI patterns adapting to changes in underlying services</td>
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</table>
Service and UI – Key Features

SAP Composite Application Framework - Service and User Interface Layer

- Modeling of entity services, application services, and external services
- Generation of persistency in form of database tables and JDO metadata
- Fully generated implementation for entity services, incl. life cycle methods (CRUD), authorization and eventing services
- Partially generated implementation of application services, incl. logging, exception handling, access to related services, monitoring
- Provisioning of WebDynpro patterns
Example: Product Concept Object in SAP xPD

Modeling Entity Services

- Attributes
- Relations
- Queries
- Permissions
- Persistency
- Mapping to remote data sources
UI Patterns

- Object browser
- Object selector
- Object editor
- Object list
- Search bar
- Collaboration
- Attachments
- File select
- Classification
- User assignment
- Authorization report
- ...
Process – Key Features

SAP Composite Application Framework - Process Layer: Guided Procedures

**Orchestration**
- Modeling and managing user centric processes across multiple backend systems
- Invocation of various types of applications and services, e.g. WebDynpro, RFCs, R/3 transactions, SAP BI queries, HTML, Interactive Forms
- Embedding application service functionality as background steps
- Mapping of parameters between process steps using a data persistency for process context

**User Experience**

**Agility**

**Efficiency**
Process – Key Features

SAP Composite Application Framework - Process Layer: Guided Procedures

<table>
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<tr>
<td>Provision of complete process visibility</td>
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<td>Guiding users through process steps providing role specific process context</td>
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<tr>
<td>Role based assignment and processing of process steps</td>
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<tr>
<td>Interactive Forms for on- and off-line execution of form based processes</td>
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<tr>
<td>Predefined or custom views for process execution, monitoring, and administration</td>
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Guided Procedure Run-Time

**Process phase navigator**

**Time-Off Process (Multi-Phase)**

**Views**
- Overview
- Process Activities
- Process Information

**Contextual panel**
- Activities
- Options
- You Can

**Application area**
- Create Request
- Approve Request
- Complete Request
- Process Role
- First Name
- Last Name
- User ID
- Position Title
- Organizational Unit
- Leave entitlement
- Check team calendar
- HR Consultant
- Ronald Fischer

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SAP Composite Application Framework - Process Layer: Guided Procedures

- Ad-hoc initiation of optional steps during process execution
- Code-free modification of process flow using reusable process components
- Interface for an individual development of application components exposing context and result states to the Guided Procedure framework
- Definition of new callable object types by customers or partners
- Modification of process control through public API
### SAP Composite Application Framework - Process Layer: Guided Procedures

#### Key Features

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<td>- Ready-to-use run-time framework with configurable user interface</td>
<td>- Gallery with custom specific, re-usable process components for phases and steps</td>
<td>- Process specific parameter and role consolidation at configuration time</td>
<td>- Predefined implementations for e.g., data input &amp; display, approval, decision, email</td>
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<td>- Integration of WebDynpro UI patterns with parameter mapping to process steps</td>
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Guided Procedures Gallery

Gallery: Repository for objects that build processes in Guided Procedures

Basic objects
- Process templates
- Blocks
- Actions
- Callable objects

Extension
- Content package
- Object views
- Event resolution templates

Re-usable process building blocks
Guided Procedure Building Blocks for Idea Management

**Process: Idea Management**

**Block/Phase: Idea Submission**
- **Action:** Describe
- **Action:** Classify

**Block: Idea Evaluation**
- **Action:** Search
- **Action:** Get Details

**Block: Idea Processing**
- **Action:** Accept
- **Action:** Archive

Callable Object (CO):
- **Classify Idea**
- **Search Idea**
- **Get Details of Idea**
- **Accept Idea**
- **Archive Idea**

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Idea Evaluation

Context Mapping for Idea Evaluation

Process: Idea Management

Block: Idea Submission
  Action: Search

Block: Idea Evaluation
  Action: Get Details
  Action: Patent Search
  Action: Search Again?

Callables Object Layer

Block: Idea Proc.

CO: Search & Select Idea
CO: Get Details for Idea
CO: Patent Search
CO: Decision

Process Context

Idea ID
Idea Title
Author...
Composite Applications from SAP and Partners

- SAP xApp Product Definition
- SAP xApp Resource and Portfolio Management
- SAP xApp Cost and Quotation Management
- SAP Global Trade Services
- SAP xApp Emissions Management
- SAP xApp Integrated Exploration and Production

Workspace Solution B2B Retail Management by Accenture
Visual Information for Plants by NRX
Restriction of Use of Hazardous Substances/Waste Electrical and Electronic Equipment (RoHS/WEEE) Compliance Solution by TechniData
Pricing Analytics by Vendavo
plannerDA by BristleCone
Manufacturing Performance Intelligence by Lighthammer
ServiceFlow by Digital Fuel
Development of Composite Apps in 2005 / 06

- Focus on light – medium weight composites
- Aim at less than 6 months for development

- Business model required (backend abstraction)
- Simple business logic
- Model-based – process flows
- Simple conditions

- Persistancy for new business objects in composite
- More complex business logic

- Additional data about backend business objects in composite
- Very complex business logic
Usage Patterns for Composites

Enable an efficient development and management of composite applications through the identification and preparation of re-usable patterns

- Self Services
- Compliance
- Simplification
- Verticalization
- External Collaboration
- Collaborative Document Creation
- Collaborative Planning
- Analytical Applications
- Risk Management
- Event Resolution
Examples for Usage Patterns

**Multi-User Guidance**

- **Start**
- **Next**
- **Next**
- **Finish**

**Examples**
- Life and Work Events (my first days)
- Employee onboarding

**R – P – A – U**

- **Enter Request**
- **Process Request**
- **Approve**
- **Update Backend**

**Examples**
- Building Request Processing
- Product Change Request Processing
- Project Scope Change Request Processing
- Leave Request Processing
- Loan Request Processing

Call Service
Timeline

Composite application development on SAP NetWeaver 2004s

- Ongoing: Composites and xApps by SAP
- Q3/2005: Light and medium weight composites by selected partners
- Q2/2006: Composite applications by partners and customers

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<td>Planning, development, and shipment of Composite Apps at SAP</td>
<td>Light-medium weight Composite Apps built by selected partners</td>
<td>General roll-out</td>
<td>Ramp-up start mySAP ERP 2005 incl. SAP NetWeaver 2004s</td>
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<td>TechEd</td>
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ESA is SAP’s architecture blueprint which enables business innovation through IT flexibility with Composite Applications.

Composite Applications drive user centric, collaborative, and highly dynamic business processes, using data and functions from platforms and applications provided as services.

SAP’s Composite Application Framework with Guided Procedures allow to develop and manage Composite Applications, enabling service composition & orchestration, rich user experience, agility and efficiency.

Composite Applications are currently built by SAP and selected partners. In 2006 the SAP Composite Application Framework will be broadly available for partner and customer development projects.
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