

Week 1: Introducing SAP Fiori Elements

Unit 1: Painting the Big Picture

Introducing SAP Fiori Elements

Painting the Big Picture



you are here

Understanding the Architecture



Introducing OData Services and Annotations



Preparing Your ABAP Development Environment



Creating an OData Service with ABAP RESTful Application Programming Model



Creating a List Report



Building Your First SAP Fiori Elements App

Creating an Object Page



Accelerating SAP Fiori App Development with SAP Fiori Tools



Preparing Your Front-end Development Environment



Generating the List Report — Object Page App



Configuring the App



Adding Custom Controls and Logic



Using More SAP Fiori Elements Capabilities

Creating an Analytical List Page



Enhancing the Analytical List Page



Creating an Overview Page



Deploying Your SAP Fiori Elements App



Building an SAP Fiori Elements App with an External OData Service



Using XML Annotation LSP for Defining Advanced UI Features



Extending a Standard SAP Fiori App

Understanding SAPUI5 Flexibility



Adapting an App as a Key User



Adapting the UI as a Developer — Basic Extensions



Adapting the UI as a Developer — Advanced Extensions



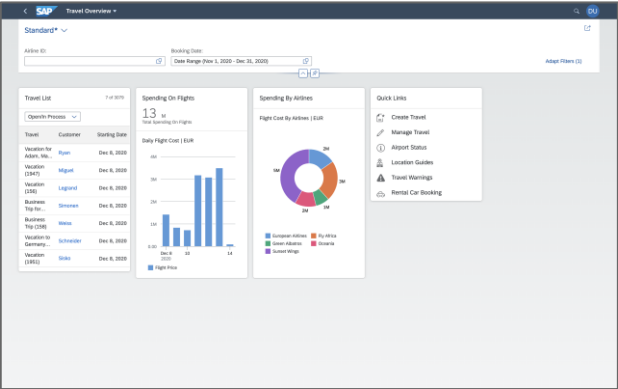
Productizing the Extended App



Painting the big picture

We will build apps for a travel desk clerk

Travel overview



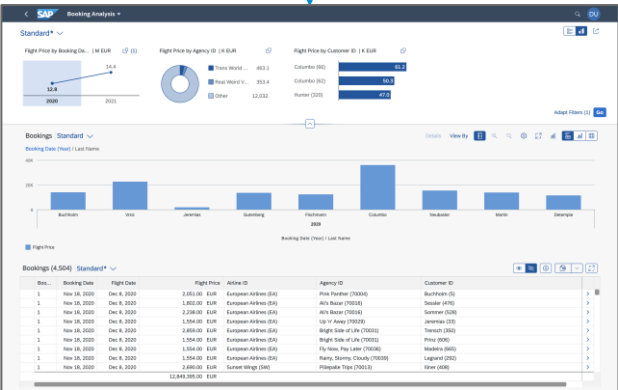
Travel list

Travel	Agency	Customer	Starting Date	End Date	Booking Price	Accept Price	Total Price	Booking Status
1332	Not Only By Bike (71000)	Mathias (245)	Oct 6, 2021	Oct 6, 2021	30.00 EUR	5.889.00 EUR	5.889.00 EUR	Accepted
2343	Rocky Horror Tours (70049)	Heller (245)	Oct 8, 2021	Oct 8, 2021	30.00 EUR	4.789.00 EUR	4.789.00 EUR	Accepted
3454	Not Only By Bike (71000)	Müller (705)	Oct 8, 2021	Oct 8, 2021	10.00 EUR	4.859.00 EUR	4.859.00 EUR	Open
2747	Miles and More (70049)	Sommer (242)	Oct 9, 2021	Oct 9, 2021	10.00 EUR	3.856.00 EUR	3.856.00 EUR	Open
3149	Not Only By Bike (71000)	Heller (245)	Oct 9, 2021	Oct 9, 2021	30.00 EUR	9.568.00 EUR	9.568.00 EUR	Accepted
3412	Rocky Horror Tours (70049)	Jewell (31)	Oct 9, 2021	Oct 9, 2021	10.00 EUR	2.257.00 EUR	2.257.00 EUR	Rejected
3638	Not Only By Bike (71000)	Coser (305)	Oct 9, 2021	Oct 9, 2021	30.00 EUR	15.753.00 EUR	15.753.00 EUR	Accepted
3642	Miles and More (70049)	Waldmann (207)	Oct 9, 2021	Oct 9, 2021	10.00 EUR	6.767.00 EUR	6.767.00 EUR	Open
2741	Not Only By Bike (71000)	Sommer (245)	Oct 9, 2021	Oct 9, 2021	10.00 EUR	7.868.00 EUR	7.868.00 EUR	Open

Travel details

The SAP Travel Details view provides a detailed look at a specific booking. It includes a 'Vacation' header with 'Total Price' (4,709.00 EUR) and 'Booking Status' (Accepted). The 'General Information' tab shows details about the vacation, including the customer (Heller (245)) and the agency (Rocky Horror Tours (70049)). The 'Bookings' tab shows a list of bookings with columns for Booking Number, Booking Date, Customer, Airline, Flight Number, Flight Date, Flight Price, Departure Airport, and Destination Airport. The 'Prices' tab shows a breakdown of the booking price, including the booking fee (30.00 EUR) and the total price (4,709.00 EUR).

Booking analysis



Travel desk clerk Jay



Food and beverages

The SAP Food and Beverages dashboard provides a comprehensive view of food and beverage data. It includes a 'Products' list with columns for Product, Quantity, Unit Cost, and Price. The list shows various products such as 'Bread', 'Eggs', 'Milk', 'Butter', 'Cheese', 'Honey', 'Jam', 'Marmalade', 'Custard', 'Ice Cream', 'Cakes', 'Pastries', 'Breads', 'Snacks', 'Drinks', 'Alcohol', and 'Tobacco'. The 'Unit Cost' and 'Price' columns show the cost and price of each product.

A consistent user experience is important to SAP's customers

“The current developments in user experience at SAP share one common vision: **a consistent user experience...** putting the user front and center.”

Thomas Saueressig
Member of the Executive Board of SAP SE
for SAP Product Engineering



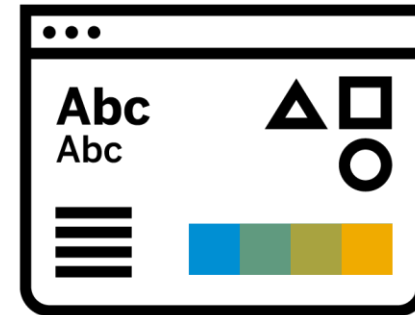
Users care about UX consistency, so developers should too

There are measurable business benefits (monetary and human value) in good UX.

Consistency is at the heart of a great user experience – and a key design principle of SAP Fiori.

UX consistency

- Increases **adoption** of your app
- Improves business **user productivity**
- Decreases **training time**
- Improves **data quality**
- Enhances user **satisfaction**



Painting the big picture

SAPUI5 powers our web applications and their great UX

SAPUI5 is an HTML framework tailored to building modern, cross-platform, enterprise-grade web applications.

SAPUI5 is the reference UI technology for the SAP Fiori user experience.

SAPUI5

- Enables the SAP Fiori design evolution for a **consistent UX** across SAP solutions (and beyond)
- Provides built-in support for **SAP's product standards** such as security, accessibility, and internationalization
- Allows a single, **responsive** app implementation for all browsers, platforms, and devices
- Can **extend** SAP's standard applications and **customize** UIs in a **code-free way**



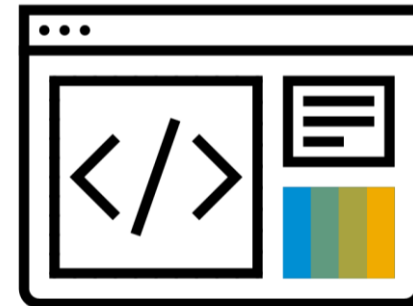
SAP Fiori elements lets you scale SAPUI5 app development

SAP Fiori elements provides standard floorplans and uses metadata to streamline and accelerate developing SAPUI5 applications.

SAP S/4HANA development teams use SAP Fiori elements to build most new apps.

SAP Fiori elements

- Delivers **enterprise-ready** SAPUI5 apps based on stable, optimized, out-of-the-box UI code
- Boosts **developer efficiency** by scaling development and maintenance in a cost-efficient way
- Provides a centrally managed, **consistent UX** complying with the latest SAP Fiori design
- Ensures **upgrade stability** and forward compatibility
- Allows **extensibility** of standard floorplans with custom controls and logic

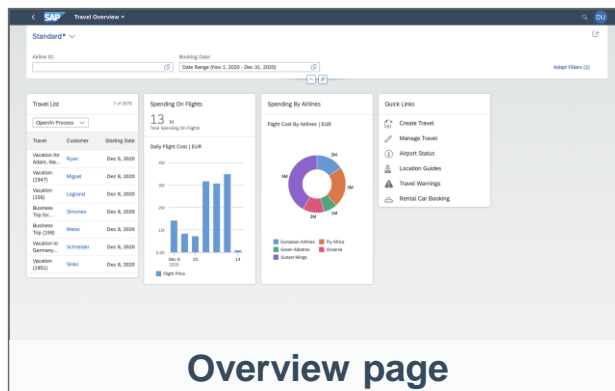


Painting the big picture

Standard floorplans drive developer productivity and UX consistency

Most enterprise use cases involve providing an **overview** of business-relevant data, working with **lists** of business objects, and managing these business **objects**.

Provide a role-based
overview



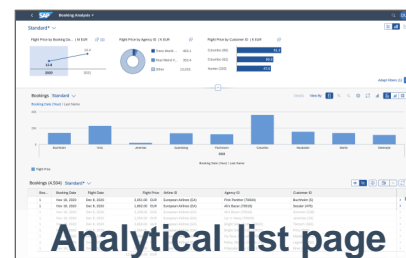
Overview page

Work on a **list** of
business objects

List report page

Manage individual
business **objects**

Object page



Analytical list page

Worklist page

Painting the big picture

SAP Fiori elements provides enterprise-ready apps out of the box

Variant mgmt
Search
Data lists

Filtering
Actions
Sorting
Personalization
Export to Excel
Navigation
Editing (incl. draft mgmt)

Object details

The screenshot displays the SAP Fiori 'Travel' application. The top section shows a list of travel bookings with columns for Travel, Agency, Customer, Starting Date, End Date, Booking Fee, Total Price, and Booking Status. The list includes details such as 'Vacation 1020', 'Rocky Horror Tours (70048)', and 'Müller (243)'. The bottom section shows the 'Object details' view for a specific booking, including 'General Information' and 'Bookings'.

SAP Fiori elements / SAPUI5 enterprise readiness features:

- Accessibility
- Internationalization
- Mobile compatibility
- Responsiveness
- Performance optimizations
- Integration
- Security checks
- Lifecycle stability
- Test automation support
- ...and more

SAP Fiori elements prioritizes efficiency over flexibility

SAPUI5 freestyle	Overall approach	SAP Fiori elements
Flexibility		Efficiency
Freestyle designs	Design requirements	SAP floorplans
Web development	Development knowledge	Annotations
Own coding, own UI logic	App ownership / maintenance	Own annotations, SAP's UI logic
Higher	Total cost of development and maintenance	Lower

Painting the big picture

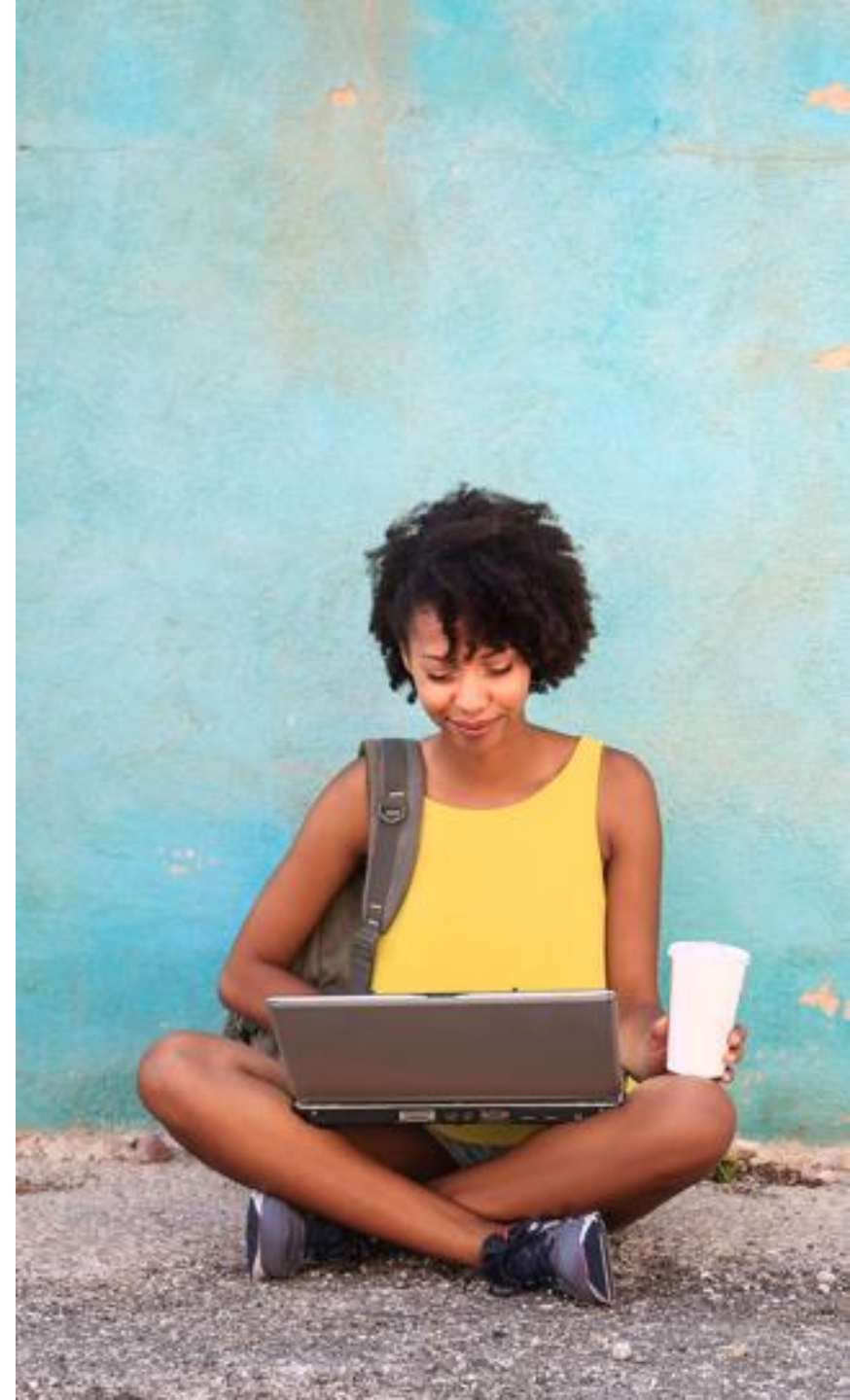
Wrap-up

IN THIS UNIT, YOU LEARNED

- Why UX consistency matters
- How SAPUI5 and SAP Fiori elements drive developer productivity, enforce UX consistency, and deliver enterprise-ready apps
- When to use SAP Fiori elements vs. SAPUI5 freestyle

NEXT UNIT

- Week 1 – Unit 2
Understanding the architecture



Thank you.

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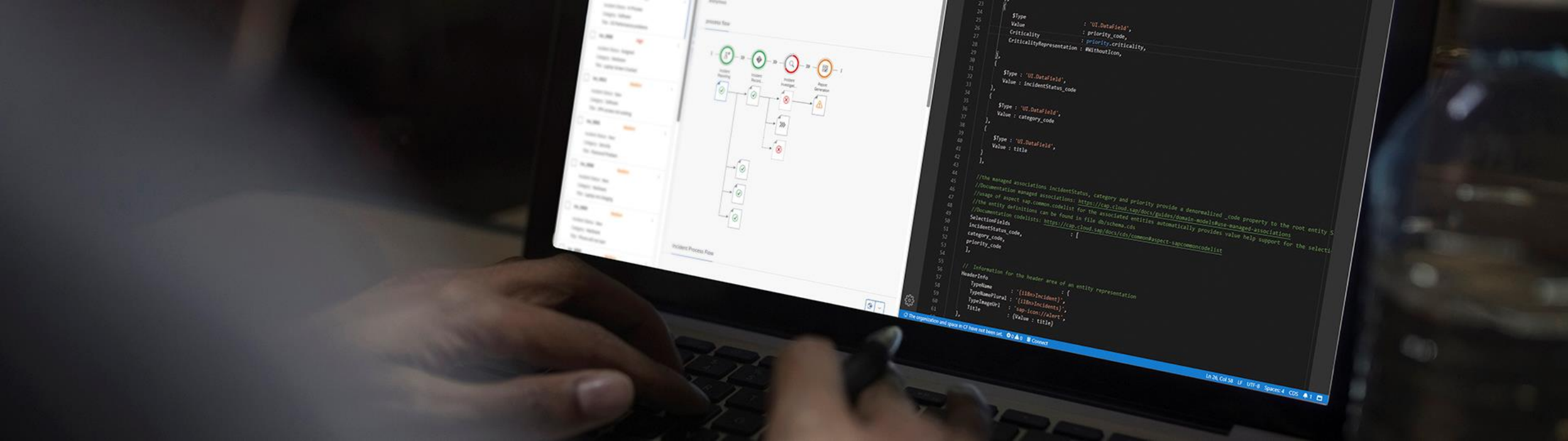
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Unit 2: Understanding the Architecture

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Adapting the UI as a Developer – Advanced Extensions

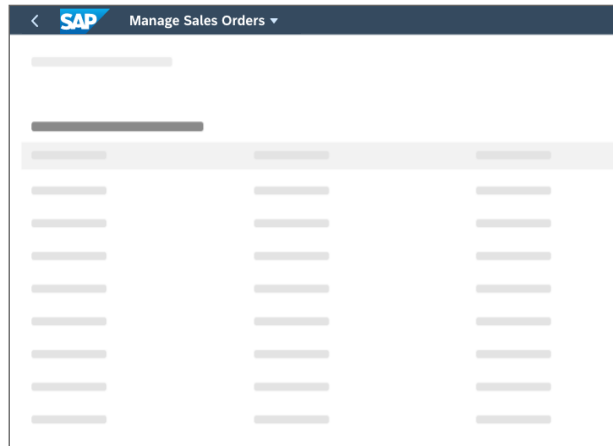


Productizing the Extended App



Understanding the architecture

SAP Fiori elements takes you from floorplans to an enterprise-ready application



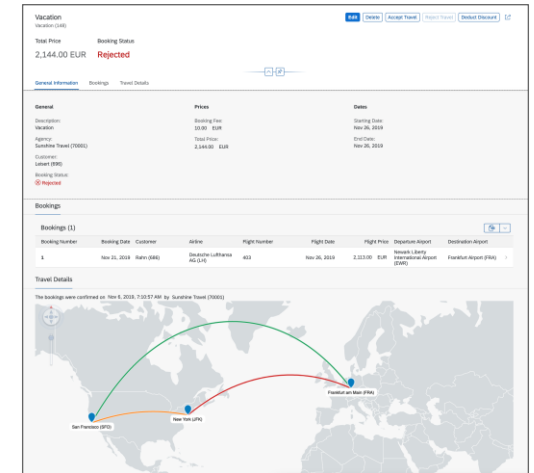
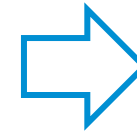
Floorplans



Travel	Agency	Customer	Starting Date	End Date	Booking Fee	Total Price	Booking Status
<input type="checkbox"/> Vacation	Not Only By Bike (70000)	Fischer (726)	Sep 25, 2020	Sep 25, 2020	2,000 JPY	725,500 JPY	Rejected
Last Changed at: Jan 18, 2021, 10:22:54 AM							
<input type="checkbox"/> Sand&Beach	Sandline Travel (70002)	Buchholz (1)	Jan 5, 2021	Jan 6, 2021	\$0.00 EUR	\$0.00 EUR	Open
Last Changed at: Jan 18, 2021, 8:11:14 AM							
<input type="checkbox"/> Vacation	SP (changed) Changes to Fly High (70002)	Kosowski (131)	Sep 21, 2020	Sep 21, 2020	\$0.00 EUR	1,912.00 EUR	In Process
Last Changed at: Jan 18, 2021, 8:10:07 AM							
<input type="checkbox"/> Vacation for Stephen	Manager Enterprises (70011)	Madero (574)	Nov 30, 2019	Nov 30, 2019	1,000 JPY	254,200 JPY	Rejected
Last Changed at: Jan 6, 2021, 2:08:57 PM							
<input type="checkbox"/> Vacation	Sandline Travel (70002)	Leiser (696)	Nov 26, 2019	Nov 26, 2019	\$0.00 EUR	2,144.00 EUR	Rejected
Last Changed at: Jan 6, 2021, 2:08:47 PM							
<input type="checkbox"/> Vacation for Theresa, Ulla, Thomas	Pleasure Steps (70013)	Cowan (957)	Nov 26, 2019	Nov 27, 2019	\$0.00 EUR	14,574.00 EUR	Rejected
Last Changed at: Jan 6, 2021, 2:08:02 PM							
<input type="checkbox"/> Visiting Benjamin	Burns, Burns, Burns (70015)	Kosowski (138)	Nov 27, 2019	Nov 27, 2019	\$0.00 USD	9,327.00 USD	Accepted
Last Changed at: Dec 23, 2020, 9:18:18 AM							
<input type="checkbox"/> Vacation	Wien and More (70016)	Buchholz (7)	Sep 26, 2020	Sep 26, 2020	3,000 JPY	1,252,800 JPY	In Process
Last Changed at: Feb 19, 2021, 12:47:09 AM							

OData service

Annotations



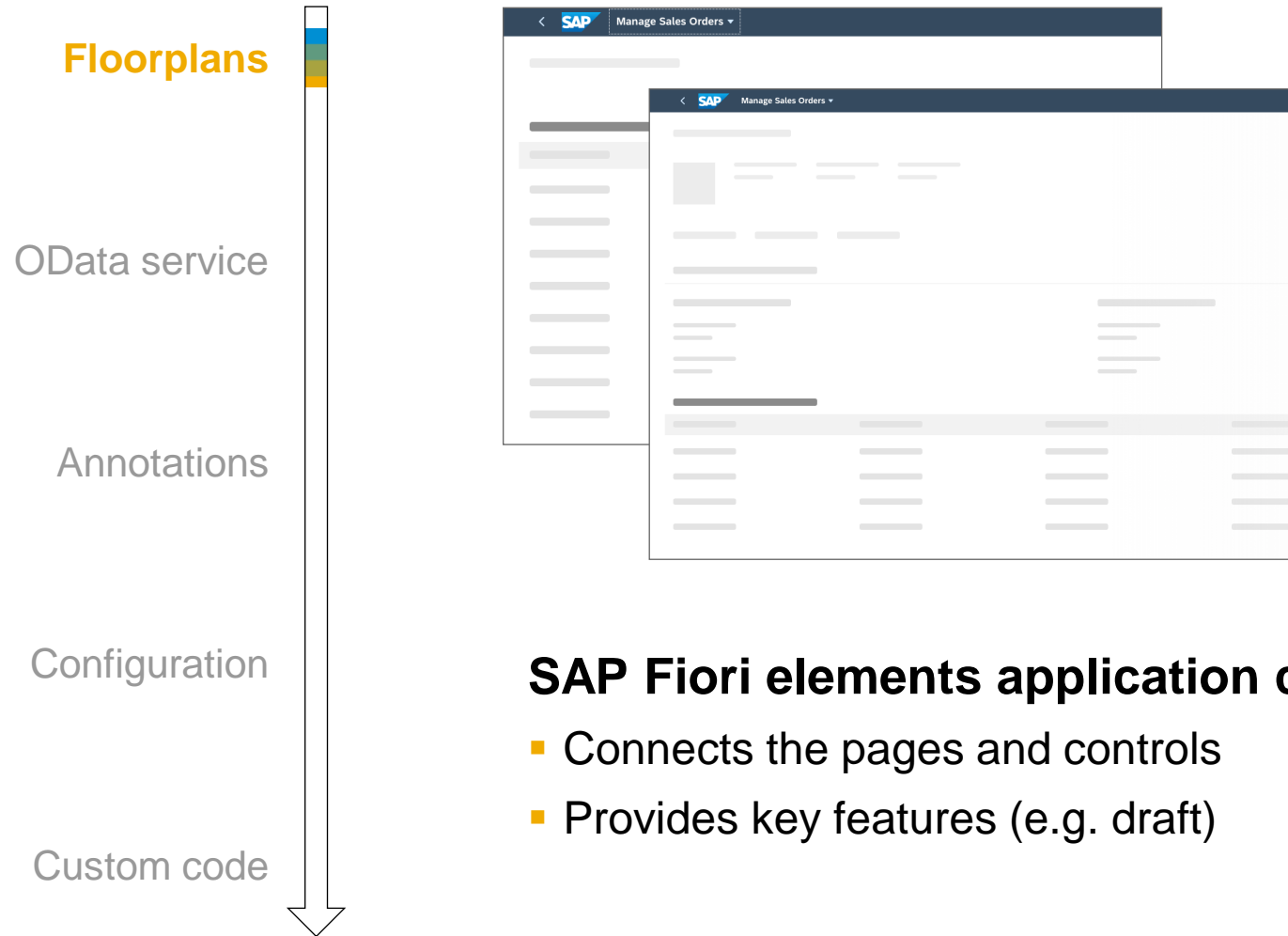
Configuration (optional)

Custom code (optional)

Provided by:
SAP Fiori elements framework

Provided by:
Application developers

The floorplans and application controller provide the basis for your application



SAP Fiori elements floorplans

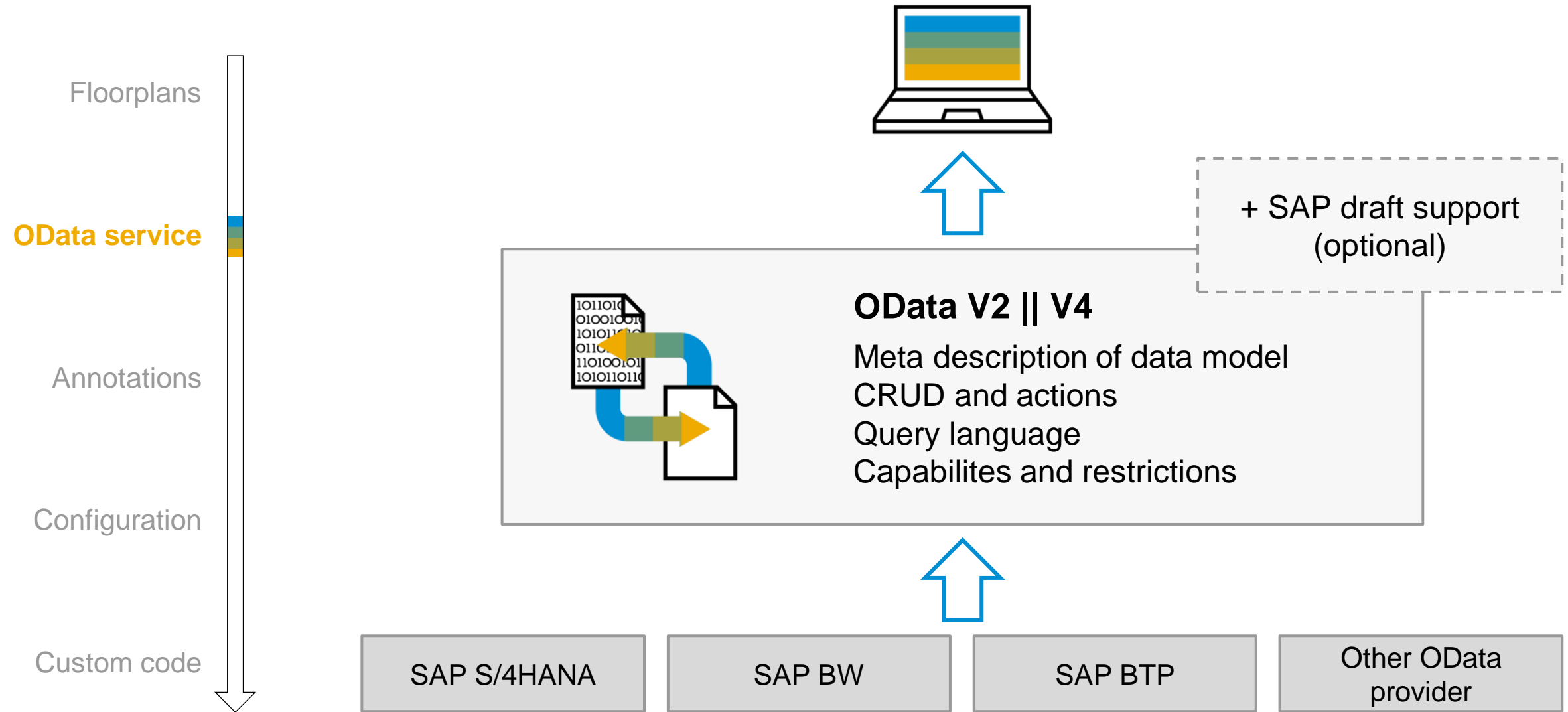
- Implemented as XML templates
- Incorporate current UX design

SAP Fiori elements application controller

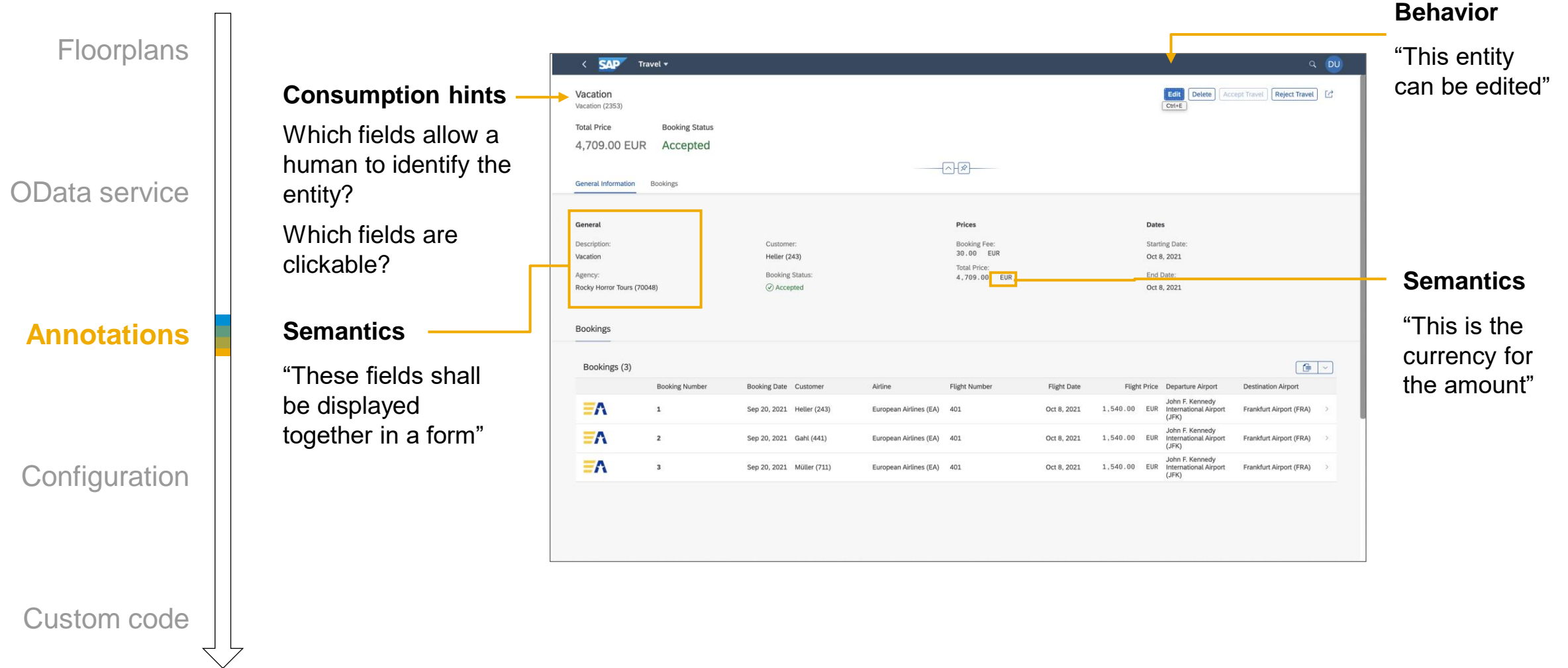
- Connects the pages and controls
- Provides key features (e.g. draft)



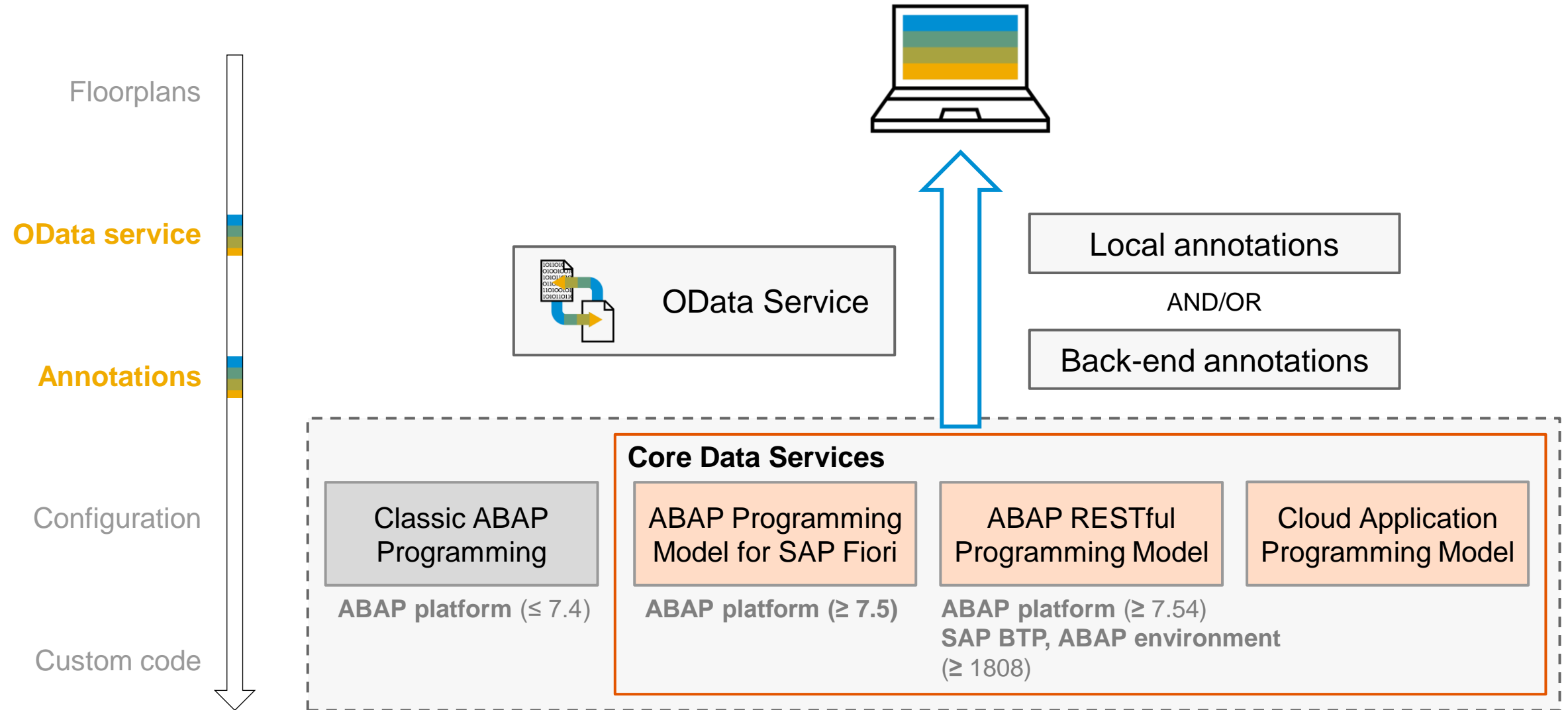
OData connects your app to the back end



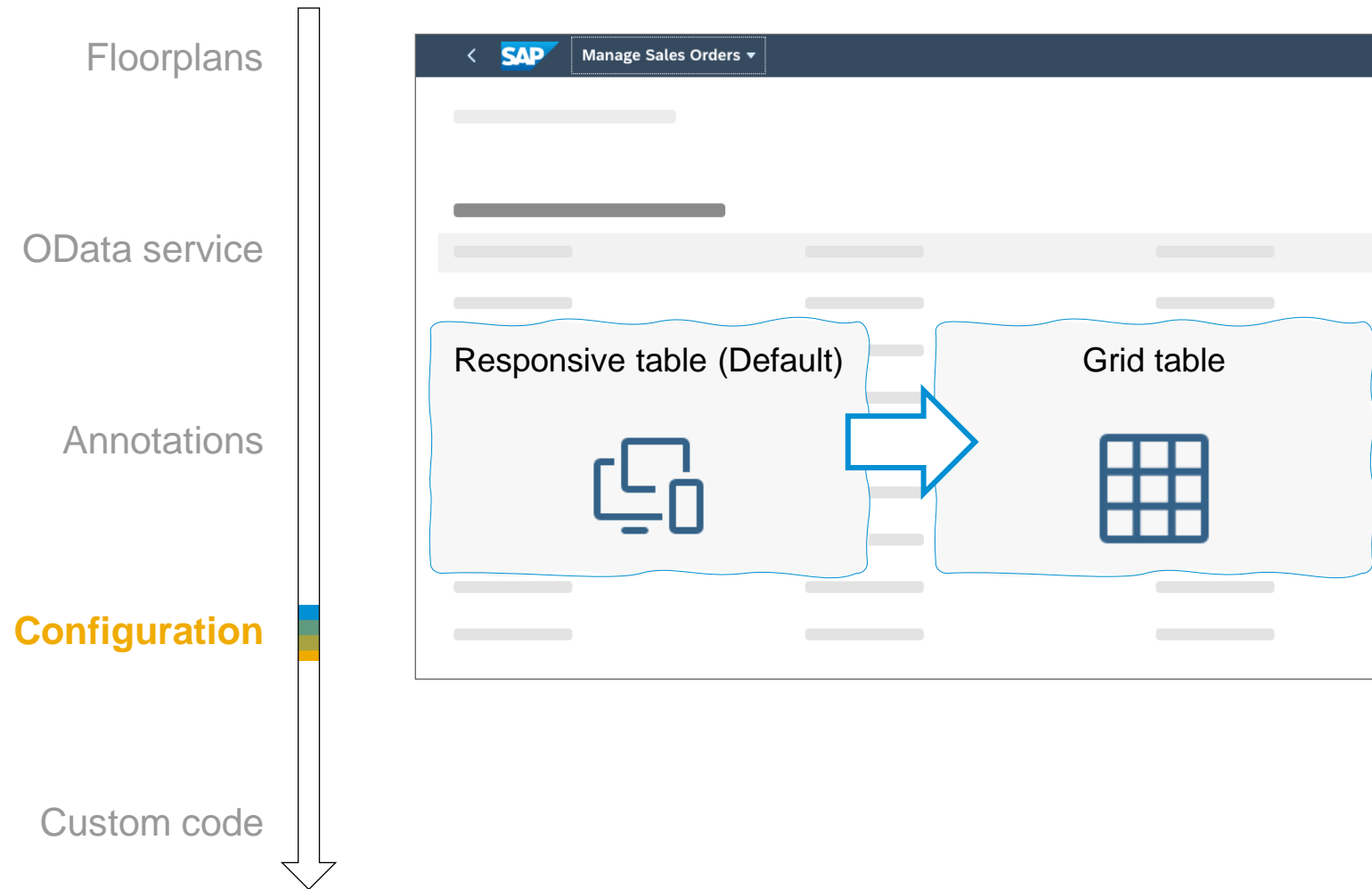
OData annotations define how the app looks and behaves



Use the power of SAP's back ends to create OData services



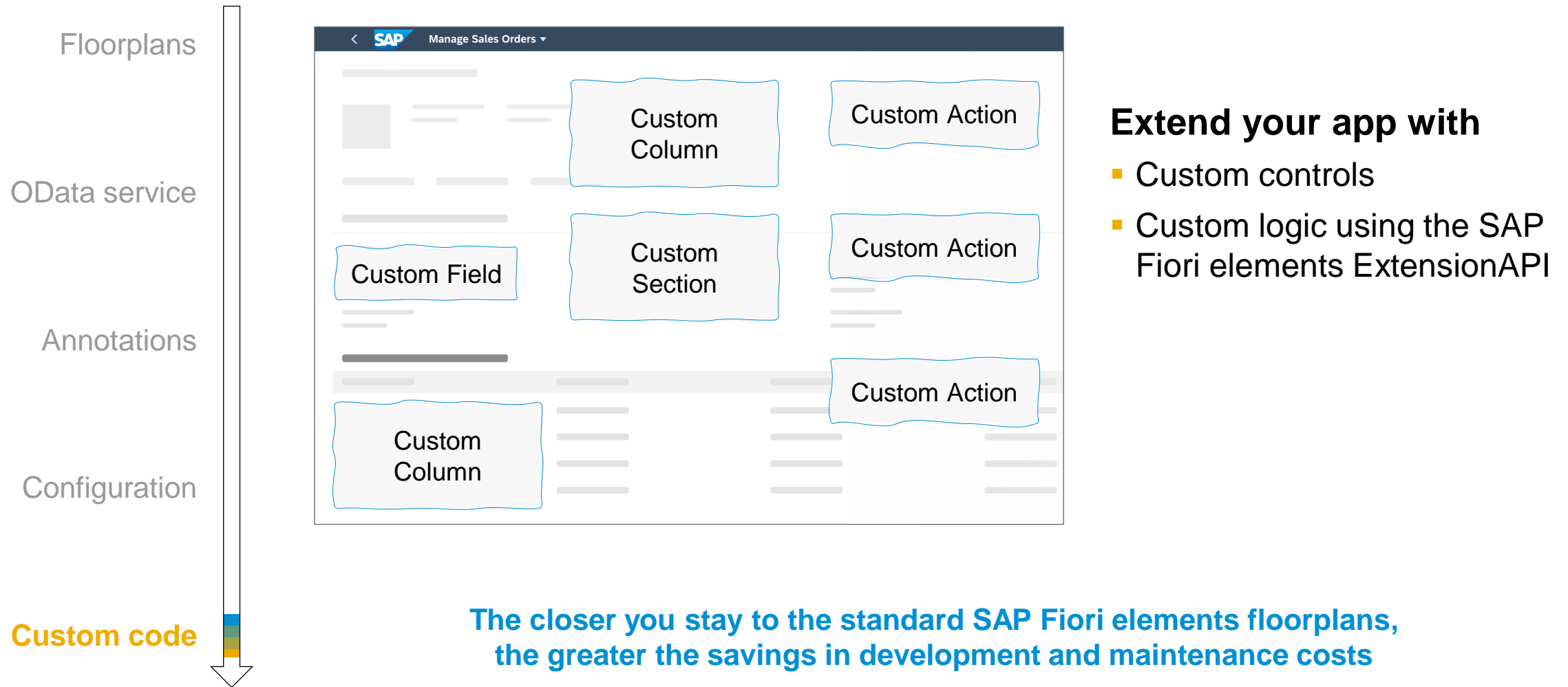
Configure the behavior and layout of your app



SAP Fiori elements provides

- Default configuration settings based on latest UX guidelines
- An easy way to change it using SAP Fiori tools
- Layered configuration using SAPUI5 flexibility

Custom code complements your app beyond standard SAP Fiori elements functionality



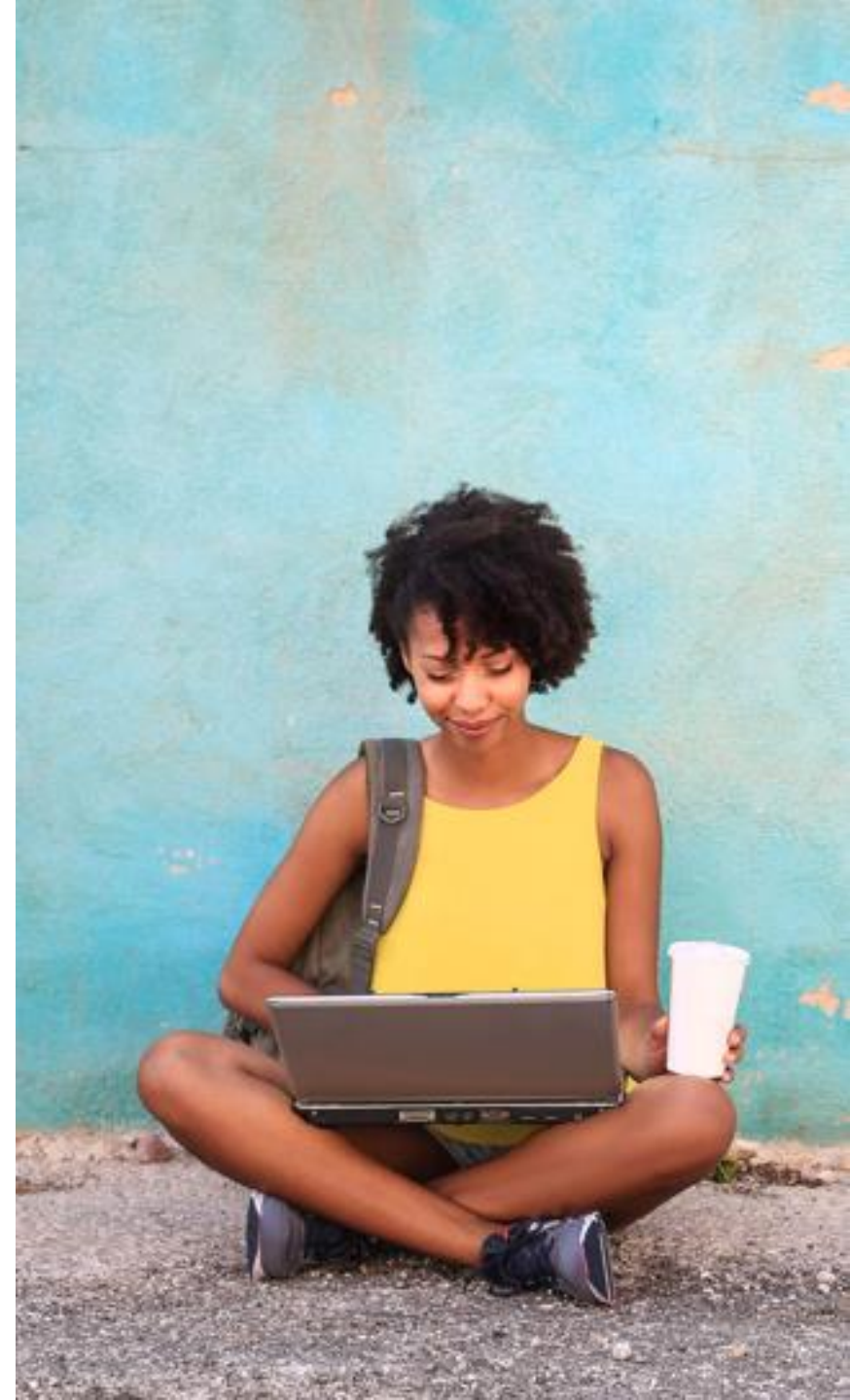
Wrap-up

IN THIS UNIT, YOU LEARNED

- About how SAP Fiori elements floorplans provide the basis for your application
- How OData services and annotations define your application
- How you can configure the behavior and layout of your app
- How you can add custom controls and logic to your SAP Fiori elements apps

NEXT UNIT

- Week 1 – Unit 3
Introducing OData services and annotations



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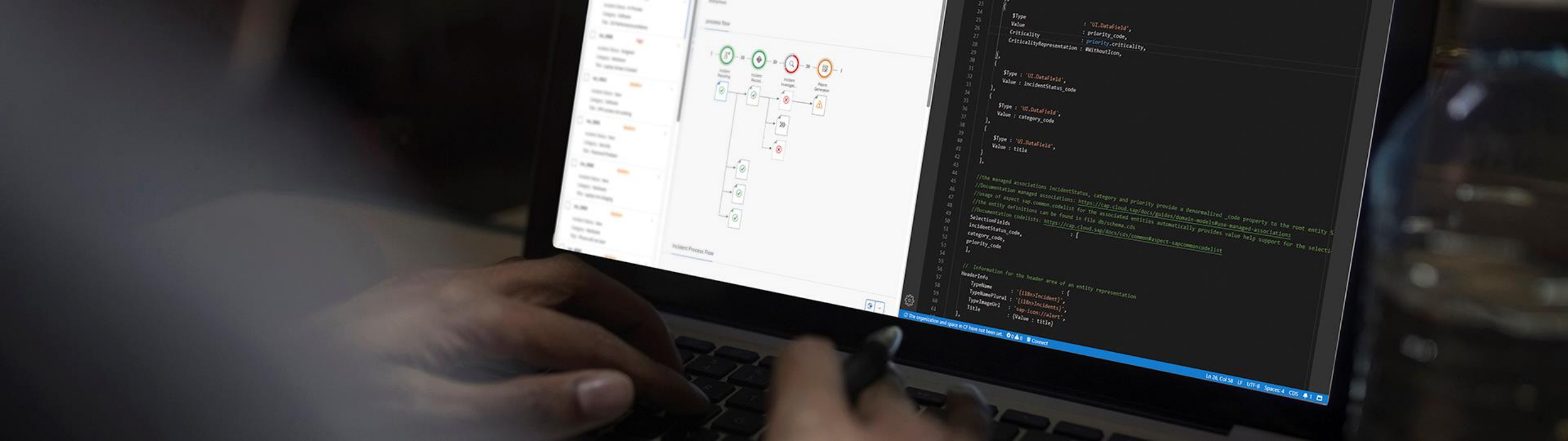
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Unit 3: Introducing OData Services and Annotations

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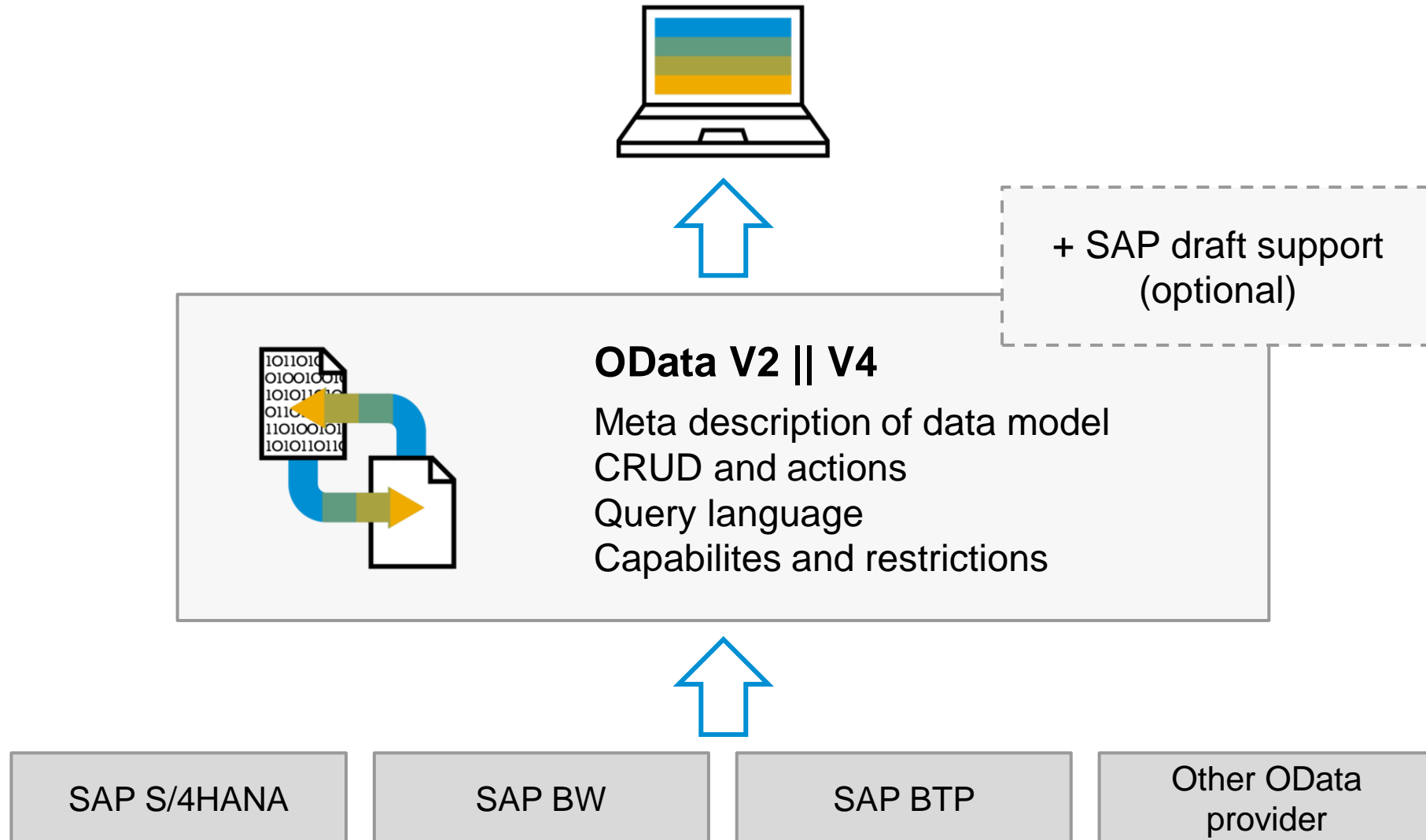
Adapting the UI as a Developer – Advanced Extensions



Productizing the Extended App



OData connects your application to the back end



OData metadata is a standardized and machine-readable description of the data model

OData contains a meta description of your data model:

- An **entity** can for example be a 'Person' with the **property** 'FirstName'
- The property can be further **qualified**, for example by providing a **datatype** or **information** like 'nullable'
- Entities can have **relationships**.
A 1:n relationship could be, for example, '1 person can be related to n trips'
- The meta description can contain complex types, actions, singletons, and so on

Example: [OData.org trip service metadata](https://odata.org/trip-service-metadata/)

```
<?xml version="1.0" encoding="utf-8"?>
<edmx:Edmx Version="4.0" xmlns:edmx="http://docs.oasis-open.org/odata/ns/edmx">
  <edmx:DataServices>
    <Schema Namespace="Trippin" xmlns="http://docs.oasis-open.org/odata/ns/edm">
      <EntityType Name="Person">
        <Key>
          <PropertyRef Name="UserName" />
        </Key>
        <Property Name="UserName" Type="Edm.String" Nullable="false" />
        <Property Name="FirstName" Type="Edm.String" Nullable="false" />
        <Property Name="LastName" Type="Edm.String" MaxLength="26" />
        <Property Name="MiddleName" Type="Edm.String" />
        <Property Name="Gender" Type="Trippin.PersonGender" Nullable="false" />
        <NavigationProperty Name="Friends" Type="Collection(Trippin.Person)" />
        <NavigationProperty Name="BestFriend" Type="Trippin.Person" />
        <NavigationProperty Name="Trips" Type="Collection(Trippin.Trip)" />
      </EntityType>
      <EntityType Name="Airline">
        <Key>
          <PropertyRef Name="AirlineCode" />
        </Key>
        ...
      </EntityType>
    </Schema>
  </edmx:DataServices>
</edmx:Edmx>
```

OData lets you request and modify resources and invoke actions

Requesting resources

- **Get list of people**

GET `https://.../TripPinServiceRW/People`

- **Get the data of an individual person**

GET `https://.../TripPinServiceRW/People('russellwhyte')`

- **Complex queries** like 'Get the first 2 persons in the system who have registered at least one trip that costs more than 3000, and only display their first name and last name.':

```
GET https://.../TripPinServiceRW/People?$top=2 &
$select=FirstName, LastName &
$filter=Trips/any(d:d/Budget gt 3000)
```

Creating a resource

- POST `https://...TripPinServiceRW/People` and provide data like first name, last name etc. in the payload

The screenshot shows the OData website with a red header containing navigation links: OData, Blog, Developers, Tools, Ecosystem, and Getting Involved. A search bar is located below the header. The main content area features the title 'Understand OData in 6 steps' and an introductory paragraph about OData as an OASIS standard. Below this, there is a section titled 'Step 1: Requesting resources' which explains the REST principles and introduces the TripPin service. At the bottom of the screenshot, there is a code editor interface with tabs for 'HTTP request', 'C#', 'Olingo JavaScript client', 'C++', 'Node.js', and 'Contribute'. The 'HTTP request' tab is active, showing a GET request to 'https://services.odata.org/v4/TripPinServiceRW/People' with 'HTTP/1.1' status, 'OData-Version: 4.0', and 'OData-MaxVersion: 4.0'. A 'View the response' button is visible below the code.

<https://www.odata.org/getting-started/understand-odata-in-6-steps/>

SAP defined a way to implement a draft pattern using OData

- Using the draft pattern is optional, but makes sense for creating and updating business objects to keep unsaved changes if an editing activity is interrupted, allowing users to resume editing later.
- A draft is an interim version of a business entity that has not been explicitly saved as an active version to the original database tables.
- In SAP Fiori elements, drafts are saved automatically in the background whenever users add or change information within a business entity while in edit state (autosave). This ongoing communication with the back end also enables dynamic interaction patterns.
- Draft handling should be implemented using a framework like ABAP RESTful Application Programming Model, ABAP Programming Model for SAP Fiori, or SAP Cloud Application Programming Model.

The screenshot displays the SAP Fiori 'Travel' application interface. At the top, there's a header with the SAP logo and a 'Travel' dropdown. Below this, a 'Standard' filter is active, showing '1 filter active: Editing Status'. The main section is titled 'Travels (4,136)' and includes 'Create', 'Delete', and 'Show Details' actions. A table lists travel entries with columns for 'Travel ID', 'Agency', 'Customer', 'Start Date', and 'End Date'. The first entry, 'Vacation 3561', is highlighted with a yellow box and labeled 'Draft'. Below the table, a detailed edit form is shown for the selected travel. It includes fields for 'Booking Fee' (0.23 EUR) and 'Total Price' (96.37 EUR), along with 'Start Date' and 'End Date' (both Nov 6, 2021). At the bottom right, a yellow box highlights the 'Draft saved' status and 'Save' and 'Cancel' buttons.

Travel ID	Agency	Customer	Start Date	End Date
Vacation 3561 Draft	Miles and More (70049)	Buchholm (7)	Nov 6, 2021	Nov 6, 2021
Vacation 3469	Miles and More (70049)	Sisko (654)	Nov 6, 2021	Nov 6, 2021
Vacation 2353	Rocky Horror Tours (70048)	Heller (243)	Nov 5, 2021	Nov 5, 2021
Vacation 1070	Miles and More (70049)	Goelke (185)	Nov 1, 2021	Nov 1, 2021

Prices

Booking Fee: 0.23 EUR

Total Price: 96.37 EUR

Dates

Start Date: Nov 6, 2021

End Date: Nov 6, 2021

Draft saved Save Cancel

OData annotations define how the app looks and behaves

Consumption hints

Which fields allow a human to identify the entity?

Which fields are clickable?

Semantics

“These fields shall be displayed together in a form”

The screenshot displays the SAP Travel app interface for a vacation booking. The top navigation bar shows the SAP logo and 'Travel' dropdown. The main content area is divided into sections: 'Vacation' (Vacation (2353)), 'Total Price' (4,709.00 EUR), and 'Booking Status' (Accepted). Below these are tabs for 'General Information' and 'Bookings'. The 'General Information' tab is active, showing a 'General' section with 'Description: Vacation' and 'Agency: Rocky Horror Tours (70048)'. The 'Prices' section shows 'Booking Fee: 30.00 EUR' and 'Total Price: 4,709.00 EUR'. The 'Dates' section shows 'Starting Date: Oct 8, 2021' and 'End Date: Oct 9, 2021'. The 'Bookings' tab is also visible, showing a table of bookings. Annotations are indicated by yellow boxes and arrows: one points to the 'Edit' button in the top right, another points to the 'Booking Fee' field in the 'Prices' section, and a third points to the 'Description' and 'Agency' fields in the 'General' section.

Booking Number	Booking Date	Customer	Airline	Flight Number	Flight Date	Flight Price	Departure Airport	Destination Airport
1	Sep 20, 2021	Heller (243)	European Airlines (EA)	401	Oct 8, 2021	1,540.00 EUR	John F. Kennedy International Airport (JFK)	Frankfurt Airport (FRA)
2	Sep 20, 2021	Gahl (441)	European Airlines (EA)	401	Oct 8, 2021	1,540.00 EUR	John F. Kennedy International Airport (JFK)	Frankfurt Airport (FRA)
3	Sep 20, 2021	Müller (711)	European Airlines (EA)	401	Oct 8, 2021	1,540.00 EUR	John F. Kennedy International Airport (JFK)	Frankfurt Airport (FRA)

Behavior

“This entity can be edited”

Semantics

“This is the currency for the amount”

Annotations provide semantics and consumption hints

Annotations are additional metadata and provide abstract definitions of data semantics. These abstract definitions are stored in vocabularies from [OData](#) and [SAP](#). SAP Fiori elements understand the annotations and generates the UI based on them.

Example:

Specify that the field “TotalPrice” has a currency assigned to it. In the [measures vocabulary of OData](#) there is a term ISOCurrency defined for that:

```
<Annotations Target="SAP__self.TravelType/TotalPrice">  
  <Annotation Term="SAP__measures.ISOCurrency" Path="CurrencyCode"/>  
</Annotations>
```

A light gray rectangular box containing the text "Total Price:" on the first line and "9,568.00 EUR" on the second line, demonstrating the result of the annotation.

Total Price:
9,568.00 EUR

SAP Fiori elements can then know that whenever the “TotalPrice” is shown on the UI, the field “CurrencyCode” comprises its currency and should be shown next to it.

Introducing OData services and annotations

Annotations can also define standard UI elements like table, form, or chart

UI.LineItem

Annotations define columns, actions, etc.

Reviews (12)			
Star Rating	User	Title	Text
★★★★★	Aida Marler Jan 4, 2019, 6:30:47 PM	Good quality, good price.	Does what it should, so definitely deserves a good rating. Excellent engineering and the feeling of a very high quality product. Can't relate to the bad...
★★★★★	Glenn Henderson Feb 25, 2019, 3:55:33 AM	Excellent!	Can't relate to the bad reviews I saw, I definitely like it. I love it so much. It looks beautiful and modern. Sleek product! They hold up and last a very long time....
★★★★★	Clint Laurence May 13, 2019, 7:12:28 AM	Nice Product!	Definitely worth the investment. Can't relate to the bad reviews I saw. I definitely like it. I do really love this product and think it's a good buy. Simpl...
★☆☆☆☆	Elsa Anderson May 6, 2019, 12:08:57 PM	Very annoying	Nice looking product, but never worked well. Looks better than it works. The Worst I have ever seen!
★☆☆☆☆	Jay Townsend Jul 29, 2019, 4:52:35 AM	Overrated and overpriced	Design Fail! Not a happy customer. Not recommending to anyone. Very cheap. No instructions included for use or installation.
★★★★★	Brigida Ware Jan 11, 2020, 5:31:28 AM	Love it	The good things are still available, this is the proof! I love it so much. It looks beautiful and modern. Sleek product! Never saw a quality like that before. Th...
★★★★★	Ariene Stiles Mar 14, 2020, 12:31:30 PM	This is the one you should buy	After using that product my business skyrocketed! Unique and beautiful. Excellent quality. Great service. A great purchase, thank you! Everyone in my bi...

UI.FieldGroup

Annotations define the group title and form fields

Basic Data

Product:
MC-B-1000

Name:
AAA Alkaline Batteries - Pack of 8

Description:
Reliable power at a low price makes these batteries a great purchase. Ideal for everyday devices. 1.5V.

Preferred Product:
Yes

Category:
Batteries

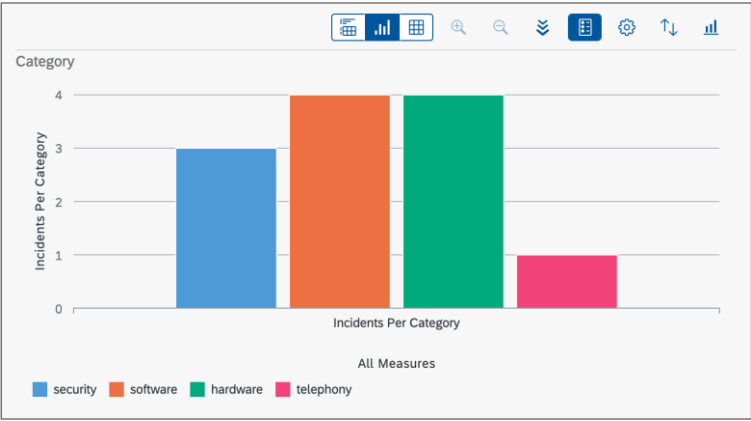
Supplier:
FamousUS (SF)

Price:
3.50 USD

Alternative Product:
MC-B-1001

UI.Chart

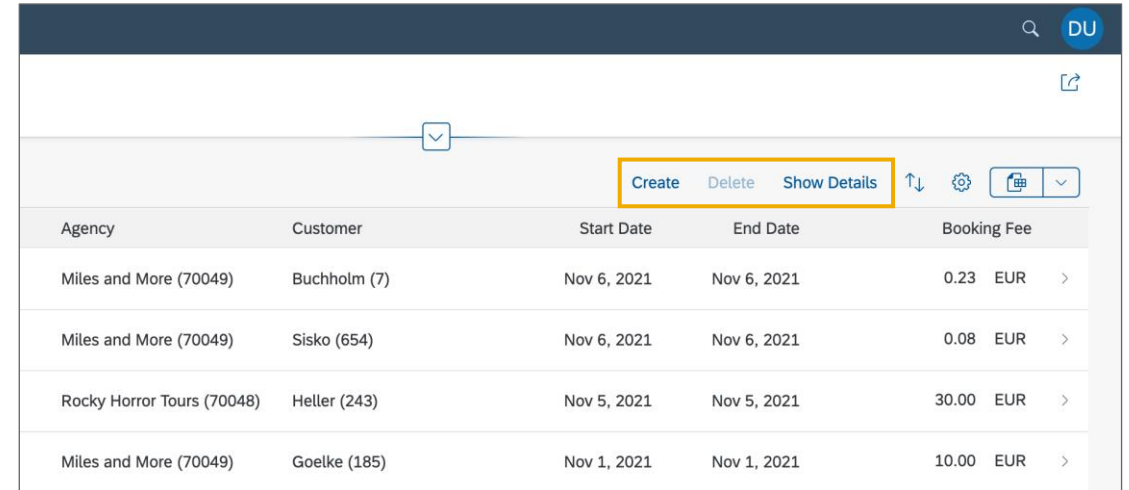
Annotations define measures, dimensions, chart type, etc.



Annotations also describe behavioral aspects of the application

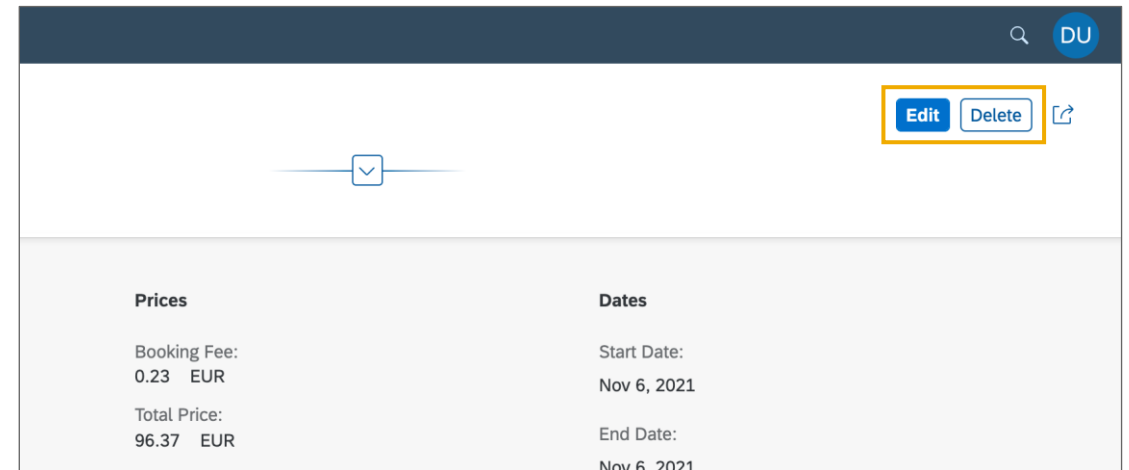
Examples of behavioral aspects are:

- An instance of a business entity can be edited and deleted. Based on this information, the corresponding buttons can be shown/hidden on the UI.
- An action can be executed on an instance of a business entity. Only if the action is applicable is a corresponding button enabled/displayed.
- When specific fields get changed on the UI it is required to request additional data from the back end. For example, when a price on an item table gets changed, the UI needs to request the new total price of the header entity from the back end.



DU

Agency	Customer	Start Date	End Date	Booking Fee
Miles and More (70049)	Buchholm (7)	Nov 6, 2021	Nov 6, 2021	0.23 EUR >
Miles and More (70049)	Sisko (654)	Nov 6, 2021	Nov 6, 2021	0.08 EUR >
Rocky Horror Tours (70048)	Heller (243)	Nov 5, 2021	Nov 5, 2021	30.00 EUR >
Miles and More (70049)	Goelke (185)	Nov 1, 2021	Nov 1, 2021	10.00 EUR >



DU

Prices	Dates
Booking Fee: 0.23 EUR	Start Date: Nov 6, 2021
Total Price: 96.37 EUR	End Date: Nov 6, 2021

SAP Fiori elements apps can be built using ABAP CDS, CAP CDS, and XML annotations

- All types of annotations enrich the OData service with semantic information that **allows the generation of metadata-driven UIs**
- Annotations can be defined either locally (XML annotations) or in the backend (ABAP CDS, CAP CDS annotations)
- Annotations in CDS views get translated to XML annotations by the corresponding back ends
- The type of annotation (ABAP CDS, CAP CDS, and XML) does not impact performance or functionality
- XML annotations can be used with any back end, for example, SAP back ends leveraging previous ABAP programming models, SAP BW, or non-SAP back ends

```
@UI.hidden: true
TravelUUID;

@UI: {
  lineItem: [ { position: 10, importance: #HIGH } ],
  selectionField: [ { position: 10 } ]
}
TravelID;

@UI: {
  lineItem:      [ { position: 20, importance: #HIGH } ],
  identification: [ { position: 30 } ],
  selectionField: [ { position: 20 } ]
}
AgencyID;

@UI: {
  lineItem:      [ { position: 30, importance: #HIGH } ],
  identification: [ { position: 40 } ],
  selectionField: [ { position: 30 } ]
}
CustomerID;
```

Annotations in ABAP CDS

Your preferred tooling affects your choice of annotation type

SAP Fiori tools

(available in **SAP Business Application Studio** or **Visual Studio Code**)

- Makes it easy and convenient to define UI semantics
- Reduces effort and the required skill level through step-by-step guides and code completion, for example
- Both **XML** and **CAP CDS** annotations are supported by SAP Fiori tools

ABAP Development Tools in Eclipse

- Used to maintain **ABAP CDS** annotations for UI semantics and other domains as well (for example, search, analytics, or ObjectModel)
- SAP Fiori tools still needed for application generation



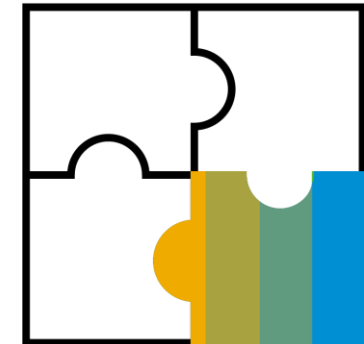
Lifecycle management and feature availability influence your choice of annotation type

Where do you want to manage the lifecycle?

- XML annotations follow the lifecycle of your app (local project)
- CDS annotations follow the lifecycle of your OData service

Do you require recently released features?

- Due to different release cycles, some new annotations might be available later in ABAP CDS
- For on-premise SAP systems, upgrade cycles can further impact the availability of new features for ABAP CDS annotations



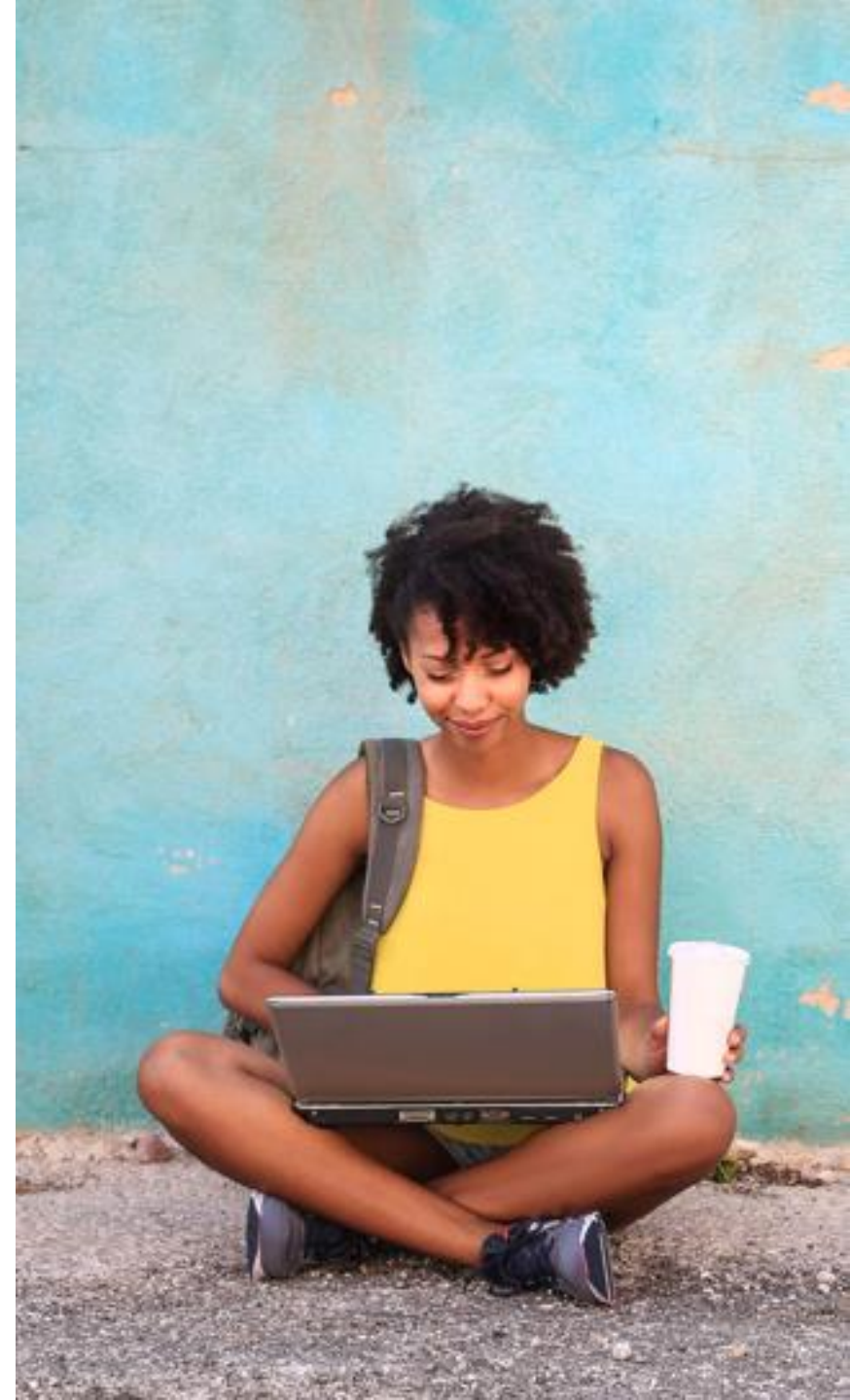
Wrap-up

IN THIS UNIT, YOU LEARNED

- What OData is
- The role of drafts
- How annotations affect your app
- That you can use different types of annotations

NEXT UNIT

- Week 1 – Unit 4
Preparing your ABAP development environment



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Week 1: Introducing SAP Fiori Elements

Unit 4: Preparing Your ABAP Development Environment

Introducing SAP Fiori Elements

Painting the Big Picture



Understanding the Architecture



Introducing OData Services and Annotations



Preparing Your ABAP Development Environment



you are here

Creating an OData Service with ABAP RESTful Application Programming Model



Creating a List Report



Building Your First SAP Fiori Elements App

Creating an Object Page



Accelerating SAP Fiori App Development with SAP Fiori Tools



Preparing Your Front-end Development Environment



Generating the List Report – Object Page App



Configuring the App



Extending the App with Custom Elements



Using More SAP Fiori Elements Capabilities

Creating an Analytical List Page



Enhancing the Analytical List Page



Creating an Overview Page



Deploying Your SAP Fiori Elements App



Building an SAP Fiori Elements App with an External OData Service



Using XML Annotation LSP for Defining Advanced UI Features



Extending a Standard SAP Fiori App

Understanding SAPUI5 Flexibility



Adapting an App as a Key User



Adapting the UI as a Developer – Basic Extensions



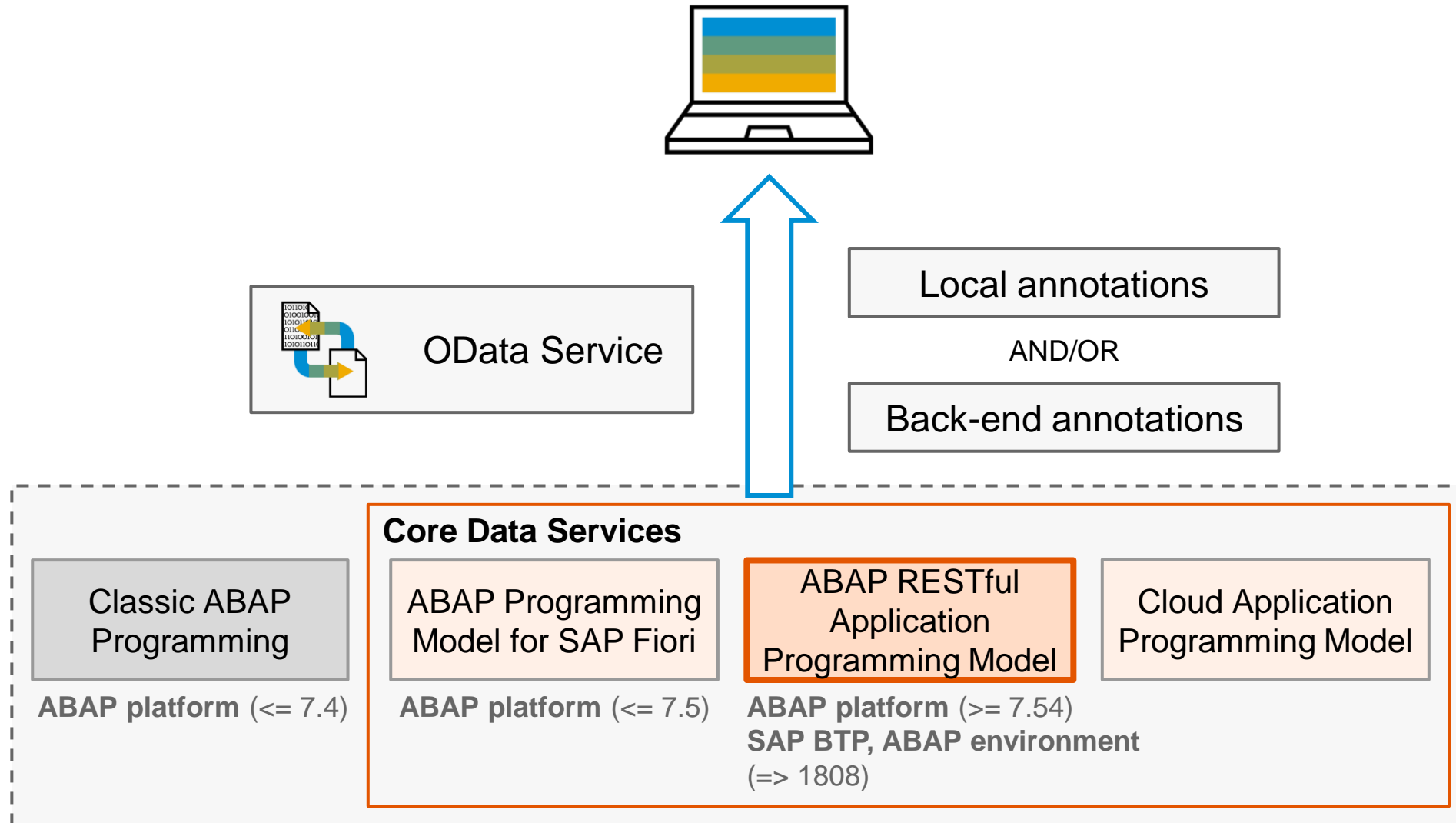
Adapting the UI as a Developer – Advanced Extensions



Productizing the Extended App



In this course we will use the ABAP environment on SAP Business Technology Platform



Register for an SAP BTP, ABAP environment trial account

The screenshot displays the SAP BTP Cockpit interface. On the left, a sidebar contains navigation links: Overview, Services, Service Marketplace, Instances and Subscriptions, Subscriptions, Cloud Foundry, HTML5 Applications, Connectivity, Security, Entitlements, Usage Analytics, Useful Links, and Legal Information. The main area shows the 'ABAP environment' with the name 'abap-trial'. Below this, there are tabs for 'Overview' and 'Service Plans'. The 'Service Plans' tab is active, showing a list of plans with 'shared' selected. A modal window titled 'New Instance or Subscription' is open, showing a three-step process: 1. Basic Info, 2. Parameters, and 3. Review. The 'Basic Info' step is currently active, displaying fields for 'Service' (ABAP environment), 'Plan' (shared), 'Runtime Environment' (Cloud Foundry), 'Space' (dev), and 'Instance Name' (with a prompt to choose a CLI-friendly name). At the bottom of the modal, there are buttons for 'Next', 'Create', and 'Cancel'.

Access to trial system

- Free of charge
- Via SAP Business Technology Platform trial access
<https://www.sap.com/cmp/td/sap-cloud-platform-trial.html>
- Trial account expires after 365 days

Rules of the game



For **educational purposes only**
No service-level agreement with regard to platform availability

Trial users **share the same back-end** system

No content separation between different users

Install and connect ABAP Development Tools to the ABAP environment trial system

The screenshot shows two web pages. The top page is the Eclipse Foundation website, specifically the 'Eclipse IDE 2020-12' download page. It features the Eclipse logo, navigation links (Members, Working Groups, Projects, More), and a 'Download' button. The main content area promotes the 'Eclipse Installer 2020-12' as the easiest way to install and update the Eclipse Development Environment. It lists download links for Mac OS X 64 bit, Windows 64 bit, and Linux 64 bit. The bottom page is the SAP Development Tools website. It has a navigation bar with links to HOME, ABAP, BW, CLOUD, CLOUD INTEGRATION, HANA, IDM, ML FOUNDATION, MOBILE, and SAPUI5. The main heading is 'ABAP Development Tools'. Below it, a paragraph explains that the site describes how to install and update the front-end components of ABAP Development Tools (ADT) and SAP BTP, ABAP environment. It also mentions that detailed information on preparing the ABAP back-end system is provided. A section titled 'Prerequisites' contains a table with the following data:

Component	Prerequisite
Eclipse Platform	2020-09 (4.17), 2020-12 (4.18)
Operating System	<ul style="list-style-type: none">Windows 10, orApple Mac OS X 10.14 or higher
Java Runtime	JRE version 11 (64-Bit). See note 2949356 for details. Recommended Java Version: SapMachine 11
SAP GUI	<ul style="list-style-type: none">For Windows OS: SAP GUI for Windows 7.60 or higherFor Apple Mac OS: SAP GUI for Java 7.50 <p>SAP GUI is not required to work with SAP BTP, ABAP environment.</p>
Microsoft VC Runtime	For Windows OS: Microsoft Visual C++ 2013 (v64) for communication with the back-end system is required.

Below the table is a section titled 'Procedure' with the following text: 'To install the front-end component of ADT, proceed as follows:'. It lists two steps: 1. Get an installation of [Eclipse 2020-12](#) (e.g. [Eclipse IDE for Java Developers](#)) and 2. In Eclipse, choose in the menu bar **Help > Install New Software...**

Access to ABAP tools

- Instructions about the local installation of Eclipse and ADT available on the central update site for all Eclipse-based SAP development tools
- <https://tools.hana.ondemand.com/#abap>

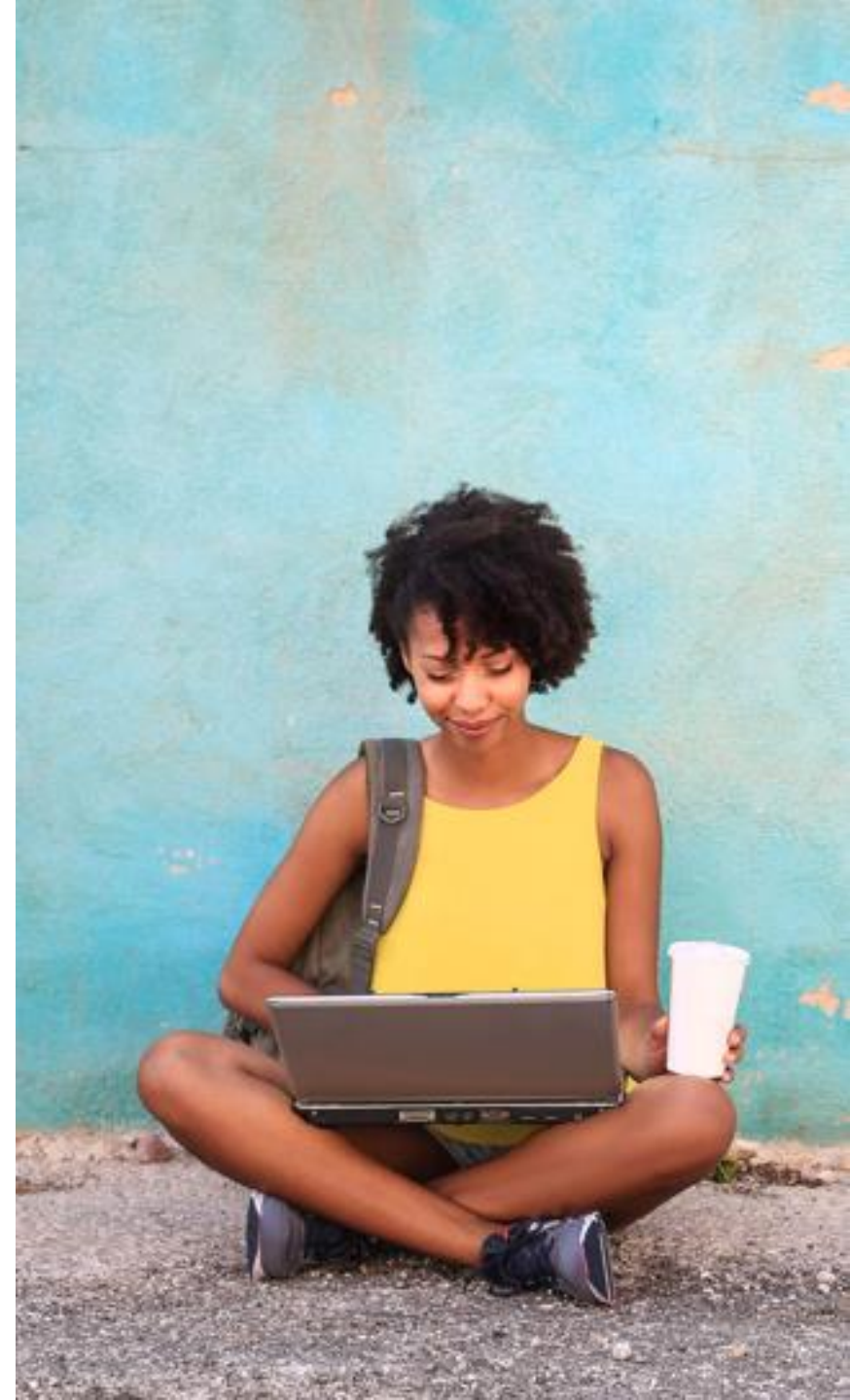
Wrap-up

IN THIS UNIT, YOU LEARNED

- How to set up your ABAP development environment for this course

NEXT UNIT

- Week 1 – Unit 5
Creating an OData Service using ABAP RESTful Application
Programming Model (RAP)



Thank you.

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Week 1: Introducing SAP Fiori elements

Unit 5: Creating an OData Service with ABAP RESTful Application Programming Model (RAP)

Introducing SAP Fiori Elements

Painting the Big Picture



Understanding the Architecture



Introducing OData Services and Annotations



Preparing Your ABAP Development Environment



Creating an OData Service with ABAP RESTful Application Programming Model



you are here

Creating a List Report



Building Your First SAP Fiori Elements App

Creating an Object Page



Accelerating SAP Fiori App Development with SAP Fiori Tools



Preparing Your Front-end Development Environment



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Using XML Annotation LSP for Defining Advanced UI Features



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Understanding SAPUI5 Flexibility



Adapting an App as a Key User



Adapting the UI as a Developer – Basic Extensions



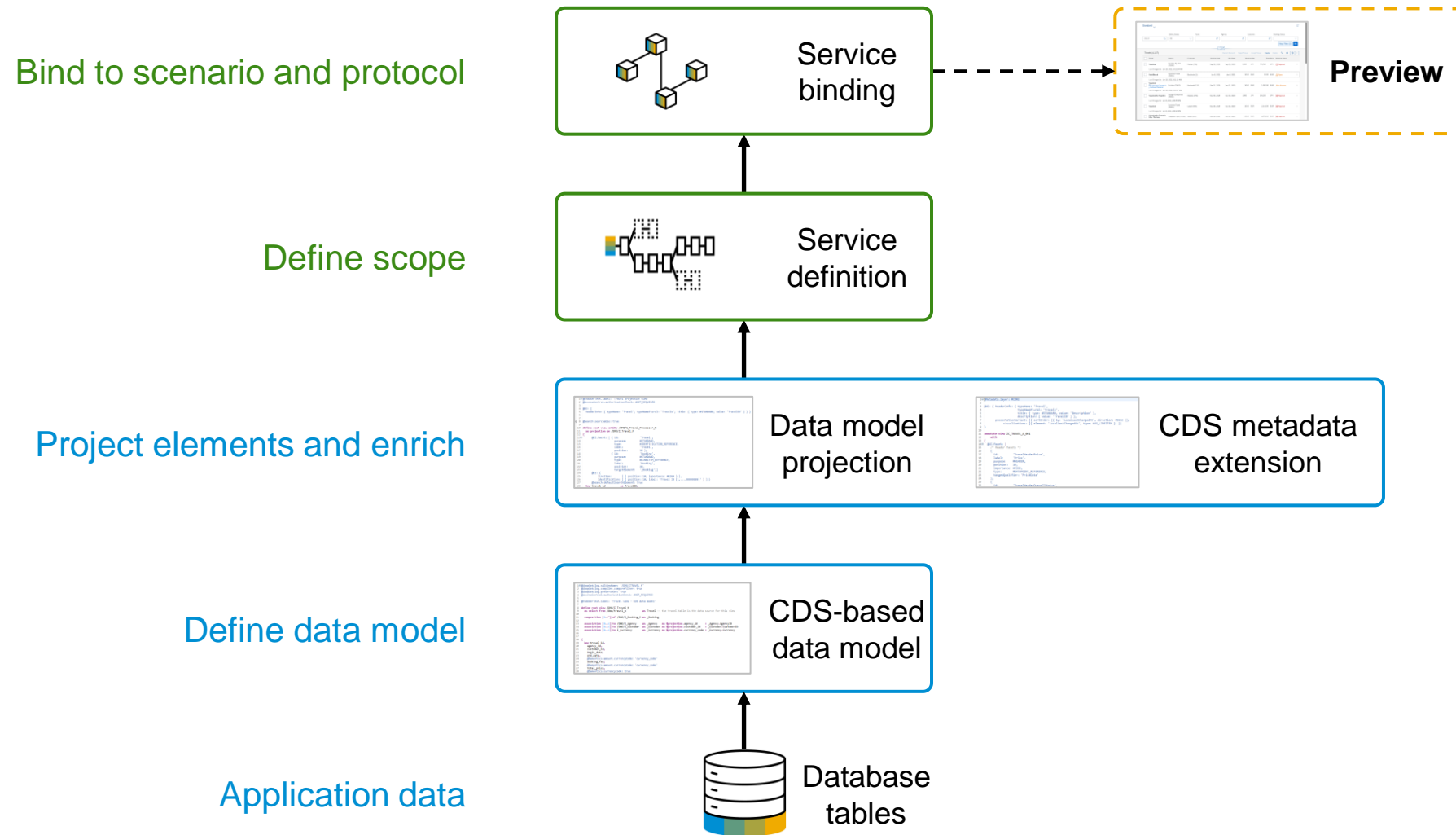
Adapting the UI as a Developer – Advanced Extensions



Productizing the Extended App



Our travel apps need back-end logic implemented by several development artifacts

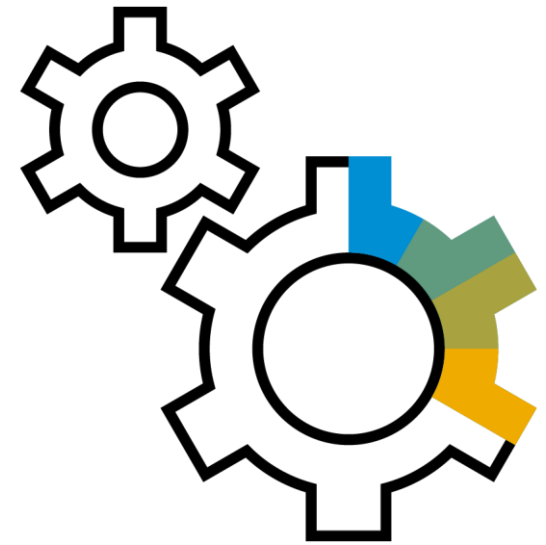


Creating an OData service with ABAP RESTful Application Programming Model

A generator will create the back-end artifacts and the OData services

As this openSAP course focuses on SAP Fiori elements and not the creation of the OData service, a generator was developed for the course which creates all the required RAP development artifacts for you. You can then use this OData service and enhance its metadata extensions.

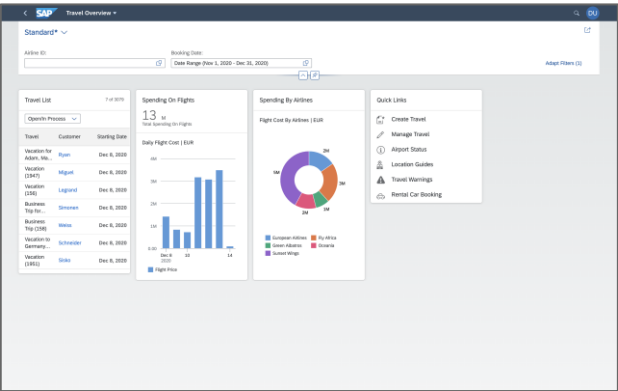
However, if you're interested in how to build such an OData service from scratch using RAP, check out the openSAP course [Building Apps with the ABAP RESTful Application Programming Model](#).



Creating an OData service with ABAP RESTful Application Programming Model

We will build the OData services for all the travel-related apps in this unit

Travel overview



Travel list

The SAP Travel List table displays a list of travel bookings. The table has columns for Travel, Agency, Customer, Booking Date, End Date, Booking Price, Total Price, and Booking Status. The data is filtered by 'Standard' and 'All'.

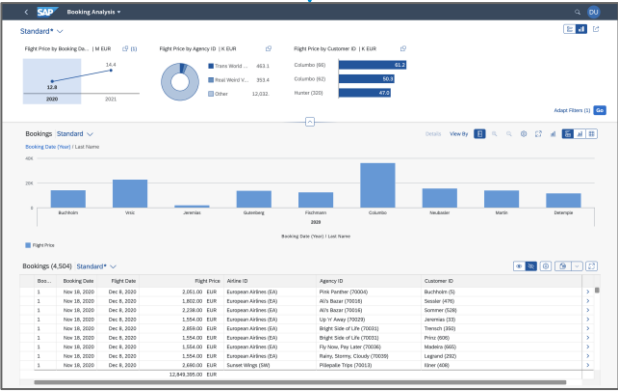
Travel	Agency	Customer	Booking Date	End Date	Booking Price	Total Price	Booking Status
1337	Not Only By Blue (11000)	Mathias (24)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	5,969.00 EUR	Accepted
2163	Ready Home Team (70446)	Heller (24)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	4,799.00 EUR	Accepted
2686	Not Only By Blue (11000)	Müller (70)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	4,859.00 EUR	Open
2737	Miles and More (70446)	Sommer (33)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	3,859.00 EUR	Open
2740	Not Only By Blue (11000)	Heller (24)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	9,169.00 EUR	Accepted
2842	Ready Home Team (70446)	Jarvis (3)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	2,257.00 EUR	Accepted
3028	Not Only By Blue (11000)	Casson (33)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	15,753.00 EUR	Accepted
3042	Miles and More (70446)	Mahmann (207)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	5,767.00 EUR	Open
2741	Not Only By Blue (11000)	Sommer (33)	Oct 6, 2021	Oct 6, 2021	10.00 EUR	7,969.00 EUR	Open

Travel details

The SAP Travel Details view shows the details of a specific travel booking. It includes a 'General Information' section with fields for Description, Location, Agency, and Booking Status. A 'Prices' section shows the Booking Price, Total Price, and End Date. A 'Bookings' section shows a list of bookings with columns for Booking Number, Booking Date, Customer, Agency, Flight Number, Flight Date, High Price, Booking Status, and Booking Agent.

Booking Number	Booking Date	Customer	Agency	Flight Number	Flight Date	High Price	Booking Status	Booking Agent
1	Oct 20, 2021	Heller (24)	European Airlines (24)	401	Oct 6, 2021	1,549.00 EUR	Open	John F. Kennedy International Airport (JFK)
2	Oct 20, 2021	Guth (46)	European Airlines (24)	401	Oct 6, 2021	1,549.00 EUR	Open	John F. Kennedy International Airport (JFK)
3	Oct 20, 2021	Müller (70)	European Airlines (24)	401	Oct 6, 2021	1,549.00 EUR	Open	John F. Kennedy International Airport (JFK)

Booking analysis



Travel desk clerk Jay



Food and beverages

The SAP Food and Beverages view shows the details of a specific food and beverage product. It includes a 'Products' section with columns for Product, Quantity, Unit Price, and Price. A 'Food and Beverages' table at the bottom shows a list of food and beverage items with columns for Product, Quantity, Unit Price, and Price.

Product	Quantity	Unit Price	Price
Food	10	1.50 EUR	15.00 EUR
Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR
Food and Beverage	10	1.50 EUR	15.00 EUR

Creating an OData service with ABAP RESTful Application Programming Model

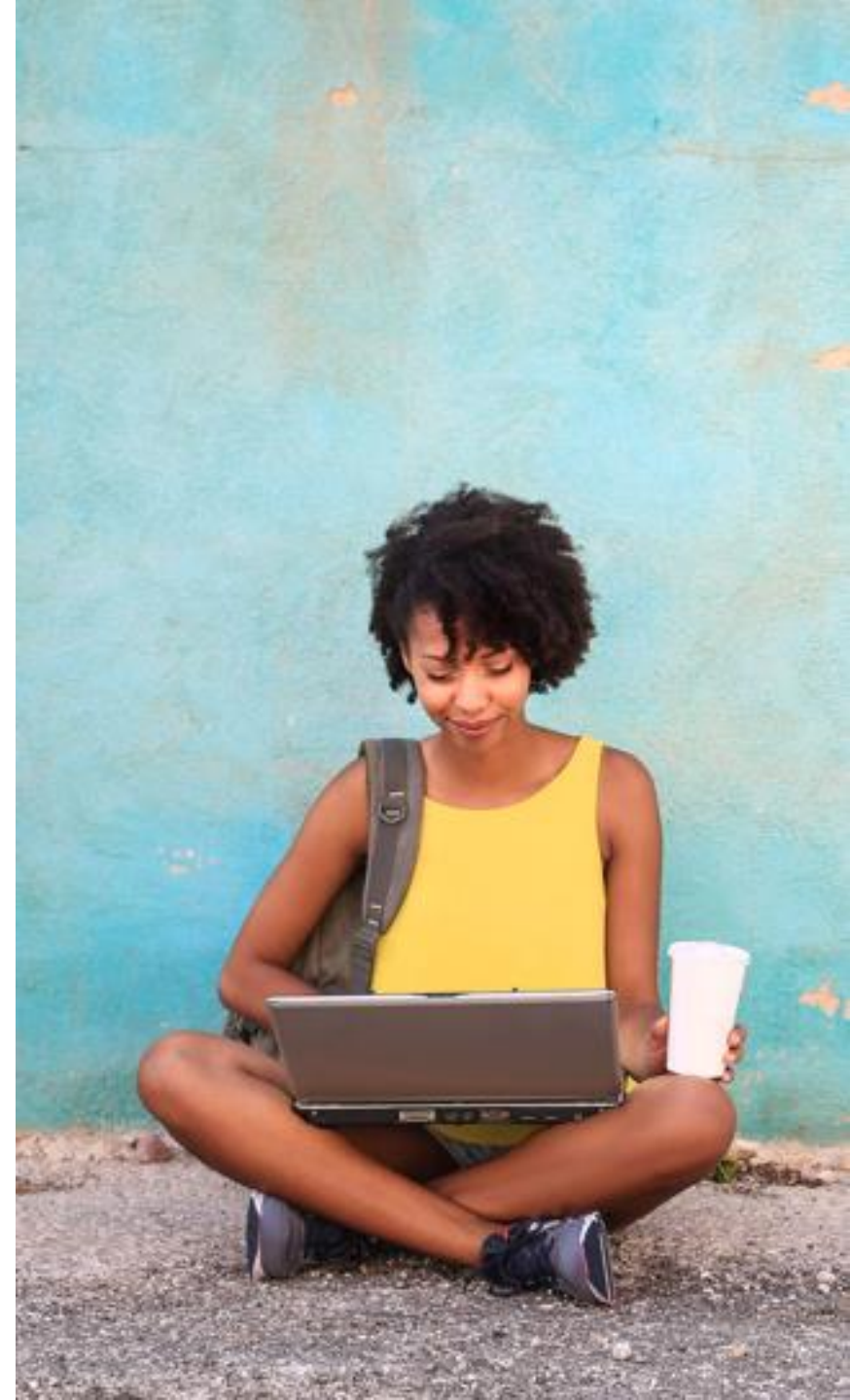
Wrap-up

IN THIS UNIT, YOU LEARNED

- How to generate the back-end artifacts and the OData services you need to build the travel-related apps

NEXT UNIT

- Week 1 – Unit 6
Creating a list report



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Week 1: Introducing SAP Fiori Elements

Unit 6: Creating a List Report

Introducing SAP Fiori Elements

Painting the Big Picture



Understanding the Architecture



Introducing OData Services and Annotations



Preparing Your ABAP Development Environment



Creating an OData Service with ABAP RESTful Application Programming Model



Creating a List Report



you are here

Building Your First SAP Fiori Elements App

Creating an Object Page



Accelerating SAP Fiori App Development with SAP Fiori Tools



Preparing Your Front-end Development Environment



Generating the List Report – Object Page App



Configuring the App



Extending the App with Custom Elements



Using More SAP Fiori Elements Capabilities

Creating an Analytical List Page



Enhancing the Analytical List Page



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Deploying Your SAP Fiori Elements App



Building an SAP Fiori Elements App with an External OData Service



Using XML Annotation LSP for Defining Advanced UI Features



Extending a Standard SAP Fiori App

Understanding SAPUI5 Flexibility



Adapting an App as a Key User



Adapting the UI as a Developer – Basic Extensions



Adapting the UI as a Developer – Advanced Extensions



Productizing the Extended App



A list report allows users to view and work with a large set of items

The **list report** offers powerful features for finding and acting on relevant data sets. It is often used as an entry point for navigating to the item details, which are usually shown on an object page.

With the list report, users can

- Search, filter, sort, and group large sets of items
- Work with different views on the same set of data, for example, on items with different statuses like 'open' or 'in progress'
- Select one or more items in the list for further action

The screenshot shows a SAP List Report for 'Travels' with 4,137 items. The interface includes a search bar, filter fields for 'Editing Status', 'Travel', 'Agency', 'Customer', and 'Booking Status', and an 'Adapt Filters (1)' button. The table below lists several travel items with their respective details and actions.

<input type="checkbox"/>	Travel	Agency	Customer	Starting Date	End Date	Booking Fee	Total Price	Booking Status	
<input type="checkbox"/>	Vacation	Not Only By Bike (70050)	Fischer (726)	Sep 25, 2020	Sep 25, 2020	2,000 JPY	715,500 JPY	❌ Rejected	>
Last Changed at: Jan 19, 2021, 10:22:54 AM									
<input type="checkbox"/>	Sun&Beach	Sunshine Travel (70001)	Buchholm (1)	Jan 5, 2021	Jan 8, 2021	10.00 EUR	10.00 EUR	⚠️ Open	>
Last Changed at: Jan 19, 2021, 8:11:14 AM									
<input type="checkbox"/>	Vacation	Unsaved Changes by Andreas Riesterer	Fly High (70002)	Sep 21, 2020	Sep 21, 2020	10.00 EUR	1,912.00 EUR	⚠️ In Process	>
Last Changed at: Jan 19, 2021, 8:10:07 AM									
<input type="checkbox"/>	Vacation for Stephen	Voyager Enterprises (70011)	Madeira (674)	Nov 30, 2019	Nov 30, 2019	1,000 JPY	254,200 JPY	❌ Rejected	>
Last Changed at: Jan 8, 2021, 2:08:57 PM									
<input type="checkbox"/>	Vacation	Sunshine Travel (70001)	Leisert (696)	Nov 26, 2019	Nov 26, 2019	10.00 EUR	2,144.00 EUR	❌ Rejected	>
Last Changed at: Jan 8, 2021, 2:08:47 PM									
<input type="checkbox"/>	Vacation for Theresia, Ulla, Thomas,	Pillepalle Trips (70013)	Cesari (357)	Nov 26, 2019	Nov 27, 2019	60.00 EUR	14,574.00 EUR	❌ Rejected	>
Last Changed at: Jan 8, 2021, 2:08:32 PM									
<input type="checkbox"/>	Visiting Benjamin	Sunny, Sunny, Sunny (70032)	Koslowski (128)	Nov 27, 2019	Nov 27, 2019	30.00 USD	9,327.00 USD	✅ Accepted	>
Last Changed at: Dec 23, 2020, 9:18:18 AM									

The list report has several key functions

Filter bar

- Allows users to filter the table based on various selection fields

Variant management

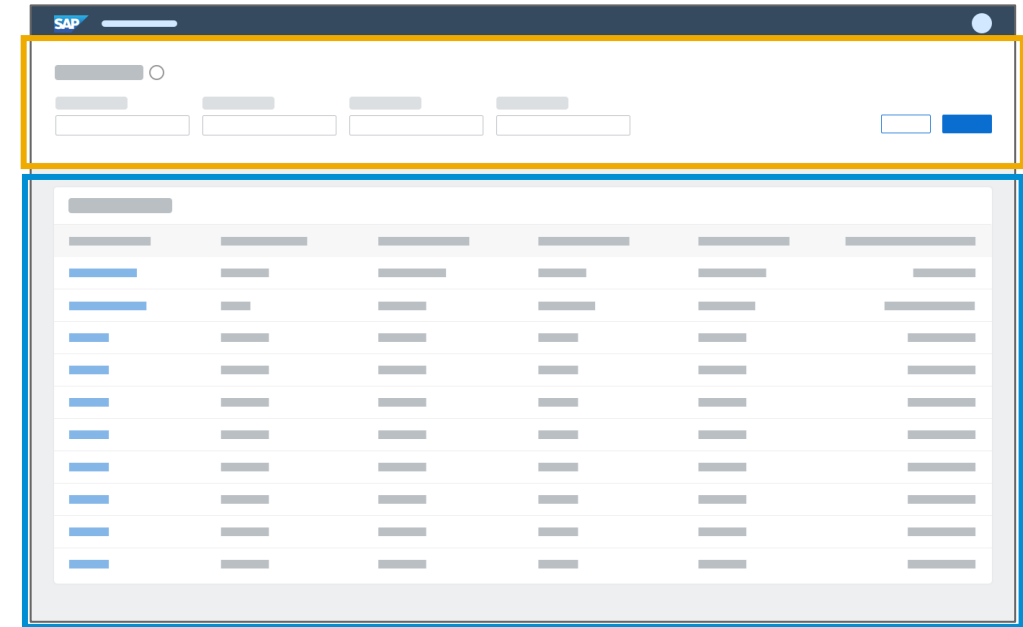
- Allows users to store custom views, such as filter settings, sorting, or table columns to be displayed

Visibility

- Is expanded initially and collapses when the user scrolls in the table
- Can be pinned to stay expanded during scrolling

Table toolbar

- Contains the table title, personalization and export options, as well as the standard actions create, edit, delete
- Can also contain app-specific actions



Check the [infographic](#) in our documentation

Personalization options

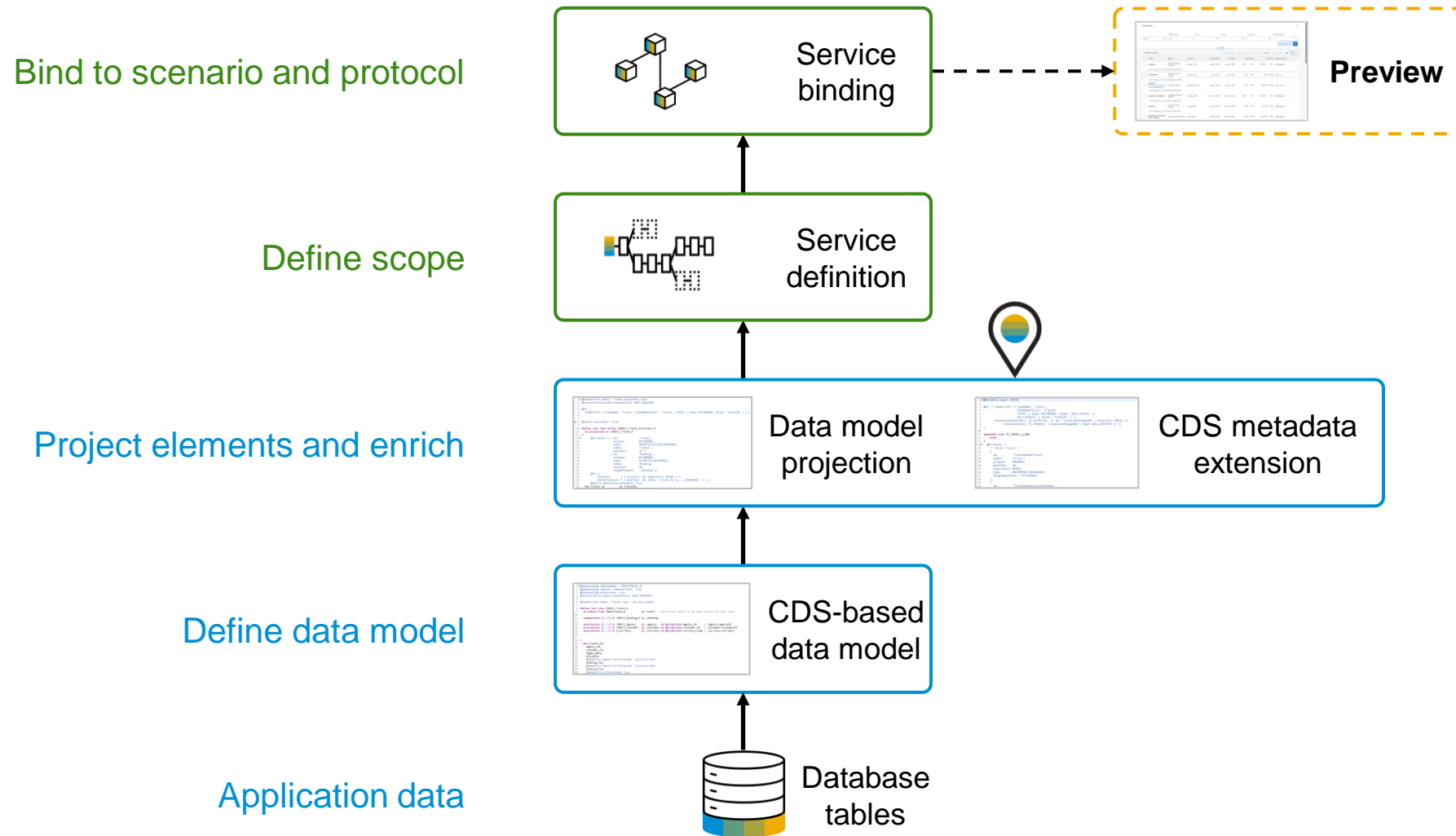
- Show and hide table columns, specify sorting and grouping

Table

- Multiple table types are supported, such as responsive table or grid table

Creating a list report

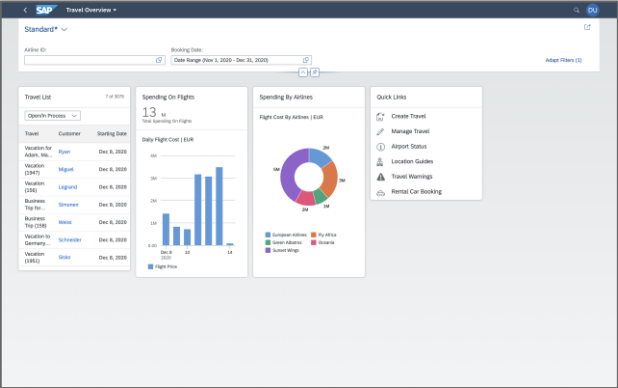
We will create UI-related ABAP CDS annotations primarily in the CDS metadata extension



Creating a list report

We will build the travel list page in this unit

Travel overview



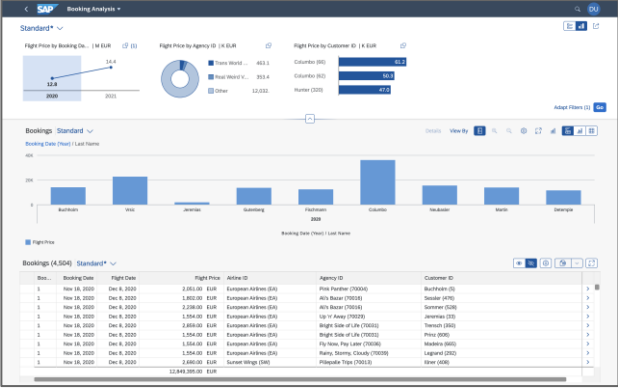
Travel list

The SAP Travel List table displays a list of travel bookings. The table has columns for Agency, Customer, Booking Date, End Date, Booking Price, Total Price, and Booking Status. The data is filtered by 'Standard' and 'Accepted' status.

Travel details

The SAP Travel Details page provides a detailed view of a specific booking. It includes a 'Vacation' section with a 'Total Price' of 4,709.00 EUR and a 'Booking Status' of 'Accepted'. The 'General Information' section shows details about the booking, including the agency, customer, and booking date. The 'Bookings' section shows a list of bookings with columns for Booking Number, Booking Date, Customer, Agency, Flight Number, Flight Date, Flight Price, Booking Status, and Booking Agent.

Booking analysis



Travel desk clerk Jay



Food and beverages

The SAP Food and Beverages table displays a list of food and beverage items. The table has columns for Product, Quantity, Unit of Measure, Price, and Total Price. The data is filtered by 'Standard' and 'Accepted' status.

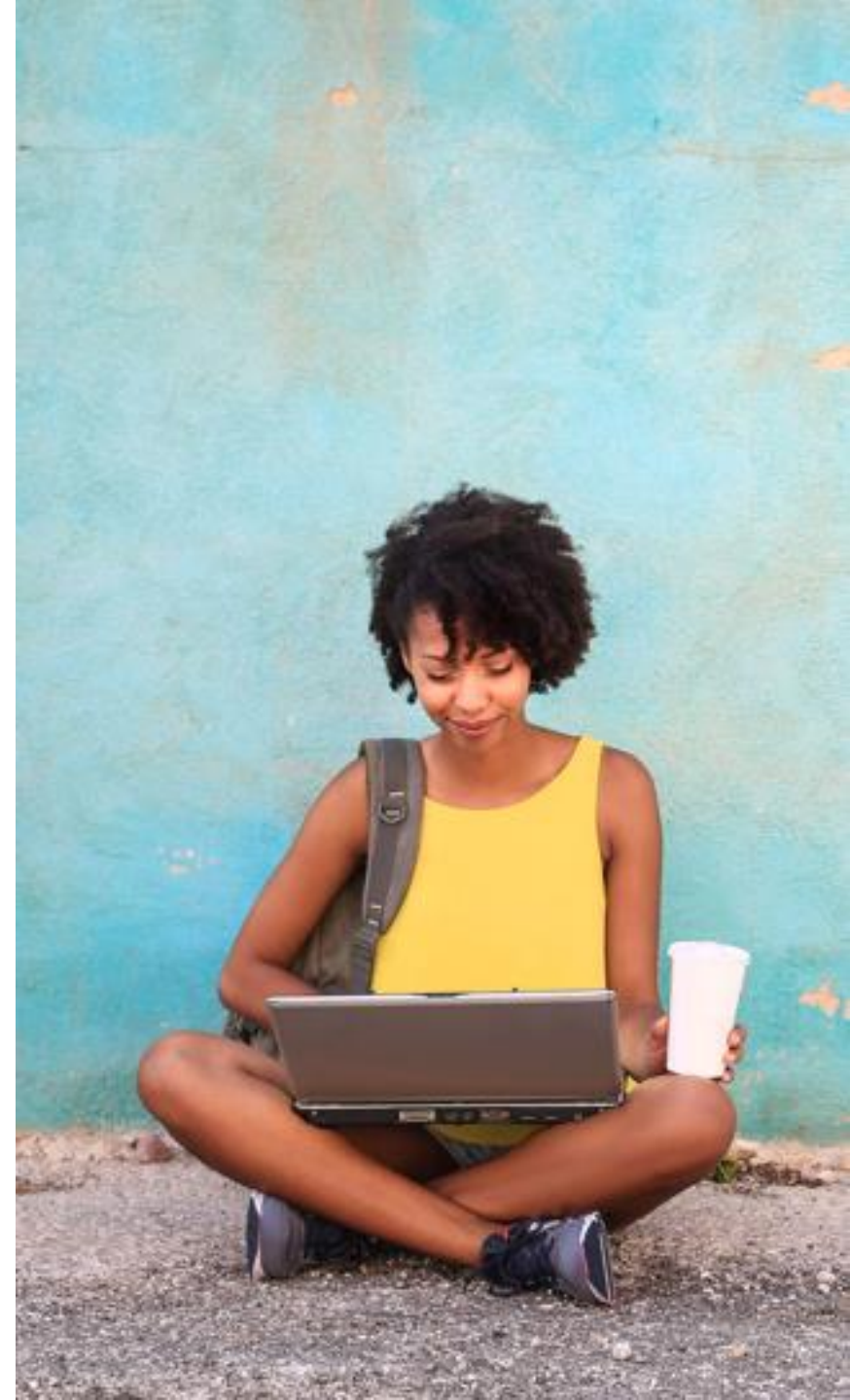
Wrap-up

IN THIS UNIT, YOU LEARNED

- When to use a list report floorplan
- About the components in a list report
- How to create a list report using ABAP CDS annotation

NEXT UNIT

- Week 2 – Unit 1
Creating an object page



Thank you.

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