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Agenda

Introduction
Architecture
Meta Model
Development Tools
Information Sources
Introduction
What is a Business Object?

A representation of a type of uniquely identifiable business entities, described by…

- a structural model
- an internal process model
- one or more service interfaces

Business processes operate on business objects.

**Examples**: “Customer Invoice”, “Sales Order”, or “Purchase Order”.
What is a Framework?

„A **software framework** is an abstraction in which common code providing generic functionality can be selectively overridden or specialized by user code providing specific functionality. …

Frameworks are similar to software libraries in that they are reusable abstractions of code wrapped in a well-defined API. Unlike libraries, however, the overall program's flow of control is not dictated by the caller, but by the framework. This **inversion of control** is the distinguishing feature of software frameworks.“

(Source: Wikipedia.com)
What is BOPF?

BOPF - Business Object Processing Framework
- Pursues a modular step-by-step approach to implement and run business objects that comply with the Enterprise Service Oriented Architecture
- Is part of Business Object Infrastructure (BOI)
Advantages of Using BOPF (1)

Rapid Prototyping
• Quick setup of a running prototype of your business object with its most basic services already enabled, such as create, retrieve, updated, delete, save, and query.

Reuse of Implementation
• Clear structuring of the business logic in small reusable parts using standardized interfaces and a clear separation of concerns.

Highly Customizable
• Support enhancement and configuration options at every level, such as defining the specific business logic and performance optimization attributes that are unique to your business object.

Less Implementation Efforts
• BOPF controls the application business logic as well as the data retrieval of the buffer and database layer – you do not have to write it on your own.
Advantages of Using BOPF (2)

User Interface Modeling (Floorplan Manager Integration)
• Create user interfaces including personal object worklists for your business objects without any coding

Status and Action Management
• Model a status diagram of your business object including special transitions and actions

Change Documents Integration
• Record transactional changes of the data of business objects and check the change history

Data Archiving
• Automatically store business object instance data in an archiving object
Advantages of using BOPF (3)

Modeled Field Control (Field Control Framework)
- Model the behavior of controls (e.g. enabled, disabled, read-only, mandatory) related to the state of the business object

Integrated Transaction Management

Rule Management Engine Integration (BRF+)
- Use the rule management expression in order to define your logic

Output Management Framework

Application Log
- Store your application log in a special application log business object

see BOPF Reuse team wiki: https://wiki.wdf.sap.corp/wiki/display/reuseBOPF/Home
Who uses BOPF?

BOPF in SAP Business ByDesign is used for more than 66% of all business objects.

BOPF in Business Suite is used by the following groups:

- SAP Quality Issue Management
- SAP Management of Change
- SAP Supplier Relationship Management
- SAP Transportation Management
- SAP Environment, Health, and Safety Management
Architecture
Architecture Layers

- Consumer
- User Interface (Floorplan Manager)
- Transaction Layer (BOPF)
- Business Object Layer (BOPF)
- Database
Development Paradigms

Access to Business Object (CORE Services) only via a Defined API

Clear Separation Between Changing and Checking Business Logic
• No mixture of methods that change the business object with methods that have the purpose to check the business object’s consistency

Clear Separation Between Business Logic and Data Buffer
• Business logic is built on top of the business object and the buffer to be independent of how and where data is buffered
• Business logic shall not be implemented within the buffer

Clear Separation Between Data Buffer and Database
• Easy exchange of the buffer algorithm (e.g. to gain performance)
• Easy exchange of the database or the way data is stored
Development Paradigms Picture
Meta Model
BOPF Meta Model (1)

- Contains Determination, Validation, Action and other model elements, which are necessary to model a business object
- Uses the components of the meta model in order to describe structure and behavior of a business object
- E.g. Customer_Invoice
- Instances of a business object model, created at runtime
- E.g. “Customer Invoice” No. 231, “Customer Invoice” No. 9439
The meta model defines elements that can be used to describe a certain business object. The most important ones are:

**Node**
A business object is a hierarchical tree of nodes. A single node consists of a set of semantically related business object data and the corresponding business logic.

**Elements**
Elements represent business information (e.g. InvoiceID, InvoicePaid).
BOPF Meta Model (3)

**Action Entities**
- Changes the business object instance
- Is triggered explicitly by the service consumer

**Determination Entities**
- Changes the business object instance (side effects)
- Is triggered internally due to changes of the business object instance

**Validation Entities**
- Does not make any changes on the business object instance
- Consistency validations
- Action validations

**Query Entities**
- Search for business object instances that fulfill certain search criteria

**Association Entities**
- Connect instances located on two nodes
Development Tools

SAP Internal Design Time (aka CONF_UI)

BO Builder (aka Enhancement Workbench)

BO Builder Test Environment (aka Test UI)
SAP Internal Development Environment

- Can be used internally in order to create, update, or delete business objects
- Allows to add entities (e.g. actions, determination, and validations) and attributes
- Can display the business object graphically
- Generates documentation templates
Create new business objects or enhance existing business objects by adding new nodes, new actions, new determinations, or new validations.

Enhance existing actions by adding a pre-action or a post-action that are automatically executed before (or after) the action of the base business object is executed.

Add further nodes to the business object.
Test every business object using a generic graphical user interface.
Execute entities and save or clean up transactions.
Receive messages from the business object.
Information Sources
Information Sources

BOIoP Wiki Space
https://wiki.wdf.sap.corp/wiki/display/BOIoP/Home

Join the Community!
Thank you