

Develop an IoT Application for Thing Model

Exercises / Solutions

Domnic Savio Benedict, SAP SE

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1 OVERVIEW & PREREQUISITES

This tutorial describes building a User interface for displaying the timeseries data. For the storage of the data and the creation of the UI SAP Leonardo foundation (Integration Framework & IoT Application Enablement) is used.

1.1 Technical Scenario

The Integration Framework ingests the data from the files or via FTP into the SAP Leonardo foundation. Data is forwarded to SAP IoT Application Enablement using Kafka as a message broker. Finally, we use SAP Web IDE to create an UI5 Application, completely code free and visualize the data stored in SAP IoT Application Enablement.

This tutorial walks you through all steps that are necessary to build a simple visualization and help you explore the possibilities.

1.2 Prerequisites

Following prerequisites hardware and software is required to set up and run this scenario.

Hardware Prerequisites:

- WLAN / Internet Access
- Laptop

Software Prerequisites:

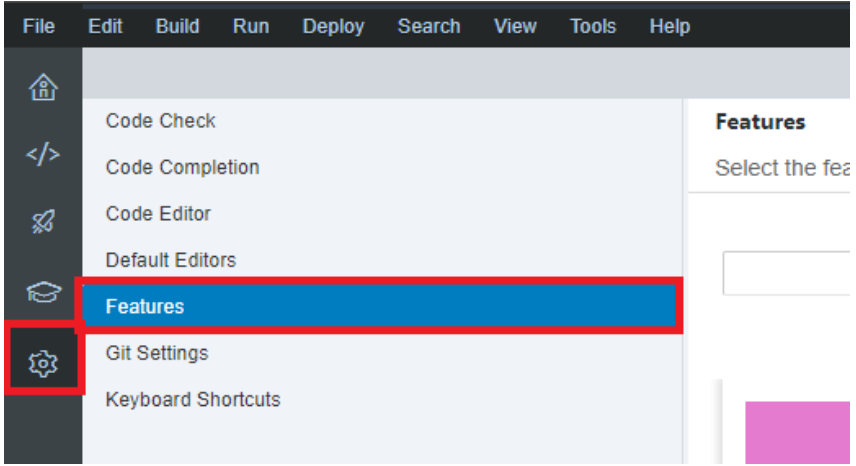
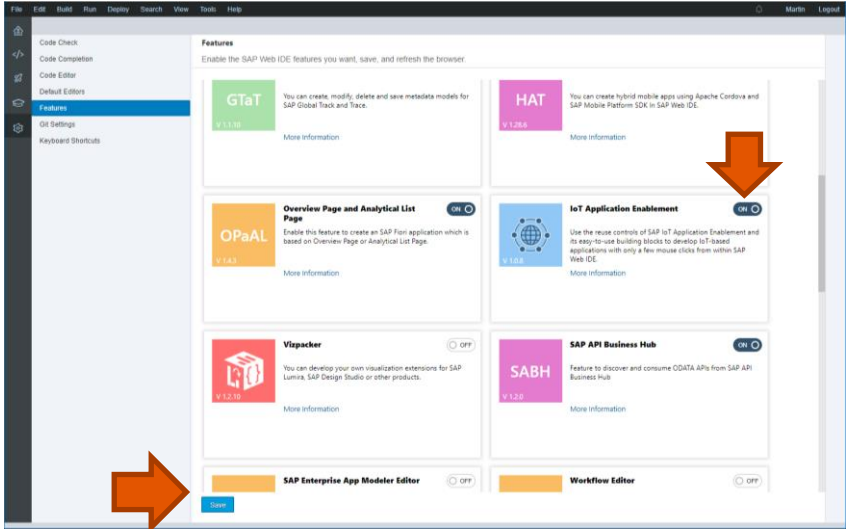
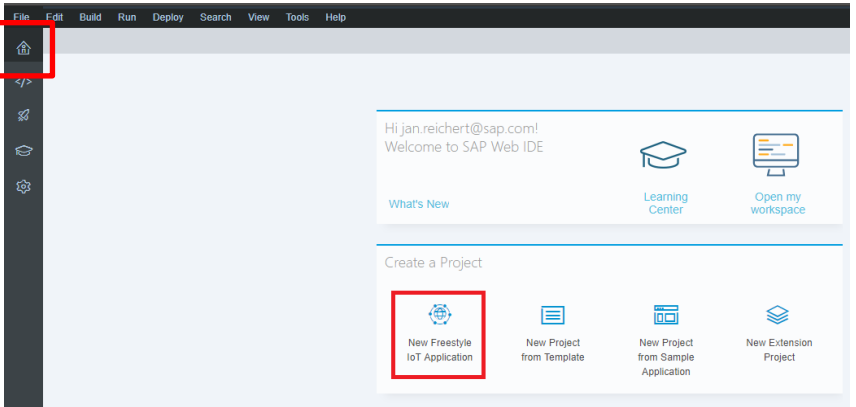
- Access to Web IDE for developing the UI

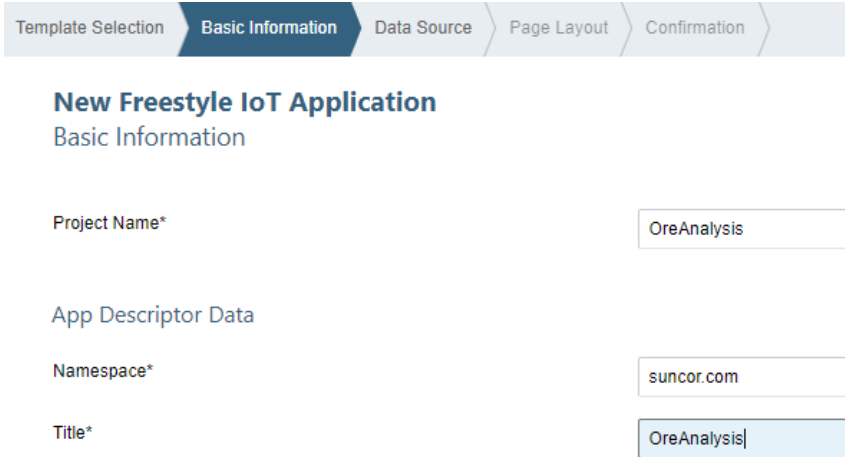

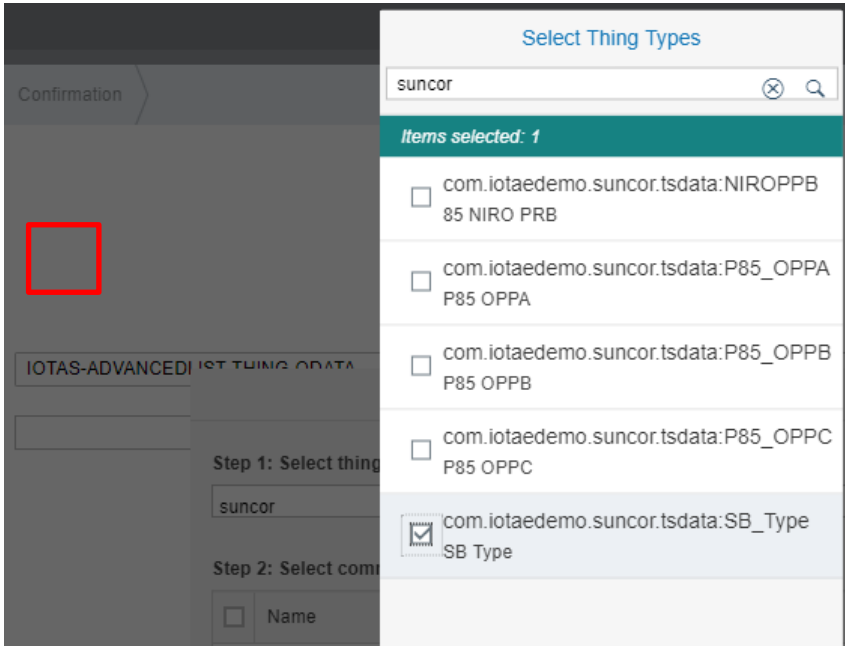
1.3 User & Tenant Access Information

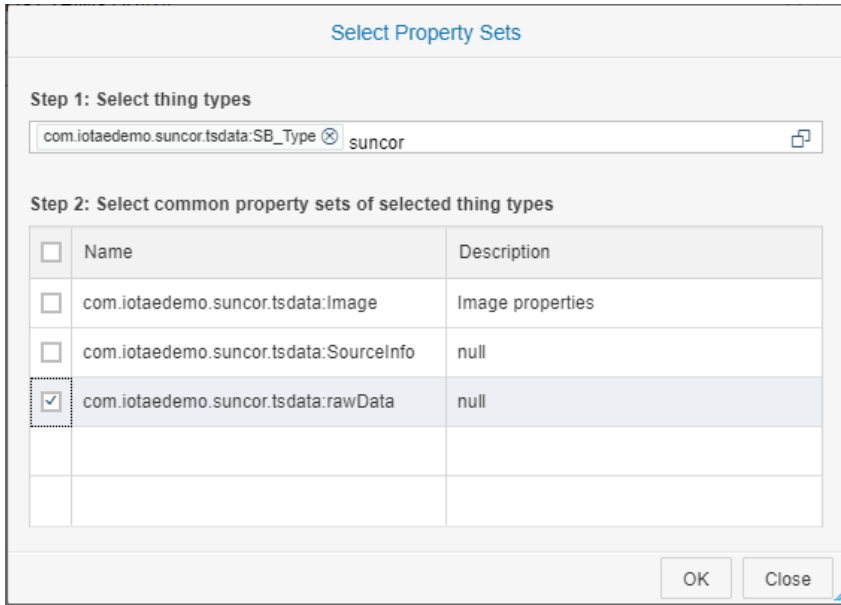
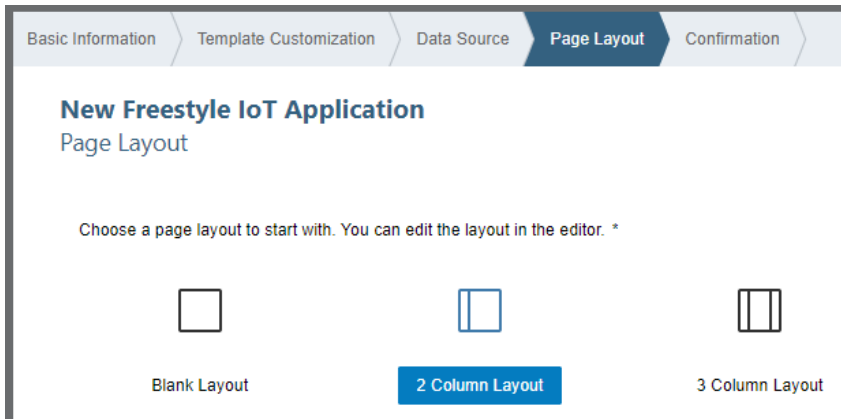
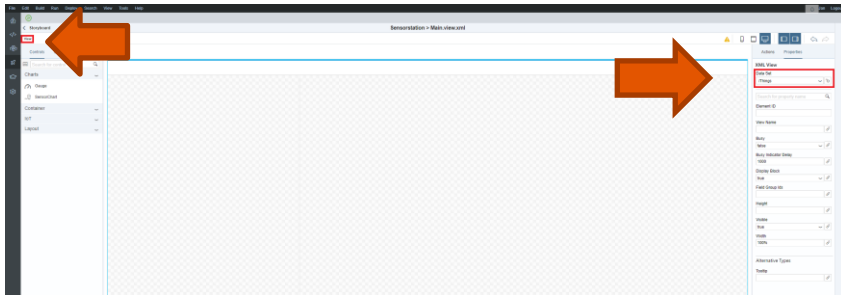
For the Leonardo live we will use the following links:

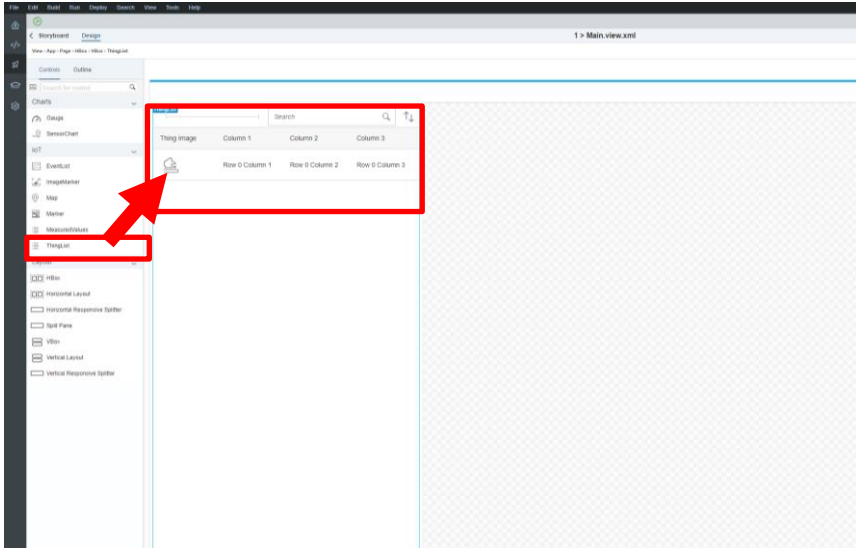
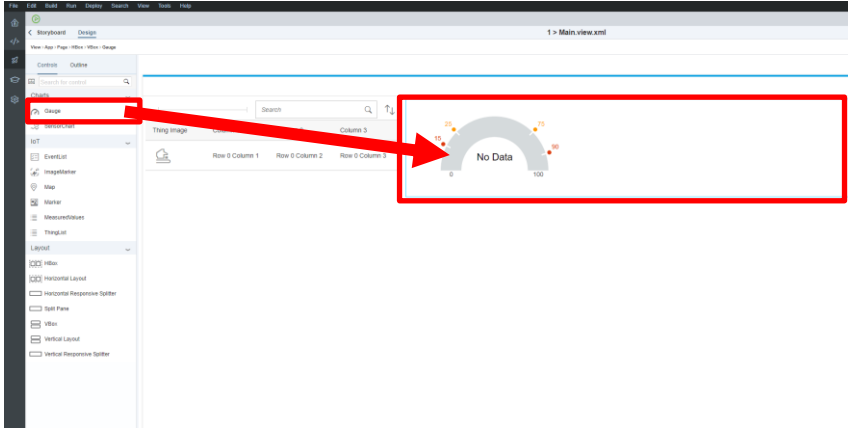
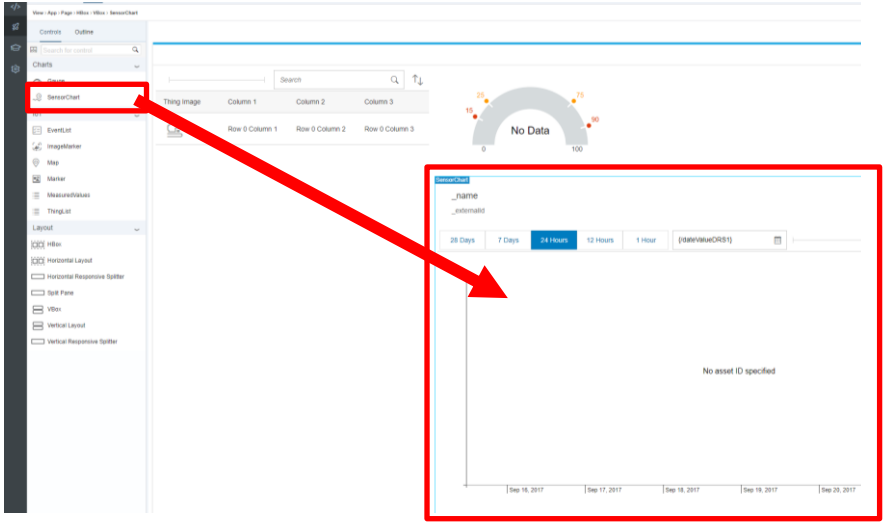
Information	Value	Comment
SAP Integration Framework	https://mb-dev.cfapps.eu10.hana.ondemand.com/B1iXcellerator/exec/dummy/com.sap.b1ip.system.cc/bfd/AdminConsole.bfd?!defdoc=/com.sap.b1i.dev.ide/ui/devIDE.xml	Select Development and Expand the package sap.suncor.
User	suncoradmin	Please do not distribute
Password	Abcd1234	Will be active till 1 st April
SAP IoT Application Enablement	https://com-iotaedemo.iot-sap.cfapps.eu10.hana.ondemand.com/launchpage/#Shell-home	Launchpage to access Thing Modeler
SAP Web IDE	https://webidecp-a1213b798.dispatcher.hana.ondemand.com	WebIDE is used to create your UI5 app
User	demo-user@gmx.net	Please do not distribute
Password	DaVinci1244	Will be active till 1 st April

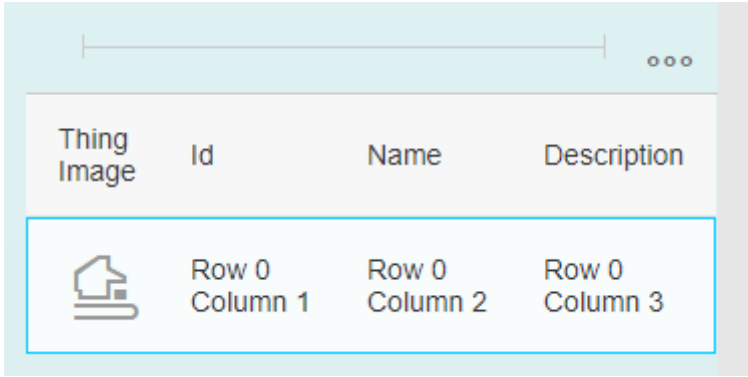
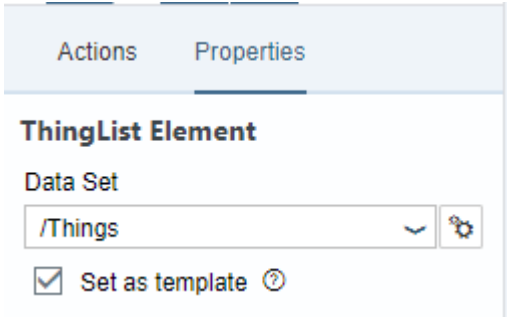
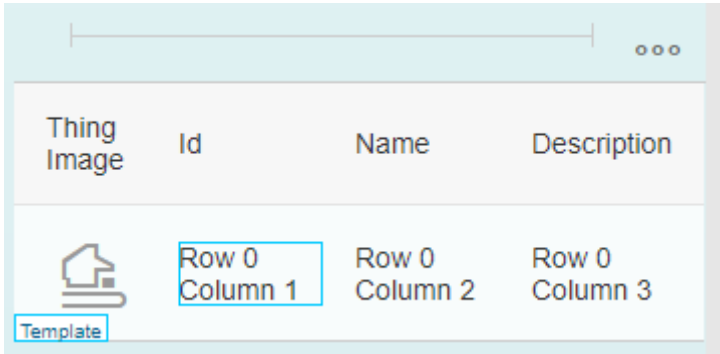
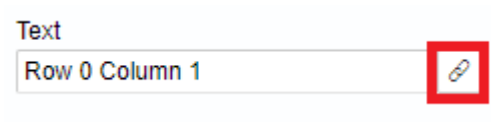
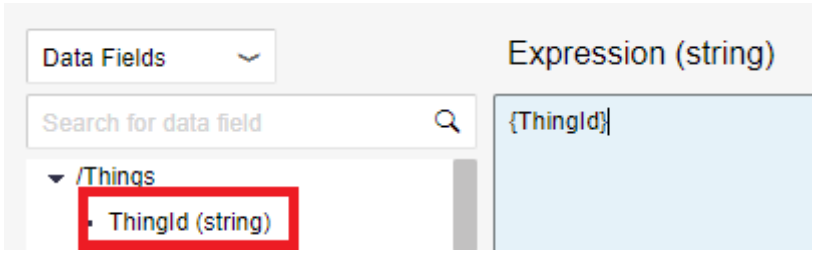
2 BUILD A UI TO DISPLAY SENSOR DATA WITH SAP IOT APPLICATION ENABLEMENT

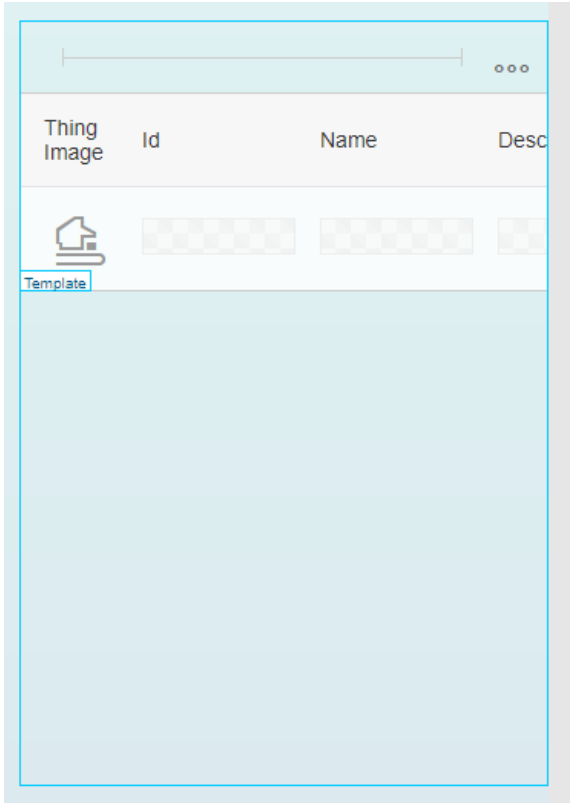
Explanation	Screenshot
<p>1) Open the SAP Web IDE: https://webidecp-a2667617c.dispatcher.hana.on-demand.com/</p> <p>2) Enter your credentials to log in</p> <p>3) Go to Preferences -> Features</p>	 <p>The screenshot shows the SAP Web IDE interface. The left sidebar contains a list of menu items: File, Edit, Build, Run, Deploy, Search, View, Tools, and Help. The 'Features' menu item is highlighted in blue. The main area displays a list of features: Code Check, Code Completion, Code Editor, Default Editors, Features, Git Settings, and Keyboard Shortcuts. The 'Features' menu item is highlighted in blue.</p>
<p>4) Make sure the IoT Application Enablement feature is enabled. If not, click on the toggle button in the upper right corner of the tile and then click on Save in the lower left corner. The SAP Web IDE will reload.</p>	 <p>The screenshot shows the 'Features' page in the SAP Web IDE. The 'IoT Application Enablement' feature tile is highlighted with a red box. The toggle switch for this feature is set to 'ON'. An orange arrow points to the 'Save' button at the bottom left of the page.</p>
<p>5) Navigate back to the Home screen and select New Freestyle IoT Application to create your Project</p>	 <p>The screenshot shows the Home screen of the SAP Web IDE. The 'New Freestyle IoT Application' button is highlighted in the 'Create a Project' section. The button is located under the 'What's New' heading.</p>

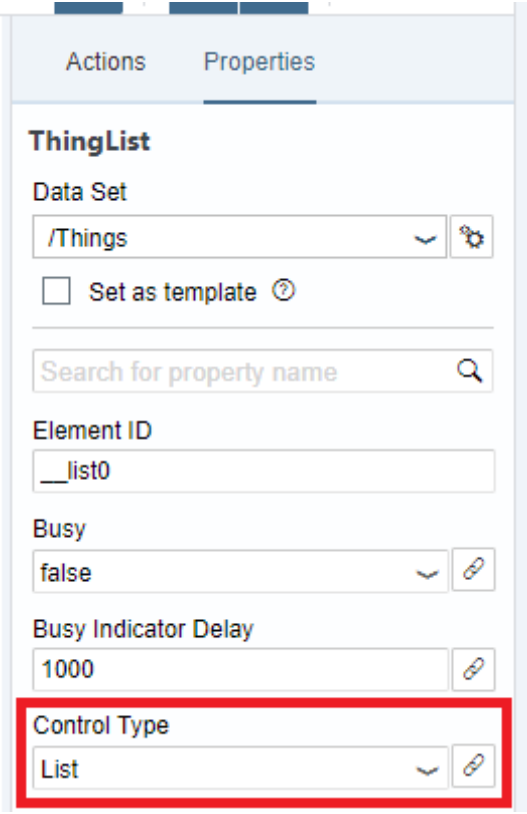
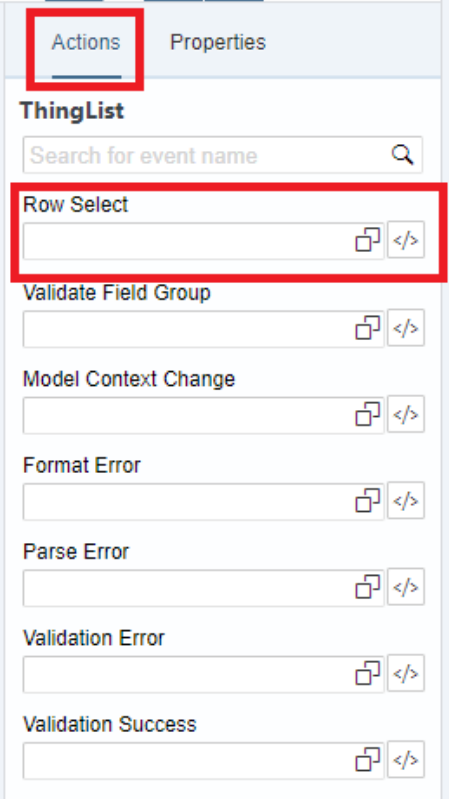
Explanation	Screenshot
<p>6) Enter the following information and click Next</p> <ul style="list-style-type: none"> Project Name: "OSIPiData" Namespace: "suncor" Title: "OreAnalysis" <p>Hint: If the project name already exists, add your initials to the name and click Next.</p>	
<p>7) Select the service Freestyle IoT: Things OData Service from the drop-down menu</p>	
<p>8) Make use of the value help (F4) to select the Property Sets. A pop-up called Select Property Sets will open.</p> <p>9) For selecting the thing type open the value help (F4) in Step1.</p> <p>10) Search for suncor, select the thing type with name com.iotaedemo.suncor.tsdata and click OK.</p> <p>11) In Step 2 of the Select Property Sets popup select all property sets.</p> <p>12) Click OK and then Next.</p>	

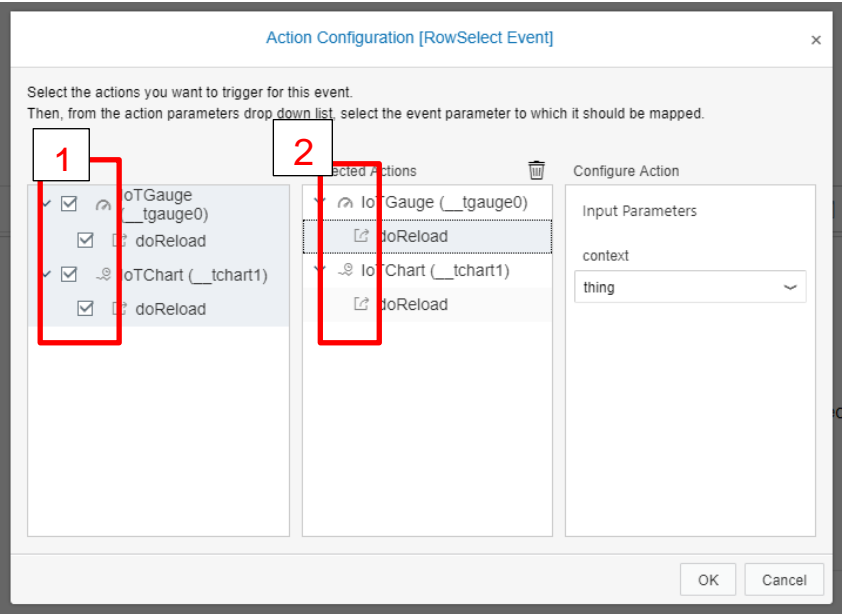
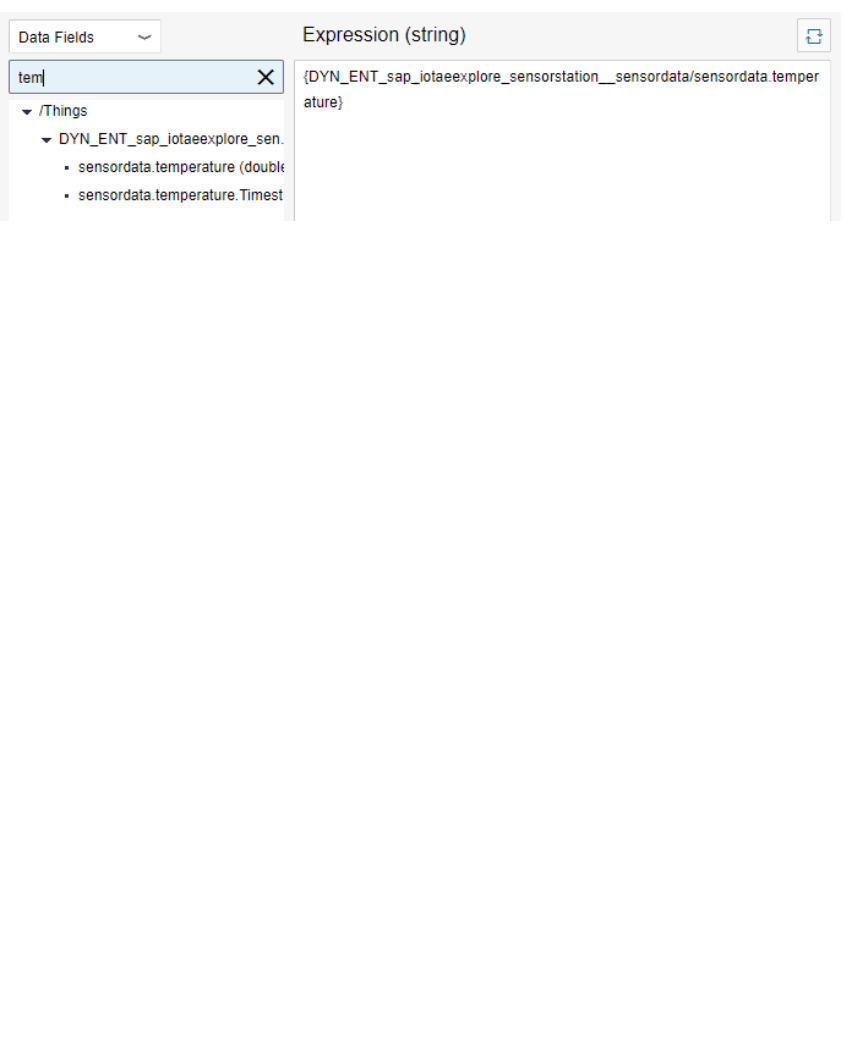
Explanation	Screenshot
	
13) As page layout select 2 Column Layout and click Finish . Your project is now generated.	
14) Click on View on the breadcrumb menu in the corner of SAP Web IDE. 15) In the menu on the right select the tab Properties . 16) Open the drop down Data Set select /Things . 17) Confirm to change the data set for the selected control. This will be you default service for all UI controls in the application.	

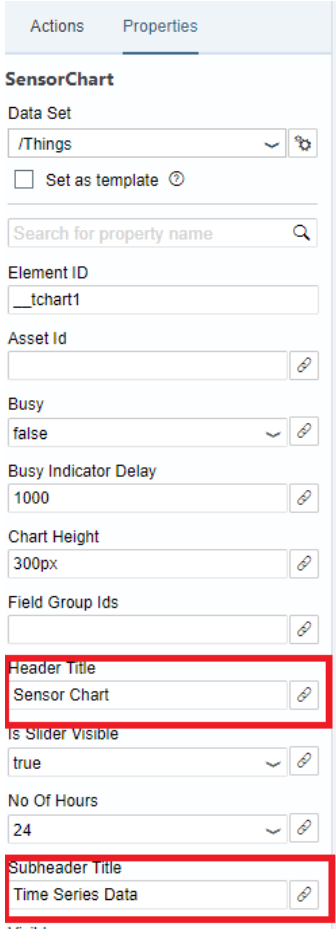
Explanation	Screenshot
<p>18) On the left side of the screen open the group IoT which contains IoT specific controls</p> <p>19) Drag&drop the Thing List to the left column of your application.</p>	
<p>20) Open the group Charts</p> <p>21) Drag&Drop the Gauge chart to the upper right</p>	
<p>22) Drag&Drop the Sensor Chart to the lower right</p>	

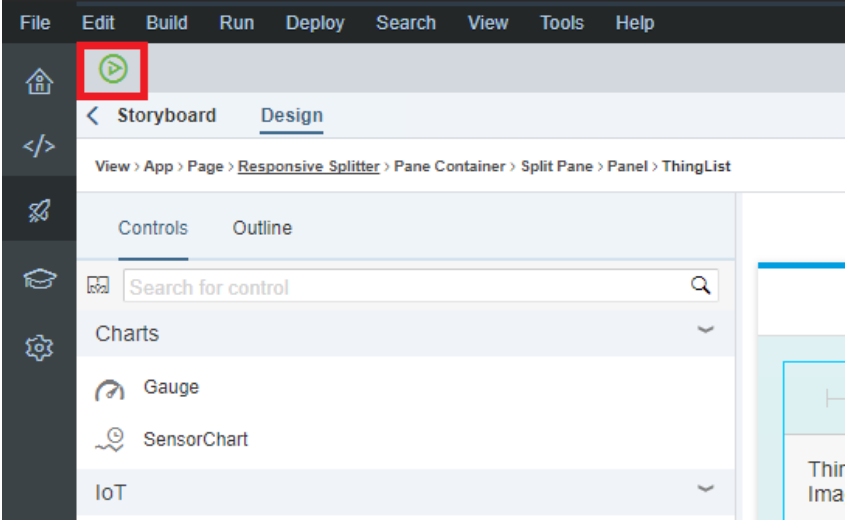
Explanation	Screenshot
<p>23) Select the second row of the Thing List control you have dragged in the left column of your application.</p> <p>Hint: You must see the blue frame around the whole row.</p>	
<p>24) On the right side of the screen in the tab Properties, activate the check box Set as template.</p> <p>25) A pop up will be shown. Confirm the creation of a template by selecting OK.</p>	
<p>26) Select the Row 0 Column 1 in the second row of the Thing List control.</p>	
<p>27) On the right side of the screen in the tab Properties click on the icon with the chain symbol in the field Text. You can then bind this property to a data field.</p> <p>28) A popup will open.</p>	
<p>29) Delete all expressions in the text field on the right</p> <p>30) Search for Data Field ThingId</p> <p>31) Double click on ThingId.</p> <p>32) Click on OK.</p>	

Explanation	Screenshot
33) Repeat step 27 to 30 for the other two columns. Select ThingName and ThingDescription .	
34) Select the complete Thing List . Hint: The blue frame must be around the complete Thing List .	

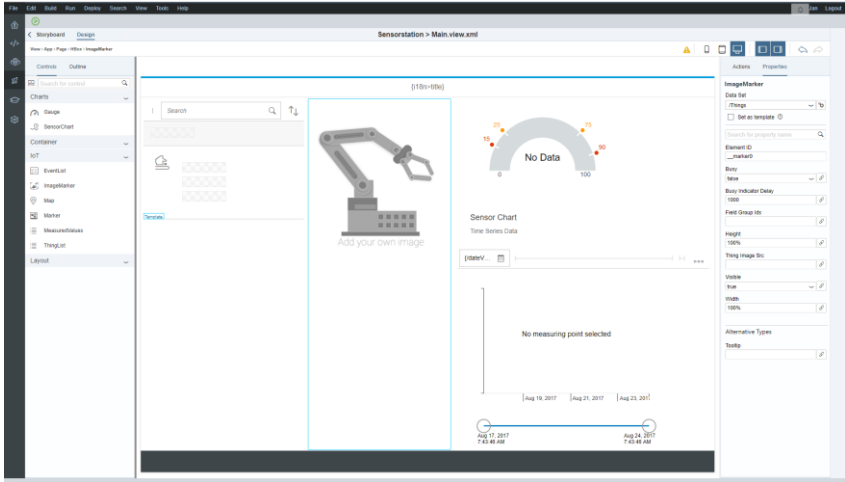
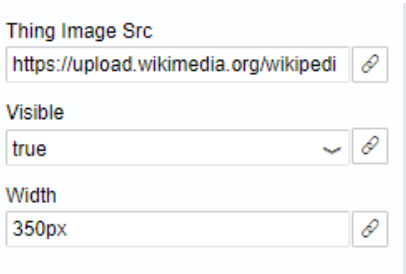
Explanation	Screenshot
<p>35) Change the Control Type to List.</p>	 <p>The screenshot shows the 'Properties' tab for a 'ThingList' control. The 'Control Type' dropdown is highlighted with a red box and set to 'List'. Other visible properties include 'Data Set' (set to '/Things'), 'Element ID' (set to '__list0'), 'Busy' (set to 'false'), and 'Busy Indicator Delay' (set to '1000').</p>
<p>36) Click on Actions, select the field Row Select and click F4.</p>	 <p>The screenshot shows the 'Actions' tab for a 'ThingList' control. The 'Row Select' action is highlighted with a red box. Other visible actions include 'Validate Field Group', 'Model Context Change', 'Format Error', 'Parse Error', 'Validation Error', and 'Validation Success'.</p>

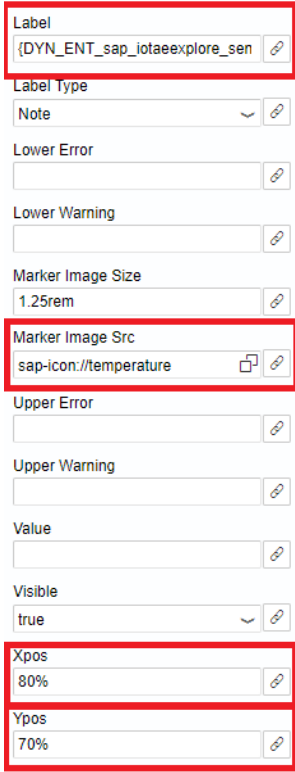

Explanation	Screenshot
<p>37) Select all check boxes and click OK.</p>	
<p>38) Select the Gauge chart and select the tab Properties on the right panel</p> <p>39) In the field Value click on Bind this Property (chain symbol).</p> <p>40) A Popup will open.</p> <p>41) Delete all expressions in the text field on the right, if there are any</p> <p>42) Under Data Fields search for temp</p> <p>43) Select the entry temperature.temperature(double)</p> <p>44) Click on OK</p> <p>45) Optional: Now enter the following values to the other fields:</p> <ul style="list-style-type: none"> • Lower Error: 15 • Lower Warning: 18 • Max Value: 40 • Upper Error: 	

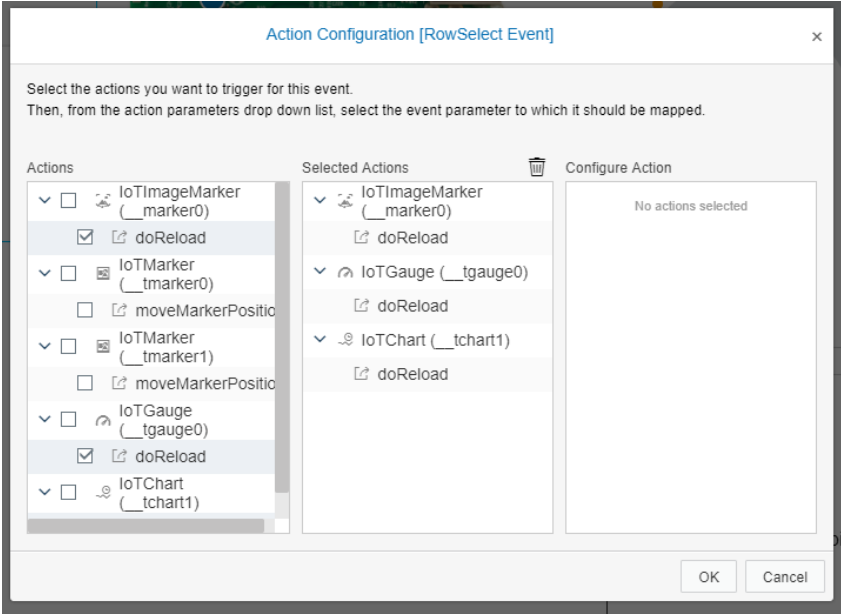
Explanation	Screenshot
<p>28</p> <ul style="list-style-type: none"> • Upper Warning: 25 • Unity Of Measure: °C • Label Temperature 	
<p>46) Select the Sensor Chart.</p> <p>47) Enter Sensor Chart as Header Title and Time Series Data as Subheader Title.</p>	 <p>The screenshot shows the 'SensorChart' configuration panel with the 'Properties' tab selected. The following properties are visible:</p> <ul style="list-style-type: none"> Data Set: /Things Set as template: <input type="checkbox"/> Search for property name: (Search bar) Element ID: _tchart1 Asset Id: (Empty field) Busy: false Busy Indicator Delay: 1000 Chart Height: 300px Field Group Ids: (Empty field) Header Title: Sensor Chart (highlighted with a red box) Is Slider Visible: true No Of Hours: 24 Subheader Title: Time Series Data (highlighted with a red box)

Explanation	Screenshot
48) Click on the green Arrow in the upper left corner. The app will open in a preview version.	 The screenshot shows the Visual Studio Code interface. At the top, there is a menu bar with options: File, Edit, Build, Run, Deploy, Search, View, Tools, and Help. Below the menu bar, there is a toolbar with icons for Home, Run and Debug (a green play button), and Source Control. The Run and Debug icon is highlighted with a red square. Below the toolbar, there are tabs for Storyboard and Design. The Design tab is active. Below the tabs, there is a breadcrumb trail: View > App > Page > Responsive Splitter > Pane Container > Split Pane > Panel > ThingList. Below the breadcrumb trail, there are tabs for Controls and Outline. The Controls tab is active. Below the Controls tab, there is a search bar labeled "Search for control" with a magnifying glass icon. Below the search bar, there is a list of controls: Charts, Gauge, SensorChart, and IoT. The Gauge and SensorChart controls are expanded, showing their sub-items. The Gauge sub-items are Gauge and SensorChart. The SensorChart sub-items are SensorChart and ThingList. The IoT sub-items are IoT and ThingList. The ThingList sub-items are ThingList and Thir lma.

3. OPTIONAL: EXTEND YOUR APPLICATION

Explanation	Screenshot
<ol style="list-style-type: none"> 1) Go back to the Application Builder. 2) Drag and drop the Image Marker between the ThingList and the Gauge. 	
<ol style="list-style-type: none"> 3) In the Properties tab enter https://upload.wikimedia.org/wikipedia/commons/e/e6/Raspberry-Pi-3-Flat-Top.jpg in the Thing Image Src field. 4) Set the Width to 350px. 	

Explanation	Screenshot
<p>5) Drag and drop a Marker on top of the ImageMarker.</p> <p>6) In the Properties tab enter 80% as Xpos and 70% as Ypos.</p> <p>7) Click on Bind this property. for the the Label property and select the temperature in the pop up.</p> <p>8) Go to the Marker Image Src property and click F4.</p> <p>9) In the pop up search for temperature and select the icon.</p>	
<p>10) Select the other Marker in the upper left corner of the ImageMarker and enter the following values:</p> <ul style="list-style-type: none"> Xpos: 20% Ypos: 20% Label: Select humidity in the pop up Animation Type: GrowPulse Animation If Error Status: false 	

Explanation	Screenshot
<p>11) Click on the ThingList and go to the Actions tab.</p> <p>12) Select Row Select and mark the checkbox doReload for the IoTImageMarker.</p> <p>13) Press OK and simulate the app via the green arrow button again to show the results in the running application</p>	 <p>The screenshot shows the 'Action Configuration [RowSelect Event]' dialog box. It contains three main sections: 'Actions', 'Selected Actions', and 'Configure Action'. The 'Actions' list on the left includes several IoT components, with 'doReload' checked for 'IoTImageMarker (__marker0)', 'IoTGauge (__tgaug0)', and 'IoTChart (__tchart1)'. The 'Selected Actions' list on the right shows these three actions being mapped to the event. The 'Configure Action' section on the right is currently empty, displaying 'No actions selected'. At the bottom right, there are 'OK' and 'Cancel' buttons.</p>