

PUBLIC

Deep dive into SAP Cloud Platform Workflow Management – Gain Real time Process Visibility

DEV-264

Exercises / Solutions
Venugopal Chembrakalathil / SAP SE

TABLE OF CONTENTS

SCENARIO.....3

Prerequisite.....3

Create Scenario.....5

Configure Phases10

Configure Calculated Attributes.....14

Configure Actions.....20

Configure Performance Indicators.....24

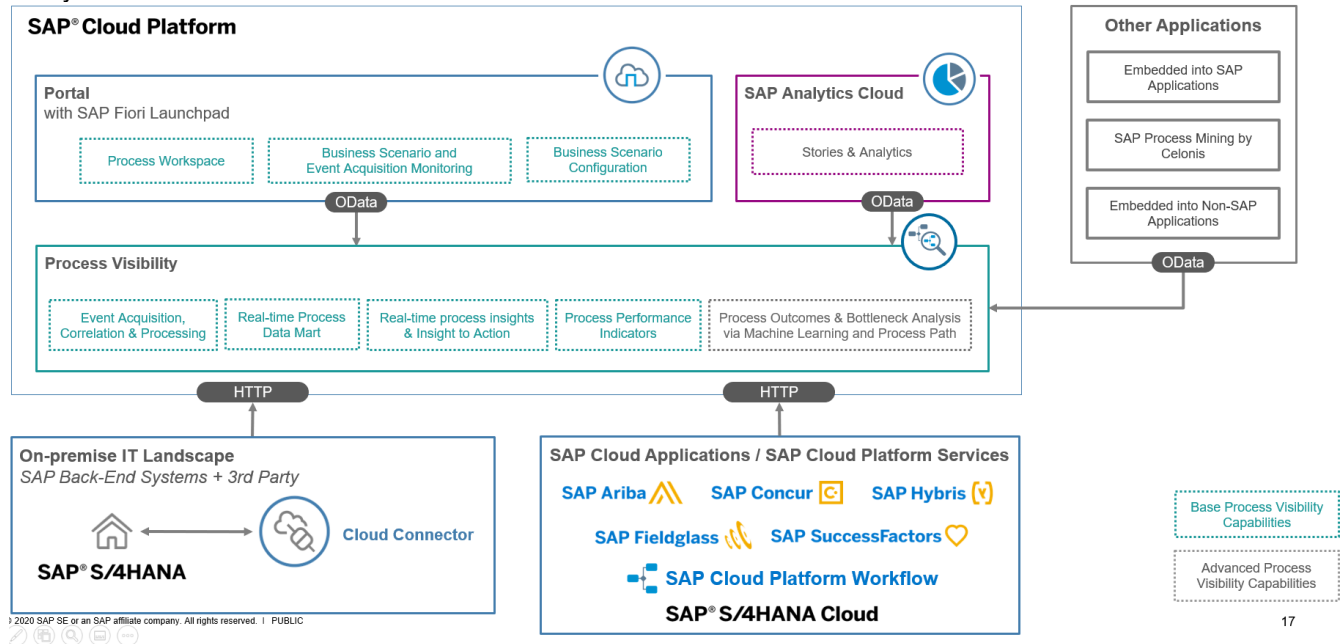
Create Workflow Instances.....32

Trigger Actions40

SUMMARY47

SAP Cloud Platform Workflow Management has Process Visibility capability enable customers to gain real time visibility into their end to end business process including insight to actions. Process visibility provides out of the box visibility into SAP Cloud Platform Workflow, Processes executing in other transactional systems, integration with SAP Business Workflow and Qualtrics.

Process Visibility offers REST/oData APIs to consume transactional events from different Line of business applications. It is possible to consume process visibility scenario data and integrate with other solutions like SAP Analytics Cloud.



17

SCENARIO

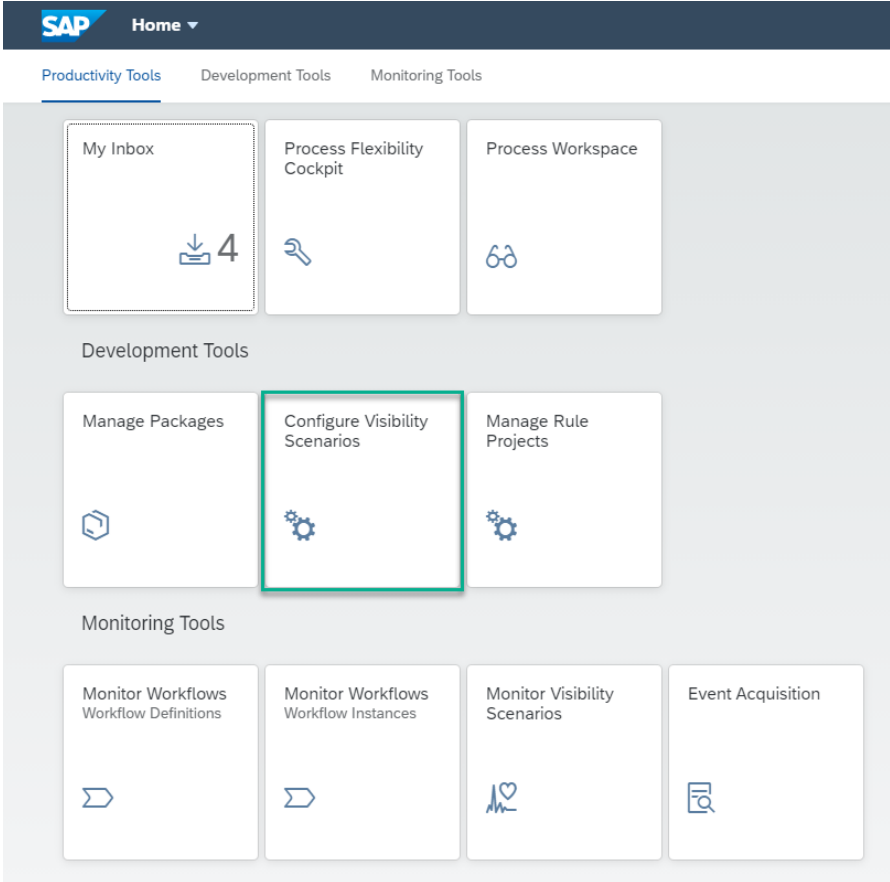
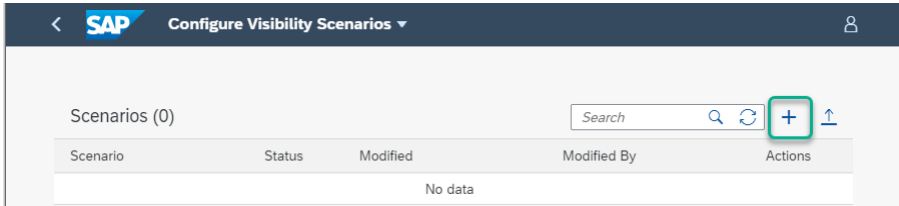
In this guide you will create a process visibility scenario based on a Cloud Platform Workflow Model. You will learn the following in this exercise.

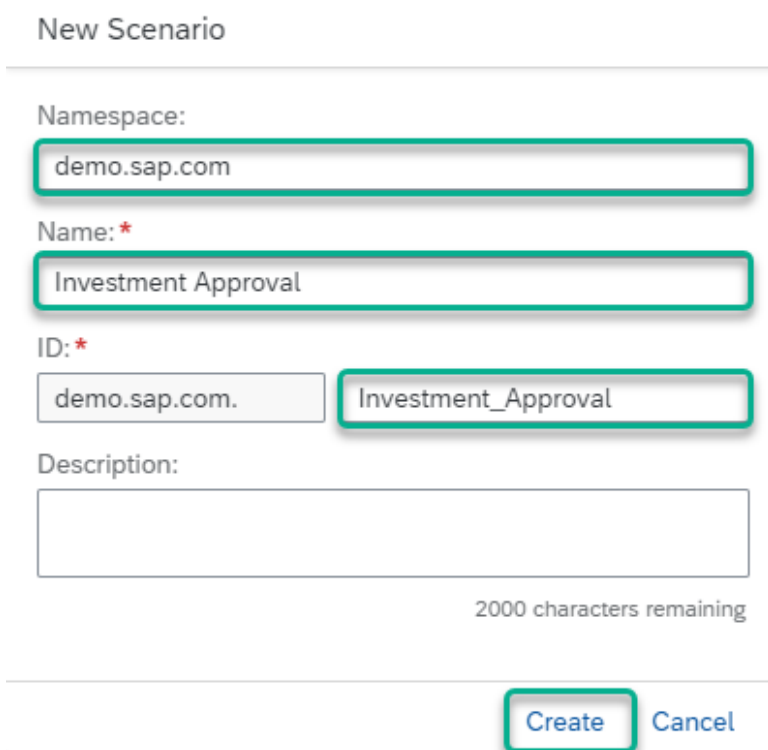
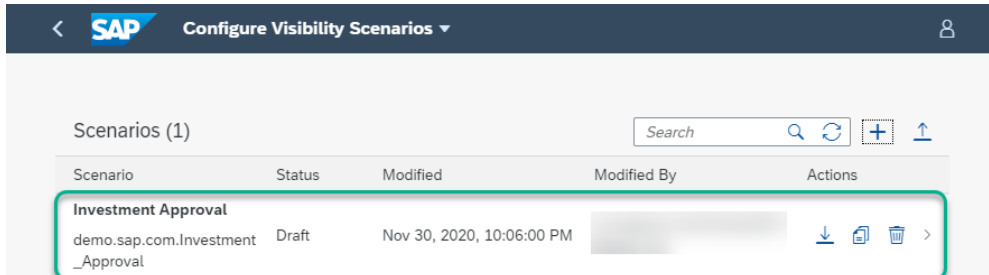
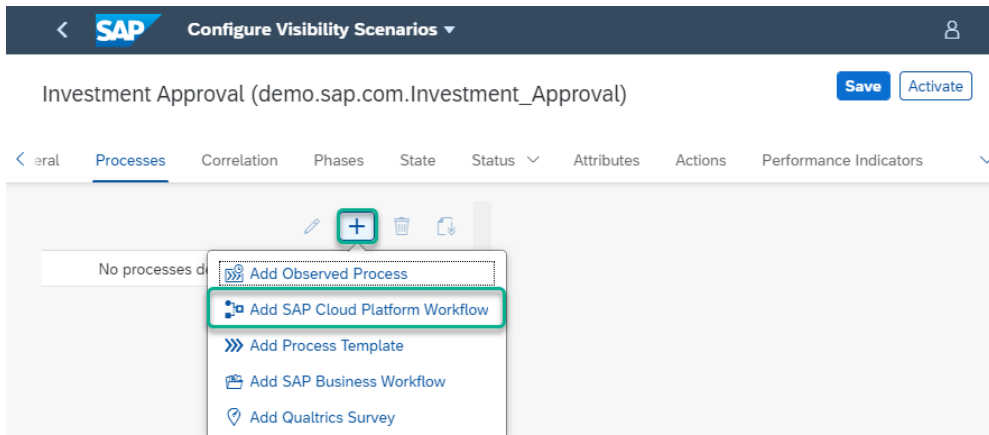
- Model Process visibility scenario
- Configure Calculated attributes.
- Configure Insight to Actions.
- Configure Process Performance Indicators.
- Deploy and Consume the process visibility scenario.
- Process Workspace
- Trigger Actions

Prerequisite

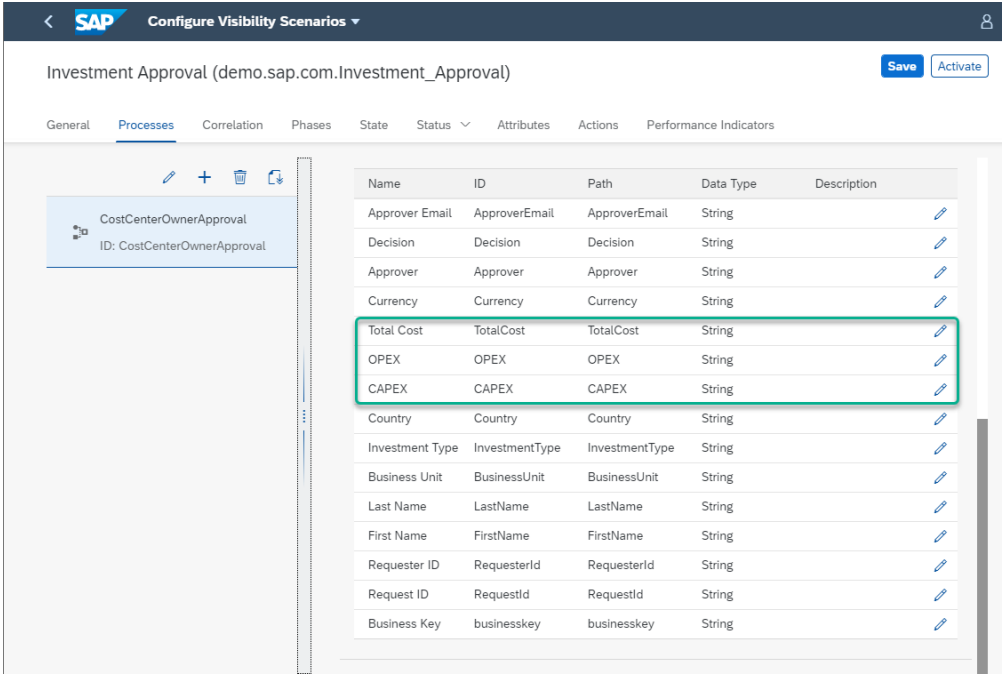
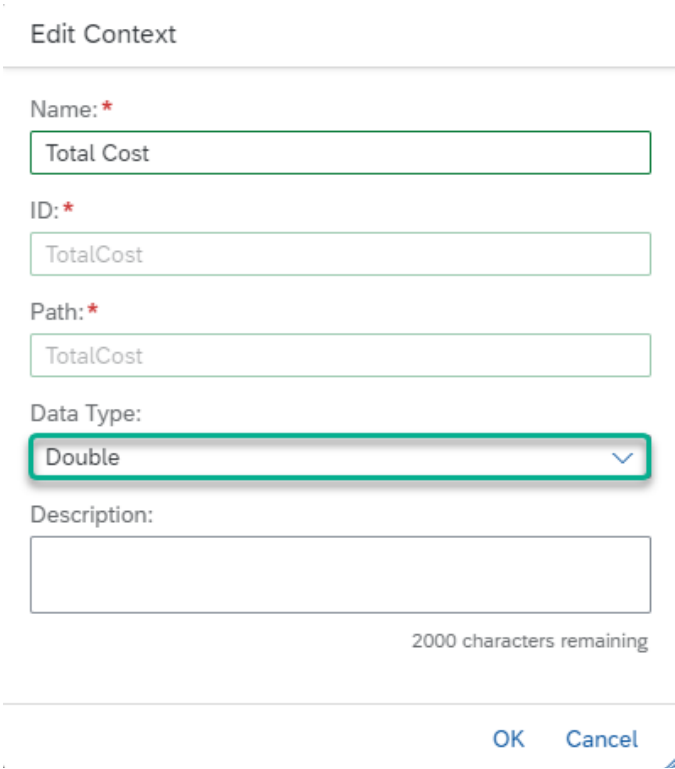
You must complete [Model Investment Approval Workflow](#) before starting this exercise.

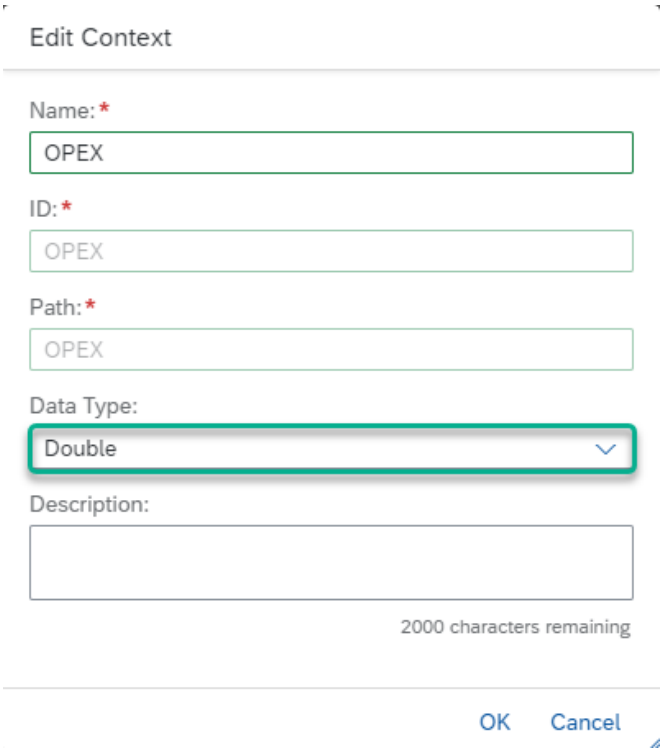
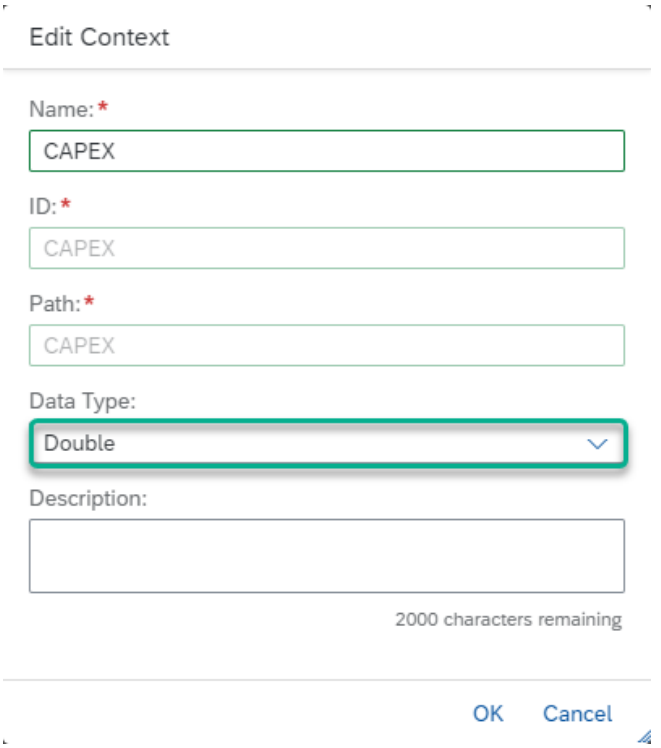
Explanation	Screenshot
<div>1. Select Subscriptions from your Cloud Platform Subaccount.</div> <div>2. Search Workflow Management and click the link Go to Application.</div> <div>3. A new browser window is opened, and Workflow Management Fiori Launch Pad is available.</div>	<p>The screenshot shows the SAP Cloud Platform Cockpit interface. On the left, a navigation menu lists various services: Overview, Services, Subscriptions (highlighted with a green box), Cloud Foundry, Connectivity, Security, Entitlements, and Usage Analytics. The main content area displays the 'Subaccount: DEV264 - Subscriptions' with 'All: 2' items. Under the 'Extension Suite - Development Efficiency' section, 'SAP Business Application Studio' is listed as 'Subscribed' with a 'Go to Application' link. Under the 'Extension Suite - Digital Process Automation' section, 'Workflow Management' is listed as 'Subscribed' with a 'Go to Application' link (highlighted with a green box). The text 'saas-application' is visible below the Workflow Management card.</p>

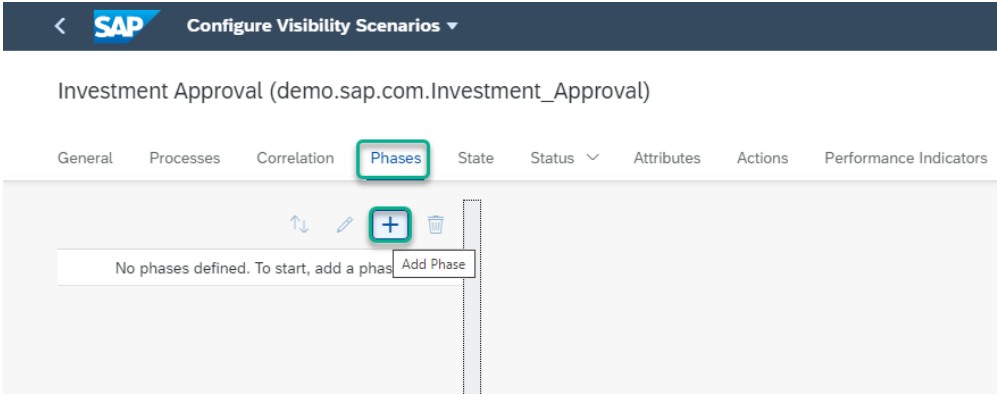
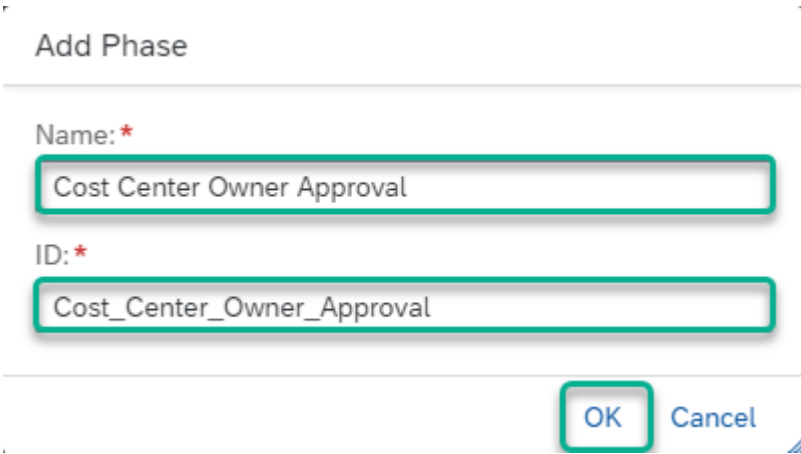
Explanation	Screenshot
<p>Create Scenario</p> <p>4. Click Configure Visibility Scenarios.</p> <p>Configure Visibility scenario enable you to create a new process visibility scenario.</p>	 <p>The screenshot shows the SAP Home dashboard. At the top, there's a navigation bar with 'SAP' logo and 'Home' dropdown. Below it are tabs for 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The main area displays several tiles: 'My Inbox' (with a download icon and '4'), 'Process Flexibility Cockpit' (with a wrench icon), 'Process Workspace' (with a glasses icon), 'Manage Packages' (with a cube icon), 'Configure Visibility Scenarios' (with a gear icon, highlighted with a red border), and 'Manage Rule Projects' (with a gear icon). Below these are 'Monitoring Tools' including 'Monitor Workflows Workflow Definitions', 'Monitor Workflows Workflow Instances', 'Monitor Visibility Scenarios', and 'Event Acquisition'.</p>
<p>5. Click + button to create a new scenario.</p>	 <p>The screenshot shows the 'Configure Visibility Scenarios' page. It has a header with 'SAP' logo, 'Configure Visibility Scenarios' dropdown, and a user icon. Below the header, there's a section 'Scenarios (0)' with a search bar and a '+' button (highlighted with a red border) next to a refresh icon. Below this is a table with columns: 'Scenario', 'Status', 'Modified', 'Modified By', and 'Actions'. The table is currently empty, showing 'No data'.</p>

Explanation	Screenshot
<p>6. Enter the following.</p> <p>Namespace: demo.sap.com Name: Investment Approval.</p> <p>7. Click Create button.</p>	
<p>8. Select the Investment Approval scenario enable navigation to the scenario editor.</p>	
<p>9. Click the + button and Select Add SAP Cloud Platform Workflow.</p> <p>Process visibility provides out of the box integration with SAP Cloud Platform Workflow.</p>	

Explanation	Screenshot
10. Select CostCetnerOwnerApproval Workflow.	<div><div>Add SAP Cloud Platform Workflow</div><div><div>Search</div><div><div>CostCenterOwnerApproval</div><div>ID: CostCenterOwnerApproval</div></div><div><div>NotifyProcessAdministrators</div><div>ID: NotifyProcessAdministrators</div></div><div><div>RestartCostCenterOwnerApproval</div><div>ID: RestartCostCenterOwnerApproval</div></div></div><div>Cancel</div></div>

Explanation	Screenshot																																																																																
<div>11. The workflow details are imported, and you can see workflow events and workflow attributes.</div> <div>12. Select attribute Total Cost and click the Edit icon.</div>	<div><p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface. The 'Processes' tab is active, displaying a table of attributes for the 'Investment Approval' scenario. The table has columns: Name, ID, Path, Data Type, and Description. The 'Total Cost' attribute is highlighted with a green box, and its edit icon (pencil) is also highlighted. Other attributes include Approver Email, Decision, Approver, Currency, OPEX, CAPEX, Country, Investment Type, Business Unit, Last Name, First Name, Requester ID, Request ID, and Business Key.</p><table><tr><th>Name</th><th>ID</th><th>Path</th><th>Data Type</th><th>Description</th></tr><tr><td>Approver Email</td><td>ApproverEmail</td><td>ApproverEmail</td><td>String</td><td></td></tr><tr><td>Decision</td><td>Decision</td><td>Decision</td><td>String</td><td></td></tr><tr><td>Approver</td><td>Approver</td><td>Approver</td><td>String</td><td></td></tr><tr><td>Currency</td><td>Currency</td><td>Currency</td><td>String</td><td></td></tr><tr><td>Total Cost</td><td>TotalCost</td><td>TotalCost</td><td>String</td><td></td></tr><tr><td>OPEX</td><td>OPEX</td><td>OPEX</td><td>String</td><td></td></tr><tr><td>CAPEX</td><td>CAPEX</td><td>CAPEX</td><td>String</td><td></td></tr><tr><td>Country</td><td>Country</td><td>Country</td><td>String</td><td></td></tr><tr><td>Investment Type</td><td>InvestmentType</td><td>InvestmentType</td><td>String</td><td></td></tr><tr><td>Business Unit</td><td>BusinessUnit</td><td>BusinessUnit</td><td>String</td><td></td></tr><tr><td>Last Name</td><td>LastName</td><td>LastName</td><td>String</td><td></td></tr><tr><td>First Name</td><td>FirstName</td><td>FirstName</td><td>String</td><td></td></tr><tr><td>Requester ID</td><td>RequesterId</td><td>RequesterId</td><td>String</td><td></td></tr><tr><td>Request ID</td><td>RequestId</td><td>RequestId</td><td>String</td><td></td></tr><tr><td>Business Key</td><td>businesskey</td><td>businesskey</td><td>String</td><td></td></tr></table></div>	Name	ID	Path	Data Type	Description	Approver Email	ApproverEmail	ApproverEmail	String		Decision	Decision	Decision	String		Approver	Approver	Approver	String		Currency	Currency	Currency	String		Total Cost	TotalCost	TotalCost	String		OPEX	OPEX	OPEX	String		CAPEX	CAPEX	CAPEX	String		Country	Country	Country	String		Investment Type	InvestmentType	InvestmentType	String		Business Unit	BusinessUnit	BusinessUnit	String		Last Name	LastName	LastName	String		First Name	FirstName	FirstName	String		Requester ID	RequesterId	RequesterId	String		Request ID	RequestId	RequestId	String		Business Key	businesskey	businesskey	String	
Name	ID	Path	Data Type	Description																																																																													
Approver Email	ApproverEmail	ApproverEmail	String																																																																														
Decision	Decision	Decision	String																																																																														
Approver	Approver	Approver	String																																																																														
Currency	Currency	Currency	String																																																																														
Total Cost	TotalCost	TotalCost	String																																																																														
OPEX	OPEX	OPEX	String																																																																														
CAPEX	CAPEX	CAPEX	String																																																																														
Country	Country	Country	String																																																																														
Investment Type	InvestmentType	InvestmentType	String																																																																														
Business Unit	BusinessUnit	BusinessUnit	String																																																																														
Last Name	LastName	LastName	String																																																																														
First Name	FirstName	FirstName	String																																																																														
Requester ID	RequesterId	RequesterId	String																																																																														
Request ID	RequestId	RequestId	String																																																																														
Business Key	businesskey	businesskey	String																																																																														
<div>13. Change the Data Type as Double.</div> <div>14. Click OK button.</div>	<div><p>The screenshot shows the 'Edit Context' dialog box for the 'Total Cost' attribute. The fields are: Name (Total Cost), ID (TotalCost), Path (TotalCost), Data Type (Double), and Description (empty). The 'Data Type' dropdown is highlighted with a green box. The 'OK' button is visible at the bottom right.</p><p>Name: *</p><p>Total Cost</p><p>ID: *</p><p>TotalCost</p><p>Path: *</p><p>TotalCost</p><p>Data Type:</p><p>Double</p><p>Description:</p><p>2000 characters remaining</p><p>OK Cancel</p></div>																																																																																

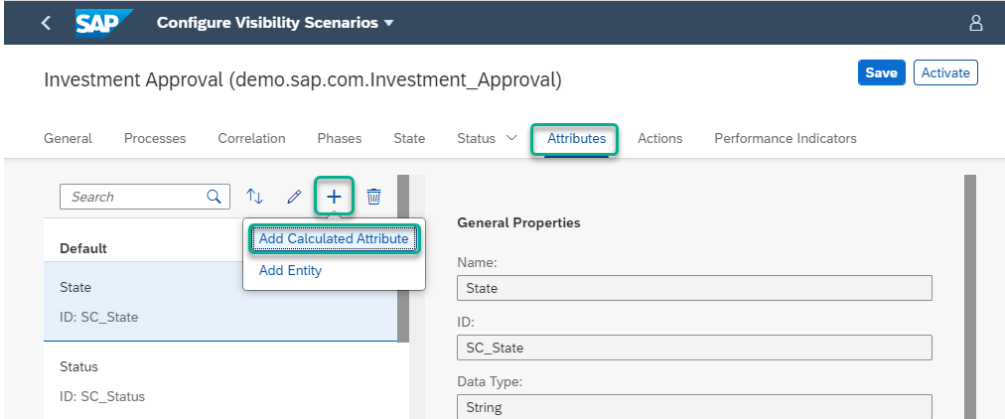
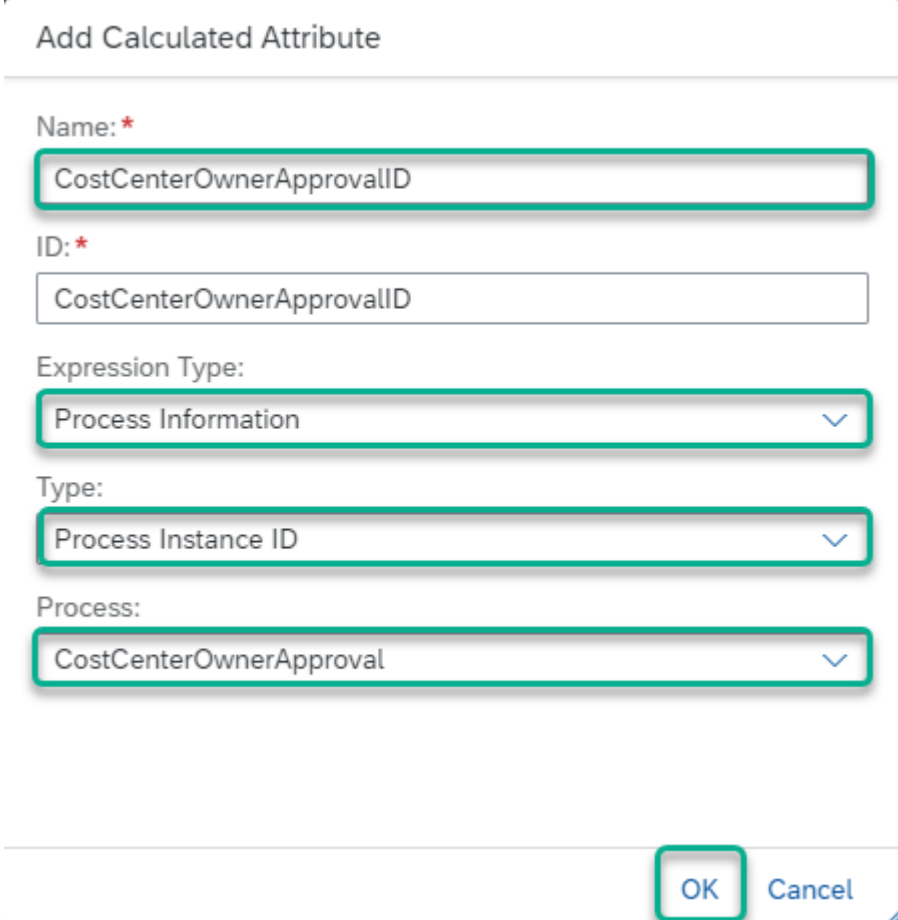
Explanation	Screenshot
15. Repeat the same for OPEX . 16. Change the Data Type as Double . 17. Click OK button.	
18. Repeat the same for CAPEX . 19. Change the Data Type as Double . 20. Click OK button.	

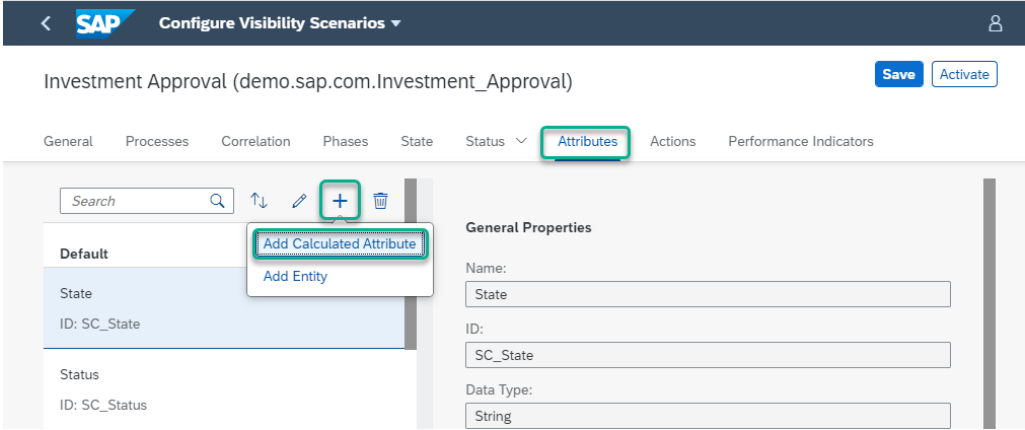
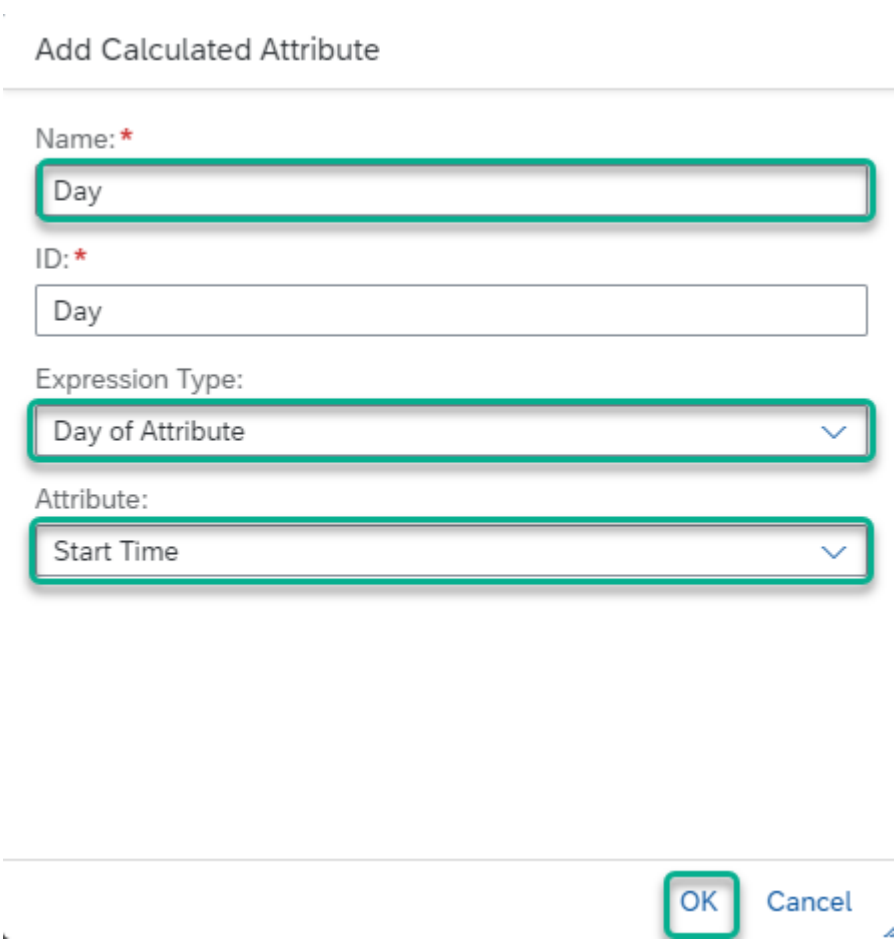
Explanation	Screenshot
<p>Configure Phases</p> <p>21. Click Phases tab. 22. Click the + button.</p> <p>A phase can be a group of activities, add value to the process and meaningful from business point of view. A scenario can have multiple phases.</p>	 <p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval (demo.sap.com.Investment_Approval)'. The 'Phases' tab is selected. A message box states 'No phases defined. To start, add a phase' with an 'Add Phase' button. A green box highlights the '+' icon in the toolbar.</p>
<p>23. Enter Name as Cost Center Owner Approval. 24. Click OK button.</p>	 <p>The screenshot shows the 'Add Phase' dialog box. The 'Name' field is filled with 'Cost Center Owner Approval' and the 'ID' field is filled with 'Cost_Center_Owner_Approval'. Both fields are highlighted with green boxes. The 'OK' button is also highlighted with a green box.</p>

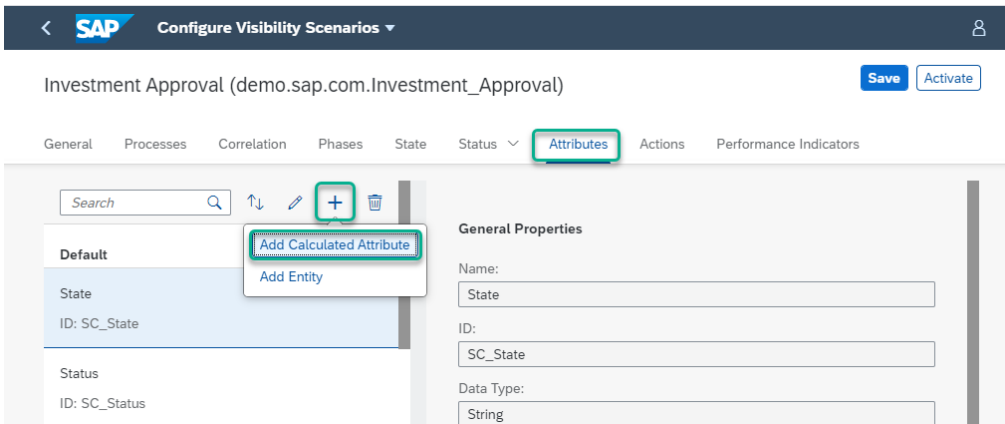
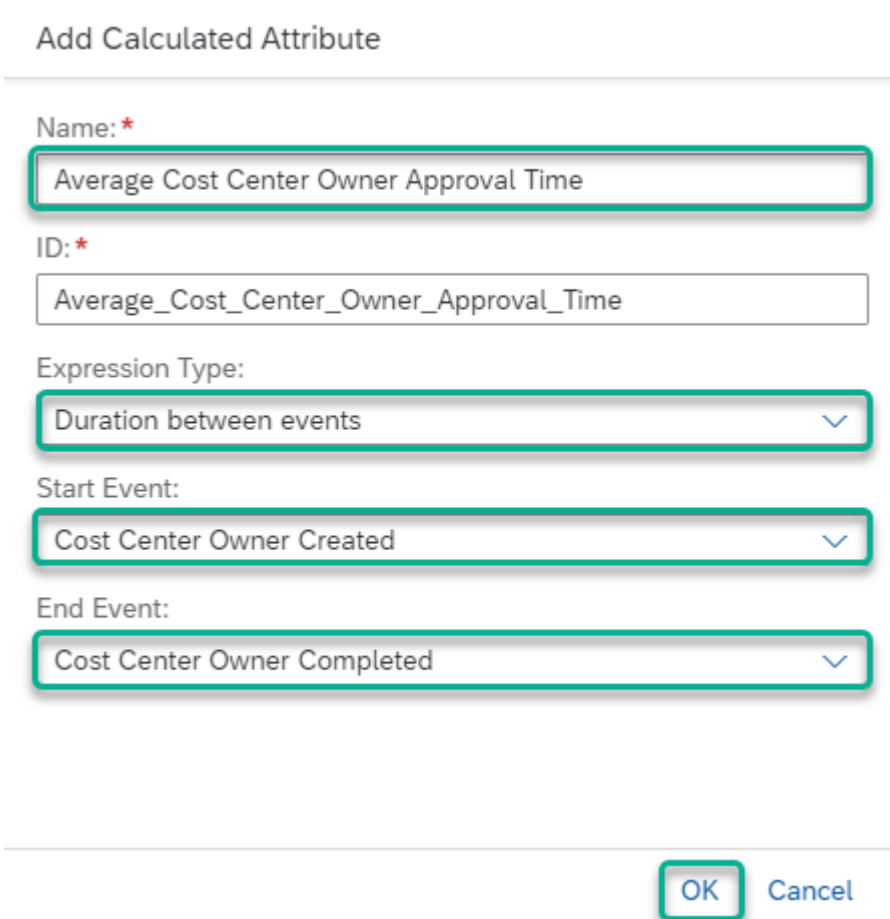
Explanation	Screenshot
25. Select Cost Center Owner Created as Start Events.	

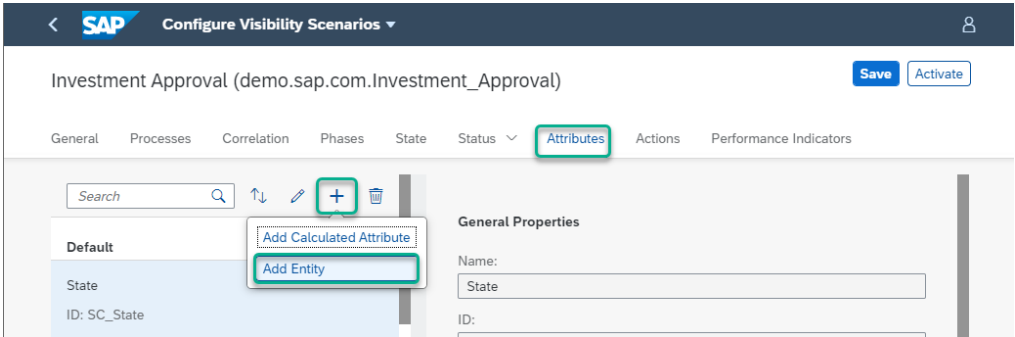
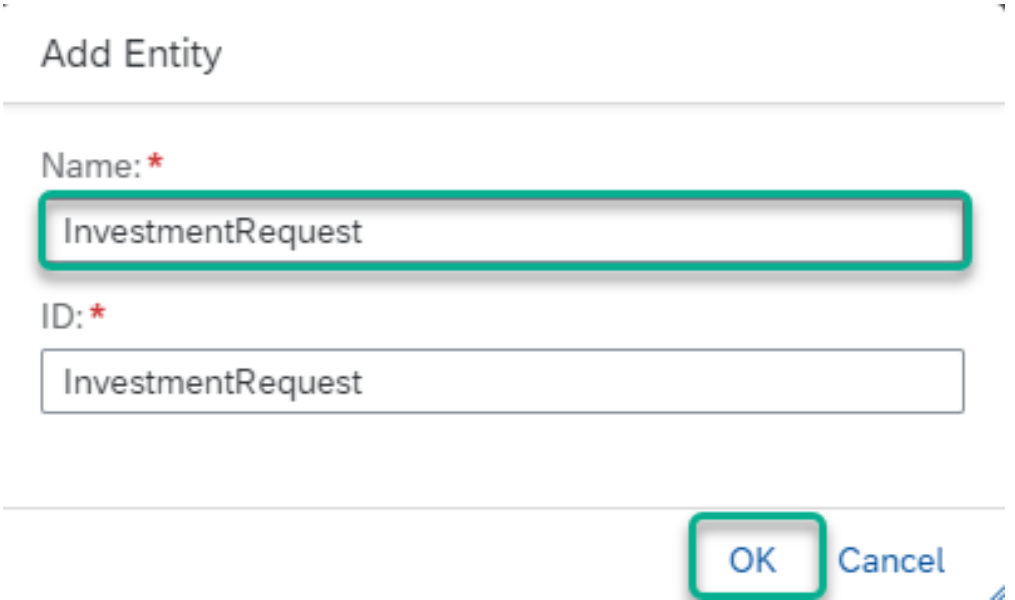
Explanation	Screenshot
26. Select Cost Center Owner Completed as End Events.	

Explanation	Screenshot
<p>27. Select Status tab and set Target Value as 1 day.</p> <p>It is possible to configure the target a dynamic value using a date or datetime attribute.</p>	<p>The screenshot displays the SAP 'Configure Visibility Scenarios' interface for the 'Investment Approval' scenario. The 'Status' tab is selected, showing configuration options for the 'Target' and 'Sub-Status'.</p> <p>Target Configuration:</p> <ul style="list-style-type: none">Target Type: ConstantTarget Value: 1 Days (The value '1' is highlighted with a red box)Threshold: 80 % <p>Sub-Status Configuration:</p> <ul style="list-style-type: none">Name: CriticalID: CRITICALDescription: Status of the instance is critical when one of the sub-statuses defined evaluates to true. <p>The 'Sub-Status' list on the left includes: Critical (expanded), Workflow Failed, Workflow Suspended, Overdue, At Risk (expanded), Threshold Violation, On Track (expanded), On Time, Completed with violations (expanded), Completed with time violations, Completed without violations, and Completed.</p>

Explanation	Screenshot
<p>Configure Calculated Attributes</p> <p>28. Select Attributes tab.</p> <p>29. Click + button and Select Add Calculated Attribute.</p> <p>A calculated Attribute enable to define new attributes based on events or process context attributes.</p> <p>Please go through help portal to know more about Attributes.</p>	 <p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval (demo.sap.com.Investment_Approval)'. The 'Attributes' tab is selected. A list of attributes is shown on the left, including 'State' (ID: SC_State) and 'Status' (ID: SC_Status). A '+' button is highlighted, and a dropdown menu shows 'Add Calculated Attribute' and 'Add Entity'. The 'General Properties' section on the right shows fields for Name, ID, and Data Type.</p>
<p>30. Enter the following details</p> <p>Name: CostCenterOwnerApprovalID</p> <p>Expression Type: Process Information</p> <p>Type: Process Instance ID</p> <p>Process: CostCenterOwnerApproval</p> <p>31. Click OK button.</p> <p>Process Information enable to access process Instance / Task Instance ID.</p>	 <p>The screenshot shows the 'Add Calculated Attribute' dialog box. The fields are filled with the following values:</p> <ul style="list-style-type: none"> Name: CostCenterOwnerApprovalID ID: CostCenterOwnerApprovalID Expression Type: Process Information Type: Process Instance ID Process: CostCenterOwnerApproval <p>The 'OK' button is highlighted at the bottom right.</p>

Explanation	Screenshot
<div>32. Select Attributes tab.</div> <div>33. Click + button and Select Add Calculated Attribute.</div>	 <p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval'. The 'Attributes' tab is selected. A list of attributes is shown on the left, including 'State' (ID: SC_State) and 'Status' (ID: SC_Status). A '+' button is highlighted, and a dropdown menu is open showing 'Add Calculated Attribute' and 'Add Entity'. The 'General Properties' section on the right shows fields for Name, ID, and Data Type.</p>
<div>34. Enter the following details</div> <div>Name: Day</div> <div>Expression Type: Day of Attribute</div> <div>Attribute: Start Time</div> <div>35. Click OK button.</div> <div>Day/Week/Month/Year of an attribute enable to get the respective values of a Date or Date Time attribute.</div>	 <p>The screenshot shows the 'Add Calculated Attribute' dialog. It contains four input fields: 'Name' (with a red asterisk) containing 'Day', 'ID' (with a red asterisk) containing 'Day', 'Expression Type' (a dropdown menu) containing 'Day of Attribute', and 'Attribute' (a dropdown menu) containing 'Start Time'. At the bottom right, there are 'OK' and 'Cancel' buttons. The 'OK' button is highlighted with a green box.</p>

Explanation	Screenshot
<p>36. Select Attributes tab.</p> <p>37. Click + button and Select Add Calculated Attribute.</p>	 <p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval (demo.sap.com.Investment_Approval)'. The 'Attributes' tab is selected. In the toolbar, the '+' button is highlighted, and a dropdown menu is open showing 'Add Calculated Attribute' and 'Add Entity'. The 'General Properties' section on the right shows fields for Name, ID, and Data Type.</p>
<p>38. Enter the following details</p> <p>Name: Average Cost Center Owner Approval Time</p> <p>Expression Type: Duration between events.</p> <p>Start Event: Cost Center Owner Created</p> <p>End Event: Cost Center Owner Completed</p> <p>39. Click OK button.</p> <p>Duration between events enable to calculate the time taken to execute two different transactions in a process Instance.</p>	 <p>The screenshot shows the 'Add Calculated Attribute' dialog box. The fields are as follows:</p> <ul style="list-style-type: none">Name: Average Cost Center Owner Approval TimeID: Average_Cost_Center_Owner_Approval_TimeExpression Type: Duration between eventsStart Event: Cost Center Owner CreatedEnd Event: Cost Center Owner Completed <p>At the bottom right, the 'OK' button is highlighted with a green box.</p>

Explanation	Screenshot
<div>40. Select Attributes tab.</div> <div>41. Click + button and Select Add Entity.</div>	 <p>The screenshot shows the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval'. The 'Attributes' tab is selected. A '+' button is highlighted with a green box, and a context menu is open showing 'Add Calculated Attribute' and 'Add Entity', with 'Add Entity' also highlighted by a green box. The 'General Properties' section on the right shows 'Name' as 'State' and 'ID' as 'SC_State'.</p>
<div>42. Enter Name as InvestmentRequest.</div> <div>43. Click OK button.</div> <div>Entity enable to identify distinct process instances. Please go through the help documentation to know more about Entities.</div>	 <p>The screenshot shows the 'Add Entity' dialog box. The 'Name' field is labeled 'Name: *' and contains the text 'InvestmentRequest'. The 'ID' field is labeled 'ID: *' and also contains the text 'InvestmentRequest'. At the bottom right, the 'OK' button is highlighted with a green box, next to a 'Cancel' button.</p>

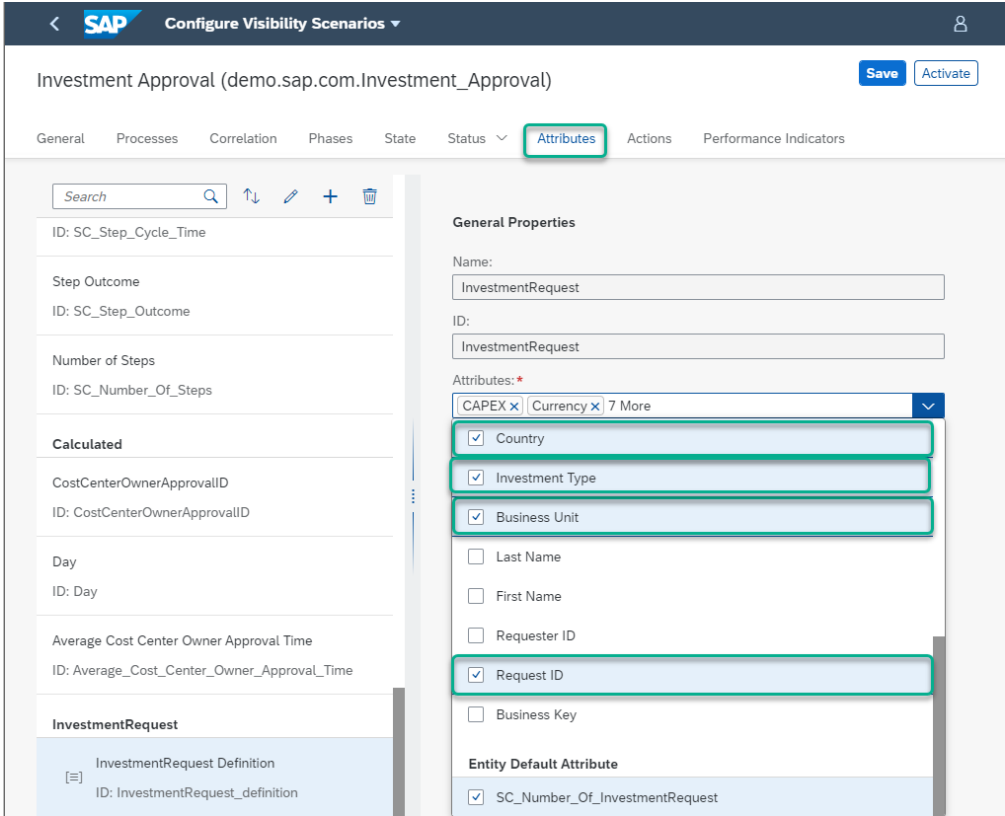
Explanation

44. Select the following attributes.

CAPEX, OPEX, Total Value, Country, Currency, Investment Type, Business Unit, Request ID

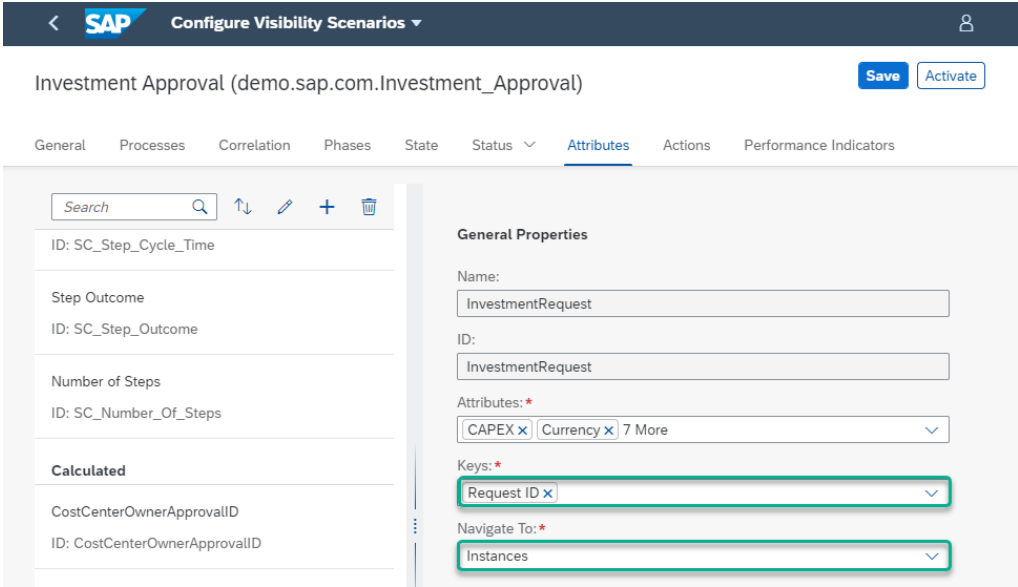
Select **SC_Number_Of_Investment Request** as **Entity Default Attribute**.

Screenshot



45. Select the following.

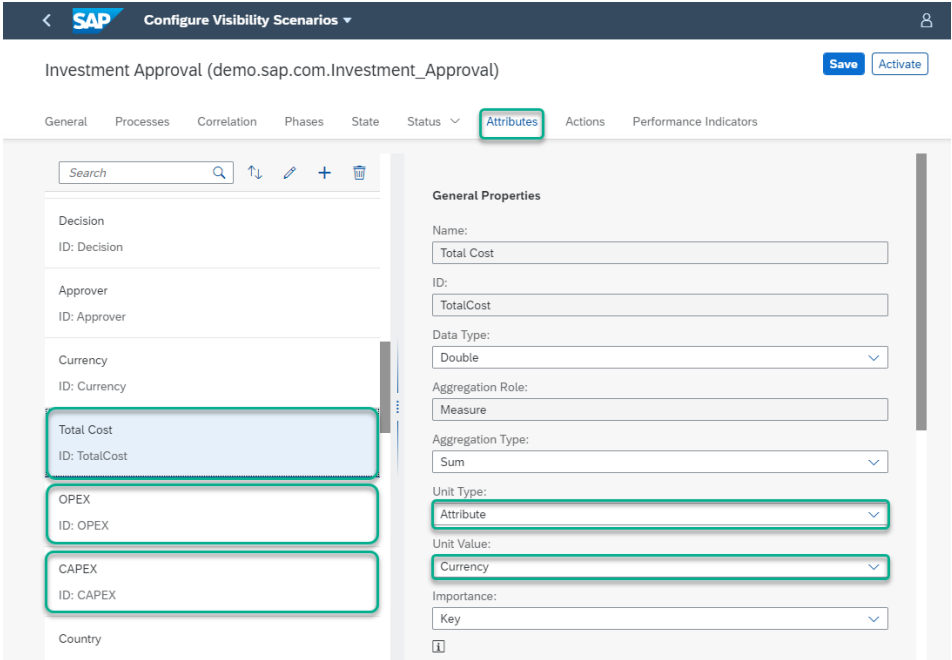
Keys: Request ID
Navigate To: Instances

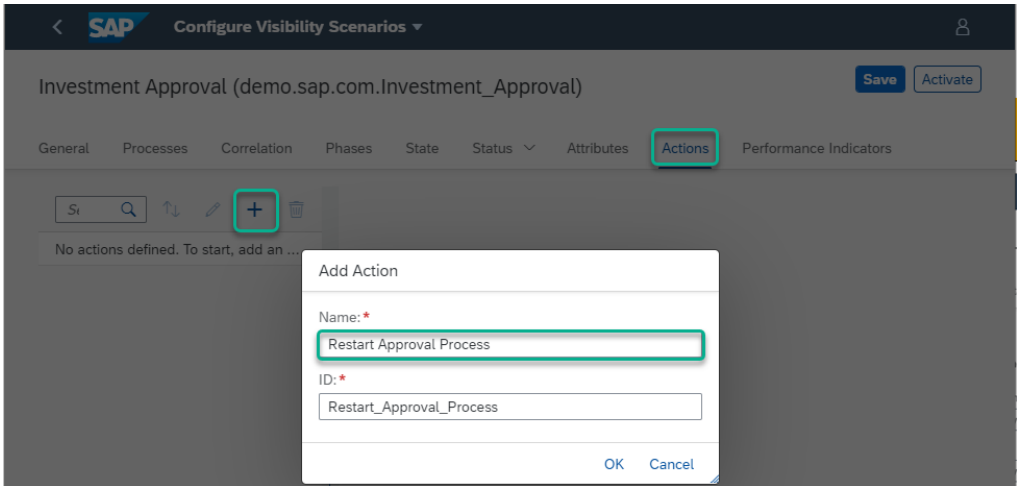
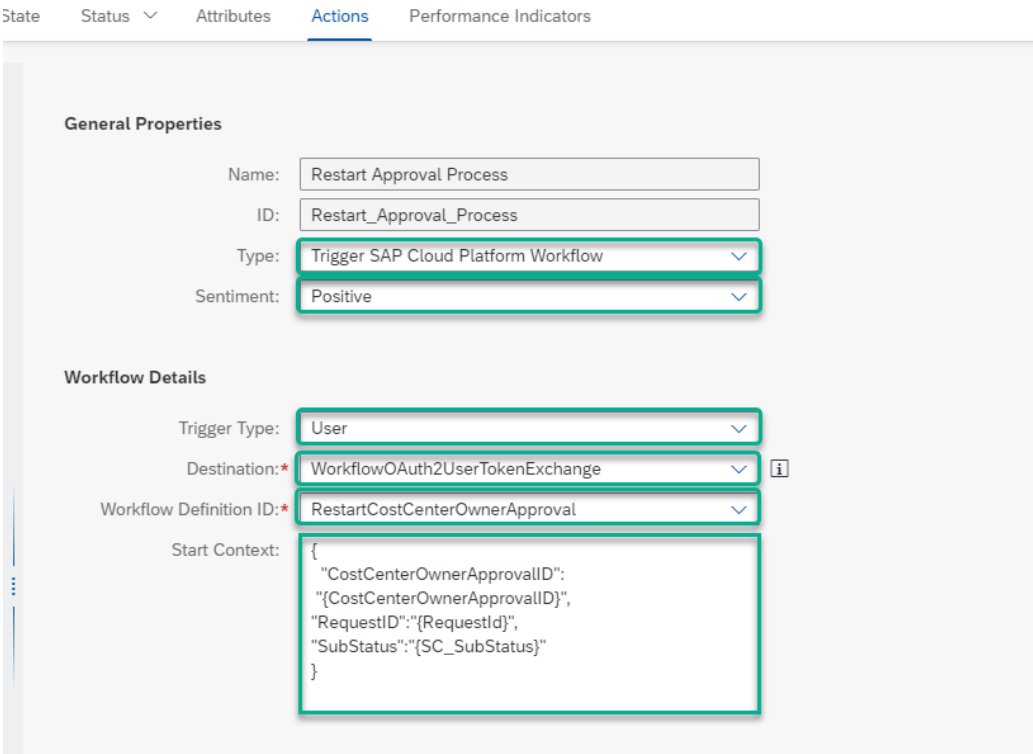


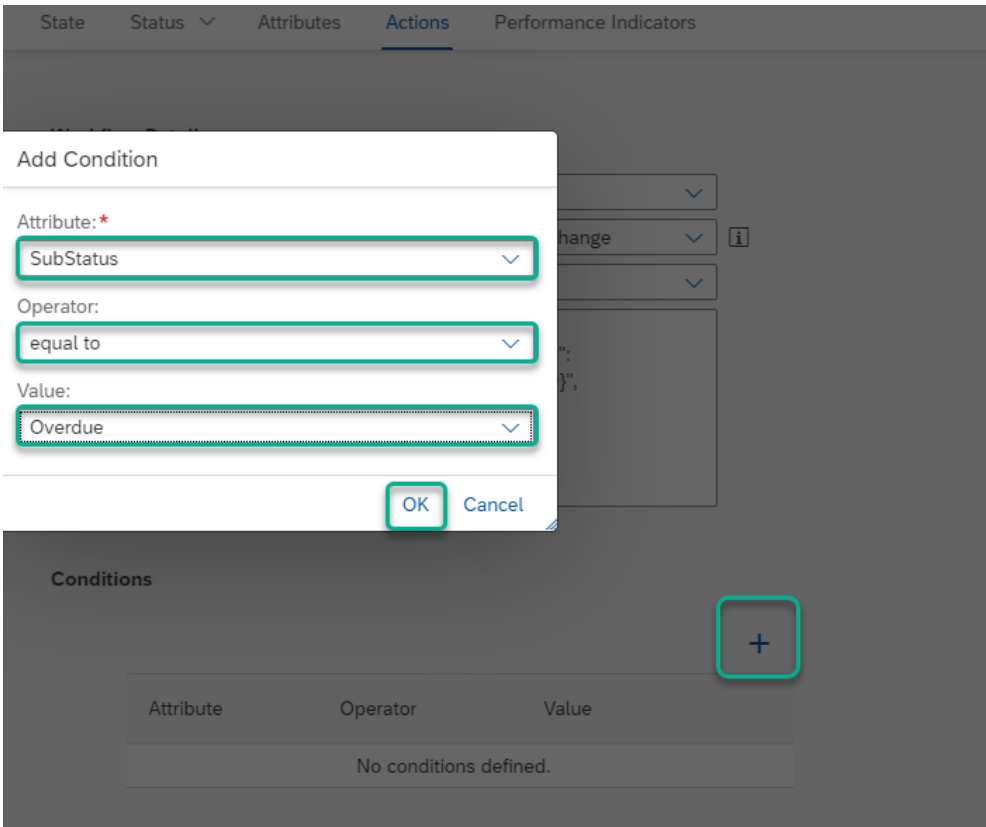
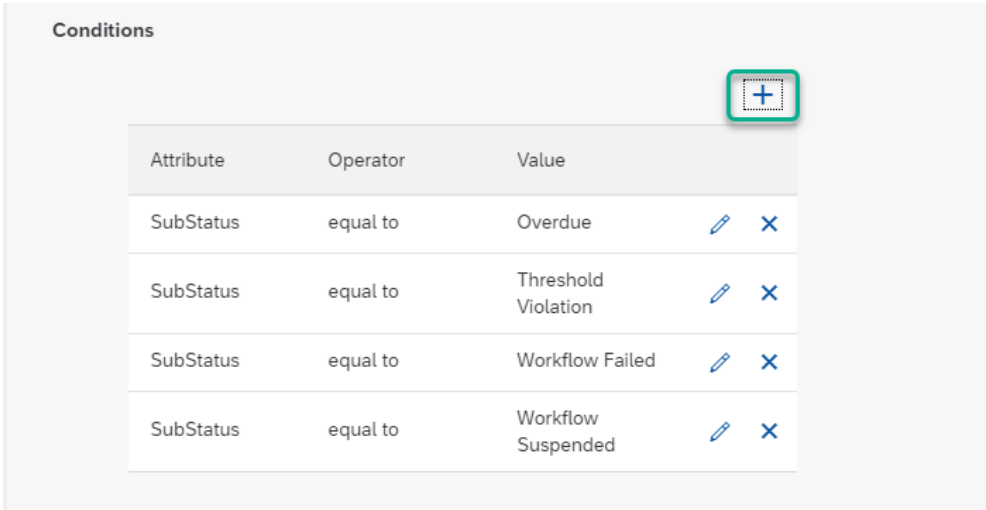
Explanation

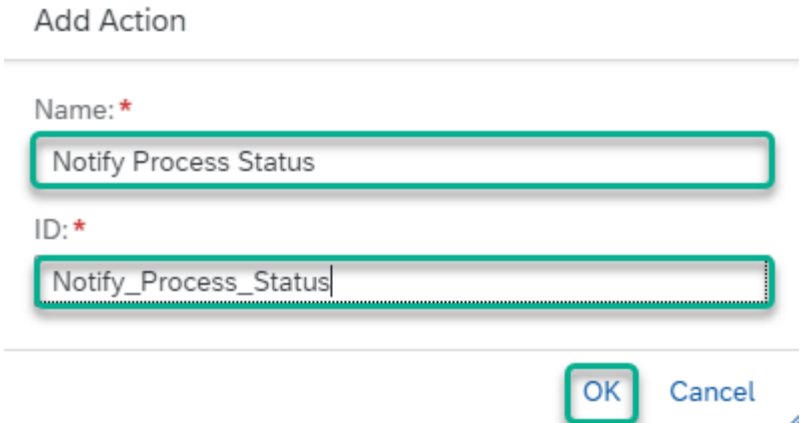
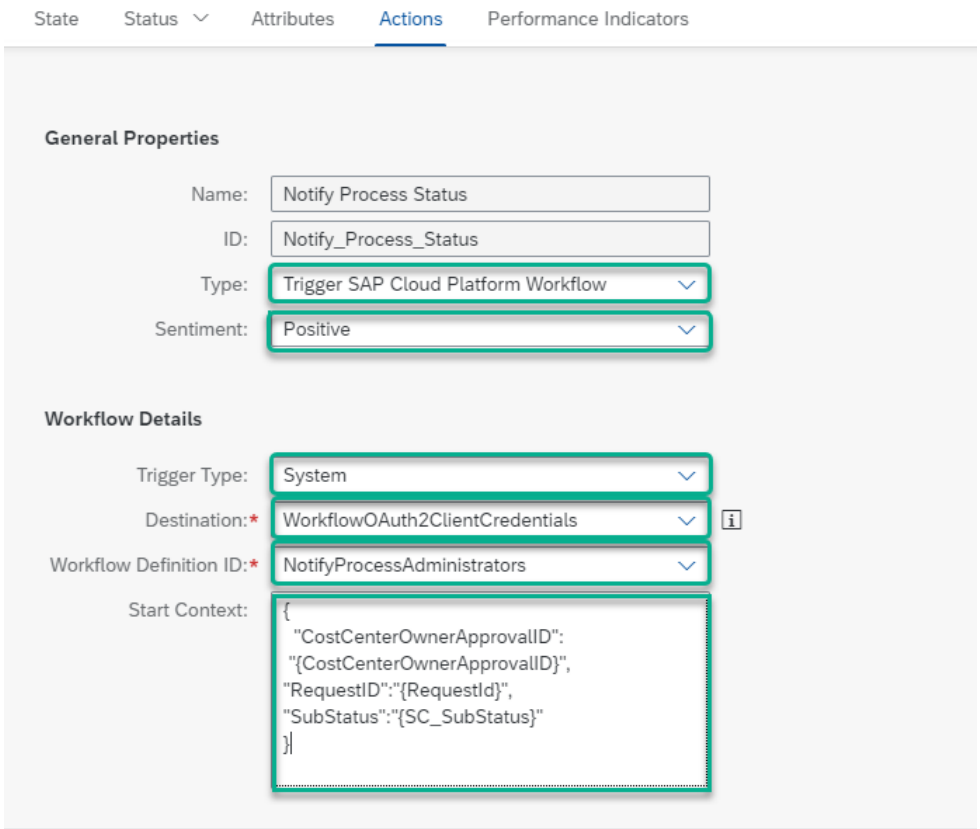
- 46. Select **Attributes**.
 - 47. Select **Total Cost**.
 - 48. Set **Unit Type** as **Attribute**.
 - 49. Set **Unit Value** as **Currency**.
- Repeat the same for **OPEX** and **CAPEX**.

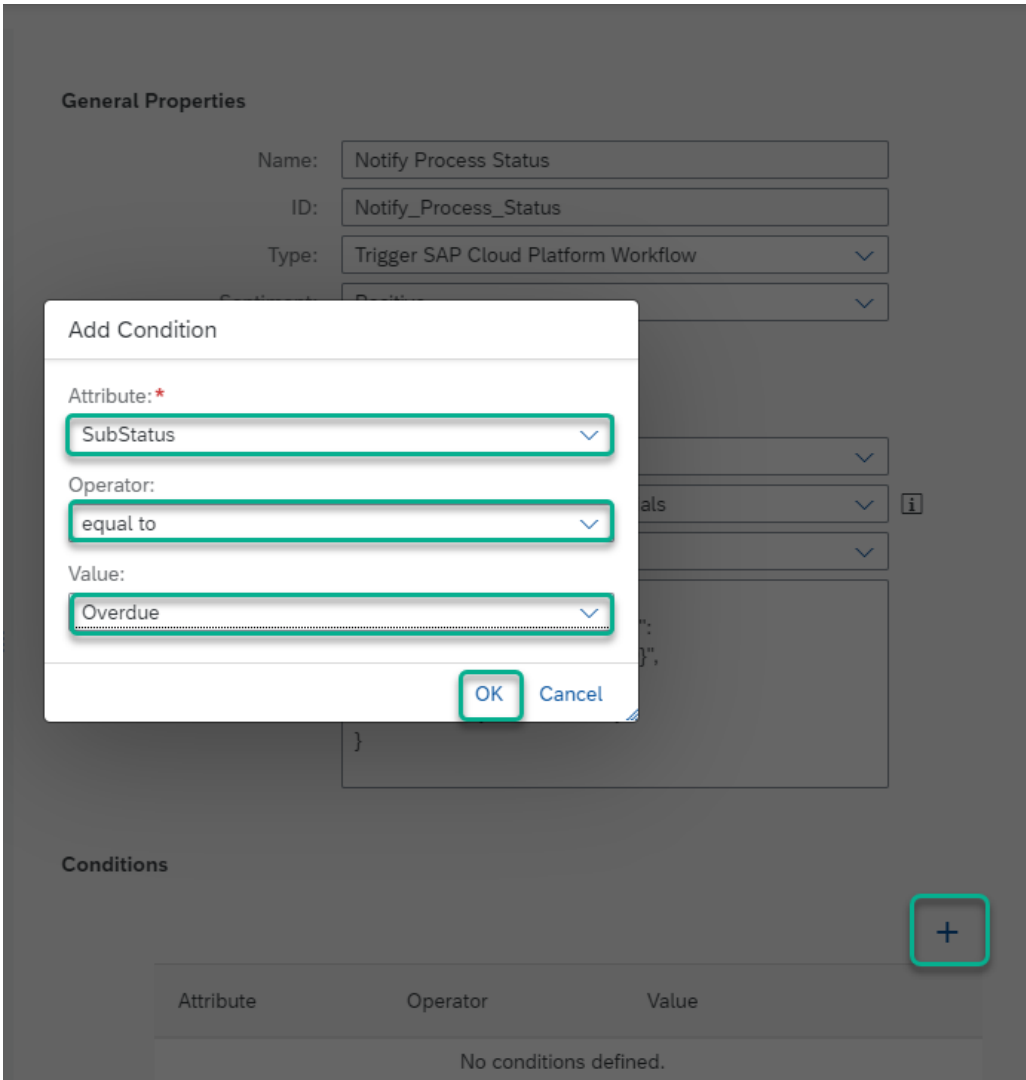
Screenshot

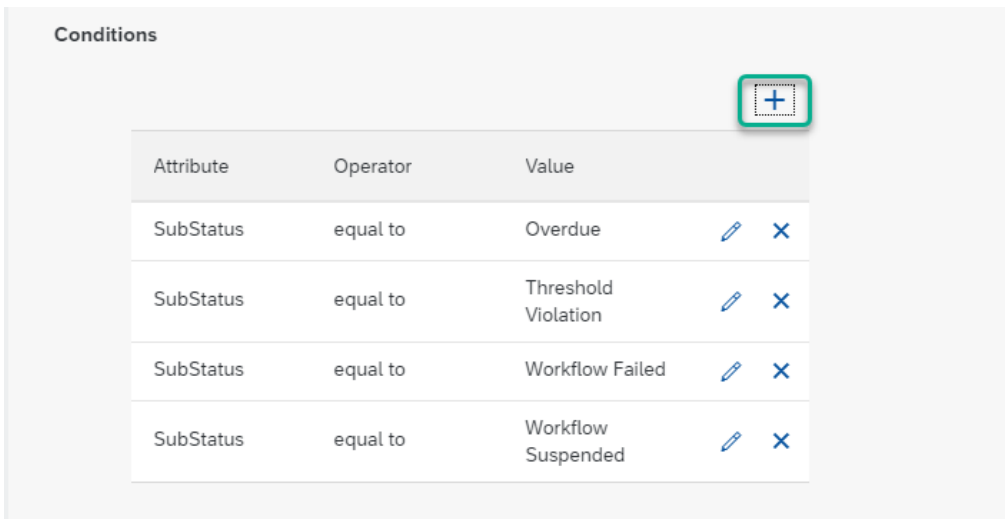
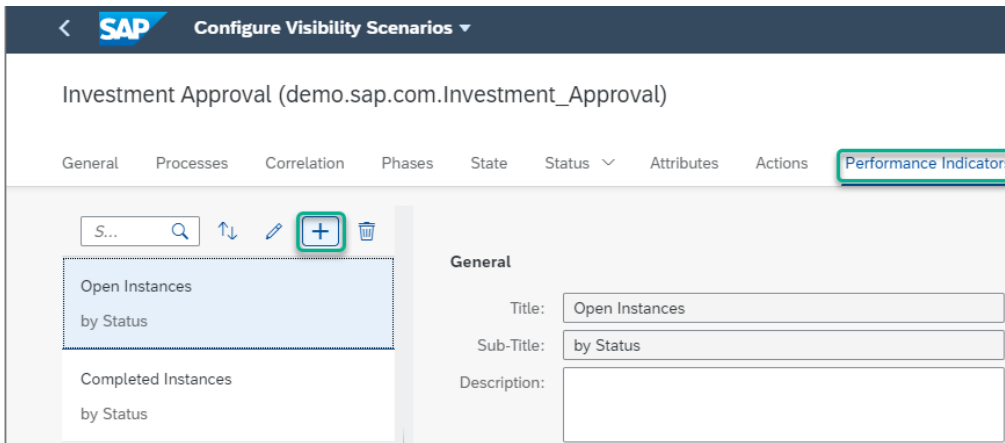
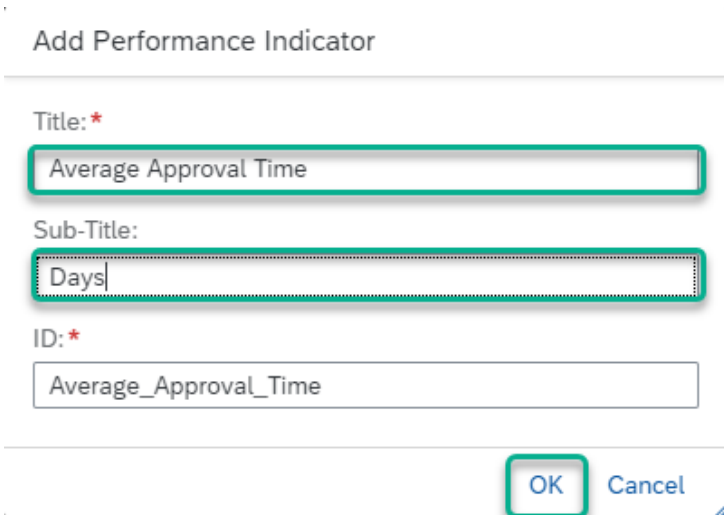


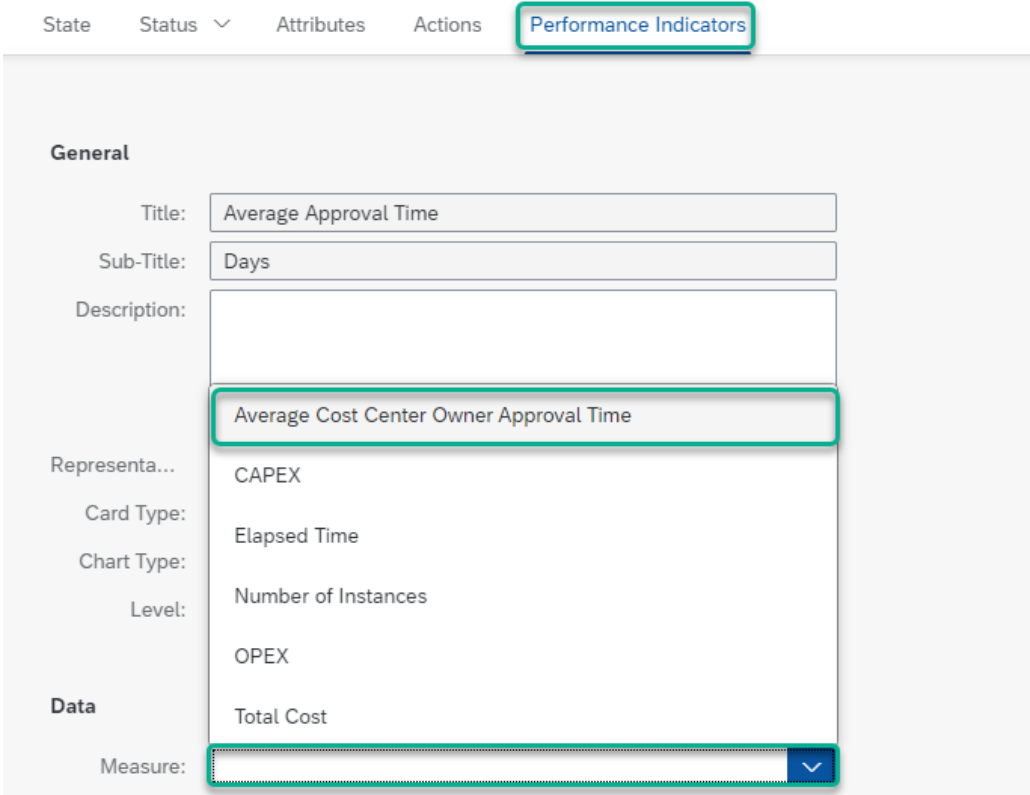
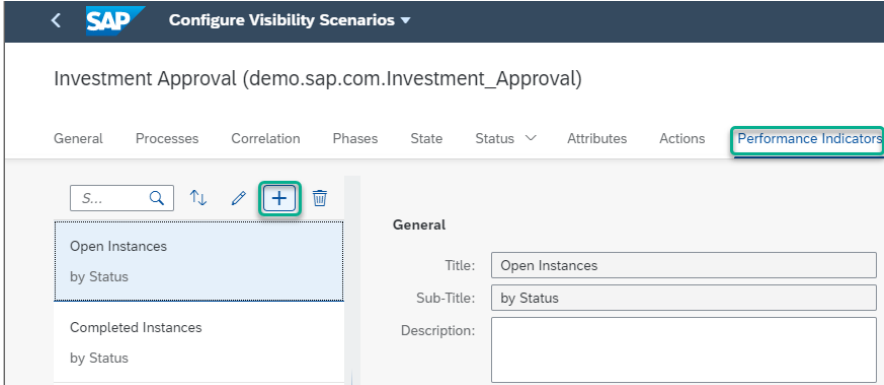
Explanation	Screenshot
<p>Configure Actions</p> <p>50. Select Actions.</p> <p>51. Click + button to add a new action.</p> <p>52. Enter Name Restart Approval Process.</p> <p>53. Click OK button.</p> <p>Actions enable to configure workflows to manage process status changes.</p> <p>Please go through help portal to know more about Actions.</p>	
<p>54. Enter the following Under General Properties and Workflow Details.</p> <p>Type: Trigger SAP Cloud Platform Workflow</p> <p>Sentiment: Positive</p> <p>Trigger Type: User</p> <p>Destination: WorkflowOAuth2UserTokenExchange</p> <p>Start Context:</p> <pre>{ "CostCenterOwnerApprovalID": "{CostCenterOwnerApprovalID}", "RequestID": "{RequestID}", "SubStatus": "{SC_SubStatus}" }</pre> <p>Copy and paste the start context JSON from the attached Visibility Start Context file.</p>	

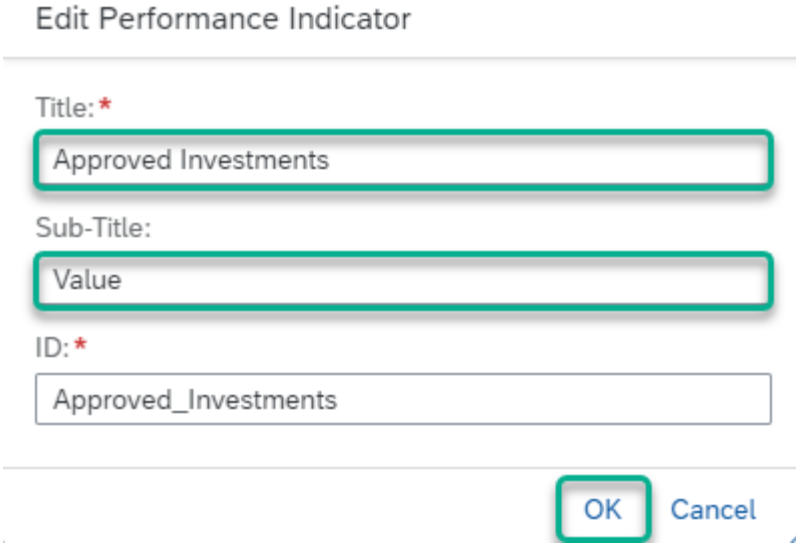
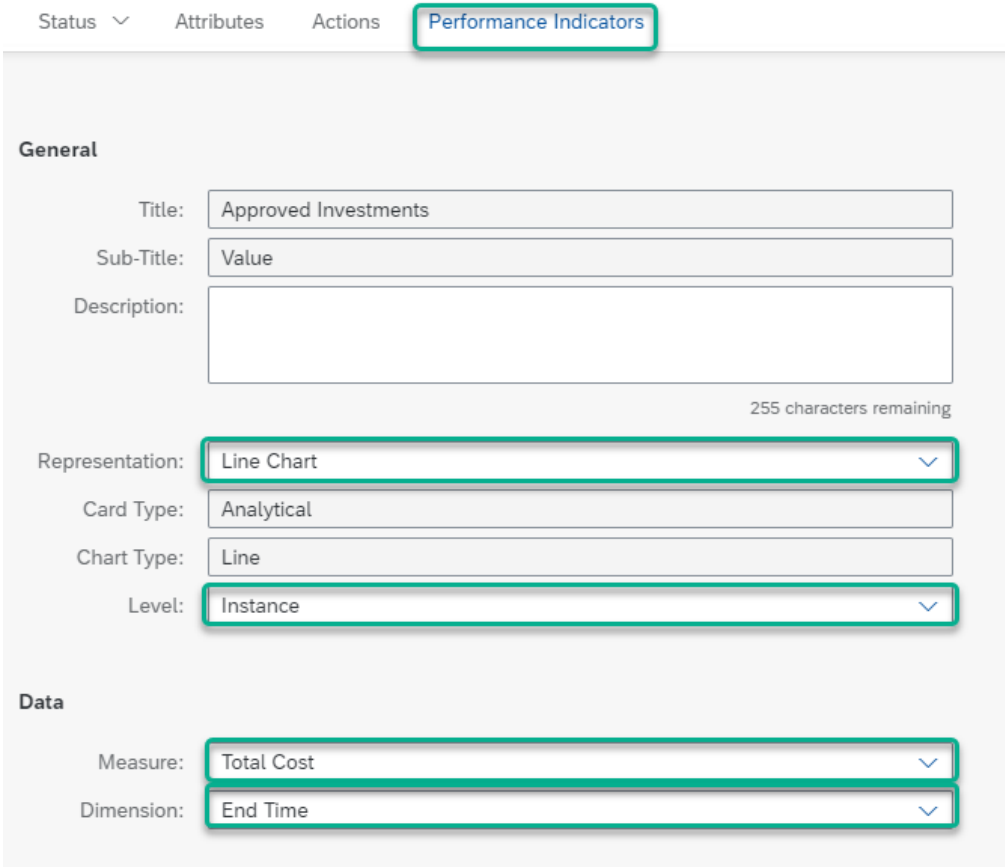
Explanation	Screenshot
<p>55. Click + button to add Conditions.</p> <p>56. Select the following conditions.</p> <p>Attribute: SubStatus Operator: equal to Value: Overdue</p> <p>57. Click OK button.</p>	
<p>58. Click + button to add three more Conditions.</p> <p>Attribute: SubStatus Operator: equal to Value: Threshold Violation</p> <p>Attribute: SubStatus Operator: equal to Value: Workflow Failed</p> <p>Attribute: SubStatus Operator: equal to Value: Workflow Suspended</p>	

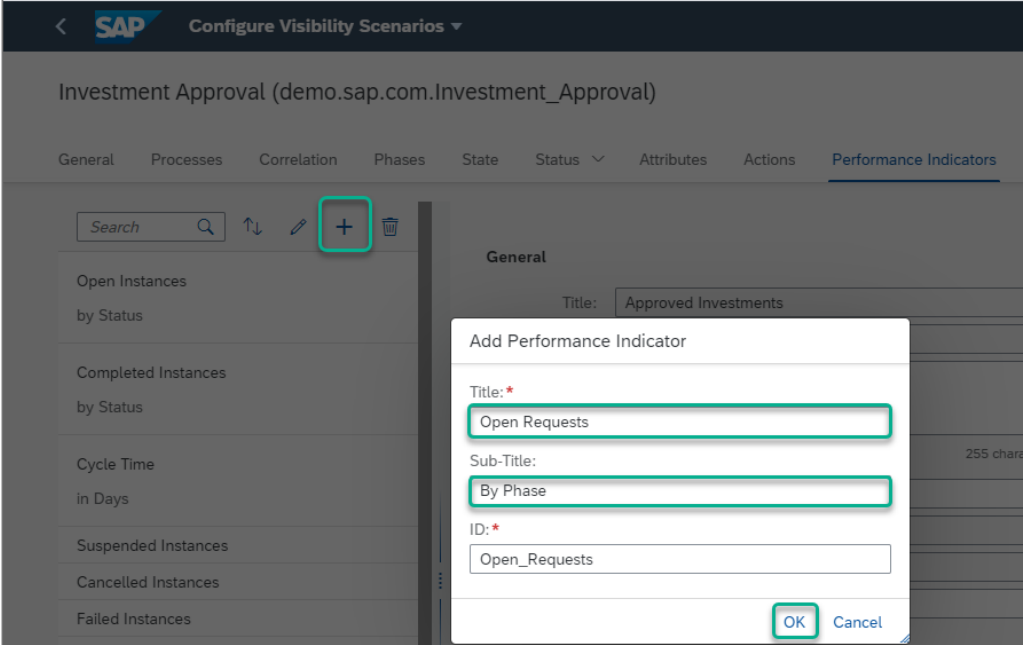
Explanation	Screenshot
<p>59. Select Actions.</p> <p>60. Click + button to add a new action.</p> <p>61. Enter Name as Notify Process Status.</p> <p>62. Click OK button.</p>	 <p>The screenshot shows the 'Add Action' dialog box. The 'Name' field contains 'Notify Process Status' and the 'ID' field contains 'Notify_Process_Status'. The 'OK' button is highlighted with a green box.</p>
<p>63. Enter the following Under General Properties and Workflow Details.</p> <p>Type: Trigger SAP Cloud Platform Workflow</p> <p>Sentiment: Positive</p> <p>Trigger Type: System</p> <p>Destination: WorkflowOAuth2ClientCredentials</p> <p>Start Context:</p> <pre>{ "CostCenterOwnerApprovalID": "{CostCenterOwnerApprovalID}", "RequestID": "{RequestID}", "SubStatus": "{SC_SubStatus}" }</pre> <p>Copy and paste the start context JSON from the attached Visibility Start Context file.</p>	 <p>The screenshot shows the 'Actions' tab in the configuration interface. The 'General Properties' section shows the following values:</p> <ul style="list-style-type: none"> Name: Notify Process Status ID: Notify_Process_Status Type: Trigger SAP Cloud Platform Workflow Sentiment: Positive <p>The 'Workflow Details' section shows the following values:</p> <ul style="list-style-type: none"> Trigger Type: System Destination: WorkflowOAuth2ClientCredentials Workflow Definition ID: NotifyProcessAdministrators Start Context: { "CostCenterOwnerApprovalID": "{CostCenterOwnerApprovalID}", "RequestID": "{RequestID}", "SubStatus": "{SC_SubStatus}" }

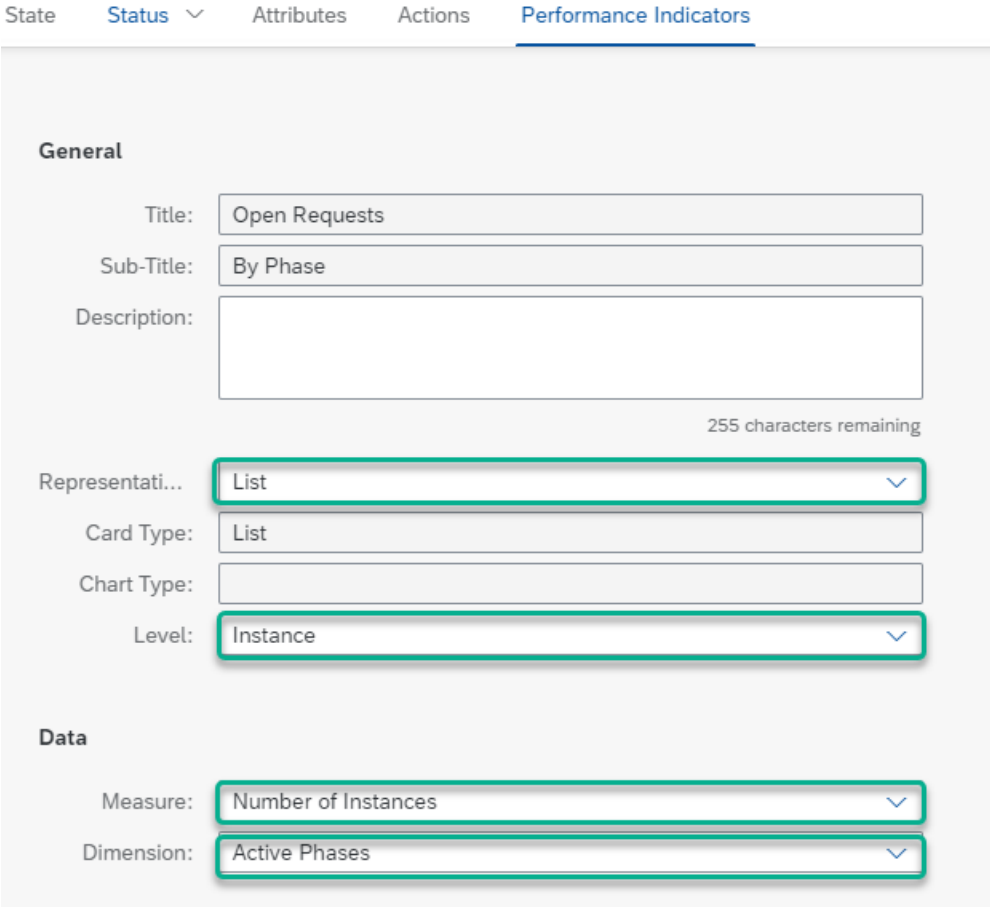
Explanation	Screenshot
<p>64. Click + button to add Conditions.</p> <p>65. Select the following conditions.</p> <p>Attribute: SubStatus Operator: equal to Value: Overdue</p> <p>66. Click OK button.</p>	

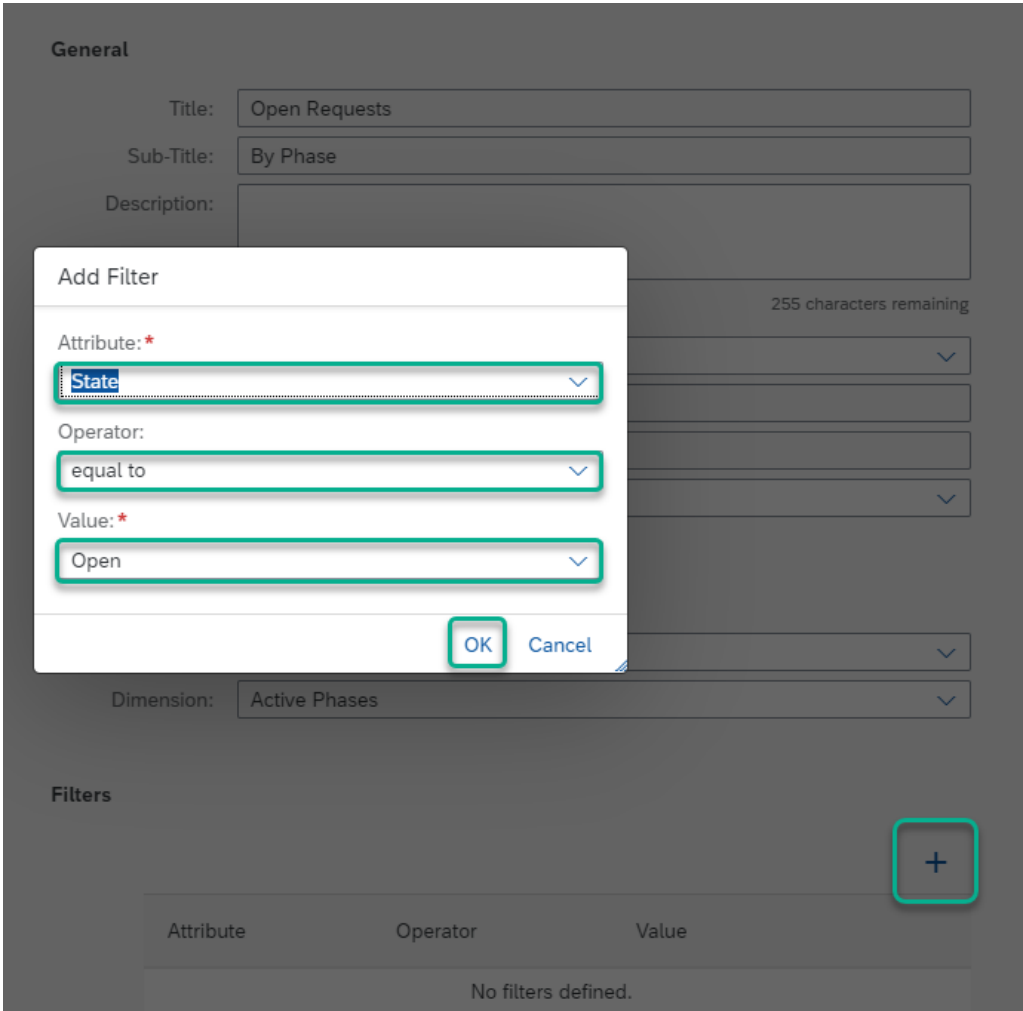
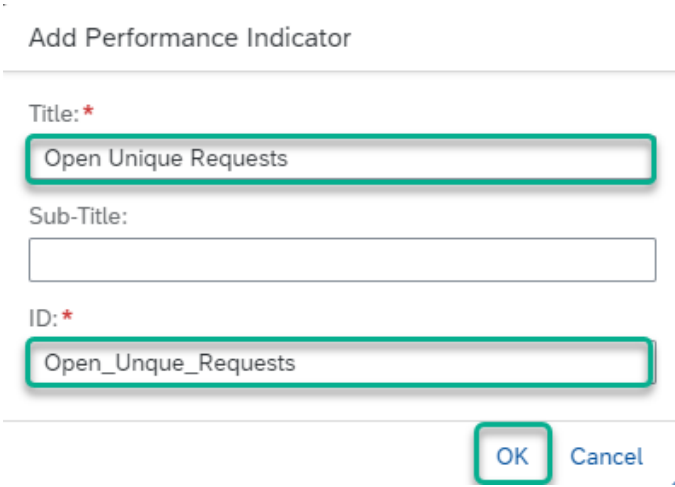
Explanation	Screenshot																									
<p>67. Click + button to add three more Conditions.</p> <p>Attribute: SubStatus Operator: equal to Value: Threshold Violation</p> <p>Attribute: SubStatus Operator: equal to Value: Workflow Failed</p> <p>Attribute: SubStatus Operator: equal to Value: Workflow Suspended</p>	 <p>Conditions</p> <table><thead><tr><th>Attribute</th><th>Operator</th><th>Value</th><th></th><th></th></tr></thead><tbody><tr><td>SubStatus</td><td>equal to</td><td>Overdue</td><td></td><td></td></tr><tr><td>SubStatus</td><td>equal to</td><td>Threshold Violation</td><td></td><td></td></tr><tr><td>SubStatus</td><td>equal to</td><td>Workflow Failed</td><td></td><td></td></tr><tr><td>SubStatus</td><td>equal to</td><td>Workflow Suspended</td><td></td><td></td></tr></tbody></table>	Attribute	Operator	Value			SubStatus	equal to	Overdue			SubStatus	equal to	Threshold Violation			SubStatus	equal to	Workflow Failed			SubStatus	equal to	Workflow Suspended		
Attribute	Operator	Value																								
SubStatus	equal to	Overdue																								
SubStatus	equal to	Threshold Violation																								
SubStatus	equal to	Workflow Failed																								
SubStatus	equal to	Workflow Suspended																								
<p>Configure Performance Indicators</p> <p>68. Select Performance Indicators Tab.</p> <p>69. Click + button.</p>	 <p>Configure Visibility Scenarios</p> <p>Investment Approval (demo.sap.com.Investment_Approval)</p> <p>General Processes Correlation Phases State Status Attributes Actions Performance Indicators</p> <p>S... </p> <p>Open Instances by Status</p> <p>Completed Instances by Status</p> <p>General</p> <p>Title: Open Instances</p> <p>Sub-Title: by Status</p> <p>Description:</p>																									
<p>70. Enter Title as Average Approval Time.</p> <p>71. Enter Sub-Title as Days.</p> <p>72. Click OK button.</p>	 <p>Add Performance Indicator</p> <p>Title: * Average Approval Time</p> <p>Sub-Title: Days</p> <p>ID: * Average_Approval_Time</p> <p>OK Cancel</p>																									

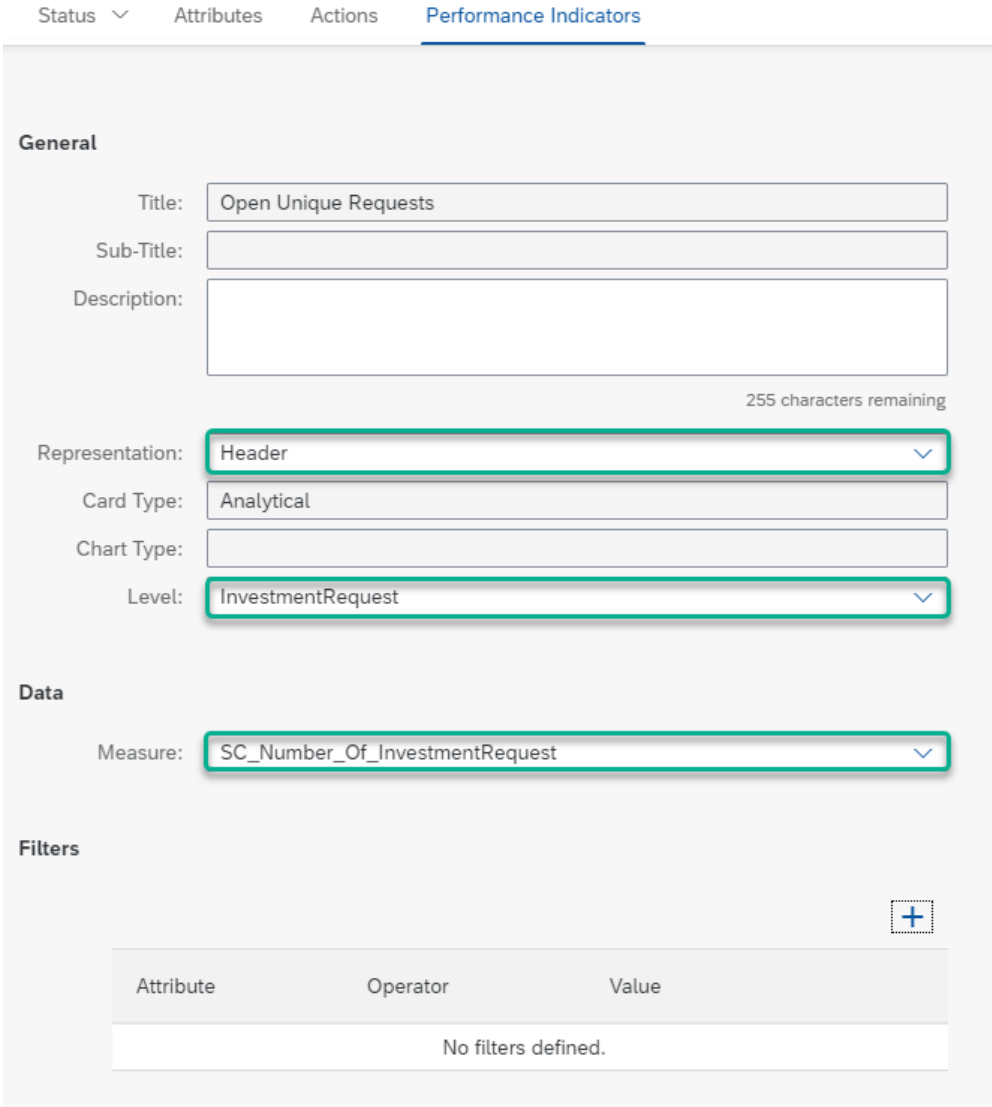
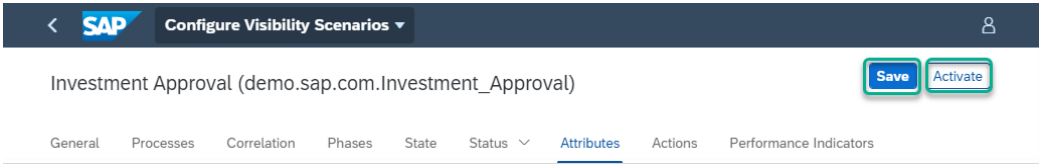
Explanation	Screenshot
73. Select Average Cost Center Owner Approval Time as Measure .	
74. Select Performance Indicators Tab. 75. Click + button.	

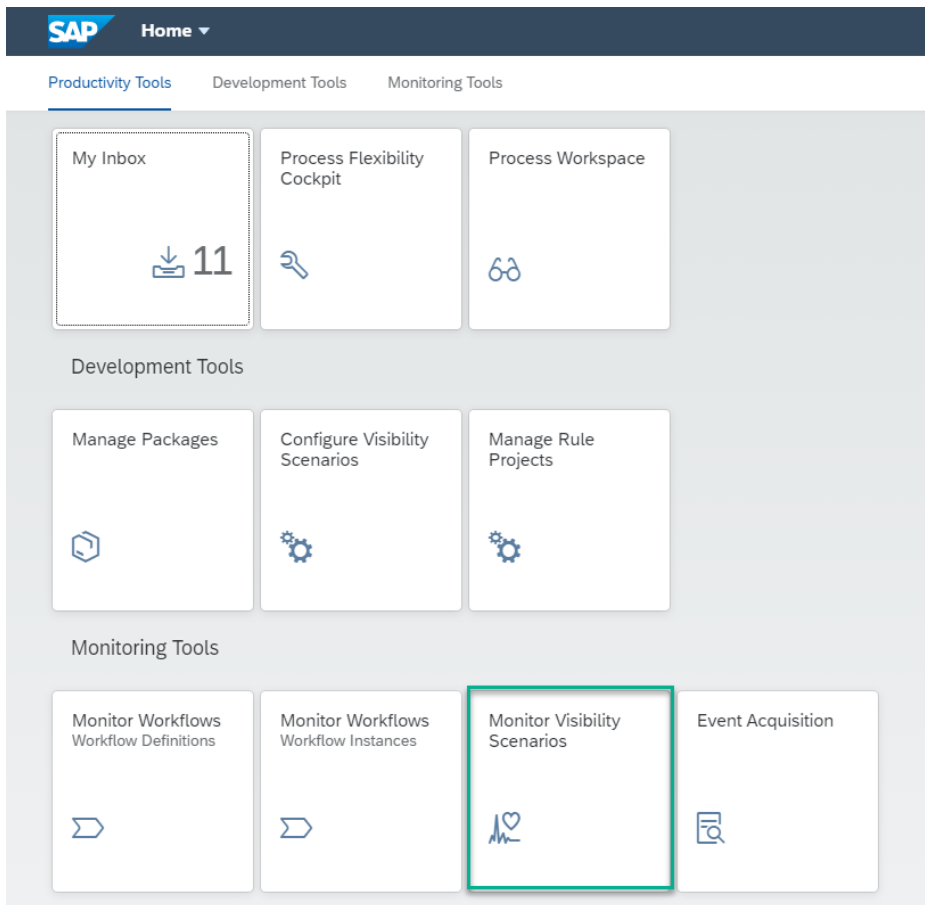
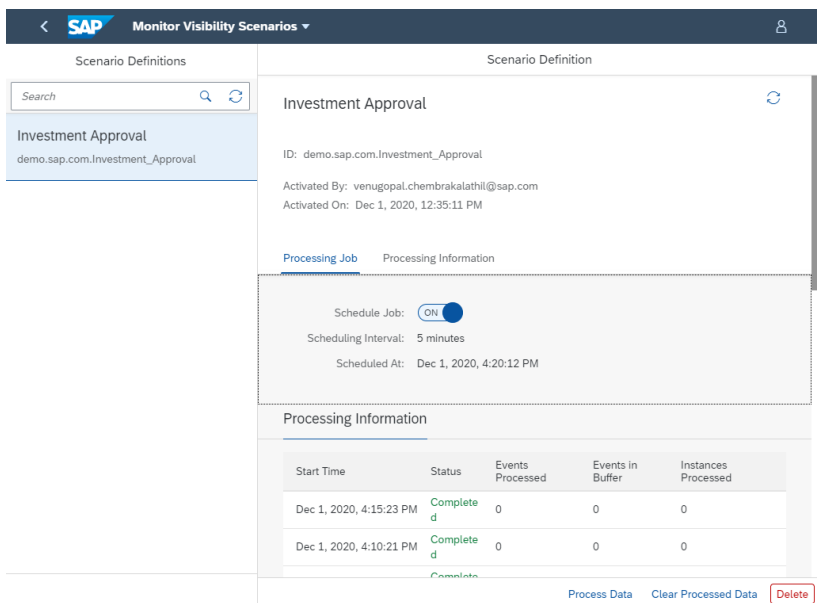
Explanation	Screenshot
<p>76. Enter Title as Approved Investments.</p> <p>77. Enter Sub-Title as Value.</p> <p>78. Click OK button.</p>	 <p>Edit Performance Indicator</p> <p>Title: * Approved Investments</p> <p>Sub-Title: Value</p> <p>ID: * Approved_Investments</p> <p>OK Cancel</p>
<p>79. Enter following details.</p> <p>Representation: Line Chart</p> <p>Level: Instance</p> <p>Measure: Total Cost</p> <p>Dimension: End Time</p>	 <p>Status ▾ Attributes Actions Performance Indicators</p> <p>General</p> <p>Title: Approved Investments</p> <p>Sub-Title: Value</p> <p>Description: 255 characters remaining</p> <p>Representation: Line Chart ▾</p> <p>Card Type: Analytical</p> <p>Chart Type: Line</p> <p>Level: Instance ▾</p> <p>Data</p> <p>Measure: Total Cost ▾</p> <p>Dimension: End Time ▾</p>

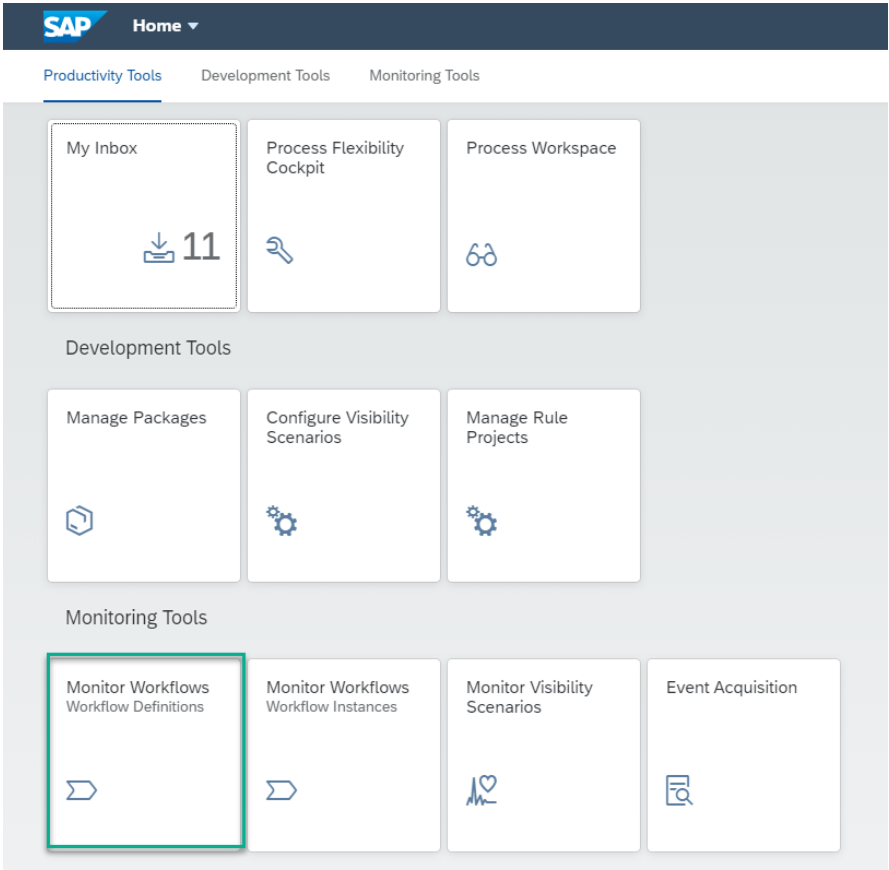
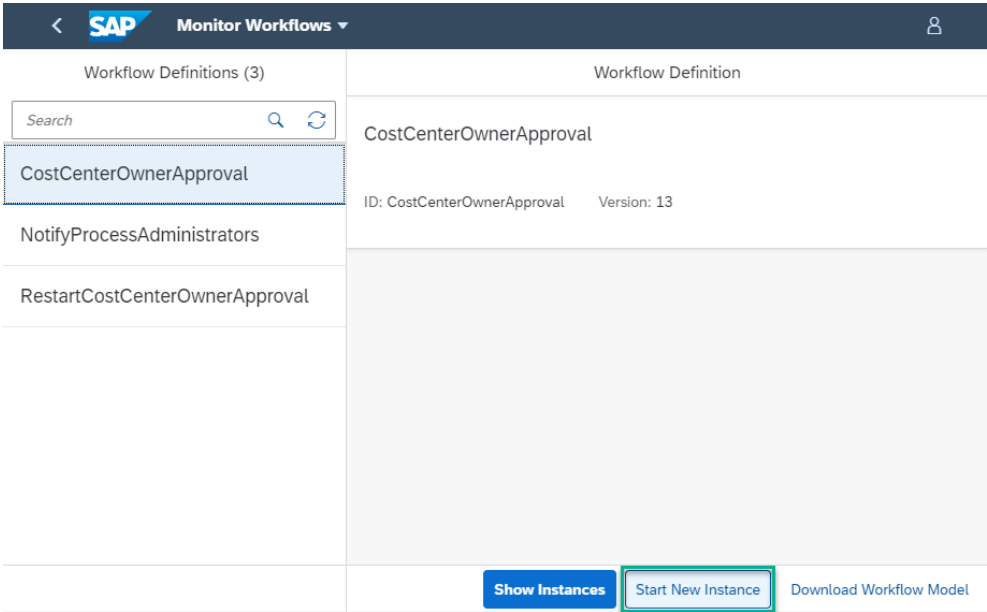
Explanation	Screenshot
<div>80. Click + button.</div> <div>81. Enter Title as Open Requests.</div> <div>82. Enter Sub-Title as By Phase.</div> <div>83. Click OK button.</div>	 <p>The screenshot displays the SAP 'Configure Visibility Scenarios' interface for 'Investment Approval (demo.sap.com.Investment_Approval)'. The 'Performance Indicators' tab is active. A list on the left shows various instance categories, with a '+' button highlighted. A modal dialog titled 'Add Performance Indicator' is open, containing the following fields: 'Title: *' with the value 'Open Requests', 'Sub-Title:' with the value 'By Phase', and 'ID: *' with the value 'Open_Requests'. The 'OK' button at the bottom right of the dialog is highlighted.</p>

Explanation	Screenshot
<p>84. Enter following details.</p> <p>Representation: List</p> <p>Level: Instance</p> <p>Measure: Number of Instances</p> <p>Dimension: Active Phases</p>	

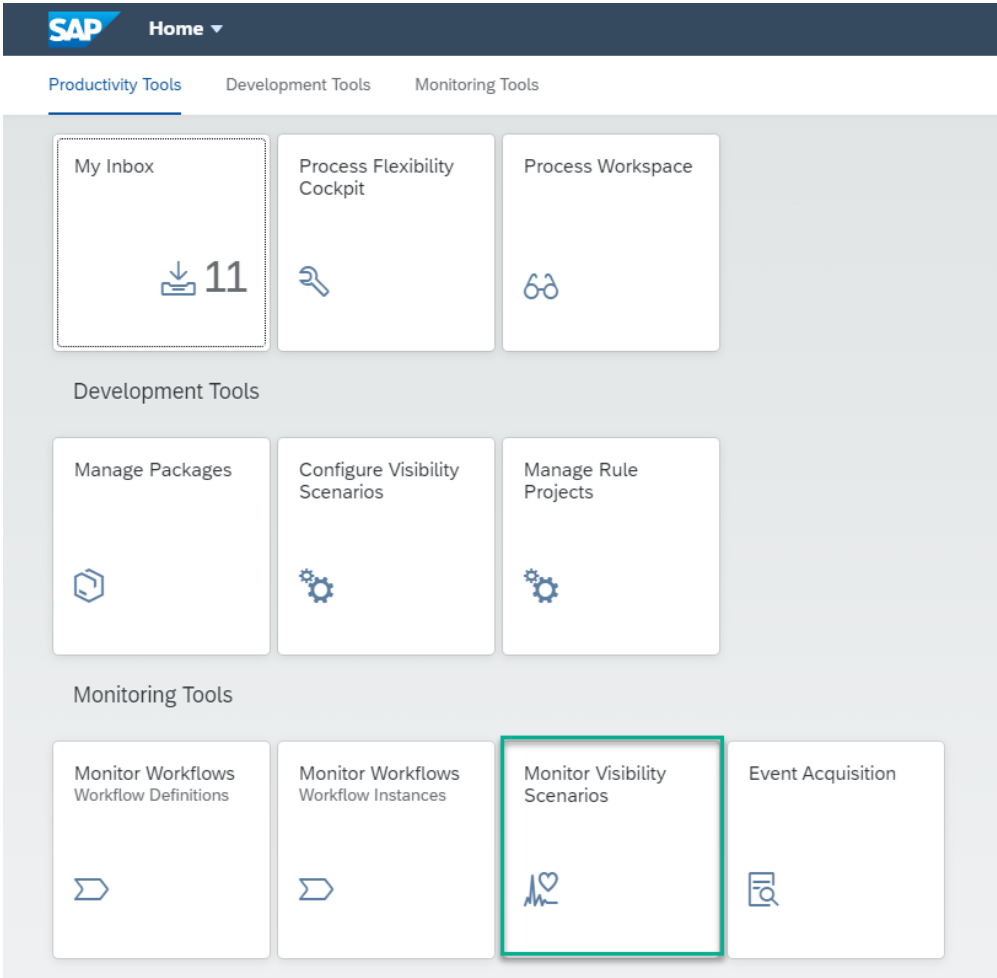
Explanation	Screenshot
<div>85. Click + button to add Filters.</div> <div>86. Select State as Attribute.</div> <div>87. Select equal to as Operator.</div> <div>88. Select Open as Value.</div> <div>89. Click OK button.</div>	
<div>90. Enter Title as Open Unique Requests.</div> <div>91. Click OK button.</div>	

Explanation	Screenshot
<p>92. Enter following details.</p> <p>Representation: Header</p> <p>Level: InvestmentReuest</p> <p>Measure: SC_Number_Of_InvestmentReq uest</p>	 <p>The screenshot shows the 'Performance Indicators' configuration interface. The 'General' section includes fields for Title ('Open Unique Requests'), Sub-Title, and Description (with a 255-character limit). The 'Representation' is set to 'Header', 'Card Type' is 'Analytical', 'Chart Type' is empty, and 'Level' is 'InvestmentRequest'. The 'Data' section shows the 'Measure' as 'SC_Number_Of_InvestmentRequest'. The 'Filters' section contains a table with columns 'Attribute', 'Operator', and 'Value', and a message 'No filters defined.'</p>
<p>93. Click Save and Activate Button.</p>	 <p>The screenshot shows the 'Configure Visibility Scenarios' page in SAP. The page title is 'Investment Approval (demo.sap.com.Investment_Approval)'. There are 'Save' and 'Activate' buttons. The bottom navigation bar includes tabs for General, Processes, Correlation, Phases, State, Status, Attributes, Actions, and Performance Indicators.</p>

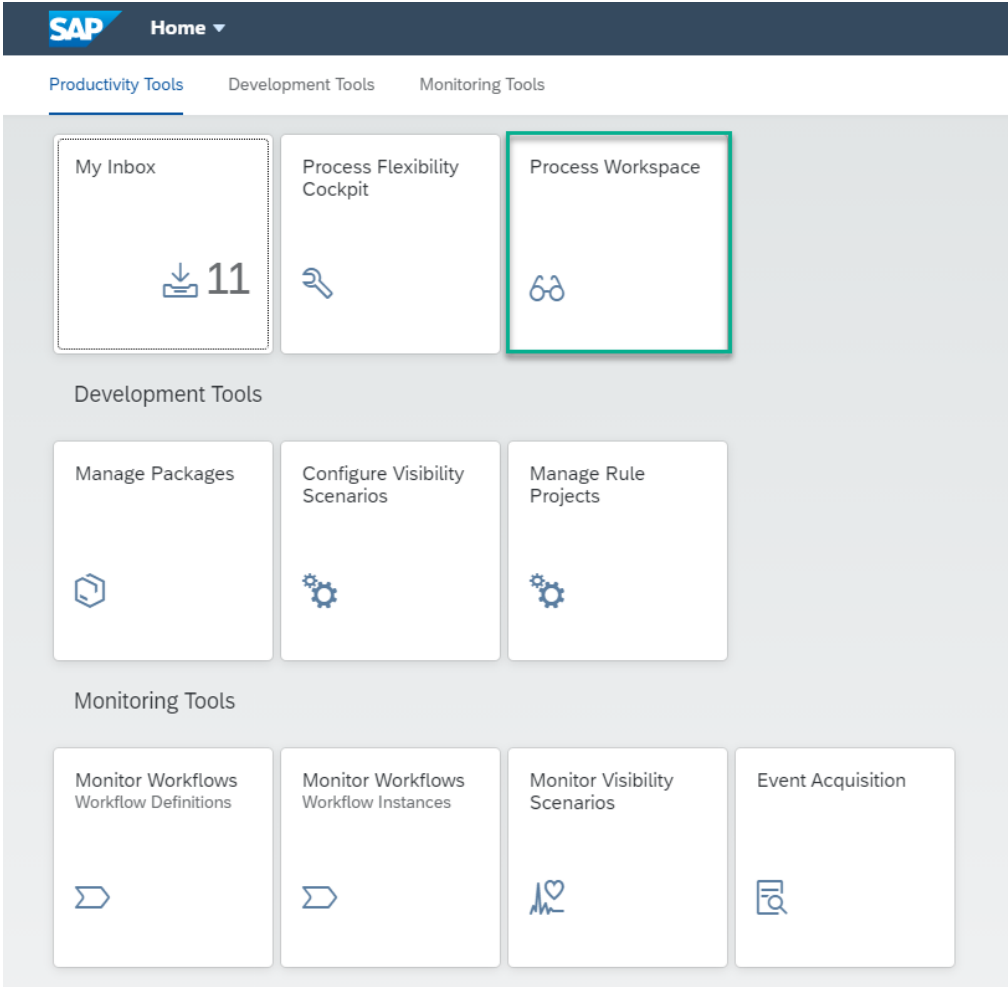
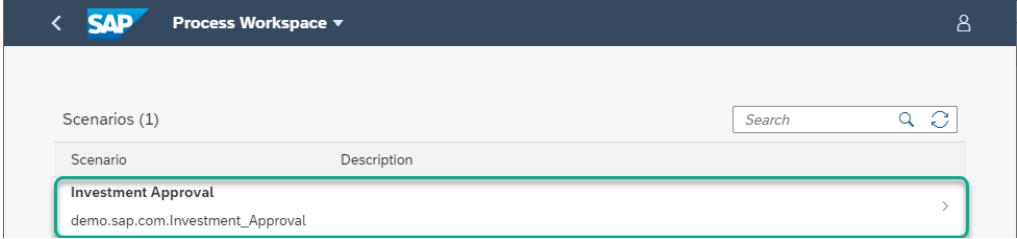
Explanation	Screenshot															
<p>94. Go to Home page.</p> <p>95. Select Monitor Visibility Scenarios.</p>	 <p>The screenshot shows the SAP Home page with a navigation bar at the top containing 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. Below the navigation bar, there are several tiles. The 'Monitor Visibility Scenarios' tile, located under the 'Monitoring Tools' section, is highlighted with a green border. It features a heart icon and a pulse line.</p>															
<p>You can see the Investment Approval scenario. Monitor scenario enable Administrators to track the event processing. The following actions are available to manage the processed data.</p> <p>Process Data: Trigger the correlation job manually.</p> <p>Clear Processed Data: Clear the correlated process data</p> <p>Delete: Delete Scenario.</p>	 <p>The screenshot shows the SAP Monitor Visibility Scenarios page. The 'Investment Approval' scenario is selected, and its details are displayed. The 'Processing Job' section shows the 'Schedule Job' toggle is turned 'ON'. Below this, the 'Processing Information' table lists the start times, status, and counts for the scenario.</p> <table><thead><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>Dec 1, 2020, 4:15:23 PM</td><td>Completed</td><td>0</td><td>0</td><td>0</td></tr><tr><td>Dec 1, 2020, 4:10:21 PM</td><td>Completed</td><td>0</td><td>0</td><td>0</td></tr></tbody></table> <p>At the bottom of the page, there are three buttons: 'Process Data', 'Clear Processed Data', and 'Delete'.</p>	Start Time	Status	Events Processed	Events in Buffer	Instances Processed	Dec 1, 2020, 4:15:23 PM	Completed	0	0	0	Dec 1, 2020, 4:10:21 PM	Completed	0	0	0
Start Time	Status	Events Processed	Events in Buffer	Instances Processed												
Dec 1, 2020, 4:15:23 PM	Completed	0	0	0												
Dec 1, 2020, 4:10:21 PM	Completed	0	0	0												

Explanation	Screenshot
<p>Create Workflow Instances</p> <p>96. Go to Home page.</p> <p>97. Select Monitor Workflows Workflow Definitions.</p>	 <p>The screenshot shows the SAP Home dashboard. The top navigation bar includes 'SAP' and 'Home'. Below it are tabs for 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The main area displays several tiles: 'My Inbox' (11 items), 'Process Flexibility Cockpit', 'Process Workspace', 'Manage Packages', 'Configure Visibility Scenarios', 'Manage Rule Projects', 'Monitor Workflows Workflow Definitions' (highlighted with a green box), 'Monitor Workflows Workflow Instances', 'Monitor Visibility Scenarios', and 'Event Acquisition'.</p>
<p>98. Select Workflow Definition CostCenterOwnerApproval.</p> <p>99. Select Monitor Workflows Workflow Definitions.</p> <p>100. Click Start New Instance.</p>	 <p>The screenshot shows the SAP Monitor Workflows page. The left sidebar lists 'Workflow Definitions (3)' with 'CostCenterOwnerApproval' selected. The main area displays details for 'CostCenterOwnerApproval', including 'ID: CostCenterOwnerApproval' and 'Version: 13'. At the bottom right, the 'Start New Instance' button is highlighted with a green box.</p>

Explanation	Screenshot
<div>101. Update Request related information.</div> <div>102. Use the Same Request Information.</div> <div>103. Click Start New Instance multiple times to create multiple workflow instances.</div>	<div><div>Start New Instance</div><div>Enter the JSON context with which to start the new instance:</div><div><pre>{ "Request": { "RequestId": "REQ01", "FirstName": "Venugopal", "LastName": "Chembrakalathil", "Email": " ", "UserId": " ", "Comments": "Please approve the request" }, "Investment": {</pre></div><div><div>Start New Instance</div><div>Start New Instance and Close</div><div>Cancel</div></div></div>

Explanation	Screenshot
104. Go to Home page 105. Select Monitor Visibility Scenario .	 <p>The screenshot shows the SAP Home page. At the top, there is a dark blue header with the SAP logo and a 'Home' dropdown menu. Below the header, there are three tabs: 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The 'Productivity Tools' tab is selected. Under this tab, there are three cards: 'My Inbox' (with a download icon and the number 11), 'Process Flexibility Cockpit' (with a wrench icon), and 'Process Workspace' (with a link icon). Below these, there is a section for 'Development Tools' with three cards: 'Manage Packages' (with a cube icon), 'Configure Visibility Scenarios' (with a gear icon), and 'Manage Rule Projects' (with a gear icon). At the bottom, there is a section for 'Monitoring Tools' with four cards: 'Monitor Workflows Workflow Definitions' (with a chevron icon), 'Monitor Workflows Workflow Instances' (with a chevron icon), 'Monitor Visibility Scenarios' (with a heart and pulse icon, highlighted with a green border), and 'Event Acquisition' (with a magnifying glass icon).</p>

Explanation	Screenshot																									
<p>106. Select Investment Approval Scenario and you can see a periodic job executing under Processing Information.</p> <p>107. This job will consume the workflow events and correlate to the scenario.</p> <p>The job runs in every 5 minutes. Please wait maximum 5 minutes to see the next job run. You can also click the Process Data button to manually trigger the job.</p>	<p>Scenario Definitions</p> <p>Search</p> <p>Investment Approval demo.sap.com.Investment_Approval</p> <p>Scenario Definition</p> <p>Investment Approval</p> <p>ID: demo.sap.com.Investment_Approval Activated By: [redacted] Activated On: Dec 1, 2020, 12:35:11 PM</p> <p>Processing Job Processing Information</p> <p>Schedule Job: <input checked="" type="checkbox"/> ON</p> <p>Scheduling Interval: 5 minutes</p> <p>Scheduled At: Dec 1, 2020, 4:50:12 PM</p> <p>Processing Information</p> <table> <tr> <th>Start Time</th><th>Status</th><th>Events Processed</th><th>Events in Buffer</th><th>Instances Processed</th></tr> <tr> <td>Dec 1, 2020, 4:46:06 PM</td><td>Completed</td><td>0</td><td>0</td><td>0</td></tr> <tr> <td>Dec 1, 2020, 4:45:35 PM</td><td>Completed</td><td>18</td><td>0</td><td>6</td></tr> <tr> <td>Dec 1, 2020, 4:40:36 PM</td><td>Completed</td><td>0</td><td>0</td><td>0</td></tr> <tr> <td>Dec 1, 2020, 4:35:20 PM</td><td>Completed</td><td>0</td><td>0</td><td>0</td></tr> </table> <p>Process Data Clear Processed Data Delete</p>	Start Time	Status	Events Processed	Events in Buffer	Instances Processed	Dec 1, 2020, 4:46:06 PM	Completed	0	0	0	Dec 1, 2020, 4:45:35 PM	Completed	18	0	6	Dec 1, 2020, 4:40:36 PM	Completed	0	0	0	Dec 1, 2020, 4:35:20 PM	Completed	0	0	0
Start Time	Status	Events Processed	Events in Buffer	Instances Processed																						
Dec 1, 2020, 4:46:06 PM	Completed	0	0	0																						
Dec 1, 2020, 4:45:35 PM	Completed	18	0	6																						
Dec 1, 2020, 4:40:36 PM	Completed	0	0	0																						
Dec 1, 2020, 4:35:20 PM	Completed	0	0	0																						

Explanation	Screenshot
108. Go to Home page Select Process Workspace .	 <p>The screenshot shows the SAP Home page. At the top, there is a dark blue header with the SAP logo and a 'Home' dropdown menu. Below the header, there are three tabs: 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The 'Productivity Tools' tab is active. Under this tab, there are three main cards: 'My Inbox' (with a download icon and the number 11), 'Process Flexibility Cockpit' (with a wrench icon), and 'Process Workspace' (with a pair of glasses icon). The 'Process Workspace' card is highlighted with a green border. Below these cards, there are two more sections: 'Development Tools' and 'Monitoring Tools'. The 'Development Tools' section contains three cards: 'Manage Packages' (with a cube icon), 'Configure Visibility Scenarios' (with a gear icon), and 'Manage Rule Projects' (with a gear icon). The 'Monitoring Tools' section contains four cards: 'Monitor Workflows Workflow Definitions' (with a chevron icon), 'Monitor Workflows Workflow Instances' (with a chevron icon), 'Monitor Visibility Scenarios' (with a heart and pulse icon), and 'Event Acquisition' (with a magnifying glass icon).</p>
109. Select Investment Approval Scenario.	 <p>The screenshot shows the SAP Process Workspace page. At the top, there is a dark blue header with the SAP logo and a 'Process Workspace' dropdown menu. Below the header, there is a search bar with the text 'Search' and a magnifying glass icon. Below the search bar, there is a table with two columns: 'Scenario' and 'Description'. The table has one row with the following data: 'Investment Approval' in the 'Scenario' column and 'demo.sap.com.Investment_Approval' in the 'Description' column. The row is highlighted with a green border.</p>

Explanation

110. All Process Instances are available in your workspace.

111. Click **Open Instances - On Track**.

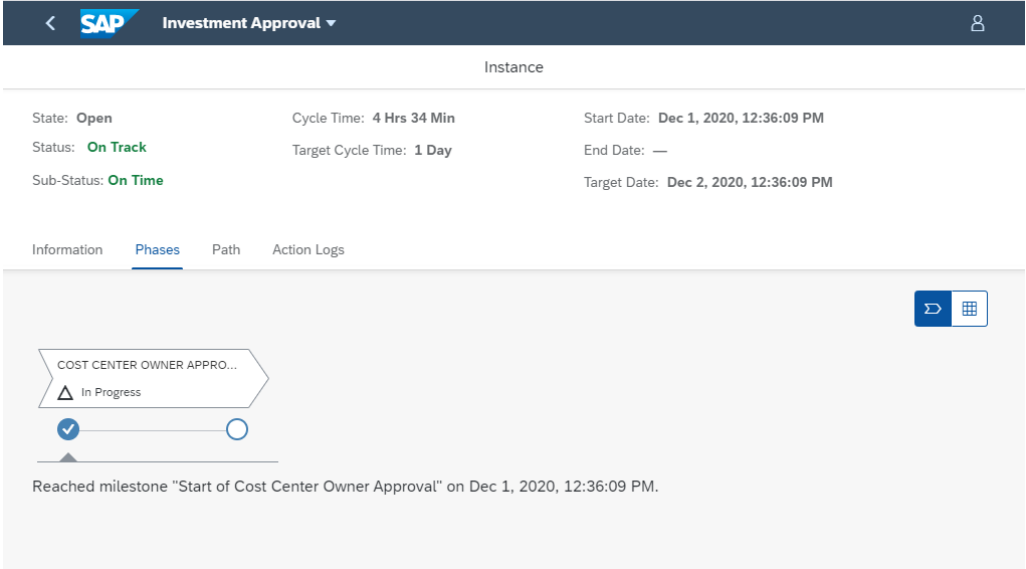
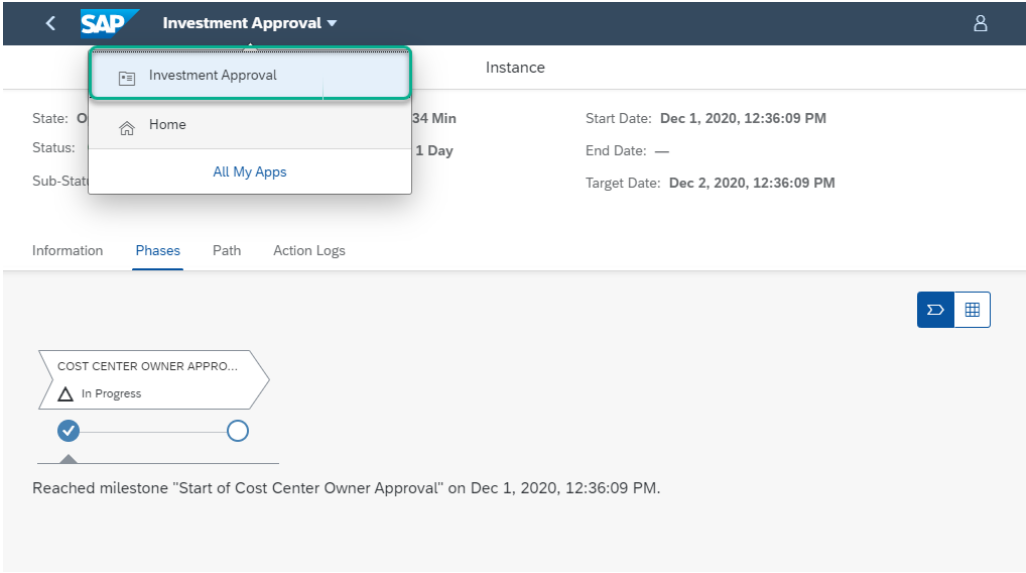
All the Performance Indicator in process workspace navigate to a list view to show all instances aggregated as part of a Process Performance Indicator.

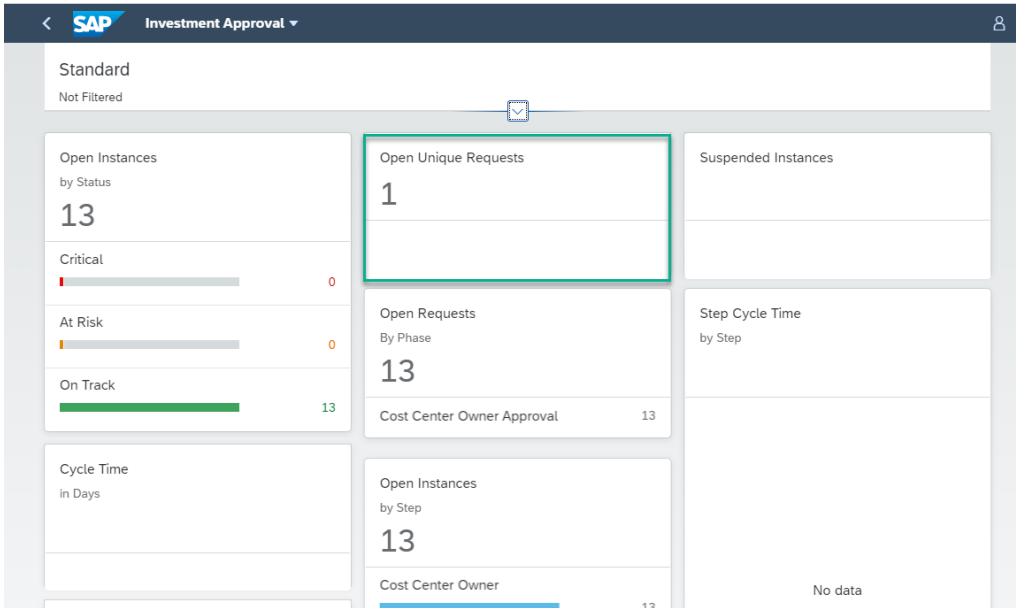
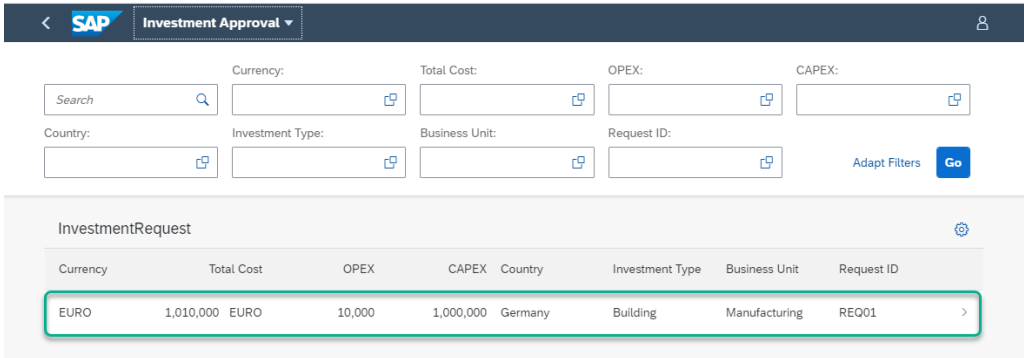
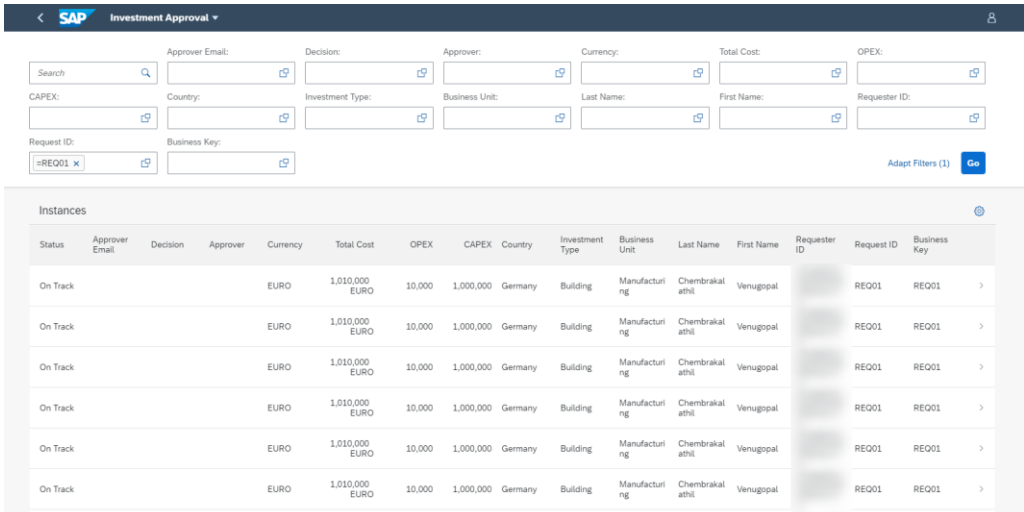
Screenshot

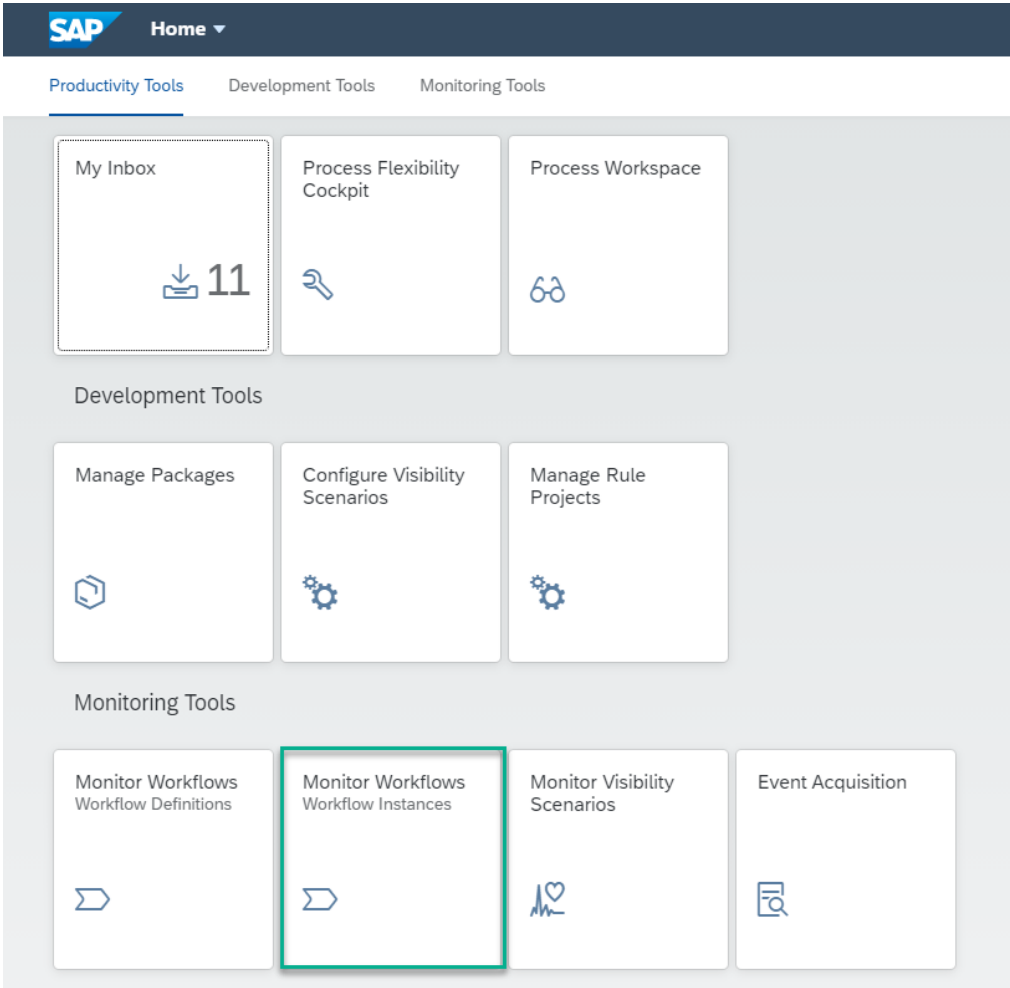
The screenshot displays the SAP Investment Approval dashboard. At the top, there's a header with the SAP logo and 'Investment Approval' with a dropdown arrow. Below this, a 'Standard' filter is set to 'Not Filtered'. The dashboard is divided into several cards: 'Open Instances by Status' showing 13 instances with a breakdown of Critical (0), At Risk (0), and On Track (13); 'Open Unique Requests' showing 1; 'Cycle Time in Days'; 'Open Instances by Step' showing 13; 'Cost Center Owner' showing 13; 'Failed Instances'; 'Approved Investments Value'; 'Open Requests By Phase' showing 13; and 'Cancelled Instances'. The 'On Track' status in the 'Open Instances by Status' card is highlighted with a red box.

112. Select a process instance to see the details.

The screenshot shows the SAP Investment Approval dashboard with a list of instances. At the top, there are search and filter options for various fields like Approver Email, Decision, Approver, Currency, Total Cost, OPEX, CAPEX, Country, Investment Type, Business Unit, Last Name, First Name, Requester ID, Request ID, and Business Key. Below this, a table lists the instances. The first instance, 'On Track', is highlighted with a red box. The table has columns for Status, Approver Email, Decision, Approver, Currency, Total Cost, OPEX, CAPEX, Country, Investment Type, Business Unit, Last Name, First Name, Requester ID, Request ID, and Business Key.

Explanation	Screenshot
<p>113. The Instance detail view shows the following.</p> <p>Information: Context data of a process instance</p> <p>Phases: Phases with status including start and end time.</p> <p>Path: Process path indicating the steps completed.</p> <p>Action Logs: Actions triggered including user and time.</p>	
<p>114. Go to Process Workspace page.</p>	

Explanation	Screenshot
<p>115. Click Open Unique Requests.</p> <p>Open Unique Requests group all instances based on the Request Id. If there are multiple process instances with the same Request ID, all be aggregated.</p>	
<p>116. Select the Process Instance and navigate to the instances view.</p> <p>You can see only attributes configured in the Entity.</p>	
<p>117. List all process instances part of the same Request ID.</p>	

Explanation	Screenshot
<p>Trigger Actions</p> <p>In this section you will suspend a workflow instance to change the process status ,it will trigger the system centric action and enable user action in process visibility.</p> <p>118.Click Monitor Workflows – Workflow Instances.</p>	 <p>The screenshot shows the SAP Home dashboard. At the top, there is a dark blue header with the SAP logo and a 'Home' dropdown menu. Below the header, there are three tabs: 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The 'Productivity Tools' tab is active, showing a grid of tiles. The first row contains 'My Inbox' (with a download icon and the number 11), 'Process Flexibility Cockpit' (with a wrench icon), and 'Process Workspace' (with a magnifying glass icon). The second row, under the 'Development Tools' sub-header, contains 'Manage Packages' (with a cube icon), 'Configure Visibility Scenarios' (with a gear icon), and 'Manage Rule Projects' (with a gear icon). The third row, under the 'Monitoring Tools' sub-header, contains four tiles: 'Monitor Workflows Workflow Definitions' (with a right-pointing arrow icon), 'Monitor Workflows Workflow Instances' (with a right-pointing arrow icon, highlighted by a red border), 'Monitor Visibility Scenarios' (with a heart and pulse icon), and 'Event Acquisition' (with a magnifying glass icon).</p>

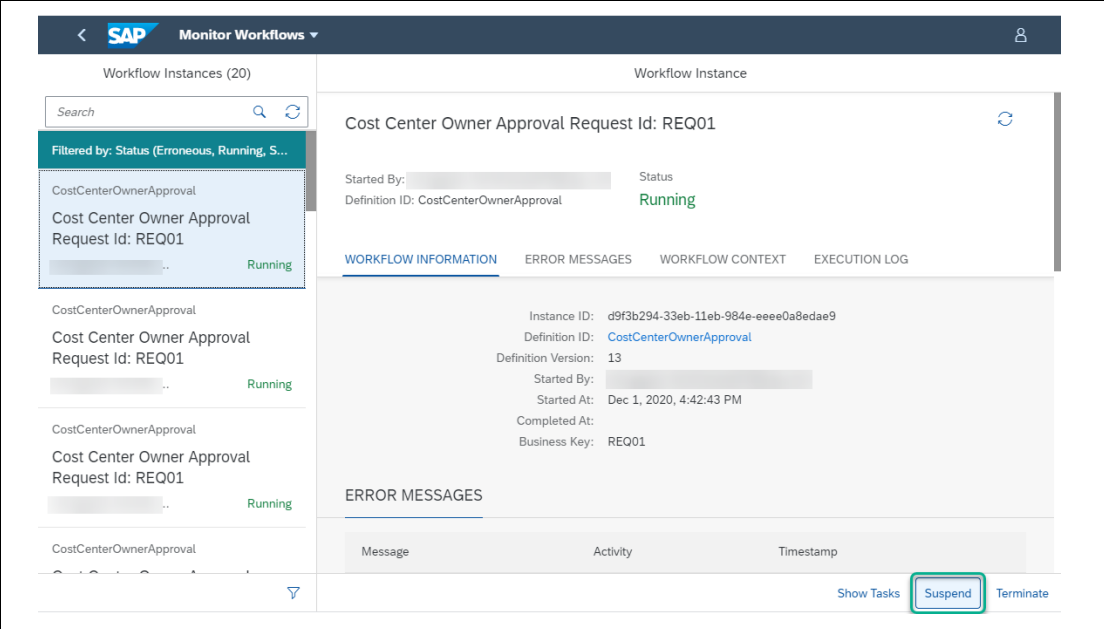
Explanation

119. Select a Running instance and click **Suspend** button in the footer.

It will take maximum 5 minutes to reflect this change Process Workspace.

The job runs in every 5 minutes. You can also go to **Monitor Visibility Scenario** application and click the **Process Data** button to manually trigger the job.

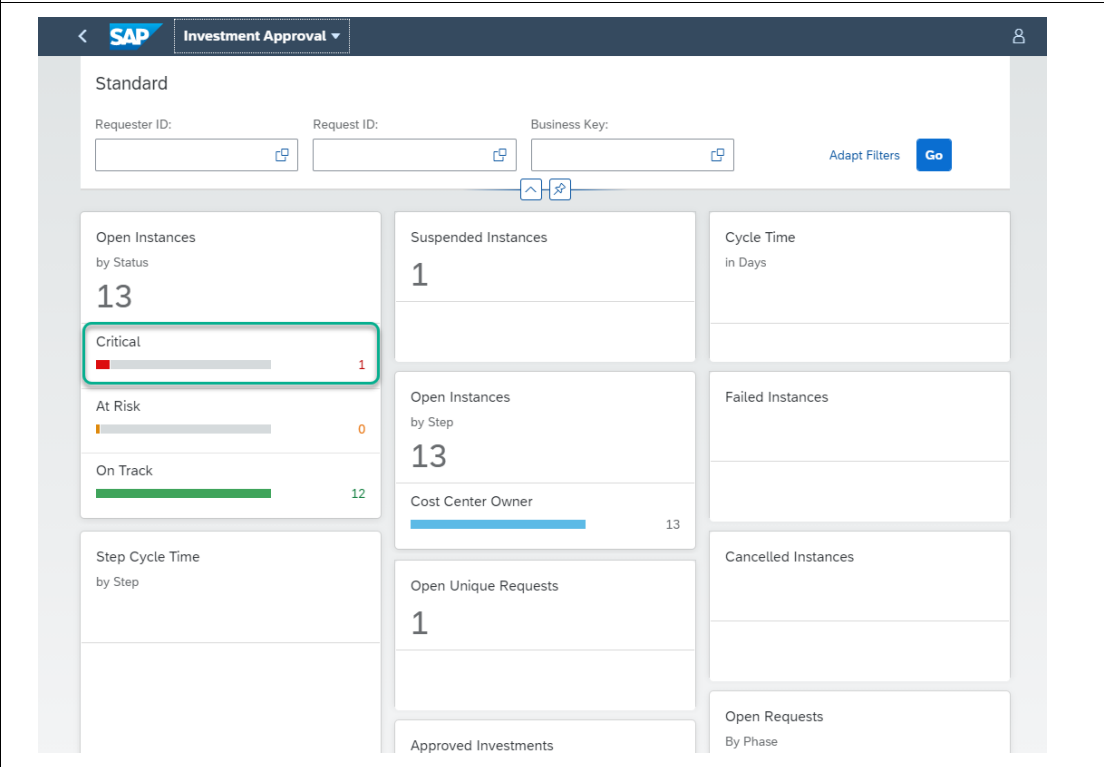
Screenshot

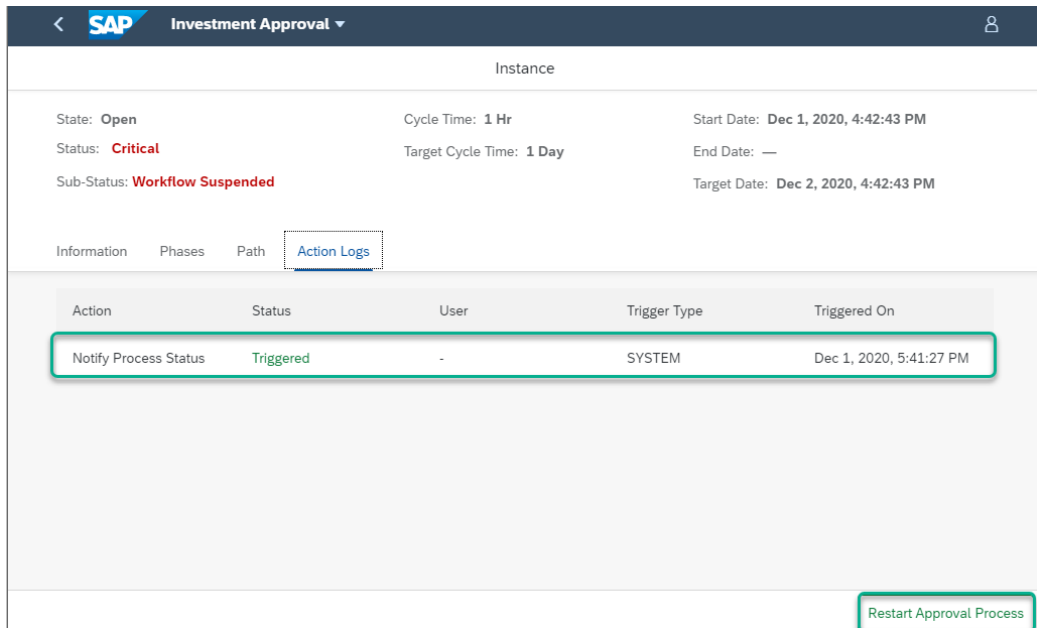
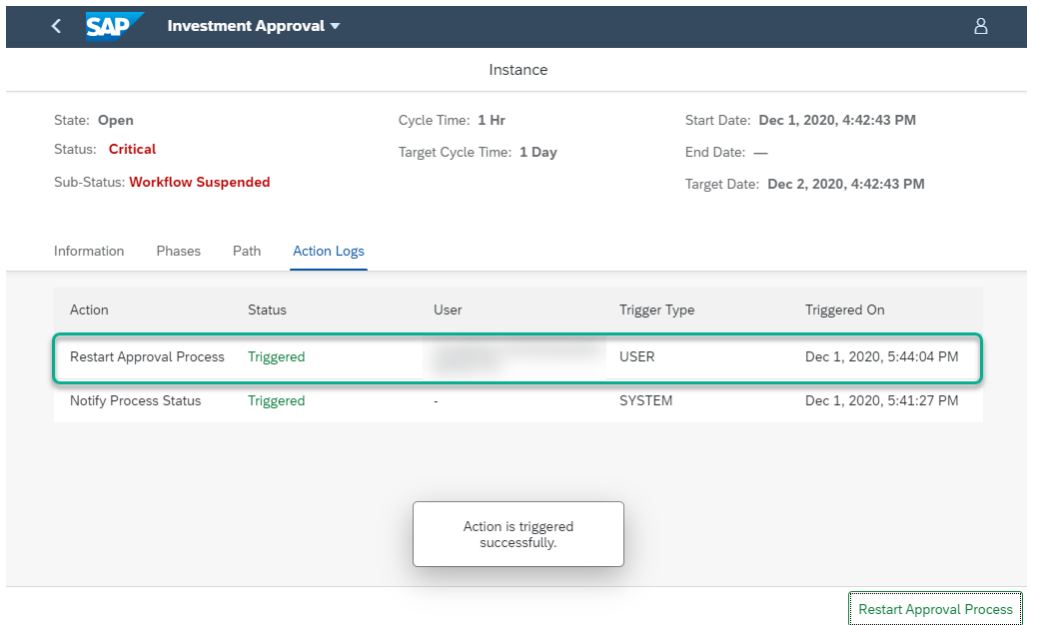


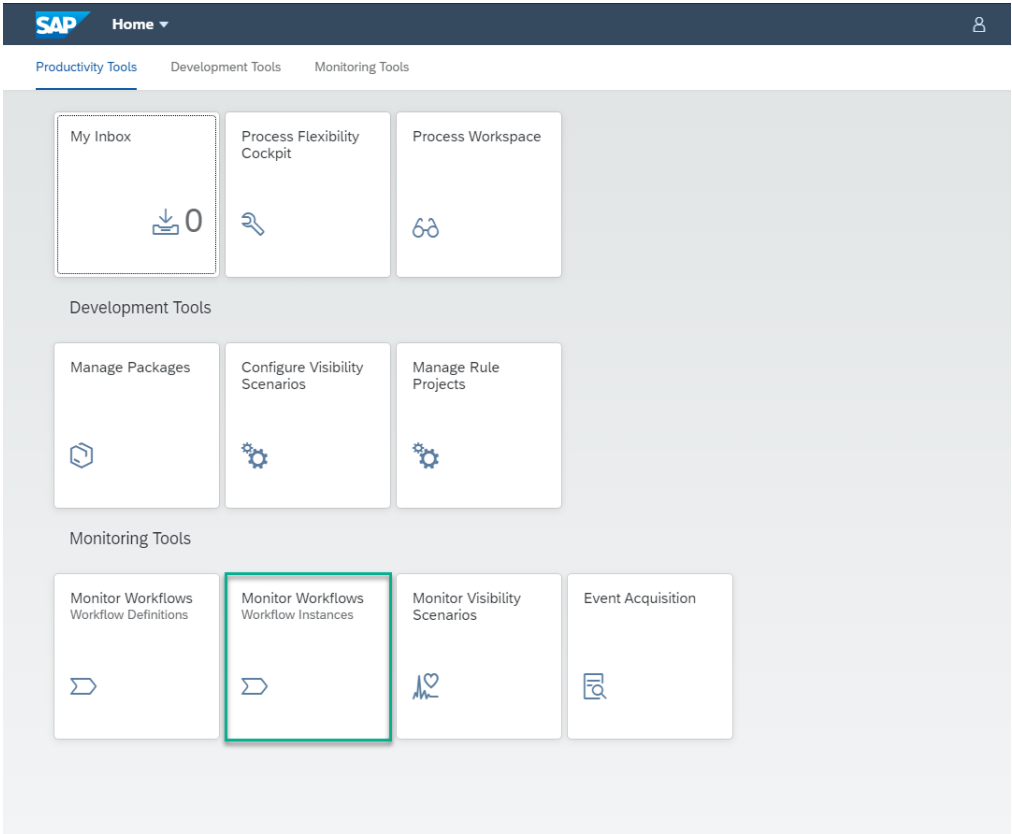
120. Go to Process Workspace.

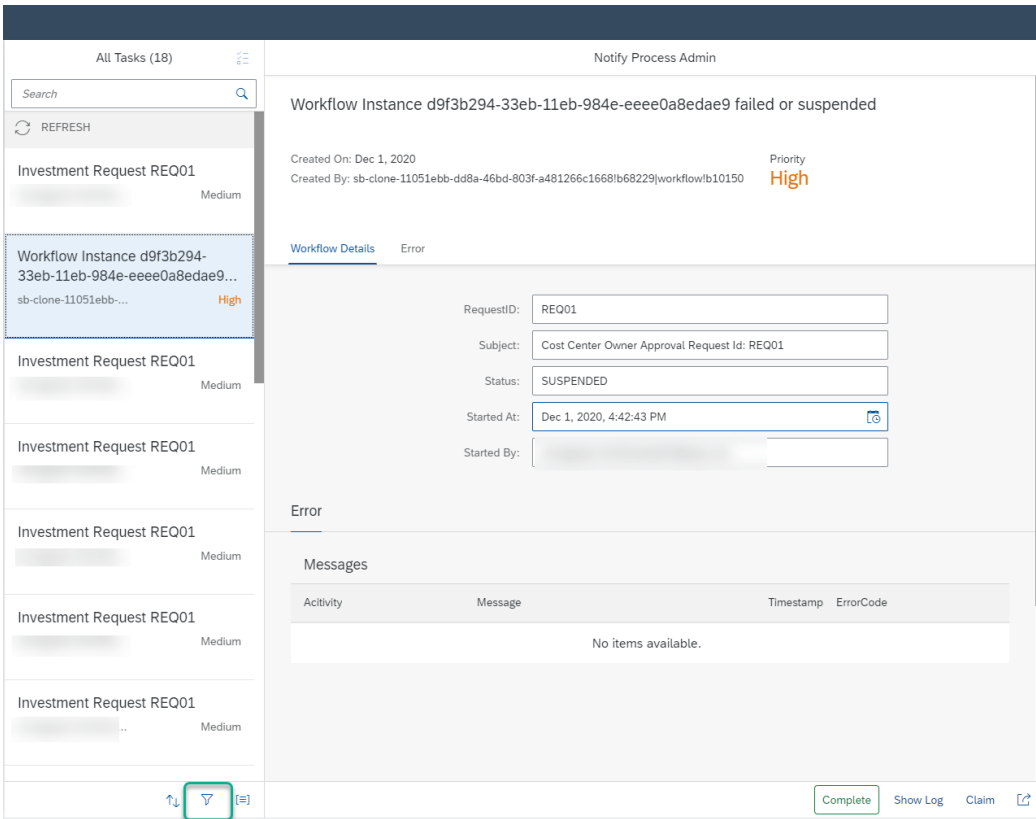
121. In Open Instances you can see 1 instance with **critical** status.

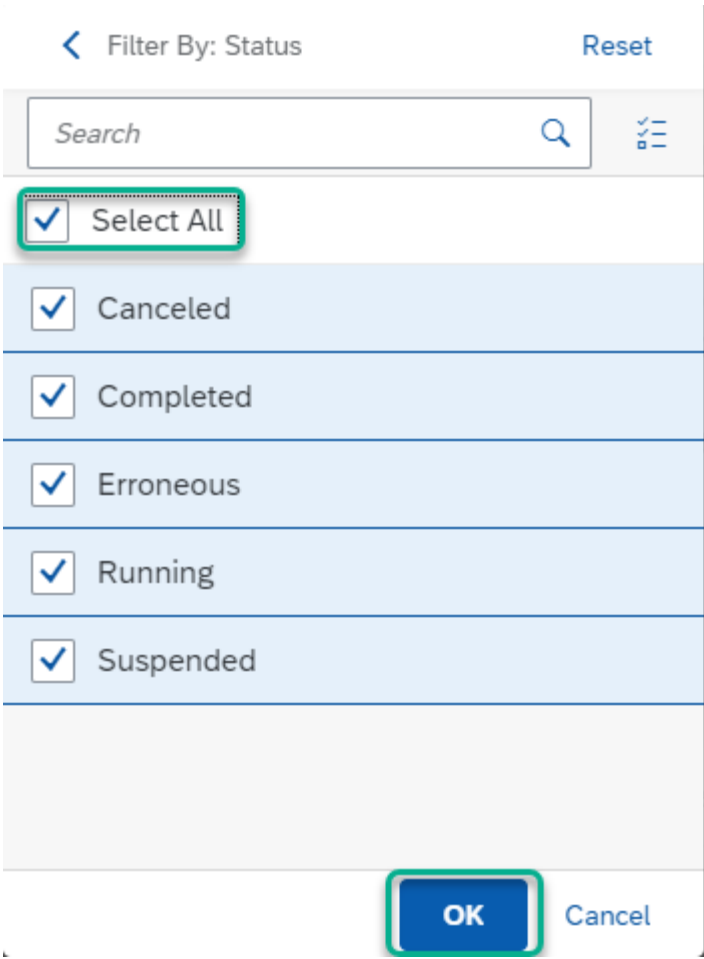
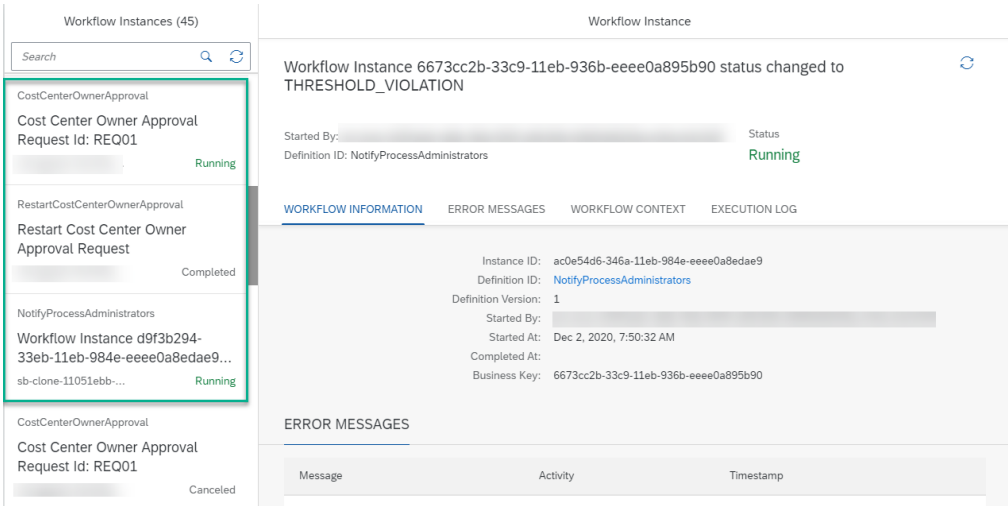
122. Click the **critical** instance and navigate to the **instance** view.

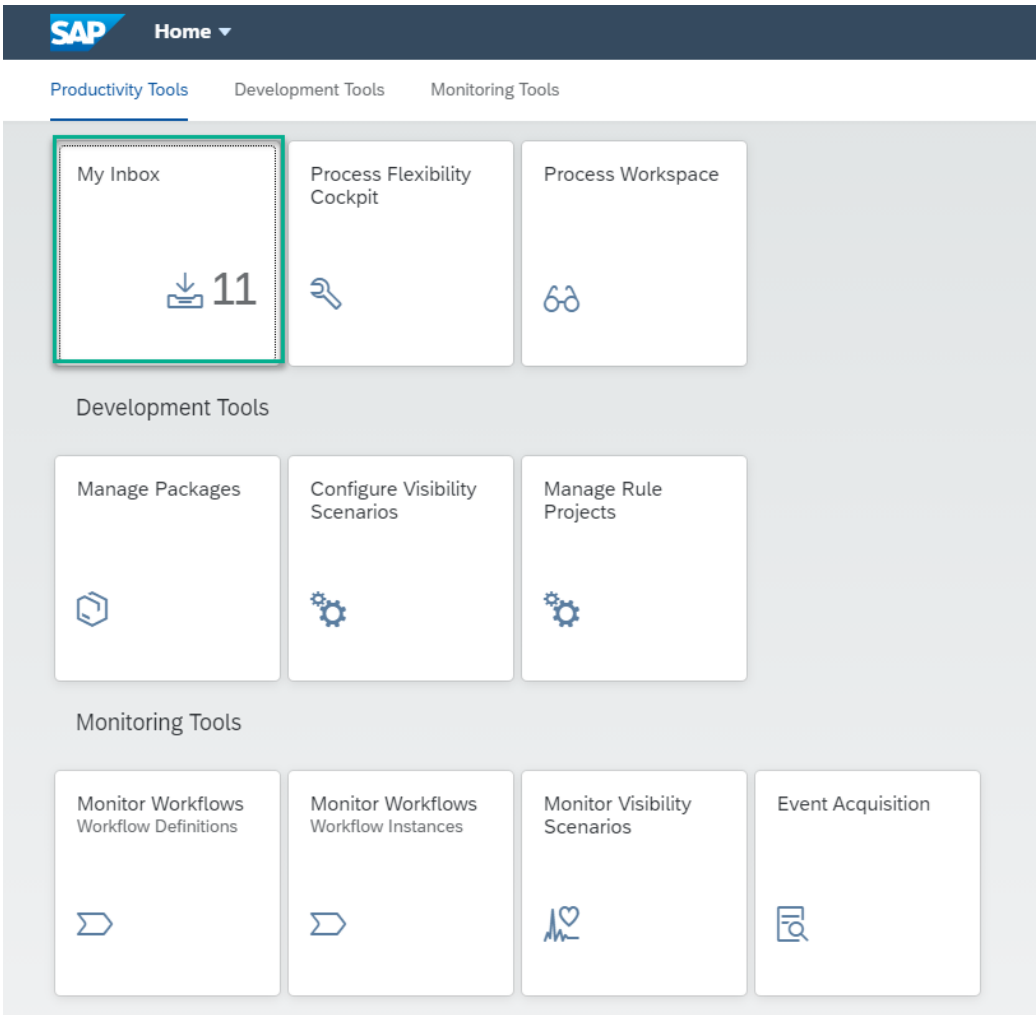


Explanation	Screenshot															
<p>123. You can see Restart Approval Process action enabled on the footer.</p> <p>124. Select Action Logs. You can see system action has already triggered.</p> <p>125. Click Restart Approval Process button.</p>	 <p>The screenshot shows the SAP Investment Approval process instance. The 'Action Logs' tab is selected, displaying a table with the following data:</p> <table><tr><th>Action</th><th>Status</th><th>User</th><th>Trigger Type</th><th>Triggered On</th></tr><tr><td>Notify Process Status</td><td>Triggered</td><td>-</td><td>SYSTEM</td><td>Dec 1, 2020, 5:41:27 PM</td></tr></table> <p>The 'Restart Approval Process' button is located at the bottom right of the screen.</p>	Action	Status	User	Trigger Type	Triggered On	Notify Process Status	Triggered	-	SYSTEM	Dec 1, 2020, 5:41:27 PM					
Action	Status	User	Trigger Type	Triggered On												
Notify Process Status	Triggered	-	SYSTEM	Dec 1, 2020, 5:41:27 PM												
<p>126. Now the Action logs shows both system and user triggered action logs.</p>	 <p>The screenshot shows the SAP Investment Approval process instance. The 'Action Logs' tab is selected, displaying a table with the following data:</p> <table><tr><th>Action</th><th>Status</th><th>User</th><th>Trigger Type</th><th>Triggered On</th></tr><tr><td>Restart Approval Process</td><td>Triggered</td><td>-</td><td>USER</td><td>Dec 1, 2020, 5:44:04 PM</td></tr><tr><td>Notify Process Status</td><td>Triggered</td><td>-</td><td>SYSTEM</td><td>Dec 1, 2020, 5:41:27 PM</td></tr></table> <p>A success message "Action is triggered successfully." is displayed in the center. The 'Restart Approval Process' button is located at the bottom right of the screen.</p>	Action	Status	User	Trigger Type	Triggered On	Restart Approval Process	Triggered	-	USER	Dec 1, 2020, 5:44:04 PM	Notify Process Status	Triggered	-	SYSTEM	Dec 1, 2020, 5:41:27 PM
Action	Status	User	Trigger Type	Triggered On												
Restart Approval Process	Triggered	-	USER	Dec 1, 2020, 5:44:04 PM												
Notify Process Status	Triggered	-	SYSTEM	Dec 1, 2020, 5:41:27 PM												

Explanation	Screenshot
<div>127. Go to Home page.</div> <div>128. Select Monitor Workflow – Workflow Instances.</div>	 <p>The screenshot shows the SAP Fiori Home page. At the top, there is a dark blue header with the SAP logo and a 'Home' dropdown menu. Below the header, there are three tabs: 'Productivity Tools', 'Development Tools', and 'Monitoring Tools'. The 'Monitoring Tools' tab is selected. The main content area displays several tiles. The 'My Inbox' tile shows a download icon and the number '0'. The 'Process Flexibility Cockpit' tile shows a magnifying glass icon. The 'Process Workspace' tile shows a link icon. Below these, there are three tiles under the 'Development Tools' section: 'Manage Packages' (cube icon), 'Configure Visibility Scenarios' (gears icon), and 'Manage Rule Projects' (gears icon). At the bottom, there are four tiles under the 'Monitoring Tools' section: 'Monitor Workflows Workflow Definitions' (arrow icon), 'Monitor Workflows Workflow Instances' (arrow icon, highlighted with a green border), 'Monitor Visibility Scenarios' (heart icon), and 'Event Acquisition' (document icon).</p>

Explanation	Screenshot
129.Click Filter button to see all workflow instances.	 <p>The screenshot displays a workflow management interface. On the left, a sidebar titled 'All Tasks (18)' contains a search bar, a 'REFRESH' button, and a list of tasks. The tasks are 'Investment Request REQ01' (Medium priority) and 'Workflow Instance d9f3b294-33eb-11eb-984e-eeee0a8edae9...' (High priority). The 'Workflow Instance' task is highlighted. On the right, the 'Workflow Details' tab is active, showing information for the selected workflow instance. The instance is titled 'Workflow Instance d9f3b294-33eb-11eb-984e-eeee0a8edae9 failed or suspended'. It was created on Dec 1, 2020, by 'sb-clone-11051ebb-dd8a-46bd-803f-a481266c1668b68229jworkflow/b10150'. The status is 'SUSPENDED'. The 'Started At' date is 'Dec 1, 2020, 4:42:43 PM'. The 'Error' tab is also visible, showing a table with columns 'Activity', 'Message', 'Timestamp', and 'ErrorCode'. The table is currently empty, displaying 'No items available.' At the bottom of the sidebar, a 'Filter' button is highlighted with a green box.</p>

Explanation	Screenshot
130.Check Select All. 131.Click OK button.	
132. You can see three new instances. Cost Center Owner Approval is restarted and in Running status. Restart Cost Center Owner Approval Request created the new Cost Center Owner Approval request. Notify Process Administrator created as escalation workflow instance with status Running .	

Explanation	Screenshot
133. Go to Home page. 134. Click My Inbox .	 <p>The screenshot displays the SAP Home dashboard. At the top, there is a dark blue header with the SAP logo and a 'Home' dropdown menu. Below the header, three tabs are visible: 'Productivity Tools' (which is selected and underlined), 'Development Tools', and 'Monitoring Tools'. The main content area is divided into three sections. The first section, under 'Productivity Tools', contains three cards: 'My Inbox' (highlighted with a red border and showing a download icon and the number 11), 'Process Flexibility Cockpit' (with a wrench icon), and 'Process Workspace' (with a glasses icon). The second section, under 'Development Tools', contains three cards: 'Manage Packages' (with a cube icon), 'Configure Visibility Scenarios' (with a gear icon), and 'Manage Rule Projects' (with a gear icon). The third section, under 'Monitoring Tools', contains four cards: 'Monitor Workflows Workflow Definitions' (with a chevron icon), 'Monitor Workflows Workflow Instances' (with a chevron icon), 'Monitor Visibility Scenarios' (with a heart and pulse icon), and 'Event Acquisition' (with a magnifying glass icon).</p>

Explanation	Screenshot
<p>135. Select task instance with Subject begin with Workflow Instance.</p> <p>You can see the details of the workflow instance with Suspended status. This will enable technical Administrators to fix the issues and complete the task.</p>	

SUMMARY

You have modeled a process visibility scenario and able to monitor processes. Please go through [help documentation](#) for more details.

www.sap.com/contactsap

© 2020 SAP SE or an SAP affiliate company. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP SE or an SAP affiliate company.

The information contained herein may be changed without prior notice. Some software products marketed by SAP SE and its distributors contain proprietary software components of other software vendors. National product specifications may vary.

These materials are provided by SAP SE or an SAP affiliate company for informational purposes only, without representation or warranty of any kind, and SAP or its affiliated companies shall not be liable for errors or omissions with respect to the materials. The only warranties for SAP or SAP affiliate company products and services are those that are set forth in the express warranty statements accompanying such products and services, if any. Nothing herein should be construed as constituting an additional warranty.

In particular, SAP SE or its affiliated companies have no obligation to pursue any course of business outlined in this document or any related presentation, or to develop or release any functionality mentioned therein. This document, or any related presentation, and SAP SE's or its affiliated companies' strategy and possible future developments, products, and/or platform directions and functionality are all subject to change and may be changed by SAP SE or its affiliated companies at any time for any reason without notice. The information in this document is not a commitment, promise, or legal obligation to deliver any material, code, or functionality. All forward-looking statements are subject to various risks and uncertainties that could cause actual results to differ materially from expectations. Readers are cautioned not to place undue reliance on these forward-looking statements, and they should not be relied upon in making purchasing decisions.

SAP and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP SE (or an SAP affiliate company) in Germany and other countries. All other product and service names mentioned are the trademarks of their respective companies. See www.sap.com/copyright for additional trademark information and notices.