

PUBLIC

# **Build a Workflow from Scratch with SAP Workflow Management**

## **DEV163**

Prerequisite / Setup  
Archana Shukla / SAP

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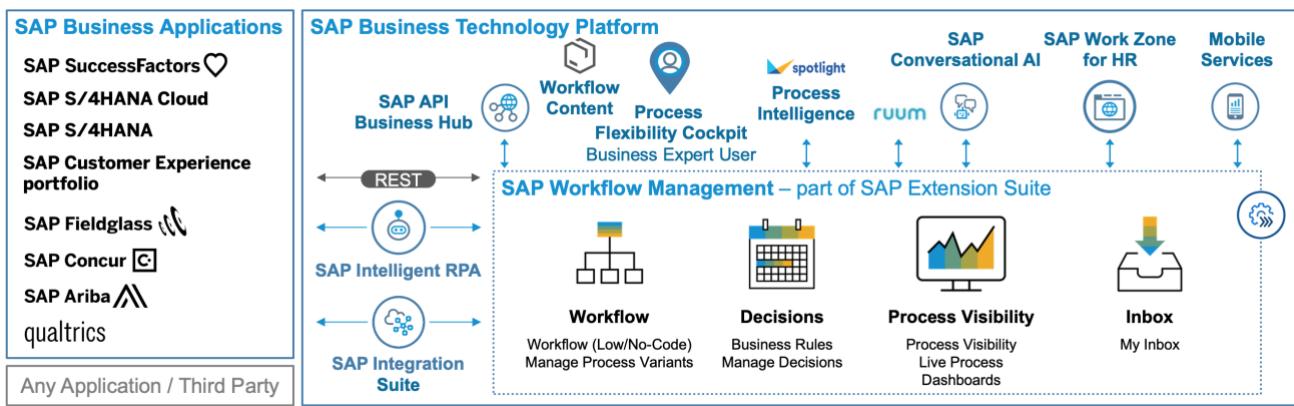
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## OVERVIEW

Estimated time: 15 minutes.

In this hands-on workshop you will be using your SAP Business Technology Platform Trial account. You will learn how to model, manage and monitor workflow, business rules and process visibility capabilities of Workflow Management.

**Workflow Management** is a cloud offering from SAP which constitutes different capabilities that helps you to digitize your processes and decisions, and to get end-to-end visibility into your processes. Not only this we are accelerating the productivity with infusion of intelligent technologies like Intelligent RPA, Conversational AI and providing ways to flexibly configure & extend the processes in a no-code low-code environment.



Before you start with the exercises, setting up your SAP BTP trial account is an important prerequisite.

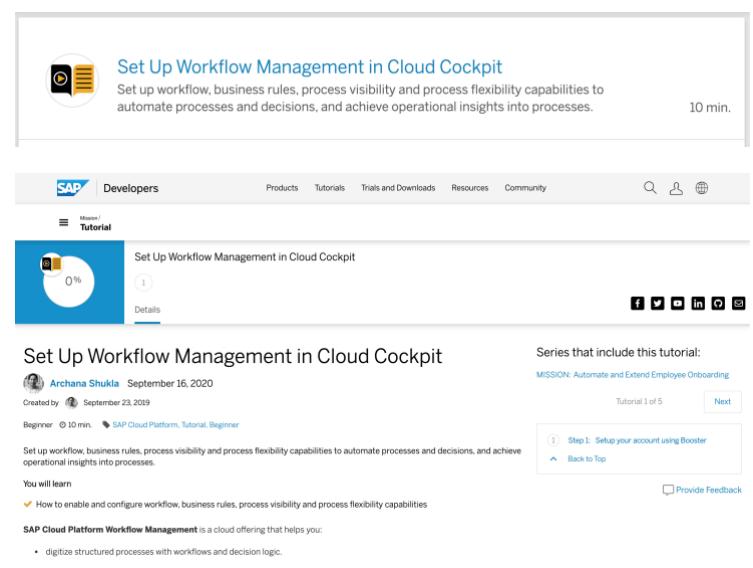
With [Booster](#), we have now fully automated the setup of workflow, business rules, process visibility and workflow management services in SAP BTP environment. It does the following tasks which you would have otherwise done manually:

- 1 Configures Business Rules, Workflow, Process Visibility and Workflow Management entitlements.
- 2 Enables Workflow Management and Business Application Studio subscriptions.
- 3 Creates service instance of Business Rules, Workflow, Process Visibility and Workflow Management.
- 4 Creates Destination with name BUSINESS\_RULES, BUSINESSRULES\_APIHUB and and 'WM\_CF\_SPACE\_PROVIDER'.  
These destinations will be used while integrating business rules with workflow, importing business rules project from API Hub and Importing live process content from process hub respectively.
- 5 Assign all the Workflow Management role collections to trial user.

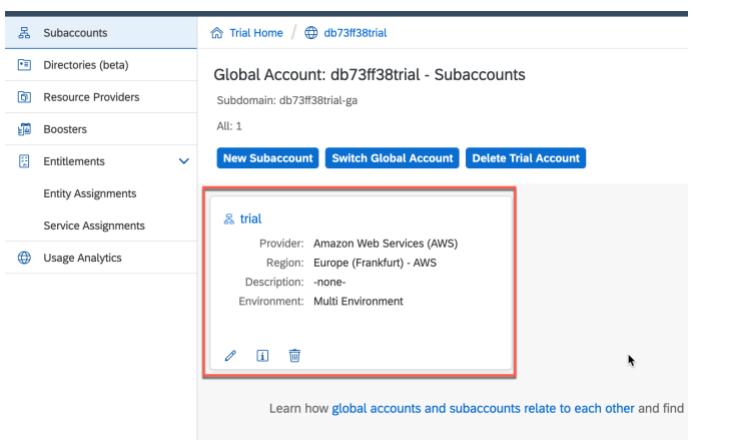
As part of the initial setup, you will do the following to make your trial account ready to get started:

1. Run the Workflow Management Booster.
2. Configure destinations to update your trial password.
3. Import & deploy sample workflow management scenario. This sample process content contains pre-built workflow, business rules and process visibility. These contents will be used in the exercises.

## SETUP BUSINESS TECHNOLOGY PLATFORM ACCOUNT USING BOOSTER

Explanation	Screenshot
<ol style="list-style-type: none"> <li>Follow the tutorial to setup your account using Booster:  <a href="https://developers.sap.com/tutorials/cp-starter-ibpm-employeeonboarding-1-setup.html">https://developers.sap.com/tutorials/cp-starter-ibpm-employeeonboarding-1-setup.html</a></li> </ol>	 <p>The screenshot shows the SAP Developers website with the title 'Set Up Workflow Management in Cloud Cockpit'. Below the title, there's a brief description: 'Set up workflow, business rules, process visibility and process flexibility capabilities to automate processes and decisions, and achieve operational insights into processes.' A progress bar indicates 0% completion. The page includes social sharing icons and a sidebar with navigation links like 'Products', 'Tutorials', 'Trials and Downloads', 'Resources', and 'Community'.</p> <p><b>Set Up Workflow Management in Cloud Cockpit</b></p> <p>Set up workflow, business rules, process visibility and process flexibility capabilities to automate processes and decisions, and achieve operational insights into processes.</p> <p>0 %</p> <p>Details</p> <p><b>Set Up Workflow Management in Cloud Cockpit</b></p> <p>Archana Shukla September 16, 2020</p> <p>Created by September 23, 2019</p> <p>Beginner 10 min. SAP Cloud Platform, Tutorial, Beginner</p> <p>Set up workflow, business rules, process visibility and process flexibility capabilities to automate processes and decisions, and achieve operational insights into processes.</p> <p>You will learn</p> <ul style="list-style-type: none"> <li>How to enable and configure workflow, business rules, process visibility and process flexibility capabilities</li> </ul> <p>SAP Cloud Platform Workflow Management is a cloud offering that helps you:</p> <ul style="list-style-type: none"> <li>digitize structured processes with workflows and decision logic.</li> </ul> <p>Series that include this tutorial: MISSION: Automate and Extend Employee Onboarding</p> <p>Tutorial 1 of 5</p> <p>Step 1: Setup your account using Booster</p> <p>Back to Top</p> <p>Provide Feedback</p>

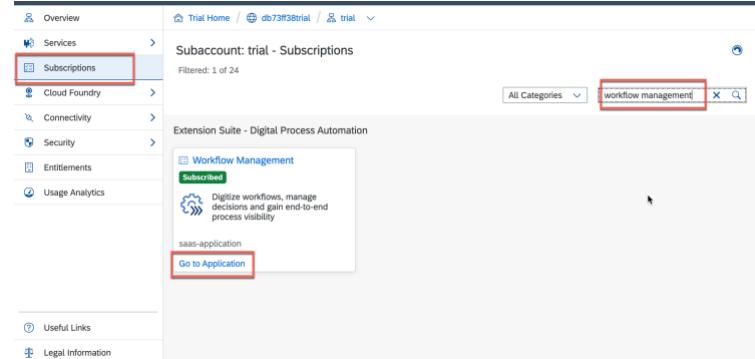
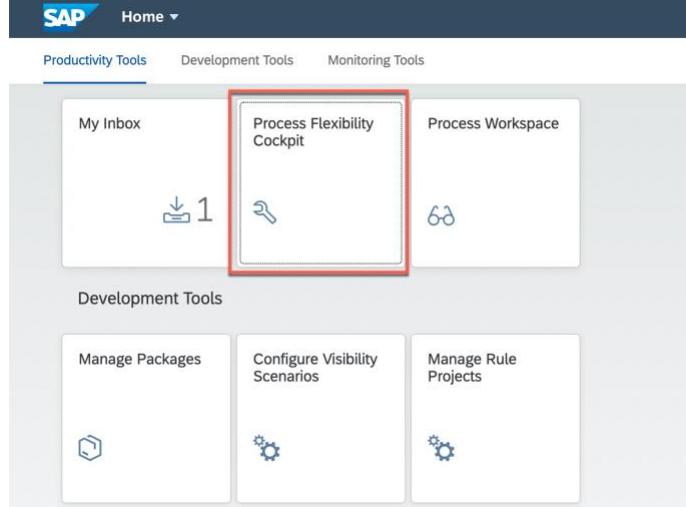
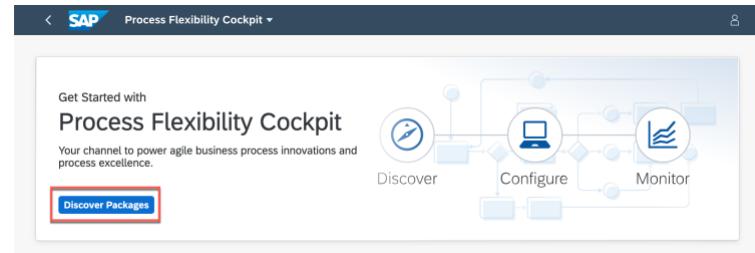
## CONFIGURE DESTINATION

Explanation	Screenshot
<p><b>WM_CF_SPACE_PROVIDER</b> destination is used in Process Flexibility Cockpit while importing the sample content from API Business Hub. This destination is already created in the previous set up tutorial, and now you will configure the destination for the password.</p> <ol style="list-style-type: none"> <li>From your global account page, click the <b>trial</b> tile to access your subaccount.</li> </ol>	 <p>The screenshot shows the SAP Global Account page for the subaccount 'trial'. The subaccount details are listed as follows:</p> <ul style="list-style-type: none"> <li>Provider: Amazon Web Services (AWS)</li> <li>Region: Europe (Frankfurt) - AWS</li> <li>Description: -none-</li> <li>Environment: Multi Environment</li> </ul> <p>Below the details, there are edit, delete, and refresh icons. A note at the bottom says: 'Learn how global accounts and subaccounts relate to each other and find'.</p>

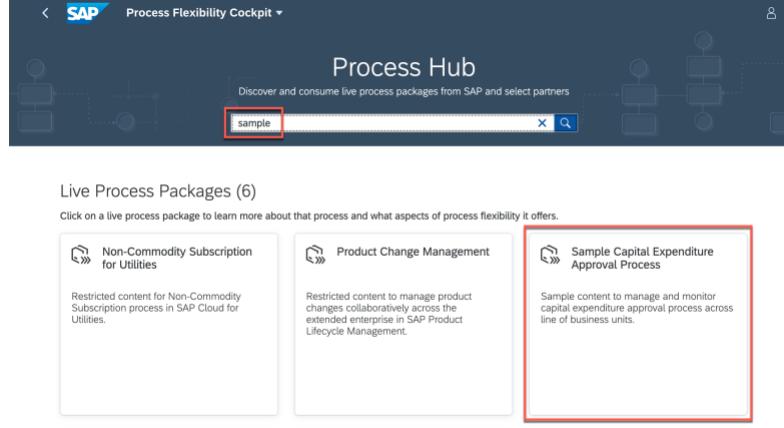
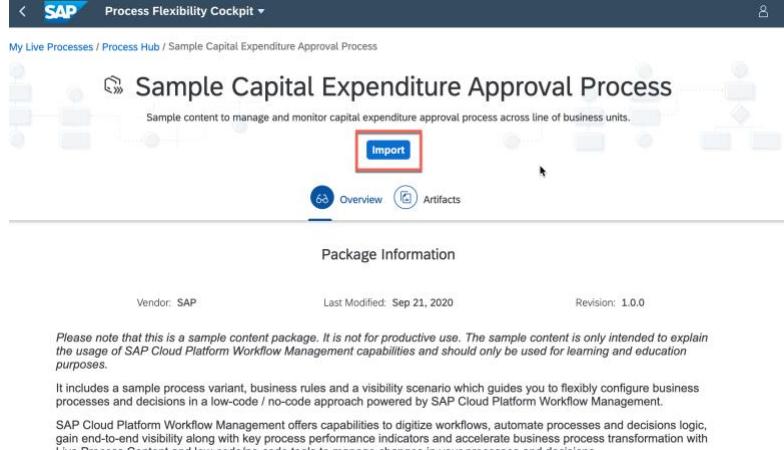
Explanation	Screenshot
<p>3. Click <b>Connectivity   Destinations</b> from the left-hand navigation and search for the destination with name <b>WM_CF_SPACE_PROVIDER</b>. Click on the destination to configure its properties.</p>	
<p>4. In <b>Destination Configuration</b> section, click <b>Edit</b> and enter your trial user password.</p> <p><b>Caution:</b> Ensure that the <b>Two Factor Authentication</b> is disabled for the user whose username and password are entered in the destination configuration. If not, then register a new user with 2FA disabled.</p>	
<p>5. Click <b>Save</b> to save the changes.</p>	

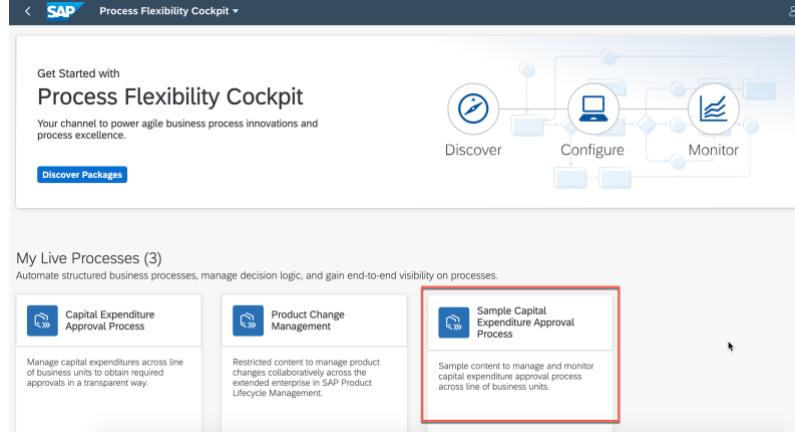
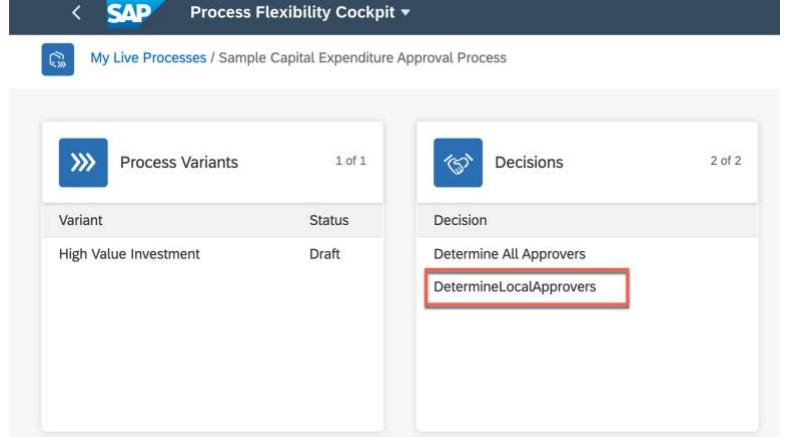
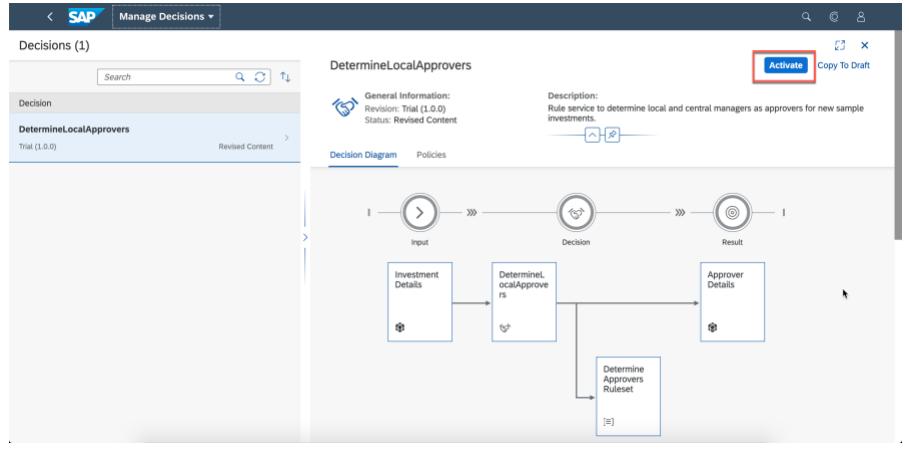
## IMPORT SAMPLE PROCESS CONTENT

## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

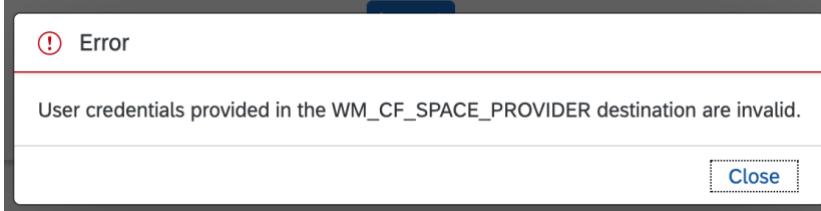
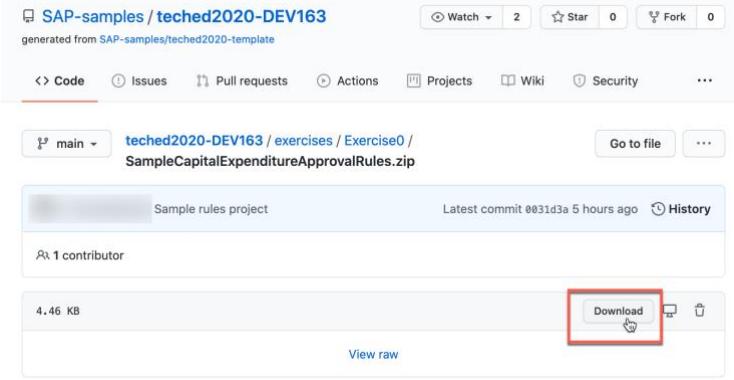
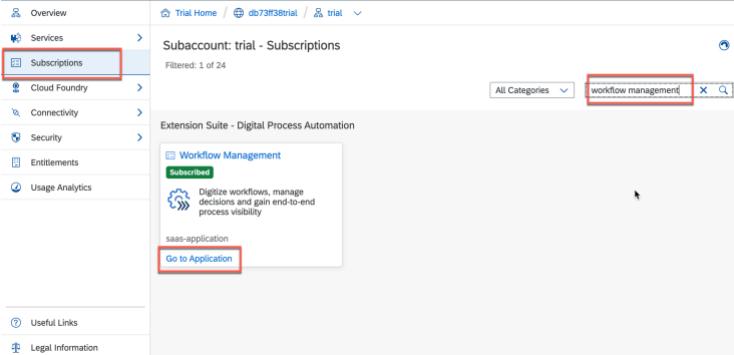
Explanation	Screenshot
<p>6. In your sub-account, click <b>Subscriptions</b>, from the left-panel.</p> <p>7. Search for <b>Workflow Management</b> and click on <b>Go to Application</b> link on the tile.</p>	 <p>The screenshot shows the SAP Subaccount interface. On the left, there's a navigation menu with 'Subscriptions' highlighted. A search bar at the top right contains the text 'workflow management'. Below the search bar, a search result for 'Workflow Management' is displayed, showing its description: 'Digitize workflows, manage decisions and gain end-to-end process visibility' and a 'saas-application' status. A red box highlights the 'Go to Application' button.</p>
<p>8. From the Workflow Management Launchpad, click <b>Process Flexibility Cockpit</b> tile.</p>	 <p>The screenshot shows the SAP Process Flexibility Cockpit launchpad. It features a central 'Process Flexibility Cockpit' tile with a download icon and a magnifying glass icon, which is highlighted with a red box. To the left is 'My Inbox' with a download count of 1. To the right is 'Process Workspace' with a count of 63. Below the main tiles are three smaller buttons: 'Manage Packages', 'Configure Visibility Scenarios', and 'Manage Rule Projects'.</p>
<p>9. Click <b>Discover Packages</b>.</p>	 <p>The screenshot shows the 'Discover Packages' page of the Process Flexibility Cockpit. It has a 'Get Started with Process Flexibility Cockpit' section with a 'Discover Packages' button highlighted with a red box. To the right is a diagram illustrating the 'Discover', 'Configure', and 'Monitor' phases of the process.</p>

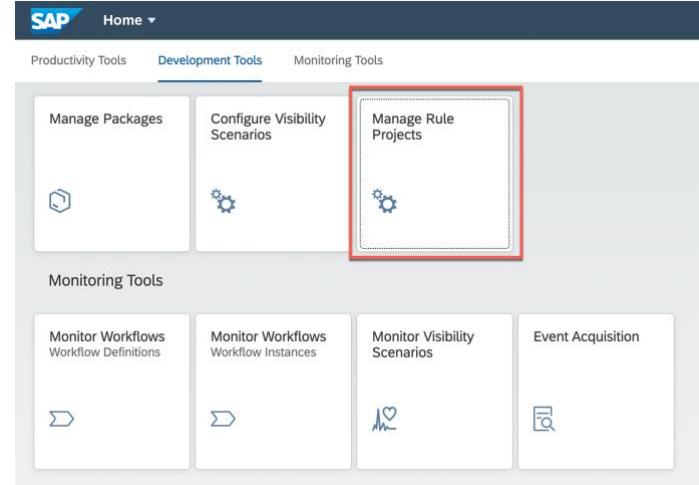
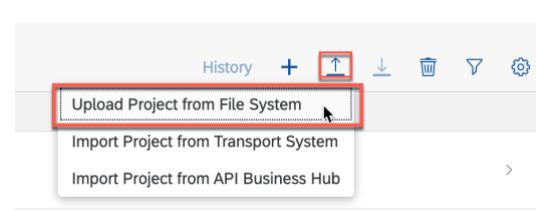
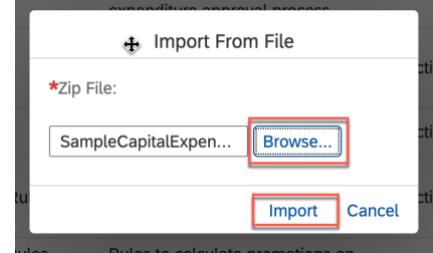
## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

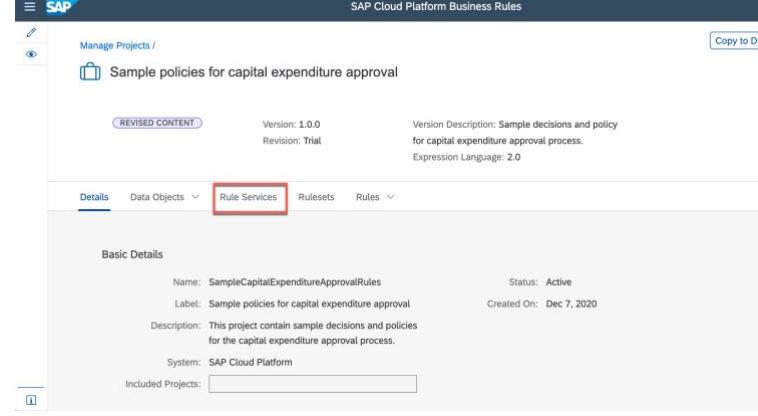
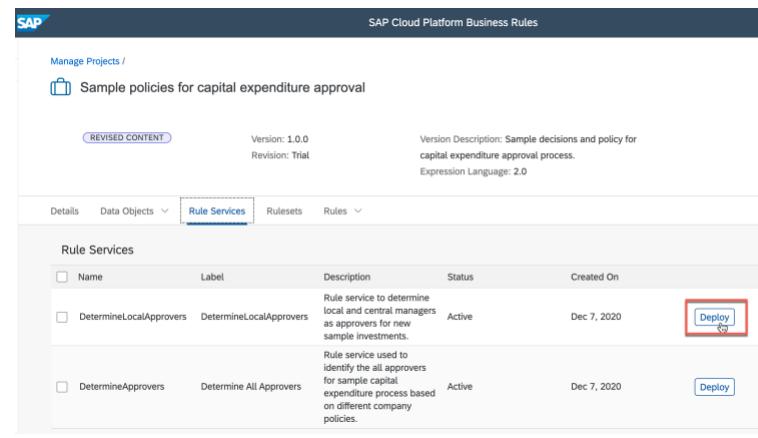
Explanation	Screenshot
<p>10. Search for <b>sample</b> and click on <b>Sample Capital Expenditure Approval Process</b>.</p>	
<p>11. Read the content overview to get information of the content and click on <b>Import</b>.</p> <p>12. In the <b>Import Package</b> popup that comes, click on <b>Import</b> to continue.</p>	
<p>Wait for the content to import. It will take 2-3 minutes for the content to be imported.</p> <p>Once the content is import successfully, you will see the <b>Import</b> button changes to <b>Configure</b>.</p> <p>13. Click on <b>My Live Processes</b> link on top left to go back the to Live Processes dashboard</p>	

Explanation	Screenshot
<p>14. Click on the <b>Sample Capital Expenditure Approval Process</b> to navigate into the package to activate the business rules.</p>	 <p>The screenshot shows the SAP Process Flexibility Cockpit interface. In the 'My Live Processes' section, there are three items listed: 'Capital Expenditure Approval Process', 'Product Change Management', and 'Sample Capital Expenditure Approval Process'. The third item is highlighted with a red box.</p>
<p>15. As you go into the package, click on <b>DetermineLocalApprovers</b> rule from <b>Decisions</b> tile.</p>	 <p>The screenshot shows the SAP Process Flexibility Cockpit interface. It displays two cards: 'Process Variants' (1 of 1) and 'Decisions' (2 of 2). The 'Decisions' card lists 'Determine All Approvers' and 'DetermineLocalApprovers'. The 'DetermineLocalApprovers' rule is highlighted with a red box.</p>
<p>16. In the <b>Manage Decisions</b> application, click on <b>Activate</b>. This will activate and deploy the business rules in your trial account.</p>	 <p>The screenshot shows the SAP Manage Decisions application. It displays the 'DetermineLocalApprovers' decision rule. On the right side, there is a 'Decision Diagram' showing the flow: Input (Investment Details) leads to Decision (DetermineLocalApprovers), which leads to Result (Approver Details). A 'DetermineApproversRuleset' node is also shown. The 'Activate' button is highlighted with a red box.</p>

## TROUBLESHOOTING

Explanation	Screenshot
<p>Symptom: Import of the sample package fails with this error as the user has 2FA enabled:</p> 	
<ol style="list-style-type: none"><li>1. Download <b>SampleCapitalExpenditureApprovalRules.zip</b> rules project <a href="https://github.com/SAP-samples/teched2020-DEV163/blob/main/exercises/Exercise0/">https://github.com/SAP-samples/teched2020-DEV163/blob/main/exercises/Exercise0/</a></li></ol>	
<ol style="list-style-type: none"><li>2. In your sub-account, click <b>Subscriptions</b>, from the left-panel.</li><li>3. Search for <b>Workflow Management</b> and click on <b>Go to Application</b> link on the tile.</li></ol>	

Explanation	Screenshot
<p>4. From the Workflow Management Launchpad, click <b>Manage Rule Projects</b> tile.</p>	
<p>5. Click <b>Import</b> and then click <b>Upload Project from File System</b>.</p>	
<p>6. Click <b>Browse</b> to select the downloaded zip file.      7. Click <b>Import</b>.</p>	
<p>8. The business rules project will be imported as REVISED CONTENT.      9. Click on the <b>Sample Capital Expenditure Approval Process</b> to navigate into the project to deploy the business rules.</p>	

Explanation	Screenshot
<p>10. Switch to <b>Rule Services</b> tab.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The title bar says "SAP Cloud Platform Business Rules". Below it, there's a breadcrumb navigation "Manage Projects / Sample policies for capital expenditure approval". A toolbar with a "Copy to Dr" button is on the right. The main content area has tabs: "REVISED CONTENT", "Version: 1.0.0", "Revision: Trial", "Version Description: Sample decisions and policy for capital expenditure approval process.", "Expression Language: 2.0". The "Rule Services" tab is highlighted with a red box. Below the tabs, there's a "Basic Details" section with fields: Name: "SampleCapitalExpenditureApprovalRules", Status: "Active", Label: "Sample policies for capital expenditure approval", Created On: "Dec 7, 2020", Description: "This project contain sample decisions and policies for the capital expenditure approval process.", System: "SAP Cloud Platform", Included Projects: [empty].</p>
<p>11. Click <b>Deploy</b> to deploy <b>DetermineLocalApprovers</b> rule service.      12. Select <b>Cloud Runtime</b> as system to deploy.      Wait for the successful deployment message to appear on the screen.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The title bar says "SAP Cloud Platform Business Rules". Below it, there's a breadcrumb navigation "Manage Projects / Sample policies for capital expenditure approval". A toolbar with a "Copy to Dr" button is on the right. The main content area has tabs: "REVISED CONTENT", "Version: 1.0.0", "Revision: Trial", "Version Description: Sample decisions and policy for capital expenditure approval process.", "Expression Language: 2.0". The "Rule Services" tab is selected. Below the tabs, there's a table titled "Rule Services" with two rows. The first row contains a checkbox, Name: "DetermineLocalApprovers", Label: "DetermineLocalApprovers", Description: "Rule service to determine local and central managers as approvers for new sample investments.", Status: "Active", Created On: "Dec 7, 2020", and a "Deploy" button with a red box around it. The second row contains a checkbox, Name: "DetermineApprovers", Label: "Determine All Approvers", Description: "Rule service used to identify the all approvers for sample capital expenditure process based on different company policies.", Status: "Active", Created On: "Dec 7, 2020", and a "Deploy" button.</p>

Explanation	Screenshot																				
<p>Symtomm: Booster setup fails at one or more steps</p>																					
<p>[For Trainee]</p> <ol style="list-style-type: none"> <li>1. Re-run the booster again. If it still fails, then inform your trainer who will provide you with an alternate system.</li> <li>2. Open the trial cockpit and navigate to your subaccount. In the subaccount, select <b>Services → Instances and Subscriptions</b> from left panel.</li> <li>3. On the right side, select <b>Subscriptions</b> tab and see if you have <b>SAP Business Application</b> subscription already added.             <ol style="list-style-type: none"> <li>a) If yes, then click on the  and start with the <b>Exercise 1 on Workflow</b>.</li> <li>b) If not, then click on <b>Create</b> button and select <b>Business Application Studio</b> subscription and <b>trial</b> plan to add the subscription to your account.                     <ul style="list-style-type: none"> <li>▪ Click on  to open Business Application Studio and start with <b>Exercise 1 on Workflow</b></li> </ul> </li> </ol> </li> </ol>	<table border="1"> <thead> <tr> <th>Application</th> <th>Plan</th> <th>Created On</th> <th>Changed On</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>SAP Business Application...</td> <td>trial</td> <td>23/09/2020</td> <td>31/01/2021</td> <td>Subscribed</td> </tr> <tr> <td>Launchpad</td> <td>standard</td> <td>20/01/2021</td> <td>20/01/2021</td> <td>Subscribed</td> </tr> <tr> <td>Workflow Management</td> <td>saa-application</td> <td>20/10/2020</td> <td>20/10/2020</td> <td>Subscribed</td> </tr> </tbody> </table>	Application	Plan	Created On	Changed On	Status	SAP Business Application...	trial	23/09/2020	31/01/2021	Subscribed	Launchpad	standard	20/01/2021	20/01/2021	Subscribed	Workflow Management	saa-application	20/10/2020	20/10/2020	Subscribed
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Workflow Management	saa-application	20/10/2020	20/10/2020	Subscribed																	
<p>[For Trainer]</p> <p><b>Alternate System Details</b></p> <p>Workflow Management Launchpad:  <a href="https://sapintelligentbpm-us10.cockpit.workflowmanagement.cfapps.us10.hana.ondemand.com/cp.portal/site#Shell-home">https://sapintelligentbpm-us10.cockpit.workflowmanagement.cfapps.us10.hana.ondemand.com/cp.portal/site#Shell-home</a></p> <p>Username: UserXXX      Password: &lt;this will change with every workshop, please contact IAS admin&gt;</p> <p>Platform user for deployment:      Username: john.edrich.sap@gmail.com      Password: &lt;this will change with every workshop, generate a new one&gt;</p>																					

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# **Build a Workflow from Scratch with SAP Workflow Management**

## **DEV163**

Exercise 1 | Workflow  
Archana Shukla / SAP

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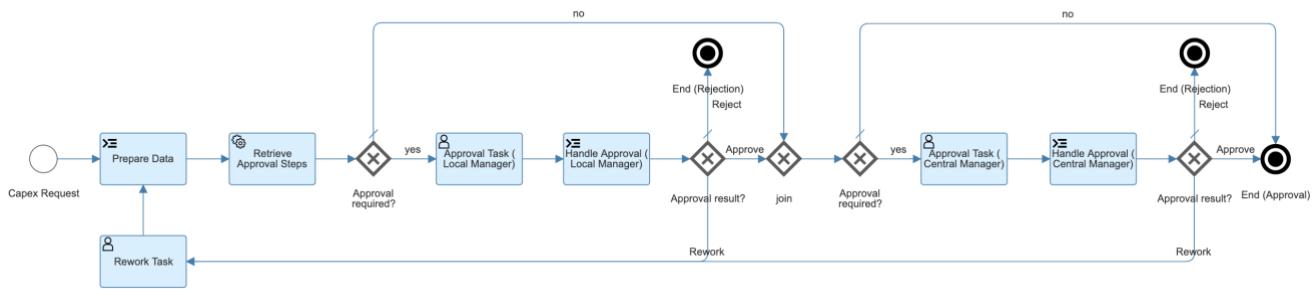
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## OVERVIEW

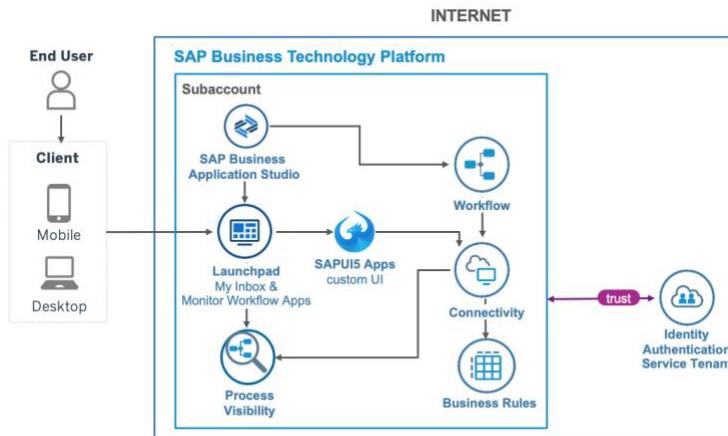
Estimated time: 90 minutes

Capital Expenditure process starts when any company receives a funding request for capital expenditures. These requests are then thoroughly reviewed, evaluated and finally approved or rejected based on the available budgets for the current period. Approval is not straight forward. There are many rules that are involved to determine how many levels of approvals will be there or who will approve it based on the investment details.

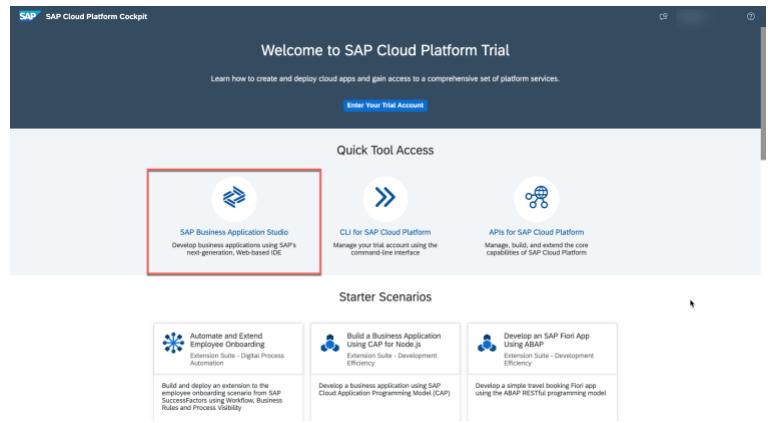
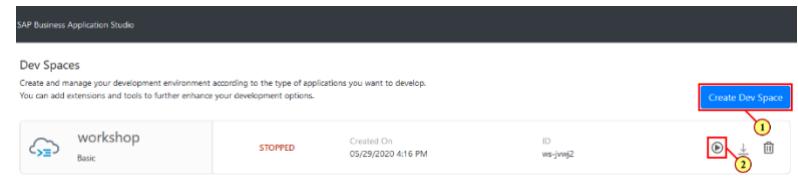
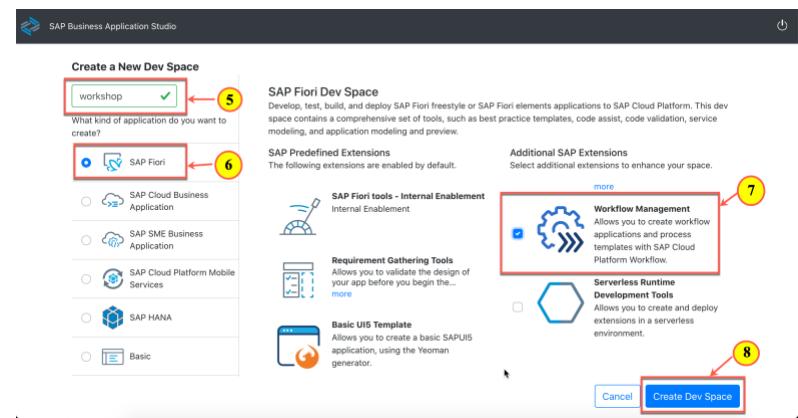
There are many challenges with capital expenditure process and companies are always looking for managing investment decisions in a transparent way. Automating capital expenditure approval process enables customer to accelerate investment decisions and to bring the agility into every step and decision such that the corporate policies are followed while taking the investment decisions.

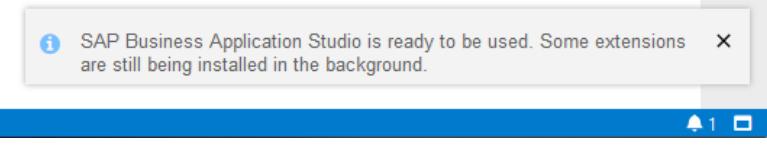
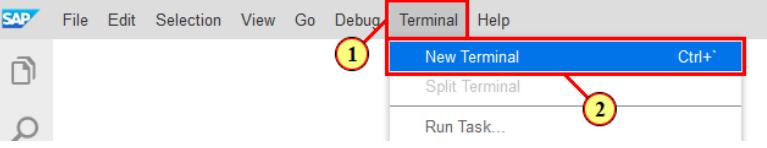
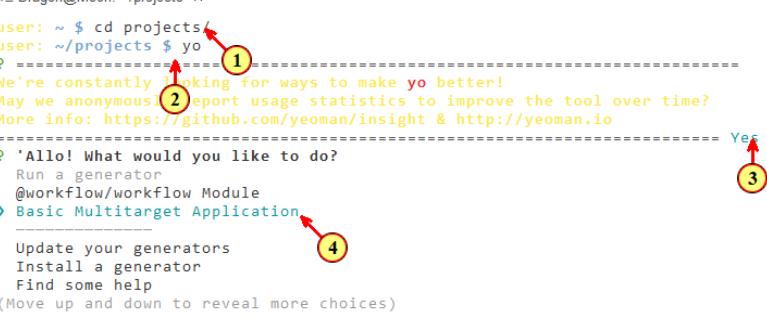
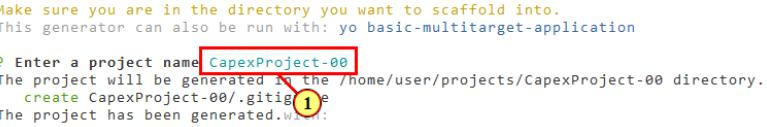


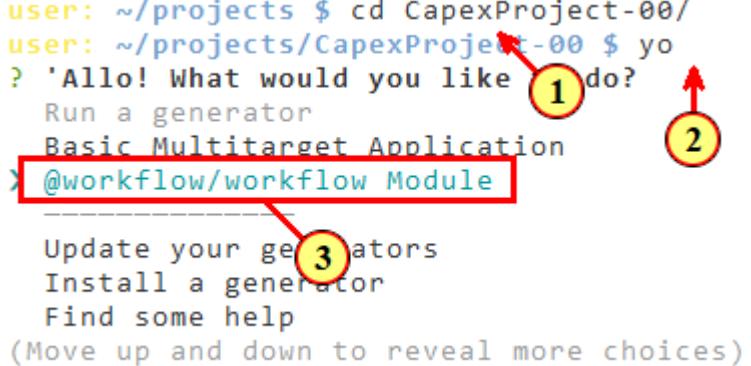
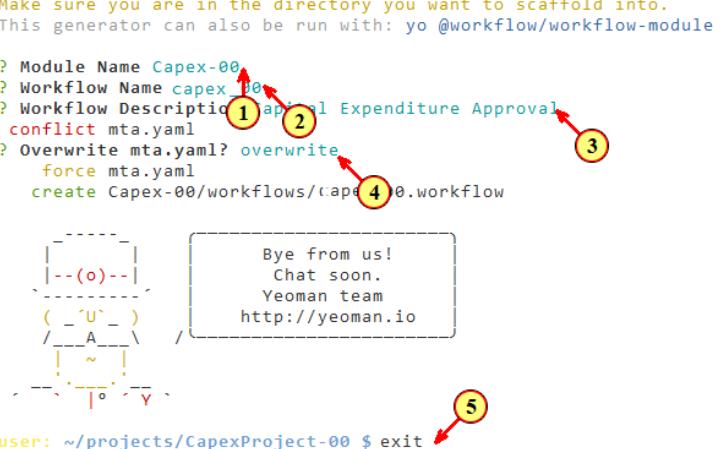
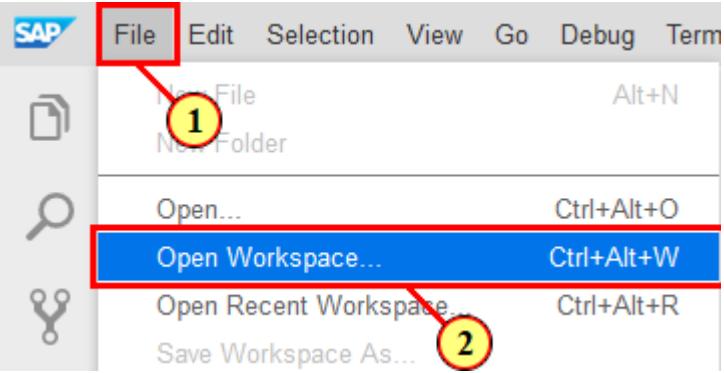
The below solution diagram explains how customer can automate CAPEX scenario using SAP Business Technology Platform.

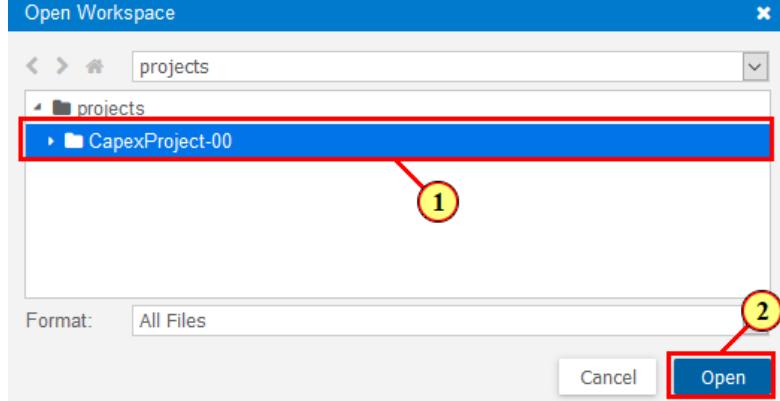
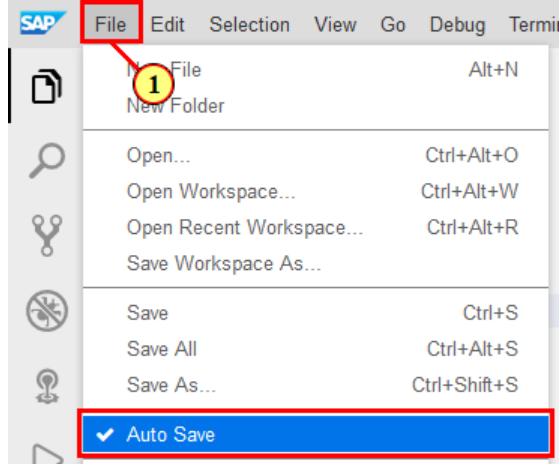
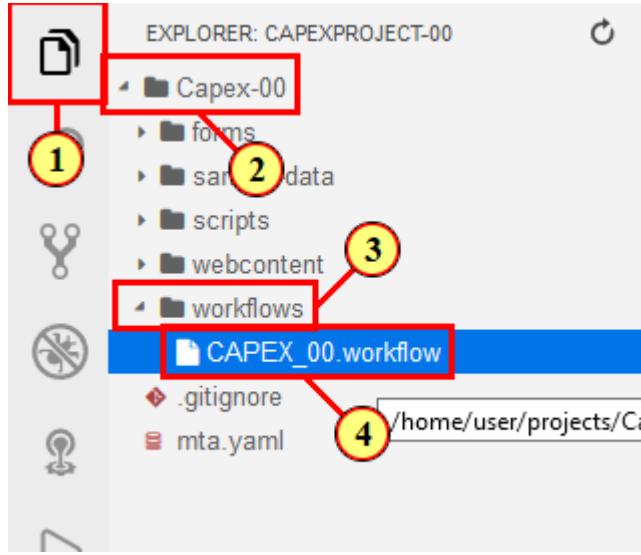


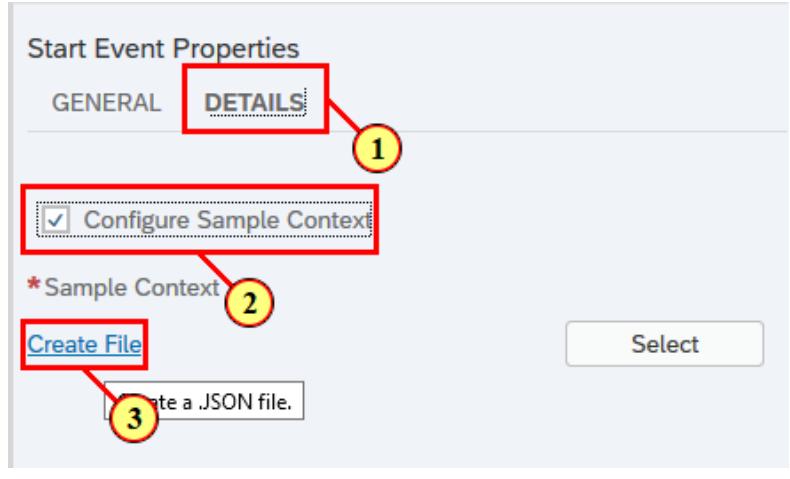
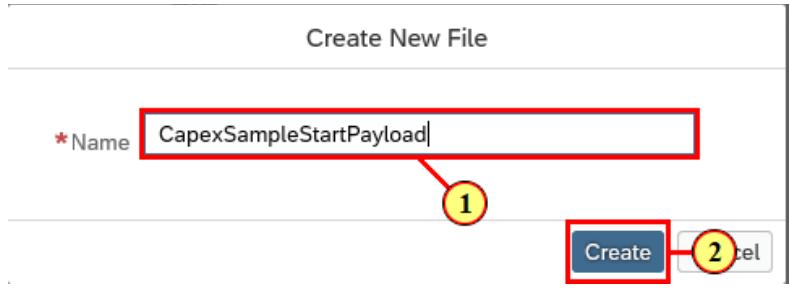
## MODEL WORKFLOW USING BUSINESS APPLICATION STUDIO

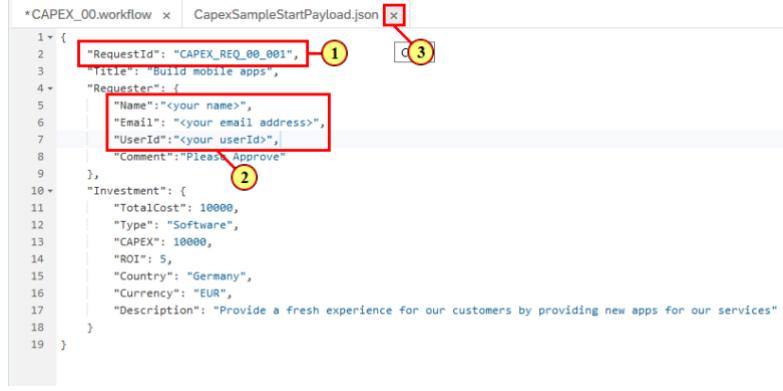
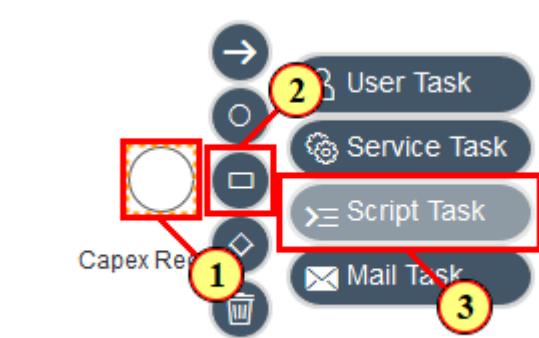
Explanation	Screenshot
<p>1. Logon to <b>SAP Cloud Platform Trial Home Page</b> with your trial username and password.</p> <p><a href="https://cockpit.hanatrial.ondemand.com/cockpit/#/home/trial">https://cockpit.hanatrial.ondemand.com/cockpit/#/home/trial</a></p> <p>2. Choose <b>SAP Business Application Studio</b>.</p>	
<p>Each SAP Business Application Studio Development Space is a virtual machine hosting your project files, securely separated from other spaces.</p> <p>3. If you have no dev space, click the <b>Create Dev Space</b> and follow instructions in step 5.</p> <p>4. Else select <b>PLAY</b> to start the space if you see the status as <b>STOPPED</b>.</p> <p>Note: Idle dev space will be shut down after some time. This is indicated by a yellow bar in the bottom of the screen with the text "Offline". In this case, return to this Dev Space selection screen from your bookmark and restart it.</p>	
<p>5. Enter <b>workshop</b> as the new <b>Dev Space name</b>.</p> <p>6. Ensure <b>Application Type</b> is selected as <b>SAP Fiori</b>.</p> <p>7. Select the extension <b>Workflow Management</b>. Note: This extension will enable the workflow modelling features.</p> <p>8. Select <b>Create Dev Space</b>.</p>	

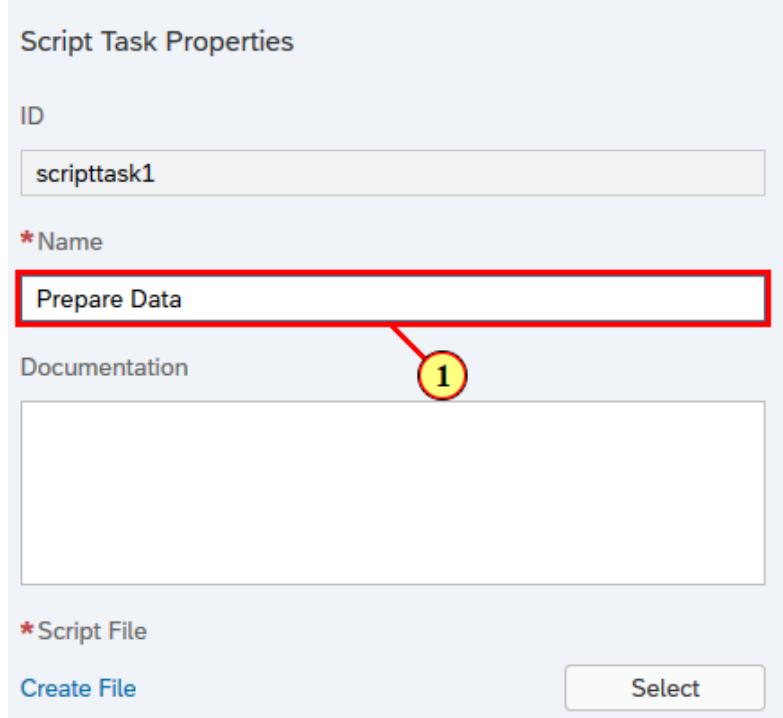
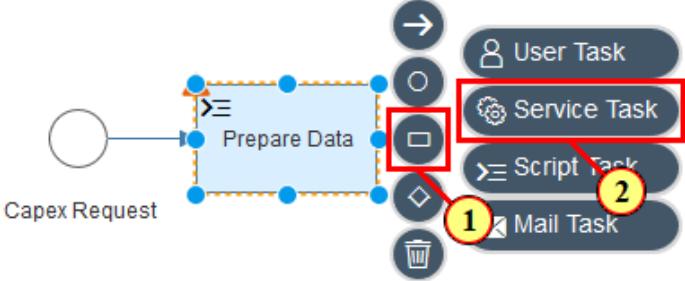
Explanation	Screenshot
<p>9. Wait until the virtual machine providing this dev space is in status <b>RUNNING</b>.</p> <p>10. Open the <b>SAP Business Application Studio</b> by clicking on the dev space name.</p>	
<p>Note: SAP Business Application Studio is a web application that loads the features of the extensions. There might be a short delay for all features to be operational when first accessed.</p>	
<p>11. From the menu, select <b>Terminal</b>.</p> <p>12. Select <b>New Terminal</b> to open a Linux Terminal window.</p>	
<p>13. Enter <b>cd projects/</b> in the <b>Terminal</b> window to go into the folder where you are going to create the workflow module. Note: This project folder is already created.</p> <p>14. Enter <b>yo</b> in the terminal window to start Yeoman.</p> <p>Note: Yeoman is a tool for quickly setting up the basic structure of projects.</p> <p>15. If asked, choose whether you want to enable telemetric for Yeoman.</p> <p>16. Select <b>Basic Multitarget Application</b> by using the up/down arrow keys and press <b>Enter</b>.</p>	
<p>17. Enter <b>CapexProject-00</b> or any name of your choice as <b>Project name</b>.</p>	

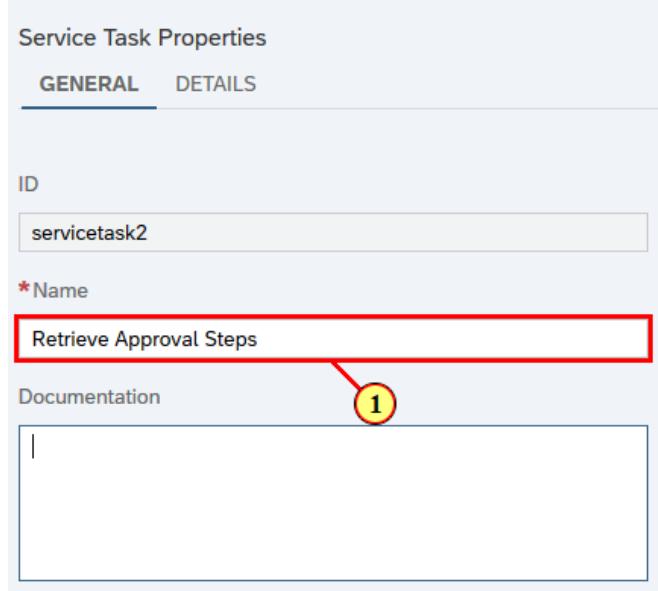
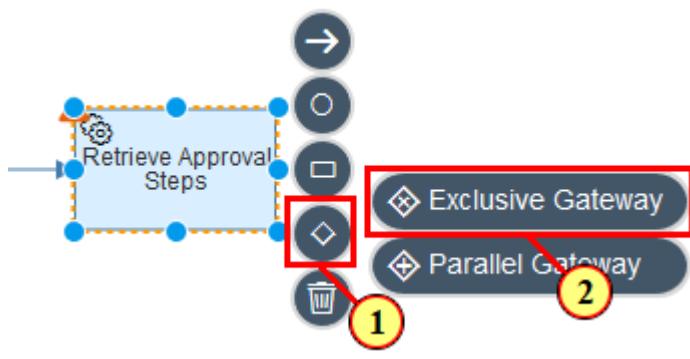
Explanation	Screenshot
<p>18. Change into the newly created directory by entering <b>cd CapexProject-00</b>. You can also use <b>TAB</b> for auto-completion, i.e. entering <b>cd Cap&lt;TAB&gt;</b> will be sufficient.</p> <p>19. Enter <b>yo</b> in the window to start Yeoman again.</p> <p>20. Select <b>Workflow Module</b> by using the up/down arrow keys and press <b>Enter</b>.</p>	 <pre>user: ~/projects \$ cd CapexProject-00/ user: ~/projects/CapexProject-00 \$ yo ? 'Allo! What would you like to do?   Run a generator   Basic Multitarget Application   X @workflow/workflow Module -----</pre> <p>Update your generators Install a generator Find some help (Move up and down to reveal more choices)</p>
<p>21. Enter <b>Capex-00</b> as <b>Module Name</b>. <i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to have a unique module name like Capex-&lt;your name or id or initials&gt;</i></p> <p>22. Enter <b>Capex_00</b> as <b>Workflow Name</b>. <i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to have a unique workflow name like Capex_&lt;your name or id or initials&gt;</i></p> <p>23. Enter <b>Capital Expenditure Approval</b> as <b>Workflow Description</b>.</p> <p>24. Yeoman will warn you that there already is an <b>mta.yaml</b> file. Type <b>Y</b> to overwrite it.</p> <p>25. You can close the <b>Terminal</b> by typing <b>exit</b> or clicking on the X in the window header.</p>	 <pre>Make sure you are in the directory you want to scaffold into. This generator can also be run with: yo @workflow/workflow-module  ? Module Name Capex-00 ? Workflow Name capex_00 ? Workflow Description Capital Expenditure Approval conflict mta.yaml ? Overwrite mta.yaml? overwrite   force mta.yaml   create Capex-00/workflows/capex_00.workflow    .--(o)--.   ( _ U _ )   / \ A \       ~     .-- .-- Y .-- .   Bye from us!   Chat soon.   Yeoman team   http://yeoman.io  user: ~/projects/CapexProject-00 \$ exit</pre>
<p>26. From the menu, select <b>File</b>.</p> <p>27. Select <b>Open Workspace....</b></p>	 <p>SAP</p> <p>File Edit Selection View Go Debug Term</p> <p>New File Alt+N</p> <p>New Folder</p> <p>Open... Ctrl+Alt+O</p> <p>Open Workspace... Ctrl+Alt+W</p> <p>Open Recent Workspace... Ctrl+Alt+R</p> <p>Save Workspace As... 2</p>

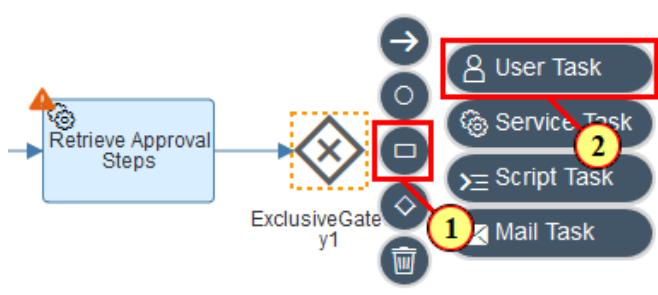
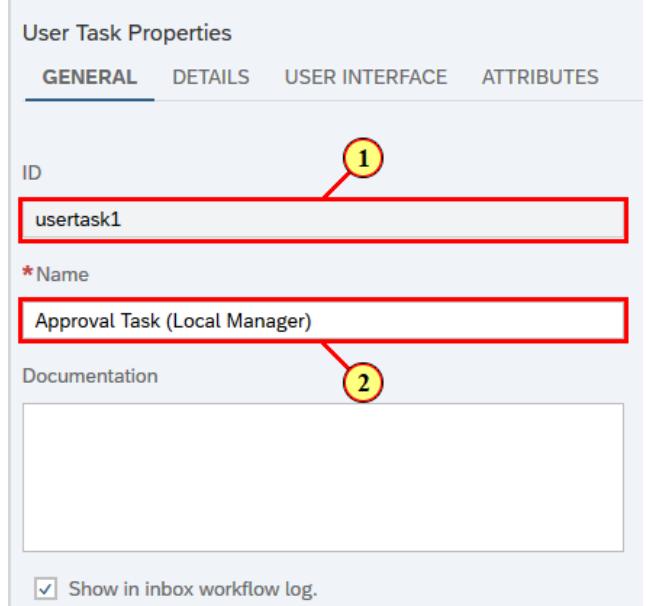
Explanation	Screenshot
<p>28. Select the directory containing your module <b>CapexProject-00</b>.</p> <p>29. Select <b>Open</b>.</p>	
<p>30. From the menu, select <b>File</b>.  Note that there is an <b>Auto Save</b> functionality (enabled by default). If you choose to disable it, remember to manually save your files.</p>	
<p>31. If it is not already open, select the <b>Explorer</b> icon from the sidebar.</p> <p>32. Open the <b>Capex-00</b> module by selecting it.</p> <p>33. Open the <b>workflows</b> directory by selecting it.</p> <p>34. Open the <b>CAPEX_00.workflow</b> by double-clicking on it.</p> <p>Note: If the graphical workflow editor is not opened, or a textual (code) editor is opened instead, the workflow plugin did not load correctly. Refresh your browser window and try again after SAP Business Application Studio has fully loaded.</p>	

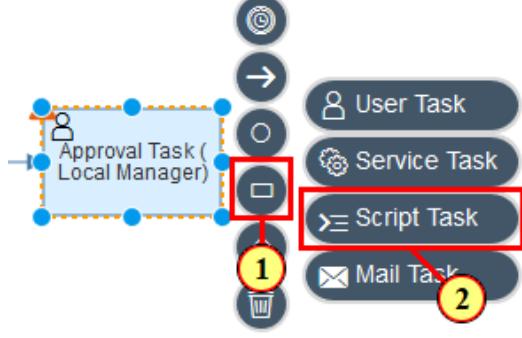
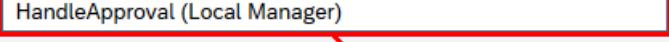
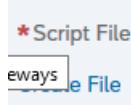
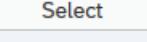
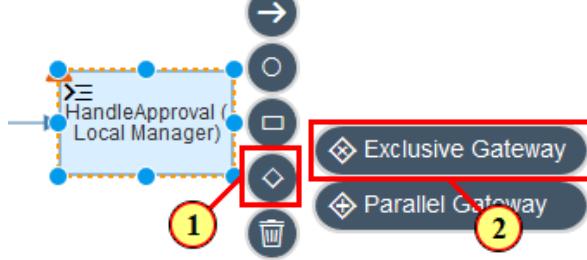
Explanation	Screenshot
<p>A new workflow with a default Start and End event is created.</p> <ul style="list-style-type: none"> <li>○ On the left side there is a toolbar for adding new flow elements.</li> <li>○ On the right side is the properties pane for the currently selected element.</li> </ul> <p>35. Click on the <b>Start Event</b>  to select it. This will show the quick action icons and the property pane will show the details of this element.</p> <p>36. Enter <b>Capex Request</b> as the <b>Name</b> of the start event.</p> <p>This will later be shown in the workflow <i>Execution Log</i> as well as in <i>Process Visibility</i>.</p>	
<p>37. Click on the tab <b>Details</b> of the start event.</p> <p>38. Select <b>Configure Sample Context</b>. When starting a new workflow, an initial context (JSON data) can be given. With this option, an example context can be configured.</p> <p>39. Click <b>Create File</b>.</p>	
<p>1. In the popup, enter <b>CapexSampleStartPayload</b> as <b>File Name</b>.</p> <p>2. Click <b>Create</b>.</p>	

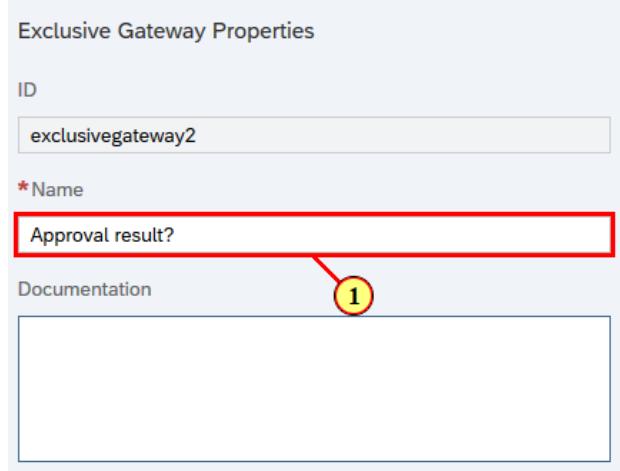
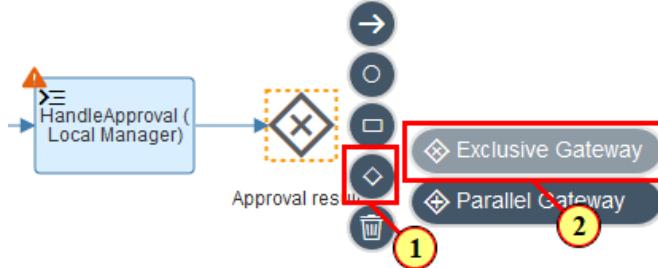
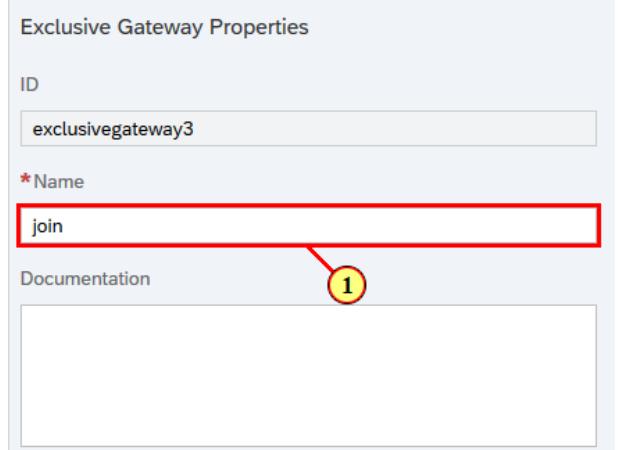
Explanation	Screenshot
<p>A new file with the name <b>CapexSampleStartPayload.json</b> is created in the project folder below <b>sample-data</b>. It is created with some default data as example.</p>	 <pre>* CAPEX_00.workflow x CapexSampleStartPayload.json x 1+ { 2   "product": "Hamlet (Paperback)", 3   "inStock": true, 4   "inventory": 20000, 5   "price": 7.49, 6   "publishingDate": "1600-04-23T18:25:43.511Z", 7   "author": { "name": "William Shakespeare" }, 8   "publishers": [ "Simon &amp; Brown", "SparkNotes", "Dover Publications" ] 9 }</pre>
<ol style="list-style-type: none"> <li>3. Remove the example content and Copy-Paste the context from the <b>CapexSampleStartPayload.json</b> file from the <i>Exercise1 → Helper</i> folder in GitHub.</li> <li>4. [Optional] You can choose to replace the <b>RequestId</b> of your choice.</li> <li>5. Insert your name, email address and user id into the respective fields. <b>UserId</b> is <b>your trial user email ID</b>.</li> <li>6. Close the file by clicking on  in the header bar. If shows a round circle instead this indicates that there are changes, which will be saved by closing.</li> </ol>	 <pre>* CAPEX_00.workflow x CapexSampleStartPayload.json x 1+ { 2   "RequestId": "CAPEX_REQ_00_001", <b>1</b> 3   "title": "Build mobile apps", 4   "Requester": { 5     "Name": "&lt;your name&gt;", 6     "Email": "&lt;your email address&gt;", 7     "UserId": "&lt;your userId&gt;", <b>2</b> 8     "Comment": "Please Approve" 9   }, 10  "Investment": { 11    "TotalCost": 10000, 12    "Type": "Software", 13    "CAPEX": 10000, 14    "ROI": 5, 15    "Country": "Germany", 16    "Currency": "EUR", 17    "Description": "Provide a fresh experience for our customers by providing new apps for our services" 18  } 19 }</pre>
<ol style="list-style-type: none"> <li>7. Click the <b>Start event</b>  to select it.</li> <li>8. Click on <b>Add Task</b> .</li> <li>9. Select the <b>Script Task</b> .</li> </ol>	

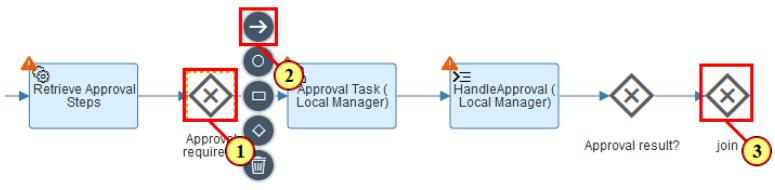
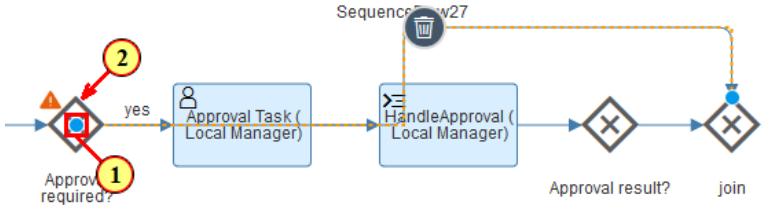
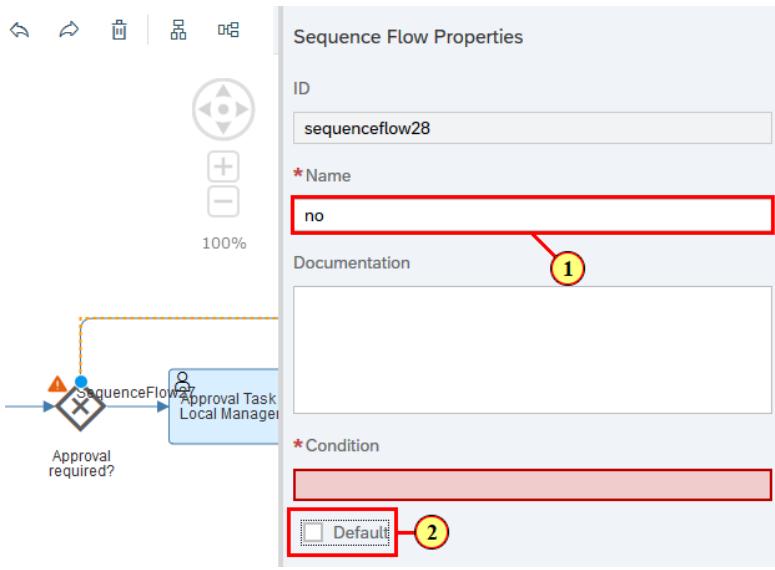
Explanation	Screenshot
<p>10. In the Script Task Properties, enter <b>Prepare Data</b> as Name.</p> <p>Note: We will configure the task later.</p>	 <p>The screenshot shows the 'Script Task Properties' dialog box. The 'Name' field contains 'scripttask1'. Below it, the 'Documentation' section has a text area with a yellow circle containing the number '1' at the top right. The 'Name' field is highlighted with a red border. The 'Script File' section includes a 'Create File' button and a 'Select' button.</p>
<p>11. On the selected Script Task 'Prepare Data', click <b>Add Task</b>  in the speed buttons.</p> <p>12. Select <b>Service Task</b> .</p>	 <p>The screenshot shows a workflow diagram with a start event 'Capex Request' connected to a script task named 'Prepare Data'. A speed button menu is open next to the script task, listing 'User Task', 'Service Task', 'Script Task', and 'Mail Task'. The 'Service Task' option is highlighted with a red box and a yellow circle containing the number '1'. Another yellow circle containing '2' is positioned near the 'Mail Task' option.</p>

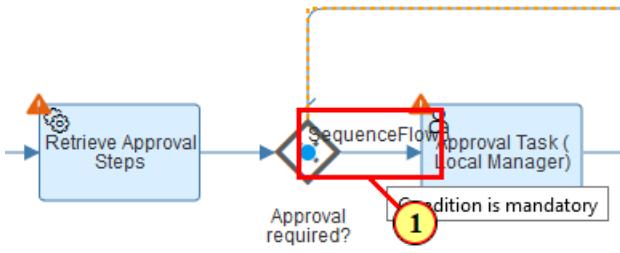
Explanation	Screenshot
<p>13. Enter <b>Retrieve Approval Steps</b> as Name.</p> <p>Note: We will configure the task later.</p>	 <p>Service Task Properties</p> <p>GENERAL DETAILS</p> <p>ID</p> <p>servicetask2</p> <p>*Name</p> <p>Retrieve Approval Steps</p> <p>Documentation</p>
<p>Note: If the workflow looks cluttered then you can use <b>Arrange Horizontally</b> on top-right corner of the editor, to realign the workflow tasks.</p>	 <p>Service Task Properties</p> <p>GENERAL DETAILS</p> <p>ID</p> <p>servicetask1</p> <p>*Name</p> <p>Retrieve Approval Steps</p> <p>Documentation</p>
<p>14. On the selected 'Retrieve Approval Steps' service task, click <b>Add Gateway</b> .</p> <p>15. Select <b>Exclusive Gateway</b> .</p>	

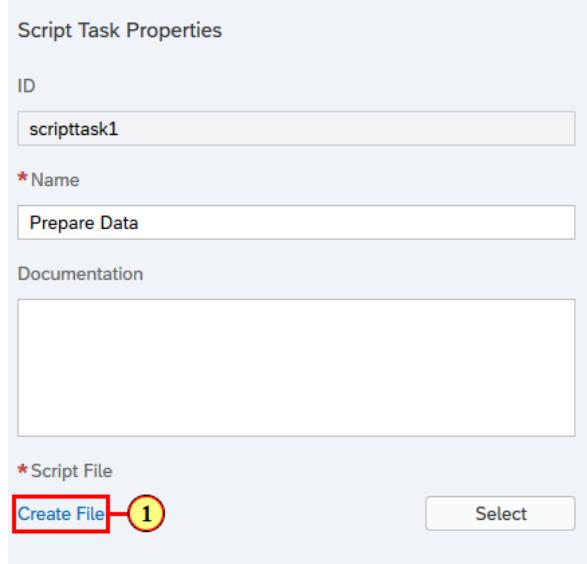
Explanation	Screenshot
<p>16. Enter <b>Approval required?</b> as gateway Name.</p> <p>Note: We will configure the gateway later, once we added more outgoing branches.</p>	
<p>17. Select <b>Add Task</b> .</p> <p>18. Select <b>User Task</b> .</p>	
<p>Note that the <b>Task ID</b> is <b>usertask1</b>. This will be needed later.</p> <p>19. Enter <b>Approval Task (Local Manager)</b> as <b>Name</b>.</p> <p>Note: IDs are automatically given to objects. If an object is deleted and re-created, it will get a new ID.</p>	

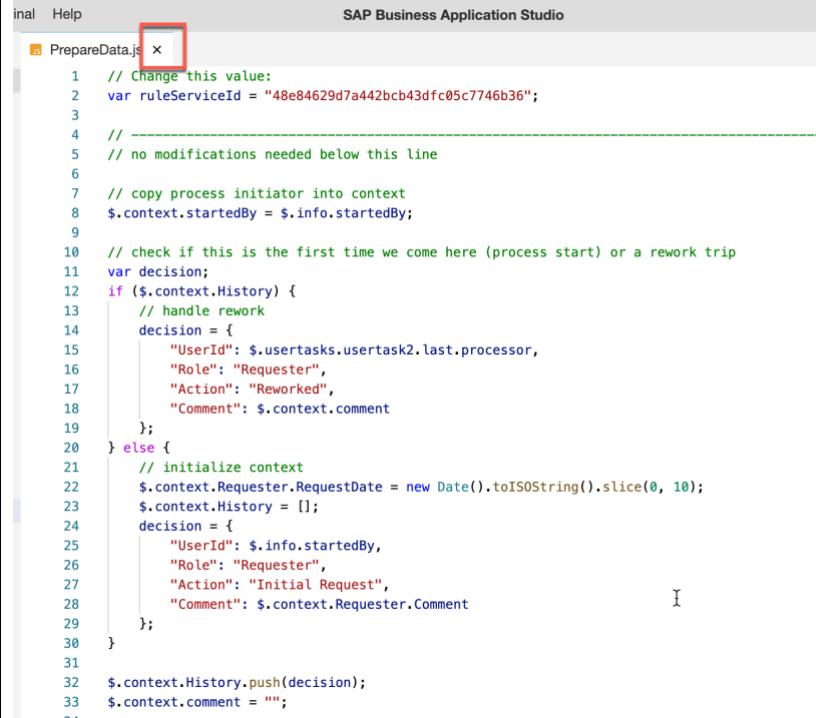
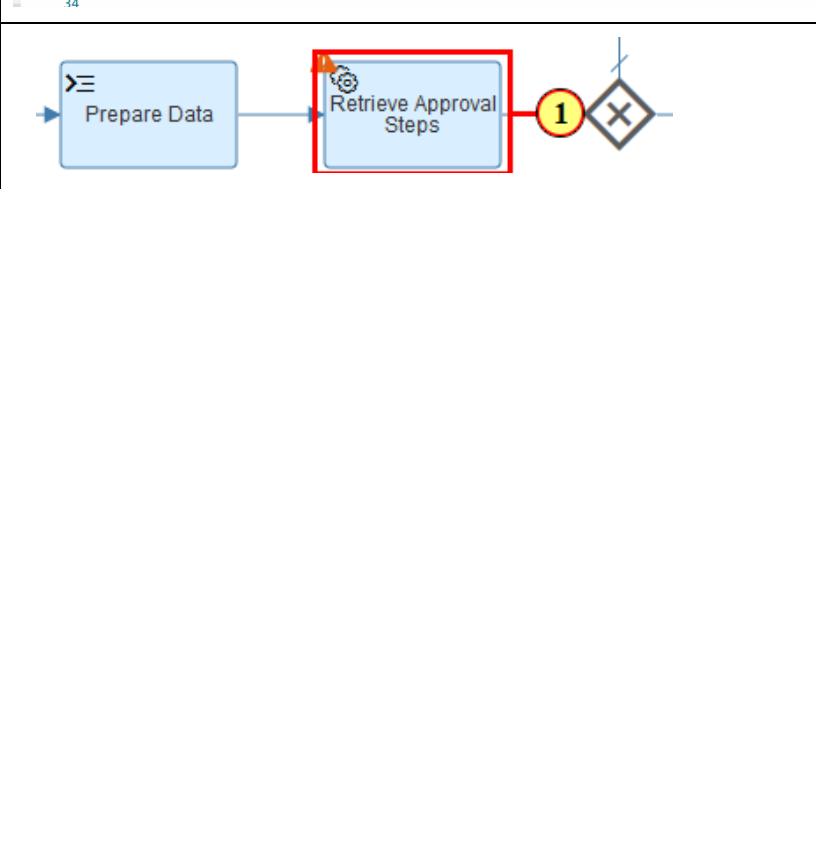
Explanation	Screenshot
<p>20. Select <b>Add Task</b> .</p> <p>21. Select <b>Script Task</b> .</p>	
<p>22. Enter <b>Handle Approval (Local Manager)</b> as <b>Name</b>.</p> <p>Note: We will configure the task later.</p>	<p><b>Script Task Properties</b></p> <p>ID: scripttask2</p> <p>* Name: HandleApproval (Local Manager) </p> <p>Documentation: </p> <p>* Script File:  </p>
<p>23. Click <b>Add Gateway</b> .</p> <p>24. Select <b>Exclusive Gateway</b> .</p>	

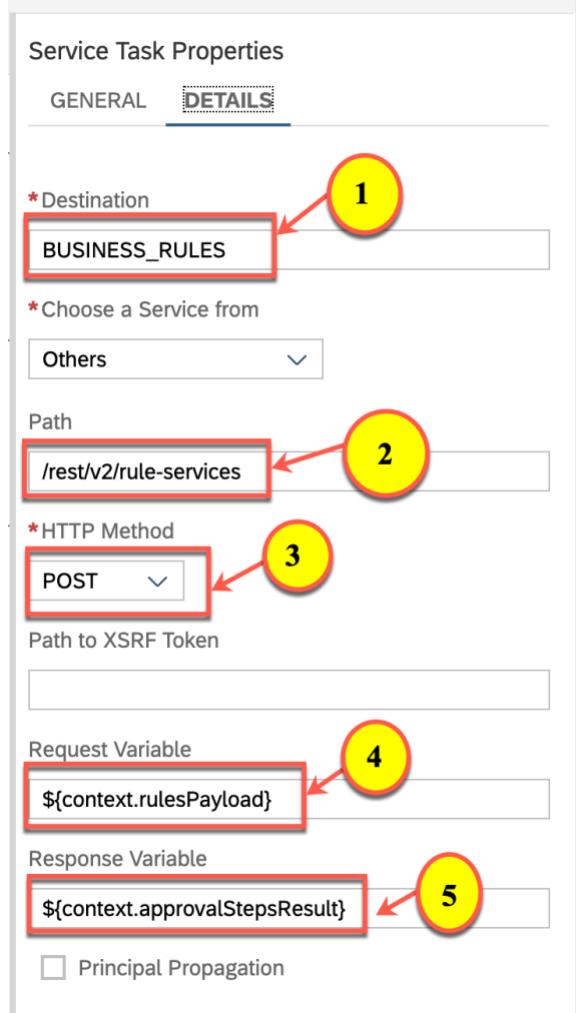
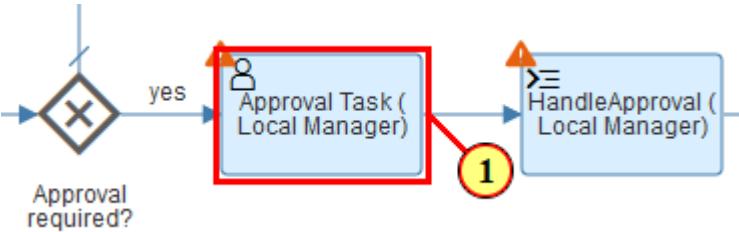
Explanation	Screenshot
<p>25. Enter <b>Approval result?</b> as Name.</p>	 <p>Exclusive Gateway Properties</p> <p>ID exclusivegateway2</p> <p>*Name <b>Approval result?</b></p> <p>Documentation</p>
<p>26. Select <b>Add Gateway</b> .</p> <p>27. Select <b>Exclusive Gateway</b> .</p>	 <p>HandleApproval (Local Manager)</p> <p>Approval result?</p> <p>Exclusive Gateway</p> <p>Parallel Gateway</p>
<p>28. Enter <b>join</b> as gateway Name.</p> <p>Note: This gateway will be joining the branches from a previous gateway together. In most cases, such joining gateway are optional and implicit, when sequence flows point to the same element. However, when the next element is a gateway as well, this needs to be made explicit.</p>	 <p>Exclusive Gateway Properties</p> <p>ID exclusivegateway3</p> <p>*Name <b>join</b></p> <p>Documentation</p>

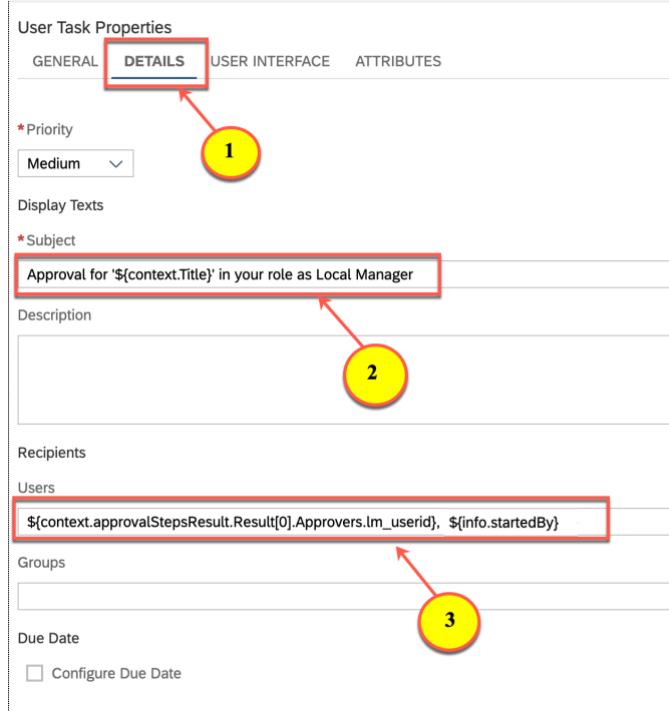
Explanation	Screenshot
<p>29. Select the <b>Exclusive Gateway</b>  with the name '<b>Approval required?</b>'</p> <p>30. Click on the <b>Sequence Flow Connector</b>  and start dragging it</p> <p>31. Drop the <b>Sequence Flow Connector</b> onto the top corner of the <b>join gateway</b>.</p> <p>Note: Sequence Flow Connectors have Connection Dots at each end. Those can be placed either in the middle or on certain positions on the edge of Flow Elements. The Layout Assistant takes this into account when drawing the connector. Additionally, the lines can be dragged with the mouse.</p>	
<p>32. Drag the <b>Connection Dot</b>  from the middle of the Exclusive Gateway with name <b>Approval required?</b> to its upper corner.</p> <p>33. Drop on <b>the upper corner</b> of the icon.</p>	
<p>Since there is now more than one Sequence Flow, each flow has a name and branch condition.</p> <p>34. Enter <b>no</b> as <b>Name</b> for the newly created (upper) Sequence Flow.</p> <p>35. Select <b>Default</b> to make this as the default branch. This will mean that if none of the condition will meet then this default route will be executed.</p>	

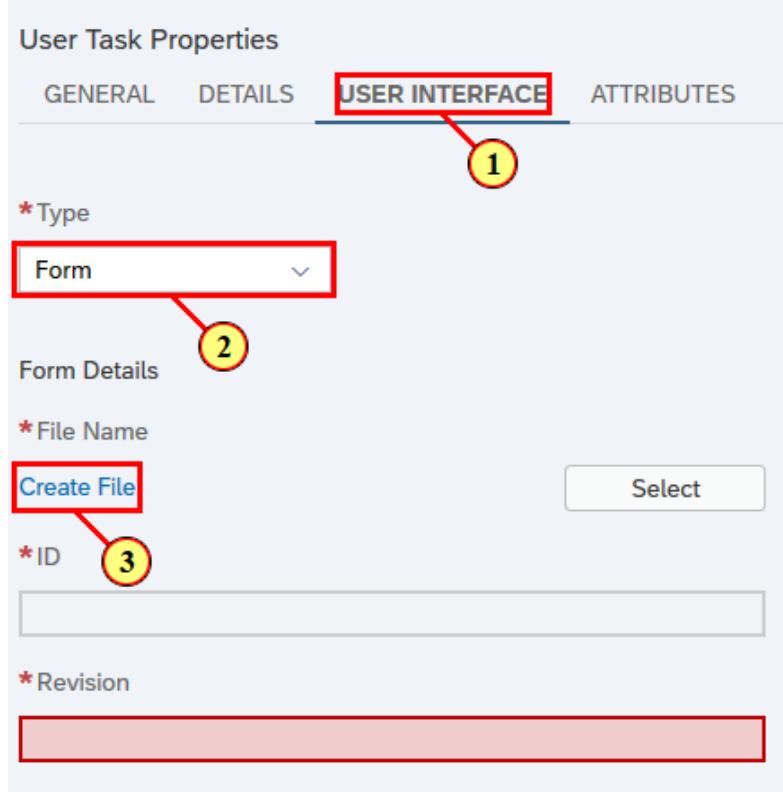
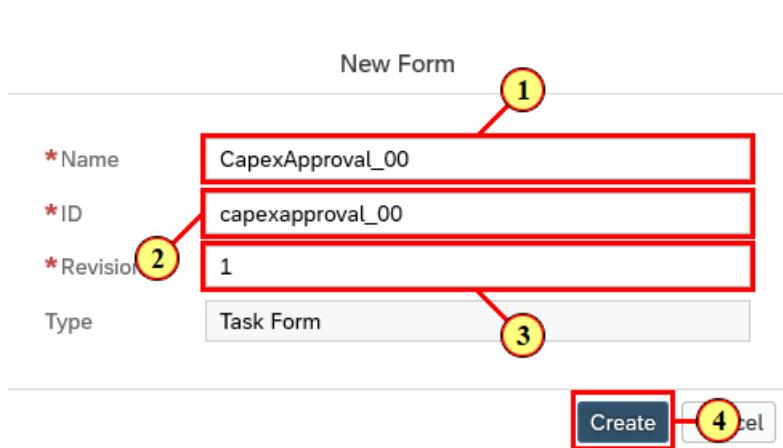
Explanation	Screenshot
<p>36. Select the <b>Sequence Flow</b> between the gateway 'Approval required?' and the user task 'Approval Task (Local Manager)'</p>	
<p>37. Enter <b>yes</b> as <b>Name</b> of the sequence flow.</p> <p>38. Enter  <code>#{context.approvalStepsResult.Result[0].Approvers.lm_required}</code> as <b>Condition</b>.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in the condition. Sometimes during copy, spaces are added automatically. In this case, they need to be removed.</p> <p>Note: This expression uses data in the workflow context to evaluate whether this branch should be taken. This data was retrieved in previous step by a service call to Business Rules.</p>	<p>Sequence Flow Properties</p> <p>ID: sequenceflow6</p> <p>*Name: yes (highlighted with a red box)</p> <p>Documentation: (highlighted with a yellow circle 1)</p> <p>*Condition: text.approvalStepsResult.Result[0].Approvers.lm_required (highlighted with a red box)</p> <p>[Default] (highlighted with a yellow circle 2)</p>
<p>39. Select the script task <b>Prepare Data</b>.</p>	

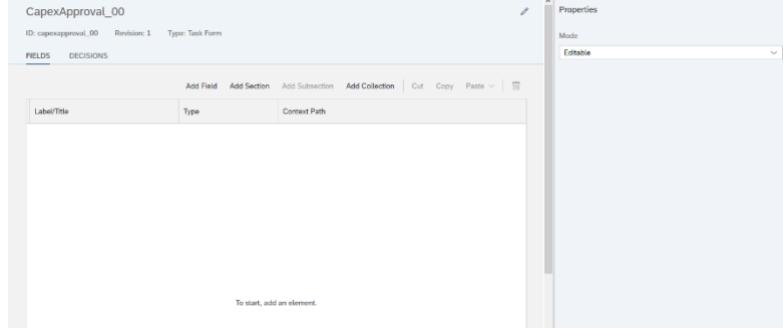
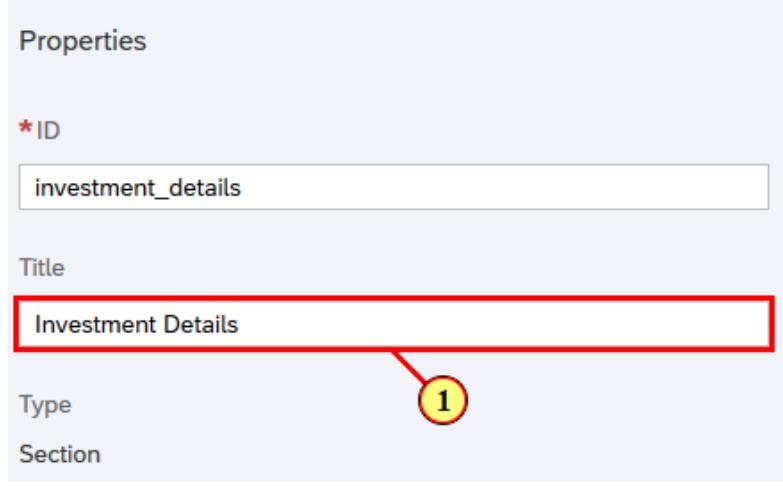
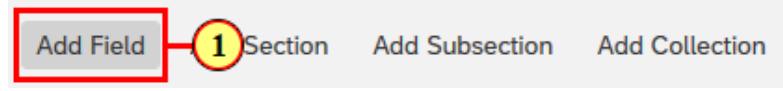
Explanation	Screenshot
40. In the properties, click <b>Create File</b> .	 <p>The screenshot shows the 'Script Task Properties' dialog box. The 'ID' field contains 'scripttask1'. The 'Name' field is labeled with an asterisk and contains 'Prepare Data'. The 'Documentation' field is empty. Under 'Script File', there is a 'Create File' button with a red box and yellow circle around it, and a 'Select' button.</p>
41. Enter <b>PrepareData</b> as Name. 42. Click on <b>Create</b> .	 <p>The screenshot shows the 'Create New File' dialog box. The 'Name' field is labeled with an asterisk and contains 'PrepareData' with a red box and yellow circle around it. Below it is a 'Create' button with a red box and yellow circle around it, and a 'Cancel' button.</p>

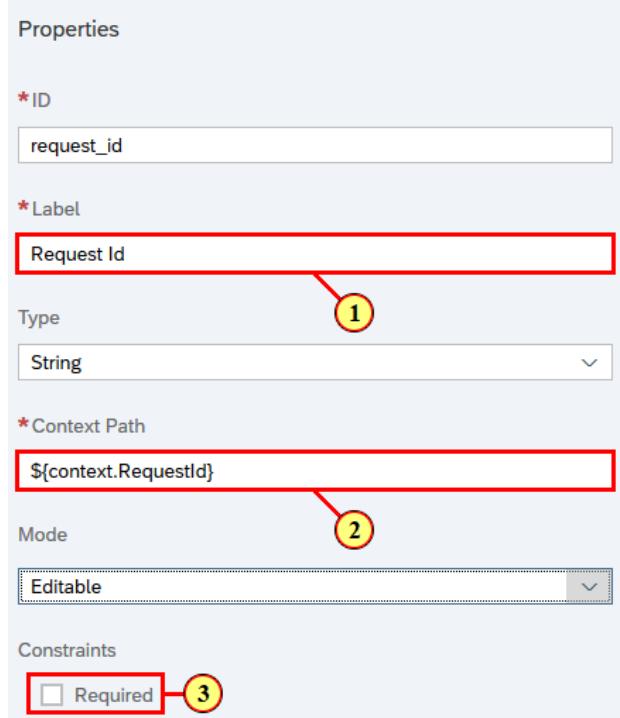
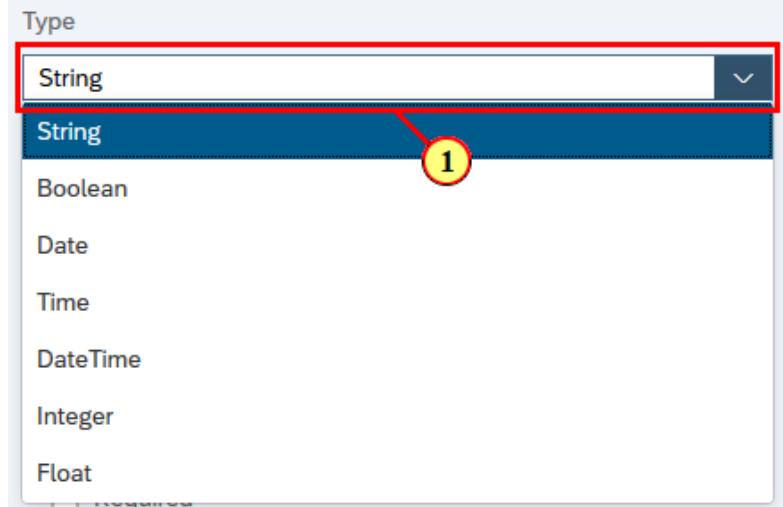
Explanation	Screenshot
<p>43. Delete all the default content and replace it with the <b>PrepareData.js</b> text from <i>Exercise 1 → Helper</i> folder in GitHub.</p> <p>Note: This workflow calls a pre-build rule which you don't need to change now. In a business rules exercise, a custom rule will be created and then you can replace it with your rule service id.</p> <p>44. Close the file by clicking on .</p>	 <pre> 1 // Change this value: 2 var ruleServiceId = "48e84629d7a442bcb43dfc05c7746b36"; 3 4 // ----- 5 // no modifications needed below this line 6 7 // copy process initiator into context 8 \$.context.startedBy = \$.info.startedBy; 9 10 // check if this is the first time we come here (process start) or a rework trip 11 var decision; 12 if (\$.context.History) { 13     // handle rework 14     decision = { 15         "UserId": \$.usertasks.usertask2.last.processor, 16         "Role": "Requester", 17         "Action": "Reworked", 18         "Comment": \$.context.comment 19     }; 20 } else { 21     // initialize context 22     \$.context.Requester.RequestDate = new Date().toISOString().slice(0, 10); 23     \$.context.History = []; 24     decision = { 25         "UserId": \$.info.startedBy, 26         "Role": "Requester", 27         "Action": "Initial Request", 28         "Comment": \$.context.Requester.Comment 29     }; 30 } 31 32 \$.context.History.push(decision); 33 \$.context.comment = ""; 34 </pre>
<p>45. Select the Service Task <b>Retrieve Approval Steps</b>.</p>	 <pre> graph LR     Start(( )) --&gt; &gt;=  Task1[Prepare Data]     Task1 --&gt; Task2[Retrieve Approval Steps]     Task2 --&gt; &gt;=  End(( ))     </pre>

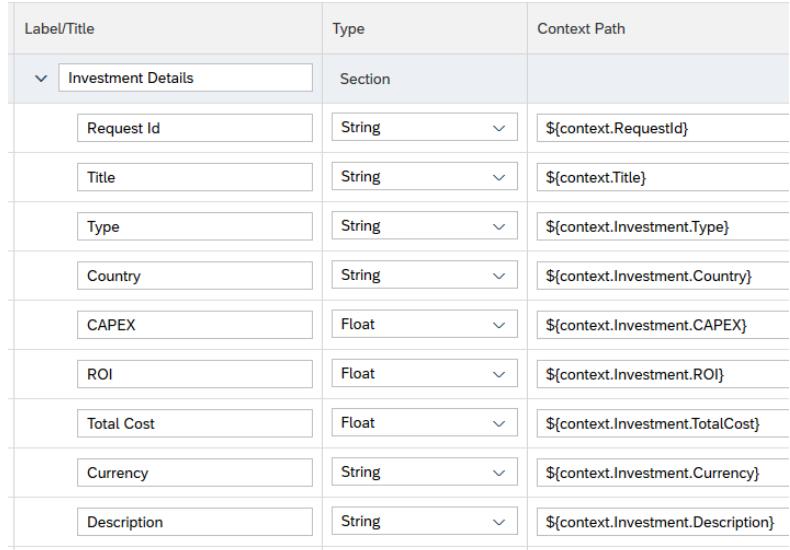
Explanation	Screenshot
<p>46. Select the <b>DETAILS</b> tab.</p> <p>47. Enter <b>BUSINESS_RULES</b> as <b>Destination</b>.</p> <p>48. Enter <b>/rest/v2/rule-services</b> as <b>Path</b>.</p> <p>49. Enter HTTP Method as <b>POST</b>.</p> <p>50. Enter <b> \${context.rulesPayload}</b> as <b>Request Variable</b>.</p> <p>51. Enter <b> \${context.approvalStepsResult}</b> as <b>Response Variable</b>.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in the <b>path, request and response variable</b> text. Sometimes during copy and paste, the spaces are added automatically. In this case, they need to be removed.</p>	 <p>Service Task Properties</p> <p>GENERAL DETAILS</p> <p>*Destination BUSINESS_RULES</p> <p>*Choose a Service from Others</p> <p>Path /rest/v2/rule-services</p> <p>*HTTP Method POST</p> <p>Path to XSRF Token</p> <p>Request Variable \${context.rulesPayload}</p> <p>Response Variable \${context.approvalStepsResult}</p> <p><input type="checkbox"/> Principal Propagation</p>
<p>52. Select the User Task <b>Approval Task (Local Manager)</b>.</p>	 <pre> graph LR     A{Approval required?} -- yes --&gt; B[Approval Task (Local Manager)]     B --&gt; C[HandleApproval (Local Manager)]     </pre>

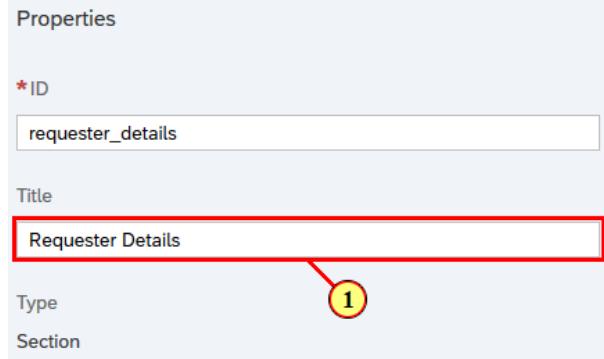
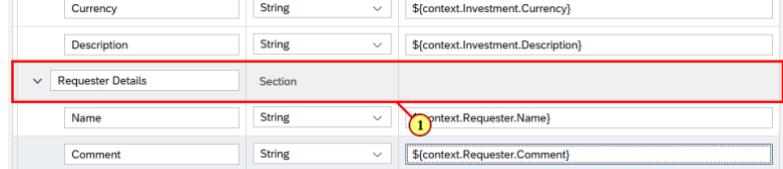
Explanation	Screenshot
<p>53. Select the <b>DETAILS</b> tab.</p> <p>54. Enter <b>Approval for</b> '<code>#{context.Title}</code>' in your role as Local Manager as <b>Subject</b>.</p> <p>55. Enter  <code>#{context.approvalStepsResult.Result[0].Approvers.lm_userid}, \${info.startedBy}</code> as <b>Recipients - Users</b>.</p> <p>It means that this user task will be sent to the users retrieved from Business Rules and the workflow initiator.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces <b>Users</b> text. Sometimes during copy and paste, the spaces are added automatically. In this case, they need to be removed.</p>	 <p>User Task Properties</p> <p>GENERAL DETAILS USER INTERFACE ATTRIBUTES</p> <p>*Priority Medium</p> <p>Display Texts</p> <p>*Subject Approval for '\${context.Title}' in your role as Local Manager</p> <p>Description</p> <p>Recipients</p> <p>Users \${context.approvalStepsResult.Result[0].Approvers.lm_userid}, \${info.startedBy}</p> <p>Groups</p> <p>Due Date</p> <p><input type="checkbox"/> Configure Due Date</p>

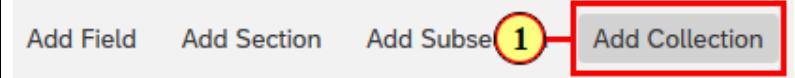
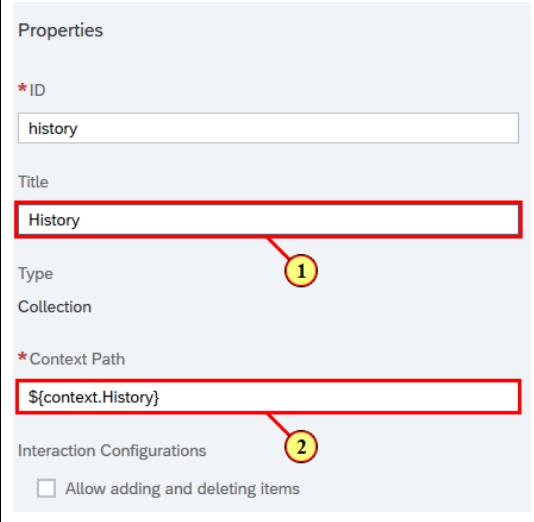
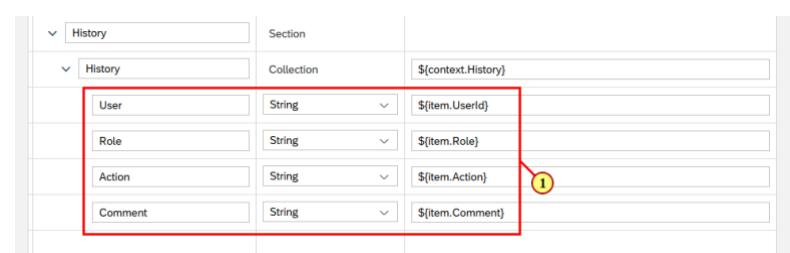
Explanation	Screenshot
<p>56. Select the <b>USER INTERFACE</b> tab.</p> <p>57. Select <b>Form</b> in the dropdown menu for <b>Type</b>.</p> <p>58. Click <b>Create File</b>.</p> <p>Note: Forms are a quick way to create simple task UIs.</p>	 <p>The screenshot shows the 'User Task Properties' dialog with the 'USER INTERFACE' tab selected (indicated by a red box and yellow circle 1). The 'Type' dropdown is set to 'Form' (indicated by a red box and yellow circle 2). The 'Create File' button is highlighted with a red box and yellow circle 3. Other fields like 'File Name', 'ID', and 'Revision' are also visible.</p>
<p>59. In the popup, enter <b>CapexApproval_00</b> as <b>Name</b>.</p> <p><i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to have a unique form name like CapexApproval_&lt;your name or id or initials&gt;</i></p> <p>60. Press <b>TAB</b> to accept the generated Id.</p> <p>61. Enter <b>1</b> as <b>Revision</b>.</p> <p>62. Click <b>Create</b>.</p>	 <p>The screenshot shows the 'New Form' dialog. The 'Name' field contains 'CapexApproval_00' (indicated by a red box and yellow circle 1). The 'ID' field contains 'capexapproval_00' (indicated by a red box and yellow circle 2). The 'Revision' field contains '1' (indicated by a red box and yellow circle 3). The 'Type' field is set to 'Task Form' (indicated by a red box and yellow circle 4). The 'Create' button is highlighted with a red box and yellow circle 4.</p>

Explanation	Screenshot
<p>Note: With Workflow Forms, building Fiori form UIs becomes as easy as building workflows. The Forms Editor enables a declarative low-code approach to rapidly develop simple form UIs. Due to its full integration into Workflow a form can directly work on the values of the workflow context.</p>	
<p>63. Click <b>Add Section</b>.</p>	
<p>64. Enter <b>Investment Details</b> as Title.</p> <p>Note: The ID field is automatically filled out based on the given title.</p>	
<p>65. Select <b>Add Field</b>.</p>	

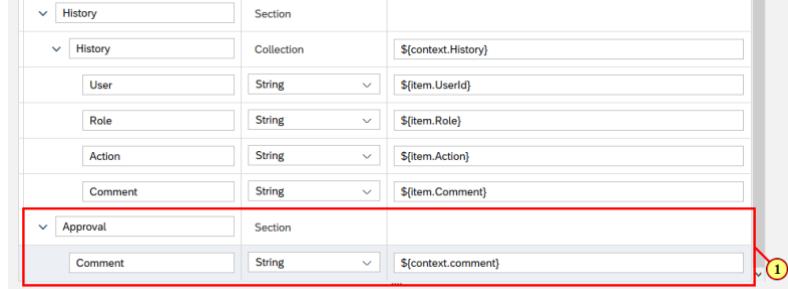
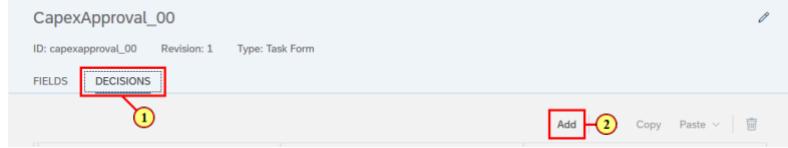
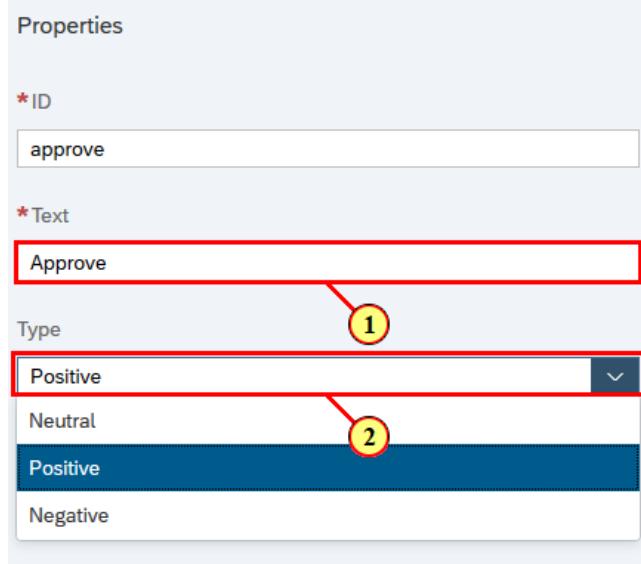
Explanation	Screenshot
<p>66. Enter <b>Request Id</b> as <b>Label</b>. The ID is then automatically derived from this.</p> <p>67. Enter <code> \${context.RequestId}</code> as <b>Context Path</b>.</p> <p>68. An input field can also be marked as <b>Required</b>. Since the <b>Request Id</b> is already given and should not be editable, leave it unchecked.</p>	 <p>The screenshot shows the 'Properties' section of the SAP Workflow Management interface. It includes fields for ID (request_id), Label (Request Id), Type (String), Context Path (\${context.RequestId}), Mode (Editable), and Constraints (Required). A red box highlights the Label and Context Path fields. A yellow circle labeled '1' points to the Type dropdown. Another yellow circle labeled '2' points to the Mode dropdown. A third yellow circle labeled '3' points to the Required checkbox.</p>
<p>69. Clicking on the <b>Type</b> field opens a dropdown list. Select the type as <b>String</b>.</p>	 <p>The screenshot shows a dropdown menu for selecting a data type. The 'String' option is selected and highlighted with a red box and a yellow circle labeled '1'. Other options in the list include Boolean, Date, Time, DateTime, Integer, and Float.</p>
<p>70. Clicking on the <b>Mode</b> field opens a dropdown list. Select <b>Display-Only</b>.</p>	 <p>The screenshot shows a dropdown menu for selecting a mode. The 'Display-Only' option is selected and highlighted with a red box and a yellow circle labeled '1'. Other options in the list include Editable.</p>

Explanation	Screenshot																																	
<p>71. In the same way, add the following fields with given Label, Type and Context Path:</p> <ul style="list-style-type: none"> <li>○ Set the property of all of the fields as <b>Editable</b> and <b>Required</b>.</li> </ul> <p><b>Label: Title</b>  <b>Type:</b> String  <b>Context Path:</b> \${context.Title}</p> <p><b>Label: Type</b>  <b>Type:</b> String  <b>Context Path:</b>  \${context.Investment.Type}</p> <p><b>Label: Country</b>  <b>Type:</b> String  <b>Context Path:</b>  \${context.Investment.Country}</p> <p><b>Label: CAPEX</b>  <b>Type:</b> Float  <b>Context Path:</b>  \${context.Investment.CAPEX}</p> <p><b>Label: ROI</b>  <b>Type:</b> Float  <b>Context Path:</b>  \${context.Investment.ROI}</p> <p><b>Label: Total Cost</b>  <b>Type:</b> Float  <b>Context Path:</b>  \${context.Investment.TotalCost}</p> <p><b>Label: Currency</b>  <b>Type:</b> String  <b>Context path:</b>  \${context.Investment.Currency}</p> <p><b>Label: Description</b>  <b>Type:</b> String  <b>Context Path:</b>  \${context.Investment.Description}</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in <b>ContextPath</b> text. Sometimes during copy and paste, the spaces are added automatically. In that case the field will show red box. Remove the spaces.</p>	 <table border="1"> <thead> <tr> <th>Label/Title</th> <th>Type</th> <th>Context Path</th> </tr> </thead> <tbody> <tr> <td style="background-color: #e0e0e0;">Investment Details</td><td style="background-color: #e0e0e0;">Section</td><td></td></tr> <tr> <td>Request Id</td><td>String</td><td> \${context.RequestId}</td></tr> <tr> <td>Title</td><td>String</td><td> \${context.Title}</td></tr> <tr> <td>Type</td><td>String</td><td> \${context.Investment.Type}</td></tr> <tr> <td>Country</td><td>String</td><td> \${context.Investment.Country}</td></tr> <tr> <td>CAPEX</td><td>Float</td><td> \${context.Investment.CAPEX}</td></tr> <tr> <td>ROI</td><td>Float</td><td> \${context.Investment.ROI}</td></tr> <tr> <td>Total Cost</td><td>Float</td><td> \${context.Investment.TotalCost}</td></tr> <tr> <td>Currency</td><td>String</td><td> \${context.Investment.Currency}</td></tr> <tr> <td>Description</td><td>String</td><td> \${context.Investment.Description}</td></tr> </tbody> </table>	Label/Title	Type	Context Path	Investment Details	Section		Request Id	String	\${context.RequestId}	Title	String	\${context.Title}	Type	String	\${context.Investment.Type}	Country	String	\${context.Investment.Country}	CAPEX	Float	\${context.Investment.CAPEX}	ROI	Float	\${context.Investment.ROI}	Total Cost	Float	\${context.Investment.TotalCost}	Currency	String	\${context.Investment.Currency}	Description	String	\${context.Investment.Description}
Label/Title	Type	Context Path																																
Investment Details	Section																																	
Request Id	String	\${context.RequestId}																																
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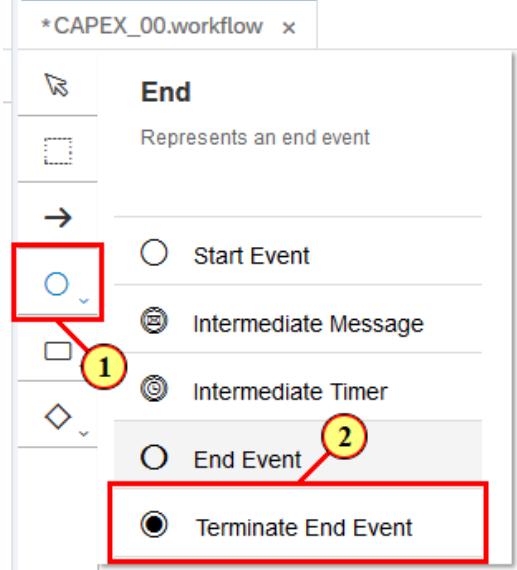
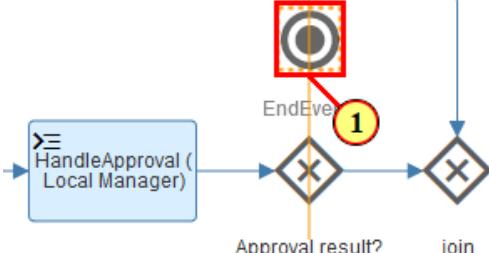
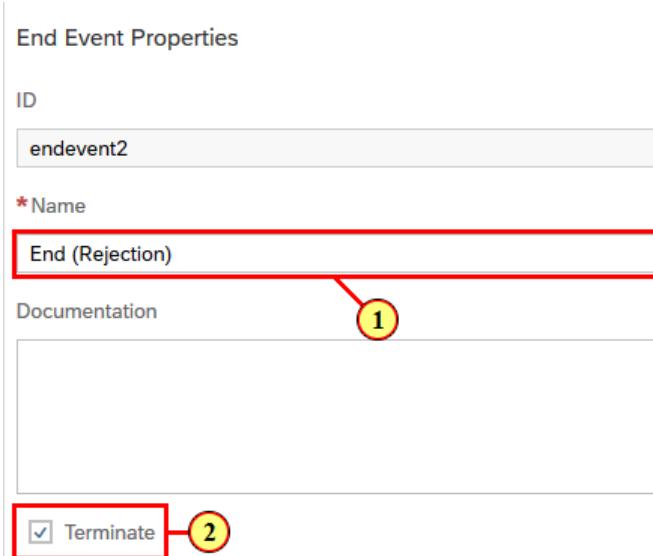
Explanation	Screenshot
<p>72. Select <b>Investment Details</b> section.</p> <p>73. Select <b>Add Section</b>.</p>	
<p>74. Enter <b>Requester Details</b> as Title.</p>	
<p>75. Add the following fields.</p> <p><b>Label:</b> Name  <b>Type:</b> String  <b>Mode:</b> Display-Only  <b>Control:</b> Input  <b>Context Path:</b> \${context.Requester.Name}</p> <p><b>Label:</b> Comment  <b>Type:</b> String  <b>Mode:</b> Editable  <b>Control:</b> Text Area  <b>Required:</b> no  <b>Context Path:</b> \${context.Requester.Comment}</p>	
<p>76. Select the <b>Requester Details</b> section.</p>	
<p>77. Select <b>Add Section</b>. Name the new Section <b>History</b>.</p>	

Explanation	Screenshot
<p>78. Select <b>Add Collection</b>.</p> <p>Note: Collections allow for an array of items to be displayed as table.</p>	
<p>79. Enter <b>History</b> as <b>Title</b>.</p> <p>80. Enter <b> \${context.History} </b> as <b>Context Path</b>.</p>	
<p>81. Add the following values for <b>Label</b> and <b>Context Path</b> and select Type <b>String</b> and mark them as <b>Display-Only</b>.</p> <p><b>Label: User</b> Context Path: <code> \${item.UserId} </code></p> <p><b>Label: Role</b> Context Path: <code> \${item.Role} </code></p> <p><b>Label: Action</b> Context Path: <code> \${item.Action} </code></p> <p><b>Label: Comment</b> Context Path: <code> \${item.Comment} </code></p> <p>Note that inside a collection, the variable <b>item</b> refers to a single row.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in <b>ContextPath</b> text. Sometimes during copy and paste, the spaces are added automatically (esp. the leading and trailing spaces). In that case the field will show red box. Remove the spaces.</p>	

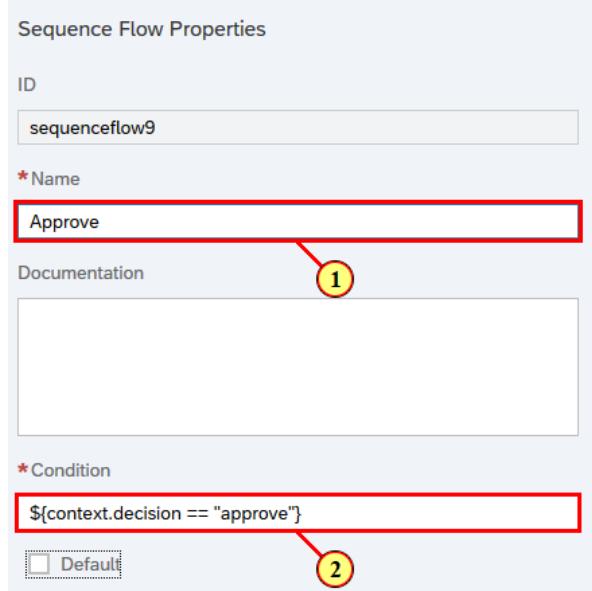
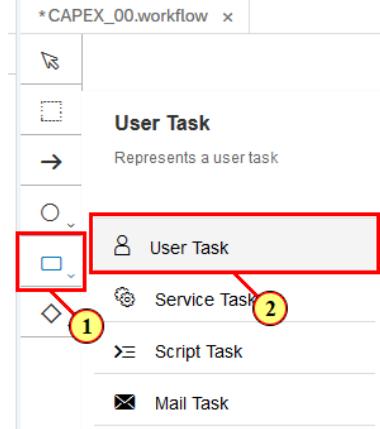
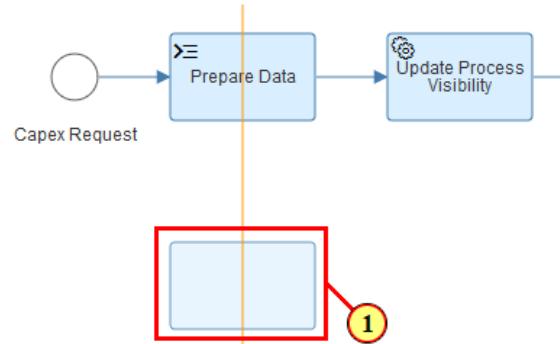
Explanation	Screenshot
<p>82. Add a new Section with title <b>Approval</b>.</p> <p>83. Add a new field and name it <b>Comment</b>.</p> <p>84. Enter <code>#{context.comment}</code> as Context Path</p> <p>85. Change the UI Control type from <b>Input</b> field to <b>Text Area</b>.</p>	<p>The screenshot shows the 'Properties' dialog for a field. The field is named 'comment'. The 'Label' is set to 'Comment'. The 'Type' is set to 'String'. The 'Context Path' is set to '<code>#{context.comment}</code>'. The 'Mode' is set to 'Editable'. In the 'UI Configuration' section, the 'Control' is currently set to 'Text Area', which is highlighted with a red box and circled with a yellow number 4. Other options shown are 'Input', 'Dropdown', and 'Radio Buttons'.</p>

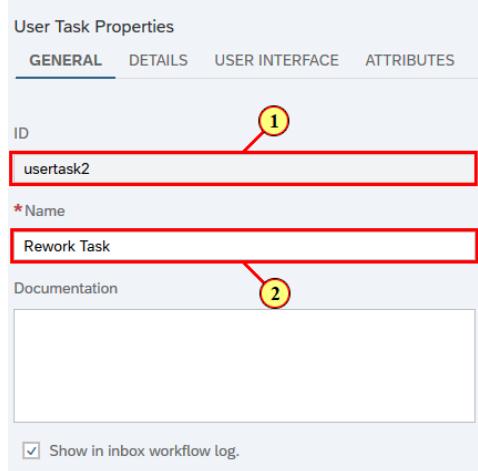
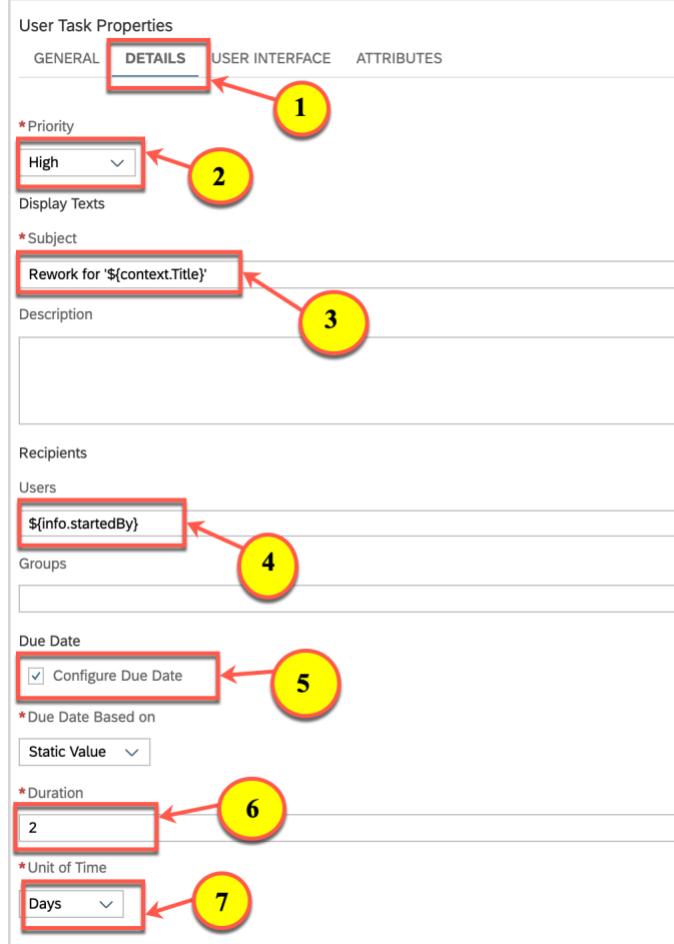
Explanation	Screenshot												
<p>86. Ensure your Form looks like this.</p>	 <p>The screenshot shows a form configuration interface with several fields:</p> <ul style="list-style-type: none"> <li>History: Section, Collection, \${context.History}</li> <li>User: String, \${item.UserId}</li> <li>Role: String, \${item.Role}</li> <li>Action: String, \${item.Action}</li> <li>Comment: String, \${item.Comment}</li> <li>Approval: Section, Comment: String, \${context.comment}</li> </ul>												
<p>87. Select the <b>Decisions</b> tab. 88. Select <b>Add</b> to add a new decision option.</p>	 <p>The screenshot shows the CapexApproval_00 form editor with the following details:</p> <ul style="list-style-type: none"> <li>ID: capexapproval_00</li> <li>Revision: 1</li> <li>Type: Task Form</li> <li>FIELDS: DECISIONS (highlighted with a red box)</li> <li>Add button (highlighted with a red box)</li> <li>Copy, Paste, and Delete buttons</li> </ul>												
<p>89. Enter <b>Approve</b> as <b>Text</b> of the decision button. 90. Select <b>Positive</b> as <b>Type</b> from the dropdown-list.</p>	 <p>The screenshot shows the Properties dialog for a decision button:</p> <ul style="list-style-type: none"> <li>*ID: approve</li> <li>*Text: Approve (highlighted with a red box)</li> <li>Type: Positive (highlighted with a red box)</li> <li>Neutral</li> <li>Positive (selected)</li> <li>Negative</li> </ul>												
<p>91. In the same way, add a decision option <b>Reject</b> with type <b>Negative</b> and one with text <b>Rework</b> of <b>Neutral</b> type.</p>	 <table border="1"> <thead> <tr> <th>Text</th> <th>ID</th> <th>Type</th> </tr> </thead> <tbody> <tr> <td>Approve</td> <td>approve</td> <td>Positive</td> </tr> <tr> <td>Reject</td> <td>reject</td> <td>Negative</td> </tr> <tr> <td>Rework</td> <td>rework</td> <td>Neutral</td> </tr> </tbody> </table>	Text	ID	Type	Approve	approve	Positive	Reject	reject	Negative	Rework	rework	Neutral
Text	ID	Type											
Approve	approve	Positive											
Reject	reject	Negative											
Rework	rework	Neutral											
<p>92. <b>Close</b> the file by clicking <b>X</b>.</p>	 <p>The screenshot shows the CapexApproval_00 form editor window with the following details:</p> <ul style="list-style-type: none"> <li>ID: capexapproval_00</li> <li>Revision: 1</li> <li>Type: Task Form</li> </ul>												

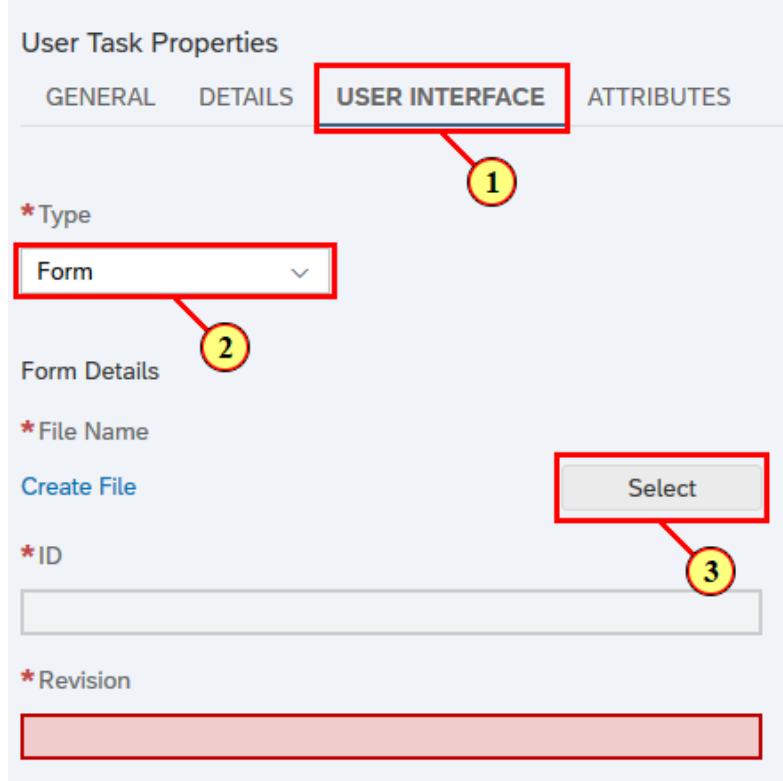
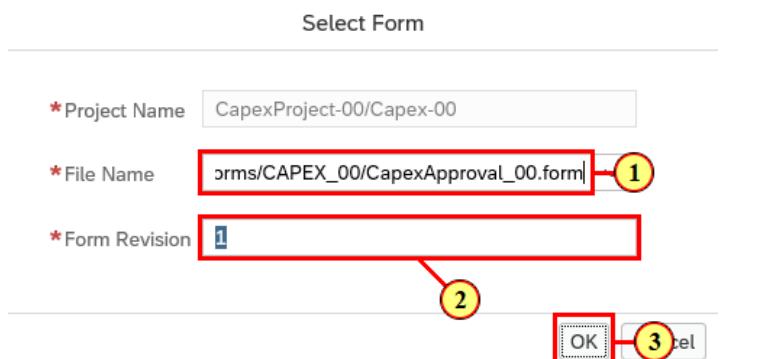
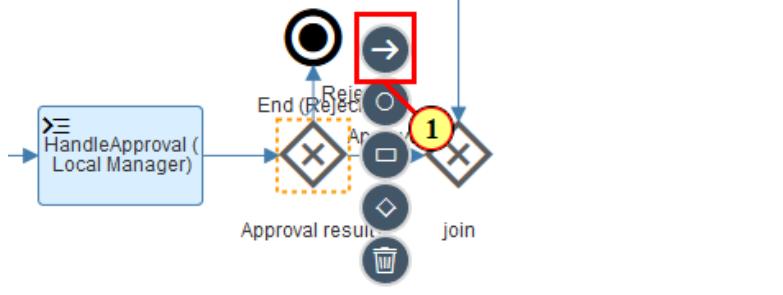
Explanation	Screenshot
<p>93. Select the script task <b>Handle Approval (Local Manager)</b>.</p>	
<p>94. In the <b>Script Task Properties</b>, select <b>Create File</b>.</p>	
<p>95. Enter <b>HandleApprovalLocalManager</b> as <b>Name</b> of the new file.</p> <p>96. Select <b>Create</b>.</p>	
<p>97. Replace the default content with the <b>HandleApprovalLocalManager.js</b> file in the <i>Exercise 1 → Helper</i> folder in GitHub.</p> <p>98. Close the file by clicking .</p> <p>Note: This script refers to the Task ID (usertask1) multiple times. This is the id of the User Task "Approval Task (Local Manager)" which was mentioned earlier. It is automatically assigned to each task. If your ID is different, it needs to be replaced here. Please note only replace if your user task has a different id.</p>	<pre> 1 var decision = { 2   "UserId": \$.usertasks.usertask1.last.processor, 3   "Role": "Local Manager", 4   "Action": \$.usertasks.usertask1.last.decision, 5   "Comment": \$.context.comment 6 }; 7 8 \$.context.History.push(decision); 9 \$.context.comment = ""; 10 11 \$.context.decision = \$.usertasks.usertask1.last.decision; </pre>

Explanation	Screenshot
<p>99. From the left sidebar, select <b>Add Event</b>.</p> <p>100. Select the <b>Terminate End Event</b> .</p>	
<p>101. Place the <b>End Event</b> above the exclusive gateway named <b>Approval result?</b></p> <p>Note: The yellow guiding lines help you position it nicely.</p>	
<p>102. Enter <b>End (Rejection)</b> as <b>Name</b>.</p> <p>103. Ensure that <b>Terminate</b> is checked.</p>	

Explanation	Screenshot
<p>104. Select the exclusive gateway with name <b>Approval result?</b></p> <p>105. Drag the sequence flow connector onto the end event with name <b>End (Rejection)</b></p>	
<p>106. Enter <b>Reject</b> as Name.</p> <p>107. Select the <b>checkbox for Default</b> condition.</p>	<p>Sequence Flow Properties</p> <p>ID: sequenceflow11</p> <p>* Name: <b>Reject</b> (highlighted with a red box)</p> <p>Documentation: (empty)</p> <p><input checked="" type="checkbox"/> Default (highlighted with a red box)</p>
<p>108. Select the sequence flow connector between the gateways named <b>Approval result?</b> and <b>join</b>.</p> <p>Note: Once there is more than one outgoing sequence flow from an Exclusive Gateway, all of them can be named. Exactly one must have the 'default', and all others customized trigger conditions based on the workflow context.</p>	

Explanation	Screenshot
<p>109. Enter <b>Approve</b> as <b>Name</b>.</p> <p>110. Enter <code>#{context.decision == "approve"}</code> as <b>Condition</b>.</p>	 <p>Sequence Flow Properties</p> <p>ID: sequenceflow9</p> <p>*Name: Approve (highlighted)</p> <p>Documentation: (highlighted with yellow circle 1)</p> <p>*Condition: <code>#{context.decision == "approve"}</code> (highlighted with red box)</p> <p>[Default] (highlighted with yellow circle 2)</p>
<p>111. From the left sidebar, select <b>Add Task</b> .</p> <p>112. Select <b>User Task</b> .</p>	 <p>* CAPEX_00.workflow x</p> <p>User Task Represents a user task</p> <p>(highlighted with red box)</p> <p>Service Task (highlighted with yellow circle 1)</p> <p>Script Task (highlighted with yellow circle 2)</p> <p>Mail Task</p>
<p>113. Place the <b>User Task</b> below the script task <b>Prepare Data</b>.</p> <p>Note: The yellow guiding lines help you position it nicely.</p>	 <pre> graph LR     Start(( )) --&gt; Prep[Prepare Data]     Prep --&gt; Update[Update Process Visibility]     </pre> <p>Capex Request</p> <p>Prepared Data</p> <p>Update Process Visibility</p> <p>(highlighted with red box)</p> <p>1 (highlighted with yellow circle)</p>

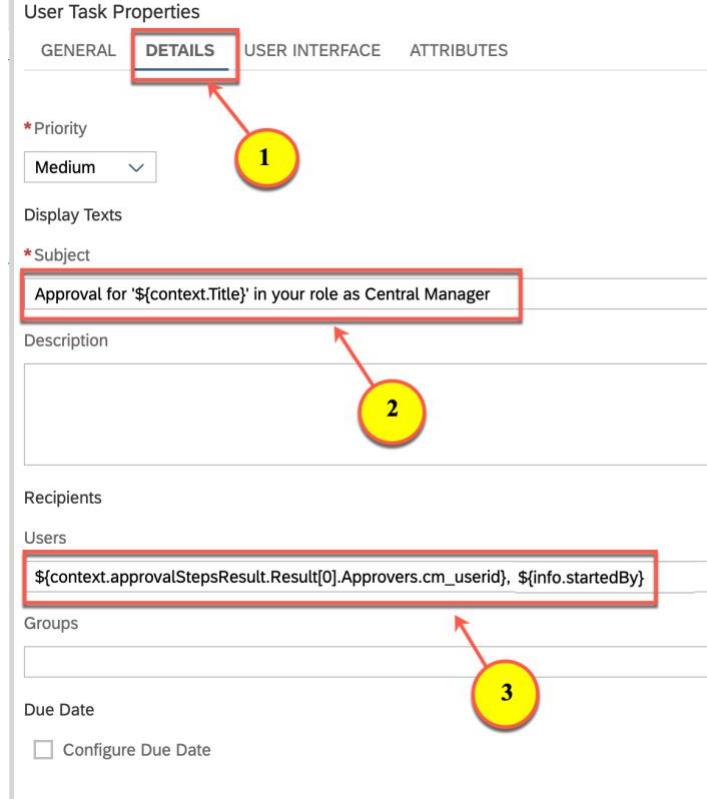
Explanation	Screenshot
<p>114. Verify that the <b>ID</b> is <code>usertask2</code>. If it differs, the references in the script file <b>Prepare Data.js</b> needs to be adapted accordingly.</p> <p>115. Enter <b>Rework Task</b> as <b>Name</b>.</p>	
<p>116. Select the <b>DETAILS</b> tab.</p> <p>117. Select the <b>Priority</b> as <b>High</b>.</p> <p>118. Enter <b>Rework for '\${context.Title}'</b> as <b>Subject</b>.</p> <p>119. Enter <b>\${info.startedBy}</b> as Recipients - User.</p> <p>120. Select <b>Configure Due Date</b>.</p> <p>121. Enter <b>2</b> as <b>Duration</b> and <b>Days</b> from the dropdown list <b>Unit of Time</b>, to mark the task as being due 2 days after it started.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in <i>Subject</i> and <i>Recipients</i> text. Sometimes during copy and paste, the spaces are added automatically. In that case the field will show red box. Remove the spaces.</p>	

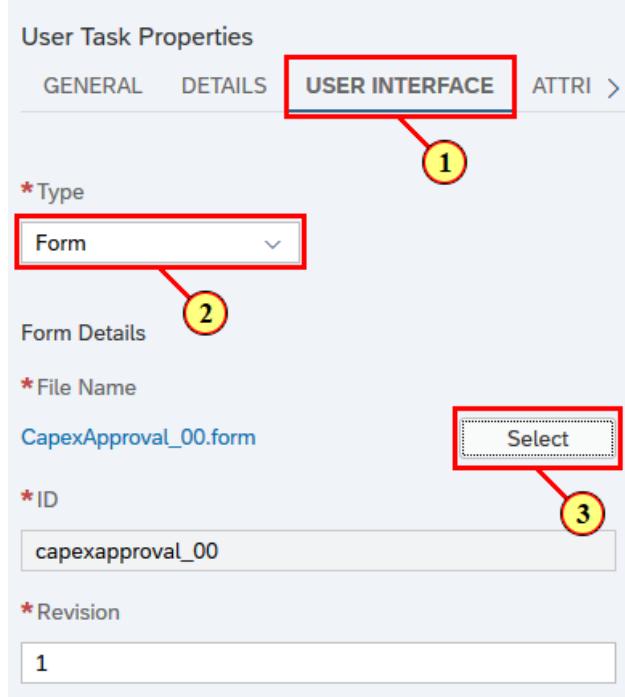
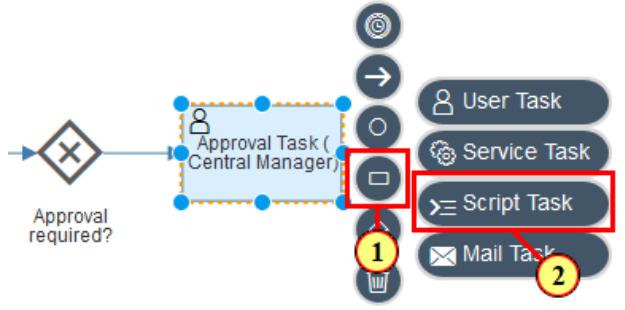
Explanation	Screenshot
<p>122. Select the <b>USER INTERFACE</b> tab.</p> <p>123. Select <b>Form</b> as <b>Type</b>.</p> <p>124. Click <b>Select</b> to choose an existing form.</p>	
<p>125. Select the previously created form <b>CapexApproval_00</b></p> <p>126. Ensure that the <b>Revision</b> is 1.</p> <p>127. Select <b>OK</b>.</p>	
<p>128. Select the Exclusive Gateway <b>Approval result?</b> and drag an additional <b>Sequence Flow Connector...</b></p>	

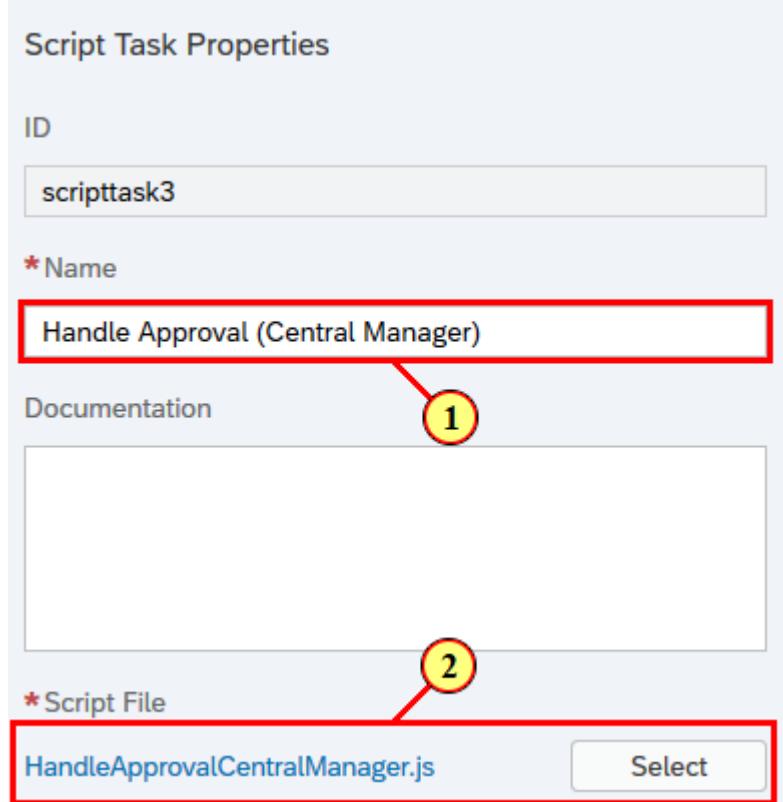
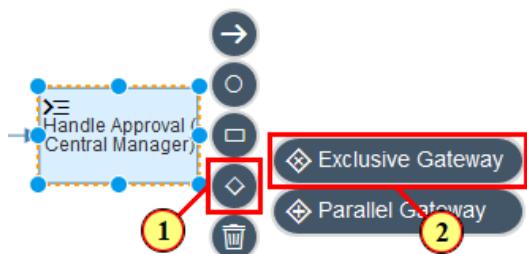
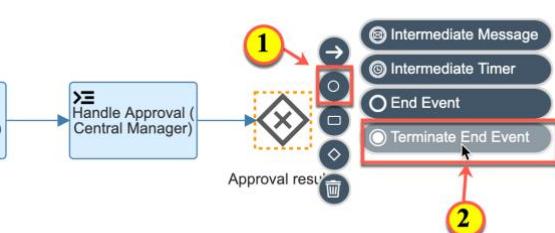
Explanation	Screenshot
<p>...onto the User Task <b>Rework Task</b>. Position it onto the highlighted middle dot.</p>	
<p>129. Click on the <b>Connection Dot</b>  of the new Sequence Flow and drag it from the middle of the Exclusive Gateway... onto the lower edge of the Exclusive Gateway.</p>	
<p>130. Ensure your outgoing Sequence Flow Connectors look like this.</p>	

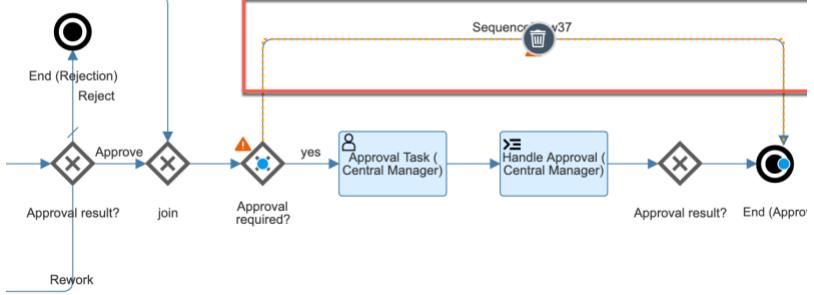
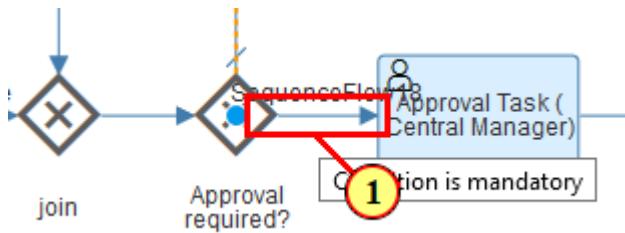
Explanation	Screenshot
<p>131. Enter <b>Rework</b> as Name.</p> <p>132. Enter <code>#{context.decision == "rework"}</code> as Condition.</p>	<p>Sequence Flow Properties</p> <p>ID: sequenceflow12</p> <p>* Name: Rework (highlighted by red box)</p> <p>Documentation: (empty field)</p> <p>* Condition: \${context.decision == "rework"} (highlighted by red box)</p> <p><input type="checkbox"/> Default (highlighted by red box)</p>
<p>133. Select User Task <b>Rework Task</b></p> <p>134. Select <b>Sequence Flow Connector</b> and drag it...</p>	<p>Capex Request → Prepare Data → Retrieve Approval Steps</p> <p>Rework Task (selected with red box)</p> <p>Sequence flow connector (highlighted by red box) being dragged from Prepare Data to Rework Task.</p>
<p>...onto the Script Task <b>Prepare Data</b>.</p>	<p>Capex Request → Prepare Data (highlighted with red box) → Retrieve Approval Steps</p> <p>Rework Task</p> <p>Sequence flow connector (highlighted by red box) connecting Prepare Data to Rework Task.</p>

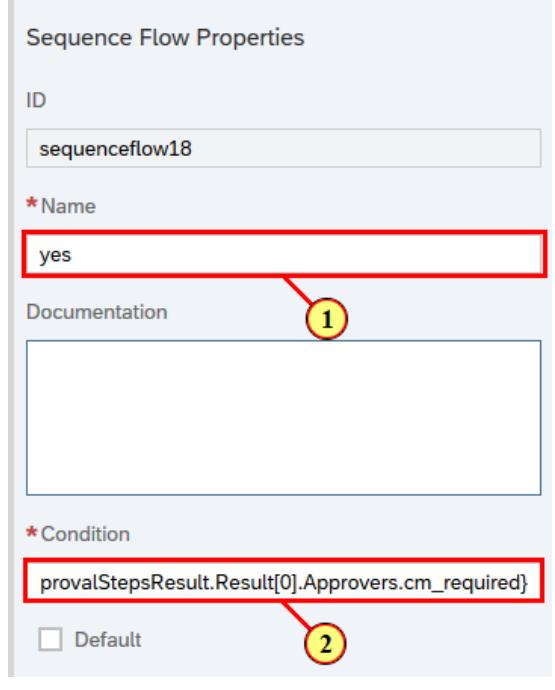
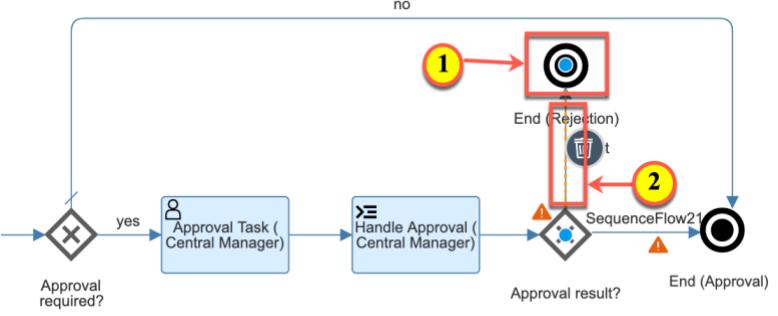
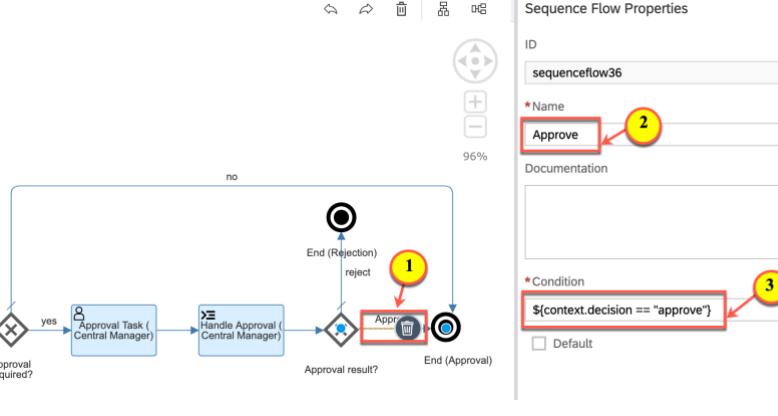
Explanation	Screenshot
<p>Ensure your workflow looks like this.</p>	<pre> graph LR     Start(( )) --&gt; PrepareData[Prepare Data]     PrepareData --&gt; RetrieveSteps[Retrieve Approval Steps]     RetrieveSteps --&gt; ApprovalRequired{Approval required?}     ApprovalRequired -- no --&gt; End(( ))     ApprovalRequired -- yes --&gt; ApprovalTask[Approval Task (Local Manager)]     ApprovalTask --&gt; HandleApproval[Handle Approval (Local Manager)]     HandleApproval --&gt; ApprovalRequired     </pre>
<p>135. Select the exclusive gateway with name <b>join</b>.          136. Select <b>Add Gateway</b> .</p> <p>137. Select the <b>Exclusive Gateway</b> option .</p> <p>138. Name it as <b>Approval required?</b></p>	
<p>139. Select <b>Add Task</b> .</p> <p>140. Select <b>User Task</b> .</p> <p>141. Enter <b>Approval Task (Central Manager)</b> as <b>Name</b>.</p>	

Explanation	Screenshot
<p>142. Select the <b>Details</b> tab.</p> <p>143. Enter <b>Approval for '\${context.Title}' in your role as Central Manager</b> as <b>Subject</b>.</p> <p>144. Enter  <code> \${context.approvalStepsResult.Result[0].Approvers.cm_userid}, \${info.startedBy}</code> as <b>Recipients - Users</b>.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in <i>Subject and Recipients</i> text. Sometimes during copy and paste, the spaces are added automatically. In that case the field will show red box. Remove the spaces.</p> <p>Note: During development, the user tasks will be sent to the process initiator. Later, the user Id will be retrieved from SAP Business Rules service.</p>	 <p>User Task Properties</p> <p>GENERAL DETAILS USER INTERFACE ATTRIBUTES</p> <p>*Priority Medium</p> <p>*Subject Approval for '\${context.Title}' in your role as Central Manager</p> <p>Description</p> <p>Recipients</p> <p>Users \${context.approvalStepsResult.Result[0].Approvers.cm_userid}, \${info.startedBy}</p> <p>Groups</p> <p>Due Date</p> <p><input type="checkbox"/> Configure Due Date</p>

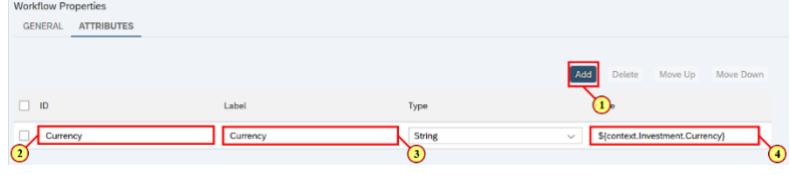
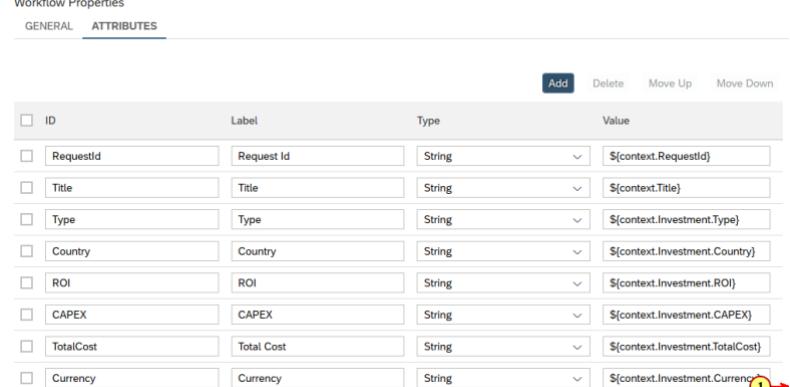
Explanation	Screenshot
<p>145. Select the <b>User Interface</b> tab.</p> <p>146. Select <b>Form</b> as <b>Type</b>.</p> <p>147. Use the <b>Select</b> button to choose the previously created form <b>capexapproval_00</b>.</p>	 <p>User Task Properties</p> <p>GENERAL DETAILS <b>USER INTERFACE</b> ATTRI &gt;</p> <p>* Type <b>Form</b></p> <p>Form Details</p> <p>* File Name <b>CapexApproval_00.form</b> <b>Select</b></p> <p>* ID <b>capexapproval_00</b></p> <p>* Revision <b>1</b></p>
<p>148. Select <b>Add Task</b> on the central manager approval.</p> <p>149. Select the <b>Script Task</b>.</p>	 <p>Approval required?</p> <p>Approval Task (Central Manager)</p> <p>1 Script Task</p> <p>2 Mail Task</p>

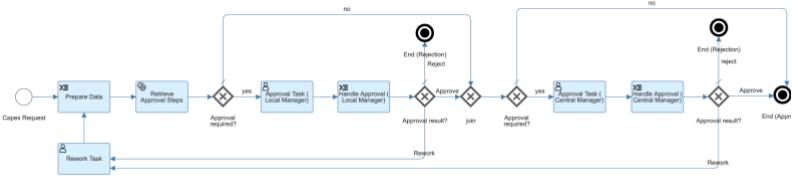
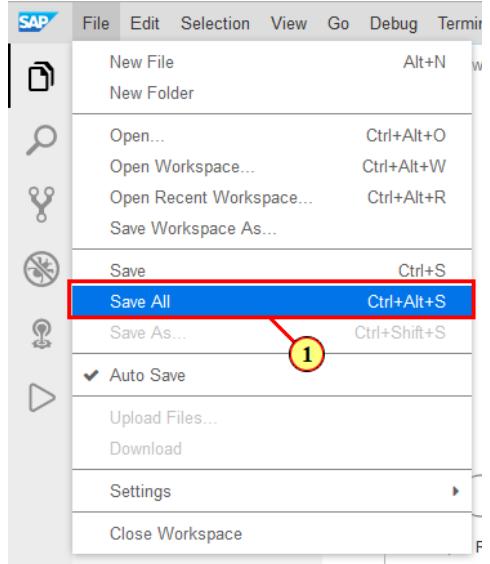
Explanation	Screenshot
<p>150. Enter <b>Handle Approval (Central Manager)</b> as <b>Name</b>.</p> <p>151. Click <b>Create File</b> to create a new file and <b>Name it HandleApprovalCentralManager</b>.</p> <p>152. Copy-paste the content of the file with the same name from the <i>Exercise 1 → Helper</i> folder in GitHub.</p> <p>Note: This script refers to the <b>Task ID</b> (usertask3) multiple times. This is the id of the User Task <b>Approval Task (Central Manager)</b> which was mentioned earlier. It is automatically assigned to each task. If your ID is different, then it needs to be replaced here.</p> <p>Note: To access the task decision the ID of the User Task is used. The difference in the two <b>Handle Approval</b> scripts are which task they refer to, and the 'Role' stored in the history element of workflow context.</p>	 <p>The screenshot shows the 'Script Task Properties' dialog. The 'Name' field contains 'Handle Approval (Central Manager)' (marked with a red box and yellow circle 1). The 'Script File' field contains 'HandleApprovalCentralManager.js' (marked with a red box and yellow circle 2).</p>
<p>153. Select <b>Add Gateway</b> .</p> <p>154. Select the <b>Exclusive Gateway</b> .</p> <p>155. Name it as <b>Approval result?</b></p>	 <p>The screenshot shows a workflow diagram with a user task labeled 'Handle Approval (Central Manager)'. A gateway icon (diamond with outgoing arrows) is highlighted with a red box and yellow circle 1. Another gateway icon is labeled 'Exclusive Gateway' and is highlighted with a red box and yellow circle 2.</p>
<p>156. Click <b>Approval result?</b> and Select <b>Add Event</b>.</p> <p>157. Select the <b>Terminate End Event</b>. Name the event as <b>End (Approval)</b>.</p>	 <p>The screenshot shows the workflow diagram after adding the gateway. The gateway is now labeled 'Approval result?' and has a red box and yellow circle 1. A 'Terminate End Event' is highlighted with a red box and yellow circle 2.</p>

Explanation	Screenshot
<p>158. On the previous exclusive gateway with name <b>Approval required?</b> add a new <b>Sequence Flow Connector</b> and drag it onto the newly added <b>Terminate End Event</b>.</p> <p>Note: To make it look nice, move the blue connection dots on both sides to the upper edge of the icons and optionally drag the line upwards further upwards.</p>	 <pre> graph LR     Start(( )) --&gt; Join  J(( ))     J --&gt; X  G1{Approval required?}     G1 -- no --&gt; Reject  EndReject(( ))     G1 -- yes --&gt; Approve  G2{Approval result?}     G2 -- X --&gt; Join  J     G2 -- Approve --&gt; X  G3{Approval required?}     G3 -- yes --&gt; X  Task1[Approval Task (Central Manager)]     Task1 --&gt; X  H1[Handle Approval (Central Manager)]     H1 --&gt; X  G4{Approval result?}     G4 -- X --&gt; Join  J     G4 -- Approve --&gt; X  EndApprove(( ))     G4 -- Reject --&gt; X  EndReject     </pre>
<p>159. Enter <b>no</b> as <b>Name</b>.</p> <p>160. Select it as <b>Default</b>.</p>	<p><b>Sequence Flow Properties</b></p> <p><b>ID</b>: sequenceflow23</p> <p><b>* Name</b>: no <span style="border: 2px solid red; padding: 2px;">1</span></p> <p><b>Documentation</b></p> <p><b>Default</b>: <input checked="" type="checkbox"/> <span style="border: 2px solid red; padding: 2px;">2</span></p>
<p>161. Select the Sequence Flow Connector  between <b>Approval required?</b> and <b>Approval Task (Central Manager)</b>.</p>	 <p>The sequence flow connector between the 'Approval required?' gateway and the 'Approval Task (Central Manager)' task is highlighted with a red box. A callout bubble labeled 'Connection is mandatory' points to this connector.</p>

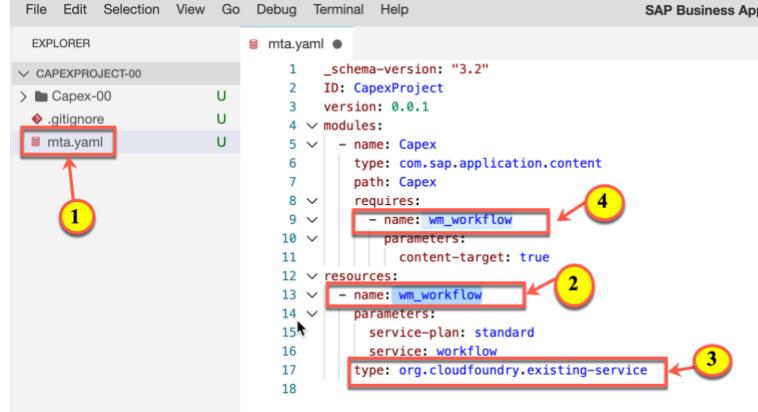
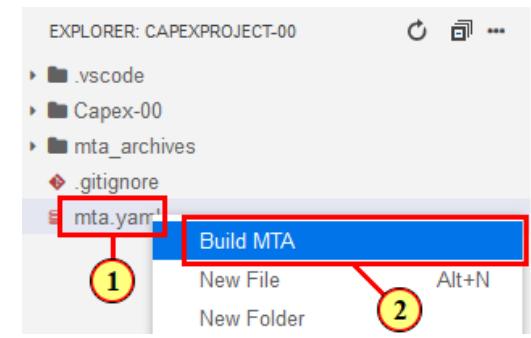
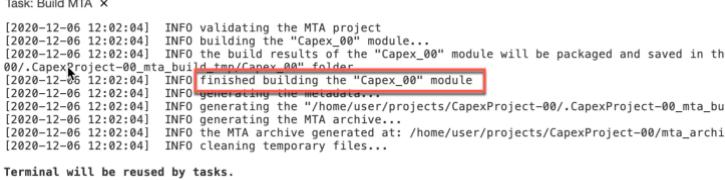
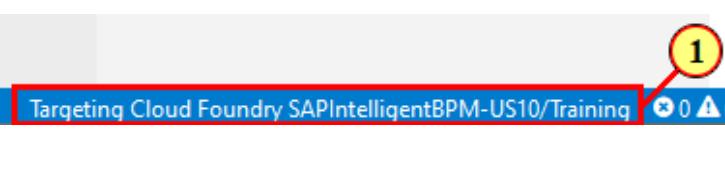
Explanation	Screenshot
<p>162. Enter <b>Yes</b> as <b>Name</b>.</p> <p>163. Enter  <code> \${context.approvalStepsResult.Result[0].Approvers.cm_required}</code> as <b>Condition</b>.</p> <p>⚠️ Be careful during copying. There are no spaces in the <b>Condition</b> text. Sometimes during copy, spaces are added automatically. In this case, then remove them.</p> <p>Note: how this accesses the field <i>cm_required</i>, for "approval required from Central Manager", whereas for the first approval, the field was called <i>lm_required</i>, for the Local Manager.</p>	 <p>Sequence Flow Properties</p> <p>ID: sequenceflow18</p> <p>* Name: yes</p> <p>Documentation: 1</p> <p>* Condition: \${context.approvalStepsResult.Result[0].Approvers.cm_required} 2</p> <p><input type="checkbox"/> Default</p>
<p>164. Create a new <b>Terminating End Event</b> and place it above the <b>Approval result?</b> gateway. Name it <b>End (Rejection)</b>.</p> <p>165. Drag a new Sequence Flow Connection from <b>Approval result?</b> onto the <b>End (Rejection)</b> event. Name it <b>Reject</b> and select <b>Default</b> as condition.</p>	 <pre> graph LR     Start(( )) --&gt; Decision{Approval required?}     Decision -- yes --&gt; Task1[Approval Task (Central Manager)]     Task1 --&gt; Handle1[Handle Approval (Central Manager)]     Handle1 --&gt; ApprovalResult{Approval result?}     ApprovalResult -- no --&gt; EndRejection((End (Rejection)))     ApprovalResult -- yes --&gt; RejectSeqFlow[SequenceFlow21]     RejectSeqFlow --&gt; EndRejection     EndRejection --&gt; EndApproval((End (Approval)))   </pre>
<p>166. Select the Sequence Flow Connection from <b>Approval result?</b> onto the <b>End (Approval)</b></p> <p>167. Name it <b>Approve</b> and enter <code> \${context.decision == "approve"}</code> as condition.</p>	 <pre> graph LR     Start(( )) --&gt; Decision{Approval required?}     Decision -- yes --&gt; Task1[Approval Task (Central Manager)]     Task1 --&gt; Handle1[Handle Approval (Central Manager)]     Handle1 --&gt; ApprovalResult{Approval result?}     ApprovalResult -- no --&gt; EndRejection((End (Rejection)))     ApprovalResult -- yes --&gt; ApproveSeqFlow[Approve]     ApproveSeqFlow --&gt; EndApproval((End (Approval)))     EndApproval --&gt; RejectSeqFlow[SequenceFlow21]     RejectSeqFlow --&gt; EndRejection   </pre> <p>Sequence Flow Properties</p> <p>ID: sequenceflow36</p> <p>* Name: Approve 2</p> <p>Documentation:</p> <p>* Condition: \${context.decision == "approve"} 3</p> <p><input type="checkbox"/> Default</p>

Explanation	Screenshot
<p>168. Drag a new Sequence Flow Connection from <b>Approval result?</b> onto the <b>Rework Task</b>.</p> <p>169. Adjust it that it starts directly downward by selecting the starting Connection Dot and move it to the lower edge of the Exclusive Gateway.</p>	<p>The screenshot shows a complex workflow involving multiple parallel paths for approval. A new sequence flow has been added from the decision diamond labeled 'Approval result?' to the 'Rework Task' node. This flow is highlighted with a red box and a yellow circle numbered 1. The 'Rework Task' node is also highlighted with a red box and a yellow circle numbered 2.</p>
<p>170. Name it as <b>Rework</b> and enter <code>\$(context.decision == "rework")</code> as condition.</p>	<p>The screenshot shows the 'Sequence Flow Properties' pane for the newly created sequence flow. The 'Name' field is set to 'Rework' (highlighted with a red box and yellow circle 2). The 'Condition' field contains the expression <code>\$(context.decision == "rework")</code> (highlighted with a red box and yellow circle 3).</p>
<p>171. Click anywhere on an empty space in the workflow editor to open <b>Workflow Properties</b>.</p> <p>172. In <b>Workflow Properties</b>, enter <b>Subject</b> as <b>CAPEX Approval for '\${context.Title}'</b></p> <p>173. Enter <b>Business Key</b> as <code>\$(context.RequestId)</code></p> <p>174. Select the <b>ATTRIBUTES</b> tab.</p>	<p>The screenshot shows the 'Workflow Properties' pane. The 'GENERAL' tab is selected, showing the 'Subject' field set to 'CAPEX Approval for \${context.Title}' (highlighted with a red box and yellow circle 2) and the 'Business Key' field set to <code>\$(context.RequestId)</code> (highlighted with a red box and yellow circle 3). The 'ATTRIBUTES' tab is also shown (highlighted with a red box and yellow circle 4).</p>
<p>Note: You can drag the vertical divider line of the <b>Workflow Properties</b> Pane to enlarge it.</p> <p>Now we will add attributes from the workflow context that will be exposed to be seen in Process Visibility scenario (in exercise 3 later)</p>	<p>The screenshot shows the 'Workflow Properties' pane with the 'ATTRIBUTES' tab selected. A vertical divider line is visible on the left side of the pane, which can be dragged to resize the window.</p>

Explanation	Screenshot
<p>175. Select <b>Add</b>.</p> <p>176. Enter <b>Currency</b> as <b>ID</b>.</p> <p>177. Enter <b>Currency</b> as <b>Label</b>.</p> <p>178. Enter  <b>Value:</b> \${context.Investment.Currency} as  <b>Value.</b></p>	
<p>179. In the same way, add the following fields:</p> <p><b>ID:</b> TotalCost  <b>Label:</b> Total Cost  <b>Value:</b> \${context.Investment.TotalCost}</p> <p><b>ID:</b> CAPEX  <b>Label:</b> CAPEX  <b>Value:</b> \${context.Investment.CAPEX}</p> <p><b>ID:</b> ROI  <b>Label:</b> ROI  <b>Value:</b> \${context.Investment.ROI}</p> <p><b>ID:</b> Country  <b>Label:</b> Country  <b>Value:</b> \${context.Investment.Country}</p> <p><b>ID:</b> Type  <b>Label:</b> Type  <b>Value:</b> \${context.Investment.Type}</p> <p><b>ID:</b> Title  <b>Label:</b> Title  <b>Value:</b> \${context.Title}</p> <p><b>ID:</b> RequestId  <b>Label:</b> Request Id  <b>Value:</b> \${context.RequestId}</p> <p>Note: Currently only String type is supported.</p> <p><b>⚠️</b> Be careful during copying. There are no spaces in the <b>Value</b> text. Sometimes during copy, spaces are added automatically. In this case, remove them. Check and remove leading and trailing spaces as well.</p>	

Explanation	Screenshot
<p>Your workflow should finally look like this.</p> 	
<p>Note: If you did not use <b>Auto Save</b>, ensure that all files are saved.</p>	

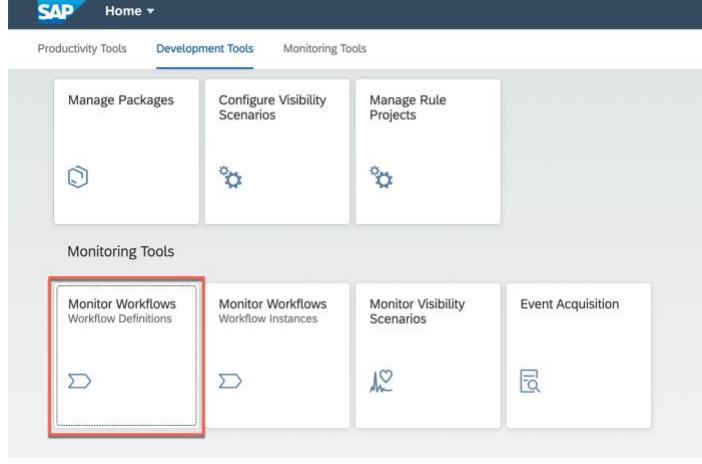
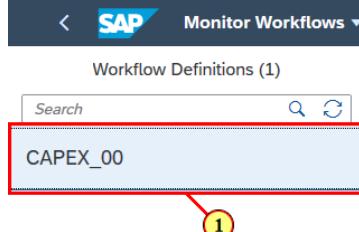
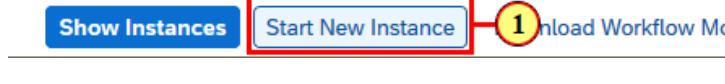
## BUILD AND DEPLOY WORKFLOW

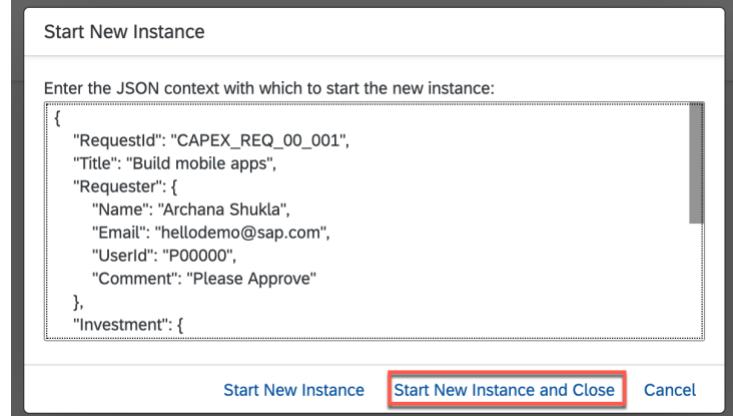
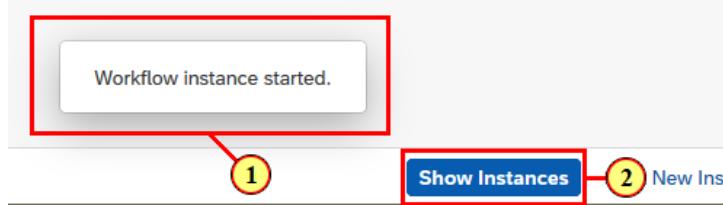
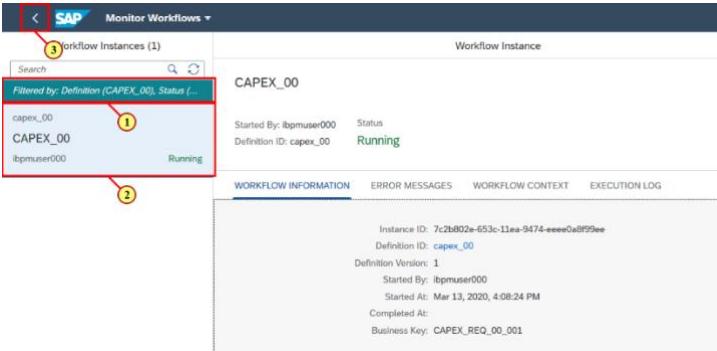
Explanation	Screenshot
<p>180. Double-click <b>mta.yaml</b> to open it.</p> <p>Note: The default MTA will mention a reference to a new workflow service instance. When you ran the Booster in the setup section, the workflow service instance is already created and so change the resource to the existing instance name.</p> <p>181. Change the resource name to <b>wm_workflow</b>.</p> <p>182. Change the resource type to <b>org.cloudfoundry.existing-service</b>.</p> <p>183. Change the resource reference to <b>wm_workflow</b>.</p> <p>184. Close the tab and ensure the file is saved.</p>	 <pre> File Edit Selection View Go Debug Terminal Help SAP Business App EXPLORER mta.yaml 1 _schema-version: "3.2" 2 ID: CapexProject 3 version: 0.0.1 4 modules: 5   - name: Capex 6     type: com.sap.application.content 7     path: Capex 8     requires: 9       - name: wm_workflow 10      parameters: 11        content-target: true 12      resources: 13        - name: wm_workflow 14          parameters: 15            service-plan: standard 16            service: workflow 17            type: org.cloudfoundry.existing-service   </pre>
<p>Before you build, ensure that there are no errors shown in the project. If there are red indicators, then open <b>View → Problems</b> menu option to see the modelling errors. Fix those first.</p> <p>185. To build the project, right-click on <b>mta.yaml</b> to open the context menu.</p> <p>186. Select <b>Build MTA</b>.</p>	
<p>187. Ensure that the <b>Build MTA</b> task exits with successful message, indicating the build is completed.</p>	 <pre> [2020-12-06 12:02:04] INFO validating the MTA project [2020-12-06 12:02:04] INFO building the "Capex_00" module... [2020-12-06 12:02:04] INFO the build results of the "Capex_00" module will be packaged and saved in the /home/user/projects/CapexProject-00/mta_archives folder [2020-12-06 12:02:04] INFO finished building the "Capex_00" module [2020-12-06 12:02:04] INFO generating the "/home/user/projects/CapexProject-00/.CapexProject-00_mta_bu... [2020-12-06 12:02:04] INFO generating the MTA archive... [2020-12-06 12:02:04] INFO the MTA archive generated at: /home/user/projects/CapexProject-00/mta_archi... [2020-12-06 12:02:04] INFO cleaning temporary files...   </pre> <p>Terminal will be reused by tasks.</p>
<p>188. Ensure that a cloud tenant has already been configured. It will be shown in the bottom left corner on a blue bar. If it is not configured yet, then click on the blue bar and follow the wizard to enter the details.</p>	

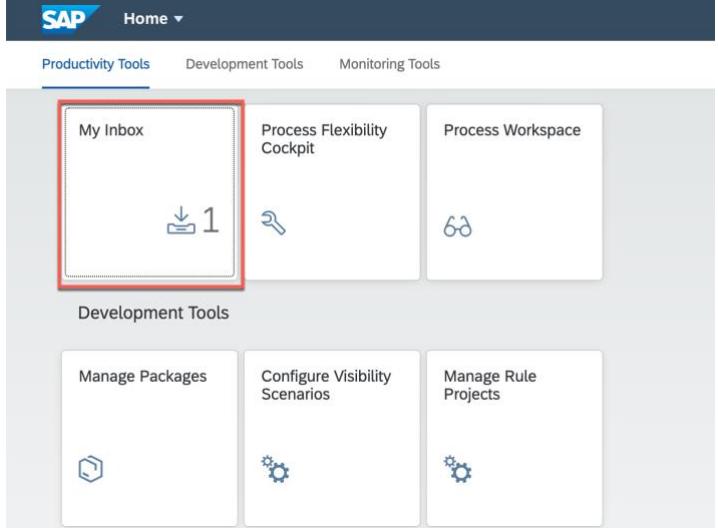
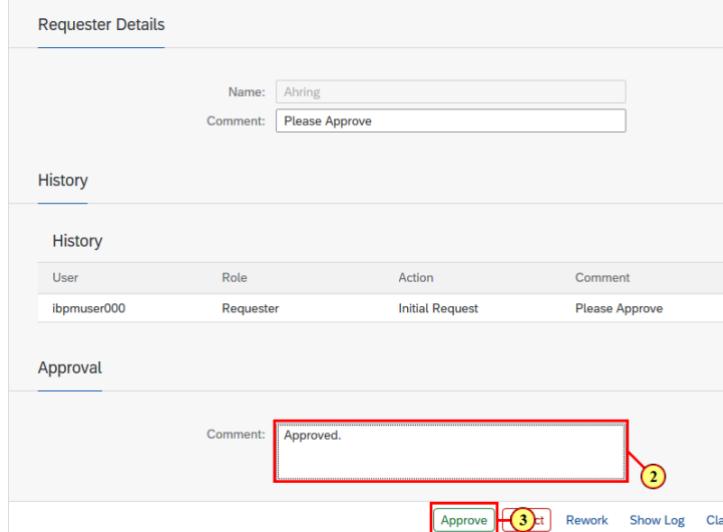
Explanation	Screenshot				
<p>You can get the need information about the Login URL, organization name and space name from you trial account.</p>	<p>The screenshot shows the SAP Cloud Platform Cockpit interface. In the left sidebar, under 'Cloud Foundry', the 'Cloud Foundry Environment' tab is selected. It displays the following details:</p> <ul style="list-style-type: none"> <li>Subaccount: trial</li> <li>Subdomain: db73ff38trial</li> <li>ID: bc6567da-cabb-49f2-998d-6177896d0d93</li> <li>Cloud Foundry Environment: 2 (24 available) Active Subscriptions</li> <li>Org Name: db73ff38trial (highlighted by a red box)</li> <li>Org ID: 20e51be8-b1ed-4788-9146-89deff83faac</li> <li>Members: 1</li> <li>API Endpoint: https://api.cf.eu10.hana.ondemand.com (highlighted by a red box)</li> <li>Disable Cloud Foundry</li> <li>Entitlements</li> <li>Spaces (1):       <table border="1"> <thead> <tr> <th>Name</th> <th>Applications</th> </tr> </thead> <tbody> <tr> <td>dev (highlighted by a red box)</td> <td>0</td> </tr> </tbody> </table> </li> </ul>	Name	Applications	dev (highlighted by a red box)	0
Name	Applications				
dev (highlighted by a red box)	0				
<p>You have to login with your trial user email and password.</p>	<p><b>Note:</b> If your trial setup has failed, and your trainer has given you another system for deployment, then you need to login with the URL, organization, space, username and password as provided by the trainer.</p> <p>[Optional] If you get this error which means you have 2FA enabled for this user in your account.</p> <p>In that case,</p> <ul style="list-style-type: none"> <li>open a <b>New Terminal</b> window and enter command <b>cf login --sso</b></li> <li>You will then be given a URL to get <b>Temporary Authentication Code</b></li> <li>Copy and open the URL in browser window, follow the instructions to copy the authorization code and paste in the terminal and click Enter. (note: Just paste is and click Enter. The code wont with be shown).</li> <li>If the code is correct, you will be prompted to select the organization else it will throw <b>Invalid passcode</b>. For latter case, get the passcode again, paste and click Enter key.</li> <li>Enter the organization index number or the organization name from the list.</li> <li>If you have only 1 space then it will automatically be selected, else it will ask you to enter the space as well.</li> <li>When your connection is done, you will see the connected cloud account information in the blue-bar.</li> </ul> <pre> user@workspaces-ws-6229h-deployment-7bffbcb8494-r4fc5: ~/projects x user: projects \$ cf login --sso API endpoint: https://api.cf.eu10.hana.ondemand.com Temporary Authentication Code ( Get one at https://login.cf.eu10.hana.ondemand.com/passcode ): ■  user@workspaces-ws-6229h-deployment-7bffbcb8494-r4fc5: ~/projects x user: projects \$ cf login --sso API endpoint: https://api.cf.eu10.hana.ondemand.com Temporary Authentication Code ( Get one at https://login.cf.eu10.hana.ondemand.com/passcode ): Authenticating... Invalid passcode Temporary Authentication Code ( Get one at https://login.cf.eu10.hana.ondemand.com/passcode ): OK  Select an org: 1. bpm-beta_inbox-consumer-9 2. BPM_bpm_services 3. bpm-cf_bpm-workflow 4. bpm-cf_bpm-workflow-consumer 5. RDM_rfp_Fnschlamment_1  Org (enter to skip): 11 Targeted org db73ff38trial Targeted space dev  API endpoint: https://api.cf.eu10.hana.ondemand.com (API version: 3.91.0) User: [REDACTED] Org: db73ff38trial Space: dev user: projects \$ ■   </pre>				

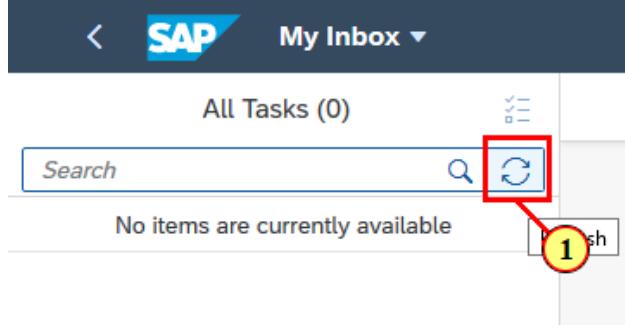
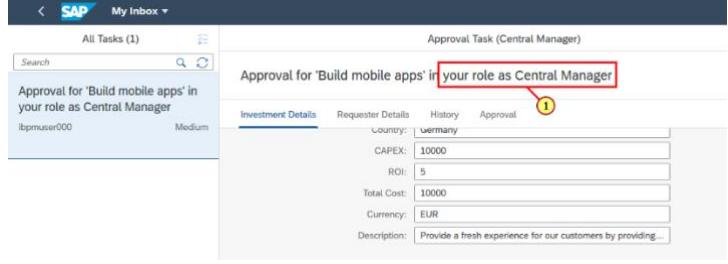
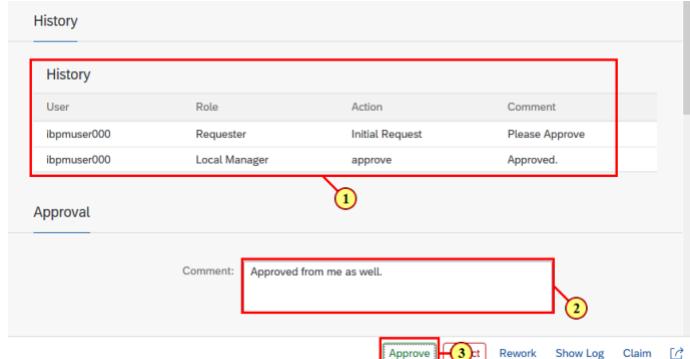
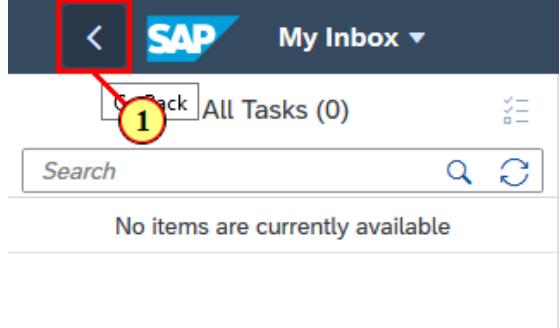
Explanation	Screenshot
<p>189. Select the newly created directory <b>mta_archives</b> to open it.</p> <p>190. Right-click on the created file <b>CapexProject-00_0.0.1.mtar</b> to open the context menu.</p> <p>191. Select <b>Deploy MTA Archive</b>.</p>	
<p>192. Ensure that the <b>Deploy MTA Archive</b> task exits with the successful message indicating that the deployment has finished.</p> <p>Note: Your deployment console should look similar to this with the "<b>Process finished</b>" in the second-to-last line, indicating success.</p> <p>If there are any errors then fix the error, build and deploy the workflow project again.</p>	<pre>&gt; Executing task: cf deploy /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar &lt; Deploying multi-target app archive /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar in org db73ff38trial / sp dev as jspap.com... There is an ongoing operation for multi-target app CapexProject-00. Do you want to abort it? (y/n)&gt; y Executing action 'abort' on operation 9b2ab30e-37bd-11eb-b80e-e0eeea091282a... OK Operation ID: b6cd741c-37c8-11eb-b95c-e0eeea09af9a4 Deploying in org "db73ff38trial" and space "dev" Detected MTA schema version: "3" No deployment key detected, this is initial deployment Detected new MTA services: "wm_workflow" Service key "Capex_00-wm_workflow-credentials" for service "wm_workflow" already exists Uploading content module "Capex_00" in target service "wm_workflow"... Deploying content module "Capex_00" in target service "wm_workflow"... Content deployment for module "Capex_00" failed. Because the command line option "--delete-services" is not specified. Process finished. Use "cf dmon -i b6cd741c-37c8-11eb-b95c-e0eeea09af9a4" to download the logs of the process.  Terminal will be reused by tasks. Task 'Deploy MTA Archive ()' was terminated by signal SIGPIPE.</pre>
<p>[Optional]</p> <p>Note: If the deployment fails saying "<b>Content deployment for module Capex_00 failed</b>", then carefully go through the deployment message in the terminal itself. It will let you know which part of the workflow model is not correctly configured.</p> <p>Note: Once you have fixed the errors in the workflow model, you have to build and deploy again. On doing so enter <b>y</b> if you get option saying: <b>There is an ongoing operation for multi-target app CapexProject-00. Do you want to abort it? (y/n)?</b></p>	<pre>Content deployment for module "Capex_00" failed. Download the logs "Capex_00_wm_workflow" via the dmon command and check them for more information. A step of the process has failed. Retrying it may solve the issue. Proceeding with automatic retry... (3 of 3 attempts left) Deployment of content module "Capex_00" in target service "wm_workflow"... [Capex_00] [FATAL] Deployment of file Id d1d8bede-37bd-11eb-b938-2b0287ee4cd Failed, Error details: while trying to invoke the method com.sap.bpm.wds.core.model.WorkflowModuleContent.getSubContents() of a null object loaded from local variable 'obj' Content deployment for module "Capex_00" failed. Download the logs "Capex_00_wm_workflow" via the dmon command and check them for more information. A step of the process has failed. Retrying it may solve the issue. Proceeding with automatic retry... (3 of 3 attempts left) Deployment of content module "Capex_00" in target service "wm_workflow"... [Capex_00] [FATAL] Deployment of file Id d1d8bede-37bd-11eb-b938-2b0287ee4cd Failed, Error details: while trying to invoke the method com.sap.bpm.wds.core.model.WorkflowModuleContent.getSubContents() of a null object loaded from local variable 'obj' Content deployment for module "Capex_00" failed. Download the logs "Capex_00_wm_workflow" via the dmon command and check them for more information. A step of the process has failed. Retrying it may solve the issue. Proceeding with automatic retry... (3 of 3 attempts left) Deployment of content module "Capex_00" in target service "wm_workflow"... [Capex_00] [FATAL] Deployment of file Id d1d8bede-37bd-11eb-b938-2b0287ee4cd Failed, Error details: while trying to invoke the method com.sap.bpm.wds.core.model.WorkflowModuleContent.getSubContents() of a null object loaded from local variable 'obj' Content deployment for module "Capex_00" failed. Download the logs "Capex_00_wm_workflow" via the dmon command and check them for more information.  Terminal will be reused by tasks.  &gt; Executing task: cf deploy /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar &lt; Deploying multi-target app archive /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar dev as ... There is an ongoing operation for multi-target app CapexProject-00. Do you want to abort it? (y/n)&gt; y</pre>

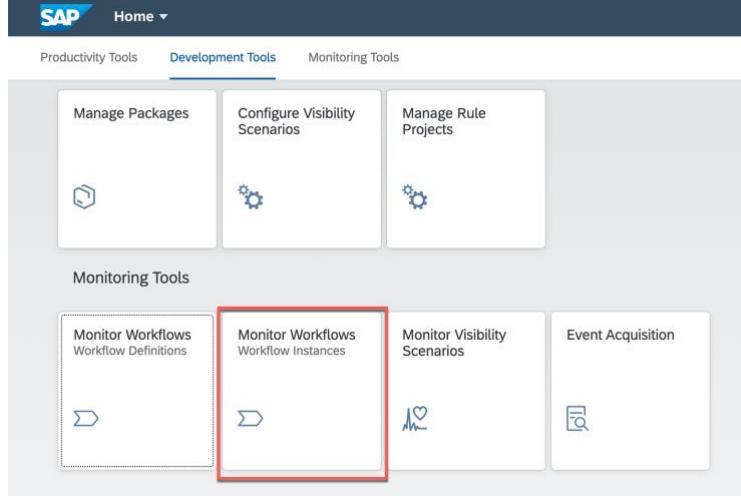
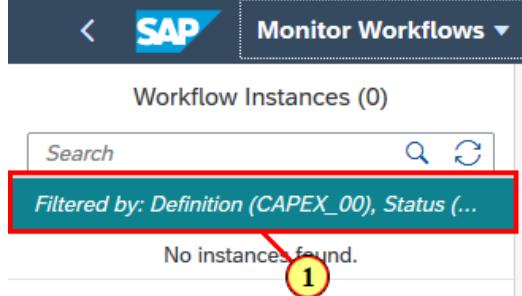
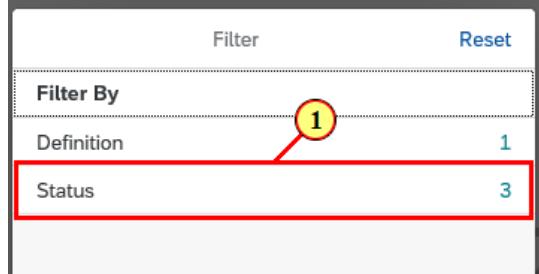
## EXECUTE AND MONITOR WORKFLOW

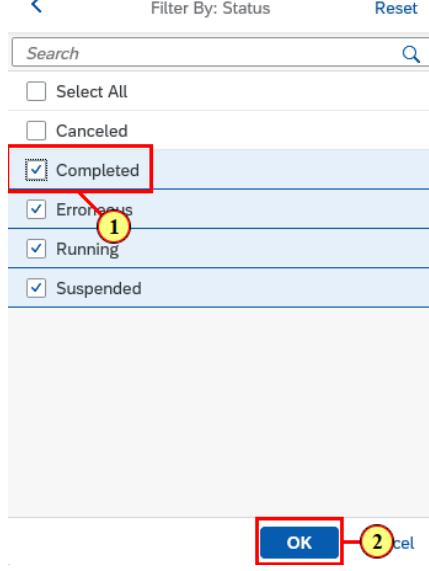
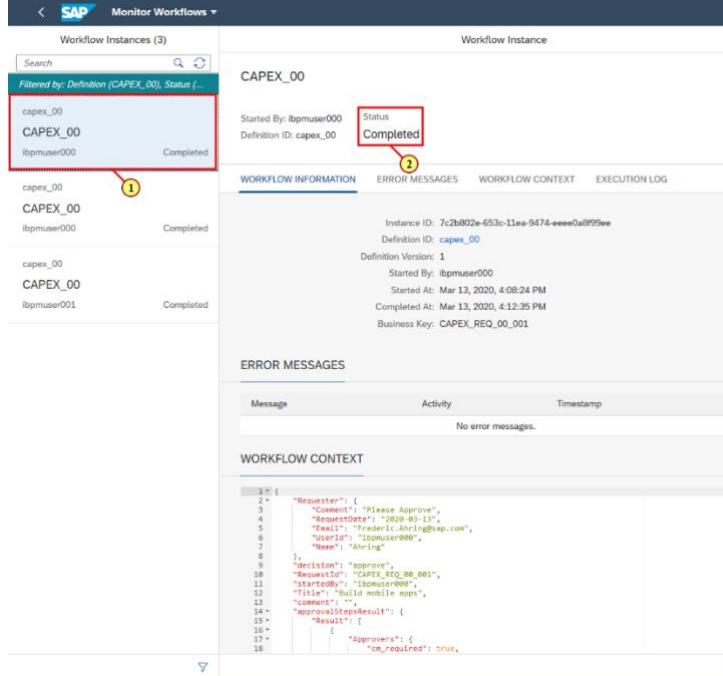
Explanation	Screenshot
<ol style="list-style-type: none"> <li>1. Open the <b>Workflow Management Launchpad</b></li> <li>2. <b>Log On</b> with your trial username and password.   <i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to login to the workflow management launchpad with the credentials provided by the trainer.</i> </li> <li>3. Select the tile <b>Monitor Workflows - Workflow Definitions</b>.</li> </ol>	
<p><b>Note:</b> <b>Monitor Workflows</b> application has Master-Detail layout where you see all the workflows deployed on left. Ensure that the workflow you just deployed - <b>CAPEX_00</b> - is existing.</p> <ol style="list-style-type: none"> <li>4. Select the workflow.   <i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to find the workflow with the unique name you provided while creating the workflow module like Capex_&lt;your name or id or initials&gt;</i> </li> </ol>	
<ol style="list-style-type: none"> <li>5. Select <b>Start New Instance</b>.</li> </ol> <p><b>Note:</b> This way of starting a workflow is mainly used for testing. Workflows can be started by end users using a Start Form or a custom UI5 application, and by other systems using the <a href="#">Workflow API</a>.</p>	

Explanation	Screenshot
<p>6. Check the start payload</p> <p>7. Click <b>Start New Instance and Close</b></p> <p>Note: The other <i>Start New Instance</i> option is to start multiple instances of the workflow from the same popup.</p>	
<p>A popup confirms that the workflow instance has been started.</p> <p>8. Select <b>Show Instances</b> to switch to the <b>Monitor Workflows - Workflow Instances</b> application where you can view all the running, completed, suspended workflow instances and their details.</p>	
<p>Note: When coming from <b>Show Instances</b>, a <b>Filter</b> is automatically added to the specific <b>Workflow Definition</b>.</p> <p>9. Select the newly started workflow instance and look at its details.</p> <p>10. Select <b>SAP icon</b> to go back to the Home Page of the Workflow Management Launchpad.</p>	

Explanation	Screenshot
<p>11. Select the tile for <b>My Inbox</b>. It should show at least one new task.</p>	
<p>12. Ensure that in the list view the new task "<b>Approval for...</b>" is selected.</p>	
<p>13. Scroll down to the <b>Approval</b> section.          14. Enter a <b>Comment</b> of your choice.          15. Click <b>Approve</b>.</p>	

Explanation	Screenshot
<p>16. In this exercise, the user task in the workflow has been configured to send all tasks in your inbox. To see the second approval task, select <b>Refresh</b> .</p>	
<p>Note: You can now see the task for the Central Manager.</p>	
<p>Note: The <b>History</b> table is filled with the comment entered in the previous task.</p> <p>17. Enter again a <b>Comment</b> of your choice.</p> <p>18. Click <b>Approve</b>.</p>	
<p>19. Select <b>SAP icon</b> to go back to the Workflow Management Home Page.</p>	

Explanation	Screenshot
<p>20. Select the <b>Monitor Workflows - Workflow Instances</b> tile.</p>	
<p>21. Be default, <b>Monitor Instances</b> application only shows Running, Suspended and Erroneous workflow instance. To see the completed workflow, click on the line showing the currently active <b>Filters</b> or select the <b>Filter</b> icon at the bottom of the screen.</p>	
<p>22. In the popup, select <b>Status</b>.</p>	

Explanation	Screenshot
<p>23. Select <b>Completed</b> to also show already completed workflow instances.</p> <p>24. Select <b>OK</b> to activate the changed filter settings.</p>	
<p>26. Ensure the correct instance is selected.</p> <p>27. Look at the details of the completed workflow instance.</p> <p><b>Congratulations! You completed the Workflow exercise.</b></p> <p>In this exercise, you learnt how to:</p> <ul style="list-style-type: none"> <li>○ Model workflow from <b>SAP Business Application Studio</b>.</li> <li>○ Build &amp; deploy workflow</li> <li>○ Start workflow instance from <b>Monitor Definitions</b></li> <li>○ Track the workflow instances from <b>Monitor Instances</b></li> <li>○ Process your work items from <b>My Inbox</b></li> </ul>	 <pre> 1: {   "Requester": {     "Comment": "Please Approve",     "Message": "2020-03-13T14:00:00Z",     "Email": "Frederic.Anring@sap.com",     "UserId": "ibpmuser000",     "Name": "Frederic Anring"   },   "Decision": "Approved",   "RequestId": "CAPEX_REQ_00_001",   "StartedBy": "ibpmuser000",   "Title": "Build mobile apps",   "Comments": "Approved",   "ApprovalStepsResult": [     {       "Result": [         {           "Approver": {             "cm_required": true,             "cm_email": "Frederic.Anring@sap.com"           }         }       ]     }   ] } </pre>

## SUMMARY

You have completed the exercise!

You are now able to:

1. Create a new workflow in **Business Application Studio**.
2. Add & configure **service task**, **script task**, **user task** and **gateways** in the workflow model.
3. **Build** and **deploy** workflow from Business Application Studio
4. Test the workflow using **Monitor Workflow | Workflow Definition** application.
5. Track and monitor the workflow using **Monitor Workflow | Workflow Instances** application.
6. View user tasks and take action from **My Inbox** application.

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PUBLIC

# **Build a Workflow from Scratch with SAP Workflow Management**

## **DEV163**

Exercise 2.1 | Business Rules  
Archana Shukla / SAP

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## AUTHOR, ACTIVATE AND DEPLOY BUSINESS RULES

### OVERVIEW

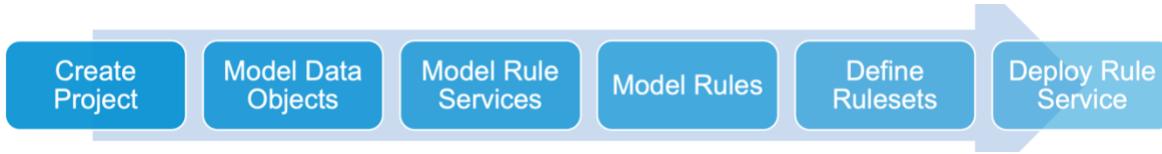
Estimated time: 45 minutes

The exercise is based on authoring and managing rules for capital expenditure, using SAP Business Rules service. The rule determines the approvers based on investment details.

The screenshot shows the SAP Business Rules application interface. At the top, there are navigation links: 'Manage Projects / Capital Expenditure Rules /' and buttons for 'Import', 'Export', 'Edit', and 'Validate'. Below this, a title bar says 'Determine Approvers Rule'. Underneath, there are two tabs: 'Details' and 'Decision Table', with 'Decision Table' being the active tab. The 'Decision Table' section contains a table with columns for 'If' and 'Then' conditions. The 'If' columns include 'Investment.Country', 'Investment.Type', and 'Investment.Total Cost'. The 'Then' columns include 'Central Manager User...', 'Local Manager User ID', 'Local Manager Appro...', and 'Central Manager Appro...'. The table rows define rules for different combinations of country and type, such as 'Germany' Software > 100, 'India' Software IN [200 .. 1000], etc.

If			Then			
Investment.Country	Investment.Type	Investment.Total Cost	Central Manager User...	Local Manager User ID	Local Manager Appro...	Central Manager Appro...
'Germany'	'Software'	> 100	'ibpmuser000'	'ibpmuser000'	true	true
'India'	'Software'	IN [ 200 .. 1000 ]	'varun.rao.001'	'kiran.shah.012'	false	true
'India'	'Software'	> 1000	'varun.rao.001'	'kiran.shah.012'	true	true
'United States of ...'	'Building'	EXISTSIN [ 100 , 5...	'frank.mathew.023'	'peter.collins.1441'	true	false
'United States of ...'	'Equipment'	>= 2500	'frank.mathew.023'	'nina.hanks.001'	true	true

In this exercise, you will learn about different enterprise rule models and how to author them using Manage Rules Application. You will create, configure and activate these business rules models, and learn how to deploy the rule service to cloud for consumption.

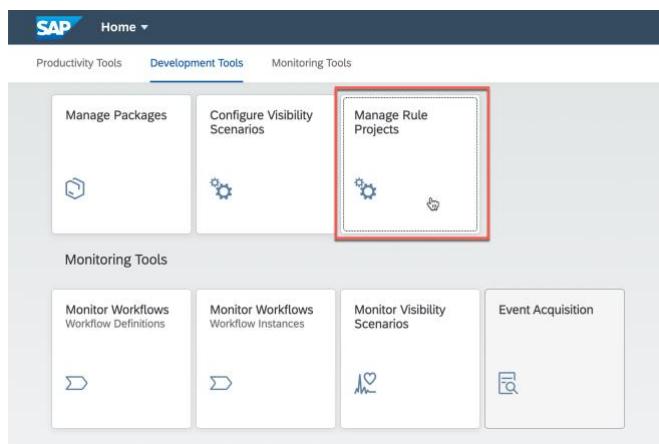
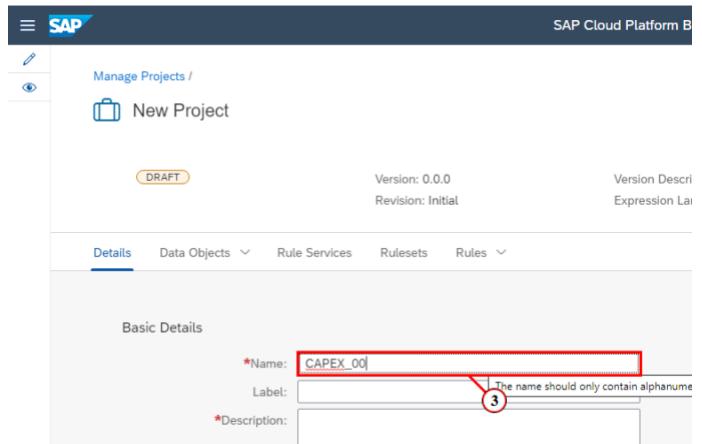
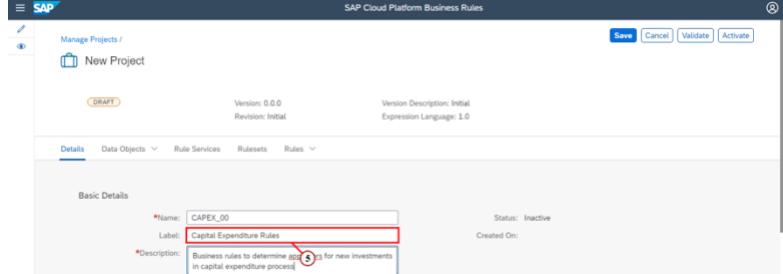


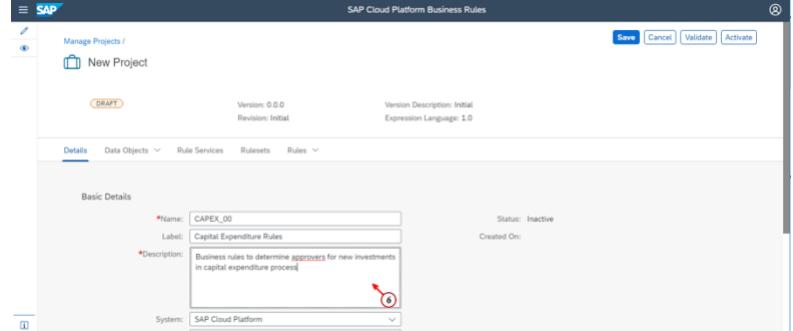
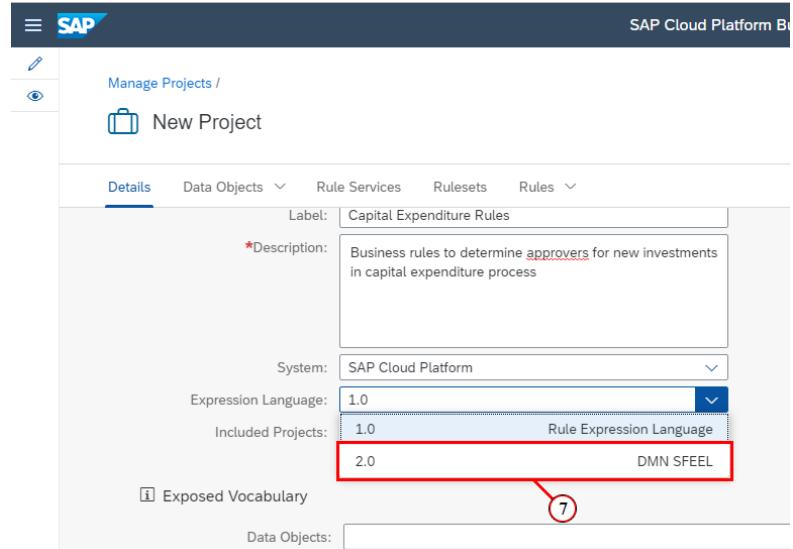
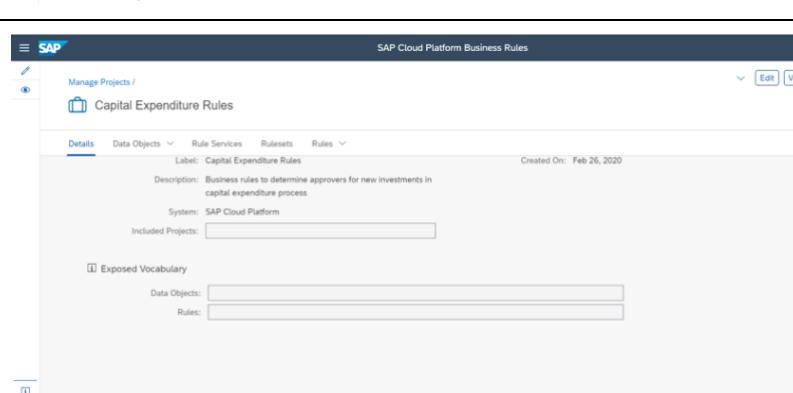
### Exercise Description:

In this exercise you will do the following:

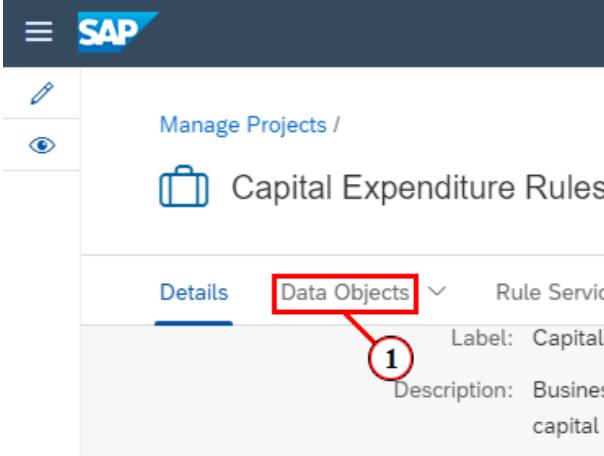
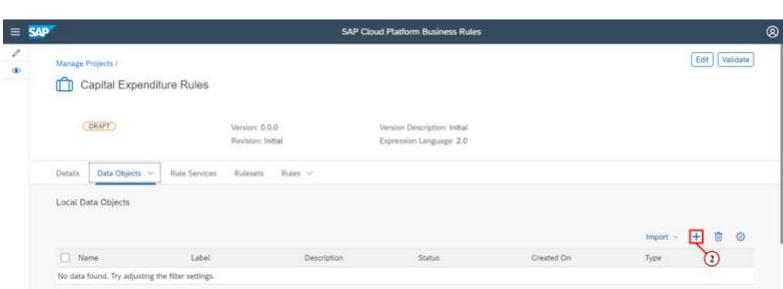
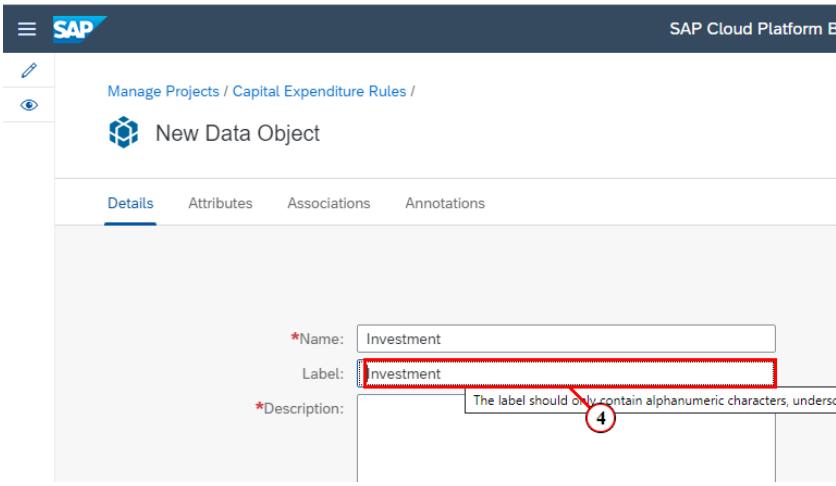
- *Create and Configure Project*
- *Create Data Objects*
- *Configure Data Object with Value Help*
- *Create Ruleservice*
- *Create Decision Table*
- *Create Ruleset*
- *Activate Projects and other Models*
- *Deploy Ruleservice in Cloud Runtime*
- *Create Rule Version*
- *Test Business Rules*

## CREATE PROJECT

Explanation	Screenshot
<p>1. Open Workflow Management Launchpad and click to open <b>Manage Rule Projects</b>.</p> <ul style="list-style-type: none"> <li>• Login with trial username and passwords</li> </ul>	
<p>2. Click + to create a new business rules project.</p>	
<p>3. Enter <b>CAPEX_00</b> in the <b>Name</b> box.</p>	
<p>4. Enter <b>Capital Expenditure Rules</b> in the <b>Label</b> box.</p>	

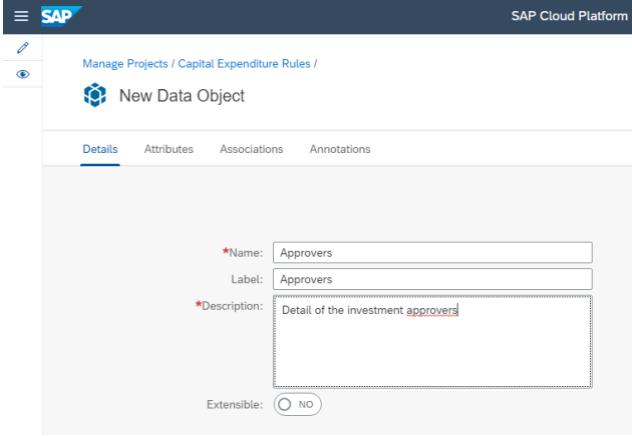
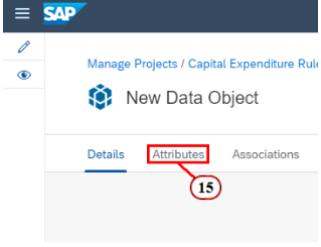
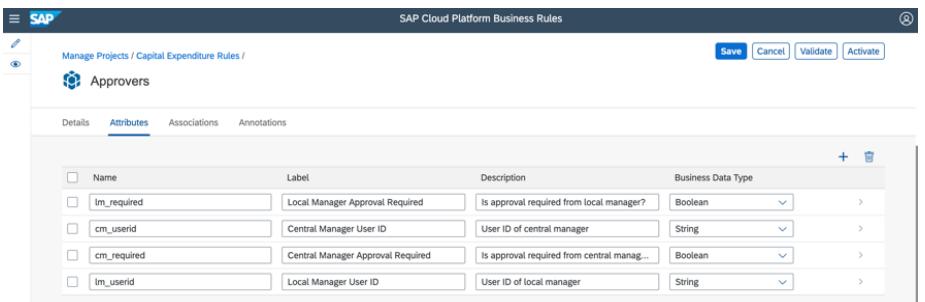
Explanation	Screenshot
<p>5. Enter <b>Business rules to determine approvers for new investments in capital expenditure process</b> in <b>Description</b> box.</p>	
<p>6. Click to select <b>2.0</b> as the <b>Expression Language</b>.</p>	
<p>7. Click <b>Save</b>.</p>	
<p>Your business rules project is created with the needed configurations.</p>	

## CREATE DATA OBJECTS

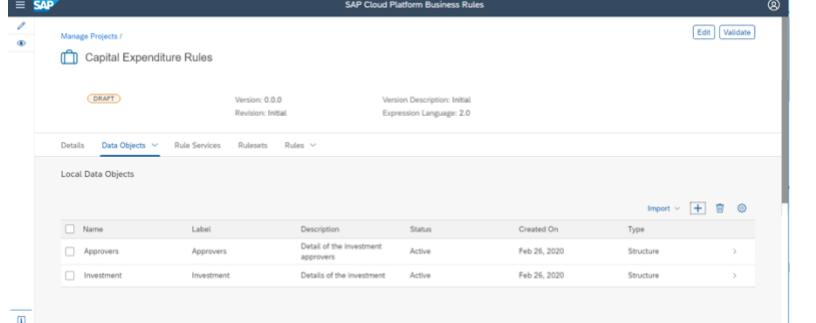
Explanation	Screenshot
<p>8. Click Data Objects.</p>	
<p>9. Click + to create data object</p>	
<p>10. Enter <b>Investment</b> in the Name and the Label box.</p>	

Explanation	Screenshot
<p>11. Enter <b>Details of the investment</b> in the <b>Description</b> box.</p>	<p>The screenshot shows the SAP Cloud Platform Business Rules interface. A new data object named "Investment" is being created. In the "Description" field, there is a placeholder message: "The description should not be empty." Other fields like Name, Label, Status, and Type are also visible.</p>
<p>12. Click <b>Attributes</b>.</p>	<p>The screenshot shows the SAP interface with the "Attributes" tab highlighted by a red box and circled with a red number 6. This indicates the next step in the process.</p>
<p>13. Click <b>+</b> to add new attributes</p>	<p>The screenshot shows the SAP Cloud Platform Business Rules interface with the "Attributes" tab open. A new attribute named "Type" has been added, indicated by a red box and circled with a red number 7. The "Business Data Type" is set to "String".</p>
<p>14. Enter <b>Type</b> in the <b>Name</b> and <b>Label</b> box. 15. Enter <b>Type of investment</b> in the <b>Description</b> box.</p>	<p>The screenshot shows the SAP Cloud Platform Business Rules interface with the "Attributes" tab open. The attribute "Type" has been updated with the following values: Name = Type, Label = Type, Description = "Type of Investment", and Business Data Type = String. A red box and circled with a red number 10 highlights the "Description" field.</p>
<p>16. Click <b>+</b> to add attribute.</p>	<p>The screenshot shows the SAP Cloud Platform Business Rules interface with the "Attributes" tab open. A second attribute is being added, indicated by a red box and circled with a red number 11. The "Business Data Type" dropdown is visible.</p>

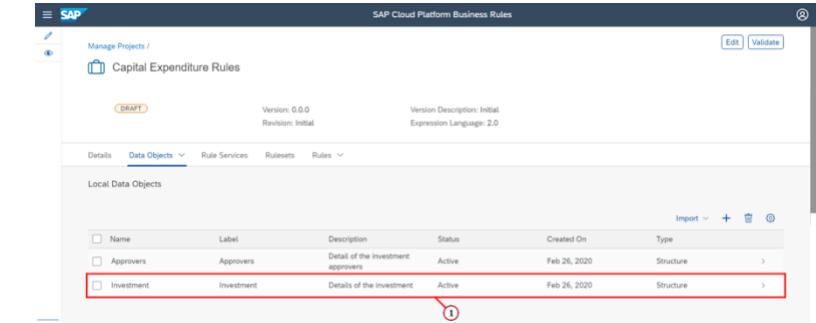
Explanation	Screenshot
<p>17. Repeat the steps to create more data object attributes with following details:</p> <p>Name: Currency Label: Currency Description: Currency Type: String</p> <p>Name: Country Label: Country Description: Country Type: String</p> <p>Name: TotalCost Label: Total Cost Description: Total cost of investment Type: Number</p>	
<p>18. Click <b>Activate</b>.</p>	
<p>19. Click <b>Capital Expenditure Rules</b>.</p>	
<p>20. Click <b>+</b> to new data object.</p> <p>Note: Ensure that you are in <b>Data Objects</b> tab.</p>	

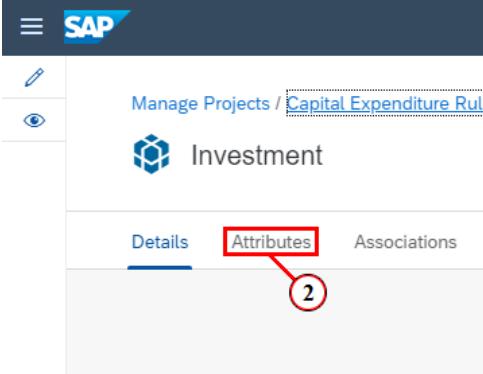
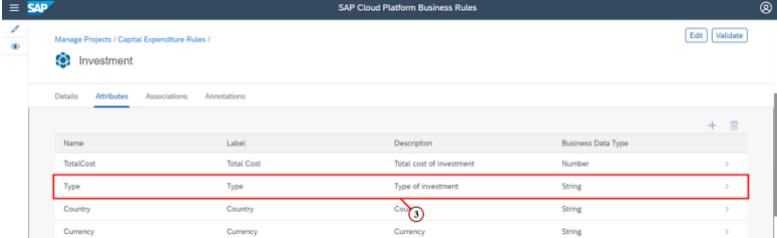
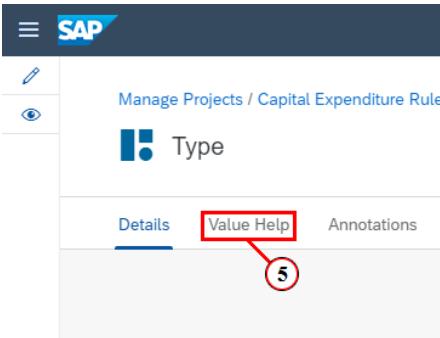
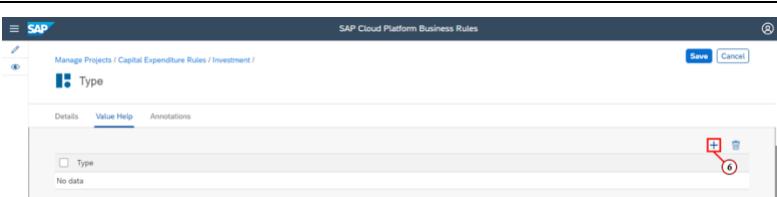
Explanation	Screenshot
<p>21. Enter <b>Approvers</b> in <b>Name</b> box.</p> <p>22. Enter <b>Approvers</b> in <b>Label</b> box.</p> <p>23. Enter <b>Detail of investment approvers</b> in <b>Description</b> box.</p>	
<p>24. Click <b>Attributes</b>.</p>	
<p>25. Repeat the steps to create Approvers data object attributes with following details:</p> <p>Name: cm_userid Label: Central Manager User ID Description: User ID of central manager Type: String</p> <p>Name: lm_userid Label: Local Manager User ID Description: User ID of local manager Type: String</p> <p>Name: lm_required Label: Local Manager Approval Required Description: Is approval required from local manager? Type: Boolean</p> <p>Name: cm_required Label: Central Manager Approval Required Description: Is approval required from central manager? Type: Boolean</p>	

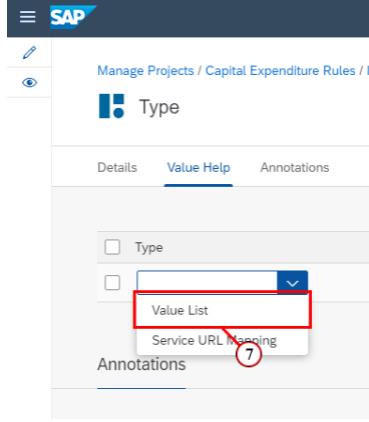
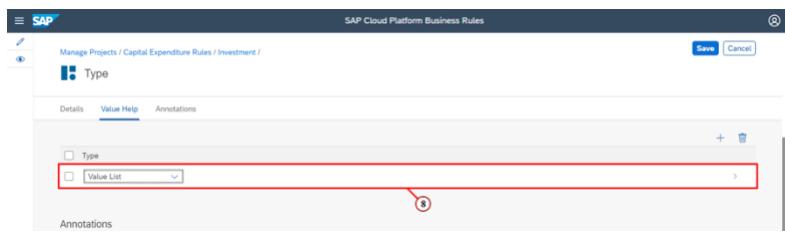
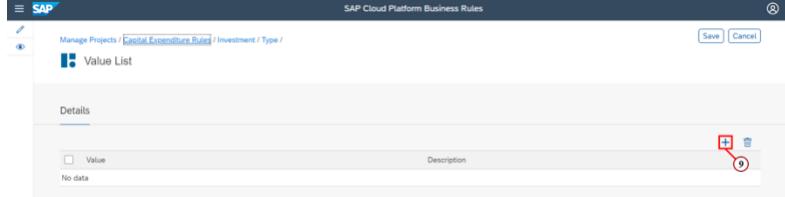
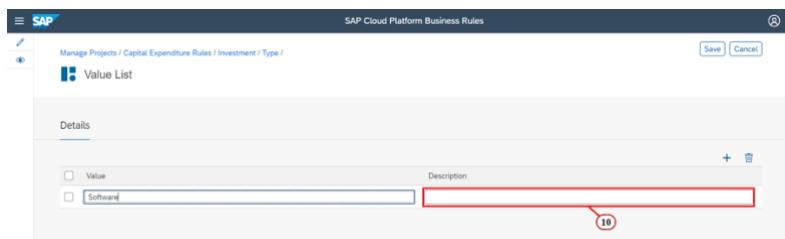
## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

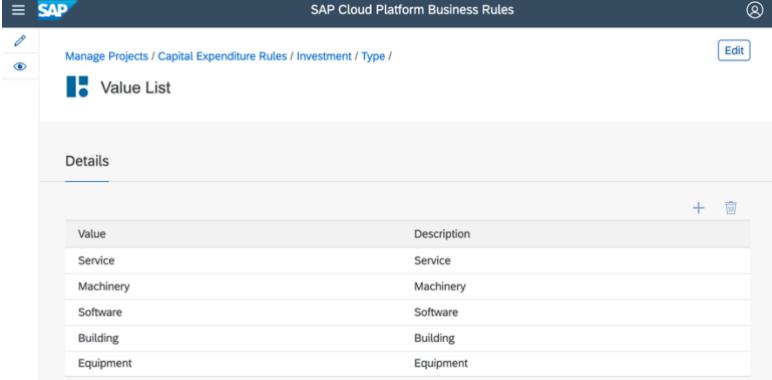
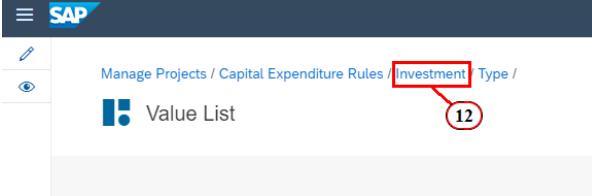
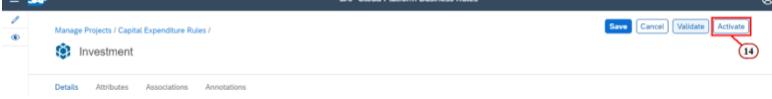
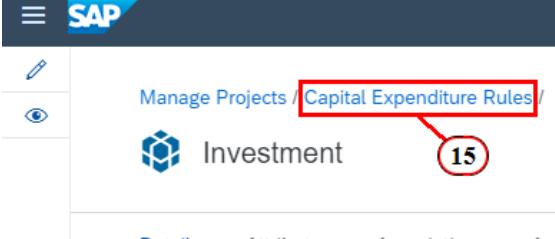
Explanation	Screenshot
26. Click <b>Activate</b> .	
27. Click <b>Capital Expenditure Rules</b> .	
<p>You have created and configured data objects in business rules project.</p> <p><b>Investment</b> data object will be used as <i>Input</i> and <b>Approver</b> data object will be used as <i>Output</i> in the rule service.</p> <p>These data object &amp; their attributes will be used while modelling rule expressions.</p>	

### CONFIGURE VALUE HELP IN DATA OBJECT

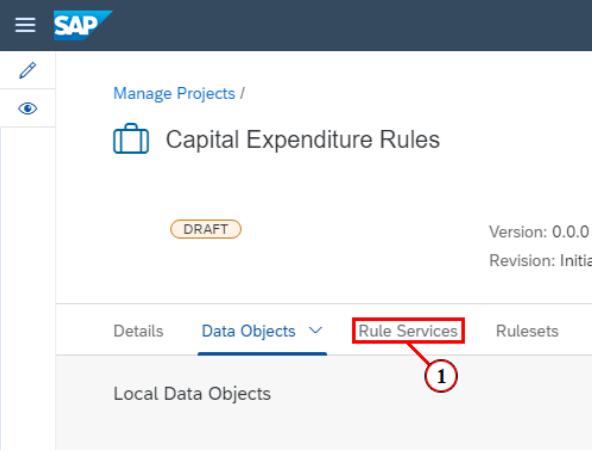
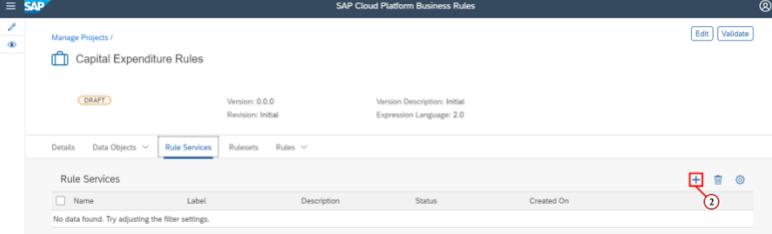
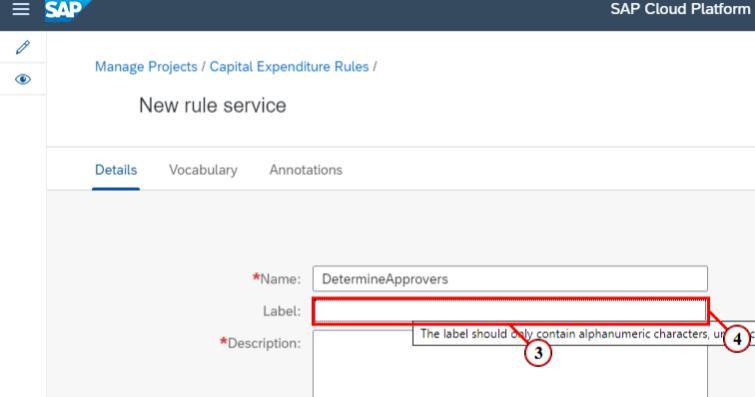
Explanation	Screenshot
28. Click to open <b>Investment</b> data object.	

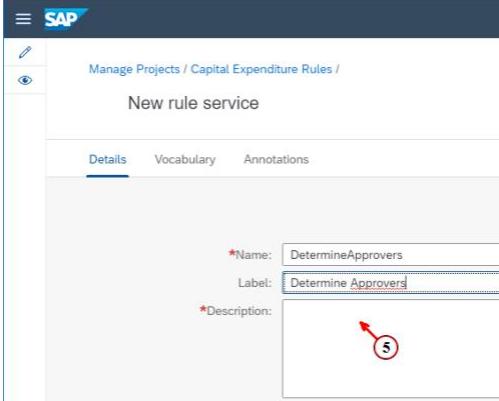
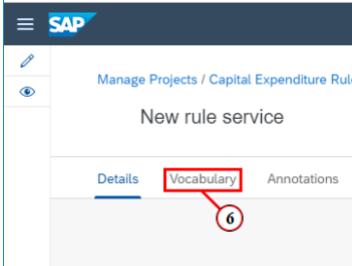
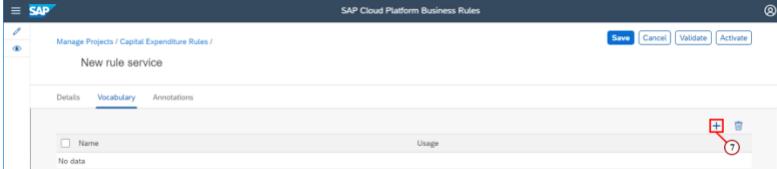
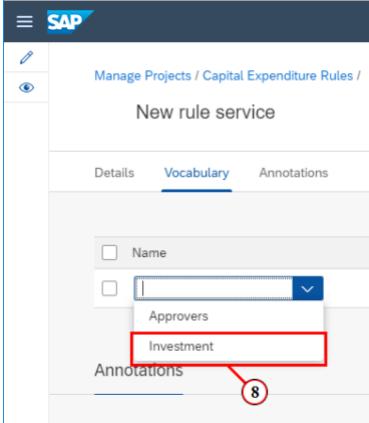
Explanation	Screenshot
29. Click <b>Attributes</b> to add attributes to the data object.	
30. Click to open <b>Type</b> attribute.	
31. Click <b>Edit</b> .	
32. Click <b>Value Help</b> .	
33. Click <b>+</b> to add value help	

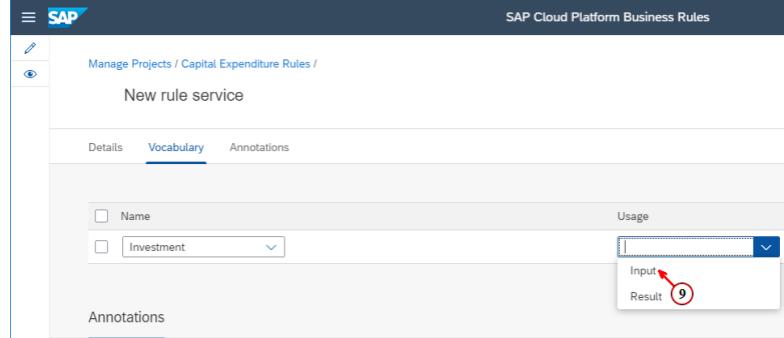
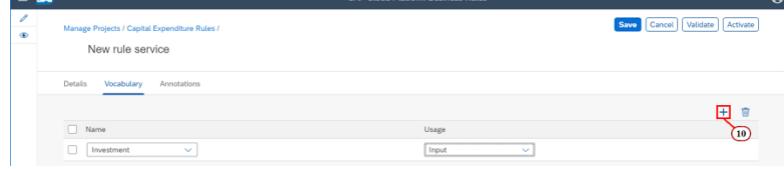
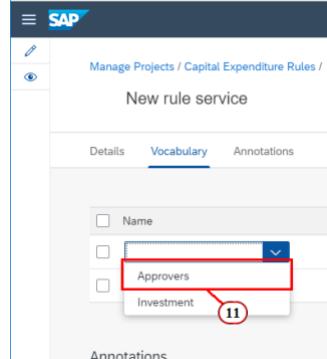
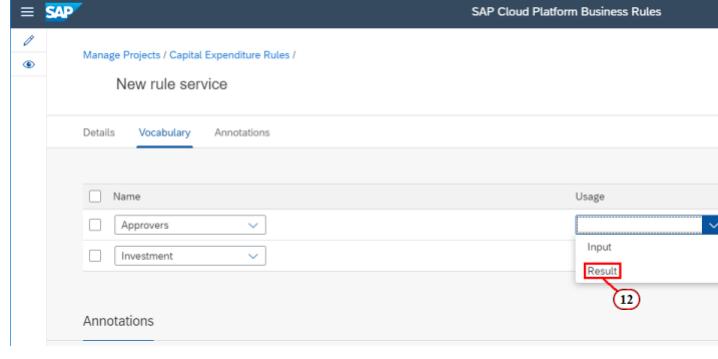
Explanation	Screenshot
<p>34. Click Value List from Type.</p>	
<p>Note: there are two kinds of value help  (a) Static and (b) Dynamic. Dynamic <b>value help</b> can be created with Service <b>URL Mapping</b> and <b>Static</b> can be created with <b>Value List</b> type. In dynamic value you can connect any backend system and make a service call. In this exercise, you will create static value help where you will manually create value-description pair.</p>	
<p>35. Click to on the Value List row.</p>	
<p>36. Click + to add values to the value list.</p>	

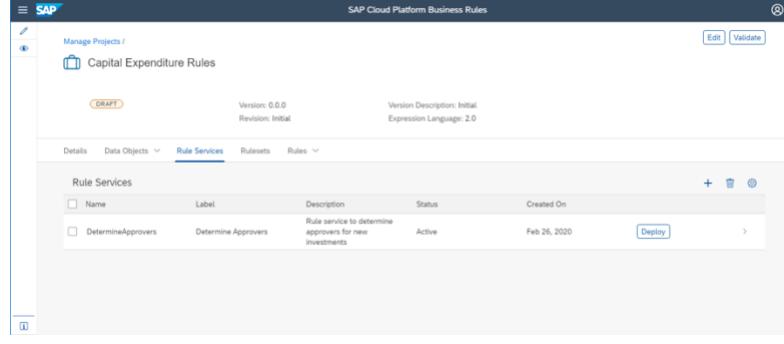
Explanation	Screenshot										
<p>38. Repeat the steps above to add few more values:</p> <table border="1"> <thead> <tr> <th>Value</th><th>Description</th></tr> </thead> <tbody> <tr> <td>Machinery</td><td>Machinery</td></tr> <tr> <td>Building</td><td>Building</td></tr> <tr> <td>Equipment</td><td>Equipment</td></tr> <tr> <td>Service</td><td>Service</td></tr> </tbody> </table>	Value	Description	Machinery	Machinery	Building	Building	Equipment	Equipment	Service	Service	
Value	Description										
Machinery	Machinery										
Building	Building										
Equipment	Equipment										
Service	Service										
<p>39. Click <b>Save</b>.</p>											
<p>40. Click <b>Investment</b>.</p>											
<p>41. Click <b>Edit</b>.</p>											
<p>42. Click <b>Activate</b>.</p>											
<p>43. Click <b>Capital Expenditure Rules</b>.</p>											

## CREATE RULE SERVICE

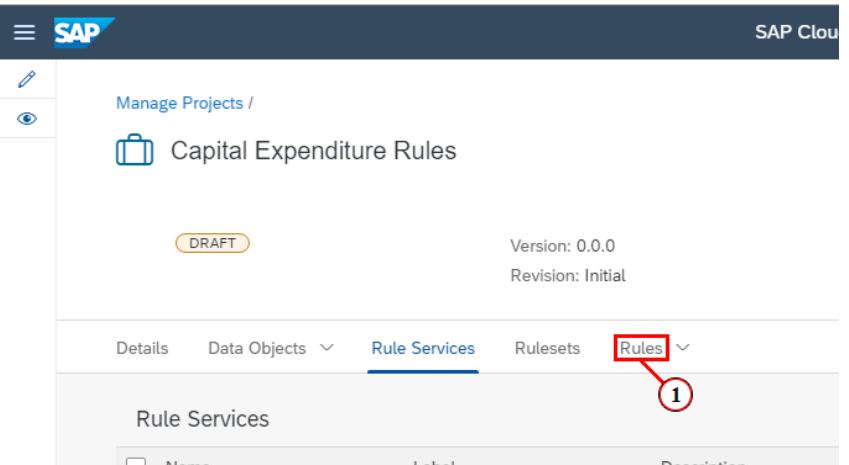
Explanation	Screenshot
<p>44. Click Rule Services.</p>	
<p>45. Click + to add new rule service</p>	
<p>53. Click to enter <b>DetermineApprovers</b> in Name box.          54. Click to enter <b>Determine Approvers</b> in Label box.</p>	

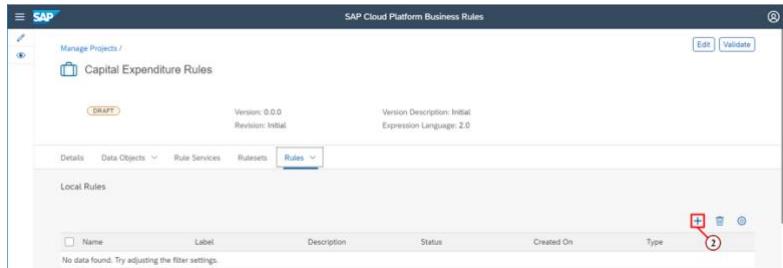
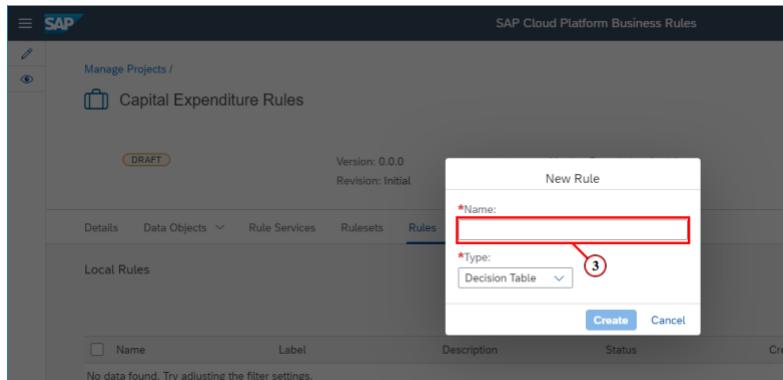
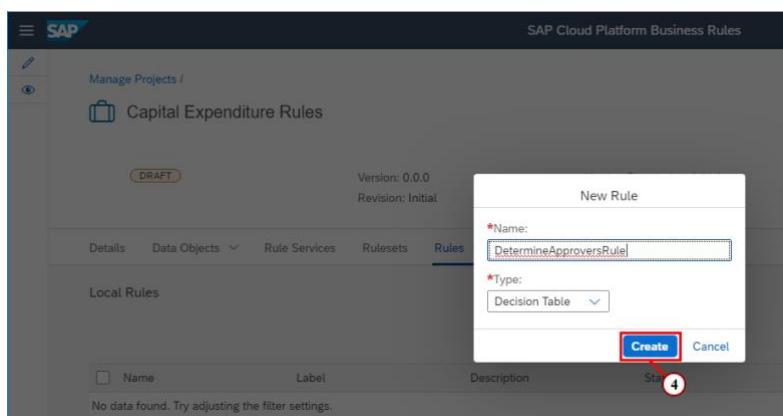
Explanation	Screenshot
<p>55. Click to enter <b>Rule service to determine approvers for new investment</b> in <b>Description</b> box.</p>	
<p>56. Click <b>Vocabulary</b>.</p>	
<p>57. Click  to add rule service vocabulary.</p>	
<p>58. Click to select <b>Investment</b>.</p>	

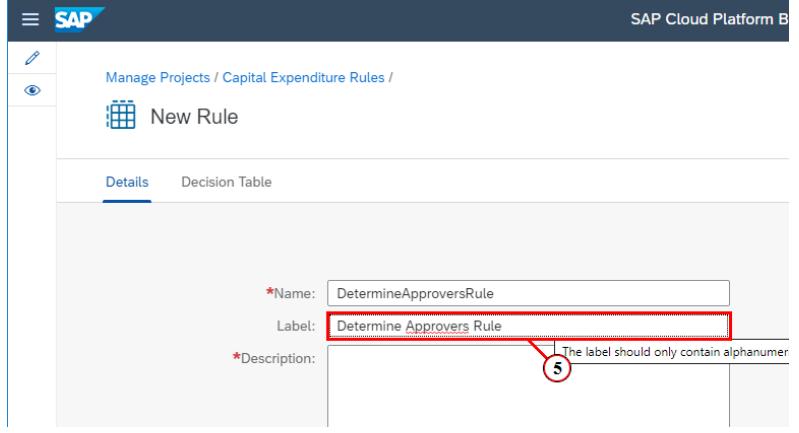
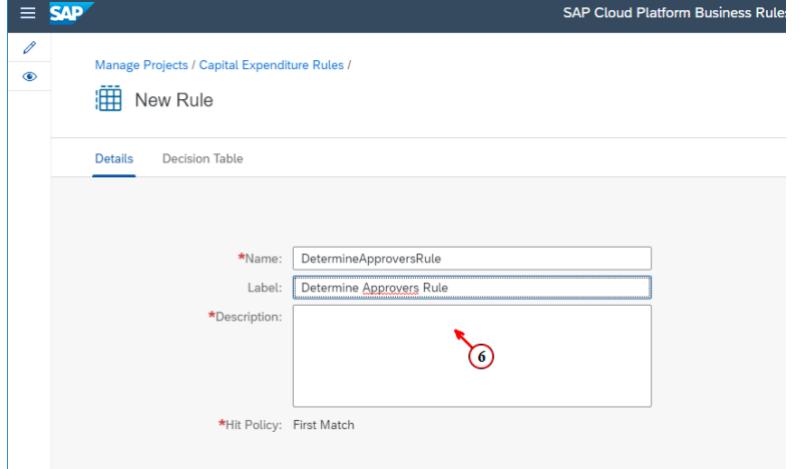
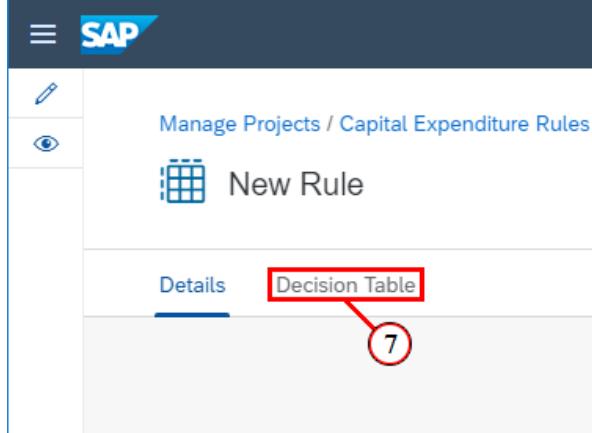
Explanation	Screenshot
<p>59. From <b>Usage</b>, select <b>Input</b>.</p>	
<p>60. Click  to add another rule service vocabulary.</p>	
<p>61. Click to select <b>Approvers</b>.</p>	
<p>62. From <b>Usage</b>, select <b>Result</b></p>	
<p>63. Click .</p>	

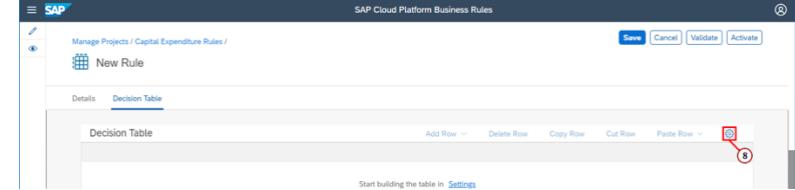
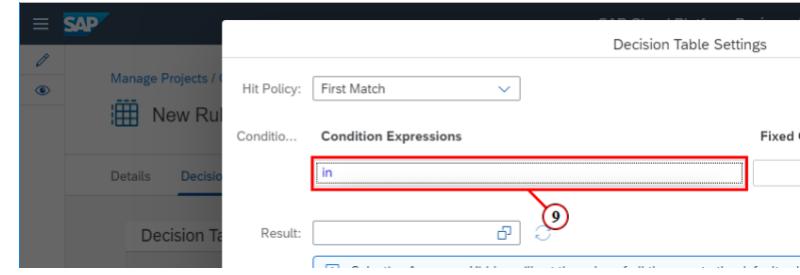
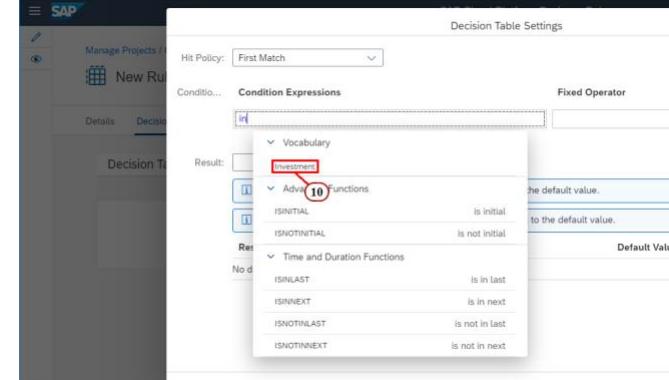
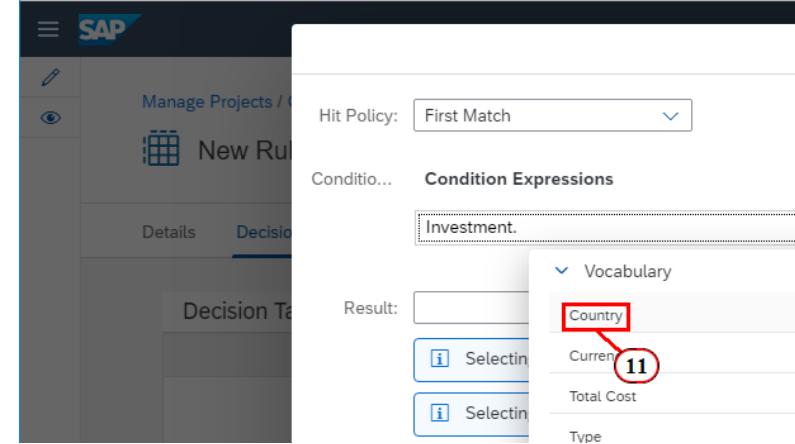
Explanation	Screenshot
<p>64. Click <a href="#">Capital Expenditure Rules</a></p>	
<p>You have created and configured Rule Service which will be finally deployed once we have configured all the rule entity models.</p>	

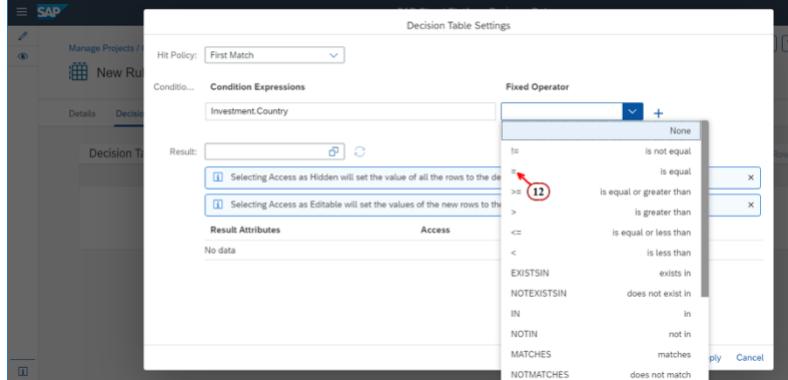
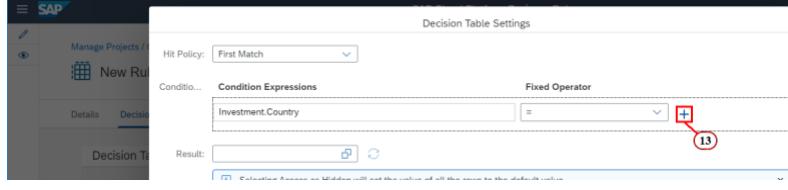
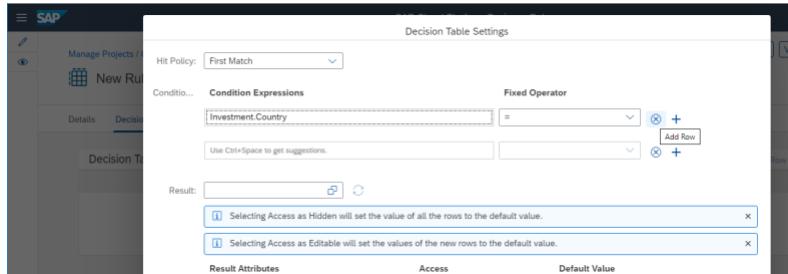
## CREATE DECISION TABLE RULE

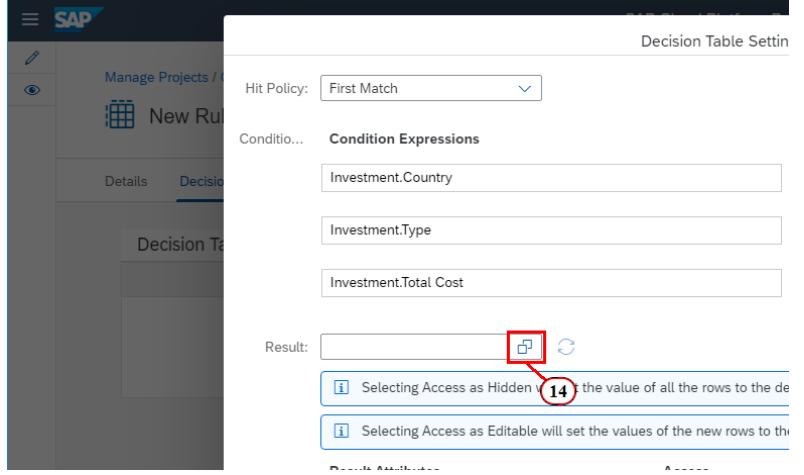
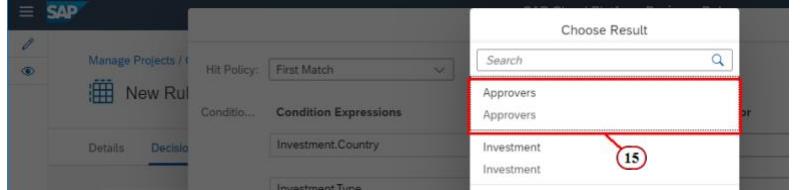
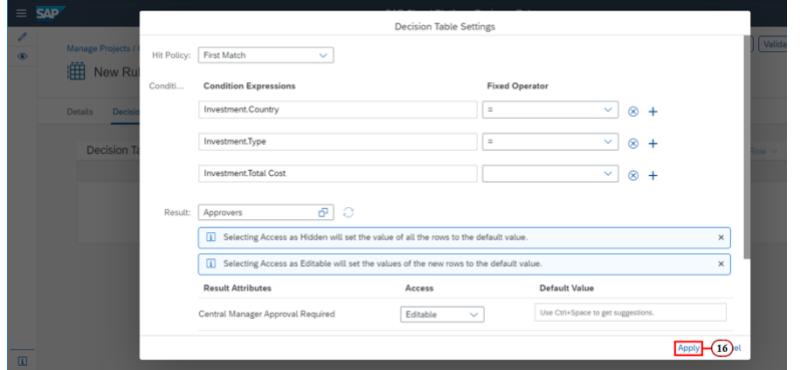
Explanation	Screenshot
<p>65. Click Rules.</p>	

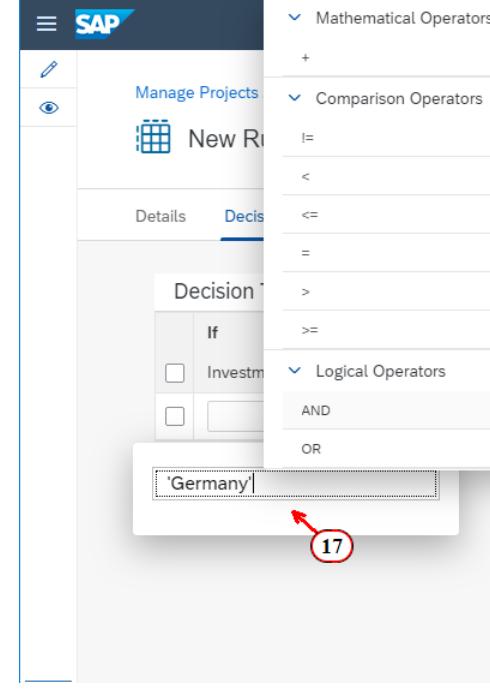
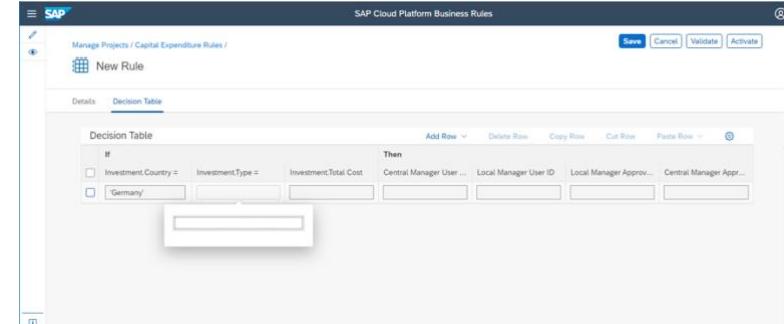
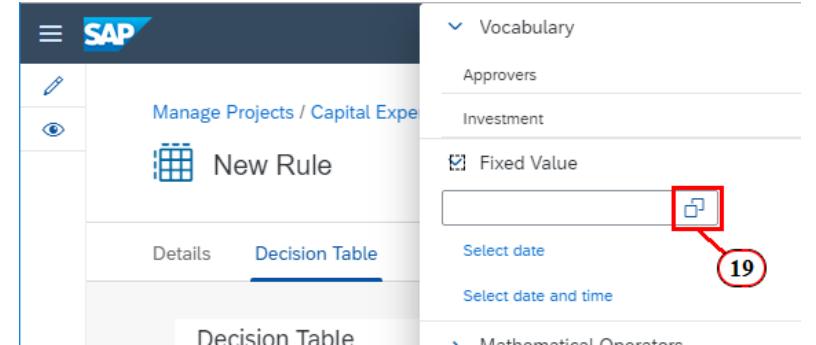
Explanation	Screenshot
<p>66. Click  to create rule.</p>	
<p>67. Click to enter <b>DetermineApproversRule</b> in Name box.</p>	
<p>68. Click .</p>	

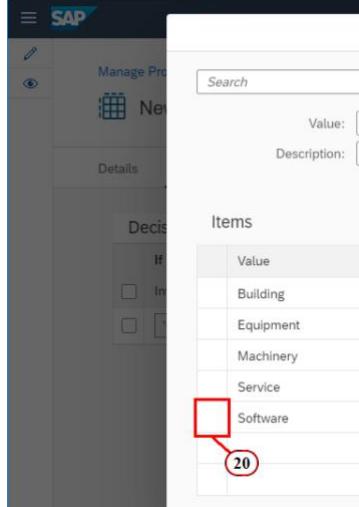
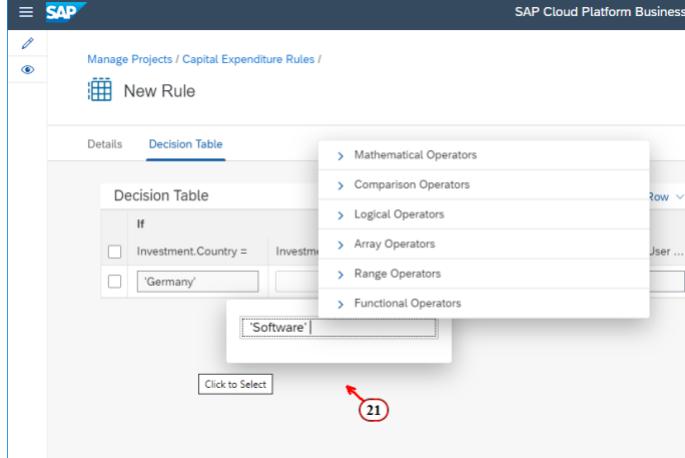
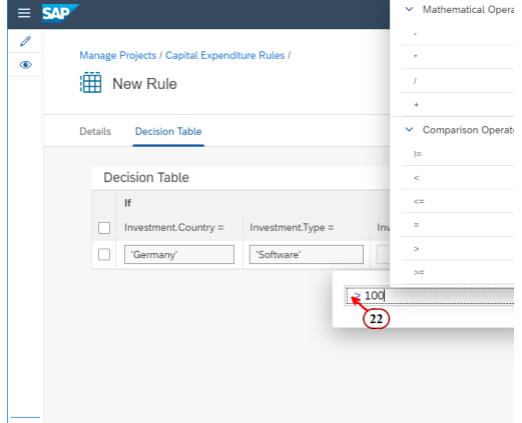
Explanation	Screenshot
<p>69. Click and enter <b>Determine Approvers Rule</b> in <b>Label</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rule interface. In the 'Details' tab, the 'Name' field is filled with 'DetermineApproversRule'. The 'Label' field contains 'Determine Approvers Rule'. A validation message 'The label should only contain alphanumeric' is displayed next to the 'Label' field, with a red circle and the number 5 pointing to it. The 'Description' field is empty.</p>
<p>70. Click to enter <b>Rules to determine approvers for the new investments based on type, country and total cost of the investment</b> in <b>Description</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rule interface. The 'Name' field is 'DetermineApproversRule'. The 'Label' field is 'Determine Approvers Rule'. The 'Description' field is empty. A validation message 'Hit Policy: First Match' is shown below the 'Description' field. A red arrow points to the 'Description' field with the number 6.</p>
<p>71. Click <b>Decision Table</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rule interface. The 'Name' field is 'DetermineApproversRule'. The 'Label' field is 'Determine Approvers Rule'. The 'Description' field is empty. The 'Decision Table' tab is highlighted with a red box and a circled number 7.</p>

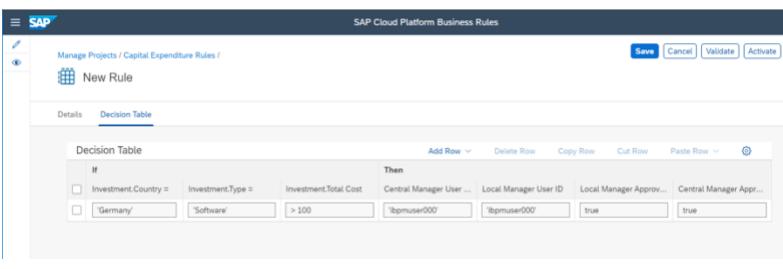
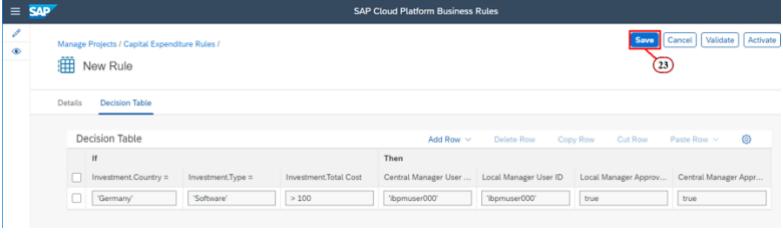
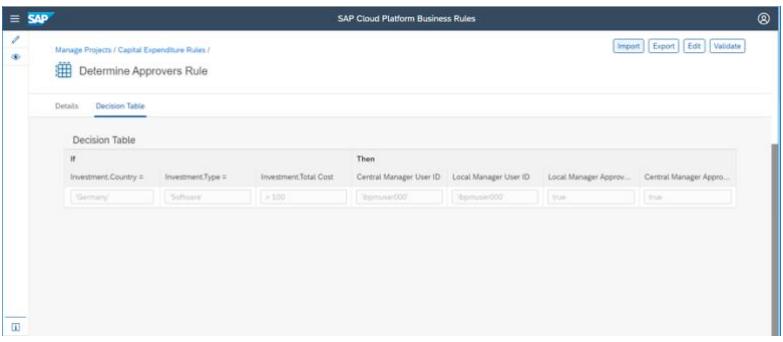
Explanation	Screenshot
<p>72. Click  to configure condition and result of the rule.</p>	
<p>Note: As you start typing in the <b>Condition Expression</b> box, you will get in-place context help with the list of Vocabulary, Operators and Functions.</p> <p>73. Click and enter <b>in</b> in the condition expression box.</p> <p>74. From the in-place context sensitive help options, select <b>Investment &gt;&gt; Country</b></p>	
<p>75. Click <b>Investment</b>.</p>	
<p>76. Click <b>Country</b>.</p>	

Explanation	Screenshot						
<p>77. In <b>Fixed Operator</b> drop down, click <b>= is equal</b> operator.</p>							
<p>78. Click <b>+</b> to add new condition expression.</p>							
<p>79. Repeat the steps above to add few more condition expressions as following:</p> <table border="1"> <thead> <tr> <th>Condition Expression</th> <th>Fixed Operator</th> </tr> </thead> <tbody> <tr> <td>Investment.Type</td> <td><b>=</b></td> </tr> <tr> <td>Investment.Total Cost</td> <td></td> </tr> </tbody> </table>	Condition Expression	Fixed Operator	Investment.Type	<b>=</b>	Investment.Total Cost		
Condition Expression	Fixed Operator						
Investment.Type	<b>=</b>						
Investment.Total Cost							

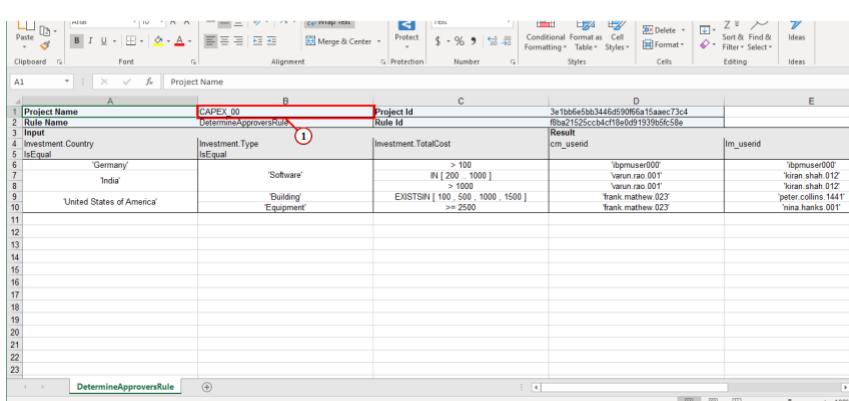
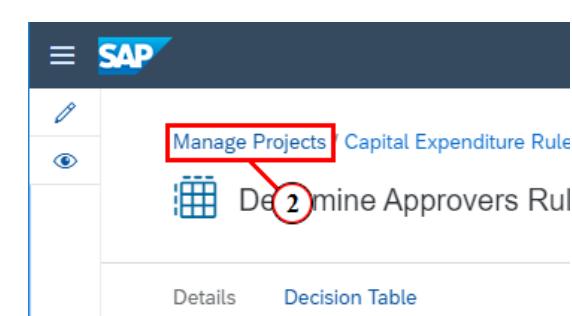
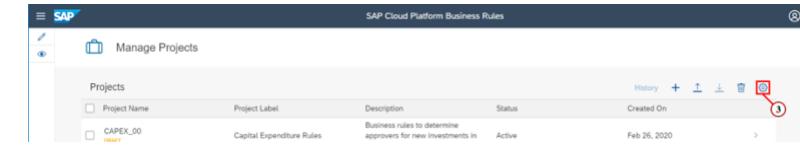
Explanation	Screenshot
<p>80. Click  to select <b>Result</b> data object.</p>	
<p>81. Select or Double-click on <b>Approvers</b>.</p>	
<p>Note: You will notice <b>Access</b> column as the result properties. When you set access as hidden, the respective column will not be seen during rule authoring in decision table.</p> <p>82. Click <b>Apply</b>.</p>	

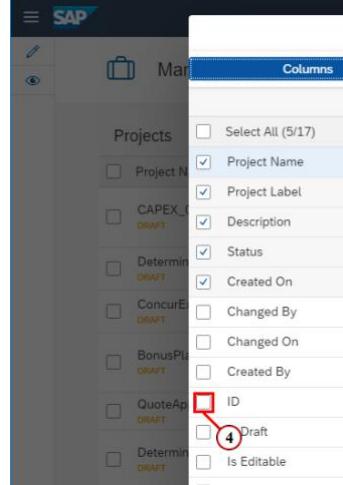
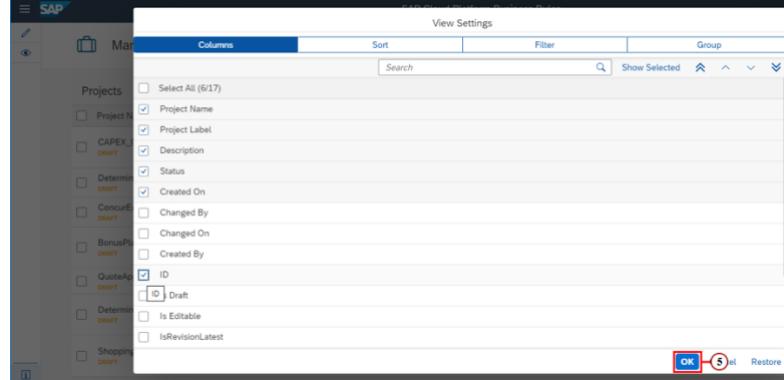
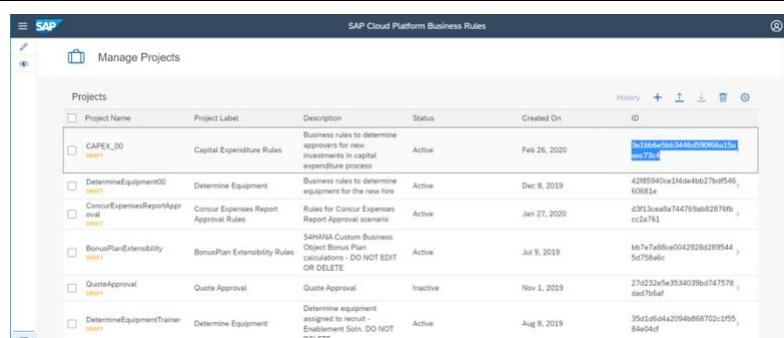
Explanation	Screenshot
<p>83. Click on the input field of <b>Investment.Country</b> column and enter 'Germany'.</p> <p>After you have finished typing, press <b>Enter</b> key to confirm or click outside the input field.</p>	
<p>Note: In this expression, you will choose the value from the value help defined for this attribute.</p> <p>84. Please press <b>Ctrl+ Space</b> or press any key.</p>	
<p>85. Expand <b>Fixed Value</b> and click  to select value help.</p>	

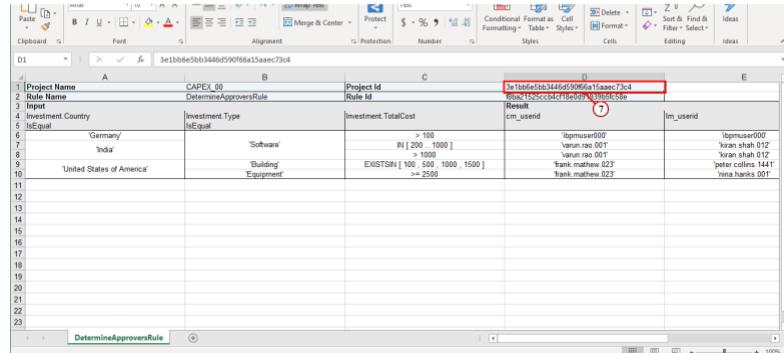
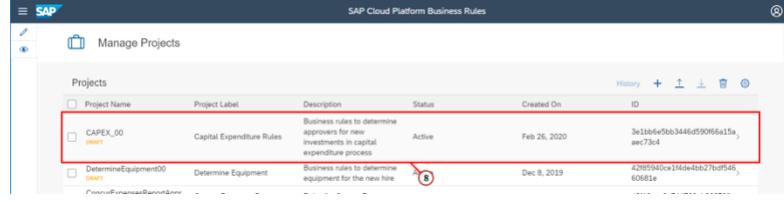
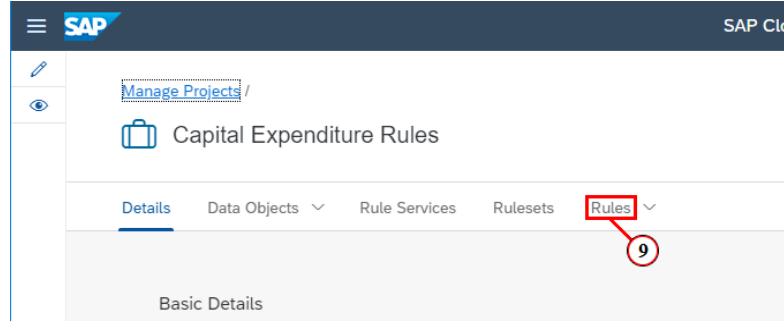
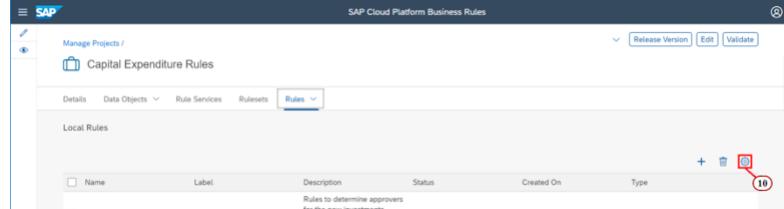
Explanation	Screenshot
<p>86. Click to select <b>Software</b> from the value help.</p>	
<p>87. Click <b>Enter</b> to confirm or click outside the input field.</p>	
<p>88. Click to enter <b>&gt; 100</b> 89. Press <b>Enter</b> to confirm.</p>	

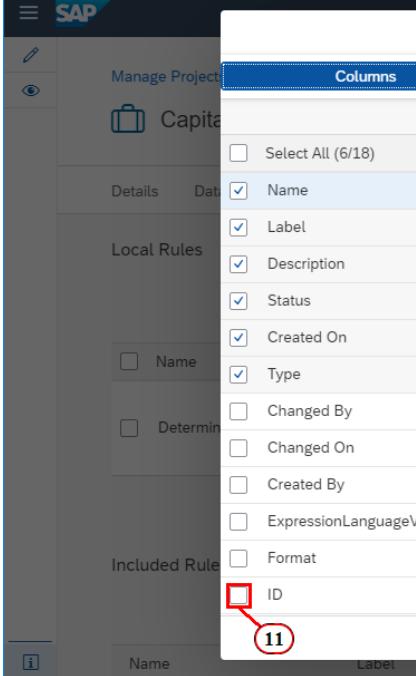
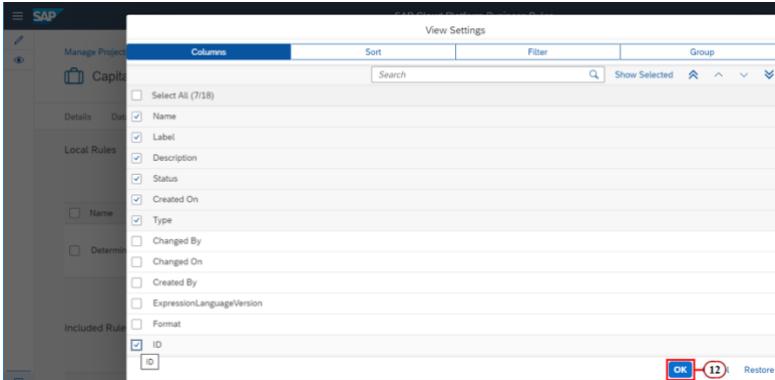
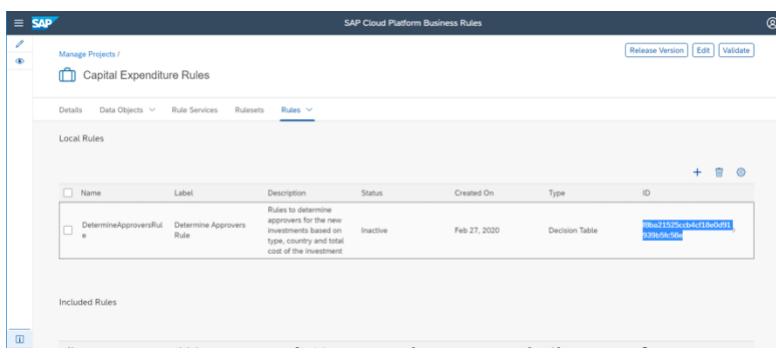
Explanation	Screenshot										
<p>90. Similarly, enter the following expression values for the respective result column:</p> <table border="1"> <thead> <tr> <th>Result Column</th><th>Expression Value</th></tr> </thead> <tbody> <tr> <td>Central Manager User ID</td><td>'your trial user number'</td></tr> <tr> <td>Local Manager User ID</td><td>'your trial user number'</td></tr> <tr> <td>Local Manager Approval Required</td><td>true</td></tr> <tr> <td>Central Manager Approval Required</td><td>true</td></tr> </tbody> </table>	Result Column	Expression Value	Central Manager User ID	'your trial user number'	Local Manager User ID	'your trial user number'	Local Manager Approval Required	true	Central Manager Approval Required	true	
Result Column	Expression Value										
Central Manager User ID	'your trial user number'										
Local Manager User ID	'your trial user number'										
Local Manager Approval Required	true										
Central Manager Approval Required	true										
<p>23. Click <b>Save</b>.</p>											
<p>You have created a decision table-based rule with condition and result columns. You have added a row to the decision table and used in-place context sensitive help to add expressions to the cell values. Now, in next chapter you will use Microsoft Excel to import the data in the decision table.</p>											

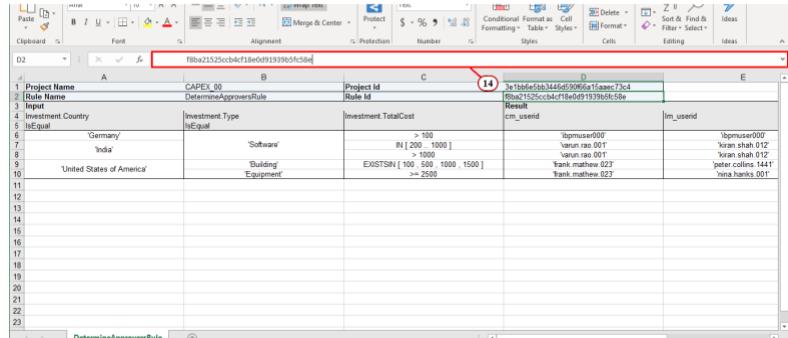
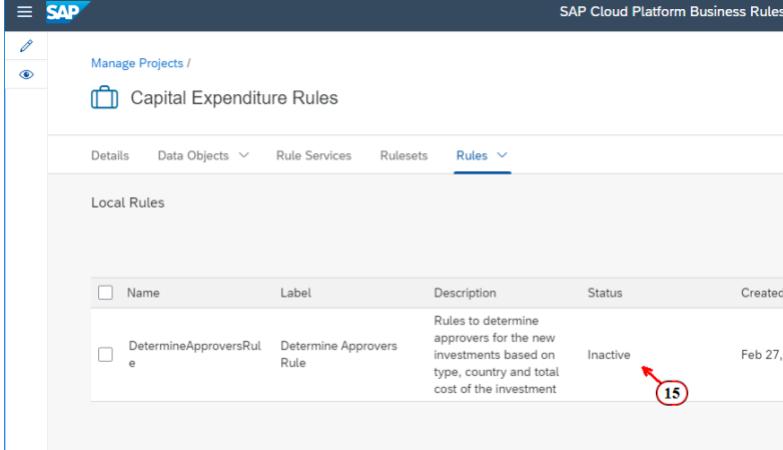
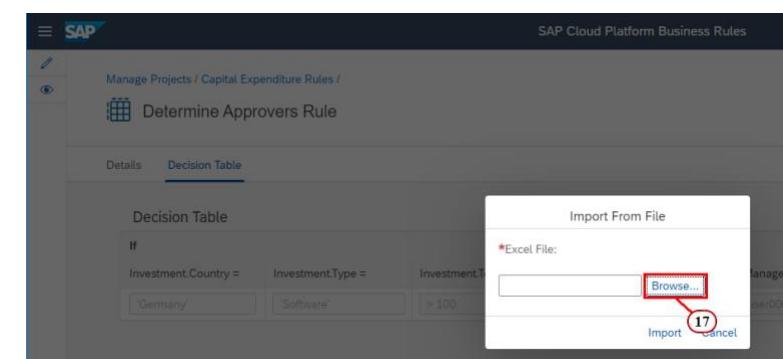
### IMPORT DECISION TABLE FROM MICROSOFT EXCEL

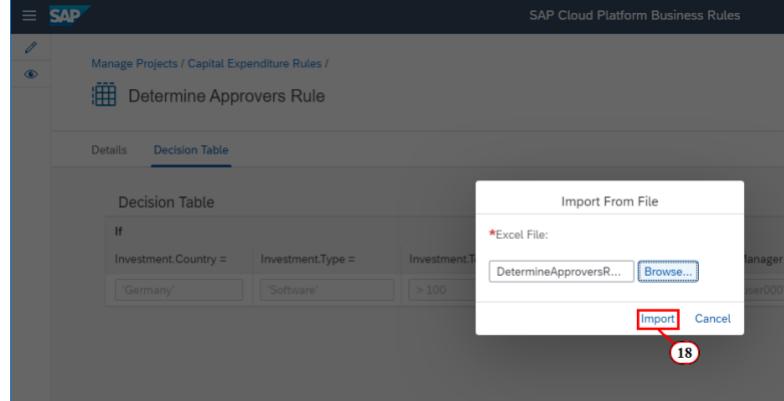
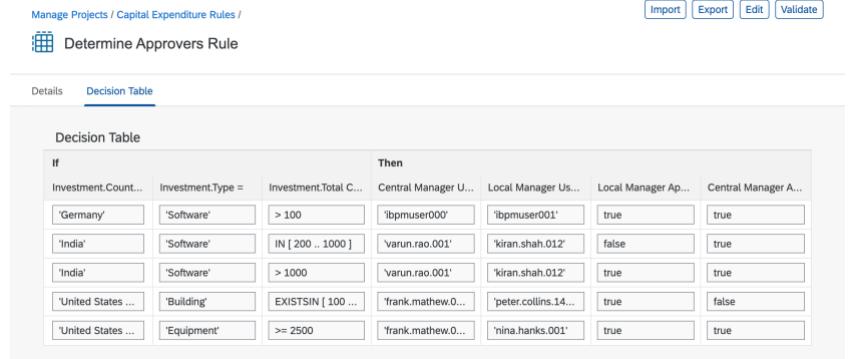
Explanation	Screenshot
<p>91. Download the <b>DetermineApproversRule</b> excel in the same folder in GitHub.</p> <p>92. Open the excel and update <b>Project Name</b>, <b>Project ID</b> and <b>Rule ID</b> in the available excel sheet as shown in steps below.</p> <p>93. Update project name with your rules project name like CAPEX_00.</p>	
<p>Now, to update the Project ID and Rule ID you have to go back to the <b>Manage Rule Projects</b> application.</p> <p>94. Navigate back to projects. 95. Click <a href="#">Manage Projects</a>.</p>	
<p>96. Click  to add new display column to get ID of the project.</p>	

Explanation	Screenshot
<p>97. Click <input type="checkbox"/> to select ID column.</p>	
<p>98. Click <b>OK</b>.</p>	
<p>99. Select and press <b>Ctrl+C</b> or <b>Command+C</b> to copy.</p>	

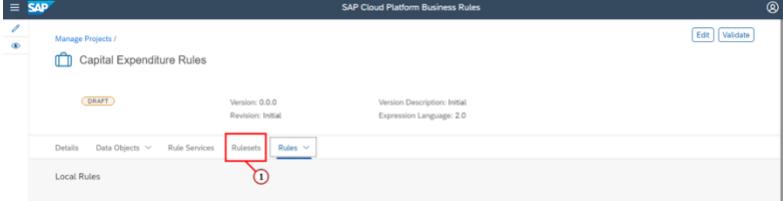
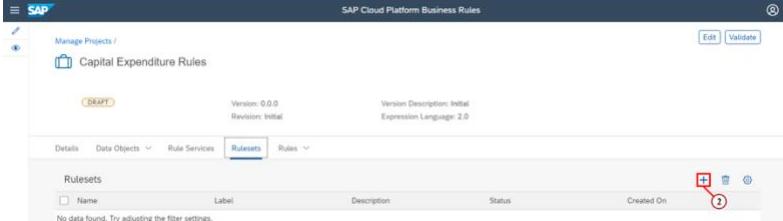
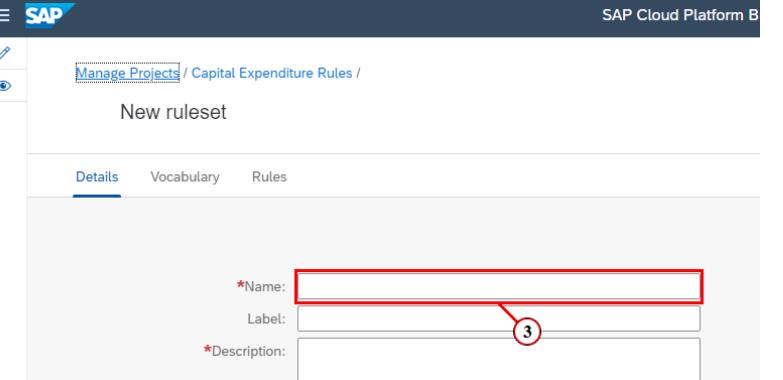
Explanation	Screenshot
<p>100. Paste the copied Project ID.</p> <p>Note: ensure that there are no leading or lagging space while you do the copy &amp; paste.</p>	
<p>101. Click to open project.</p>	
<p>102. Click Rules.</p>	
<p>103. Click  to add new display column to get ID of the rule.</p>	

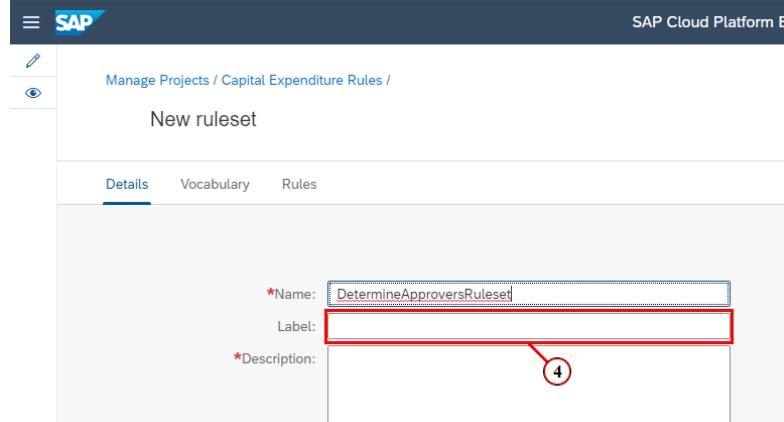
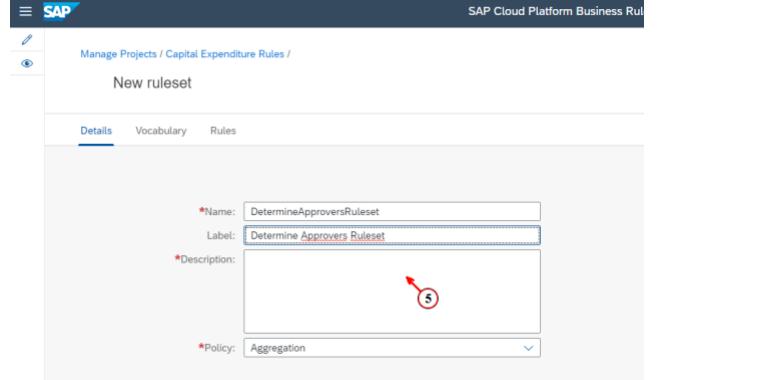
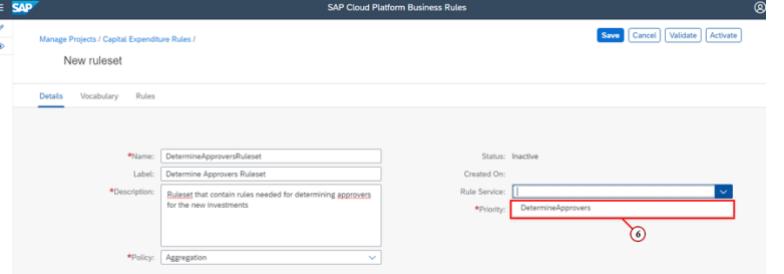
Explanation	Screenshot
104. Click <input type="checkbox"/> of ID option.	
105. Click  .	
106. Select and press <b>Ctrl+C</b> or <b>Command+C</b> to copy.	

Explanation	Screenshot
<p><b>107. Paste the Rule ID</b></p> <p>Note: ensure that there are no leading or trailing spaces while you do the copy paste</p> <p><b>108. Also, change the <i>cm_userid</i> and <i>lm_userid</i> of the first row (line number 6) to your trial username.</b></p>	
<p><b>109. Click to open the rule.</b></p>	
<p><b>110. Click <b>Import</b>.</b></p>	
<p><b>111. Click <b>Browse...</b> and select the excel sheet updated in steps above.</b></p>	

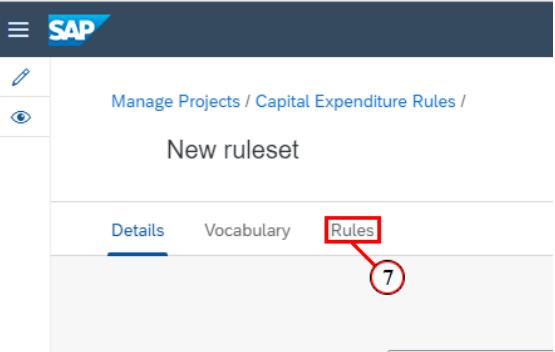
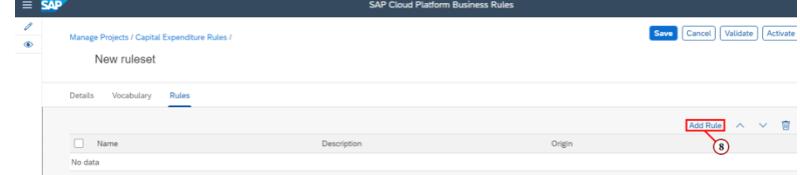
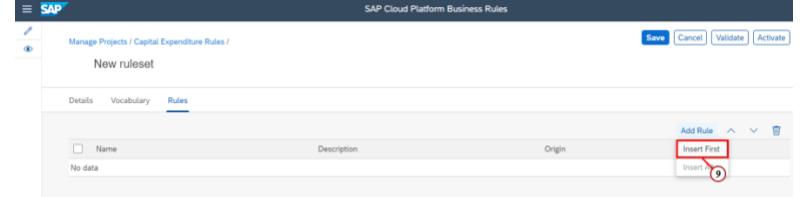
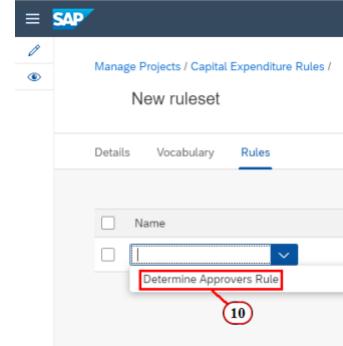
Explanation	Screenshot																						
112. Click <a href="#">Import</a> .																							
You will have the rows imported in your decision table.	 <table border="1"> <thead> <tr> <th>If</th> <th>Then</th> </tr> </thead> <tbody> <tr> <td>Investment.Country = 'Germany'</td> <td>Investment.Type = 'Software' &amp; Investment.Total C... &gt; 100</td> </tr> <tr> <td>'India'</td> <td>Investment.Type = 'Software' &amp; IN [ 200 .. 1000 ]</td> </tr> <tr> <td>'India'</td> <td>Investment.Type = 'Software' &amp; Investment.Total C... &gt; 1000</td> </tr> <tr> <td>'United States ...'</td> <td>Investment.Type = 'Building' &amp; EXISTSIN [ 100 ... ]</td> </tr> <tr> <td>'United States ...'</td> <td>Investment.Type = 'Equipment' &amp; Investment.Total C... &gt;= 2500</td> </tr> <tr> <td></td> <td>Central Manager User = 'ibpmuser001' &amp; Local Manager User = 'ibpmuser001' &amp; Local Manager Approval = true &amp; Central Manager Approval = true</td> </tr> <tr> <td></td> <td>Central Manager User = 'varun.rao.001' &amp; Local Manager User = 'kiran.shah.012' &amp; Local Manager Approval = false &amp; Central Manager Approval = true</td> </tr> <tr> <td></td> <td>Central Manager User = 'varun.rao.001' &amp; Local Manager User = 'kiran.shah.012' &amp; Local Manager Approval = true &amp; Central Manager Approval = true</td> </tr> <tr> <td></td> <td>Central Manager User = 'frank.mathew.0...' &amp; Local Manager User = 'peter.collins.14...' &amp; Local Manager Approval = true &amp; Central Manager Approval = false</td> </tr> <tr> <td></td> <td>Central Manager User = 'frank.mathew.0...' &amp; Local Manager User = 'hina.hanks.001' &amp; Local Manager Approval = true &amp; Central Manager Approval = true</td> </tr> </tbody> </table>	If	Then	Investment.Country = 'Germany'	Investment.Type = 'Software' & Investment.Total C... > 100	'India'	Investment.Type = 'Software' & IN [ 200 .. 1000 ]	'India'	Investment.Type = 'Software' & Investment.Total C... > 1000	'United States ...'	Investment.Type = 'Building' & EXISTSIN [ 100 ... ]	'United States ...'	Investment.Type = 'Equipment' & Investment.Total C... >= 2500		Central Manager User = 'ibpmuser001' & Local Manager User = 'ibpmuser001' & Local Manager Approval = true & Central Manager Approval = true		Central Manager User = 'varun.rao.001' & Local Manager User = 'kiran.shah.012' & Local Manager Approval = false & Central Manager Approval = true		Central Manager User = 'varun.rao.001' & Local Manager User = 'kiran.shah.012' & Local Manager Approval = true & Central Manager Approval = true		Central Manager User = 'frank.mathew.0...' & Local Manager User = 'peter.collins.14...' & Local Manager Approval = true & Central Manager Approval = false		Central Manager User = 'frank.mathew.0...' & Local Manager User = 'hina.hanks.001' & Local Manager Approval = true & Central Manager Approval = true
If	Then																						
Investment.Country = 'Germany'	Investment.Type = 'Software' & Investment.Total C... > 100																						
'India'	Investment.Type = 'Software' & IN [ 200 .. 1000 ]																						
'India'	Investment.Type = 'Software' & Investment.Total C... > 1000																						
'United States ...'	Investment.Type = 'Building' & EXISTSIN [ 100 ... ]																						
'United States ...'	Investment.Type = 'Equipment' & Investment.Total C... >= 2500																						
	Central Manager User = 'ibpmuser001' & Local Manager User = 'ibpmuser001' & Local Manager Approval = true & Central Manager Approval = true																						
	Central Manager User = 'varun.rao.001' & Local Manager User = 'kiran.shah.012' & Local Manager Approval = false & Central Manager Approval = true																						
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	Central Manager User = 'frank.mathew.0...' & Local Manager User = 'hina.hanks.001' & Local Manager Approval = true & Central Manager Approval = true																						
113. Click <a href="#">Edit</a> .																							
114. Click <a href="#">Activate</a> .																							
115. Click <a href="#">Capital Expenditure Rules</a> .																							

## CREATE RULESET

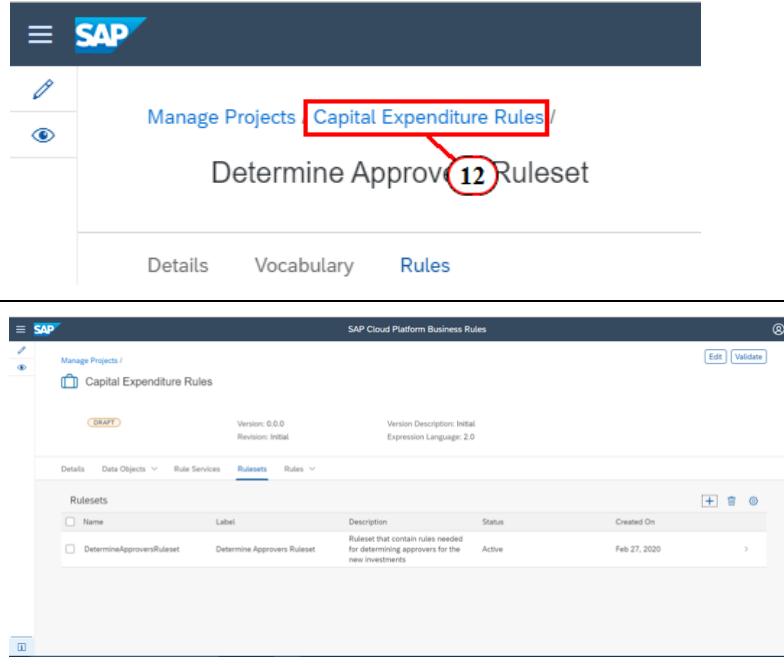
Explanation	Screenshot
<p>116. Click <b>Rulesets</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A project named "Capital Expenditure Rules" is selected. The top navigation bar includes "Manage Projects / Capital Expenditure Rules", "Edit", and "Validate". Below the navigation is a status bar with "Version: 0.0.0", "Revision: Initial", "Version Description: Initial", and "Expression Language: 2.0". The main area has tabs for "Details", "Data Objects", "Rule Services", "Rulesets" (which is highlighted with a red box and circled with a red number 1), and "Rules". A sub-header "Local Rules" is visible.</p>
<p>117. Click  to create ruleset.</p>	 <p>The screenshot shows the same SAP Cloud Platform Business Rules interface. The "Rulesets" tab is still selected. A new row for a "Rulesets" entry is being created, indicated by a plus sign icon with a red box and circled with a red number 1. The columns for Name, Label, Description, Status, and Created On are shown.</p>
<p>118. Click to enter <b>DetermineApproversRuleset</b> in <b>Name</b> box.</p>	 <p>The screenshot shows the "New ruleset" dialog. It has tabs for "Details", "Vocabulary", and "Rules", with "Details" selected. The "Name" field is highlighted with a red box and circled with a red number 3. Below it are fields for "Label" and "Description".</p>

Explanation	Screenshot
<p>119. Click to enter <b>Determine Approvers Ruleset</b> in <b>Label</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the 'Details' tab, the 'Name' field contains 'DetermineApproversRuleset'. The 'Label' field is highlighted with a red box and circled with a red number 4. The 'Description' field is empty.</p>
<p>120. Click to enter <b>Ruleset that contain rules needed for determining approvers for the new investments</b> in <b>Description</b> box.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Name' field contains 'DetermineApproversRuleset'. The 'Label' field contains 'Determine Approvers Ruleset'. The 'Description' field contains 'Ruleset that contain rules needed for determining approvers for the new investments' and is highlighted with a red box and circled with a red number 5. The 'Policy' dropdown is set to 'Aggregation'.</p>
<p>121. Click to select <b>DetermineApprovers</b> as <b>Rule Service</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. The 'Name' field contains 'DetermineApproversRuleset'. The 'Label' field contains 'Determine Approvers Ruleset'. The 'Description' field contains 'Ruleset that contain rules needed for determining approvers for the new investments'. The 'Status' is listed as 'Inactive'. The 'Created On' field is empty. The 'Rule Service' dropdown is highlighted with a red box and circled with a red number 6. The 'Priority' dropdown is also highlighted with a red box and circled with a red number 6. The 'Policy' dropdown is set to 'Aggregation'.</p>

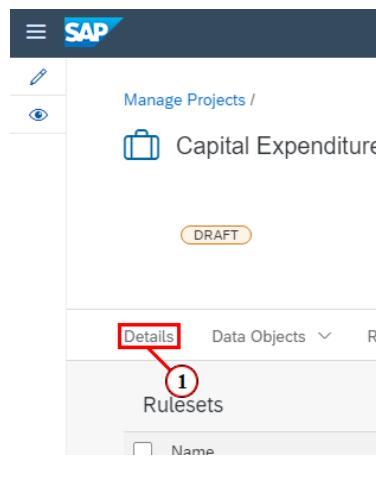
## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

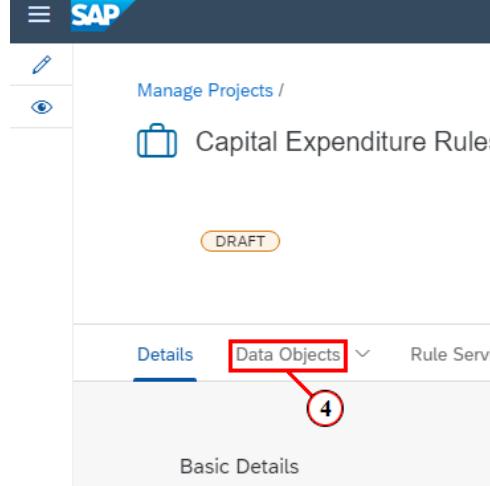
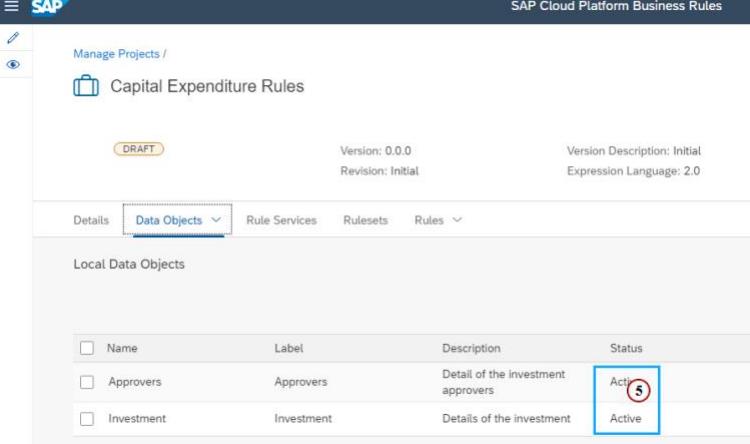
Explanation	Screenshot
122. Click <b>Rules</b> .	
123. Click <b>Add Rule</b> .	
124. Click <b>Insert First</b> .	
125. Click to select <b>Determine Approvers Rule</b> .	
126. Click <b>Activate</b> .	

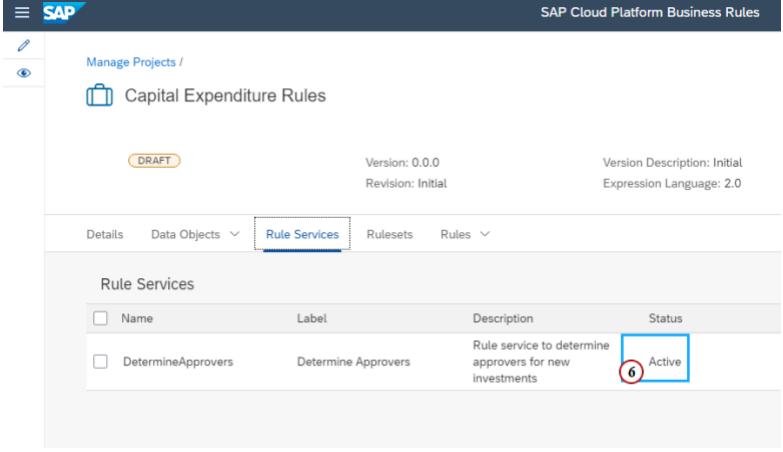
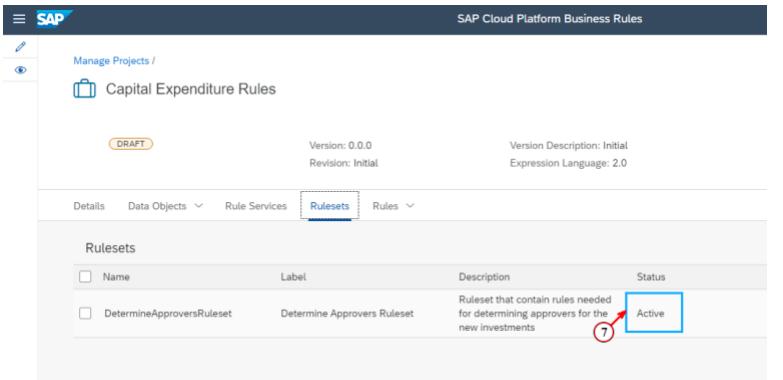
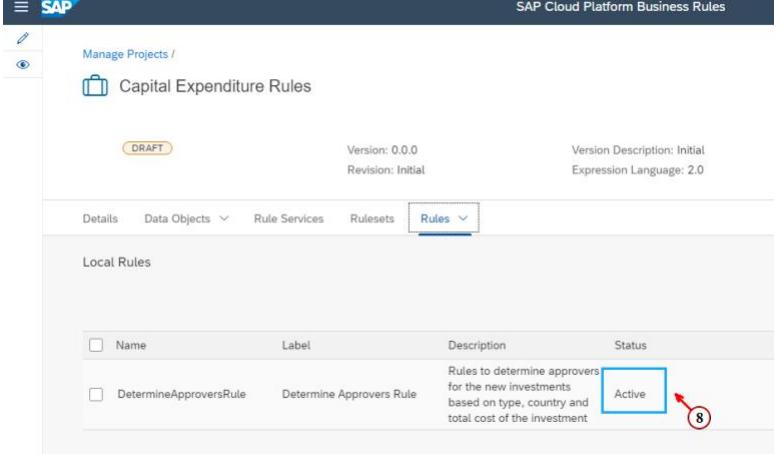
## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

Explanation	Screenshot
<p>127. Click <a href="#">Capital Expenditure Rules</a>.</p> <p>You have created the ruleset, associated it with rule service and added the rule. Ruleset is a collection of rules of similar output.</p>	

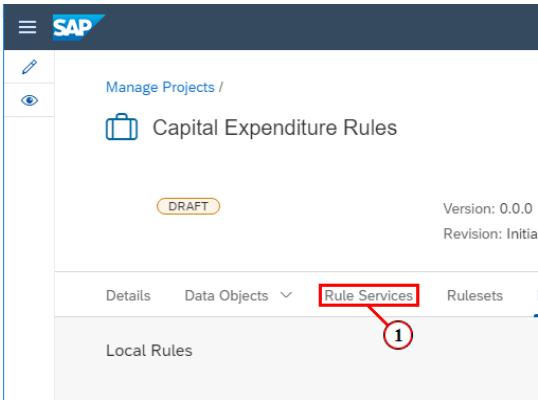
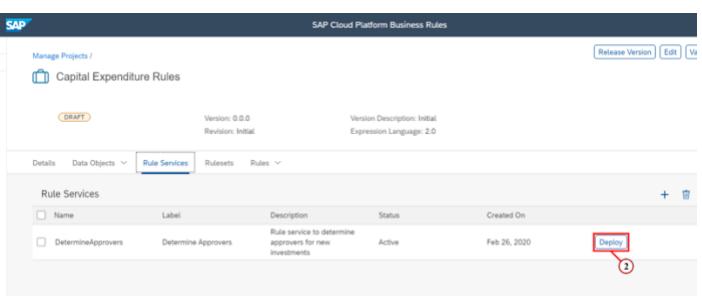
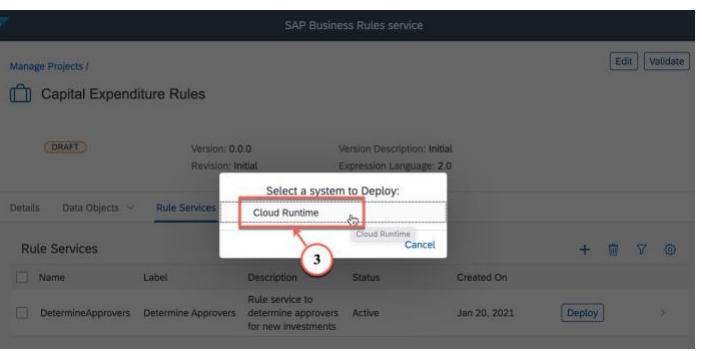
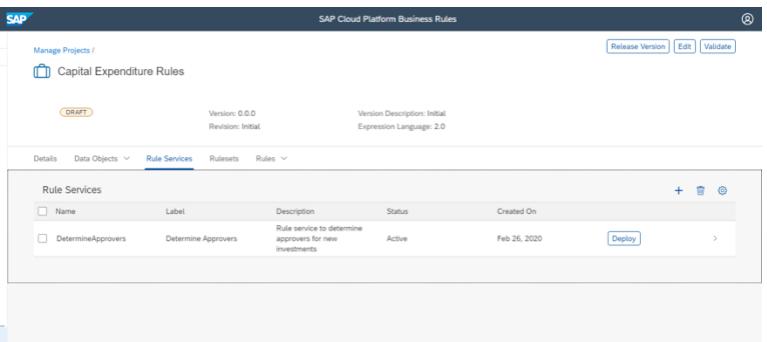
### ACTIVATE RULES PROJECT

Explanation	Screenshot
<p>Before you deploy the rule service, all the rule entity models have to be in activated state. In this chapter, you will go through all the models to ensure that they are activated.</p> <p>128. Click <a href="#">Details</a>.</p>	
<p>129. Click <a href="#">Edit</a>.</p>	

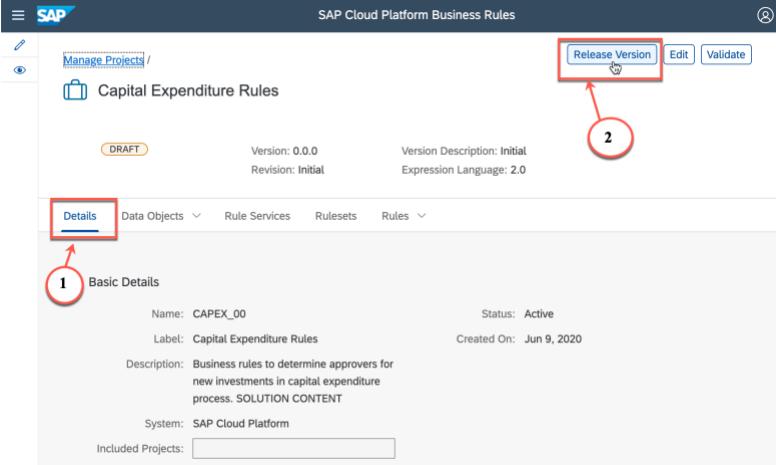
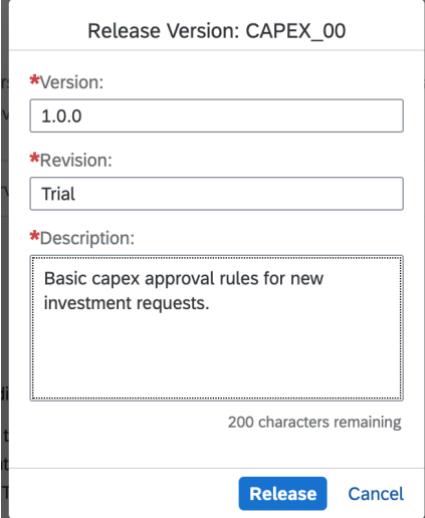
Explanation	Screenshot												
130. Click <b>Activate</b> .													
131. Click <b>Data Objects</b> .													
132. Check if all the data objects are in <b>Active</b> state.	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>Approvers</td> <td>Approvers</td> <td>Detail of the investment approvers</td> <td>Active</td> </tr> <tr> <td>Investment</td> <td>Investment</td> <td>Details of the investment</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	Approvers	Approvers	Detail of the investment approvers	Active	Investment	Investment	Details of the investment	Active
Name	Label	Description	Status										
Approvers	Approvers	Detail of the investment approvers	Active										
Investment	Investment	Details of the investment	Active										

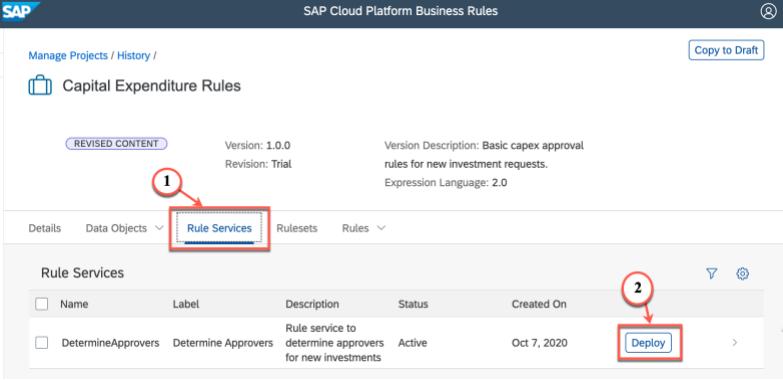
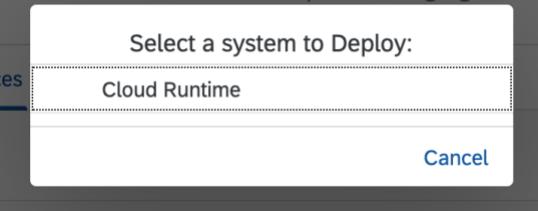
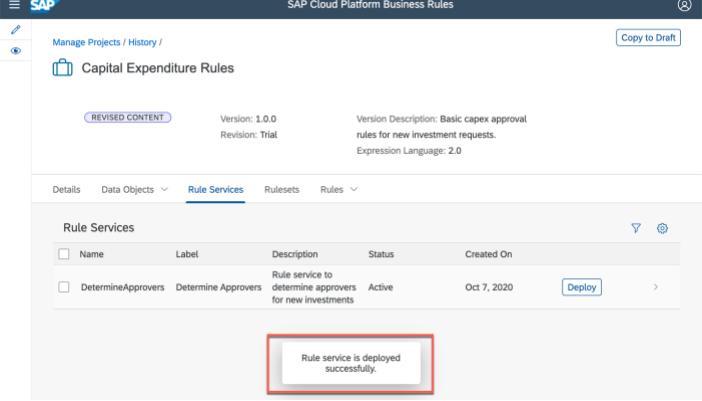
Explanation	Screenshot								
<p>133. Check if all the rule services are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApprovers</td> <td>Determine Approvers</td> <td>Rule service to determine approvers for new investments</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active
Name	Label	Description	Status						
DetermineApprovers	Determine Approvers	Rule service to determine approvers for new investments	Active						
<p>134. Check if all rulesets are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApproversRuleset</td> <td>Determine Approvers Ruleset</td> <td>Ruleset that contain rules needed for determining approvers for the new investments</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contain rules needed for determining approvers for the new investments	Active
Name	Label	Description	Status						
DetermineApproversRuleset	Determine Approvers Ruleset	Ruleset that contain rules needed for determining approvers for the new investments	Active						
<p>135. Check if all rules are in <b>Active</b> state.</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>Label</th> <th>Description</th> <th>Status</th> </tr> </thead> <tbody> <tr> <td>DetermineApproversRule</td> <td>Determine Approvers Rule</td> <td>Rules to determine approvers for the new investments based on type, country and total cost of the investment</td> <td>Active</td> </tr> </tbody> </table>	Name	Label	Description	Status	DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Active
Name	Label	Description	Status						
DetermineApproversRule	Determine Approvers Rule	Rules to determine approvers for the new investments based on type, country and total cost of the investment	Active						

## DEPLOY RULE SERVICE

Explanation	Screenshot
<p>136. Click <b>Rule Services</b>.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. In the top navigation bar, there is a 'Rule Services' tab highlighted with a red box and a circled number '1'. Below the navigation bar, there are tabs for 'Details', 'Data Objects', 'Rule Services' (which is active), 'Rulesets', and 'Rules'. The main content area displays a table for 'Rule Services' with one entry: 'DetermineApprovers'.</p>
<p>137. Click <b>Deploy</b>.</p>	 <p>The screenshot shows the same SAP Cloud Platform Business Rules interface as the previous step. The 'Rule Services' tab is still active. A 'Deploy' button is highlighted with a red box and a circled number '2'.</p>
<p>138. Click <b>Cloud Runtime</b> to deploy the rule service.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A modal dialog box titled 'Select a system to Deploy:' is open, showing options like 'Cloud Runtime', 'Cloud Runtime', and 'Cancel'. The 'Cloud Runtime' option is highlighted with a red box and a circled number '3'.</p>
<p>139. After the ruleset is deployed successfully, you will see the message. Now, the rule service can be consumed via the REST APIs</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface after deployment. A success message 'Deployment successful' is displayed above the 'Rule Services' table. The table shows the 'DetermineApprovers' rule service with its details and status.</p>

## CREATE VERSION

Explanation	Screenshot
<p>140. Click on <b>Details</b> tab</p> <p>141. Click <b>Release Version</b> to create a new version of the rules project.</p>	 <p>The screenshot shows the SAP Cloud Platform Business Rules interface. A red box highlights the 'Details' tab in the navigation bar. Another red box highlights the 'Release Version' button in the top right corner. A circled number '2' points to the 'Release Version' button.</p>
<p>142. Enter the following in the Release Version pop-up:</p> <p>Version: 1.0.0 Revision: Trial Description: Basic capex approval rules for new investment requests.</p> <p>143. Click <b>Release</b></p>	 <p>The screenshot shows a 'Release Version' dialog box. It contains fields for Version (1.0.0), Revision (Trial), and Description (Basic capex approval rules for new investment requests). A character counter at the bottom left says '200 characters remaining'. At the bottom are 'Release' and 'Cancel' buttons.</p>
<p>144. To view the version created, <b>navigate back</b> to main page by clicking on <b>Manage Projects</b> link on top-left corner of the screen</p> <p>145. Click the <b>checkbox</b> of the business rules project for which you created the version.</p> <p>146. Click <b>History</b>.</p>	 <p>The screenshot shows the 'Manage Projects' page. A red box highlights the checkbox next to the project name 'CAPEX_00'. Another red box highlights the 'History' button in the top right corner of the table header. A circled number '2' points to the 'History' button.</p>

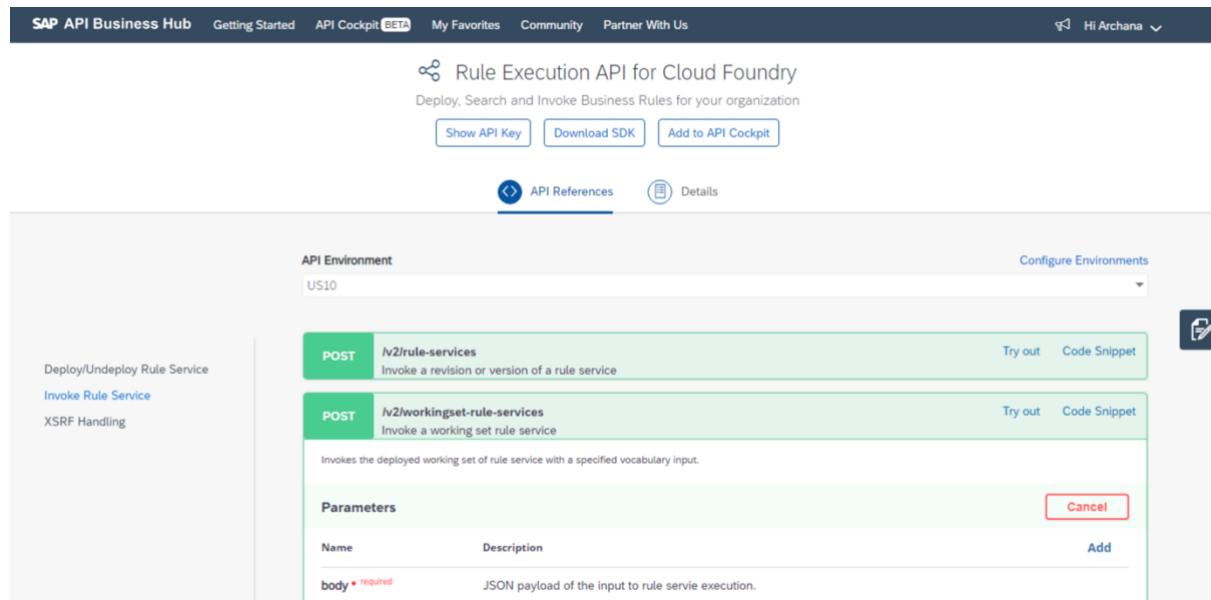
Explanation	Screenshot										
<p>You will see all the versions of the rule Project created here.</p> <p>147. Click to navigate into version 1.0.0</p>	 <table border="1"> <thead> <tr> <th>Version</th> <th>Revision</th> <th>Description</th> <th>Changed By</th> <th>Changed On</th> </tr> </thead> <tbody> <tr> <td>1.0.0</td> <td>Trial</td> <td>Basic capex approval rules for new investment requests.</td> <td>Archana</td> <td>Oct 7, 2020</td> </tr> </tbody> </table>	Version	Revision	Description	Changed By	Changed On	1.0.0	Trial	Basic capex approval rules for new investment requests.	Archana	Oct 7, 2020
Version	Revision	Description	Changed By	Changed On							
1.0.0	Trial	Basic capex approval rules for new investment requests.	Archana	Oct 7, 2020							
<p>148. Click <b>Rule Services</b> tab.</p> <p>149. Click <b>Deploy</b>.</p>											
<p>150. Click <b>Cloud Runtime</b> to deploy the rule service.</p>											
<p>151. After the rule service is deployed successfully, you will see the message.</p> <p>Now, the rule service can be consumed via the REST APIs</p>											

## TEST BUSINESS RULE

### OVERVIEW

Estimated time: 15 minutes

In the following exercise you will learn the basics of testing business rules invocation from APIs available in SAP API Business Hub.



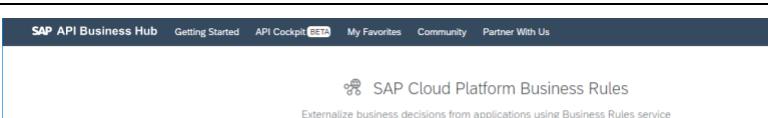
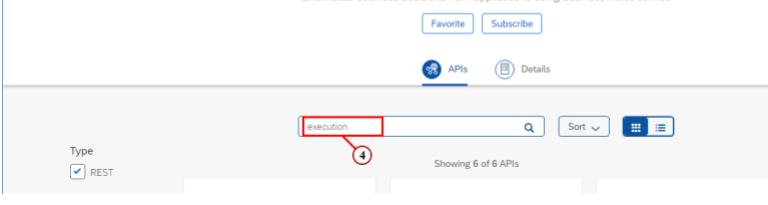
The screenshot shows the SAP API Business Hub interface. At the top, there is a navigation bar with links for SAP API Business Hub, Getting Started, API Cockpit (BETA), My Favorites, Community, and Partner With Us. On the right, it says "Hi Archana". Below the navigation bar, there is a banner for the "Rule Execution API for Cloud Foundry" which says "Deploy, Search and Invoke Business Rules for your organization". There are three buttons: "Show API Key", "Download SDK", and "Add to API Cockpit". Below the banner, there are two tabs: "API References" (which is selected) and "Details". Under "API References", there is a section for "API Environment" set to "US10" with a "Configure Environments" dropdown. On the left, there is a sidebar with links for "Deploy/Undeploy Rule Service", "Invoke Rule Service", and "XSRF Handling". The main content area shows two API endpoints: "POST /v2/rule-services" (Invoke a revision or version of a rule service) and "POST /v2/workingset-rule-services" (Invoke a working set rule service). Both endpoints have "Try out" and "Code Snippet" buttons. Below these endpoints, there is a "Parameters" section with a "Cancel" button and an "Add" button. A note says "body \* required" and "JSON payload of the input to rule service execution".

### Exercise Description

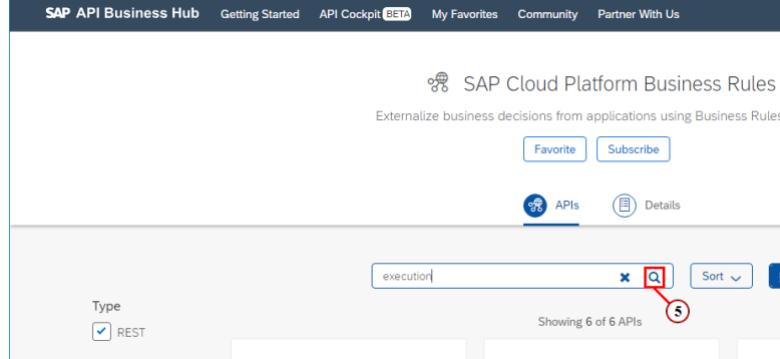
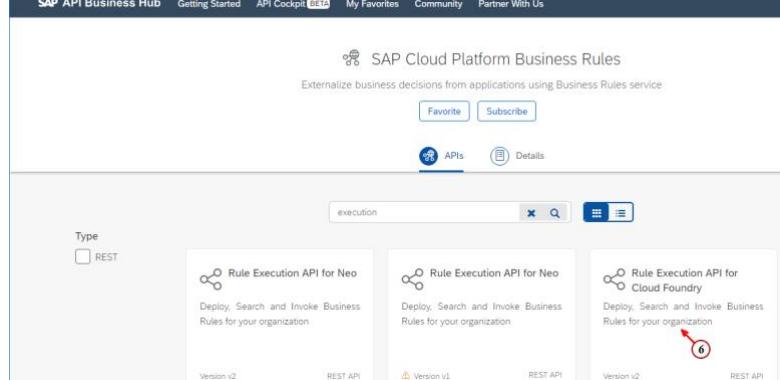
In this exercise you will do the following:

- Discover Business Rules API in SAP API Business Hub
- Configure Cloud Foundry Test Environment
- Invoke Business Rules

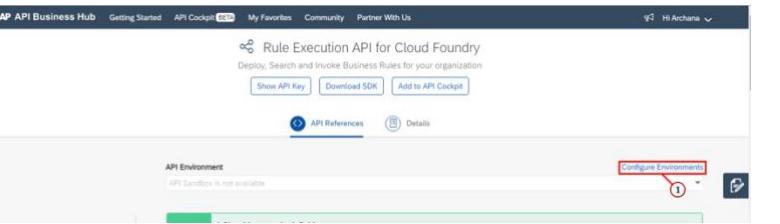
## DISCOVER BUSINESS RULES API

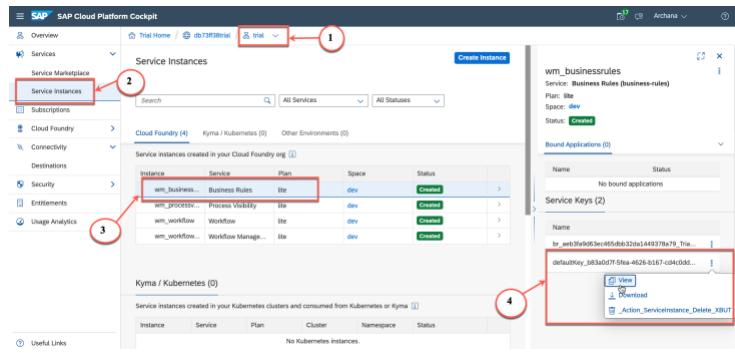
Explanation	Screenshot
<p>152. Open <b>API Business Hub</b> using this URL: <a href="https://api.sap.com">https://api.sap.com</a></p> <p style="text-align: center;"><b>Log On →</b></p> <p>153. Click <b>Log On</b>.</p>	
<p>154. using your S or P user ID</p>	
<p>155. Search Business Rules API          156. In <b>Search</b> box, enter <b>business rule</b> and press <b>Enter key</b> to search.</p>	
<p>157. Click <b>SAP Cloud Platform Business Rules API Package</b>.</p>	
<p>158. Enter <b>execution</b> in the  box.</p>	

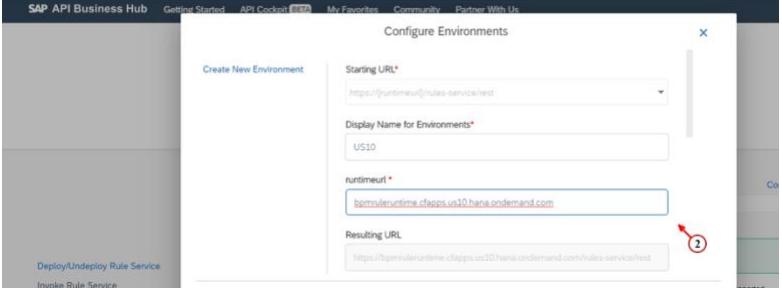
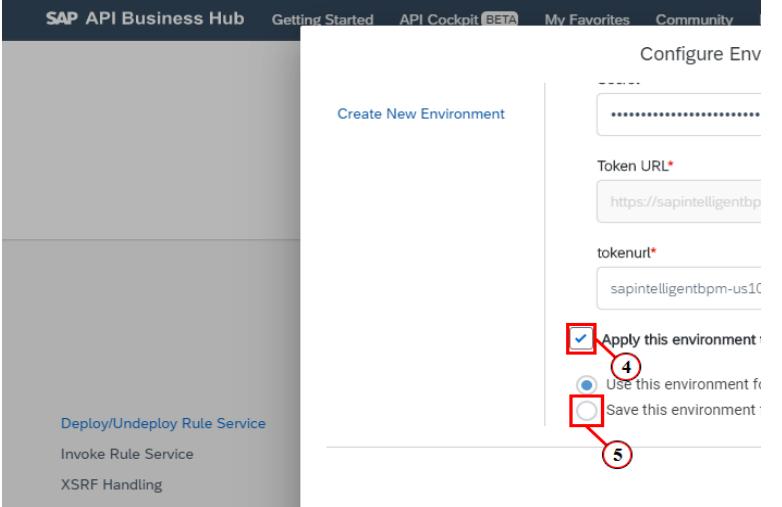
## DEV163 - Build a Workflow from Scratch with SAP Workflow Management

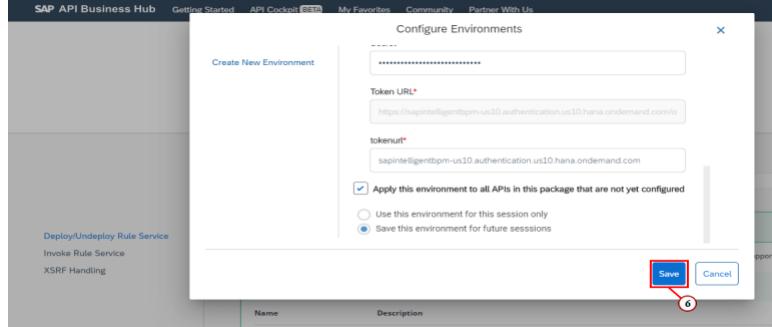
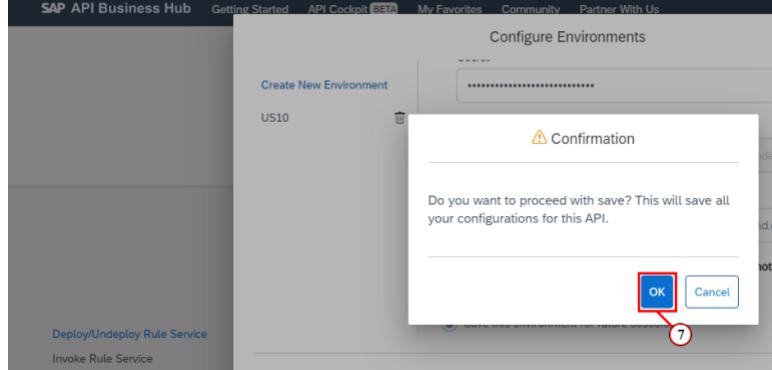
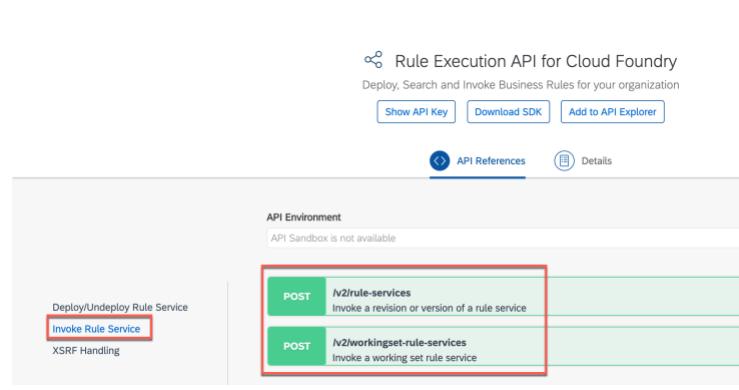
Explanation	Screenshot
<p>Note: Business Rules have two set of APIs: Authoring and Execution. You will also notice two set of versions v1 and v2. Version v1 is currently deprecated and will soon be unsupported.</p> <p>159. Click  to search the execution APIs.</p>	
<p>160. Click on Rule Execution API for Cloud Foundry version v2 APIs.</p>	

## CONFIGURE TEST ENVIRONMENT

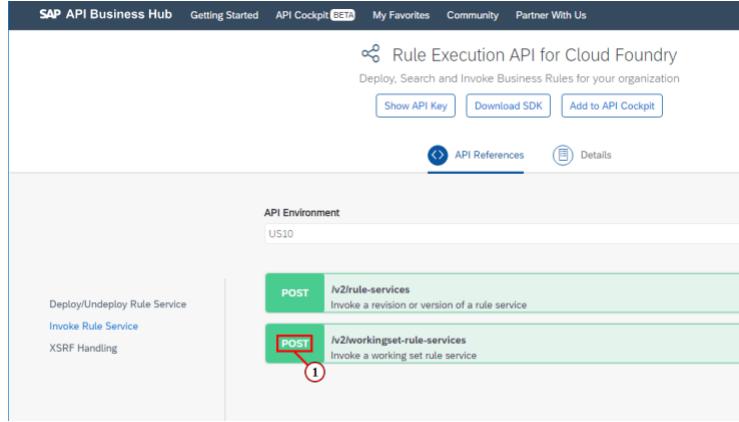
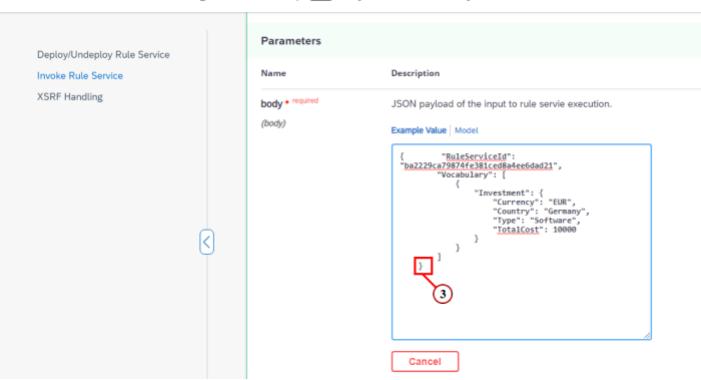
Explanation	Screenshot
<p>161. Click <a href="#">Configure Environments</a>.</p>	

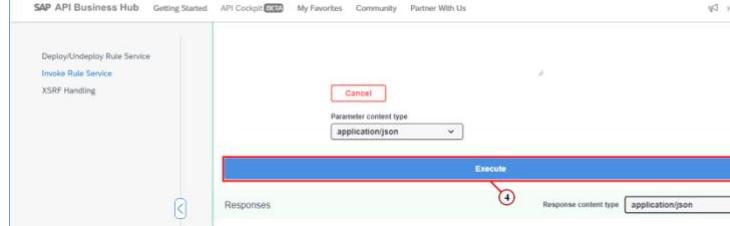
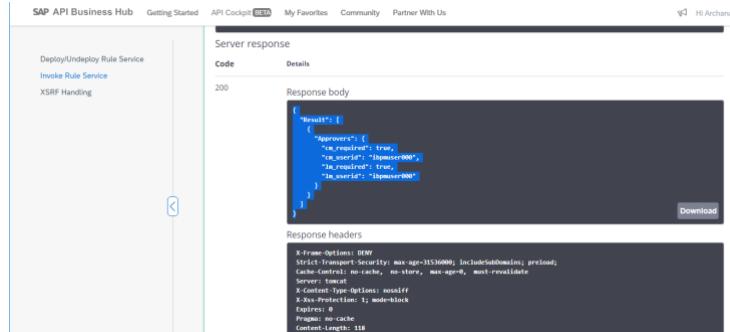
Explanation	Screenshot
<p>Fetch the information from Business Rules service instance key to configure the API Hub environment. To do so,</p> <ol style="list-style-type: none"> <li>162. Login to your trial account and navigate into your sub-account.</li> <li>163. From left panel, click <b>Service Instances</b>.</li> <li>164. From among the available instances, click on <b>wm_businessrules</b> instance to view service keys.</li> <li>165. From available service keys, click  on any service key and select <b>View</b>.</li> </ol>	
<p>166. Copy the</p> <ul style="list-style-type: none"> <li>○ rule_runtime_url,</li> <li>○ clientid,</li> <li>○ clientsecret,</li> <li>○ url (this is token url)</li> </ul> <p>These will be used to configure the testing environment in API Business Hub.</p>	 <pre>{   "endpoints": {     "rule_repository_url": "https://bpmrulerrepository.cfapps.eu10.hana.ondemand.com",     "rule_runtime_url": "https://bpmruleruntime.cfapps.eu10.hana.ondemand.com"   },   "html5-apps-repo": {     "app_host_id": "4e486beb-e3e3-4aaa-8a5a-c843e767f708"   },   "uaa": {     "tenantmode": "dedicated",     "sburl": "https://internal-xsuaa.authentication.eu10.hana.ondemand.com",     "subaccountid": "bc6567da-cabb-49f2-998d-6177896d0d93",     "clientid": "sb-clone-b83a0d7f-5fea-4626-b167-cd4c0dd187b4",     "clientsecret": "Y1Ry",     "url": "https://db73ff38trial.authentication.eu10.hana.ondemand.com",     "uaadomain": "authentication.eu10.hana.ondemand.com",     "verificationkey": "-----BEGIN PUBLIC KEY-----",     "-----END PUBLIC KEY-----"   } }</pre>

Explanation	Screenshot
<p>167. Set configuration properties</p> <p>Enter the respective details in the configuration properties as copied from the business rules service key in previous step:</p> <ul style="list-style-type: none"> <li>• Display Name: Trial</li> <li>• <b>runtimeurl:</b> &lt;as copied above&gt;</li> <li>• <b>Client Id:</b> &lt;as copied above&gt;</li> <li>• <b>Secret:</b> &lt;as copied above&gt;</li> </ul> <p>Press <b>Tab</b> to move to next property.</p>	
<p>168. Enter the following as token url and other standard properties:</p> <p><b>tokenurl:</b> &lt;as copied above&gt;</p> <p>Note: please remove <b>https://</b> from the token url and copy the rest.</p> <p>For Example: If the URL is <a href="https://db73ff38trial.authentication.eu10.hana.ondemand.com">https://db73ff38trial.authentication.eu10.hana.ondemand.com</a></p> <p>Then token URL will be: db73ff38trial.authentication.eu10.hana.ondemand.com</p> <p>169. Click  for <b>Apply this environment to all APIs.</b></p> <p>170. Click  for <b>Save this environment for future sessions.</b></p>	

Explanation	Screenshot
<p>171. Click .</p>	
<p>172. Click .</p>	
<p>There are two kinds of runtime APIs.</p> <ul style="list-style-type: none"> <li>○ The first one is for versioned invocation which means if you have deployed any version of the rule service and want to invoke it.</li> <li>○ The second one is for the working set invocation which means that you do not have any version but have deployed the working set directly.</li> </ul> <p>173. From the left options, click <u>Invoke Rule Service</u>.</p>	

## INVOKE BUSINESS RULES

Explanation	Screenshot
<p>174. Click <b>POST</b> of <b>/v2/working-set-rule-services</b> API.</p>	
<p>175. Click <b>Try out</b>.</p>	
<p>176. Press <b>Tab</b> until you reach the <b>body</b> section.</p> <p>177. In the <b>body</b> section, <b>Copy &amp; Paste</b> this text:</p> <pre> {   "RuleServiceId": "ba2229ca79874fe381ced8a4ee6dad21",   "Vocabulary": [     {       "Investment": {         "Currency": "EUR",         "Country": "Germany",         "Type": "Software",         "TotalCost": 10000       }     }   ] } </pre> <p>Replace the <b>RuleServiceId</b> with rule service id of your rules project.</p>	 <p><b>⚠️</b> Be careful during copying. Sometimes during copy and paste, the spaces are added automatically. In that case the payload will be considered as invalid and execution will fail. Remove the spaces.</p>

Explanation	Screenshot
<p>178. Click <b>Execute</b>.</p>	
<p>You will see the response after the successful rule execution. Try and change the country to “India” in the input body, and you will see a different response.</p>	 <pre> {   "Result": [     {       "Approver": "US",       "Country": "USA"     }   ] }   </pre>

## SUMMARY

You have completed the exercise!

You are now able to:

- Create & Activate Project, Data Object, Ruleservice, Ruleset and Rules.
- Configure Value Help in Data Object.
- Use Microsoft Excel Import/Export functionality in Decision Table.
- Deploy Ruleservice in Cloud Runtime.
- Discover Business Rules API in SAP API Business Hub.
- Configure Test Environment for Cloud Foundry.
- Execute Business Rules Execution API.

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PUBLIC

# **Build a Workflow from Scratch with SAP Workflow Management**

## **DEV163**

Exercise 2.2 | Integrate Business Rules with Workflow  
Archana Shukla / SAP

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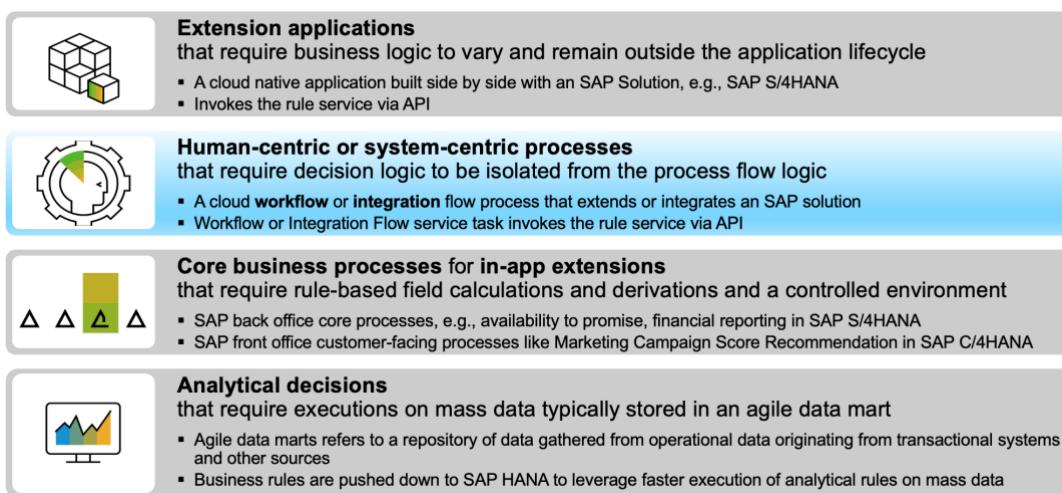
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## OVERVIEW

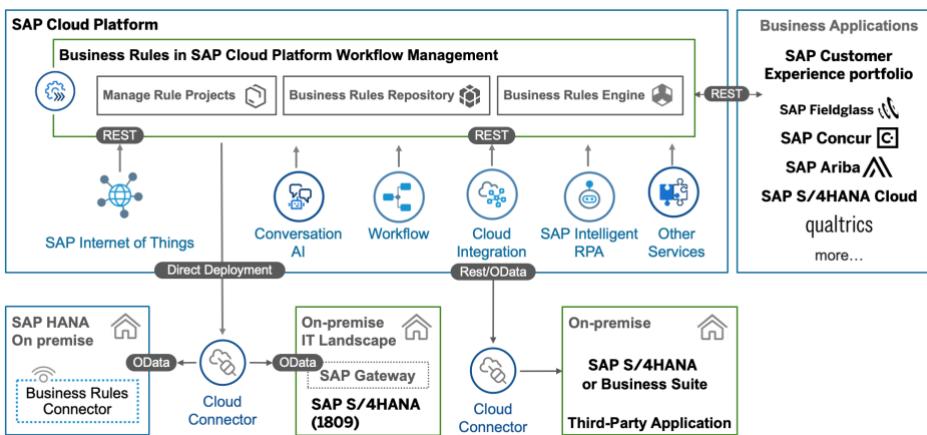
Estimated time: 30 minutes

Prerequisite: You have to run Exercise 2.1 before running this exercise.

**Business Rules** in SAP Workflow Management enables business users & application developers to automate their decisions and enhance their decision-making experience. Integration and consumption are the key. There are **4 consumption patterns** that you can use to leverage the power of business rules capabilities in your applications/solutions.

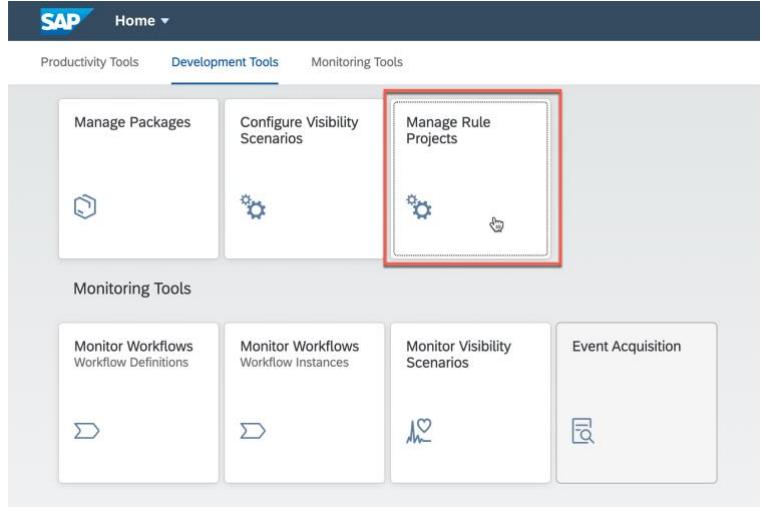
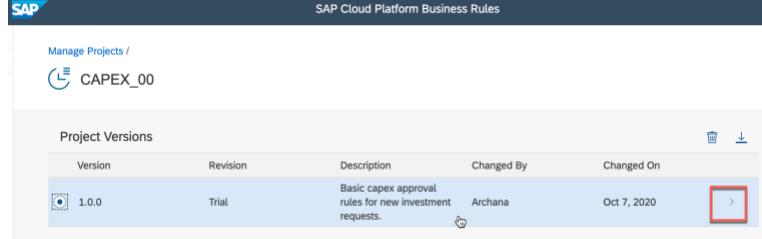
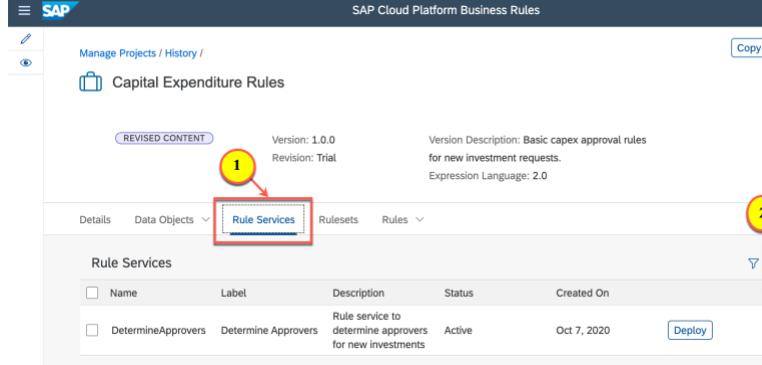


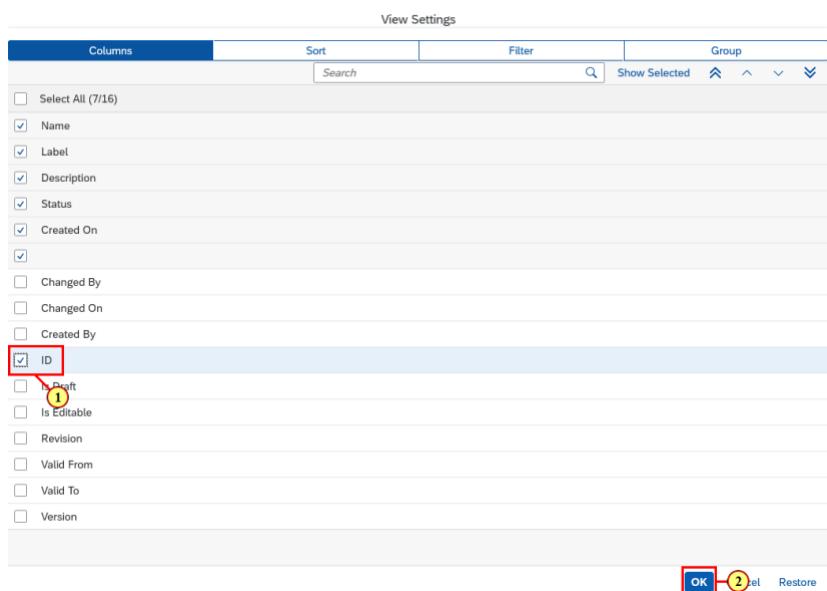
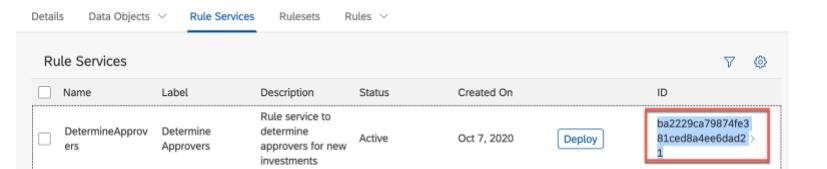
**Pattern 2** talk about how business rules can be used to abstract the decision logic in process orchestration scenarios. **Workflow** and **Business Rules** work harmoniously to provide an unmatched support to automate decisions in workflow such that the business users can easily modify the rules without changing the process flow. **Business rule service can be accessed in Workflow using a Service Task**.



In this exercise, you will integrate the approver determination rules you build in earlier exercise with the capex approval workflow. For that you will configure the Service Task with the details of the Business Rules API.

## INTEGRATE BUSINESS RULES WITH WORKFLOW

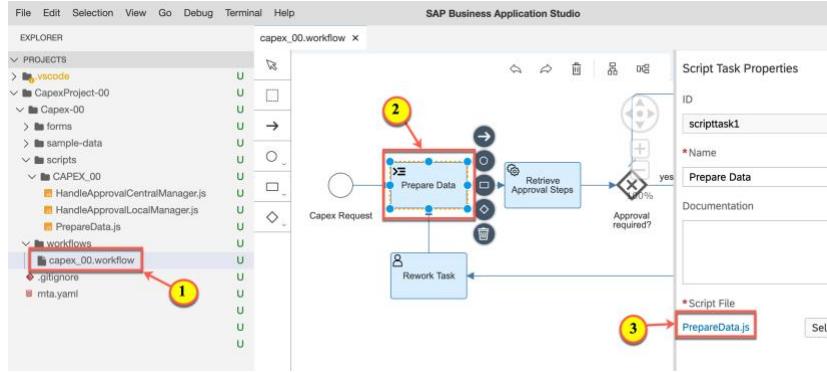
Explanation	Screenshot
<p>There are two kind of rule invocation APIs (a) versioned and (b) working-set. In this exercise, we will integrate business rules with workflow using versioned invocation API. For that, you have to get the rule service ID of the versioned rule service.</p> <ol style="list-style-type: none"> <li>From <b>Workflow Management Launchpad Home page</b>, open <b>Manage Rule Projects</b> application.</li> </ol>	
<ol style="list-style-type: none"> <li>Select your business rule project and click on <b>History</b>.</li> </ol>	
<ol style="list-style-type: none"> <li>Click to navigate into the version <b>1.0.0</b>.</li> </ol>	
<ol style="list-style-type: none"> <li>Click <b>Rule Services</b> tab.</li> <li>Click <b>Deploy of DetermineApprovers</b> to deploy the versioned rule service.</li> <li>Select <b>Settings</b> .</li> </ol>	

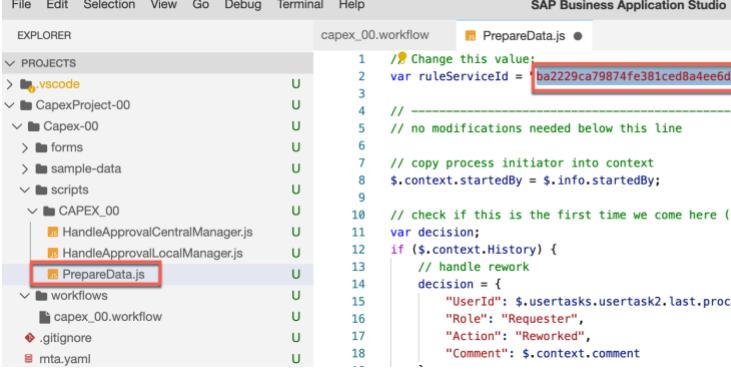
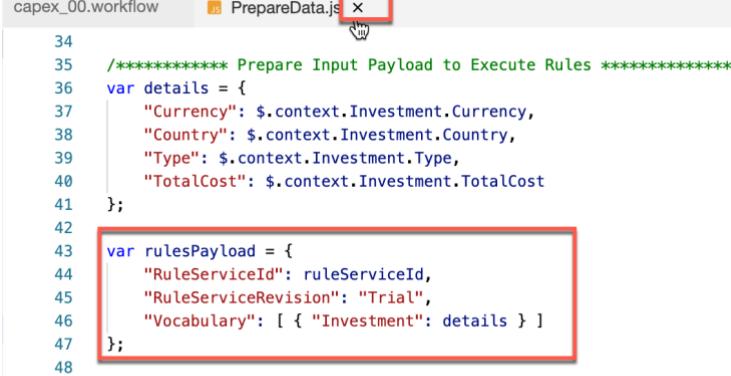
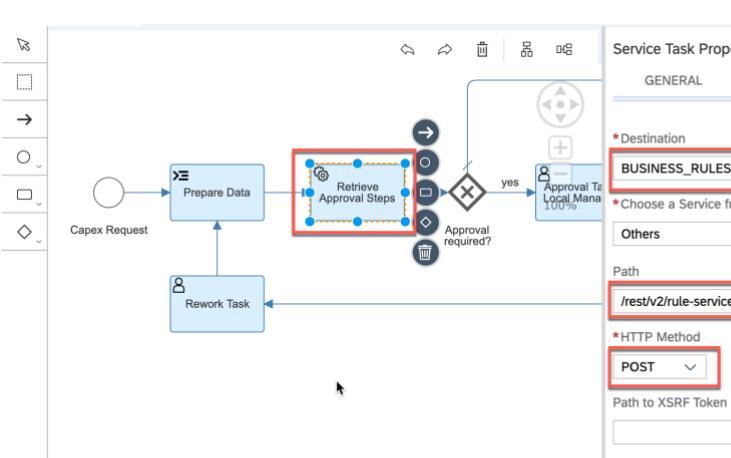
Explanation	Screenshot
<p>7. Select the <b>ID column</b> which will display the ID of the rule service.</p> <p>8. Select <b>OK</b>.</p>	
<p>9. Copy the <b>Rule Service ID</b> and paste it in a notepad.</p>	

Now we will use the copied rule service information to configure the workflow.

If you have not executed *Exercise 1 on Workflow* and are coming directly to execute *Exercise 2* then you have to first import the workflow in SAP Business Application Studio.

#### To do so, follow the Appendix | Import Sample Workflow.

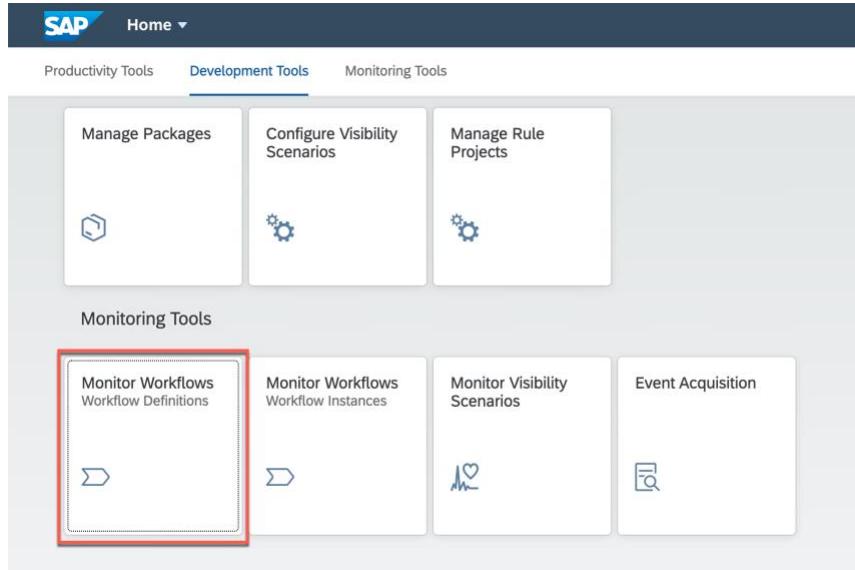
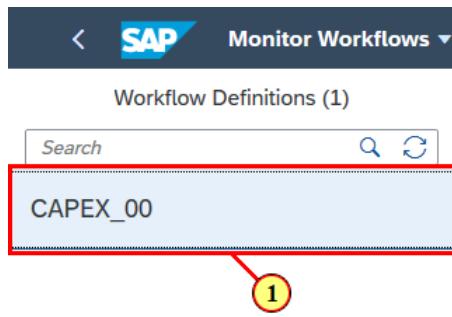
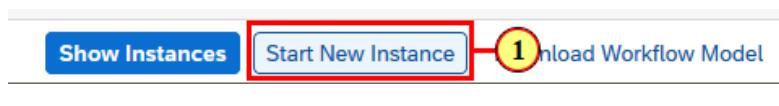
<p>10. Expand the imported workflow project and click to open the workflow and select <b>Prepare Data</b> script task.</p> <p>11. From the service task properties, select the script file <b>PrepareData.js</b> to open it.</p>	
--	--

Explanation	Screenshot
<p>12. Paste the Rule Service ID as value of <code>ruleServiceId</code> variable.</p>	 <pre> File Edit Selection View Go Debug Terminal Help capex_00.workflow PrepareData.js  EXPLORER PROJECTS &gt; .vscode   CapexProject-00     Capex-00       forms       sample-data       scripts         CAPEX_00           HandleApprovalCentralManager.js           HandleApprovalLocalManager.js         PrepareData.js       workflows         capex_00.workflow       .gitignore       mta.yaml  1 // Change this value: 2 var ruleServiceId = 'ba2229ca79874fe381ced8a4ee6dad21'; 3 4 // ----- 5 // no modifications needed below this line 6 7 // copy process initiator into context 8 \$.context.startedBy = \$.info.startedBy; 9 10 // check if this is the first time we come here (process start) or a 11 // new decision; 12 if (\$.context.History) { 13   // handle rework 14   decision = 15     "UserId": \$.usertasks.usertask2.last.processor, 16     "Role": "Requester", 17     "Action": "Reworked", 18     "Comment": \$.context.comment 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 **** Prepare Input Payload to Execute Rules **** 36 var details = { 37   "Currency": \$.context.Investment.Currency, 38   "Country": \$.context.Investment.Country, 39   "Type": \$.context.Investment.Type, 40   "TotalCost": \$.context.Investment.TotalCost 41 }; 42 43 var rulesPayload = { 44   "RuleServiceId": ruleServiceId, 45   "RuleServiceRevision": "Trial", 46   "Vocabulary": [ { "Investment": details } ] 47 }; 48 49 \$.context.rulesPayload = rulesPayload; 50 </pre>
<p>Scroll down in the javascript file and notice how the input payload is constructed to call the business rules API in the workflow script task.</p> <p>13. Save and close  the file.</p>	 <pre> 34 35 **** Prepare Input Payload to Execute Rules **** 36 var details = { 37   "Currency": \$.context.Investment.Currency, 38   "Country": \$.context.Investment.Country, 39   "Type": \$.context.Investment.Type, 40   "TotalCost": \$.context.Investment.TotalCost 41 }; 42 43 var rulesPayload = { 44   "RuleServiceId": ruleServiceId, 45   "RuleServiceRevision": "Trial", 46   "Vocabulary": [ { "Investment": details } ] 47 }; 48 49 \$.context.rulesPayload = rulesPayload; 50 </pre>
<p>14. Click to open the workflow again and select <b>Retrieve Approval Steps</b> service task.</p> <p>Notice the service task properties:</p> <ul style="list-style-type: none"> <li><b>BUSINESS_RULES</b> destination is created when you ran the Booster. This destination contains the credentials to run business rules invocation API.</li> <li><b>Path</b> is the relative path of the versioned API</li> <li><b>Request variable</b> is the input payload as constructed in the script task before.</li> <li><b>Response variable</b> is where the output of the rules will be appended.</li> </ul>	

Explanation	Screenshot
<p>15. From the workflow model, select <b>Approval Task (Local Manager)</b> user task.</p> <p>In <b>User Task Properties</b>, notice the <b>Users</b> section. It is directly consuming the output from the business rules execution from the response variable.</p>	
<p>16. Save your changes, build the workflow by right-click on <b>mta.yaml</b> to open the context menu and click <b>Build MTA</b>.</p>	
<p>17. Ensure that the <b>Build MTA</b> task exits with code 0, indicating the build is completed.</p>	
<p>Ensure that a cloud tenant has already been configured. It will be shown in the bottom left corner on a blue bar. If it is not configured yet, then click on the blue bar and click on the blue-bar and follow the wizard to enter the details.</p>	

Explanation	Screenshot
<p>18. You can get the needed information about the Login URL, organization name and space name from your trial account.</p> <p>You have to login with your trial user email and password.</p> <p><i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to login with the URL, organization, space, username and password as provided by the trainer.</i></p>	<p>SAP Cloud Platform Cockpit</p> <p>Subaccount: trial</p> <p>Subdomain: db73ff38trial ID: bc6567da-cabb-49f2-998d-6177896d0d93</p> <p>Cloud Foundry Environment Entitlements</p> <p>Org Name: db73ff38trial Org ID: 20e51be8-b1ed-4788-9146-89def783faac Members: 1 API Endpoint: https://api.cf.eu10.hana.ondemand.com</p> <p>Spaces (1)</p> <p>Name Applications dev 0</p> <p>Entitlements</p>
<p>19. Select the newly created directory <b>mta_archives</b> to open it.</p> <p>20. Right-click on the created file <b>CapexProject-00_0.0.1.mtar</b> to open the context menu.</p> <p>21. Select <b>Deploy MTA Archive</b>.</p>	<p>EXPLORER: CAPEXPROJECT-00</p> <ul style="list-style-type: none"> <li>.vscode</li> <li>Capex-00</li> <li>mta_archives             <ul style="list-style-type: none"> <li>CapexProject-00_0.0.1.mtar</li> </ul> </li> <li>.gitignore</li> <li>mta.yaml</li> </ul> <p>Deploy MTA Archive</p>
<p>22. Ensure that the <b>Deploy MTA Archive</b> task exits with code 0 indicating that the deployment has finished.</p> <p><i>Note: You can also click on the icon in the lower right corner to toggle display of the console panels.</i></p>	<p>Task 'Deploy MTA Archive (MTA)' has exited with code 0.</p> <p>Task 'Deploy MTA Archive (MTA)' has been started.</p> <p>Ln 18, Col 1 LF UTF-8 Spaces: 2 YAML</p>
<p><i>Note: Your deployment console should look similar to this with the "Process finished" in the second-to-last line, indicating success.</i></p> <p>If there are any errors then fix the error, build and deploy the workflow project again.</p>	<pre> Problems  &gt; Task: Deploy MTA Archive  &gt; Task: Build MTA Deploying multi-target app archive /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar workflow@gmail.com...  Uploading 1 files... /home/user/projects/CapexProject-00/mta_archives/CapexProject-00_0.0.1.mtar OK Deploying in org "SAPIntelligentBPM-US10" and space "Training" Detected MTA schema version: "" No deployed MTA detected - this is initial deployment Detected new MTA version: "0.0.1" Service key "Capex-00-BPMWorkflow-credentials" for service "BPMWorkflow" already exists Uploading content module "Capex-00" in target service "BPMWorkflow"... Deploying content module "Capex-00" in target service "BPMWorkflow"... Skipping deletion of services, because the command line option "--delete-services" is not specified. Process finished. Use "cf dm0l -i c29f3b28-96ba-11ea-920e-eeee0a81d618" to download the logs of the process. </pre>

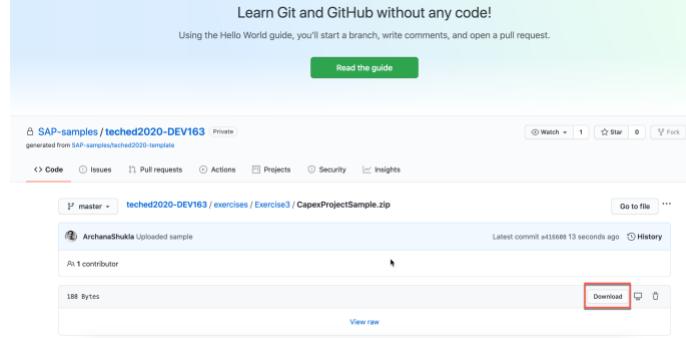
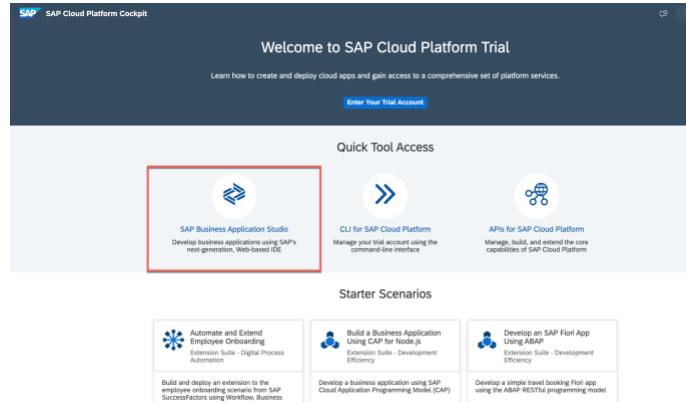
## EXECUTE AND MONITOR WORKFLOW

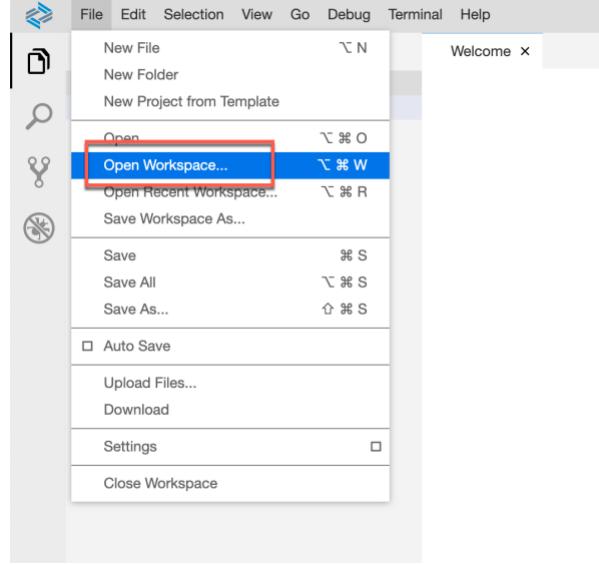
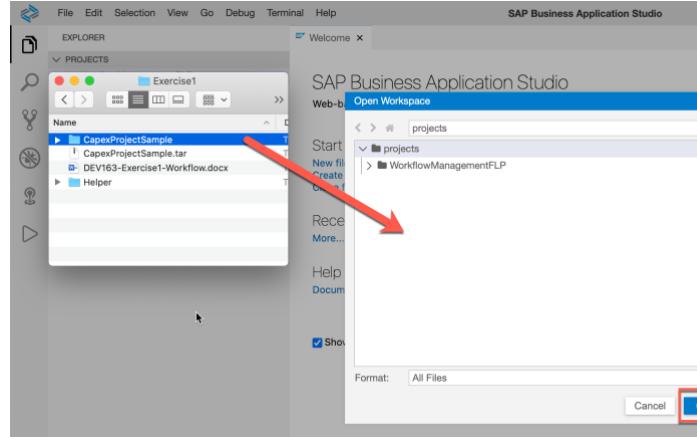
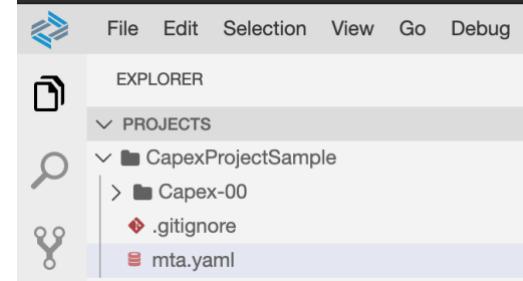
Explanation	Screenshot
<p>1. Open the <b>Workflow Management Launchpad</b> Home Page.</p> <p>2. <b>Log On</b> with your trial username and password.</p> <p><i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to login to the workflow management launchpad with the credentials provided by the trainer.</i></p> <p>3. Select the tile <b>Monitor Workflows - Workflow Definitions</b>.</p>	
<p><b>Note:</b> Monitor Workflows application has Master-Detail layout where you see all the workflows deployed on left. Ensure that the workflow you just deployed - <b>CAPEX_00</b> - is existing.</p> <p>4. Select the workflow.</p> <p><i>Note: If your trial setup has failed, and your trainer has given you another system for deployment, then you need to find the workflow with the unique name you provided while creating the workflow module like Capex_&lt;your name or id or initials&gt;</i></p>	
<p>5. Select <b>Start New Instance</b>.</p>	

Explanation	Screenshot				
<p>6. Modify the <b>RequestId</b> in the JSON to any string.</p> <p>7. Adapt the following fields in the JSON element.  <b>Requester:</b></p> <ul style="list-style-type: none"> <li>o <b>Name</b> can be anything</li> <li>o <b>Email</b> should be your trial user email ID</li> <li>o <b>UserId</b> is your trial user id</li> </ul> <p>8. Select <b>Start New Instance</b>.</p>	<p>Start New Instance</p> <p>Enter the JSON context with which to start the new instance:</p> <pre>{   "RequestId": "CAPEX_REQ_00_001", <span style="border: 1px solid red;">1</span>   "Title": "Build mobile apps",   "Requester": {     "Name": "Ahring",     "Email": "Frederic.Ahring@sap.com",     "UserId": "ibpmuser000",     "Comment": "Please Approve"   }, <span style="border: 1px solid red;">2</span>   "Investment": {     "TotalCost": 10000,   } }</pre> <p><span style="border: 1px solid red;">3</span> Start New Instance</p>				
<p>A popup confirms that the workflow instance has been started.</p> <p>9. Select <b>Show Instances</b> to switch to the <b>Monitor Workflows - Workflow Instances</b> application where you can view all the running, completed, suspended workflow instances and their details.</p>	<p>Workflow instance started.</p> <p><span style="border: 1px solid red;">1</span></p> <p><span style="border: 1px solid red;">2</span> Show Instances New Instance</p>				
<p>10. Select the latest created workflow instance and click on <b>Refresh</b> button on top-right corner.</p> <p>11. From the <b>EXECUTION LOG</b>, you will notice that the service task <b>Retrieve Approval Steps</b> is completed successfully which executes the business rules service.</p>	<p>Workflow Instances (1)</p> <p>Filtered by: Definition (CAPEX_00), Status ...</p> <table border="1"> <tr><td>caperx_00</td><td>CAPEX Approval for 'Build mobile apps'</td><td>Archana</td><td>Running</td></tr> </table> <p>Workflow Instance</p> <p>CAPEX Approval for 'Build mobile apps'</p> <p>Started By: Archana Status: Running Definition ID: caperx_00</p> <p>WORKFLOW INFORMATION ERROR MESSAGES WORKFLOW CONTEXT EXECUTION LOG</p> <p>"Approval required?" reached Oct 11, 2020, 10:53:02 PM</p> <p>"Retrieve Approval Steps" completed successfully Oct 11, 2020, 10:53:02 PM Service endpoint: BUSINESS_RULES</p> <p>"Retrieve Approval Steps" started Oct 11, 2020, 10:53:01 PM</p> <p>"Prepare Data" completed successfully Oct 11, 2020, 10:53:01 PM</p> <p><span style="border: 1px solid red;">1</span> <span style="border: 1px solid red;">2</span> <span style="border: 1px solid red;">3</span></p>	caperx_00	CAPEX Approval for 'Build mobile apps'	Archana	Running
caperx_00	CAPEX Approval for 'Build mobile apps'	Archana	Running		
<p>You can also switch to <b>WORFKLOW CONTEXT</b> and see the output of the rule execution collected inside <b>approvalStepResult</b> element.</p>	<pre> "approvalStepsResult": {   "Result": [     {       "Approvers": {         "cm_required": true,         "cm_userid": "ibpmuser000",         "lm_required": true,         "lm_userid": "ibpmuser001"       }     }   ] } </pre>				

## APPENDIX

### Import Sample Workflow

Explanation	Screenshot
<p>1. Download <b>CapexProjectSample.zip</b> project from given <b>GitHub</b> link in your local file system and <b>extract</b> the files.</p> <p><a href="https://github.com/SAP-samples/teched2020-DEV163/blob/master/exercises/Exercise3/CapexProjectSample.zip">https://github.com/SAP-samples/teched2020-DEV163/blob/master/exercises/Exercise3/CapexProjectSample.zip</a></p>	
<p>2. Logon to <b>SAP Cloud Platform Trial Home Page</b> with your trial username and password.</p> <p>3. Choose <b>SAP Business Application Studio</b>.</p>	

Explanation	Screenshot
<p>4. Click on the <b>Dev Space</b> to go into the workspace and from <b>File</b> menu choose <b>File   Open Workspace</b>.</p> <p>Note: If you have no dev space, click the <b>Create Dev Space</b> with:</p> <ol style="list-style-type: none"> <li>1. <i>Application Type</i> as SAP Fiori.</li> <li>2. <i>Extension</i> as Workflow Management.</li> </ol> <p>Else select <b>PLAY</b>  to start the space if you see the status as <b>STOPPED</b>.</p>	
<p>5. Drag and drop the extracted <b>CapexProjectSample</b> folder in the <b>Open Workspace</b> dialog and click <b>Open</b>.</p>	
<p>6. You will see that the <b>CapexProjectSample</b> project is imported into your workspace.</p>	

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PUBLIC

# **Build a Workflow from Scratch with SAP Workflow Management**

## **DEV163**

Exercise 3 | Process Visibility  
Archana Shukla / SAP

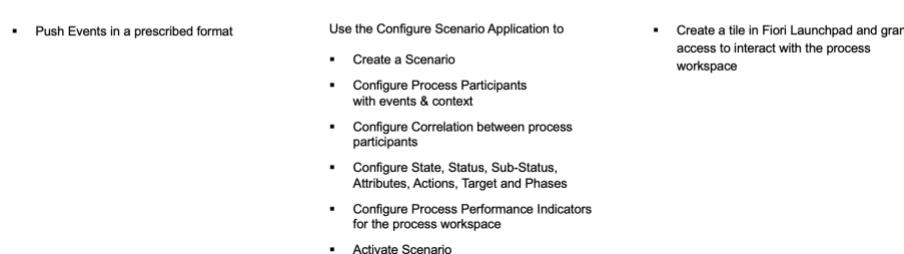
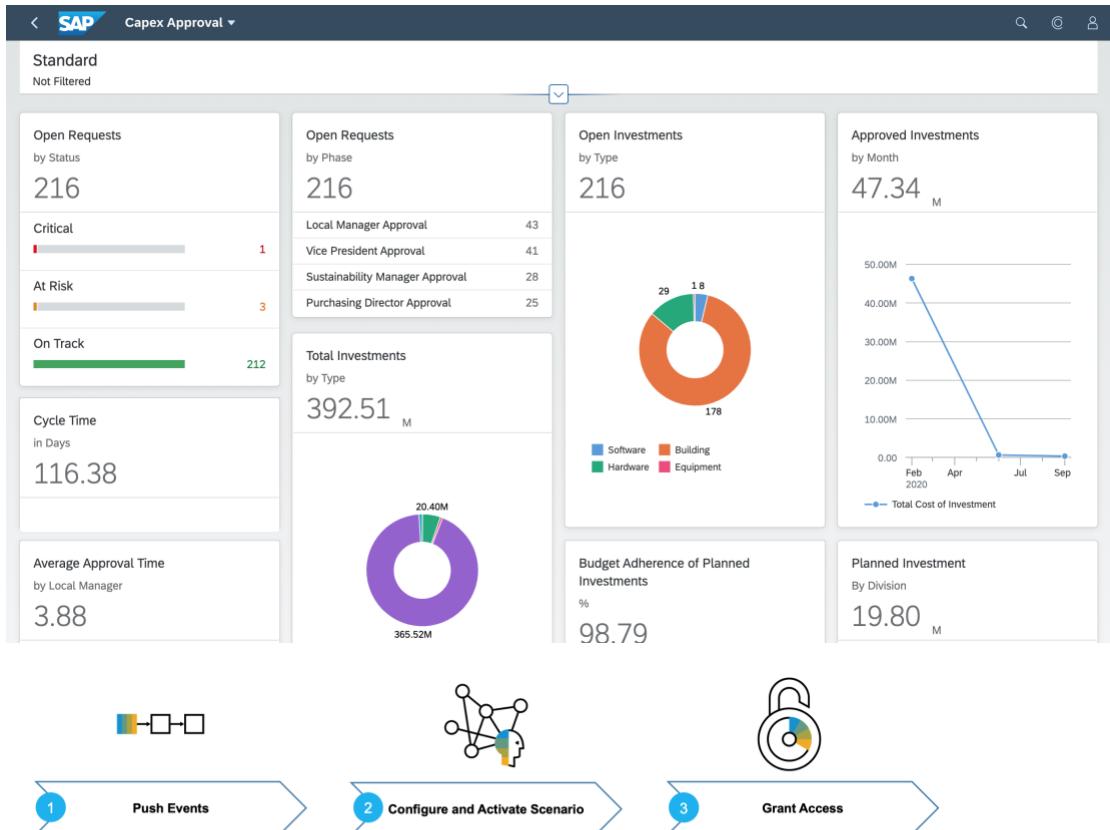
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## OVERVIEW

Estimated time: 60 minutes

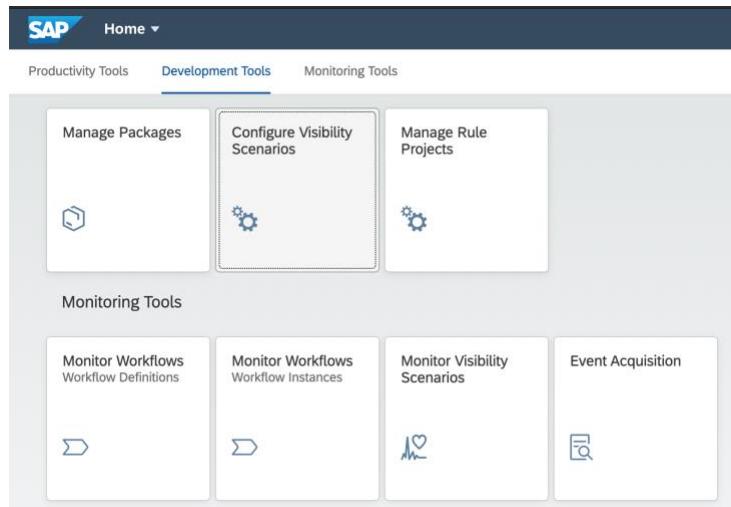
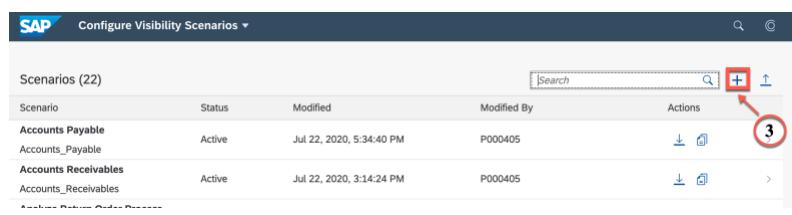
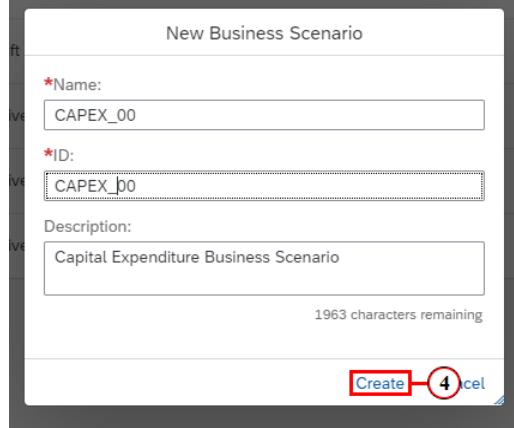
Process Visibility service offers the capabilities to monitor and track the business processes and key business KPIs in real-time so that the business users can identify real time operational inconsistencies of the ongoing process that helps them to take better tactical day-to-day decisions. In this exercise, you will create the visibility scenario to track capital expenditure approval process and learn how it helps to get the real-time insight into the operational progress and business KPIs using customized workspace.

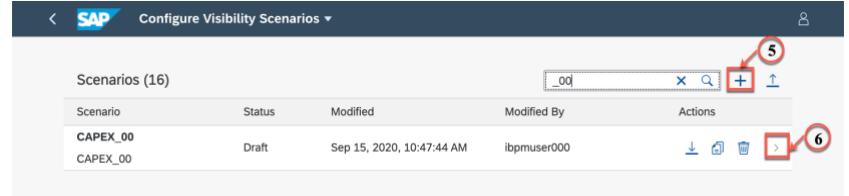
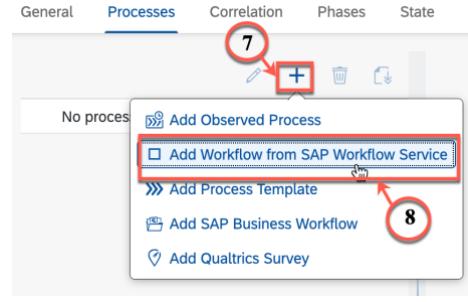
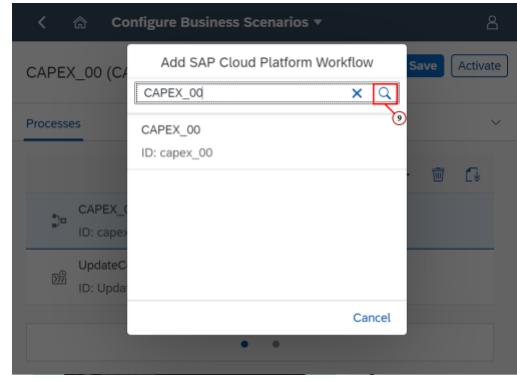
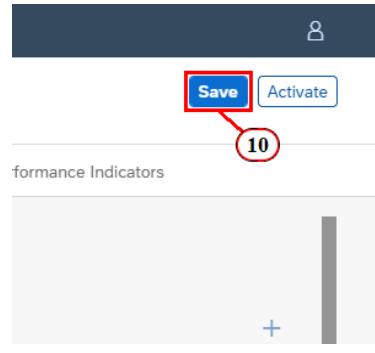


In this exercise, you will learn how to:

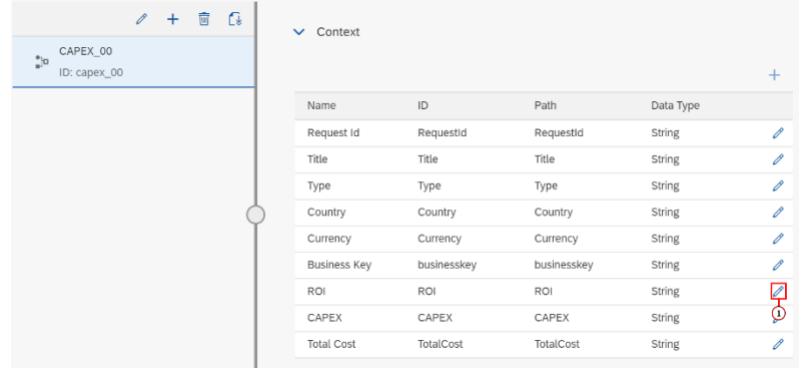
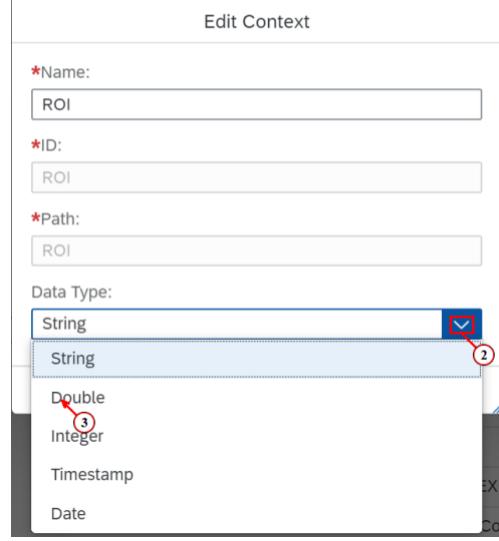
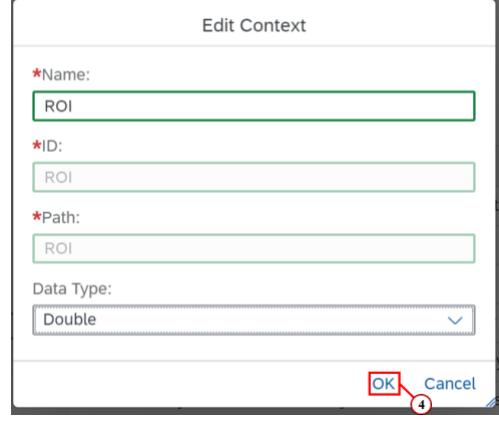
1. *Configure & Activate a visibility scenario.*
2. *Define correlation between process participants.*
3. *Configure phases and process performance indicators.*
4. *View events that have been acquired by process visibility service.*
5. *Process acquired events.*
6. *Access process workspace to track end to end process in real-time.*

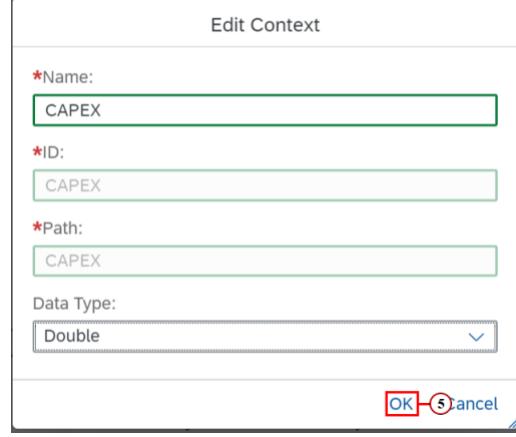
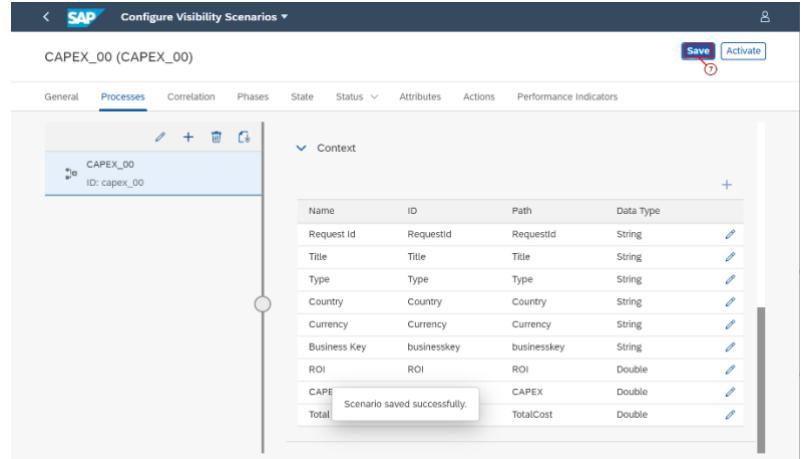
## CREATE A VISIBILITY SCENARIO

Explanation	Screenshot						
<p>If you have not executed <i>Exercise 1 on Workflow</i> and are coming directly to execute this exercise then you have to first import and deploy the workflow in your account.</p> <p>To do so, follow the Appendix   Import and Deploy Sample Workflow.</p>							
<ol style="list-style-type: none"> <li>1. Open <b>Workflow Management Launchpad</b> using your trial username and password.</li> <li>2. Click to open Create Visibility Scenarios.</li> </ol>							
<ol style="list-style-type: none"> <li>3. Click  to add a new visibility scenario</li> </ol>							
<p>Provide the following details:</p> <table border="1"> <tr> <td>Name</td><td><b>CAPEX_00</b></td></tr> <tr> <td>ID</td><td><b>CAPEX_00</b></td></tr> <tr> <td>Description</td><td>Capital Expenditure Business Scenario</td></tr> </table> <ol style="list-style-type: none"> <li>4. Click <b>Create</b>.</li> </ol>	Name	<b>CAPEX_00</b>	ID	<b>CAPEX_00</b>	Description	Capital Expenditure Business Scenario	
Name	<b>CAPEX_00</b>						
ID	<b>CAPEX_00</b>						
Description	Capital Expenditure Business Scenario						

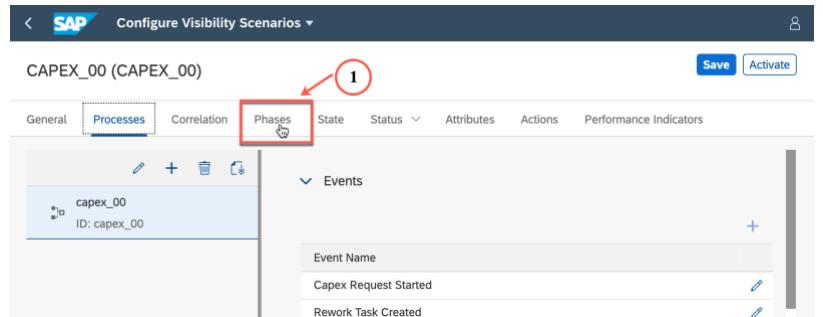
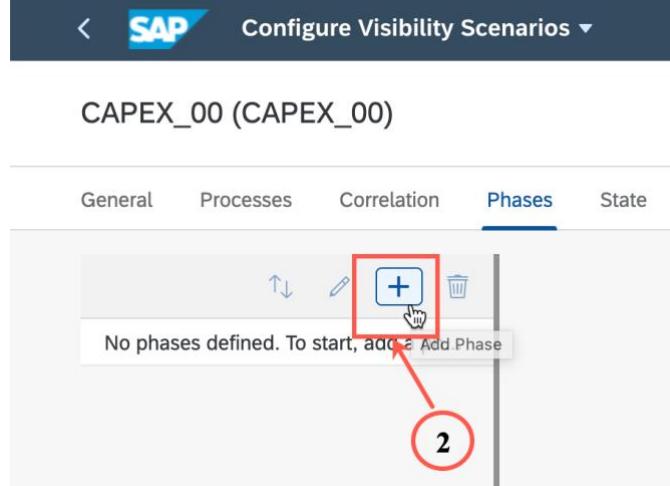
Explanation	Screenshot
<p>5. The new visibility scenario will be created.</p> <p>Note: The <b>Status</b> is in '<b>Draft</b>' status.</p> <p>Note: You can search for the visibility scenario you created using the search box.</p> <p>6. Click  to open the newly created visibility scenario</p>	
<p>7. To add workflow as a participant, click .</p> <p>8. Click <b>Add Workflow from SAP Workflow Service</b></p>	
<p>9. All Workflows that are deployed of the SAP Workflow service in your tenant will be shown. Type the name of the workflow you created and click  to search.</p>	
<p>10. Click .</p>	

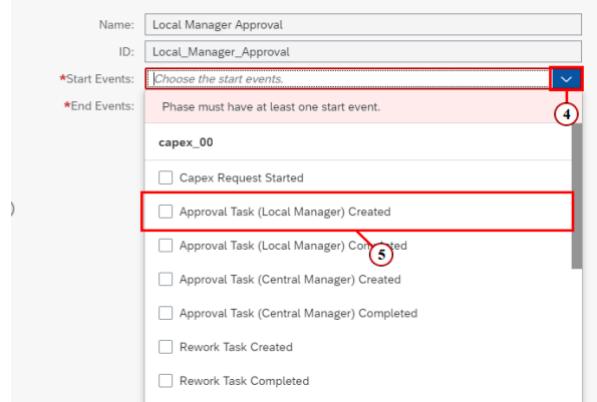
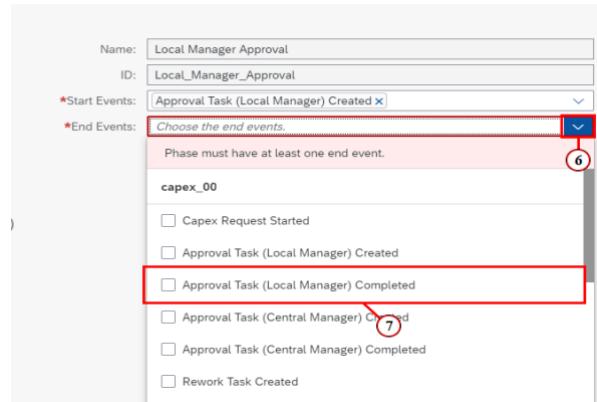
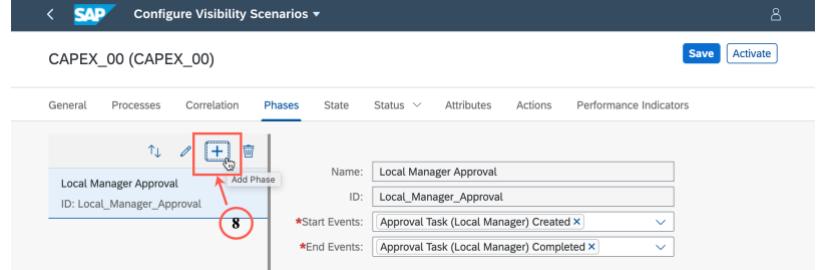
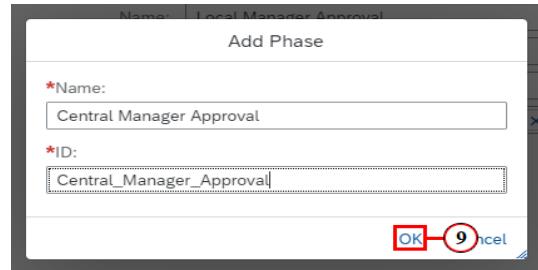
## CHANGE CONTEXT VARIABLE DATA TYPES

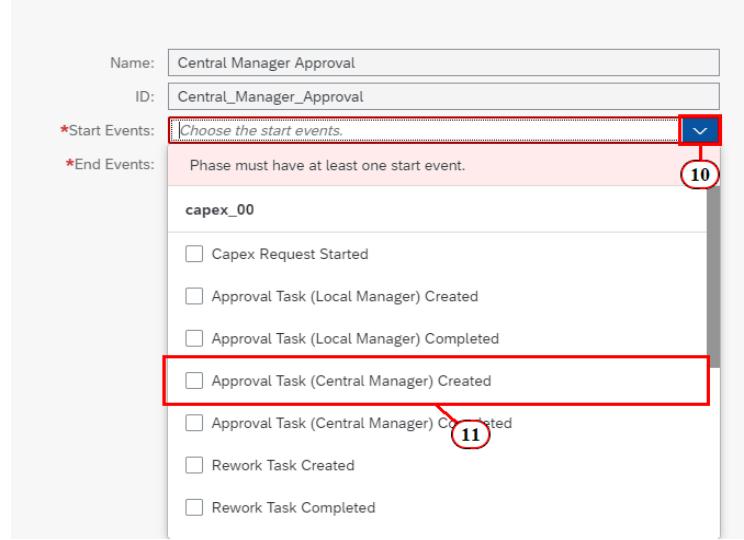
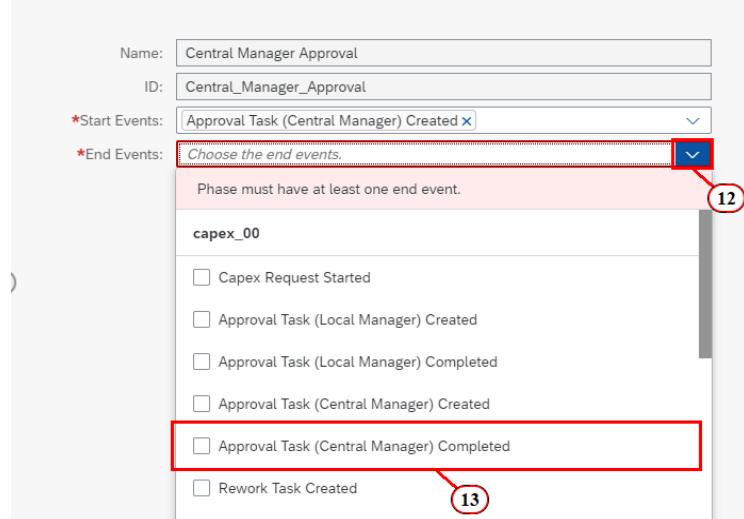
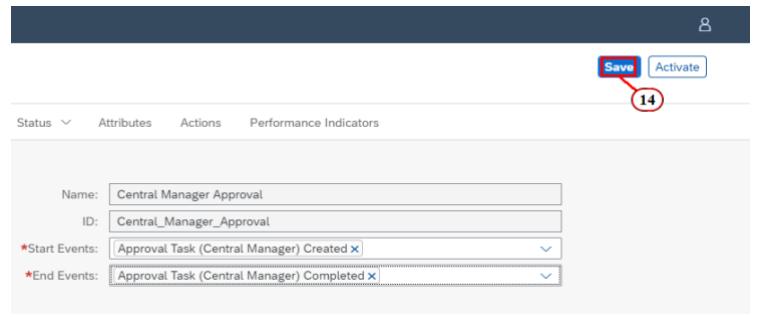
Explanation	Screenshot																																								
<p>By default, the context variables from the workflow will be of type 'String'. You will now change the data-type of few context attributes in order to use them in the performance indicators.</p> <p>11. Select the attribute '<b>ROI</b>' and click .</p>	 <table border="1"> <thead> <tr> <th>Name</th> <th>ID</th> <th>Path</th> <th>Data Type</th> </tr> </thead> <tbody> <tr> <td>Request Id</td> <td>Requestid</td> <td>Requestid</td> <td>String </td> </tr> <tr> <td>Title</td> <td>Title</td> <td>Title</td> <td>String </td> </tr> <tr> <td>Type</td> <td>Type</td> <td>Type</td> <td>String </td> </tr> <tr> <td>Country</td> <td>Country</td> <td>Country</td> <td>String </td> </tr> <tr> <td>Currency</td> <td>Currency</td> <td>Currency</td> <td>String </td> </tr> <tr> <td>Business Key</td> <td>businesskey</td> <td>businesskey</td> <td>String </td> </tr> <tr> <td>ROI</td> <td>ROI</td> <td>ROI</td> <td>String </td> </tr> <tr> <td>CAPEX</td> <td>CAPEX</td> <td>CAPEX</td> <td>String </td> </tr> <tr> <td>Total Cost</td> <td>TotalCost</td> <td>TotalCost</td> <td>String </td> </tr> </tbody> </table>	Name	ID	Path	Data Type	Request Id	Requestid	Requestid	String 	Title	Title	Title	String 	Type	Type	Type	String 	Country	Country	Country	String 	Currency	Currency	Currency	String 	Business Key	businesskey	businesskey	String 	ROI	ROI	ROI	String 	CAPEX	CAPEX	CAPEX	String 	Total Cost	TotalCost	TotalCost	String 
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CAPEX	CAPEX	CAPEX	String 																																						
Total Cost	TotalCost	TotalCost	String 																																						
<p>12. Click  drop down for the <b>Data Type</b>.</p> <p>13. Select <b>Double</b> from the drop down.</p> <p>14. Click <b>OK</b>.</p>	 <div> <p><b>Edit Context</b></p> <p>*Name: ROI</p> <p>*ID: ROI</p> <p>*Path: ROI</p> <p>Data Type:</p> <ul style="list-style-type: none"> <li>String </li> <li>String </li> <li>Double </li> <li>Integer </li> <li>Timestamp</li> <li>Date</li> </ul> </div>																																								
	 <div> <p><b>Edit Context</b></p> <p>*Name: ROI</p> <p>*ID: ROI</p> <p>*Path: ROI</p> <p>Data Type: Double</p> <p><b>OK</b> <b>Cancel</b> </p> </div>																																								

Explanation	Screenshot																																								
<p>15. Similarly, select the context variable <b>CAPEX</b> and set the <b>Data Type</b> to <b>Double</b>.</p>	 <p>Edit Context</p> <p>*Name: CAPEX</p> <p>*ID: CAPEX</p> <p>*Path: CAPEX</p> <p>Data Type: Double</p> <p>OK Cancel</p>																																								
<p>16. Finally select the context variable with name <b>Total Cost</b> and set the <b>Data Type</b> to <b>Double</b>.</p>	 <p>Edit Context</p> <p>*Name: Total Cost</p> <p>*ID: TotalCost</p> <p>*Path: TotalCost</p> <p>Data Type: Double</p> <p>OK Cancel</p>																																								
<p>17. Click <b>Save</b></p>	 <p>CAPEX_00 (CAPEX_00)</p> <p>Save Activate</p> <table border="1"> <thead> <tr> <th>Name</th> <th>ID</th> <th>Path</th> <th>Data Type</th> </tr> </thead> <tbody> <tr> <td>Request Id</td> <td>Requestid</td> <td>Requestid</td> <td>String</td> </tr> <tr> <td>Title</td> <td>Title</td> <td>Title</td> <td>String</td> </tr> <tr> <td>Type</td> <td>Type</td> <td>Type</td> <td>String</td> </tr> <tr> <td>Country</td> <td>Country</td> <td>Country</td> <td>String</td> </tr> <tr> <td>Currency</td> <td>Currency</td> <td>Currency</td> <td>String</td> </tr> <tr> <td>Business Key</td> <td>businesskey</td> <td>businesskey</td> <td>String</td> </tr> <tr> <td>ROI</td> <td>ROI</td> <td>ROI</td> <td>Double</td> </tr> <tr> <td>CAPE</td> <td>CAPE</td> <td>CAPEX</td> <td>Double</td> </tr> <tr> <td>Total</td> <td>Total</td> <td>TotalCost</td> <td>Double</td> </tr> </tbody> </table> <p>Scenario saved successfully.</p>	Name	ID	Path	Data Type	Request Id	Requestid	Requestid	String	Title	Title	Title	String	Type	Type	Type	String	Country	Country	Country	String	Currency	Currency	Currency	String	Business Key	businesskey	businesskey	String	ROI	ROI	ROI	Double	CAPE	CAPE	CAPEX	Double	Total	Total	TotalCost	Double
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ROI	ROI	ROI	Double																																						
CAPE	CAPE	CAPEX	Double																																						
Total	Total	TotalCost	Double																																						

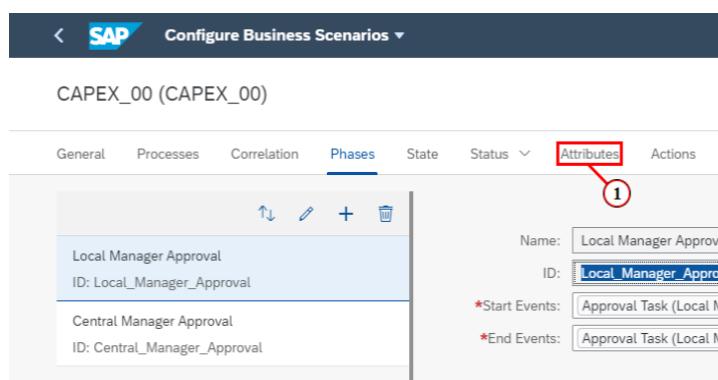
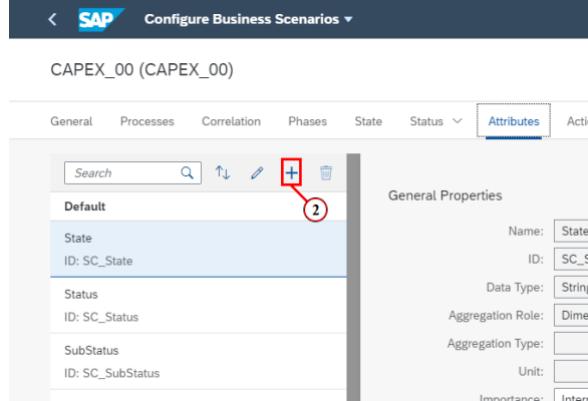
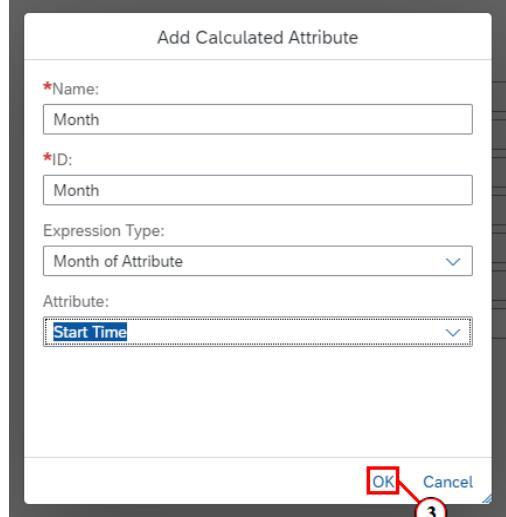
## ENHANCE VISIBILITY SCENARIO WITH PHASES

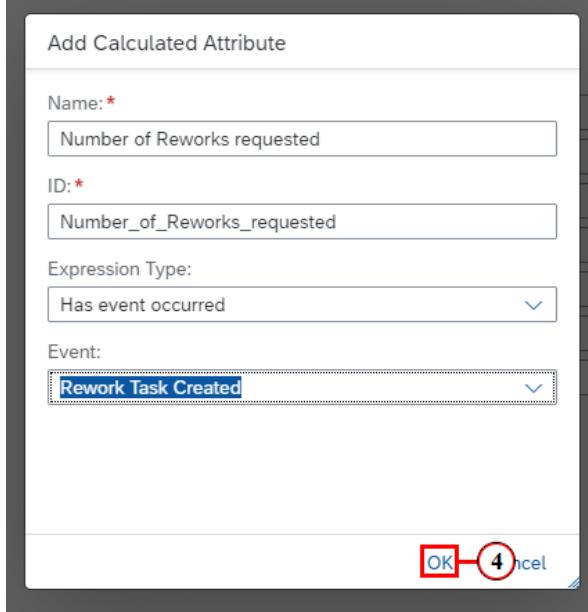
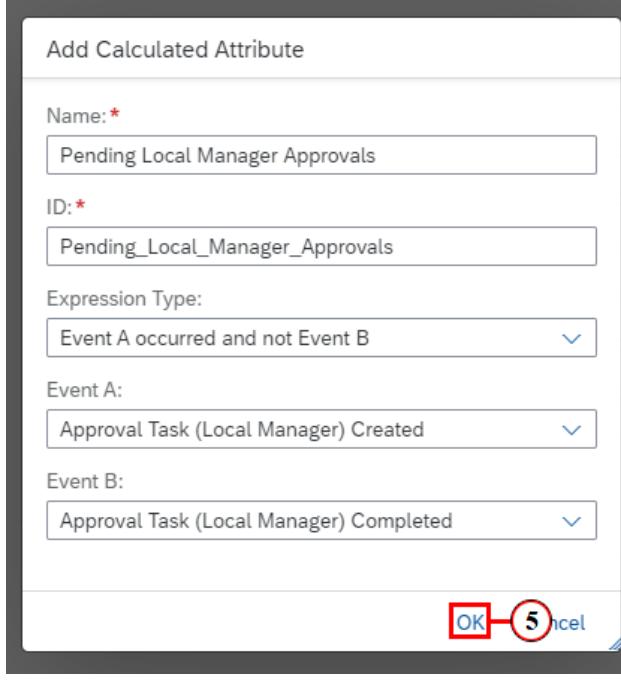
Explanation	Screenshot				
<p>You can define <b>Phases</b> for your Visibility Scenario. <b>Phases</b> usually are a business-friendly aggregated view of activities and steps in the process. An event(s) marks the start of the phase and a set of subsequent events can mark the end of it.</p> <p>18. Click the <b>Phases</b> tab.</p>	 <p>The screenshot shows the SAP interface for 'Configure Visibility Scenarios'. The top navigation bar has tabs: General, Processes, Correlation, and Phases (which is highlighted with a red box and circled with a red arrow). Below the tabs, there's a table with one row: 'capex_00' (ID: capex_00). To the right of the table is a section titled 'Events' with two entries: 'Event Name' (Capex Request Started) and another entry partially visible ('Rework Task Created'). At the bottom right of the screen are 'Save' and 'Activate' buttons.</p>				
<p>19. Click  to add a new phase and provide the following information:</p> <table border="1"> <tr> <td>Name</td> <td>Local Manager Approval</td> </tr> <tr> <td>ID</td> <td>Local_Manager_Approval</td> </tr> </table> <p>20. Click <b>OK</b>.</p>	Name	Local Manager Approval	ID	Local_Manager_Approval	 <p>The screenshot shows the 'Configure Visibility Scenarios' screen with the 'Phases' tab selected. A message at the top says 'No phases defined. To start, add a phase.' A red box highlights the '+' button, which is circled with a red arrow and numbered '2'. Below this is a modal dialog titled 'Add Phase'.</p> <div> <p>Add Phase</p> <p>*Name: Local Manager Approval</p> <p>*ID: Local_Manager_Approval</p> <p><b>OK</b> </p> </div>
Name	Local Manager Approval				
ID	Local_Manager_Approval				

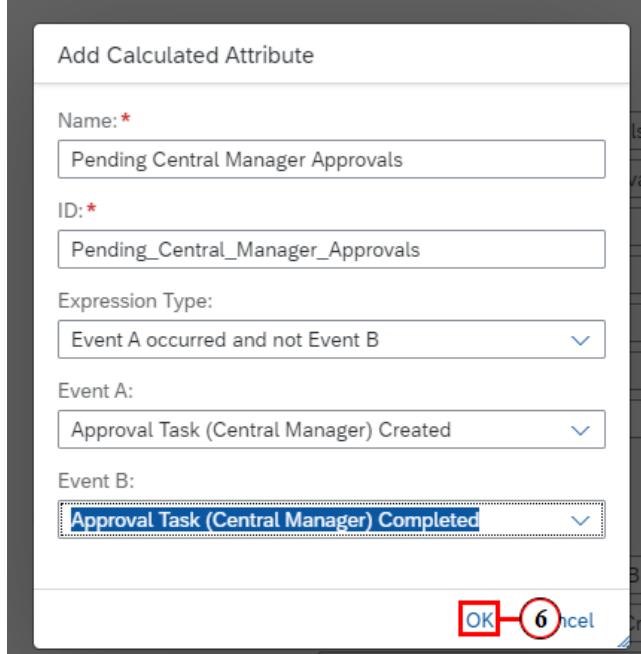
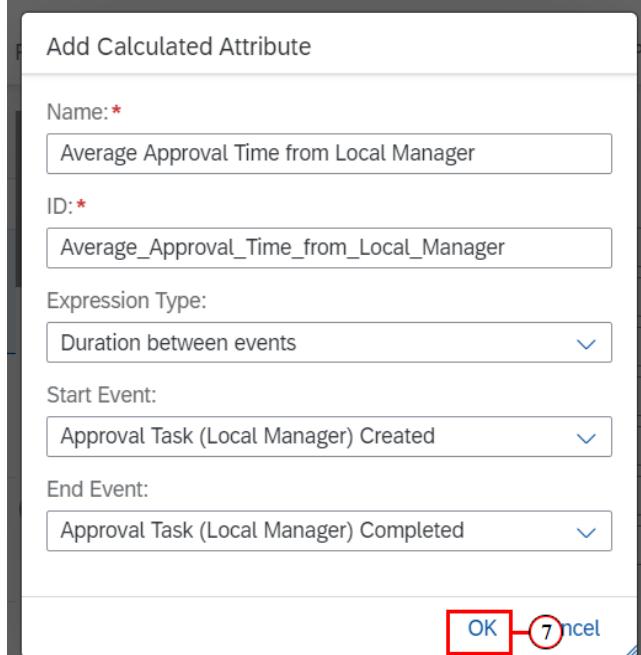
Explanation	Screenshot				
<p>21. Click the dropdown button  for <b>Start Events</b>.</p> <p>22. Click Approval Task (Local Manager) Created.</p>					
<p>23. Click the dropdown button  for <b>End Events</b>.</p> <p>24. Click Approval Task (Local Manager) Completed.</p>					
<p>25. Click  to create another phase</p>					
<p>Provide the following information</p> <table border="1"> <tr> <td>Name</td> <td>Central Manager Approval</td> </tr> <tr> <td>ID</td> <td>Central_Manager_Approval</td> </tr> </table> <p>26. Click .</p>	Name	Central Manager Approval	ID	Central_Manager_Approval	
Name	Central Manager Approval				
ID	Central_Manager_Approval				

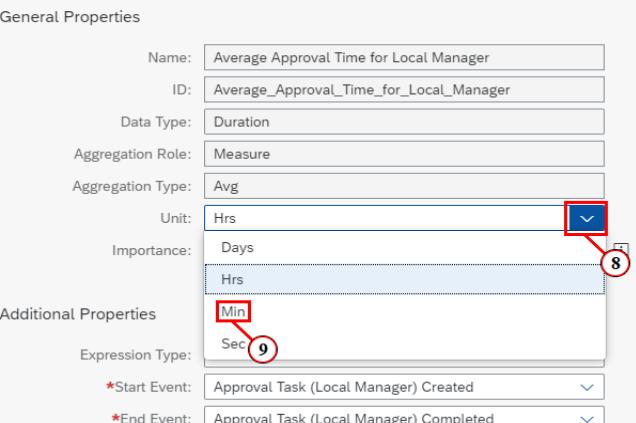
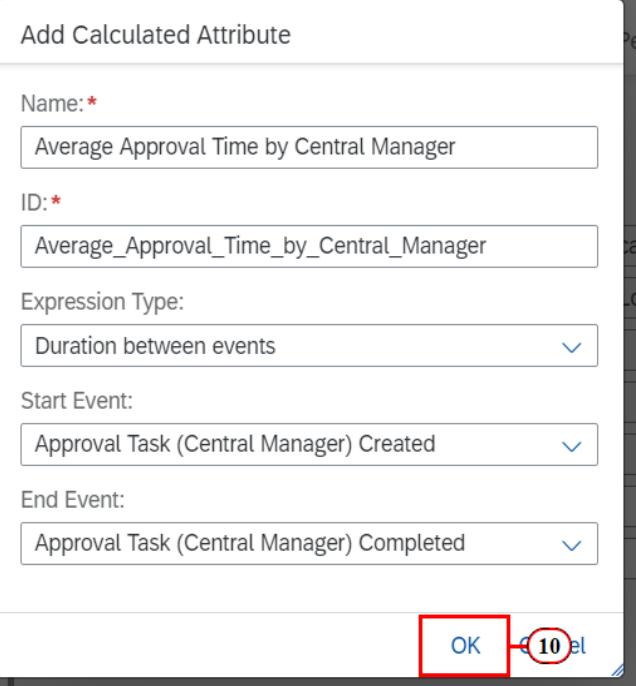
Explanation	Screenshot
<p>27. Click the dropdown button  for <b>Start Events</b>.</p> <p>28. Click Approval Task (Central Manager) Created.</p>	 <p>Name: Central Manager Approval ID: Central_Manager_Approval *Start Events: Choose the start events. *End Events: Phase must have at least one start event. capex_00 <input type="checkbox"/> Capex Request Started <input type="checkbox"/> Approval Task (Local Manager) Created <input type="checkbox"/> Approval Task (Local Manager) Completed <input checked="" type="checkbox"/> Approval Task (Central Manager) Created <span style="border: 2px solid red; padding: 2px;">10</span> <input type="checkbox"/> Approval Task (Central Manager) Completed <span style="border: 2px solid red; padding: 2px;">11</span> <input type="checkbox"/> Rework Task Created <input type="checkbox"/> Rework Task Completed</p>
<p>29. Click the dropdown button  for <b>End Events</b>.</p> <p>30. Click Approval Task (Central Manager) Completed.</p>	 <p>Name: Central Manager Approval ID: Central_Manager_Approval *Start Events: Approval Task (Central Manager) Created <span style="border: 2px solid red; padding: 2px;">10</span> *End Events: Choose the end events. Phase must have at least one end event. capex_00 <input type="checkbox"/> Capex Request Started <input type="checkbox"/> Approval Task (Local Manager) Created <input type="checkbox"/> Approval Task (Local Manager) Completed <input type="checkbox"/> Approval Task (Central Manager) Created <input checked="" type="checkbox"/> Approval Task (Central Manager) Completed <span style="border: 2px solid red; padding: 2px;">12</span> <input type="checkbox"/> Rework Task Created <span style="border: 2px solid red; padding: 2px;">13</span> <input type="checkbox"/> Rework Task Completed</p>
<p>31. Click Save .</p>	 <p>Status  Attributes Actions Performance Indicators</p> <p>Name: Central Manager Approval ID: Central_Manager_Approval *Start Events: Approval Task (Central Manager) Created <span style="border: 2px solid red; padding: 2px;">10</span> *End Events: Approval Task (Central Manager) Completed <span style="border: 2px solid red; padding: 2px;">11</span></p>

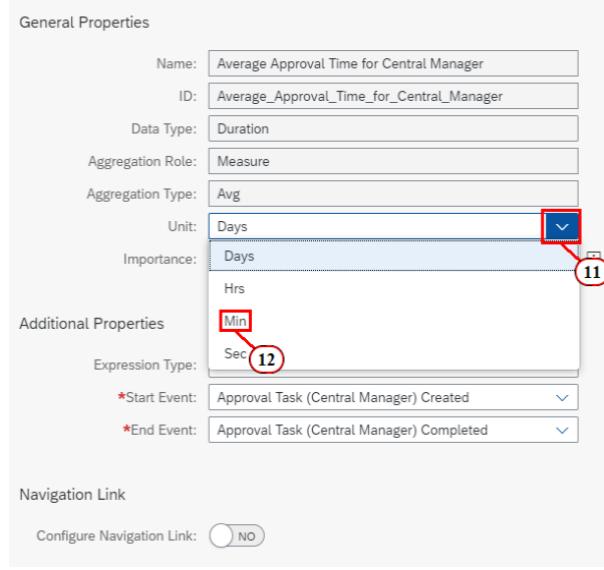
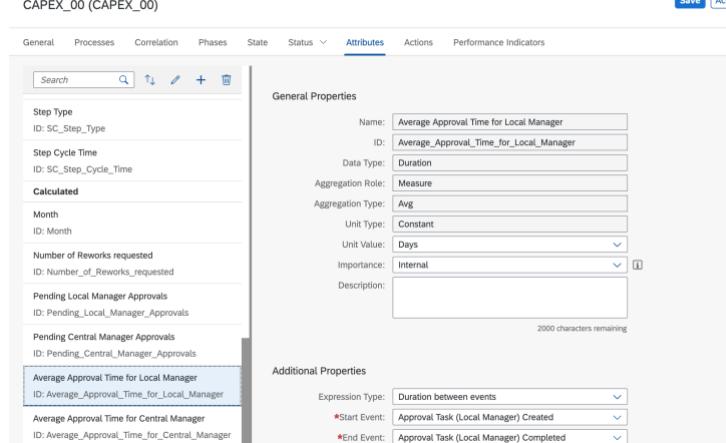
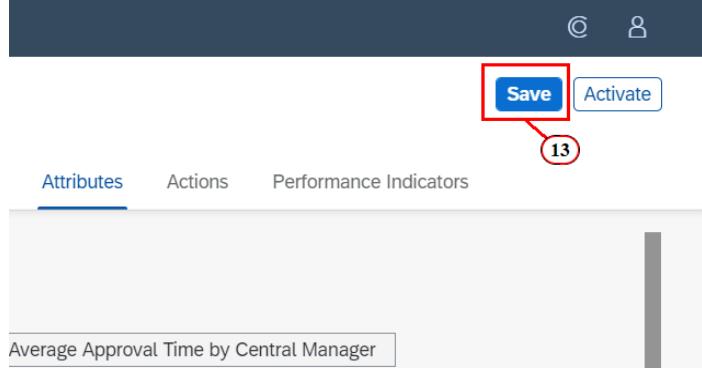
## CREATE CALCULATED ATTRIBUTES

Explanation	Screenshot
<p>A visibility scenario has 4 types of attributes (a) Default, (b) Context, (c) Step and (d) Calculated.</p> <p>In this section you will create calculated attributes based on aggregation and expression types. These calculated attributes will act as a <i>Measure</i> while configuring <i>Process Performance Indicators</i>.</p> <p>32. Click Attributes</p>	
<p>33. Click  to add new attributes</p> <p>Provide the following details:</p> <p><b>Name:</b> Month</p> <p><b>ID:</b> &lt;this will automatically be created as Month&gt;</p> <p><b>Expression Type:</b> Month of Attribute</p> <p><b>Attribute:</b> Start Time</p> <p>34. Click </p>	 

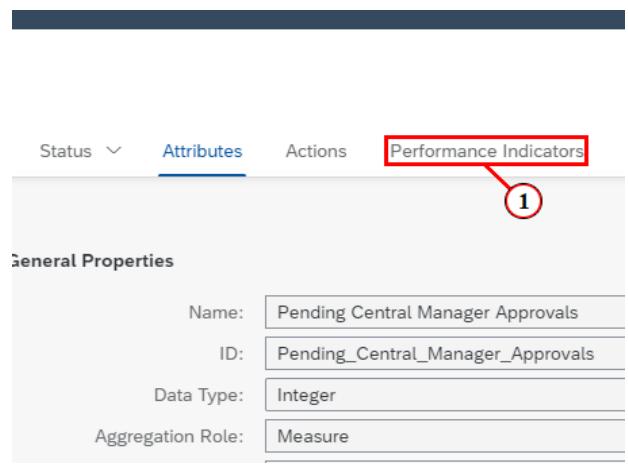
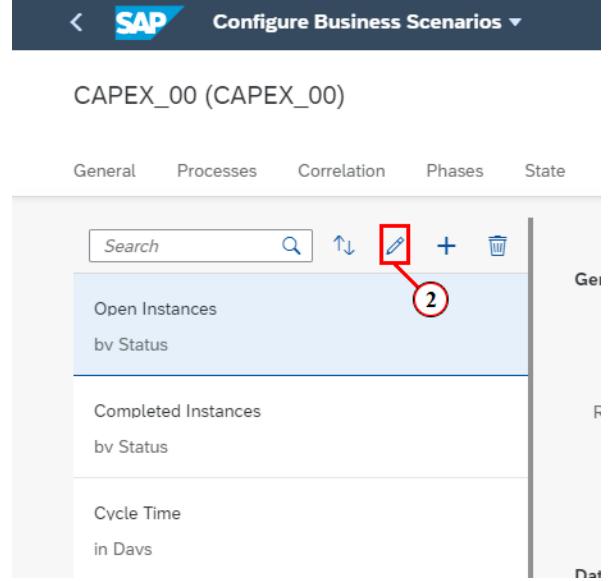
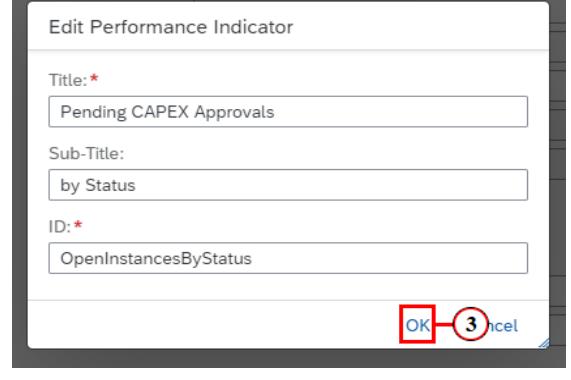
Explanation	Screenshot
<p>35. Repeat the steps and create 2<sup>nd</sup> attribute with following details:</p> <p><b>Name:</b> Number of Reworks requested</p> <p><b>ID:</b> &lt;this will automatically be created as Number_of_Reworks_requested&gt;</p> <p><b>Expression Type:</b> Has event occurred</p> <p><b>Event:</b> Rework Task Created</p> <p>36. Click <b>OK</b>.</p>	
<p>37. Add 3<sup>rd</sup> attribute with the following details:</p> <p><b>Name:</b> Pending Local Manager Approvals</p> <p><b>ID:</b> &lt;this will automatically be created as Pending_Local_Manager_Approvals&gt;</p> <p><b>Expression Type:</b> Event A occurred and not Event B</p> <p><b>Event A:</b> Approval Task (Local Manager) Created</p> <p><b>Event B:</b> Approval Task (Local Manager) Completed</p> <p>38. Click <b>OK</b>.</p>	

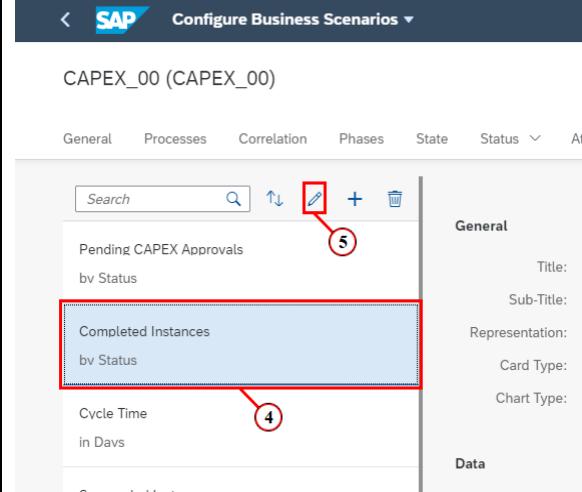
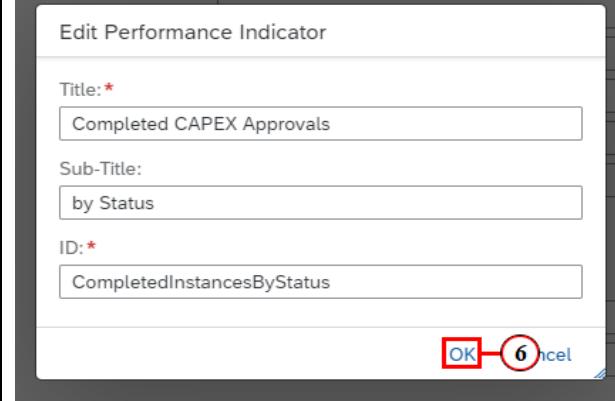
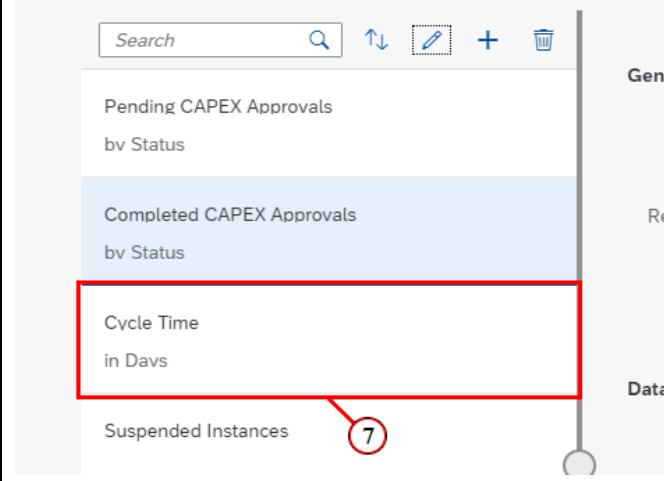
Explanation	Screenshot
<p>39. Add 4<sup>th</sup> attribute with following details:</p> <p><b>Name:</b> Pending Central Manager Approvals</p> <p><b>ID:</b> &lt;this will automatically be created as Pending_Central_Manager_Approvals&gt;</p> <p><b>Expression Type:</b> Event A occurred and not Event B</p> <p><b>Event A:</b> Approval Task (Central Manager) Created</p> <p><b>Event B:</b> Approval Task (Central Manager) Completed</p> <p>40. Click <b>OK</b>.</p>	
<p>41. Add 5<sup>th</sup> attribute with following details:</p> <p><b>Name:</b> Average Approval Time from Local Manager</p> <p><b>ID:</b> &lt;this will automatically be created as Average_Approval_Time_from_Local_Manager&gt;</p> <p><b>Expression Type:</b> Duration between events</p> <p><b>Event A:</b> Approval Task (Local Manager) Created</p> <p><b>Event B:</b> Approval Task (Local Manager) Completed</p> <p>42. Click <b>OK</b>.</p>	

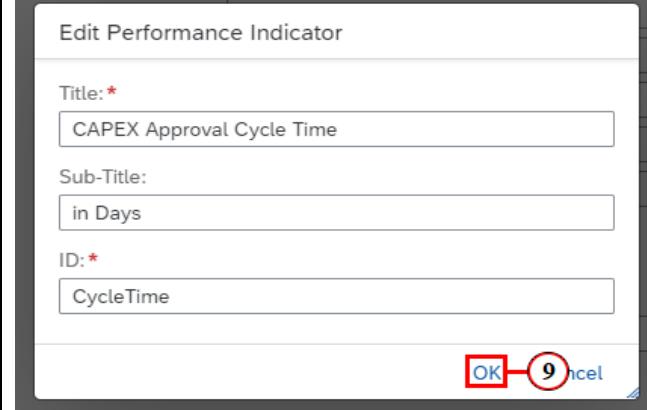
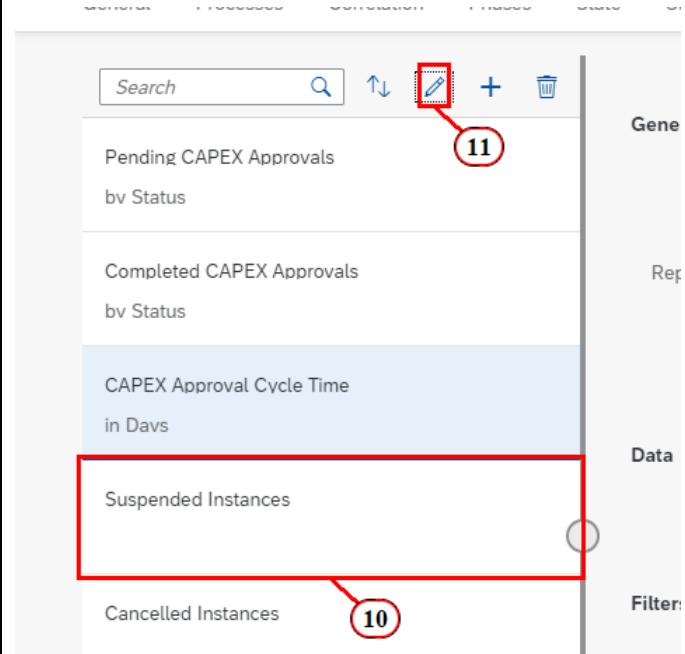
Explanation	Screenshot
<p>By default, the <b>Unit</b> is set to <b>Days</b>. Now, change it to hours or minutes to have a quicker calculation in this exercise.</p> <p>43. Click  to open the <b>Unit</b> dropdown.</p> <p>44. Click <b>Min</b>.</p>	 <p>The screenshot shows the 'General Properties' dialog. In the 'Unit' dropdown, 'Days' is currently selected. A red box labeled '8' highlights the dropdown arrow. Below it, the 'Min' option is highlighted with a red box and labeled '9'. Other options like 'Hrs' and 'Sec' are also visible.</p>
<p>45. Add 6<sup>th</sup> attribute with following details:</p> <p><b>Name:</b> Average Approval Time from Central Manager</p> <p><b>ID:</b> &lt;this will automatically be created as Average_Approval_Time_from_Central_Manager&gt;</p> <p><b>Expression Type:</b> Duration between events</p> <p><b>Event A:</b> Approval Task (Central Manager) Created</p> <p><b>Event B:</b> Approval Task (Central Manager) Completed</p> <p>46. Click .</p>	 <p>The screenshot shows the 'Add Calculated Attribute' dialog. It contains fields for Name, ID, Expression Type, Start Event, and End Event. The 'OK' button at the bottom right is highlighted with a red box and labeled '10'.</p>

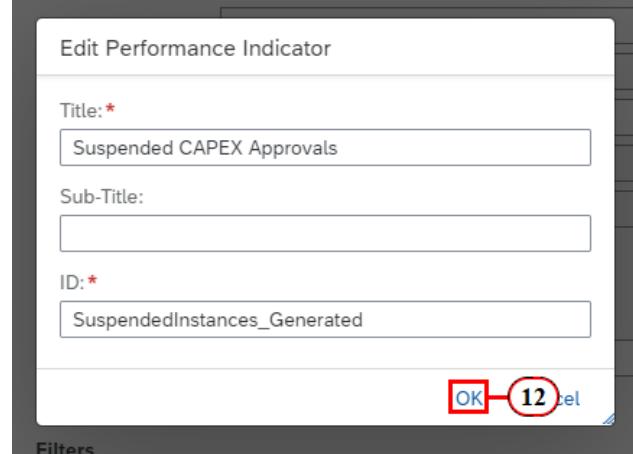
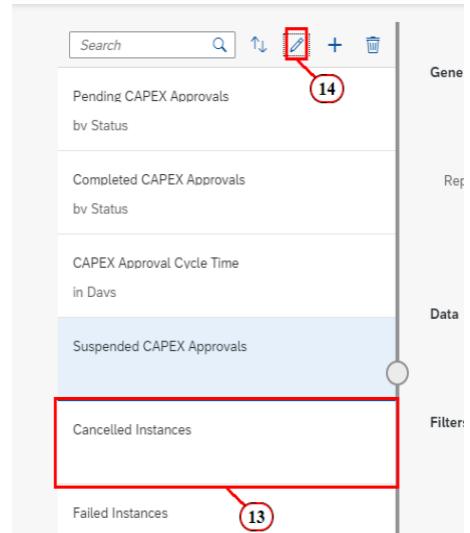
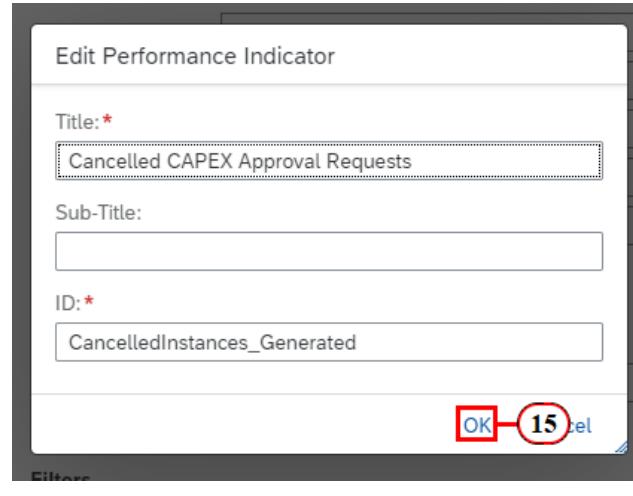
Explanation	Screenshot
<p>47. By default, the <b>Unit</b> is set to <b>Days</b>. Change it to hours or minutes to have a quicker calculation in this exercise.</p> <p>48. Click  to open the <b>Unit</b> dropdown.</p> <p>49. Click <b>Min</b>.</p>	
<p>You have now created all the attributes that will be used to create process performance indicators for the capital expenditure approval process.</p>	
<p>50. Click .</p>	

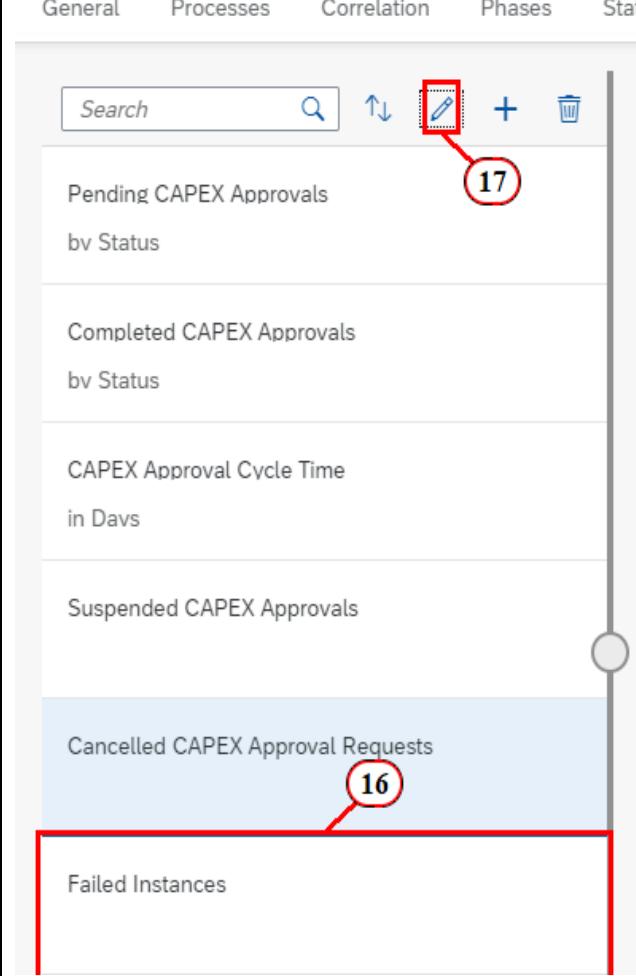
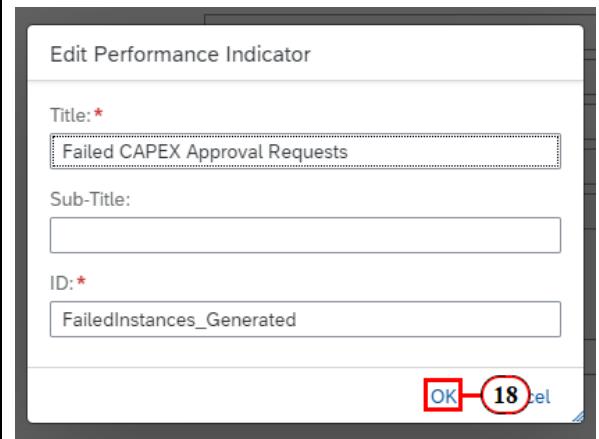
## CREATE PROCESS PERFORMANCE INDICATORS

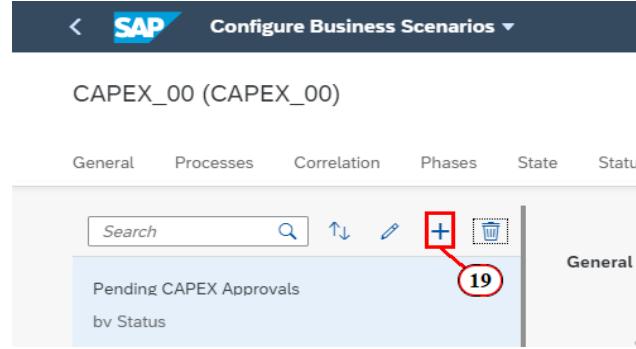
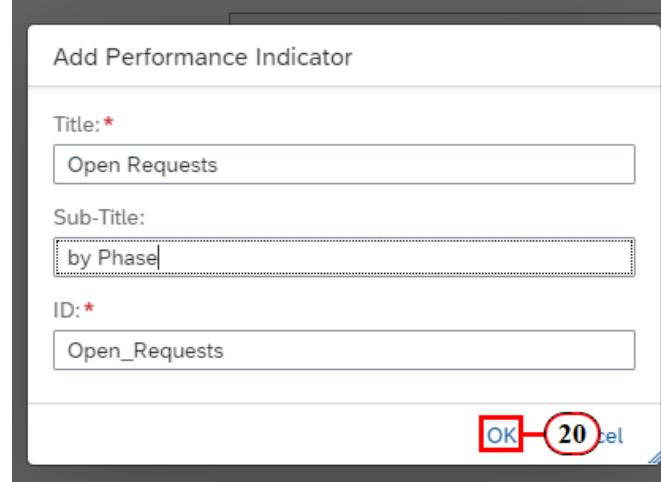
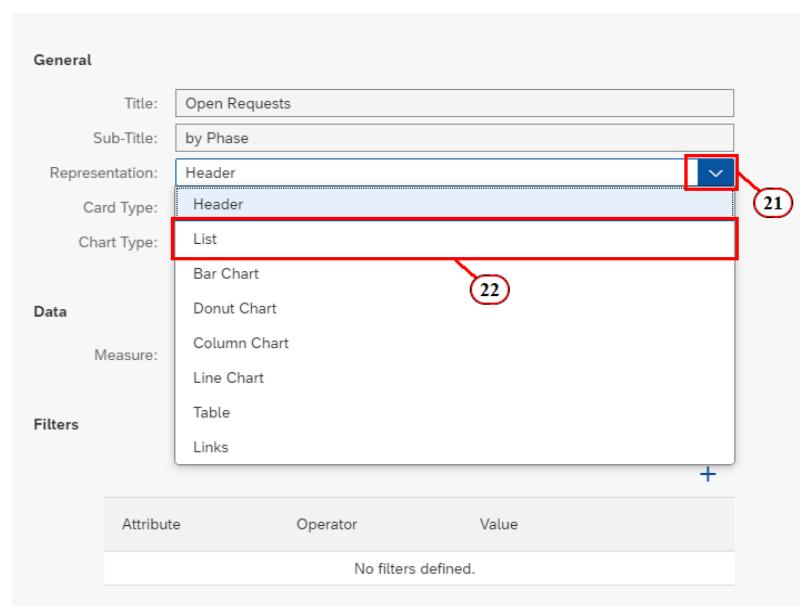
Explanation	Screenshot
<p><b>Performance Indicator</b> represent aggregated information of a measure, grouped by dimensions and applied filters. A group of performance indicators gives the business users a holistic view of the process and enables them to understand process performance at a glance.</p> <p>Commonly used process performance indicators are created by-default when you create the visibility scenario.</p> <p>51. Click <b>Performance Indicators</b> tab</p>	 <p>The screenshot shows the SAP Fiori interface with the 'Performance Indicators' tab highlighted in red and circled with a red number '1'. Below it, the 'General Properties' section displays the following details:</p> <ul style="list-style-type: none"> <li>Name: Pending Central Manager Approvals</li> <li>ID: Pending_Central_Manager_Approvals</li> <li>Data Type: Integer</li> <li>Aggregation Role: Measure</li> </ul>
<p>You will now rename the default process performance indicators.</p> <p>52. Select <b>Open Instances</b> and click  to rename.</p> <p>53. In the pop-up, change the <b>Title</b> as <b>Pending CAPEX Approvals</b>.</p>	 <p>The screenshot shows the 'Configure Business Scenarios' screen with the 'Open Instances' item selected. A red box highlights the edit icon next to the item, and a red circle with the number '2' is placed over it.</p>
<p>54. Click .</p>	 <p>The screenshot shows the 'Edit Performance Indicator' dialog box. It contains the following fields:</p> <ul style="list-style-type: none"> <li>Title: * Pending CAPEX Approvals</li> <li>Sub-Title: by Status</li> <li>ID: * OpenInstancesByStatus</li> </ul> <p>A red box highlights the 'OK' button, and a red circle with the number '3' is placed over it.</p>

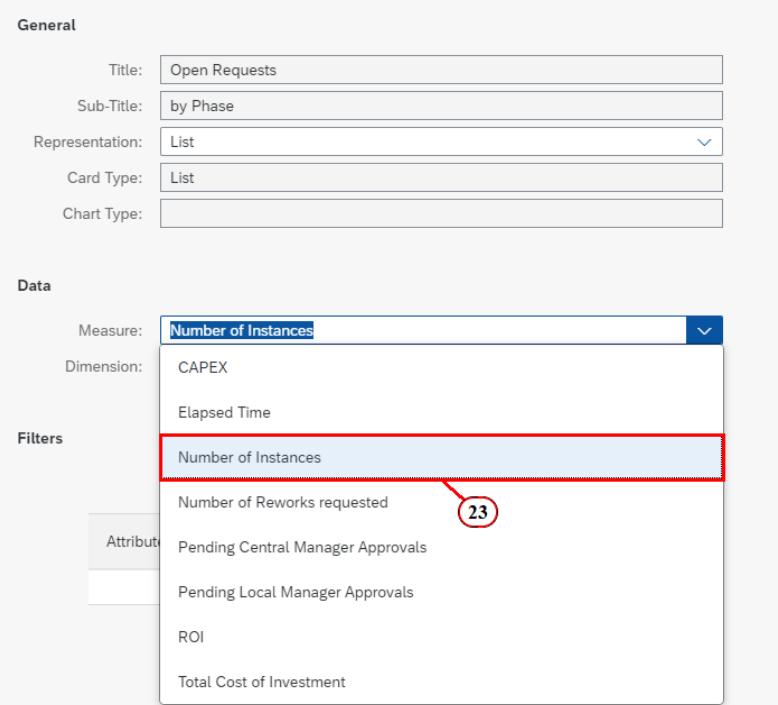
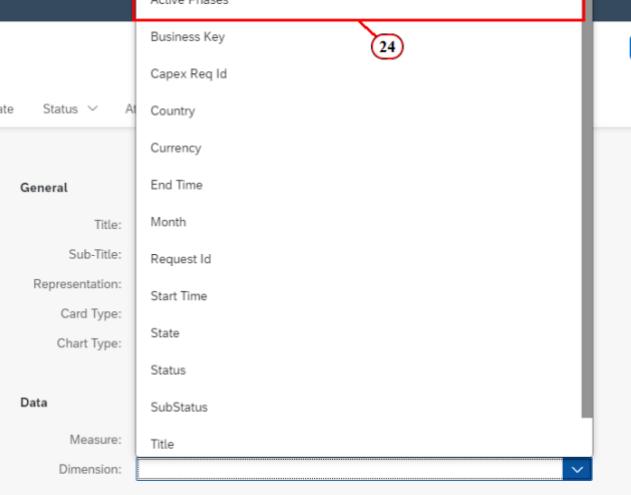
Explanation	Screenshot
<p>55. Now, select the 2<sup>nd</sup> indicator named <b>Completed Instances</b>.</p> <p>56. Click .</p>	 <p>The screenshot shows the SAP Configure Business Scenarios interface for scenario CAPEX_00. In the central panel, under the 'Data' section, there is a list of indicators. The second item in the list, 'Completed Instances by Status', is highlighted with a red box and a red arrow pointing to it. To the right of the list, there is a 'General' configuration area with fields for Title, Sub-Title, Representation, Card Type, and Chart Type. At the top of the screen, there are several tabs: General, Processes, Correlation, Phases, State, Status, and At.</p>
<p>57. In the pop-up, change the <b>Title</b> as <b>Completed CAPEX Approvals</b>.</p> <p>58. Click .</p>	 <p>The screenshot shows the 'Edit Performance Indicator' dialog box. It contains fields for Title, Sub-Title, and ID. The 'Title' field has been changed to 'Completed CAPEX Approvals'. The 'ID' field has been changed to 'CompletedInstancesByStatus'. At the bottom right of the dialog box, there is an 'OK' button with a red box around it and a red arrow pointing to it, indicating the next step.</p>
<p>59. Now, select the 3<sup>rd</sup> indicator named <b>Cycle Time in Days</b>.</p>	 <p>The screenshot shows the SAP Configure Business Scenarios interface again. This time, the third indicator in the list, 'Cycle Time in Days', is highlighted with a red box and a red arrow pointing to it. The interface includes tabs for General, Processes, Correlation, Phases, State, Status, and At, along with a search bar and other standard UI elements.</p>

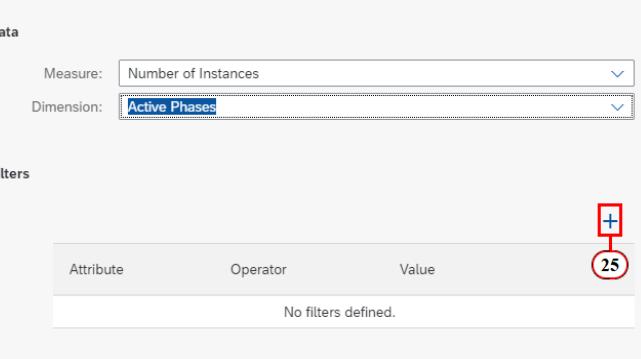
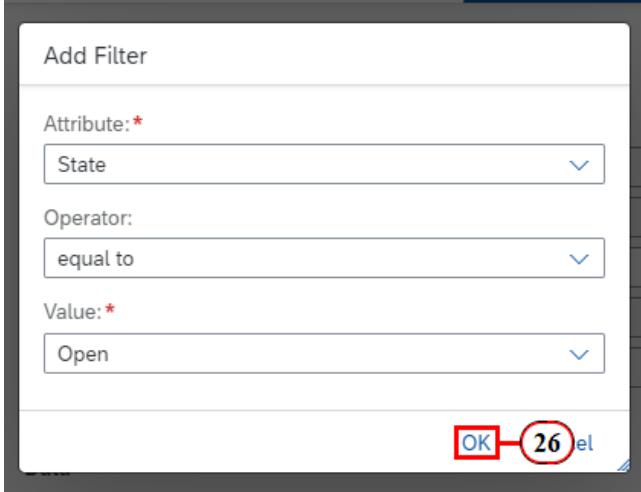
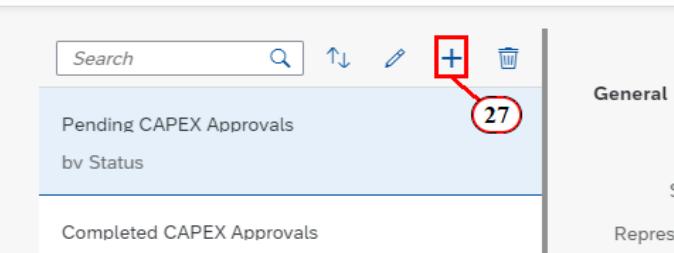
Explanation	Screenshot
<p>60. Click .</p>	 <p>CAPEX_00 (CAPEX_00)</p> <p>General Processes Correlation Phases State</p> <p>Pending CAPEX Approvals bv Status</p>
<p>61. In the pop-up, change the <b>Title</b> as <b>CAPEX Approval Cycle Time</b>.</p> <p>62. Click .</p>	 <p>Edit Performance Indicator</p> <p>Title: * CAPEX Approval Cycle Time</p> <p>Sub-Title: in Days</p> <p>ID: * CycleTime</p> <p>OK Cancel</p>
<p>63. Now, select the 4<sup>th</sup> indicator named <b>Suspended Instances</b>.</p> <p>64. Click .</p>	 <p>Pending CAPEX Approvals bv Status</p> <p>Completed CAPEX Approvals bv Status</p> <p>CAPEX Approval Cycle Time in Days</p> <p>Suspended Instances</p> <p>Cancelled Instances</p>

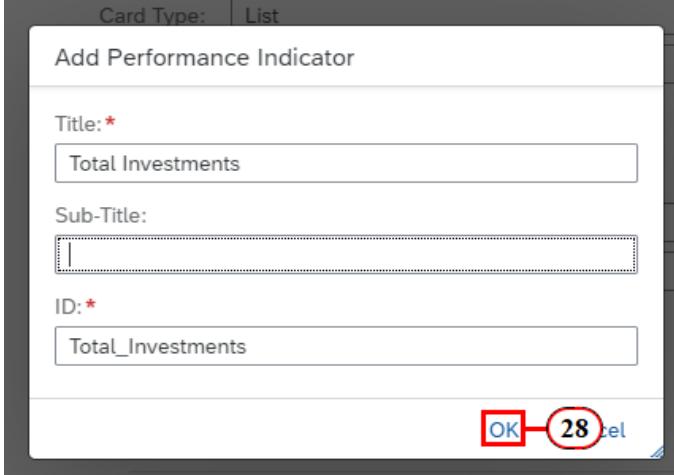
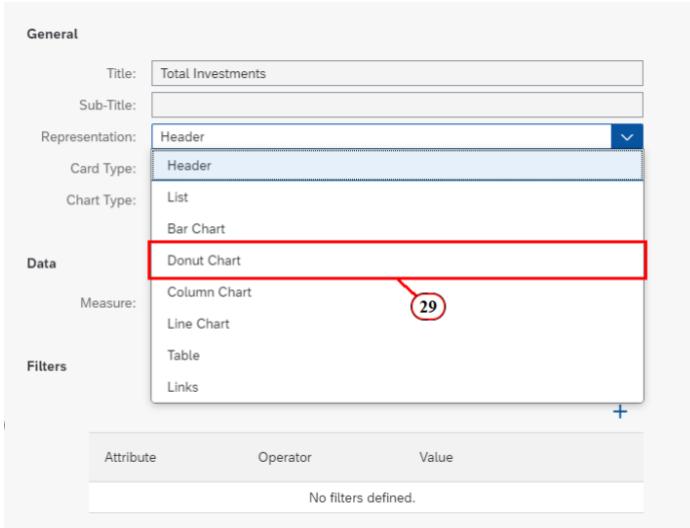
Explanation	Screenshot
<p>65. In the pop-up, change the <b>Title</b> as <b>Suspended CAPEX Approvals</b>.</p> <p>66. Click <b>OK</b>.</p>	
<p>67. Now, select the 5<sup>th</sup> default indicator named <b>Cancelled Instances</b>.</p> <p>68. Click .</p>	
<p>69. In the pop-up, change the Title as <b>Cancelled CAPEX Approval Requests</b>.</p> <p>70. Click <b>OK</b>.</p>	

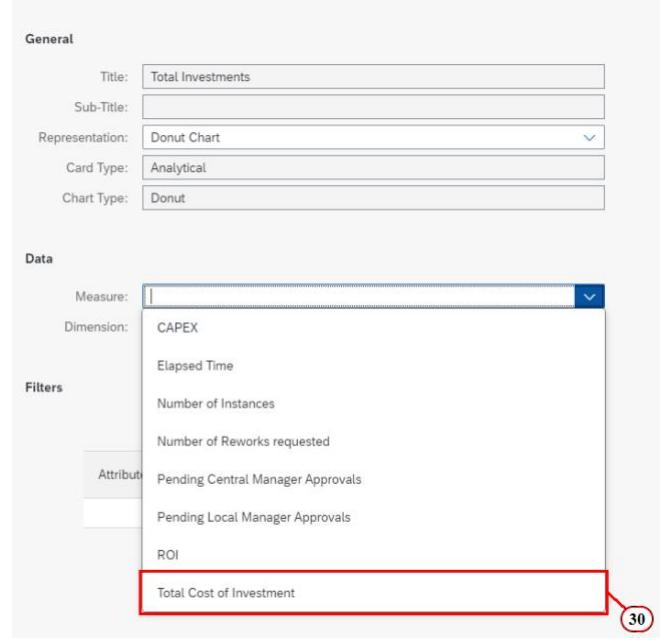
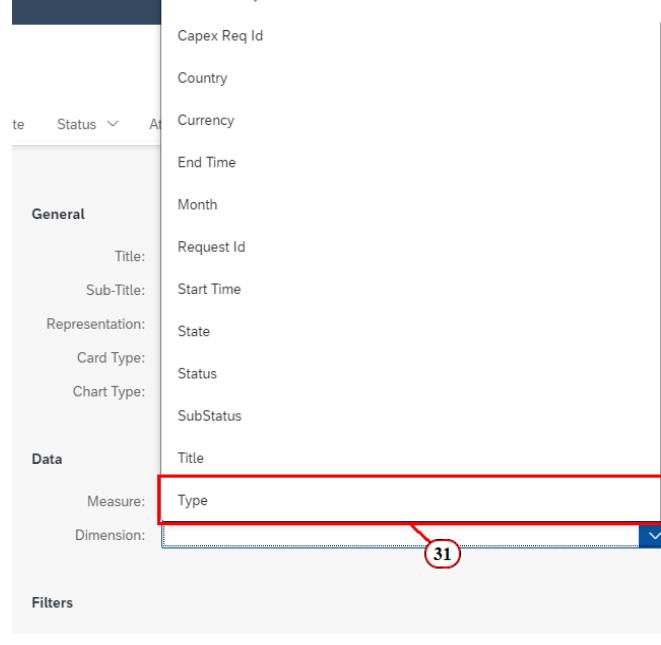
Explanation	Screenshot
<p>71. Now, select the 6<sup>th</sup> and final default indicator named <b>Failed Instances</b>.</p> <p>72. Click .</p>	 <p>Pending CAPEX Approvals bv Status</p> <p>Completed CAPEX Approvals bv Status</p> <p>CAPEX Approval Cycle Time in Davs</p> <p>Suspended CAPEX Approvals</p> <p>Cancelled CAPEX Approval Requests <b>16</b></p> <p>Failed Instances</p>
<p>73. In the pop-up, change the Title as Failed CAPEX Approval Requests.</p> <p>74. Click .</p>	 <p>Edit Performance Indicator</p> <p>Title: * Failed CAPEX Approval Requests</p> <p>Sub-Title:</p> <p>ID: * FailedInstances_Generated</p> <p>OK <b>18</b> Cancel</p>

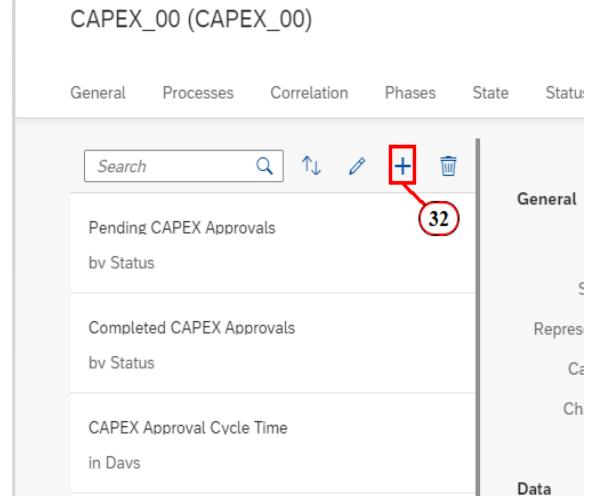
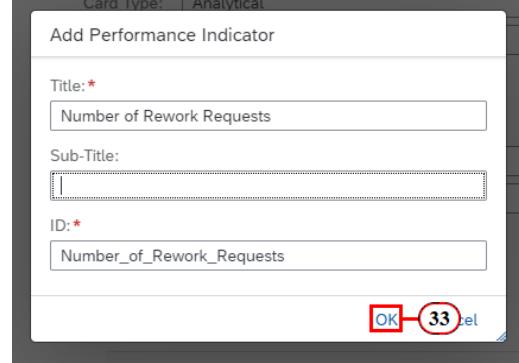
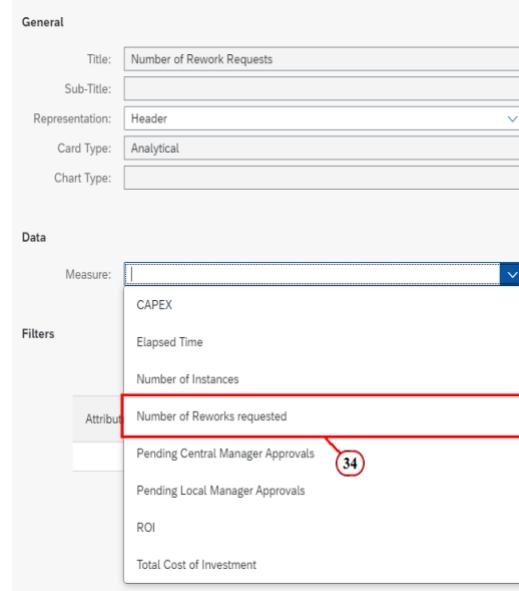
Explanation	Screenshot						
<p>Let's now create some custom <i>Performance Indicators</i>. Each process performance indicator are shown as a tile in <i>Process Workspace</i>.</p> <p>75. Click  to add a process performance indicator which will show the details of <b>Open Capex Requests</b>, distributed by phase and filtered by the <b>State</b> of the process.</p>							
<p>Provide the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Open Requests</td> </tr> <tr> <td>Sub-Title</td> <td>by Phase</td> </tr> <tr> <td>ID</td> <td>Open_Requests</td> </tr> </table> <p>76. Click .</p>	Title	Open Requests	Sub-Title	by Phase	ID	Open_Requests	
Title	Open Requests						
Sub-Title	by Phase						
ID	Open_Requests						
<p>77. Click the dropdown button from the <b>Representation</b>.</p> <p>78. Click the <b>List</b> type.</p>							

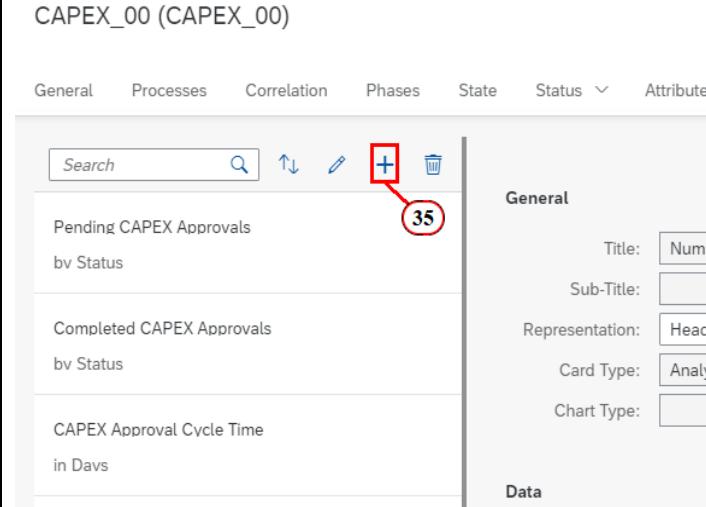
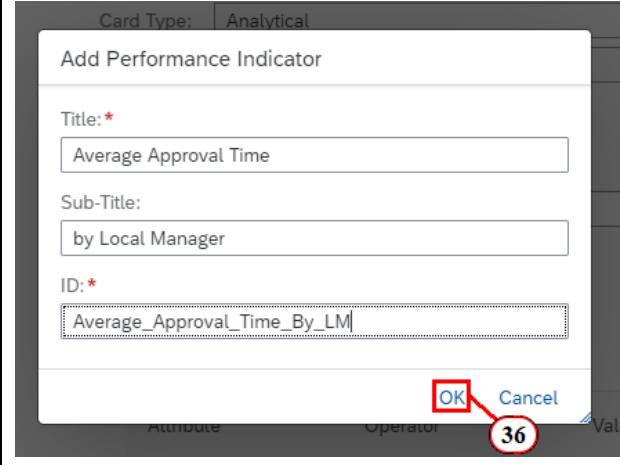
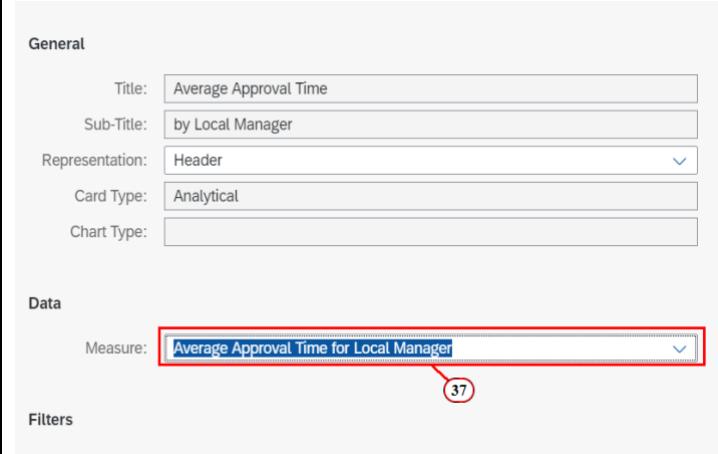
Explanation	Screenshot
<p>79. From the <b>Measures</b> dropdown, select <b>Number of Instances</b>.</p>	 <p>The screenshot shows the 'Data' configuration section. The 'Measure' field is set to 'Number of Instances'. A dropdown menu is open, showing several options: CAPEX, Elapsed Time, Number of Instances (which is highlighted with a red box and circled with a red circle labeled '23'), Number of Reworks requested, Pending Central Manager Approvals, Pending Local Manager Approvals, ROI, and Total Cost of Investment.</p>
<p>80. From the <b>Dimensions</b> dropdown, select <b>Active Phases</b>.</p>	 <p>The screenshot shows the 'Dimensions' configuration section. The 'Dimension' field is set to 'Active Phases'. A dropdown menu is open, showing several options: Active Phases (highlighted with a red box and circled with a red circle labeled '24'), Business Key, Capex Req Id, Country, Currency, End Time, Month, Request Id, Start Time, State, Status, SubStatus, Title, and Type.</p>

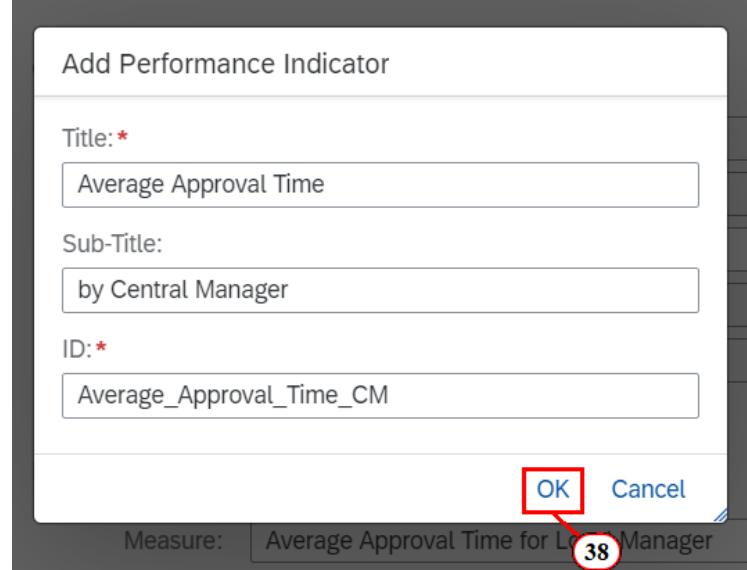
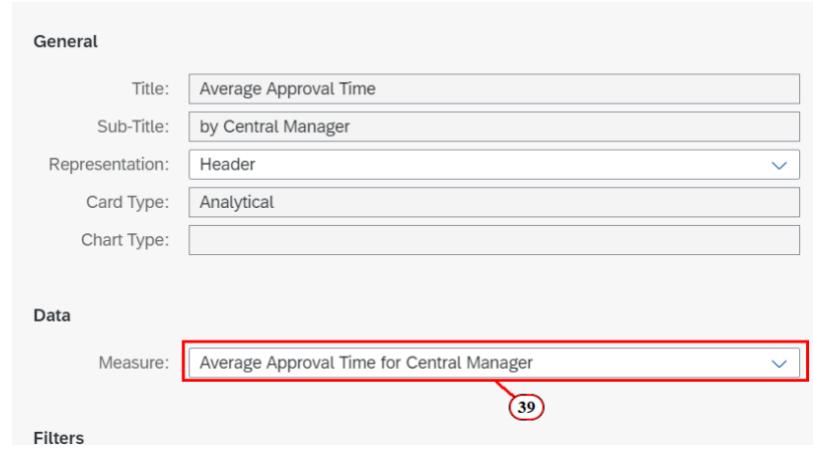
Explanation	Screenshot						
<p>81. Click  to add a filter</p>	 <p>Data</p> <p>Measure: Number of Instances</p> <p>Dimension: Active Phases</p> <p>Filters</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">Attribute</th> <th style="text-align: left;">Operator</th> <th style="text-align: left;">Value</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td style="text-align: right;">(25)</td> </tr> </tbody> </table> <p>No filters defined.</p>	Attribute	Operator	Value			(25)
Attribute	Operator	Value					
		(25)					
<p>Provide the following details:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Attribute</td> <td style="width: 50%;">State</td> </tr> <tr> <td>Operator</td> <td>equal to</td> </tr> <tr> <td>Value</td> <td>Open</td> </tr> </table> <p>82. Click .</p>	Attribute	State	Operator	equal to	Value	Open	 <p>Add Filter</p> <p>Attribute:*</p> <p>State</p> <p>Operator:</p> <p>equal to</p> <p>Value:*</p> <p>Open</p> <p>OK (26) Cancel</p>
Attribute	State						
Operator	equal to						
Value	Open						
<p>Similarly, create 2<sup>nd</sup> custom process performance indicator to show <i>Total Investments</i> distributed across <i>Type of Investments</i> in a Donut Chart.</p> <p>83. Click  to add a new Performance Indicator.</p>	<p>CAPEX_00 (CAPEX_00)</p> <p>General Processes Correlation Phases State Status</p> <p>Pending CAPEX Approvals bv Status</p> <p>Completed CAPEX Approvals</p> <p></p>						

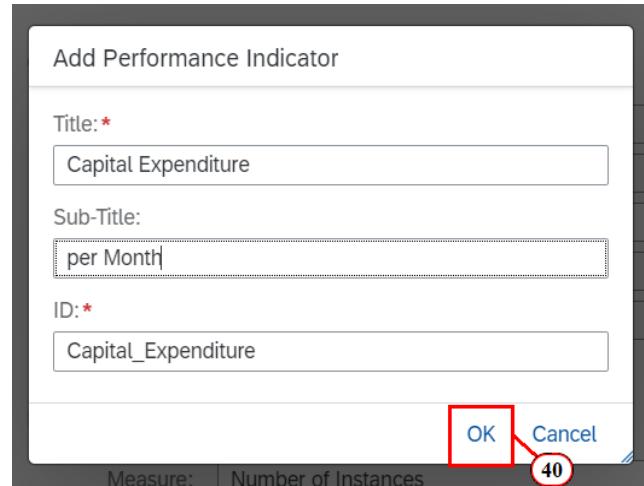
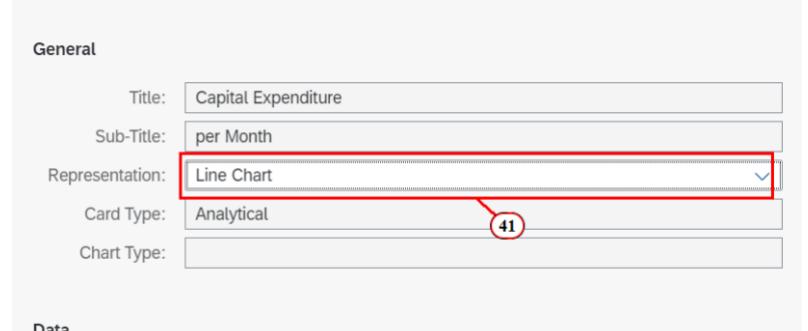
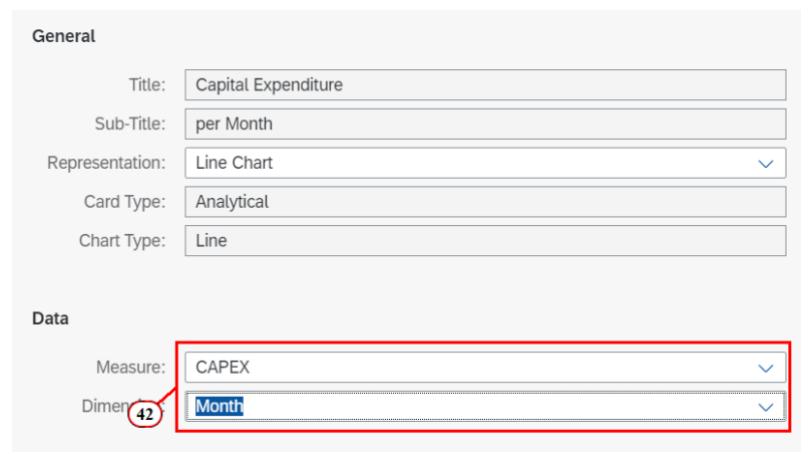
Explanation	Screenshot						
<p>Provide the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Total Investments</td> </tr> <tr> <td>Sub-Title</td> <td></td> </tr> <tr> <td>ID</td> <td>Total_Investments</td> </tr> </table> <p>84. Click <b>OK</b>.</p>	Title	Total Investments	Sub-Title		ID	Total_Investments	
Title	Total Investments						
Sub-Title							
ID	Total_Investments						
<p>85. Select <b>Donut Chart</b> from the <b>Representation</b> dropdown.</p>							

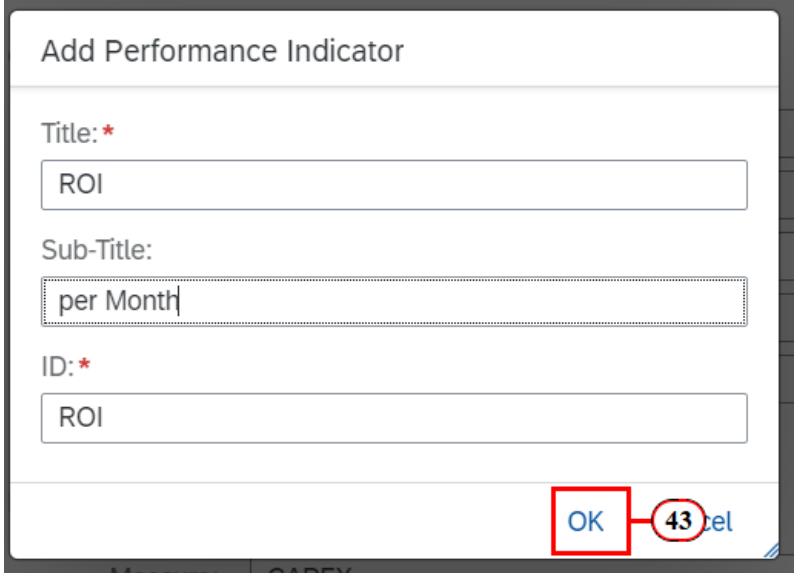
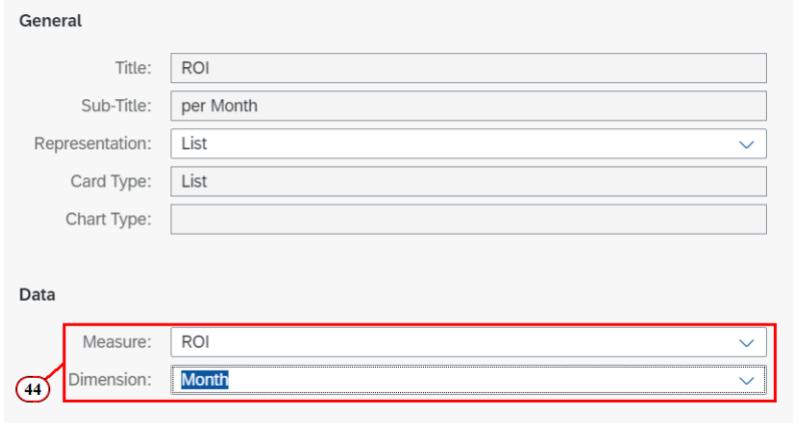
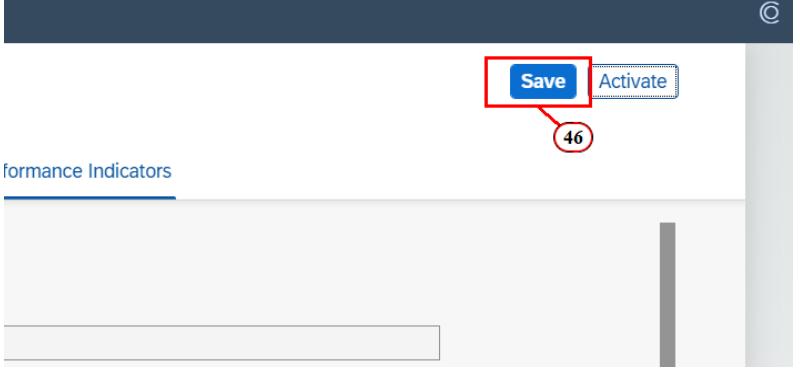
Explanation	Screenshot
<p>86. Select Total Cost of Investment from the Measure dropdown.</p>	 <p>The screenshot shows the SAP Fiori launchpad configuration interface. In the 'General' section, the 'Title' field is set to 'Total Investments'. The 'Measure' dropdown is open, and the option 'Total Cost of Investment' is highlighted with a red box and circled with the number 30.</p>
<p>87. Select Type from the Dimension dropdown.</p>	 <p>The screenshot shows the SAP Fiori launchpad configuration interface. In the 'General' section, the 'Title' field is set to 'Capex Req Id'. The 'Dimension' dropdown is open, and the option 'Type' is highlighted with a red box and circled with the number 31.</p>

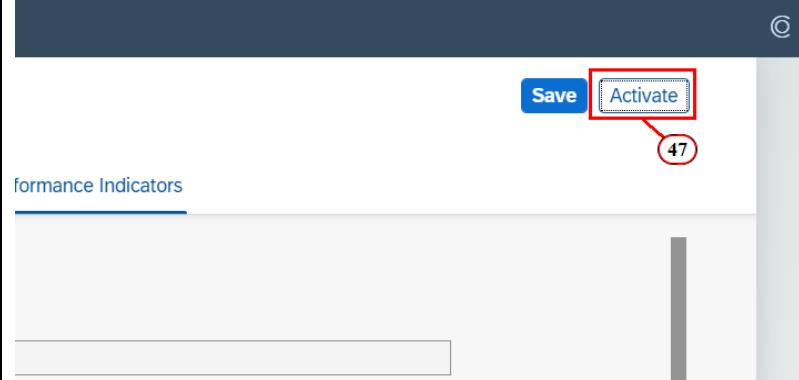
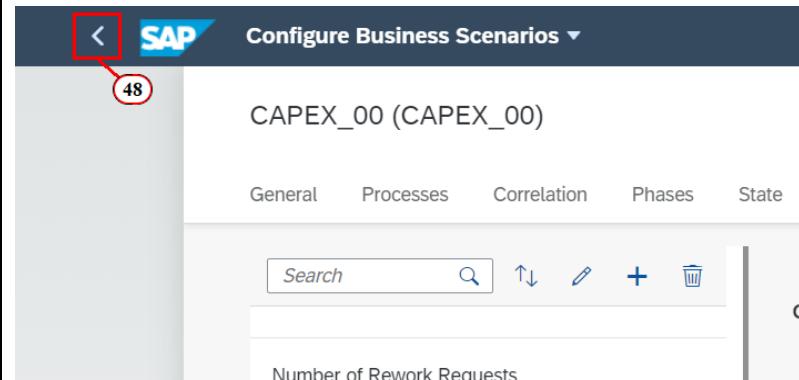
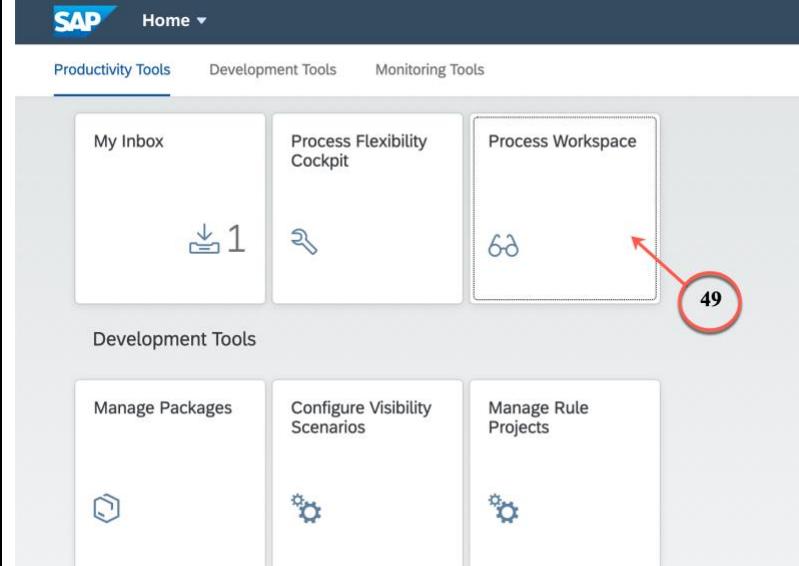
Explanation	Screenshot						
<p><i>Rework</i> in an approval process lead to delays and increases overall operational cost. So, you will now create a 3<sup>rd</sup> custom process performance indicator to track <i>Number of Rework Requests</i> in a Header Chart.</p> <p>88. Click  to add another Performance Indicator.</p>							
<p>Provide the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Number of Rework Requests</td> </tr> <tr> <td>Sub-Title</td> <td></td> </tr> <tr> <td>ID</td> <td>Number_of_Rework_Requests</td> </tr> </table> <p>89. Click .</p>	Title	Number of Rework Requests	Sub-Title		ID	Number_of_Rework_Requests	
Title	Number of Rework Requests						
Sub-Title							
ID	Number_of_Rework_Requests						
<p>90. Select Number of Reworks requested from the Attribute dropdown.</p>							

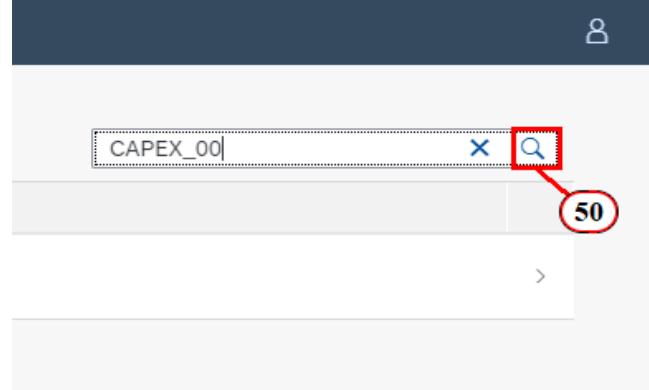
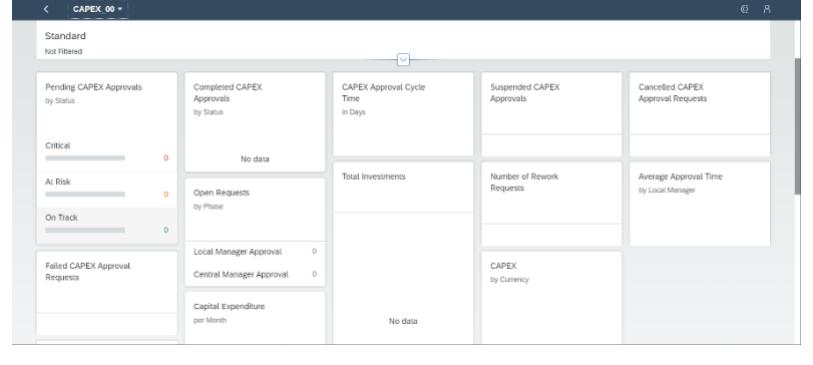
Explanation	Screenshot						
<p>Similarly, create 4<sup>th</sup> and 5<sup>th</sup> custom process performance indicator to track overall time taken to approve the capital investment request in form of <i>Average Approval Time</i> by Local &amp; Central Managers displayed as the <i>Header</i> chart.</p> <p>In any process, the overall time taken to complete the process is always a key performance metrics, as it indicates any bottlenecks in the process in real-time and helps business user to take appropriate actions to unblock the business process.</p> <p>91. Click  to create a Performance Indicator.</p>	 <p>CAPEX_00 (CAPEX_00)</p> <p>General Processes Correlation Phases State Status Attribute</p> <p>Pending CAPEX Approvals bv Status</p> <p>Completed CAPEX Approvals bv Status</p> <p>CAPEX Approval Cycle Time in Days</p> <p>General</p> <ul style="list-style-type: none"> <li>Title: <input type="text"/></li> <li>Sub-Title: <input type="text"/></li> <li>Representation: <input type="text"/></li> <li>Card Type: <input type="text"/></li> <li>Chart Type: <input type="text"/></li> </ul> <p>Data</p>						
<p>Provide the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Average Approval Time</td> </tr> <tr> <td>Sub-Title</td> <td>by Local Manager</td> </tr> <tr> <td>ID</td> <td>Average_Approval_Time_By_LM</td> </tr> </table> <p>92. Click .</p>	Title	Average Approval Time	Sub-Title	by Local Manager	ID	Average_Approval_Time_By_LM	 <p>Card Type: Analytical</p> <h3>Add Performance Indicator</h3> <p>Title: * <input type="text" value="Average Approval Time"/></p> <p>Sub-Title: <input type="text" value="by Local Manager"/></p> <p>ID: * <input type="text" value="Average_Approval_Time_By_LM"/></p> <p>Attribute Operator Value</p> <p>OK Cancel 36</p>
Title	Average Approval Time						
Sub-Title	by Local Manager						
ID	Average_Approval_Time_By_LM						
<p>93. Select Average Approval Time for Local Manager from the Measure dropdown.</p>	 <p>General</p> <p>Title: Average Approval Time</p> <p>Sub-Title: by Local Manager</p> <p>Representation: Header</p> <p>Card Type: Analytical</p> <p>Chart Type: </p> <p>Data</p> <p>Measure: <input type="text" value="Average Approval Time for Local Manager"/> 37</p> <p>Filters</p>						

Explanation	Screenshot						
<p>Similarly, create another <i>Average Approval Time</i> performance indicator for <i>Central Manager</i> with the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Average Approval Time</td> </tr> <tr> <td>Sub-Title</td> <td>by Central Manager</td> </tr> <tr> <td>ID</td> <td>Average_Approval_Time_CM</td> </tr> </table> <p>94. Click <b>OK</b>.</p>	Title	Average Approval Time	Sub-Title	by Central Manager	ID	Average_Approval_Time_CM	
Title	Average Approval Time						
Sub-Title	by Central Manager						
ID	Average_Approval_Time_CM						
<p>95. Select <i>Average Approval Time for Central Manager</i> from the Measure dropdown.</p>							

Explanation	Screenshot						
<p>Now create 6<sup>th</sup> custom process performance indicator to track the <i>total amount of the capital expenditure requests</i> have been raised over past months shown as <i>Line Chart</i>.</p> <p>Enter the following details:</p> <table border="1"> <tr> <td>Title</td> <td>Capital Expenditure</td> </tr> <tr> <td>Sub-Title</td> <td>per Month</td> </tr> <tr> <td>ID</td> <td>Capital_Expenditure</td> </tr> </table> <p>96. Click <b>OK</b>.</p>	Title	Capital Expenditure	Sub-Title	per Month	ID	Capital_Expenditure	
Title	Capital Expenditure						
Sub-Title	per Month						
ID	Capital_Expenditure						
<p>97. Select <b>Line Chart</b> from the <b>Representation</b> dropdown.</p>							
<p>98. Select the <b>Measure</b> as <b>CAPEX</b> and <b>Dimension</b> as <b>Month</b> from the respective dropdowns.</p>							

Explanation	Screenshot						
<p>Now create 7<sup>th</sup> custom process performance indicator to track the <i>return of investment</i> over past months shown as <i>List Chart</i>.</p> <p>Enter the following details:</p> <table border="1"> <tr> <td>Title</td> <td>ROI</td> </tr> <tr> <td>Sub-Title</td> <td>per Month</td> </tr> <tr> <td>ID</td> <td>ROI</td> </tr> </table> <p>99. Click <b>OK</b></p>	Title	ROI	Sub-Title	per Month	ID	ROI	
Title	ROI						
Sub-Title	per Month						
ID	ROI						
<p>100. Select <b>ROI</b> as the <b>Measure</b> and <b>Month</b> as the <b>Dimension</b> from the respective dropdowns.</p>							
<p>101. Click <b>Save</b>.</p>							

Explanation	Screenshot
<p>Now we have completed configuring all the custom performance indicators.</p> <p>102. Click <b>Activate</b> to activate the visibility scenario.</p> <p>Once you activate the visibility scenario, it becomes live and you can start tracking the process from <i>Process Workspace</i>.</p>	
<p>103. Click <b>SAP</b> to go back to the <b>Home Page</b> of the Workflow Management launchpad.</p>	
<p>104. Click the <b>Process Workspace</b> tile to view all activated visibility scenarios.</p>	

Explanation	Screenshot
<p>105.If needed, search for the visibility scenario by entering the name of your visibility scenario in the <b>Search Box</b> and click  .</p>	
<p>106.You should see the activated visibility scenario and click to navigate into the dashboard.</p>	
<p>You will see the <b>Visibility Scenario</b> dashboard.</p> <p>Note that it will have no data. In the next section you will deal with that.</p>	

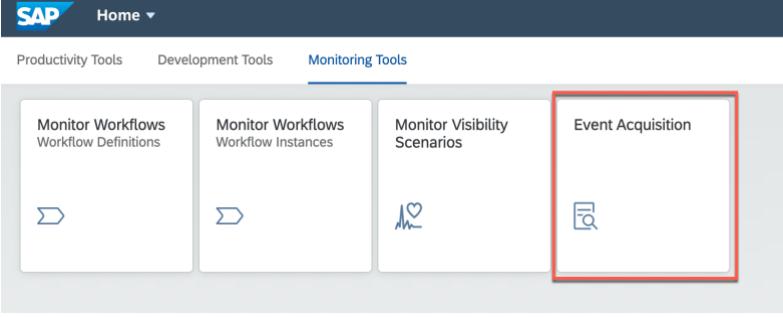
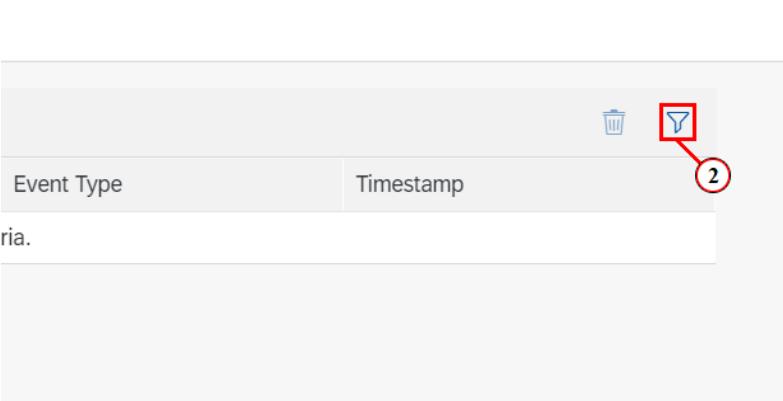
## CONFIGURE AND MONITOR PROCESS VISIBILITY SCENARIOS

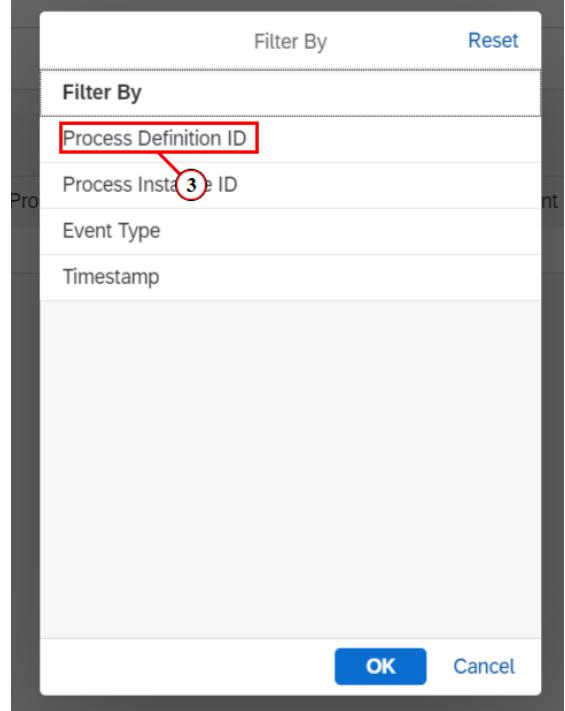
Once the visibility scenario is activated, events of the workflow instances that are started after the visibility scenario was activated will be auto subscribed and pushed to process visibility. Workflow attributes configured in the workflow are pushed as context attributes.

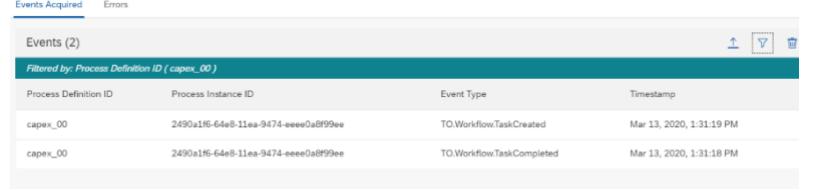
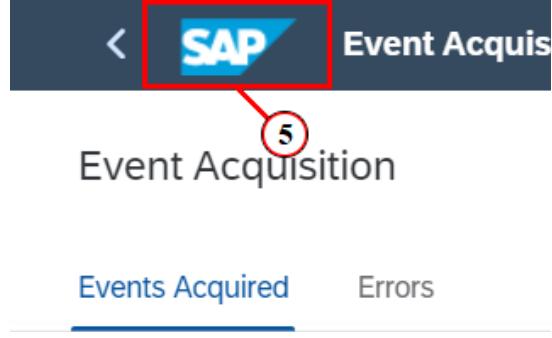
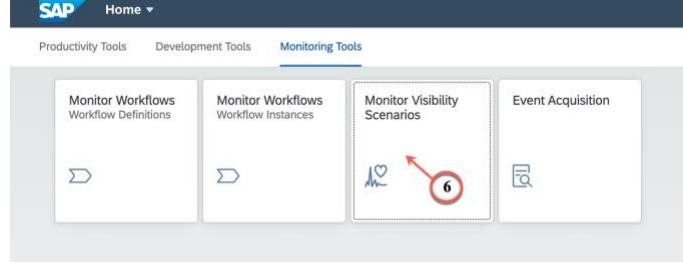
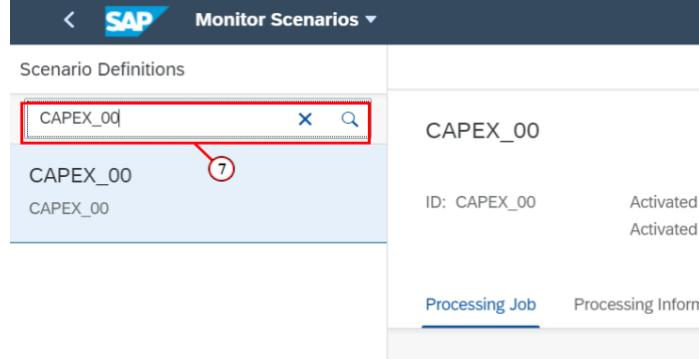
The following events are pushed from Workflow to Process Visibility service

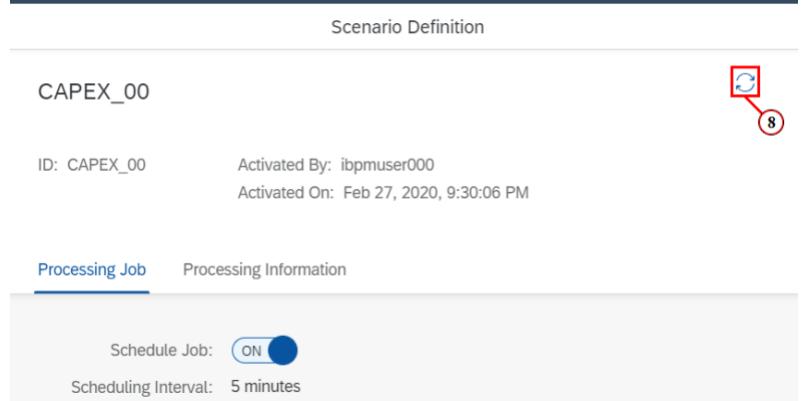
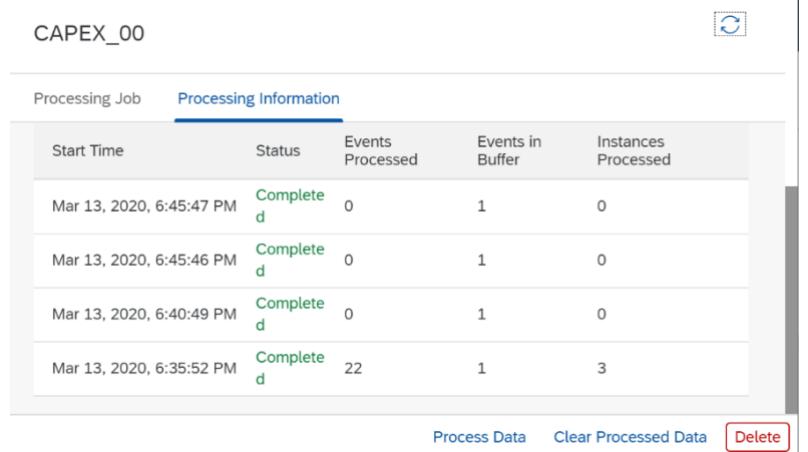
Workflow Activity	Event
Workflow lifecycle events	Started,Completed, Canceled, Suspended
User Task	Created,Completed
Intermediate message event	Triggered, Reached

To start the workflow that you have associated with the visibility scenario, follow section **EXECUTE AND MONITOR WORKFLOW** from Exercise 1

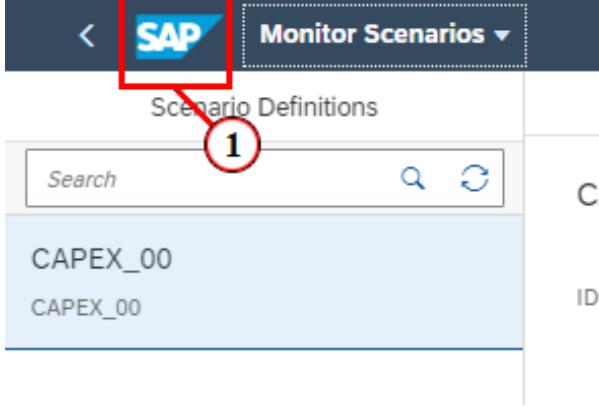
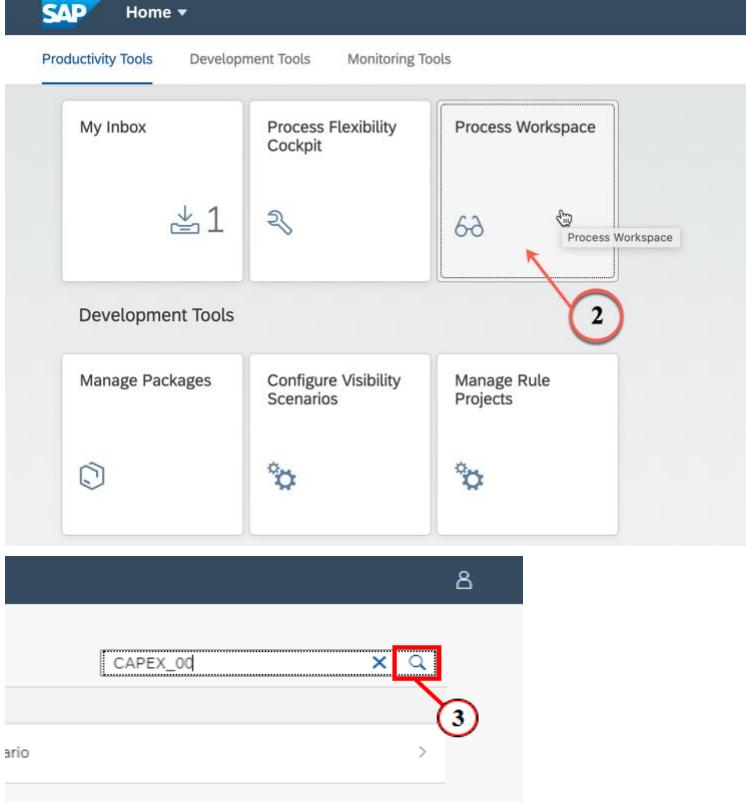
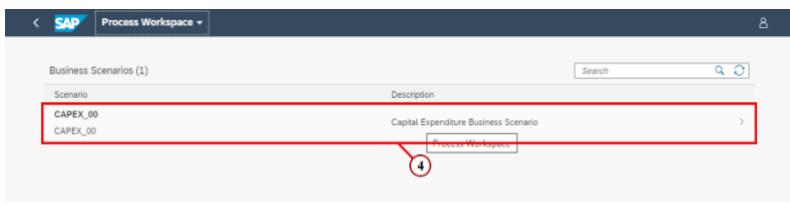
Explanation	Screenshot
<p>In this unit, you will learn how to view the events acquired by the process visibility service. This is more of an <i>Administrative</i> task and therefore need <i>PVTenantAdmin</i> and <i>PVOperator</i> roles to access the application.</p> <p>107. From the <b>Workflow Management Launchpad</b> Home Page, click <b>Event Acquisition</b> tile.</p>	
<p>Using the <b>Event Acquisition</b> application, you can do the following:</p> <ul style="list-style-type: none"> <li>View the events that have been acquired by process visibility.</li> <li>Monitor errors while consuming the events pushed to the service.</li> </ul> <p>108. Click filter  to select the process for which you can view its respective events.</p>	

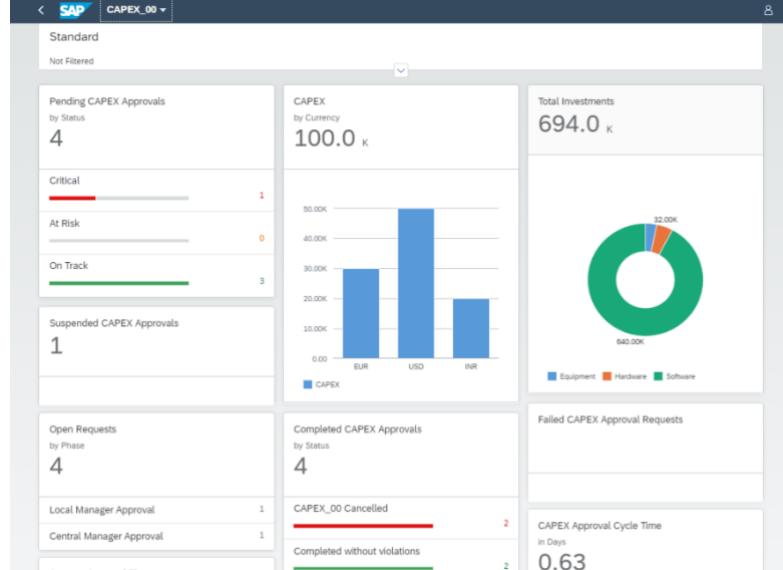
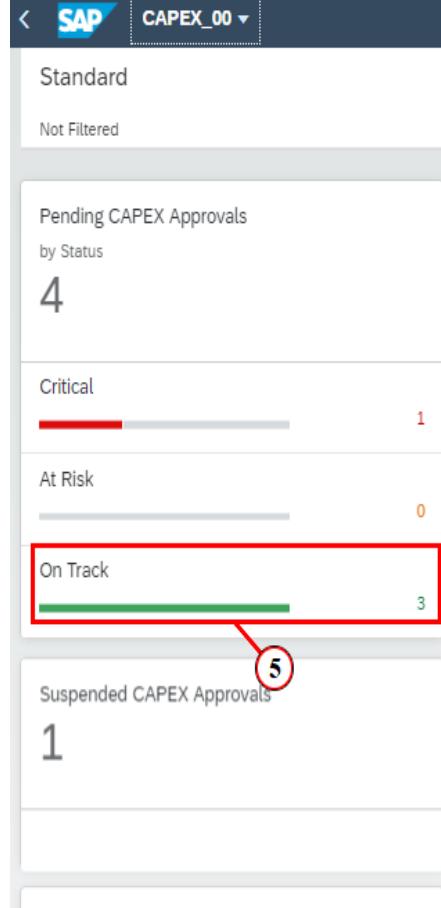
Explanation	Screenshot
<p>109.Click <b>Process Definition</b> in the filter dialog.</p>	 <p>The screenshot shows a 'Filter By' dialog box. At the top right are 'Filter By' and 'Reset' buttons. Below them is a list of filtering options: 'Process Definition ID' (which is highlighted with a red box), 'Process Instance ID' (with a red circle containing the number '3' pointing to it), 'Event Type', and 'Timestamp'. At the bottom are 'OK' and 'Cancel' buttons.</p>
<p>Enter <b>CAPEX_00</b> which refers to the workflow definition id that was imported in your visibility scenario.</p> <p>110.Click <b>OK</b>.</p>	 <p>The screenshot shows a 'Filter By: Process Definition ID' dialog box. It has a back arrow, a 'Filter By' button, a 'Reset' button, and an input field containing 'capex_00'. At the bottom are 'OK' and 'Cancel' buttons, with a red circle containing the number '4' pointing to the 'OK' button.</p>

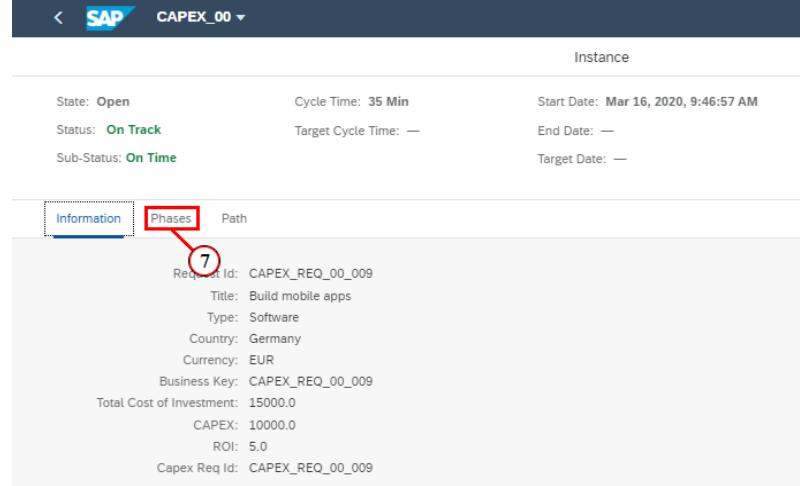
Explanation	Screenshot
<p>You should be able to see the events corresponding to the <b>Process Definition ID</b>.</p>	
<p>111.Click  to go back to the <b>Home Page</b> of the Worflow Management launchpad.</p>	
<p>112.Click <b>Monitor Visibility Scenarios</b> tile.</p>	
<p>113.If needed, search for your scenario by providing the scenario name as <b>CAPEX_00</b>.</p>	

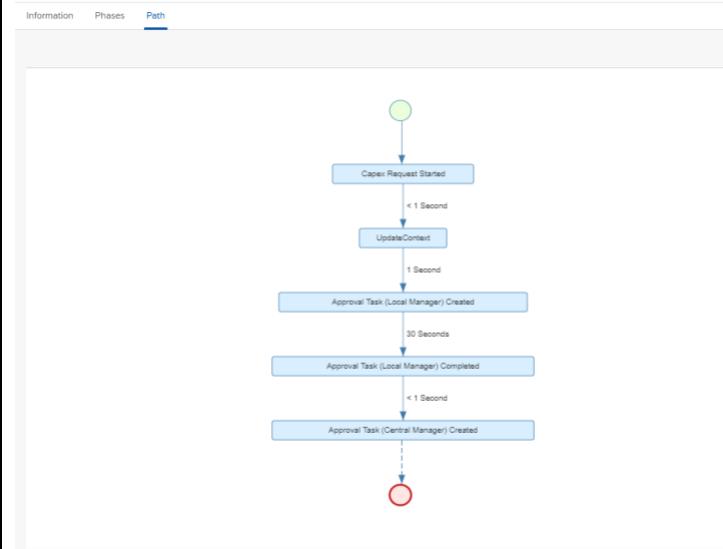
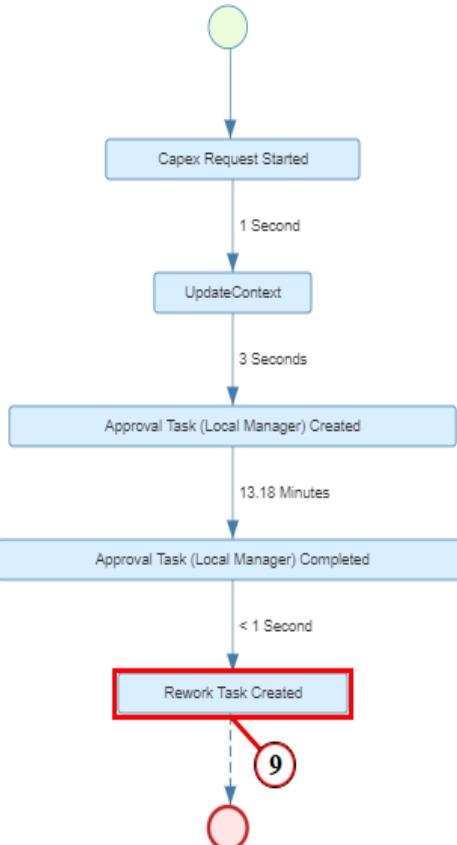
Explanation	Screenshot																											
<p>Note:</p> <ul style="list-style-type: none"> <li>For a given scenario, processing of events is auto scheduled on scenario activation. The default schedule frequency for processing is <b>5 minutes</b>.</li> <li>Click the refresh button (on top-right corner) to see the fresh processing information. You can see all the events from your scenario definition.</li> <li>The <b>Process Data</b> and <b>Clear Processed Data</b> buttons on the footer enable you to manually trigger the processing the data and clearing the processed data respectively. Once you have cleared the processed data, you can click again <i>Processed Data</i> to reprocess the subscribed events.</li> </ul>	 <p>Scenario Definition</p> <p>CAPEX_00</p> <p>ID: CAPEX_00 Activated By: ibpmuser000 Activated On: Feb 27, 2020, 9:30:06 PM</p> <p><b>Processing Job</b> Processing Information</p> <p>Schedule Job: <b>ON</b> Scheduling Interval: 5 minutes</p>																											
<p>114. Click .</p> <p>All processed job information will be shown.</p>	 <p>CAPEX_00</p> <table border="1"> <thead> <tr> <th>Processing Job</th> <th>Processing Information</th> </tr> <tr> <th>Start Time</th> <th>Status</th> <th>Events Processed</th> <th>Events in Buffer</th> <th>Instances Processed</th> </tr> </thead> <tbody> <tr> <td>Mar 13, 2020, 6:45:47 PM</td> <td>Completed</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Mar 13, 2020, 6:45:46 PM</td> <td>Completed</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Mar 13, 2020, 6:40:49 PM</td> <td>Completed</td> <td>0</td> <td>1</td> <td>0</td> </tr> <tr> <td>Mar 13, 2020, 6:35:52 PM</td> <td>Completed</td> <td>22</td> <td>1</td> <td>3</td> </tr> </tbody> </table> <p>Process Data Clear Processed Data <b>Delete</b></p>	Processing Job	Processing Information	Start Time	Status	Events Processed	Events in Buffer	Instances Processed	Mar 13, 2020, 6:45:47 PM	Completed	0	1	0	Mar 13, 2020, 6:45:46 PM	Completed	0	1	0	Mar 13, 2020, 6:40:49 PM	Completed	0	1	0	Mar 13, 2020, 6:35:52 PM	Completed	22	1	3
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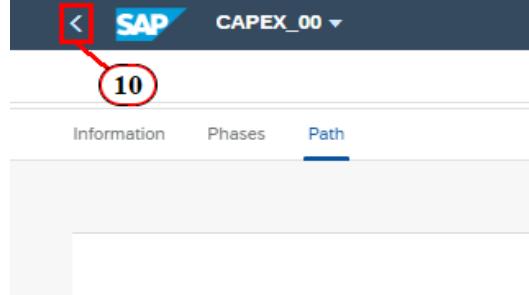
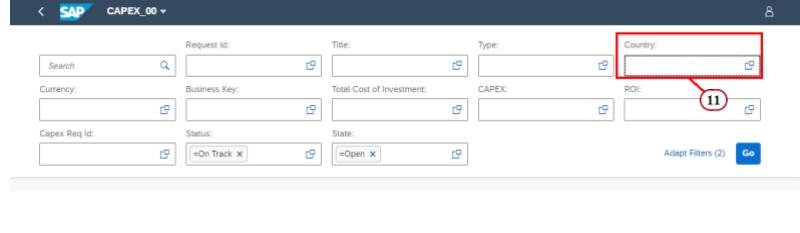
### ACCESS PROCESS WORKSPACE

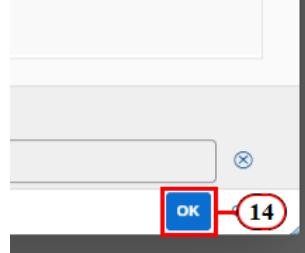
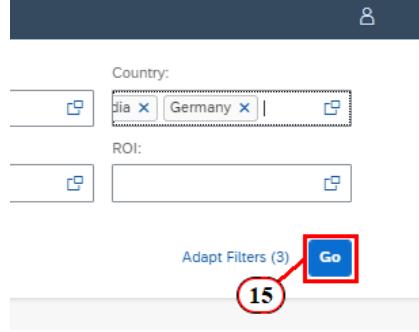
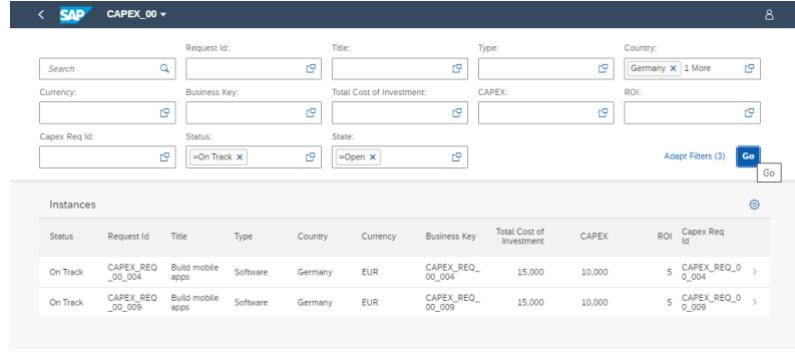
Explanation	Screenshot
<p>115. Click <b>SAP</b> to go back to the <b>Home Page</b> of the Workflow Management launchpad.</p>	
<p>116. Click <b>Process Workspace</b>.      117. If needed, enter the visibility scenario name in the search field and click .</p>	
<p>118. Select the Visibility Scenario by clicking on it.</p>	

Explanation	Screenshot
<p>You will see the <b>Process Performance Indicator</b> tiles you configured in the dashboard. You can rearrange the tiles in order of preference by dragging-and-dropping them.</p>	 <p>The screenshot shows the SAP CAPEX_00 dashboard with the following tiles:</p> <ul style="list-style-type: none"> <li>Pending CAPEX Approvals by Status: 4 (Critical: 1, At Risk: 0, On Track: 3)</li> <li>CAPEX by Currency: 100.0 K (EUR: ~30K, USD: ~50K, INR: ~20K)</li> <li>Total Investments: 694.0 K (Equipment: ~640K, Hardware: ~20K, Software: ~34K)</li> <li>Suspended CAPEX Approvals: 1</li> <li>Open Requests by Phase: 4 (Local Manager Approval: 1, Central Manager Approval: 1)</li> <li>Completed CAPEX Approvals by Status: 4 (CAPEX_00 Cancelled: 2, Completed without violations: 2)</li> <li>Failed CAPEX Approval Requests: 0</li> <li>CAPEX Approval Cycle Time in Days: 0.63</li> </ul>
<p>119. Let us drill down into a process instance. For this, click any of the PPI you are interested.</p> <p>For example, to view what CAPEX approval processes are <b>On Track</b> KPI, click.</p>	 <p>The screenshot shows the SAP CAPEX_00 dashboard with the 'On Track' KPI highlighted with a red box and circled number 5. The 'On Track' KPI value is 3.</p>

Explanation	Screenshot																																												
<p>All <b>On Track</b> CAPEX approval process instances will be listed out. The table will have rows corresponding to the context of the process instance and custom attributes that you configured while creating visibility scenario.</p> <p>120. Select an instance to further drill down and get more details.</p>	 <table border="1"> <thead> <tr> <th>Status</th> <th>Request Id</th> <th>Title</th> <th>Type</th> <th>Country</th> <th>Currency</th> <th>Business Key</th> <th>Total Cost of Investment</th> <th>CAPEX</th> <th>ROI</th> <th>Capex Req Id</th> </tr> </thead> <tbody> <tr> <td>On Track</td> <td>CAPEX_REQ_00_007</td> <td>Build mobile apps</td> <td>Equipment</td> <td>United States of America</td> <td>USD</td> <td>CAPEX_REQ_00_007</td> <td>22,000</td> <td>20,000</td> <td>5</td> <td>CAPEX_REQ_0_007</td> </tr> <tr> <td>On Track</td> <td>CAPEX_REQ_00_004</td> <td>Build mobile apps</td> <td>Software</td> <td>Germany</td> <td>EUR</td> <td>CAPEX_REQ_00_004</td> <td>15,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_0_004</td> </tr> <tr style="outline: 2px solid red;"> <td>On Track</td> <td>CAPEX_REQ_00_009</td> <td>Build mobile apps</td> <td>Software</td> <td>Germany</td> <td>EUR</td> <td>CAPEX_REQ_00_009</td> <td>15,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_0_009</td> </tr> </tbody> </table>	Status	Request Id	Title	Type	Country	Currency	Business Key	Total Cost of Investment	CAPEX	ROI	Capex Req Id	On Track	CAPEX_REQ_00_007	Build mobile apps	Equipment	United States of America	USD	CAPEX_REQ_00_007	22,000	20,000	5	CAPEX_REQ_0_007	On Track	CAPEX_REQ_00_004	Build mobile apps	Software	Germany	EUR	CAPEX_REQ_00_004	15,000	10,000	5	CAPEX_REQ_0_004	On Track	CAPEX_REQ_00_009	Build mobile apps	Software	Germany	EUR	CAPEX_REQ_00_009	15,000	10,000	5	CAPEX_REQ_0_009
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<p>Here you can see all information corresponding to the process as configured in <b>Default Attributes</b>.</p> <p>121. Let's now navigate to <b>Phases</b>.</p>	 <p>Information Phases Path</p> <p>Request Id: CAPEX_REQ_00_009      Title: Build mobile apps      Type: Software      Country: Germany      Currency: EUR      Business Key: CAPEX_REQ_00_009      Total Cost of Investment: 15000.0      CAPEX: 10000.0      ROI: 5.0      Capex Req Id: CAPEX_REQ_00_009</p>																																												
<p>Here you will see a graphical representation of the phases with started and end timestamp. The filled checkbox indicate that the process is currently running at that phase.</p> <p>Note: You can also change the representation by clicking .</p> <p>122. Let's now view the <b>Path</b> of the process instance.</p>	 <p>Information Phases Path</p> <p>LOCAL MANAGER APPROVAL: Completed      CENTRAL MANAGER APPROVAL: In Progress</p> <p>Reached milestone "Start of Central Manager Approval" on Mar 16, 2020, 9:47:31 AM.</p>																																												

Explanation	Screenshot
<p>Path is represented as flow diagram which shows the transition from one activity to another, together with the time taken.</p> <p>Note: You can also choose the representation by clicking</p> 	 <pre> graph TD     Start(( )) --&gt; CapexRequestStarted[Capex Request Started]     CapexRequestStarted -- "&lt; 1 Second" --&gt; UpdateContext[UpdateContext]     UpdateContext -- "1 Second" --&gt; ApprovalTaskLocalManagerCreated[Approval Task (Local Manager) Created]     ApprovalTaskLocalManagerCreated -- "30 Seconds" --&gt; ApprovalTaskLocalManagerCompleted[Approval Task (Local Manager) Completed]     ApprovalTaskLocalManagerCompleted -- "&lt; 1 Second" --&gt; ApprovalTaskCentralManagerCreated[Approval Task (Central Manager) Created]     ApprovalTaskCentralManagerCreated --&gt; End((( )))   </pre>
<p>For example: A process that has undergone (or pushed to) rework will look like this.</p>	 <pre> graph TD     Start(( )) --&gt; CapexRequestStarted[Capex Request Started]     CapexRequestStarted -- "1 Second" --&gt; UpdateContext[UpdateContext]     UpdateContext -- "3 Seconds" --&gt; ApprovalTaskLocalManagerCreated[Approval Task (Local Manager) Created]     ApprovalTaskLocalManagerCreated -- "13.18 Minutes" --&gt; ApprovalTaskLocalManagerCompleted[Approval Task (Local Manager) Completed]     ApprovalTaskLocalManagerCompleted -- "&lt; 1 Second" --&gt; ReworkTaskCreated[Rework Task Created]     ReworkTaskCreated --&gt; End((( 9 )))   </pre>

Explanation	Screenshot
<p>123. You can navigate back to the previous pages by clicking on .</p>	
<p>You can filter through the Instances by using the filters based on the context or state/status. For example, if there are multiple countries, you can filter by preference.</p> <p>Note: You can try this out by creating multiple workflow instances and providing varied details, such as different country, currency etc.</p> <p>124. For example, let's filter by country</p> <p>Country:</p> <div style="border: 1px dashed black; width: 150px; height: 30px; margin-top: 5px;"></div>	
<p>125. Clicking  with no data will bring up the value help.</p> <p>126. Select the filter as:</p> <div style="display: flex; align-items: center;"> <input style="width: 20px; height: 20px; border: 1px solid #ccc; margin-right: 10px;" type="checkbox"/> Germany       </div>	

Explanation	Screenshot
<p>127. Click  to apply the filters</p>	
<p>128. Click  to search based on the filters</p>	
<p>The filtered list can be viewed.</p>	
<p>As mentioned earlier, you can click any PPI to view its details. For example, in case you wish to view all the <b>CAPEX approvals for Software</b> click the section in the donut chart.</p>	

Explanation	Screenshot																																																																														
<p>All instances pertaining to CAPEX for software expenses will be listed.</p> <p>Feel free to explore the capabilities by creating new workflow instances and viewing the dashboard in real-time.</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="12">Instances</th> </tr> <tr> <th>Status</th> <th>Request Id</th> <th>Title</th> <th>Type</th> <th>Country</th> <th>Currency</th> <th>Business Key</th> <th>Total Cost of Investment</th> <th>CAPEX</th> <th>ROI</th> <th>Capex Req Id</th> </tr> </thead> <tbody> <tr> <td>On Track</td> <td>CAPEX_REQ_00_004</td> <td>Build mobile apps</td> <td>Software</td> <td>Germany</td> <td>EUR</td> <td>CAPEX_REQ_00_004</td> <td>15,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_00_004 &gt;</td> </tr> <tr> <td>On Track</td> <td>CAPEX_REQ_00_009</td> <td>Build mobile apps</td> <td>Software</td> <td>Germany</td> <td>EUR</td> <td>CAPEX_REQ_00_009</td> <td>15,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_00_009 &gt;</td> </tr> <tr> <td>Completed without violations</td> <td>CAPEX_REQ_00_002</td> <td>Build mobile apps</td> <td>Software</td> <td>India</td> <td>INR</td> <td>CAPEX_REQ_00_001</td> <td>300,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_00_002 &gt;</td> </tr> <tr> <td>CAPEX_00 Cancelled</td> <td>CAPEX_REQ_00_002</td> <td>Build mobile apps</td> <td>Software</td> <td>India</td> <td>INR</td> <td>CAPEX_REQ_00_002</td> <td>300,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_00_002 &gt;</td> </tr> <tr> <td>Completed without violations</td> <td>CAPEX_REQ_00_001</td> <td>Build mobile apps</td> <td>Software</td> <td>Germany</td> <td>EUR</td> <td>CAPEX_REQ_00_001</td> <td>10,000</td> <td>10,000</td> <td>5</td> <td>CAPEX_REQ_00_001 &gt;</td> </tr> </tbody> </table>	Instances												Status	Request Id	Title	Type	Country	Currency	Business Key	Total Cost of Investment	CAPEX	ROI	Capex Req Id	On Track	CAPEX_REQ_00_004	Build mobile apps	Software	Germany	EUR	CAPEX_REQ_00_004	15,000	10,000	5	CAPEX_REQ_00_004 >	On Track	CAPEX_REQ_00_009	Build mobile apps	Software	Germany	EUR	CAPEX_REQ_00_009	15,000	10,000	5	CAPEX_REQ_00_009 >	Completed without violations	CAPEX_REQ_00_002	Build mobile apps	Software	India	INR	CAPEX_REQ_00_001	300,000	10,000	5	CAPEX_REQ_00_002 >	CAPEX_00 Cancelled	CAPEX_REQ_00_002	Build mobile apps	Software	India	INR	CAPEX_REQ_00_002	300,000	10,000	5	CAPEX_REQ_00_002 >	Completed without violations	CAPEX_REQ_00_001	Build mobile apps	Software	Germany	EUR	CAPEX_REQ_00_001	10,000	10,000	5	CAPEX_REQ_00_001 >
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## SUMMARY

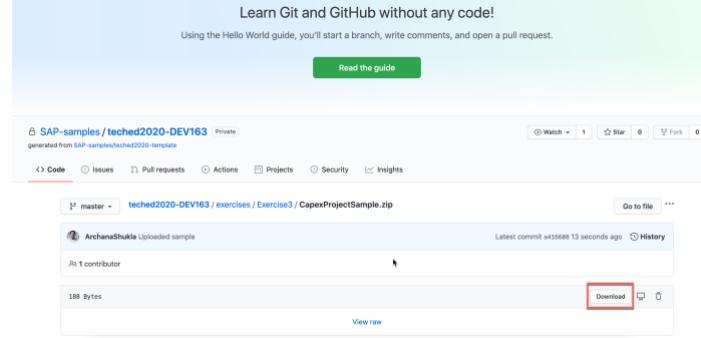
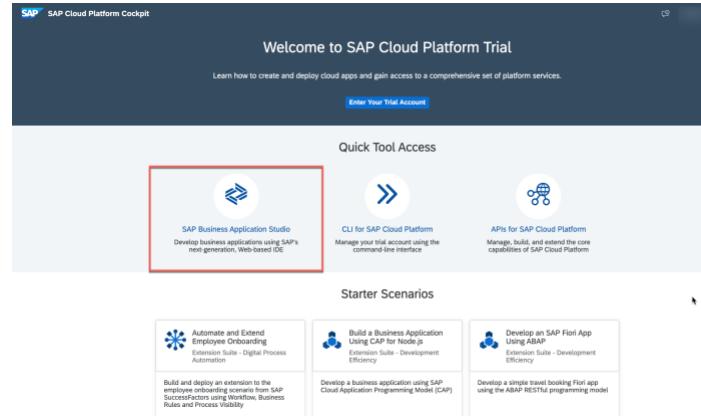
You have completed the exercise!

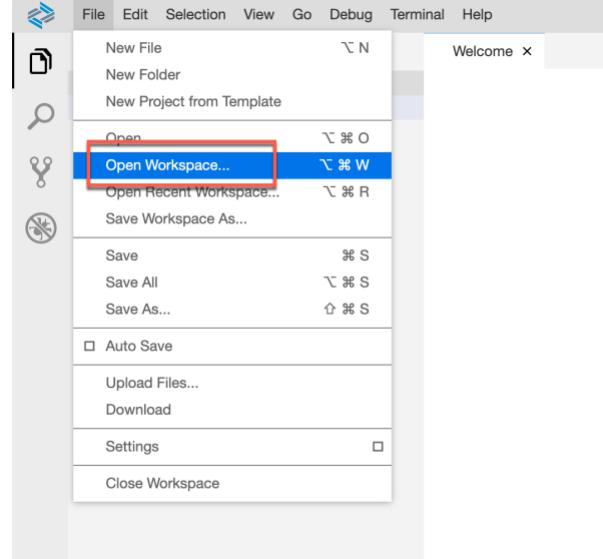
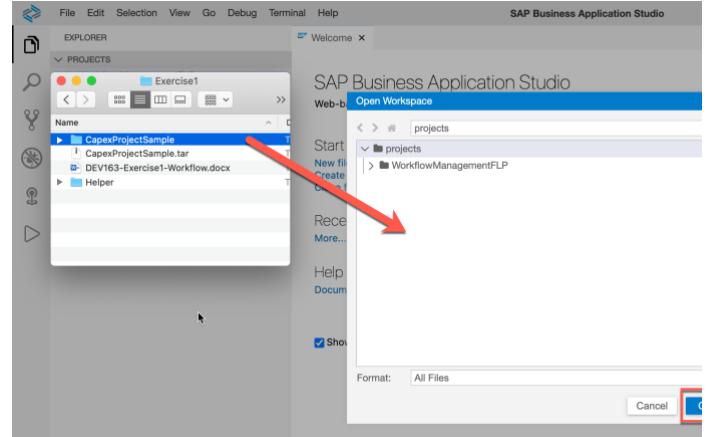
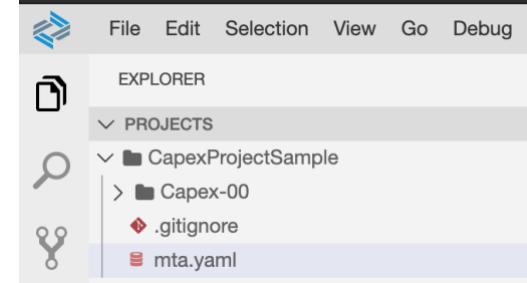
You are now able to:

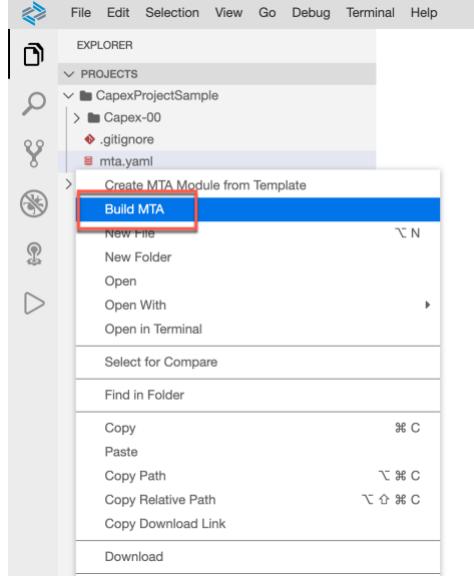
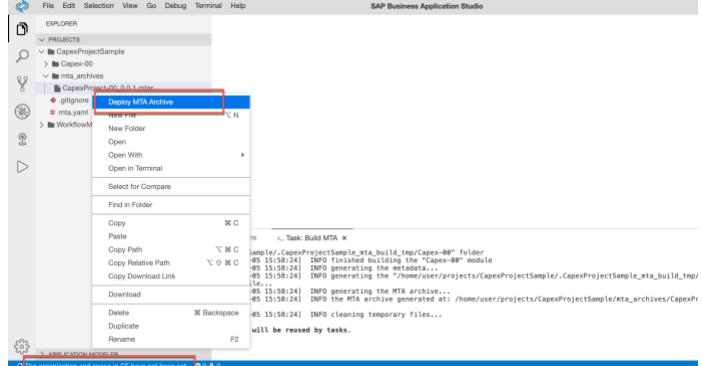
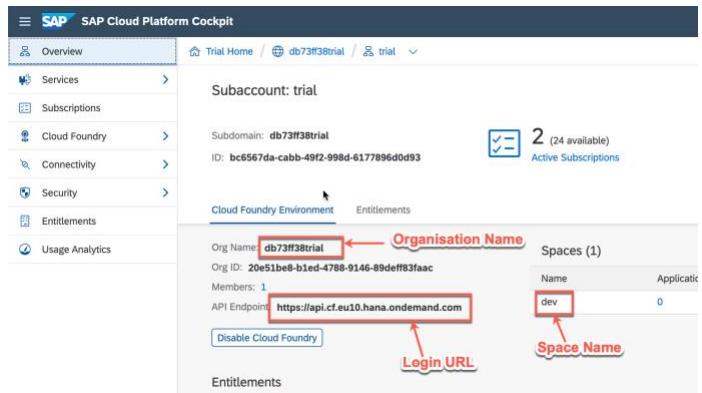
1. Create a new visibility scenario using **Configure Visibility Scenario** application.
2. Add workflow as a process participant.
3. Configure the visibility scenario with **phases** and **calculated attributes**.
4. Create **process performance indicators** that help you track your key business KPIs.
5. Use **Event Acquisition** application to view the acquired events.
6. Use **Monitor Scenarios** application to schedule processing of events.
7. Access **Process Workspace** to track your end to end processes and key business KPIs in real-time

## APPENDIX

### Import and Deploy Sample Workflow

Explanation	Screenshot
<p>1. Download <b>CapexProjectSample.zip</b> from given <b>GitHub</b> link in your local file system and <b>extract</b> the files.</p> <p><a href="https://github.com/SAP-samples/teched2020-DEV163/blob/master/exercises/Exercise3/CapexProjectSample.zip">https://github.com/SAP-samples/teched2020-DEV163/blob/master/exercises/Exercise3/CapexProjectSample.zip</a></p>	
<p>2. Logon to <b>SAP Cloud Platform Trial Home Page</b> with your trial username and password.</p> <p>3. Choose <b>SAP Business Application Studio</b>.</p>	

Explanation	Screenshot
<p>4. Click the <b>Dev Space</b> to go into the workspace and from <b>File</b> menu choose <b>File   Open Workspace</b>.</p> <p>Note: If you have no dev space, click the <b>Create Dev Space</b> with:</p> <ul style="list-style-type: none"> <li>○ Application Type as SAP Fiori.</li> <li>○ Extension as Workflow Management.</li> </ul> <p>Else select <b>PLAY</b>  to start the space if you see the status as <b>STOPPED</b>.</p>	
<p>5. Drag and drop the extracted <b>CapexProjectSample</b> folder in the <b>Open Workspace</b> dialog and click <b>Open</b>.</p>	
<p>6. You will see that the <b>CapexProjectSample</b> project is imported into your workspace.</p>	

Explanation	Screenshot
<p>7. Right-click the <b>mta.yaml</b> file inside the <b>CapexProjectSample</b> folder and choose the <b>Build MTA</b> option.</p>	
<p>8. Once the build is completed successfully, right-click the build file inside <b>mta_archives</b> and choose <b>Deploy MTA Archive</b>.</p> <p>Note: The deployment will fail if you have not logged in to the trial account.</p> <p>Check in the bottom blue bar, if you have already logged in to your trial account. If it does not show <b>organization-name/space-name</b>, then click the <i>blue-bar</i> and follow the wizard to login to your trial account.</p>	
<p>9. You can get the need information about the Login URL, organization name and space name from you trial account.</p> <p>You have to login with your trial user email and password.</p> <p>A successful deployment message will be shown in the terminal once the deployment has completed successfully.</p>	

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