

CD102

Web Dynpro for ABAP Overview



Thomas Jung, SAP NetWeaver Solution Management
Phoenix: October 13th and 16th
Vienna: October 27th



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Agenda



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Objectives of Web Dynpro



- ## Future Proof UI Declaration

- ## Central implementation of user interface standards

- ## Supports major platforms

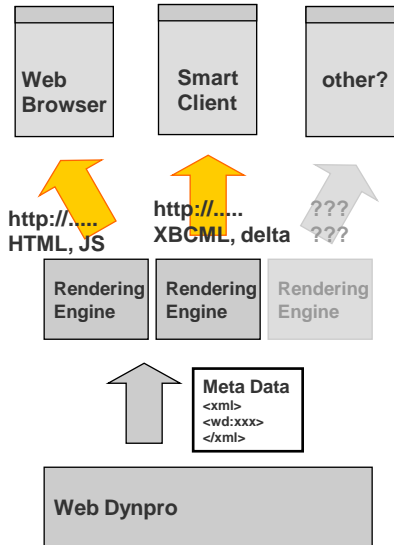
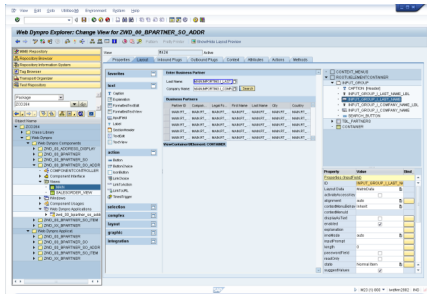
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Motivation Web Dynpro (1/2)

SAP

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



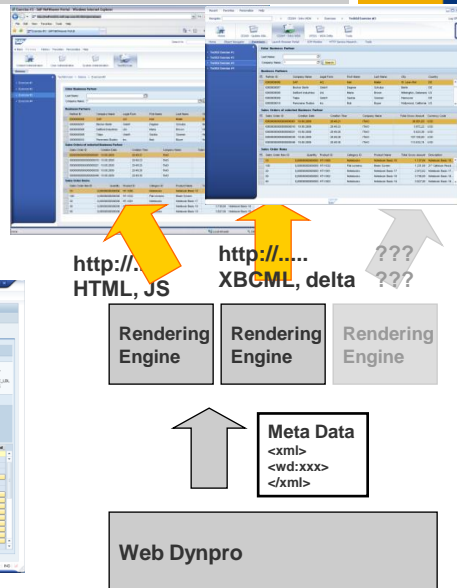
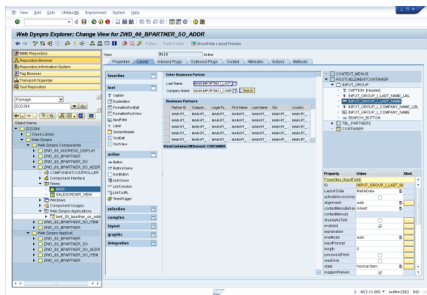
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Motivation Web Dynpro (2/2)

SAP

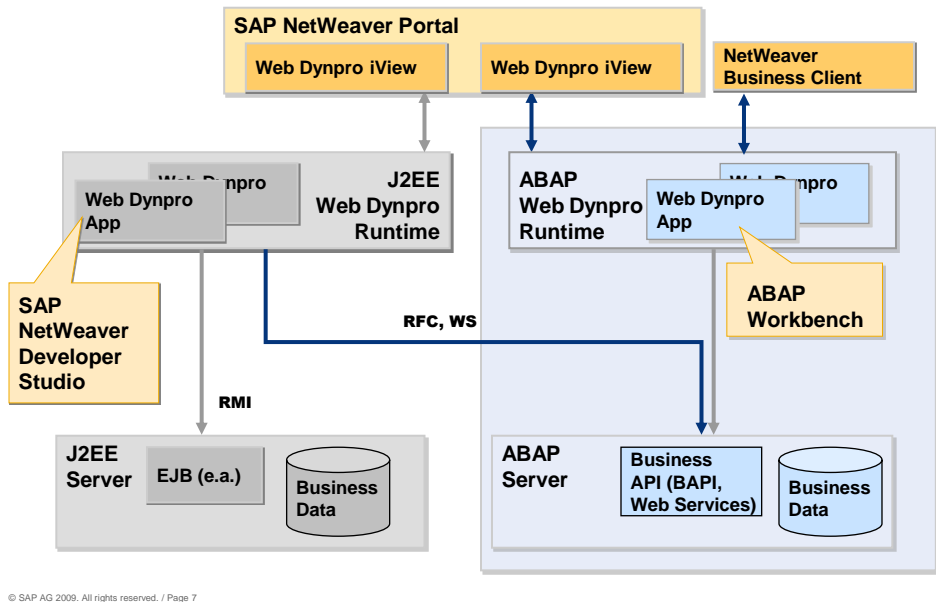
Web Dynpro

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



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Application Scenarios With Web Dynpro



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Web Dynpro Development in ABAP

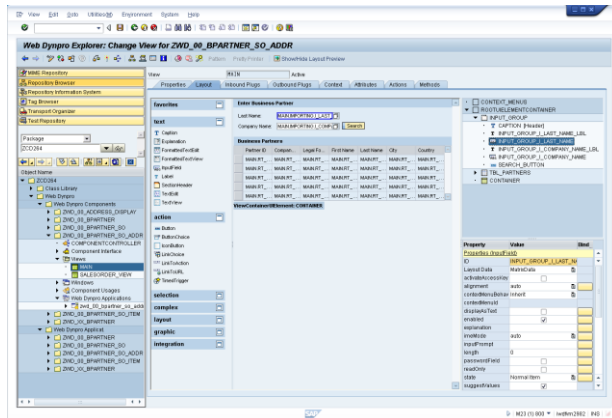


Development completely integrated into ABAP Workbench

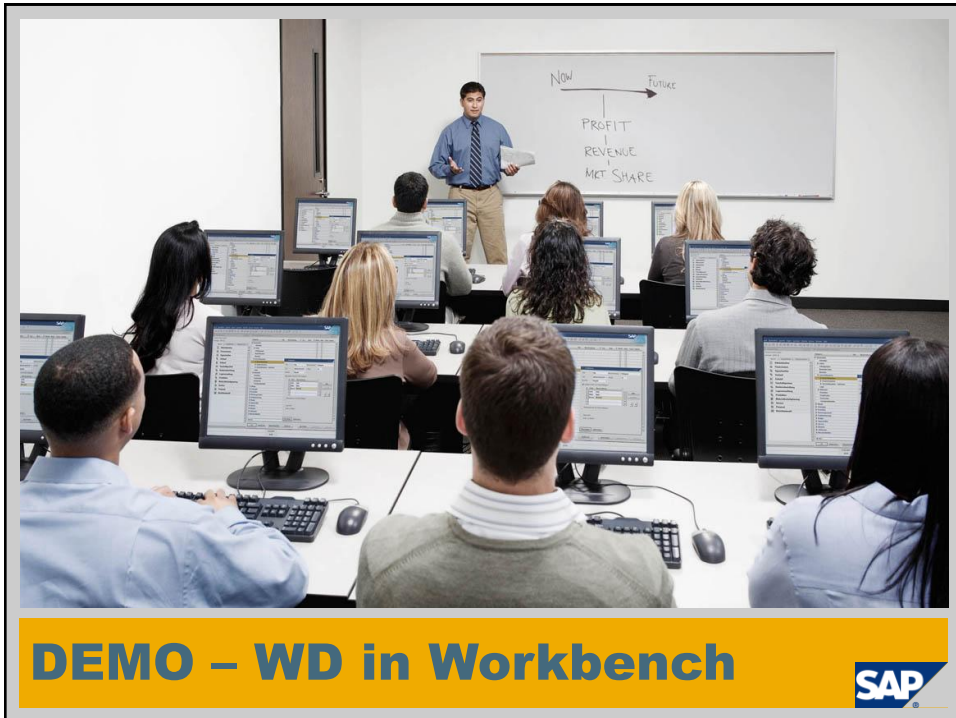
- Graphical View Layout design
- Declarative UI development
- ABAP editor with forward navigation
- ABAP dictionary data types directly available
- Simple remote debugging
- Functionality and services of the ABAP environment directly usable

ABAP lifecycle management

- Transport
- Translation
- Enhancements



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DEMO – WD in Workbench

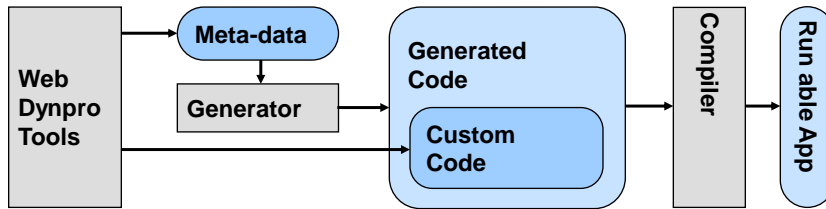


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1. Web Dynpro Motivation
- 2. Web Dynpro ABAP Programming Model**
 - 2.1. Views and UI Elements
 - 2.2. Controllers and Context
 - 2.3. Component Usage and Navigation
3. Web Dynpro Integration Capabilities
 - 3.1. Integration into SAP NetWeaver Portal
 - 3.2. Adobe Interactive Forms
 - 3.3. Adobe Flash Islands
4. Summary

Meta-Model Declarations and Custom Coding



Meta-model Declarations

Guarantees common app. design

Good for graphical tool support

- Screen Layout and Nesting
- Navigation and Error Handling
- Data Flow
- Componentization
- ...

Custom Coding

Guarantees universality

Good for data-driven, dynamic apps

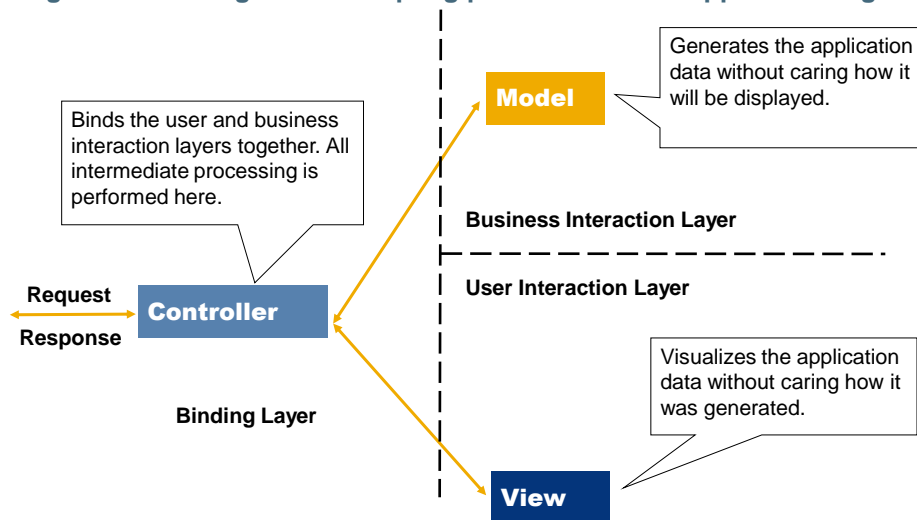
- Implementation of business rules
- Dynamic screen modifications
- Access to services (files etc.)
- Portal eventing
- ...

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Model View Controller (MVC)



Original MVC design for decoupling presentation and application logic



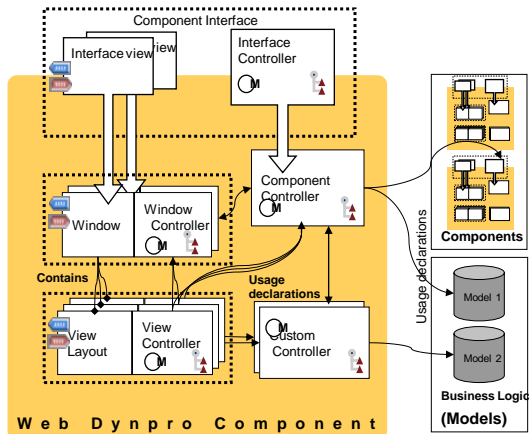
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Web Dynpro Component Architecture



SAP Web Dynpro uses principles of MVC paradigm

- Controller handle the user input and steer the application
- Views define the layout
- Model hold and provide the business logic



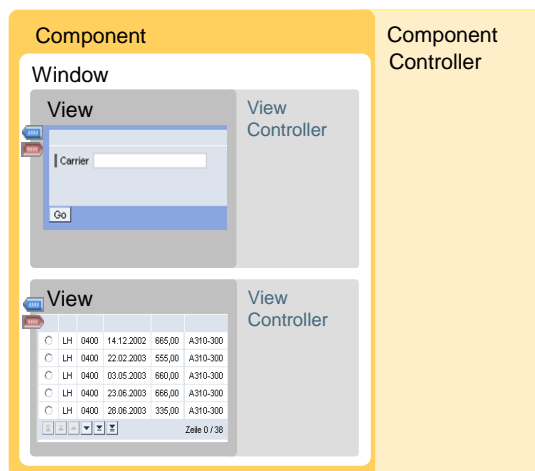
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Web Dynpro Components



Web Dynpro Component contains

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



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Views and UI Elements



View

- Is embedded into window
- Defines the visible layout via predefined UI elements
- Does not 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 hierarchical structure

Window

View

Search
 Company Name:

Orders of selected Business Partner

Id	Company Name	Total Gr. Amount	Currency Code
5000000003	ITeIO	5.631,08	USD
5000000013	ITeIO	24.395,00	USD
5000000018	ITeIO	178,14	USD
5000000025	ITeIO	5.860,75	USD
5000000038	ITeIO	24.220,07	USD

Company Name: TECLUM
 City: Muenster
 Postal Code: 48155
 Street: Albersloher Weg
 Country: DE

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Defining View Layout



UI element libraries

UI element tree of view

View layout

Drag and Drop

Properties of selected UI element

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UI Element Categories



Various categories of UI elements are supported

text	selection	layout	graphic
<ul style="list-style-type: none"> Caption Explanation FormattedTextEdit FormattedTextView InputField Label SectionHeader TextEdit TextView 	<ul style="list-style-type: none"> CheckBox CheckBoxGroup DropDownByIndex DropDownByKey ItemListBox RadioButton RadioButtonGroupByIndex RadioButtonGroupByKey ToggleButton ToggleLink TriStateCheckBox 	<ul style="list-style-type: none"> Accordion ButtonRow ContextualPanel DropTarget Group HorizontalContextualPanel HorizontalGutter InvisibleElement MessageArea Multipane NavigationList PageHeader Panel RowRepeater ScrollContainer TabStrip TransparentContainer Tray ViewContainerUIElement 	<ul style="list-style-type: none"> BusinessGraphics Gantt GeoMap ValueComparison Image Network ProgressIndicator ThresholdSlider

integration

- AcExecute
- AcUpDownload
- FileDownload
- FileUpload
- Frame
- InteractiveForm
- OfficeControl

Each UI element object is represented as an abstract class that is independent of any client presentation layer.

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Controller and Context



Controller

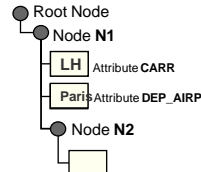
- Contains the logic of the UI layer
- Implements event handlers
- Reads and writes context node content
- Each view has its own view controller

Context

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

View Controller

Context



```

method WD_DO_INIT
node = wd_context->get_child_node('N1').
node->set_attribute( name = 'DEP_AIRP'
                    value = 'Paris').
    
```

```

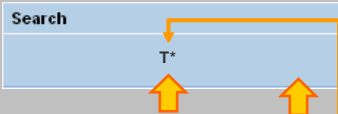
Method onAction_GOTO_NEXT
node = wd_context->get_child_node('N1').
node->get_attribute( name = 'CARR'
                    value = carrier ).
    
```

View Controller and View Context



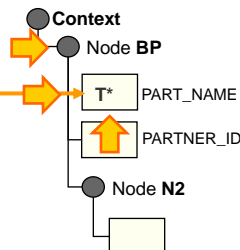
Window

View



Controller contains methods and events for user interactions

View Controller



```

Method onAction_GOTO_NEXT
node = wd_context->get_child_node('BP').
node->get_attribute( name = 'PART_NAME'
                    value = part_name ).
    
```



Component Controller and Context Mapping



Component Controller

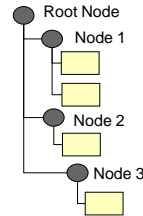
- Controller which is the backbone of the component
- Has its own Context
- Contains the logic for interaction with the model (ABAP class, function modules, BAPIs, Web Services)

Context Mapping

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

Component Controller

Component Controller Context



```

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

Model Class,
ABAP Objects
API,

BAPIs,
Other WD
Component,
...

Component Controller



Component

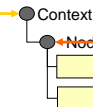
Mapping of context data

Window

View

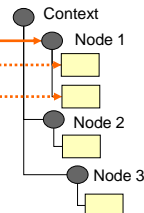
Business Partners		
Partner Id	Company Name	Country
0000000011	TECLUM	DE
0000000012	Asia High tech	JP
0000000013	Laurent	FR

View Controller



Component Controller

Component Controller Context



```

Method show_bpartners
BPs = BO->get...
node1 = wd_context->...
node1->bind_elements(
  BPs ).
  
```

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

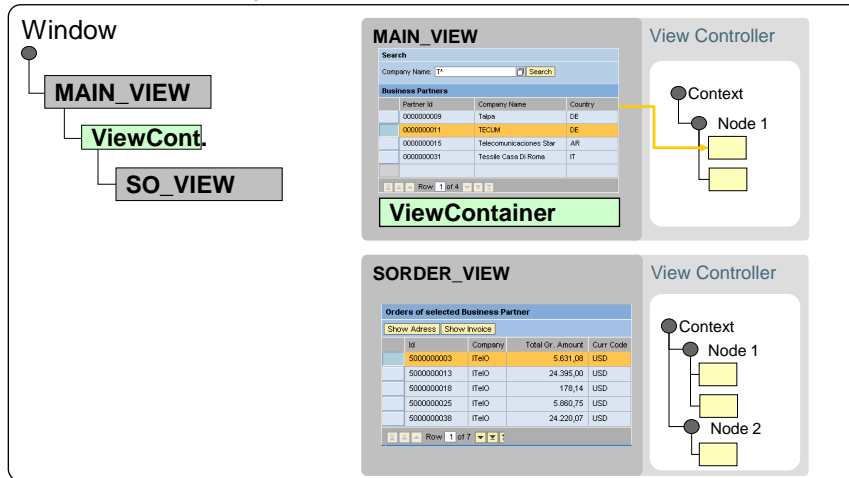
Component
controller connects
to business logic
and gets/sets data

Views in Views



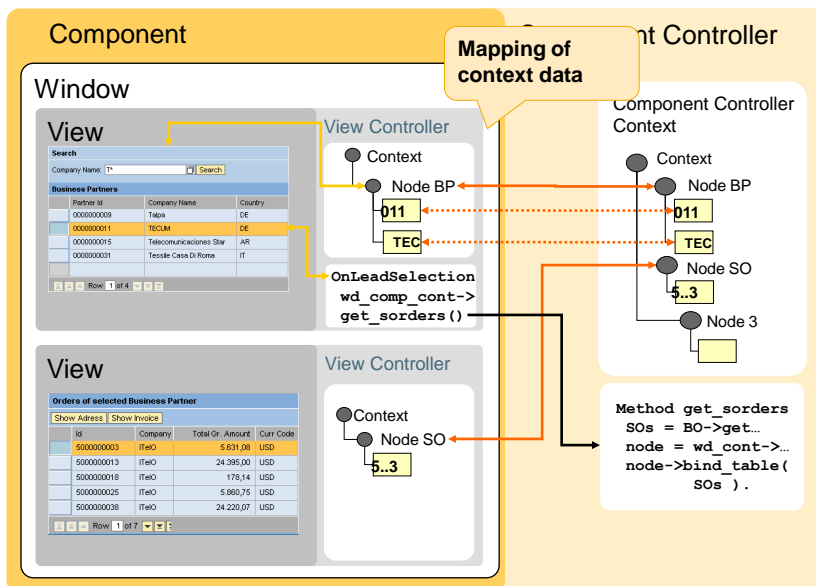
ViewContainer UI element

- Views can be structured with ViewContainer UI elements
- How they are arranged within each other is declared in the window



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Interaction Between Views and Controllers



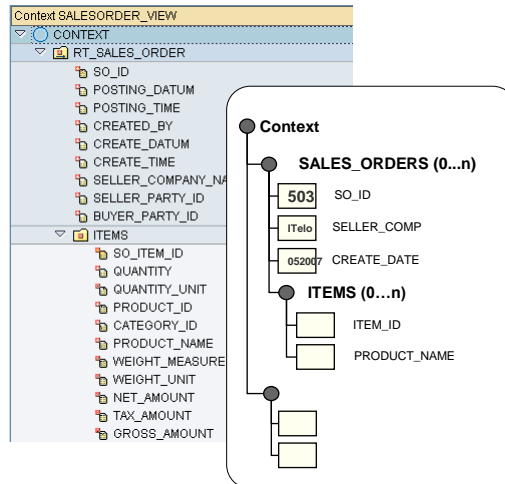
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Context Node at Design Time



Declaration of Context Nodes

- Create metadata which defines the structure of the context
- Two dimensional hierarchy like files and folders
- But each node can be a collection
- Min and max number of elements in a node is steered by Cardinality
 - (0..1)
 - (1..1)
 - (0..n)
 - (1..n)



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Complex Data in Context Node

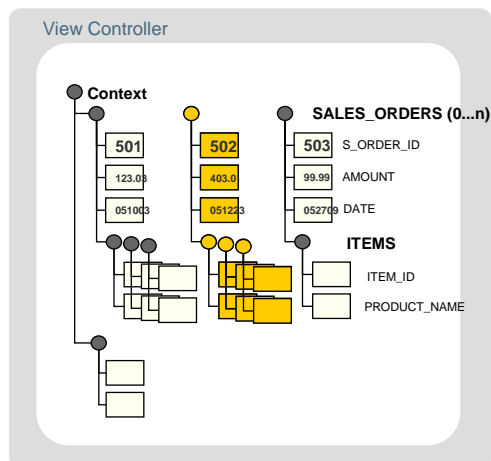


Context at runtime

- Nodes with cardinality (0..n) can contain several elements at runtime
- Each element can have its own set of sub nodes at runtime which are again collections of elements

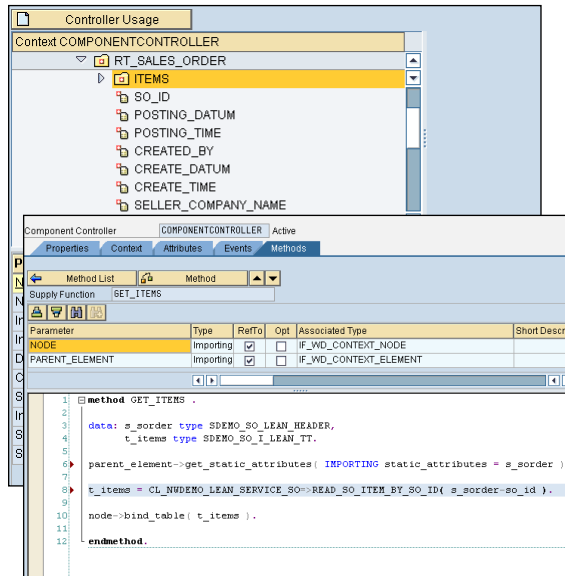
Example: Sales Orders with Items

- Items of selected sales order should be displayed in second table on the same view
- Each sales order has its own set of items



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Supply Function of Context Node



Supply Function

- Is triggered if lead selection of parent element changes
- Is implemented as method of controller
- Has access to parent element
- Singleton property of context node steers if supply function is called
 - Every time lead selection changes
 - Only at first time for each element

Agenda



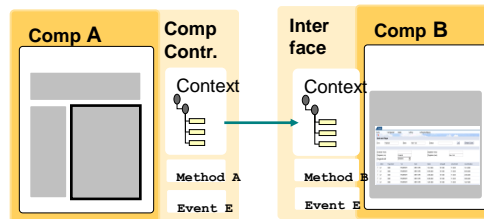
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Web Dynpro Component Usage



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

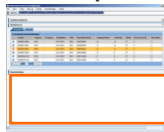


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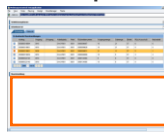
Web Dynpro Component Usage



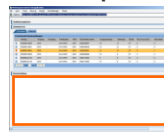
Main Comp A



Main Comp B



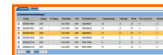
Main Component



Sub Component



Sub Comp A

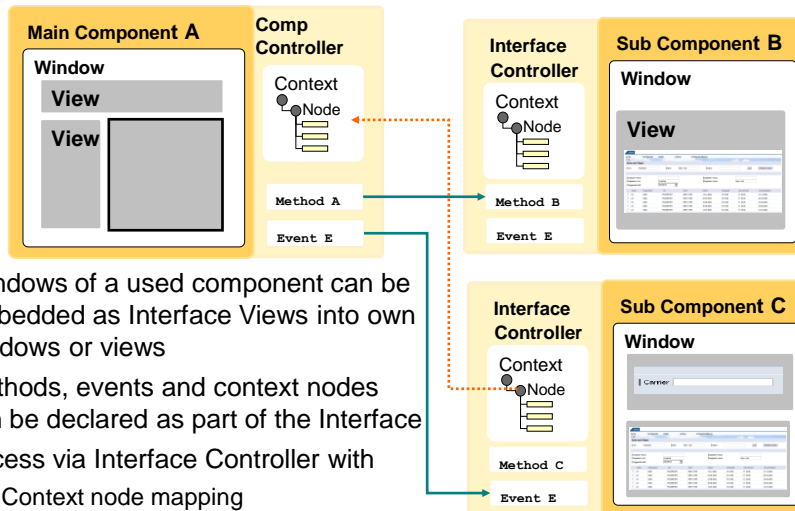


Sub Comp B

- Several main components need the same functionality
- Functionality is developed once in reusable component
- Main components declare Component Usage of sub component
- Sub component is instantiated in each main component at runtime
- Main component needs different functionalities in a given view area
- View container provides place for sub components
- Several Component Usages to different sub components with the same Interface are defined
- Which component is used is decided at runtime

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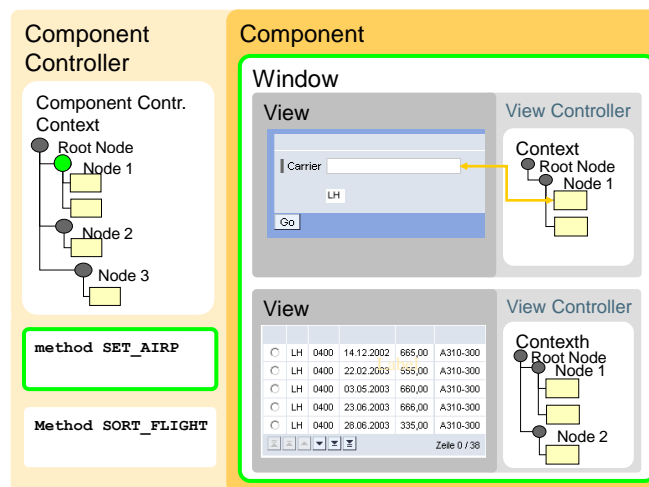
Web Dynpro Component Reuse



- Windows of a used component can be embedded as Interface Views into own windows or views
- Methods, events and context nodes can be declared as part of the Interface
- Access via Interface Controller with
 - Context node mapping
 - Method call, Events raised
 - Embedding of Interface View

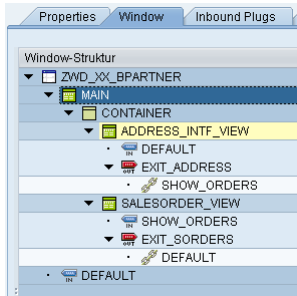
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Concepts: Component Interface

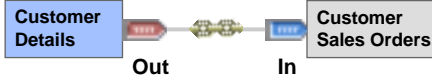


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Navigation Between Views



Window



Inbound plug



Outbound plug



Navigation link

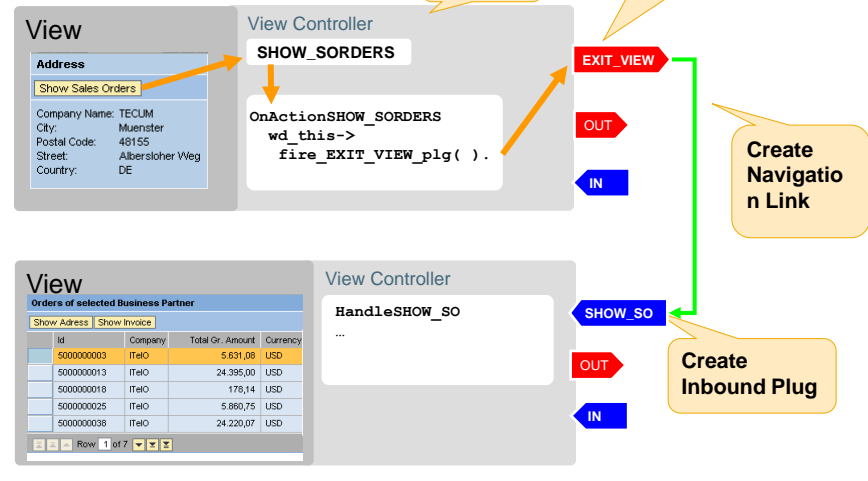
- To define the navigation between two views, you need to create exit and entry points for each view using outbound and inbound plugs.
- Only then you can specify the navigation flow using navigation links

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Plugs and Navigation



Window



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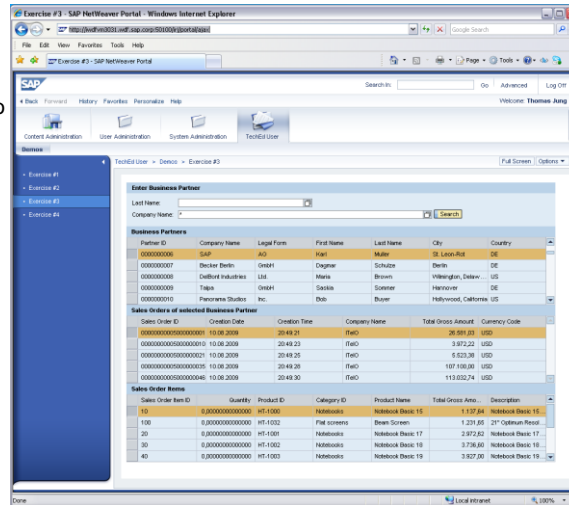
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Web Dynpro and SAP NetWeaver Portal



Portal Integration

- Generic iViews for displaying Web Dynpro Applications
- Easy integration via Web Dynpro iView Wizard
- Central User management
- Portal eventing support
- Object Based Navigation
- Unified branding by portal themes

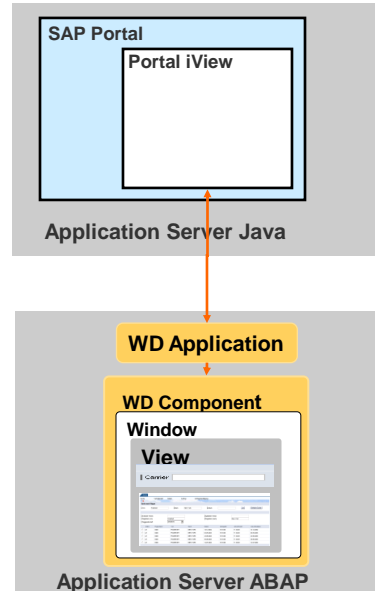


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Portal Integration




- AS ABAP application system is declared in portal
 - Server, port,...
 - User mapping
- Create iView for WD ABAP application
- iView points to logical backend server, name space and WD application
- iView is assigned to portal role




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DEMO – Portal Integration



A Consistent and Flexible SAP NetWeaver UI




SAP NetWeaver Portal:
The “yellow pages” of enterprise apps and UI assets, with new Web 2.0 services and collaboration


Web Dynpro: The heartbeat of the runtime for enterprise applications, providing client abstraction support

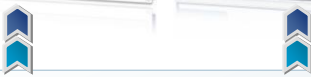
Provides the “flexibility” of model-driven UI for both declarative programming and UI modeling of Visual Composer

SAP NetWeaver Business Client
(smart client on Microsoft Windows desktop)



SAP NetWeaver Portal Client
(zero footprint client with Web 2.0)





1
SAP NetWeaver Portal Platform + UI Services

2
Web Dynpro ABAP & Java Prog. Model + Runtime

3
Visual Composer Modeling + Eclipse

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What Does it Look Like ?



Paper-like layout

- Self-explanatory
- Natural look and feel

User Handling

- Save locally
- Distribute via email / Portal
- Digital signature (future)
- Local printing

Background Services

- Structured data in XML
- Prefilled application values
- Prefilled list boxes, help values, ...
- Automatic data extraction and integration in application

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Adobe Interactive Forms in WD ABAP (1/2)



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

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Adobe Interactive Forms in WD ABAP (2/2)

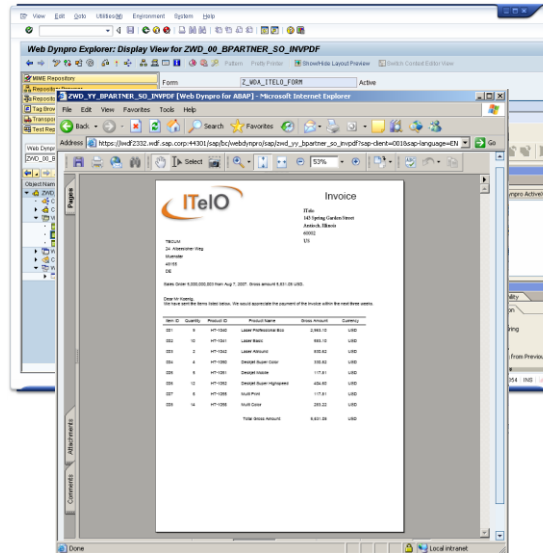


Basic Forms Functionality

- Define Form in system
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Integration into Web Dynpro

- Place Form in InteractiveForm UI container element
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DEMO – IFbA



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Adobe Flash Islands in WD ABAP

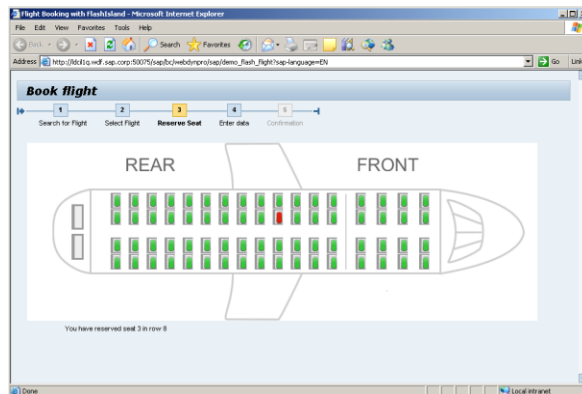


Adobe Flash Applications

- Rich Internet Applications for complex visualization tasks
- Developed in Adobe Flex Builder
- Running in Adobe Flash Player
- Used if Web Dynpro UI elements are not sufficient for required user experience

Integration into Web Dynpro

- Running as WD Island
- Contained in MIME repository
- Communication to WD component via
 - SAP Flash Library
 - Context Nodes
 - Events



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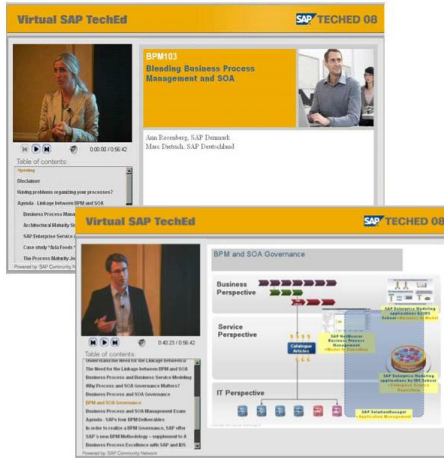
Summary



- 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 7.0
- Programming model similar to Web Dynpro for Java
- Completely Integrated into the SAP NetWeaver Application Server ABAP

The screenshot shows the Microsoft Excel 2010 interface. The 'Formulas' ribbon is active, and the 'More Functions' button is highlighted. A dropdown menu is open, showing a search bar and a list of function categories: All, Algebra, Database, Date & Time, Financial, Engineering, Logical, Lookup & Reference, Math & Trig, Statistical, Text, and Web. The 'More Functions' button is highlighted in the ribbon.

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<http://www.sdn.sap.com/irj/scn/virtualeched-allsessions>

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Further Information



➔ SAP Public Web:

SAP Developer Network (SDN): www.sdn.sap.com

Business Process Expert (BPX) Community: www.bpx.sap.com

SAP BusinessObjects Community (BOC): www.boc.sap.com

- Web Dynpro ABAP: <http://www.sdn.sap.com/irj/sdn/nw-wdabap>
- NWBC: <http://www.sdn.sap.com/irj/sdn/nw-businessclient>
- Islands: <http://www.sdn.sap.com/irj/sdn/adobe-flash-islands>
- FPM: <http://www.sdn.sap.com/irj/sdn/nw-wdabap?rid=/webcontent/uuid/00b4312a-ac72-2b10-e0ad-e0219cfeb78e>

➔ Related SAP Education and Certification Opportunities

<http://www.sap.com/education/>

- NET310: 5-day introductory classroom training on Web Dynpro ABAP
- NET311: 3-day classroom training on advanced Web Dynpro ABAP
- NET312: 3-day classroom training on UI elements
- NET313: new 2-day classroom training on Floorplan Manager

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Further Information



→ Related Workshops/Lectures at SAP TechEd 2009

CD102, Web Dynpro ABAP Overview, Lecture (1 hour)

CD264, Developing User Interfaces with Web Dynpro ABAP, Hands-On (4 hours)

CD260, ABAP Development: Update Your Skills to SAP NetWeaver 7, Hands-on (4 hours)

UP162, Personalization, Configuration, and Customization of Web Dynpro ABAP with Floorplan Manager, Hands-On (2 hours)

UP100, SAP's User Interaction Strategy: Introduction and Novelties in SAP NetWeaver 7.2, Lecture (2 hours)

UP107, SAP NetWeaver Business Client, Lecture (1 hour)

UP264, Creating Online and Offline Form Processing Scenarios with Adobe Forms and Web Dynpro for ABAP, Hands-On (2 hours)

UP250, ASUG Influence: SAP NetWeaver User Interaction Strategy and User Interface Technology

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Thank You!





Feedback

Please complete your session evaluation.

Be courteous — deposit your trash,
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THANK YOU !



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