Web Dynpro for ABAP
Your Instructor

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Learning Objectives

As a result of this workshop, you will:

- Know why Web Dynpro is SAP’s preferred UI model
- Understand the Web Dynpro programming model
- Be able to create basic Web Dynpro applications in ABAP
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IT practices “slice” SAP NetWeaver to directly address key issues ... and help enterprises find the right starting point.
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SAP UI Framework Roadmap: From SAP GUI to Web Dynpro

- SAP GUI
- ITS Technology (SAP GUI for HTML)
- ITS (IACs, Flow Logic)
- JSP & HTMLB (tag library) Java
- HTMLB for BSP
- Business Server Pages (BSP)
- ITS UIs (Web GUI, IACs)
- NW 2004s
- Web Dynpro Java
- Web Dynpro ABAP

NW 2004
What is Web Dynpro?

A Programming Model for User Interfaces
- Defines a standard structure for user interface applications
  - Derived from the MVC (“model-view-controller”) design pattern

A Set of Tools for User Interface Design
- Focus on graphical modelling
  - Code is generated from meta-model declarations
- Integrated in SAP NetWeaver Developer Studio and the ABAP Workbench

A Runtime Environment for Applications
- Framework running on SAP Web AS server offers common services

A Technology for Software Modularization
- Components help structure applications and support pattern-based UIs
Deliver an Enterprise Quality Web Development Environment

- minimize coding, maximize design
- separate layout and logic
- support arbitrary backend systems
- support reuse of components
- configuration of UI patterns
- support Web services and data-binding

Achieve Independence

- run on multiple platforms

Improve User Experience through a "High Fidelity Web UI"

- browser based, zero footprint
- screen updates w/o page reloads
- client-side dynamics
- performance through caching
- 508 accessibility support
Motivation Web Dynpro

Web Dynpro

- UI definition independent of client technology
- As much abstract declaration as possible
- Different rendering engines for different (future) UI technologies without adapting application coding

Rendering Engine

other?

???

http://.....
HTML, JS

http://.....
XML, delta

Meta Data
<xml>
<wd:xxx>
</xml>

Web Dynpro
Motivation of Web Dynpro

The Web Dynpro Programming Model

Views and UI elements
Controllers and Context
Navigation and Plugs
Advanced Topics
Summary
Demo

Hello World
Model View Controller (MVC)

Original MVC design for decoupling presentation and application logic

**Model**
Generates the application data without caring how it will be displayed.

**View**
Visualizes the application data without caring how it was generated.

**Controller**
Binds the user and business interaction layers together. All intermediate processing is performed here.

**Binding Layer**

**User Interaction Layer**

**Business Interaction Layer**

Request → **Controller** → Response

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Web Dynpro Component contains

- Windows
- Views
  - UI elements
  - Layout
- Controllers
  - Context Data
  - Eventing
  - Methods
  - Attributes
- Component Interface
  - Interface Contr.
  - Interface View

Component

Window

View

View Controller

View Controller
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**View**
- Is embedded into window
- Defines the visible layout via predefined UI elements
- Doesn’t contain any HTML or scripting

**UI elements**
- Are the smallest UI building blocks (button, input field,...)
- Available as provided UI element libraries
- Have properties which steer their behavior
- Can be nested with Container UI elements
- Are positioned in a hierarchical structure
Various categories of UI elements are supported

- **Standard Simple**
  - e.g. Button, InputField, Label
  - Gantt, Network

- **Standard Complex**
  - e.g. DateNavigator, Table, Tree
  - InteractiveForm, BusinessGraphics, GeoMap

- **Standard Container**
  - e.g. TransparentContainer, Tray
  - BI Application Frame, OfficeControl

Each UI element object is represented as an abstract class that is independent of any client presentation layer.
Demo - Views & UI elements
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Controller

- Contains the logic of the UI layer
- Implements event handlers
- Reads and writes context node content
- Each view has its own view controller

Context

- Hierarchy of nodes and attributes
- Contains the data of the UI
- Nodes and attributes can be bound to UI elements
- Framework cares about updating the values

Controller And Context

```c
method WD_DO_INIT
    node = wd_context->get_child_node(‘N1’).
    node->set_attribute( name = ‘DEP_AIRP’,
                        value = ‘Paris’).
```

```c
Method onAction_GOTO_NEXT
    node = wd_context->get_child_node(‘N1’).
    node->get_attribute( name = ‘CARR’
                        value = carrier ).
```
Controller contains methods...

...and events for user interactions

Method \texttt{onAction\_GOTO\_NEXT}
\begin{verbatim}
node = wd_context->get_child_node(\textquote{N1}).
node->get_attribute( name = \textquote{CARR}
value = \textquote{carrier} ).
\end{verbatim}

Method \texttt{WD\_DO\_INIT}
\begin{verbatim}
node = wd_context->get_child_node(\textquote{N1}).
node->set_attribute( name = \textquote{DEP\_AIRP}
value = \textquote{Paris} ).
\end{verbatim}
Component Controller

- Controller which is the backbone of the component
- Has its own Context
- Contains the logic for interaction with the model (ABAP class, function modules, BAPIs, Web Services)

Context Mapping

- Nodes of Component Controller context can be mapped to nodes of other contexts
- Framework cares about data transport (references)
Component Controller

Component controller connects to business logic and gets/sets data

Mapping of context data

Method show_flights
flights = BO->get...
node1 = wd_context->...
nodel->bind_elements(flights).

Component controller connects to business logic and gets/sets data

Model Class, ABAP Objects API, BAPIs, Other WD Component, ...

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Demo Controller & Context
To define the navigation between two views, you need to create exit and entry points for each view using outbound and inbound plugs.

Only then you can specify the navigation flow using navigation links.
Plugs And Navigation

Window

View

View Controller

Outbound Plug

SEARCH_FLIGHTS

Create Action

Inbound Plug

method ONACTIONSEARCH_FLIGHTS .
   wd This->Fire Goto Mainview Plug( ).
endmethod.
Demo
“Navigation between Views”
Advanced Topics

- Component Usage & ALV
- Dynamic Web Dynpro Programming
- Adobe Forms integration
- Portal Integration
Web Dynpro Component Usage

Reuse of Web Dynpro Components

- Real business applications usually consist of several WD components
- Reusable components for dedicated often used tasks in different applications
  - Customer address display
  - Order details
  - ...
- Generic components as part of the Web Dynpro environment
  - ALV
  - Select Options
  - Message Viewer
ALV in Web Dynpro

- Provide a more advanced display component compared to TableView
- Offer same functionality as common ALV in ABAP

ALV realized as WD Component not as UI control

- More complex interface
- Included via Component Usage
- Data binding by reverse context mapping
Dynamic Web Dynpro Programming (cont.)

Layout Manipulation
- Include/Delete UI elements
- Bind UI elements to context
- Create actions in WD_DO_MODIFY_VIEW

Context Manipulation
- Create, fill, bind nodes
- Add attributes

Dynamic Navigation
- Generic call of Outbound Plug
- Define navigation between plugs

Dynamic Component Usage
- Create Component Usage
- Event registration
Adobe Forms Integration

Business Scenarios

Online Interactive Form Scenario
- SAP system access needed
- Full integration into Web Dynpro framework
- Context-sensitive value help, online checks

Offline Interactive Form Scenario
- No SAP system access needed
- Static value help, static checking, simple arithmetic calculations
- Self-contained PDF (XML data+layout)

Form Processing Scenario
- Documents get printed, e-mailed, archived or faxed
Adobe Forms in WD ABAP

Basic Forms Functionality
- Define Form in system
  - Layout (Adobe Designer)
  - Data structure
- Form is generated
  - Function for generating PDF
  - API for setting/getting data

Integration into Web Dynpro
- Place Form in InteractiveForm UI container element
- Map context data to forms API
- Form is displayed at runtime
  - Printing
  - Interactive Form
Portal Integration

- Easy integration via Web Dynpro iView Wizard
- Central User management
- Portal eventing support
- Object Based Navigation
- Unified branding by portal themes
Portal Integration

- SAP NW AS ABAP application system is declared in portal
  - Server, port,…
  - User mapping
- Create iView for WD ABAP application
- iView points to logical backend server, namespace and WD application
- iView is assigned to portal role
Flexible Interaction

- Allows direct interaction between independent iViews
- Event consumer subscribes to event
- Event raiser fires event

Loose Coupling

- EP Client Manager based (JavaScript Library)
- iViews can run on different systems
- iViews can be implemented via different technologies (WD ABAP, WD Java, BSPs, Portal Components, JSPs, …)
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- Web Dynpro is SAP’s UI strategy
- Declarative, MVC based UI programming model
- UI definition independent of rendering technology
- Web Dynpro for ABAP available with SAP NetWeaver 2004s
- Programming model similar to Web Dynpro for Java
- Completely Integrated into the SAP NetWeaver Application Server ABAP
Further Information

Public Web:

- [www.sap.com](http://www.sap.com)

Help Portal: [www.help.sap.com](http://www.help.sap.com) -> Documentation -> SAP NetWeaver -> SAP NW04s


SAP Developer NetWeaver (SDN)

Q&A

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Stay Tuned…

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Web Services in ABAP
Speaker: Peter McNulty