Developing SAP Business ByDesign Applications Using Partner Development Infrastructure

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SAP Business ByDesign Solution Management
October 2010

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SAP Business ByDesign™
Designed as a complete On-demand Suite

- On Demand deployment model – running in the SAP Cloud
- Full Suite covering all relevant aspects
  - Large set of scenarios & processes
  - SOA architected and model driven
  - Modular & Flexible – easy to configure and change
  - Business Network enabled
  - Intuitive user experience incl. Collaboration
  - Business Insight & Analytics
- Flexibility, Extensibility & Partner platform
- Integrated knowledge base
- Built in compliance
- Built in Service & Support
Many end-to-end business processes reduce TCO!

- Full Set of End-to-End Integration scenarios
- Covering extended suite: CRM; SRM; FIN; SOM; PLM; HCM; PRO
- Business driven Configuration with Simple scoping
- Process view beyond corporate boundaries
- Designed for phased implementation
- PS880 certified (financial certification) by Ernst & Young

Example: Order-to-Cash (Sell-from-Stock)

Scenario Overview

- Handling an Incoming Customer Inquiry
- Creating Sales Quotes
- Creating Sales Orders
- Initiating Outbound Delivery
- Processing Outbound Delivery
- Creating Customer Invoices
- Processing Receivables and Payments

Marketing-To-Opportunity

Order-to-Cash for products
- Order-to-Cash for services
- Make-to-Order
- Make-to-Stock
- Drop Shipments
- Customer Returns
- Stock Transfer
- Strategic Sourcing
- Procure-to-Pay products/services
- Product Engineering
- Demand and Supply Planning
- Site Logistics and Warehousing
- Quality Assurance
- Financial Closing
- Cash and Liquidity management
- Project Lifecycle Management
- Field Service and Repair
- Request-to-Resolve
- Workforce Administration
- Payroll Services
- Expense and Reimbursement Management

Business Areas

- Accounts Receivable
- Accountant

The following business roles are involved in this scenario:

- Sales/Customer Service Representative
- Warehouse Manager
- Warehouse Operator
- Accounts Receivable Accountant

Credit Card
- Sales order processing supports the payment by credit cards with integration to payment service providers

Credit Limit Check
- You can minimize credit risk by specifying a credit limit for a customer. If a credit limit in an order is exceeded, a delivery block is set automatically

Automatic Order Creation
- A sales order can be created on the basis of a lead, opportunity, sales quote, or through an e-shop or B2B interface (external system)
SAP Business ByDesign™
Details on Business Functionality Level (Examples)

Financial Management
- Credit limit check
- Revenue on projects / project profitability
- Recurring documents
- Audit work center
- Closing cockpit
- Incoming payment by credit card
- Petty cash

Customer Relationship Mgmt
- Campaign management
- Project-based selling
- Down payments
- Recurring invoicing
- Support of drop shipment
- Support of eCommerce

Supplier Relationship Mgmt
- List prices
- Down payment
- Recurring invoices
- Stock transfer (inter-company via B2B)
- Return to supplier
- Expense product
- Support of drop shipment

Project Management
- Project cost estimation
- Project invoicing
- Project profitability
- Editable Gantt chart
- XML up- and download (e.g. for Microsoft Project)

Product Development
- Product definition
- Product engineering

Supply Chain Management
- Make-to-order (lean)
- Drop shipment
- Intra-company stock transfer
- Return-to-supplier
- Quality assurance
- Freight list
- Cycle counting
- Production order-based replenishment & feasibility check
- Labeling & serial numbers
- Inbound advanced shipping notification

Human Resources
- Quick time data-entry including periodical overview
- Excel upload for employee times
- Working time accounts
- Resource pool management
- HR dashboard for corporate performance

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Details on User Experience & Cross Topics (Examples)

Analytics & Manager
- Corporate performance
- Executive dashboards
- Formatted reports
- KPI Monitor
- New work center Business Analytics for key users
- Easy creation of new reports

User Productivity
- Enhanced search on business objects, documents within ByDesign and via external search service providers
- Add and manage favorites from ByDesign and external content
- Enhanced web services/mashups
- Personalize work center sort order, page UI, date/time/number format
- Quick access via keyboard navigation
- Less clicks for finishing an action
- Personalize screen content: hide and show fields

Business Task Management
- Work assignment across organization
- Delegate work based on workload and responsibility
- Task monitoring and reporting

Groupware Integration
- Synchronization of ByDesign appointments, emails, tasks, contacts with Outlook client
- Follow-up on service requests from Outlook directly
- Support both Outlook 2003 and 2007

Office Integration
- Refresh previously downloaded data in Excel with real-time ByDesign data
- Uploading new data from an Excel template into ByDesign
- Create business document with ByDesign data in Microsoft Word

People Collaboration
- Telephony integration
- Click to dial directly from UI
- Automatic incoming caller determination, with related business content

Business Configuration
- Definition of customer-specific fields
- Application work center allows fine tuning
- Support of a partial implementation approach (e.g. CRM or SRM only)
- Extend the partial implementation in a follow up phase (e.g. adding Financials once CRM has been implemented)

Output Management
- Form editing with simple form editor
- Advanced error handling

Identity and Access Management
- New audit reports
- Enhanced rules for segregation of duty
- Self-service for password changes
SAP Business ByDesign™
Services embedded into the Product!

Automated & Built-In Support
- Self-healing capabilities
- Preventative measures address potential issues
- Integrated incident management

Providing full contextual information

Built-in learning
- Built-in learning environment
- Learning "on the job"
- Learning content always up-to-date and continuously growing

SAP Support
- 24x7 direct support – one phone number
- Technical and application experts available to support you
- Direct support in local language

Online Help Resource
- ByDesign™ tightly integrated with communities using Web 2.0 features

www.sap.com
e-learning
Community
Web 2.0

Source: SAP

Architecture Overview

Client Tier
- Rich Internet Application UI
- Office Integration (Excel, Word)

Application Tier
- Meta Data Repository
- Public solution model
- Local Connectivity
- Business Object
- Business Object
- Business Object
- Business Object
- Business Foundation
- Neural Components
- Application Logic Implementation
- Fast Search
- Service Layer
- Compound Service
- UI Controller
- Analytics

DB Tier
- Database
- TREX

Centralized Components
- Crystal Reports
- KM
- Print Server

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**SAP Business ByDesign Core Applications**

**3 Tier Architecture**

- **User Interface**
  - Work Center
  - Transactional UI

- **Application Business Logic**
  - Service-oriented architecture:
    - Core Services standardize the access to business objects like SQL standardizes access to database tables
      - Create
      - Read
      - Update
      - Delete

- **Persistence**
  - Database and Search Engine

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**“Business Object”**

**Definition**

*A business object is an entity of significance to a business.*

- A Business Objects represents a clearly defined, self-contained business entity

In Business ByDesign business objects

- Encapsulate **business logic** (by its definition and implementation) and **business data** (represented by concrete instances)
- Act as service consumer and provider: provides data via well-defined interfaces to other business objects and consumes services of other business objects
- Are accessible exclusively through a standardized set of (core) services
- Are described by a business object model which defines:
  - Structure
  - Type of the attributes
  - Aspects of the behavior
  - Service interfaces

**Note:** In our context business object means the type and **not** the instance!

**Business object:**  
**Business object instance:**

- **Purchase Order**
- **Customer Invoice**
- **Accounting Document**
- **Business Partner**
- **Product**
- **Dunning Strategy**
- **…**
Business Object Node Attributes

- As soon as the nodes are defined and their business semantic is clear, the attributes can be assigned.
- Assign the attributes as elements to nodes according to their semantic.
- Attributes are typed by global data types (GDTs) or core data types (CDTs).
- All business objects and service interfaces share the same pool of global data types, published in SAP Developer Network (SDN): http://wiki.sdn.sap.com/wiki/display/GDT/SAP+Global+Data+Type+Catalog

```
<table>
<thead>
<tr>
<th>Element</th>
<th>Global Data Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID</td>
<td>ID</td>
</tr>
<tr>
<td>Ordered Date</td>
<td>DateTime</td>
</tr>
<tr>
<td>DataOrigin</td>
<td>TypeCode</td>
</tr>
<tr>
<td>Name</td>
<td>Name</td>
</tr>
<tr>
<td>Gross Amount</td>
<td>Amount</td>
</tr>
</tbody>
</table>
```

“Integration Scenario ”

Definition

“An integration scenario is a realization of a given end-to-end business process. The model shows the required entities for the process and the high-level process integration points.”

Integration Scenario “Bonus Management”

- Customer Relationship Management
  - Sales Order Processing
    - Sales Order
  - Bonus Management
    - Bonus Entitlement
    - Bonus Plan
    - Bonus Policy
- Human Capital Management
  - Message-based interaction
    - Employee Compensation Agreement
  - Compensation Management

Process Interaction: Defines the interaction between business objects in different deployment units.

Deployment Unit: A software package that can be operated with the foundation layer, isolated from other deployment units. It contains a set of process components.
Refinement of an Object Model: Compositions and Associations

- The internal structure of a business object is described by its components (object nodes).
- Nodes are compositions with cardinality and are related via a strict hierarchical relationship and exposes semantics and business understanding.
- Elements (attributes) in one node can be mandatory or optional. Elements with cardinality larger than 1 require a separate node.

**Sales Order**

- **Root**
  - **Item** 1..n
  - **Party** 1..n
- **Product ID**
- **Quantity**
- **Party Role Code**
- **Party ID**

**Business Partner**

- **Root**
- **Product**
- **Bonus Policy**
- **Bonus Plan**

External relationships to business object in the same deployment unit and to business objects in foundation are expressed as associations.

Communication Capabilities

- User Interface
  - **Work Center**
  - **Transactional UI**
  - **Analytical UI**
  - **Print Forms**

- Business Communication
  - **Mail**
  - **Business Task**
  - **Print, Fax, Mail**

- Process Integration
  - **Message Type**
  - **Service Interface**
  - **Business Object**
UI Interaction Model
UI Floor Plans

The following floor plans are available in ByD:

- **Work Center (WC), Control Center (CC):**
  An area where an employee can perform the typical tasks or functions that they are responsible for within an enterprise. The Control Center is a dedicated work center that is the central starting point for all business activities.

- **Object Work List (OWL)**

- **Quick Activity (QA), Fact Sheet (FS), Object Instance (OI)**
  For viewing and maintaining the key properties of an object and for viewing the full set of properties of a business object. The employee can switch back and forth between different views.

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**Agenda**

1. SAP ByDesign
   - Overview
   - Architecture

2. ByDesign Studio
   - Overview

3. Demo
**SAP Business ByDesign**

**Types of Partner Solution**

- SAP is focusing on SAP Business ByDesign as the application platform with core business scope.
- Solution Partner integrate best-of-breed applications and services
  - Increase Solution Reach with additional backend functionality
  - Increase Solution Attractiveness on front-end

**Solution Attractiveness**

1. **Mashups**
   - Frontend integrations like maps, company information.
2. **Integrated Software and Services**
   - Backend integrations like credit card processing, payroll services.
3. **Lightweights**
   - Forms, Reports, Excel Workbooks, and UI Adaptations.
4. **Add-on solutions**
   - Native solutions, e.g., Trade promotion management, Service desk.
5. **(Micro-)vertical solutions**
   - Pre-configured or native micro-verticals like Pharmaceutical Solution, Wineyard Solution.

**Examples:**
- 1. Mashups
  - Frontend integrations like maps, company information.
- 2. Integrated Software and Services
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- 3. Lightweights
  - Forms, Reports, Excel Workbooks, and UI Adaptations.
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- 5. (Micro-)vertical solutions
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**ByDesign Studio**

Efficient partner development infrastructure provided by SAP

**ByD Software Development Toolkit**

- Integrated development environment based on MS Visual Studio.
- UI designer for desktop and mobile devices.
- End-to-end software lifecycle management.
- Reuse of key user tools e.g., reports builder, forms editor.
- Enhanced developer productivity – wizards support.
- Link to Commercial Platform via Partner Control Center.

**Partner solutions**

- Modification-free
- Multi-tenant
- Multi-device
- De-coupled lifecycle
- Scalable
- Easy to integrate

Source: SAP
Business Logic

New Business Objects

- Business objects contain nodes, elements, associations and actions
- The business objects are tree-like structured by nodes and sub-nodes
- The data of the elements is persisted in the database. Transient elements are also possible
- Associations can point to other BOs within the add-on or to ByD BOs
- Actions capulate the business logic
- Authorization on instance level
- Link ByD BO to BO of partner

Scripting

- Implement the business logic of add-ons. Examples: Calculate bonus, initialize elements, check user input
- Usual control structures like „if“, „while“, „foreach“, …
- Read-write access to elements of own or associated BOs
- Query BO-instances
- Exception handling
- Library of reuse services
- Usable in different contexts: BOs, process agents, service adaptations, exit implementation

UI’s, Forms, Reports and Workflows

Custom Analytics

- Custom reports (new or based on existing)
- Use (custom) fields
- Create & personalize Excel Workbook
- Create formatted reports
- Create new reporting views and reports for partner BOs

Workflow

- Add an approval workflow to partner business object
- Add task to universal work list

Partner UIs

- Build ByD conform standard UIs for Partner BOs
- Create Mobile UIs
- Create new partner specific UI controls (e.g. CAD drawings) using Silverlight

Forms Maintenance

- Custom forms via highly accessible form editor
- Use additional fields (custom or standard)
- Create new print forms for partner BOs and associated ByD BOs, and for ByD BOs
External and internal Integration

External Integration
- Provide synchronous web services to access BOs of partners and ByD from the outside
- Push to and retrieve data from ByD via external actor
- File upload to ByD BOSs or partner BOSs

Asynchronous Process Integration within ByD
- Functional decoupling via asynchronous integration
- Well defined interfaces and messages
- Send / receive messages across ByD deployment units

Tracing and Supportability
- Write trace statements from Scripting coding
- Explore and manage traces within ByDesign Studio

Lifecycle Management

Support of the full lifecycle of a partner add-on
- Initial creation / registration of a partner add-on
- Ensure the adherence to lifecycle relevant constraints during development (namespaces, packages, transports)
- Assemble shippable add-ons
- Manage shipping of add-ons to repository and customer systems
- Deploy and activate add-on on customer systems
- Set up maintenance processes: split maintenance from development version, build and apply hot-fixes
Supported Application Patterns - an excerpt

Add-On’s
- Inbound / Outbound handling (providing data and consuming)
- UI simplification (cockpits)

Use Cases
- Bonus management
- Planning Service Orders
- Simplify confirmation within professional service

3rd Party Software Integration
- Synchronous (external initiated) integration (push/pull from external)
- File upload

Use Cases
- Ticketing integration, Daily upload of cash journal

Logic Extension
- Calculated extension fields
- Adaptation of ByD screens

Use Cases
- Fast order entry
- Inventory Properties Management

Preconfigured Template
- Deliver preconfigured project templates for initial project start
- Template includes BC sets, Reports, basic data

Use Cases
- Professional service template

DEMO

Business ByDesign Studio: Build a Customer Classification Application
**Customer Classification**

**Business Scope**
- Provide a revenue based calculation of the customer classification

**New BO Customer Classification**
- Query sales orders
- Calculate the classification based on the revenue
- Write back the classification to the Business Partner

**UI Interaction Model Customer Classification**
- New
- Edit
- Find
- Query
- Sales Orders
- OWL
- QA

- CalculateClassification
  - Read the Revenue and set the ABC Classification
BO Interaction Model

BO: CustomerClassification

Root Node
- Association: To Buyer
- Revenue

BO: Sales Order

Root Node
- Revenue

Node Item [1..N]
- Structure of Item Node

Node Schedule Line [1..N]
- Structure of Schedule Line

Node Description
- Node AccessControlList

BO: Business Partner

Root Node
- Structure of Root Node

Classification

Node - Business PartnerRole
- Node - Email
- Node - Address

Legend
- Node Association
- Data Passage

Summary

We have covered today:

- SAP Business ByDesign as a complete onDemand Suite and a Platform
- Architectural Overview and Development Model.
- Developing own Business Objects with the corresponding UI’s using ByDesign Studio
Further Information

SAP Public Web:

Related SAP Education and Certification Opportunities
http://www.sap.com/education/

Related Workshops/Lectures at SAP TechEd 2010
CD115: SAP Business ByDesign - Easy to Implement, Easy to Extend, Lecture

Feedback

Please complete your session evaluation.
Be courteous — deposit your trash, and do not take the handouts for the following session.

THANK YOU !