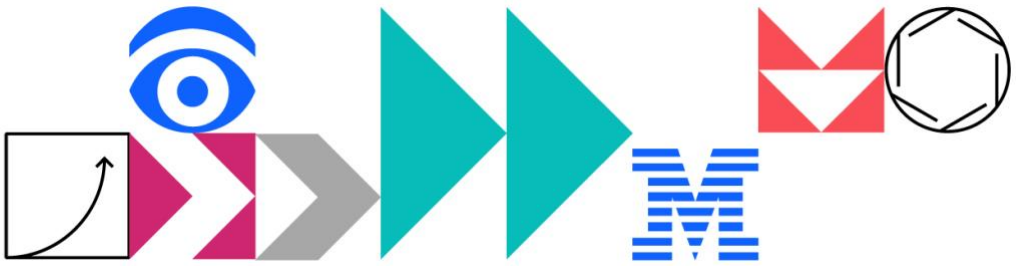
IBM TechXchange



IBM Business Automation Workflow: A 360-Degree View of Work

Session 4242

Lab Exercise Guide

Swapnil Agrawal

Senior Product Manager – IBM Business Automation SaaS

aswapnil@ca.ibm.com

Notices and disclaimers

U.S. Government Users Restricted Rights — use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM.

This document is current as of the initial date of publication and may be changed by IBM at any time. Not all offerings are available in every country in which IBM operates.
Information in these presentations (including information relating to products that have not yet been announced by IBM) has been reviewed for accuracy as of the date of initial publication and could include unintentional technical or typographical errors. IBM shall have no responsibility to update this information.

This document is distributed "as is" without any warranty, either express or implied. In no event, shall IBM be liable for any damage arising from the use of this information, including but not limited to, loss of data, business interruption, loss of profit or loss of opportunity. IBM products and services are warranted per the terms and conditions of the agreements under which they are provided. The performance data and client examples cited are presented for illustrative purposes only. Actual performance results may vary depending on specific configurations and operating conditions.

IBM products are manufactured from new parts or new and used parts.
In some cases, a product may not be new and may have been previously installed. Regardless, our warranty terms apply."

Any statements regarding IBM's future direction, intent or product plans are subject to change or withdrawal without notice.

Performance data contained herein was generally obtained in a controlled,
isolated environments. Customer examples are presented as illustrations of how those customers have used IBM products and the results they may have achieved. Actual performance, cost, savings or other results in other operating environments may vary.

References in this document to IBM products, programs, or services does not imply that IBM intends to make such products, programs or services available in all countries in which IBM operates or does business.

Workshops, sessions and associated materials may have been prepared by independent session speakers, and do not necessarily reflect the views of IBM. All materials and discussions are provided for informational purposes only, and are neither intended to, nor shall constitute legal or other guidance or advice to any individual participant or their specific situation.

It is the customer's responsibility to ensure its own compliance with legal requirements and to obtain advice of competent legal counsel as to the identification and interpretation of any relevant laws and regulatory requirements that may affect the customer's business and any actions the customer may need to take to comply with such laws. IBM does not provide legal advice or represent or warrant that its services or products will ensure that the customer follows any law.

Notices and disclaimers (Continued)

Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products. IBM does not warrant the quality of any third-party products, or the ability of any such third-party products to interoperate with IBM's products. **IBM expressly disclaims all warranties, expressed or implied, including but not limited to, the implied warranties of merchantability and fitness for a purpose.** The provision of the information contained herein is not intended to, and does not, grant any right or license under any IBM patents, copyrights, trademarks or other intellectual property right.

Table of Contents

1 Introduction

1.1 IBM Business Automation Workflow

IBM Business Automation Workflow is a software that combines business process management and case management capabilities in a single integrated workflow solution. It unites information, process, and users to provide a 360-degree view of work to help drive more successful business outcomes. The included low-code designer lets users easily create enterprise-grade user interfaces and service integrations.

Additional information about IBM Business Automation Workflow can be found here.

1.2 Lab Overview

In this lab, you will learn how to work with a Workflow solution by extending a partially implemented Client Onboarding scenario. It covers how to build a solution using both Case and Process features, shows you how to build easy to use low-code UIs, how to integrate with external services and how to consume other capabilities of IBM Cloud Pak for Business Automation such as Decisions.

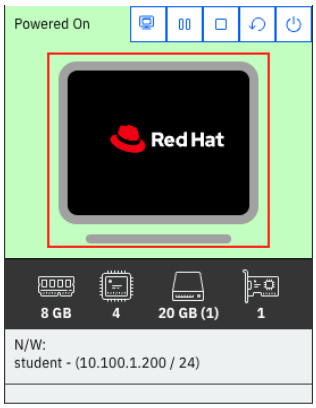
Overall, we want to add the following extensions to the partially implemented scenario:

- Call a Decision based on a machine learning model from the Decision capability to perform risk assessment.
- Update the Workflow and the UI to consume a new property “Risk Confidence” that is provided by the Decision. This property tells us how confident the machine learning model is about its risk assessment.
- Create a service integration with an email server using REST to send an email to the client when a decision is made on the onboarding request.

1.3 Lab Setup Instructions

All exercises in this lab will be completed in a remote virtual machine exclusively assigned to you for this lab session. You can access the remote virtual machine through the browser in your physical lab station. Once you have launched the lab environment from the physical lab station, follow the steps below to access your virtual machine:

1. On the tile that represents your virtual machine, click over the monitor icon with the RedHat logo. This will open a new tab in your browser showing the remote virtual machine desktop.



Once in the virtual machine desktop, double click on top of the Firefox shortcut to open the Firefox browser in the remote virtual machine.

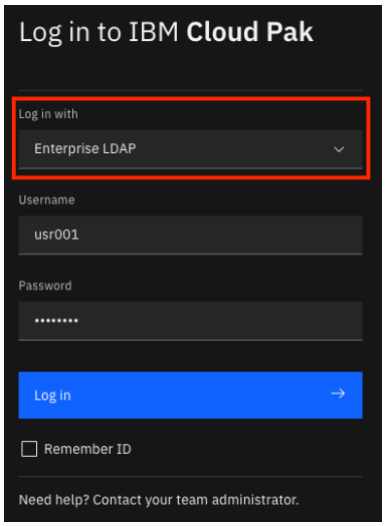
2 Exercise: Create the Client Onboarding solution

2.1 Introduction

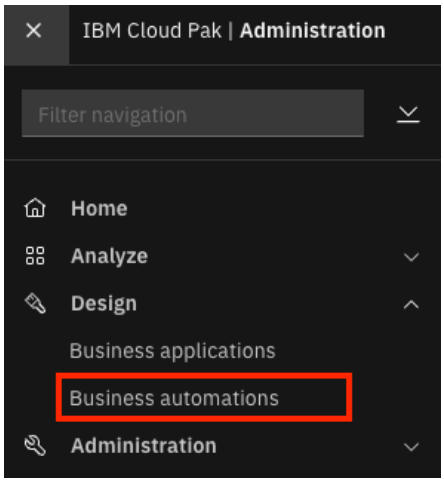
In this exercise, you will learn how to create a Workflow solution that includes Case features. The solution you create will be based on a template with a partial implementation which will help you complete the lab faster.

2.2 Exercise Instructions

1. Open the browser and go to the **IBM Business Automation Studio** bookmark.
2. On the login screen, under **Log in with**, select the **Enterprise LDAP** option.
3. Enter the username and password provided to you and click **Log in**.

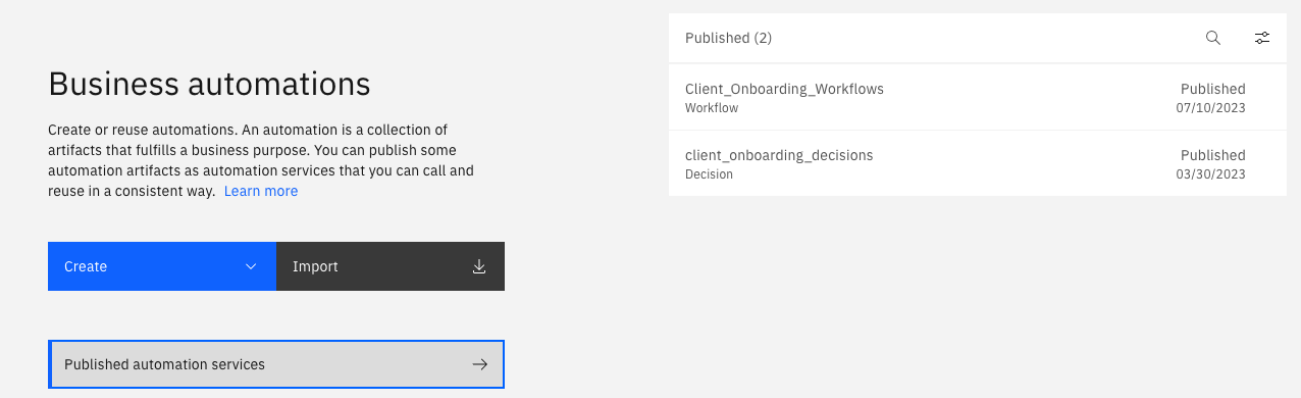


4. In the top-left corner, click on the hamburger menu icon and select **Design → Business automations** to access the automation repository.



This brings up the Business automations page where you can create or reuse automations from different capabilities of IBM Cloud Pak for Business Automation. The different automations from each capability are exposed as **Automation Services**. These automation services provide a unified way within the platform to publish and consume services between capabilities such as Decisions and Workflow.

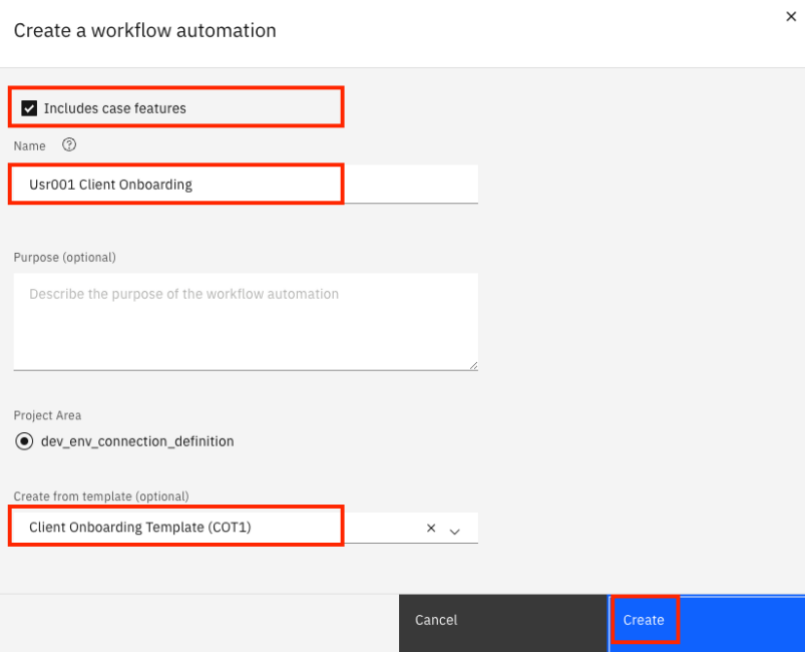
In your environment, you will see two exposed Automation Services:



In this lab, we will be using the **client_onboarding_decisions** Automation Service to perform risk assessment for a client that is to be onboarded. To do that, we will first need to create the Workflow solution.

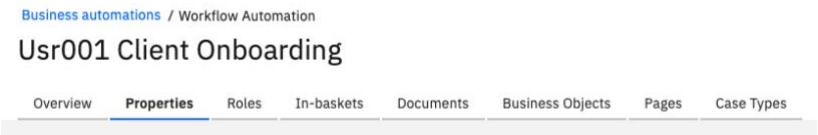
5. Click on **Create → Workflow → Workflow automation**.
6. Check the **Includes case features** checkbox.

   Note: As a best practice, you should include the case features when you want to create a Workflow automation project that contains unstructured activities, is content intensive (i.e., activities triggered by documents) and/or requires persistence (i.e., a permanent system of record).
7. In the Create from template field, select Client Onboarding Template.
8. In the **Name** field, enter ***UsrNNN* Client Onboarding** where U*srNNN* is your username.
9. Click on **Create**.



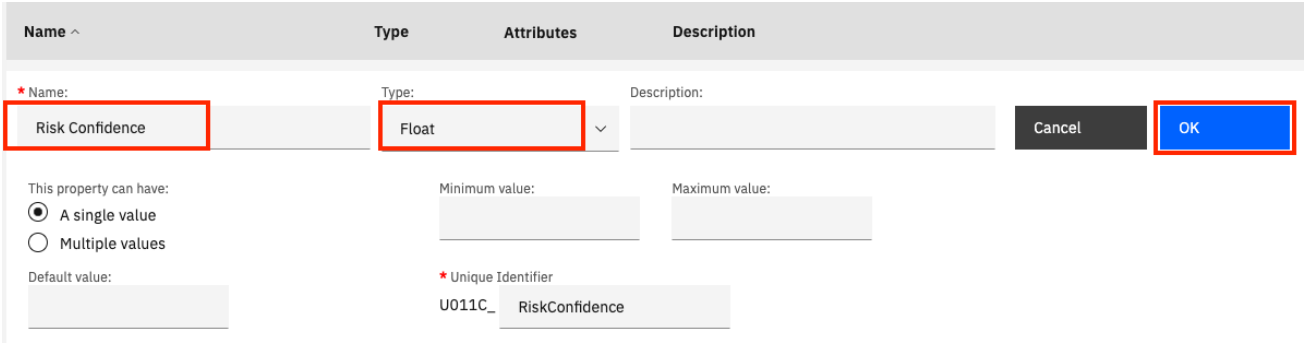
This launches the Case Builder where you can design your solution. Since this solution was created from a template, a partial implementation already exists. Next, we will explore some of the features of the solution in the Case Builder and add items as discussed in the Lab Overview section.

10. Click on the **Properties** tab at the top.

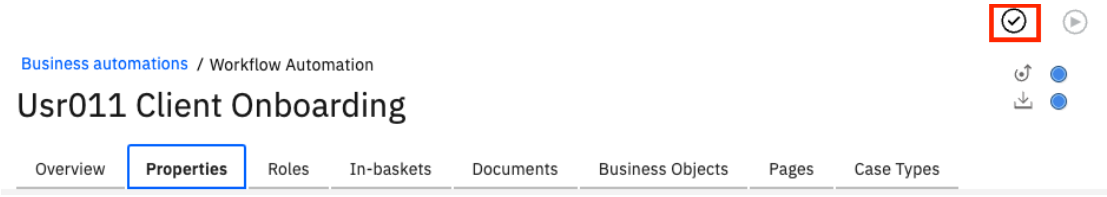


This tab shows you all the properties that are used in the Workflow. Explore the different property and property types in this tab. Since we will be calling a Decision that provides us with a "Risk Confidence" level, we will now add a property to hold that decision value.

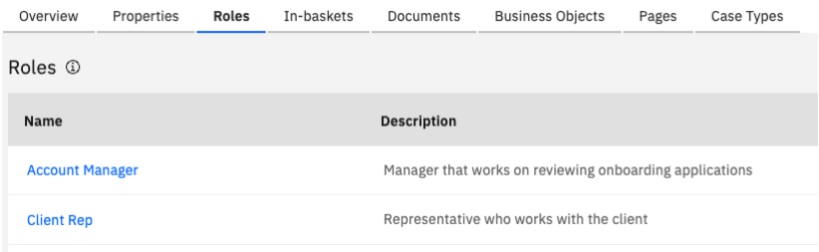
11. In the top-right corner, Click on **Add Property → New**.
12. In the **Name** field, enter **Risk Confidence**.
13. For the **Type** field, select **Float**. We do this because the decision provides a decimal value for the risk confidence. Based on the type selected, you will get different options to configure the property. For example, Strings provide choice lists which means the value can only one of the items in the list of choices.
14. Click on **OK**.



15. Click on the **Save** button in the top-right corner:

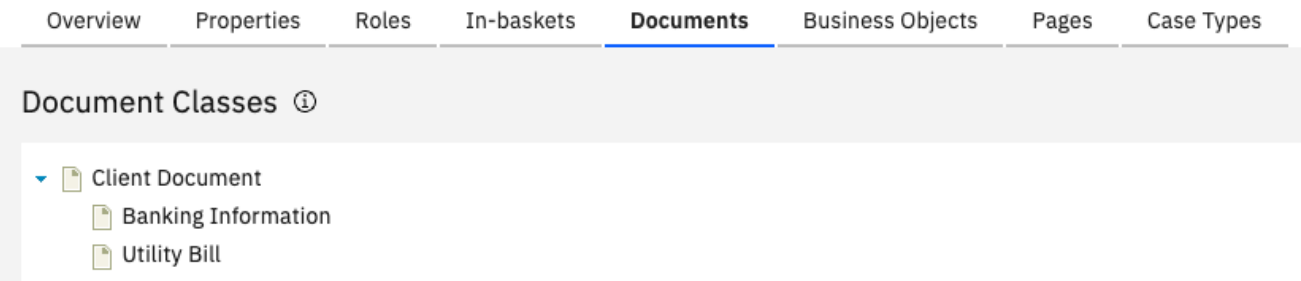


16. Click on the **Roles** tab at the top.



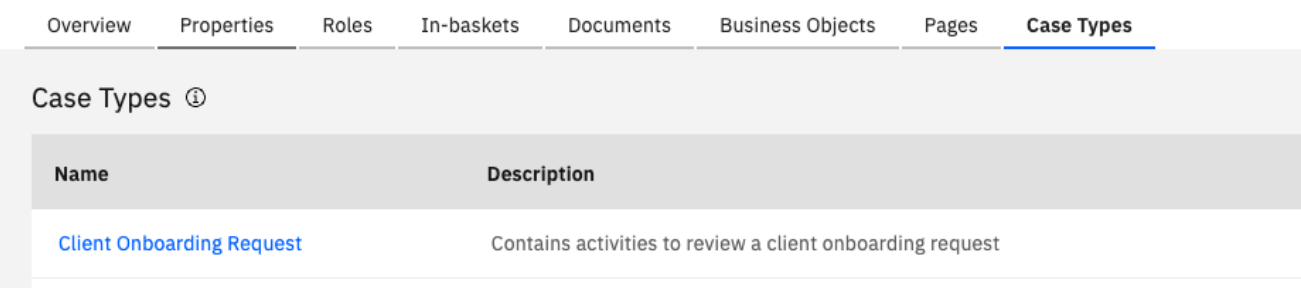
Here you see the different roles, **Account Manager** and **Client Rep**, defined for the solution along with their descriptions. A role defines and groups users by the type of work they can do. The role can be associated with steps in a Workflow. Additional roles can be added and each role will see their own list of tasks based on what is assigned to that role. For this lab, we don't need to add any new roles. In this scenario, the Account Manager reviews the client onboarding requests and the Client Rep interacts with the client.

17. Click on the **Documents** tab at the top.
18. Expand the **Client Document** section.



This section lists the document classes available to the Workflow. These document classes help you organize and classify documents belonging to a case. For example, you can start new tasks or activities based on a document being added to the case or trigger a new case when a document is received. In this tab, you can add new document classes or select existing ones from the Content capability of the IBM Cloud Pak for Business Automation platform. Using an existing document class also imports all the document properties of that class into the Workflow. For this lab, we will leave the section as is as we will not be working with documents.

19. Click on the **Case Types** tab at the top.

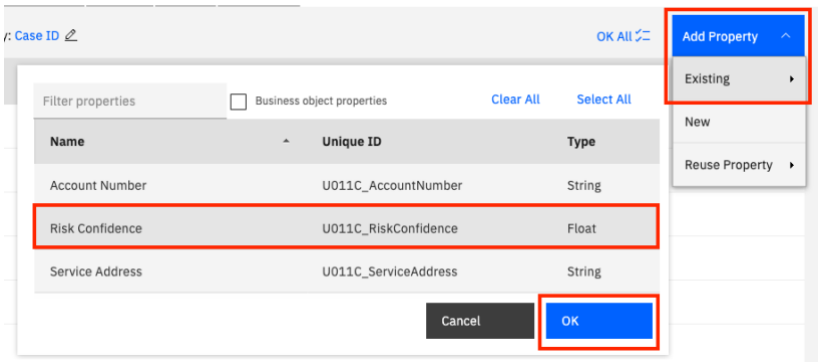


A case type identifies the activities, content, user interface, etc. that are required to manage the case. A case solution can have multiple case types.

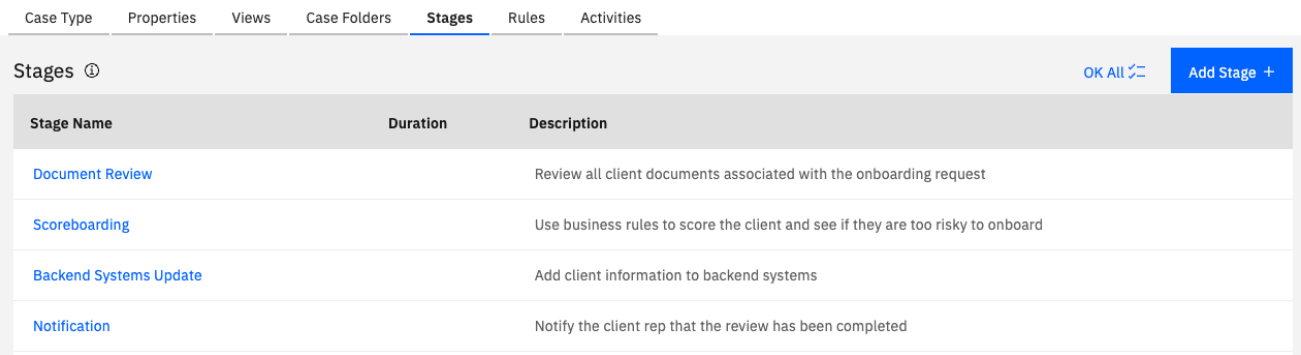
20. Click on the existing **Client Onboarding Request** case type to open it.

    Note: The field **Starting document class** is set to **<None>** but it's an important field to note. This field allows the case to be triggered automatically when a document of the selected class is added to the content repository backing the Workflow server. This has several use cases like - starting a mortgage application case if a mortgage application form is uploaded, starting an insurance claim request if a picture of a car is submitted. Case types can also be triggered via API and manually by Case workers.

21. Click on the **Properties** tab to add the **Risk Confidence** property from the solution into the case type.
22. In the properties tab, click on **Add Property** → **Existing** → **Risk Confidence** then click on the **OK** button.

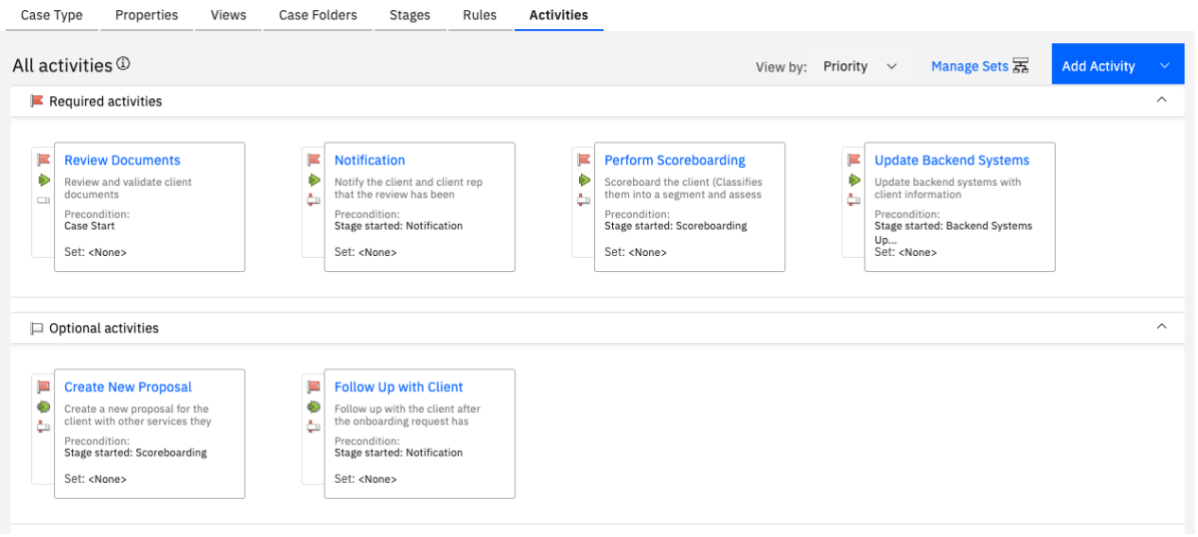


23. Click on the **OK** button again and then click on the **Save** icon in the top-right corner.
24. Click on the **Stages** tab.



You can define stages to represent the lifecycle of a case. The first stage starts automatically when the case is started. Stages are useful to track progress of the case, trigger activities based on the start of a stage and each stage can be optionally assigned a duration for further tracking. In this scenario, the onboarding request first goes through a document review, then the scoreboarding stage does the risk assessment, the backend systems update runs APIs and RPA bots to update internal systems and the notification stage notifies the client rep that the review is completed.

25. Click on the **Activities** tab.



As you can see here, the case represents a non-sequenced list of activities. An activity represents a specific operation that is performed as part of a case and can consist of several steps that must be completed to complete the activity. In this scenario, you see that we have 4 required activities and 2 optional activities. The optional activities can be configured to start manually and/or on a pre-condition such as the start of a stage, change in the value of a property, the value of a property set to a specific value, or a document added to the case. In the next exercise, we will modify the **Perform Scoreboarding** activity to consume a machine learning backed decision that uses the Risk Confidence property you added and update the review user interface to show this property. Keep the Activities tab open for the next exercise.

26. Click on the **Deploy** icon in the top-right corner and click **Deploy** in the dialog to deploy the case part of the solution. Once the solution is successfully deployed, you will see two green checkmarks.

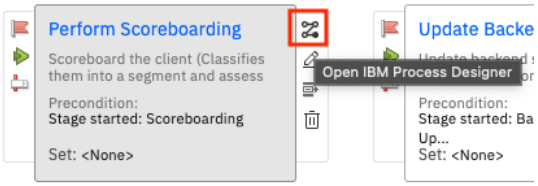
3 Exercise: Add a Decision to your Workflow

3.1 Introduction

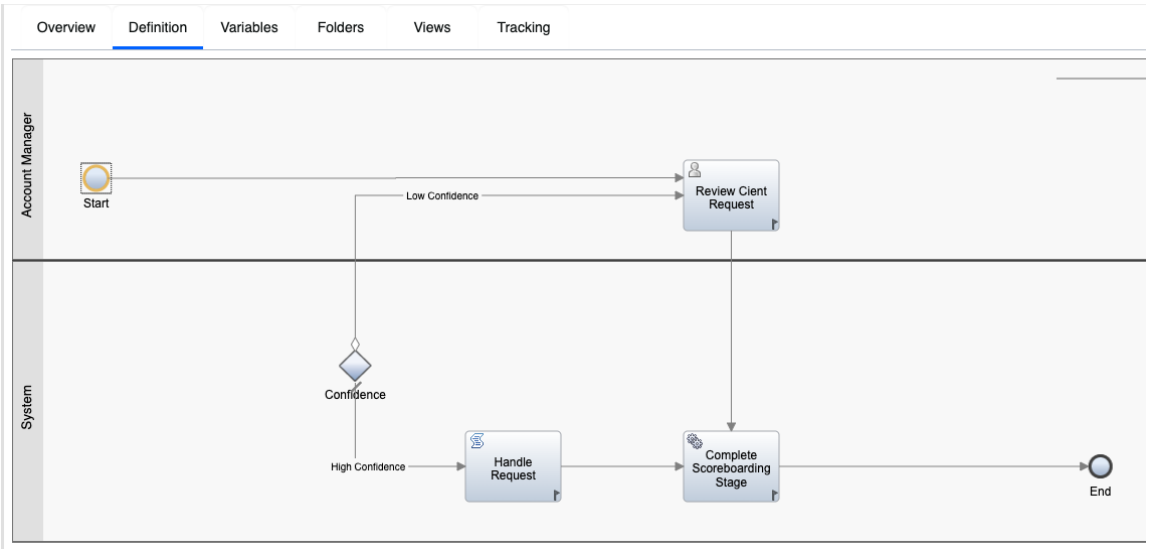
In this exercise, we will be using the Client Onboarding Decisions automation service to perform risk assessment on the client being onboarded. This automation service was created using the Decision capability of IBM Cloud Pak for Business Automation and is backed by a machine learning model that provides a decision on the risk assessment along with the confidence level of that decision. Once we consume this automation service, we will update the user interface shown to the account manager to review the onboarding request so that they can use the values provided by the prediction to make a better decision.

3.2 Exercise Instructions

1. Continuing from the **Activities** tab in the previous exercise, hover over the **Perform Scoreboarding** activity and click on the **Open IBM Process Designer** icon.



This opens a new window with the definition of the activity in the Process Designer. The Process contains two lanes – **Account Manager** and **System**. The Account Manager lane contains tasks that would need to be performed by users assigned to the Account Manager role. System lanes contain service calls / anything that is done by the Workflow system. You can add/remove lanes and assign them to different roles depending on the requirements of your business. Note how this definition is created using sequential tasks unlike the activities of a case.



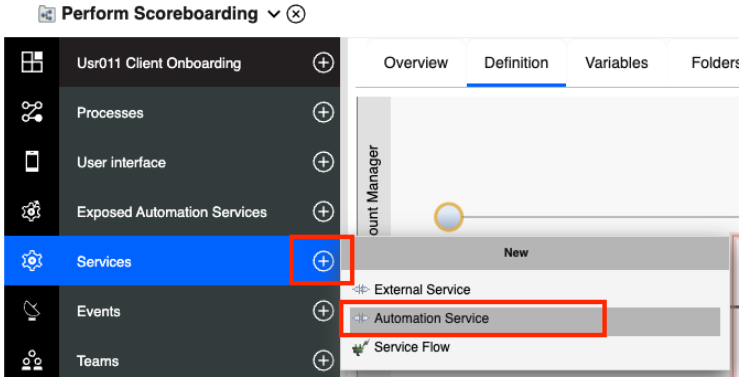
At the top of the definition, you will see various tabs like **Overview**, **Definition**, **Variables**, etc. You can optionally explore these tabs. For example, the **Variables** tab contains all variables that can be used in the implementation (e.g., case properties).

On the right of the definition, you will see the palette that lets you add different tasks to the definition.

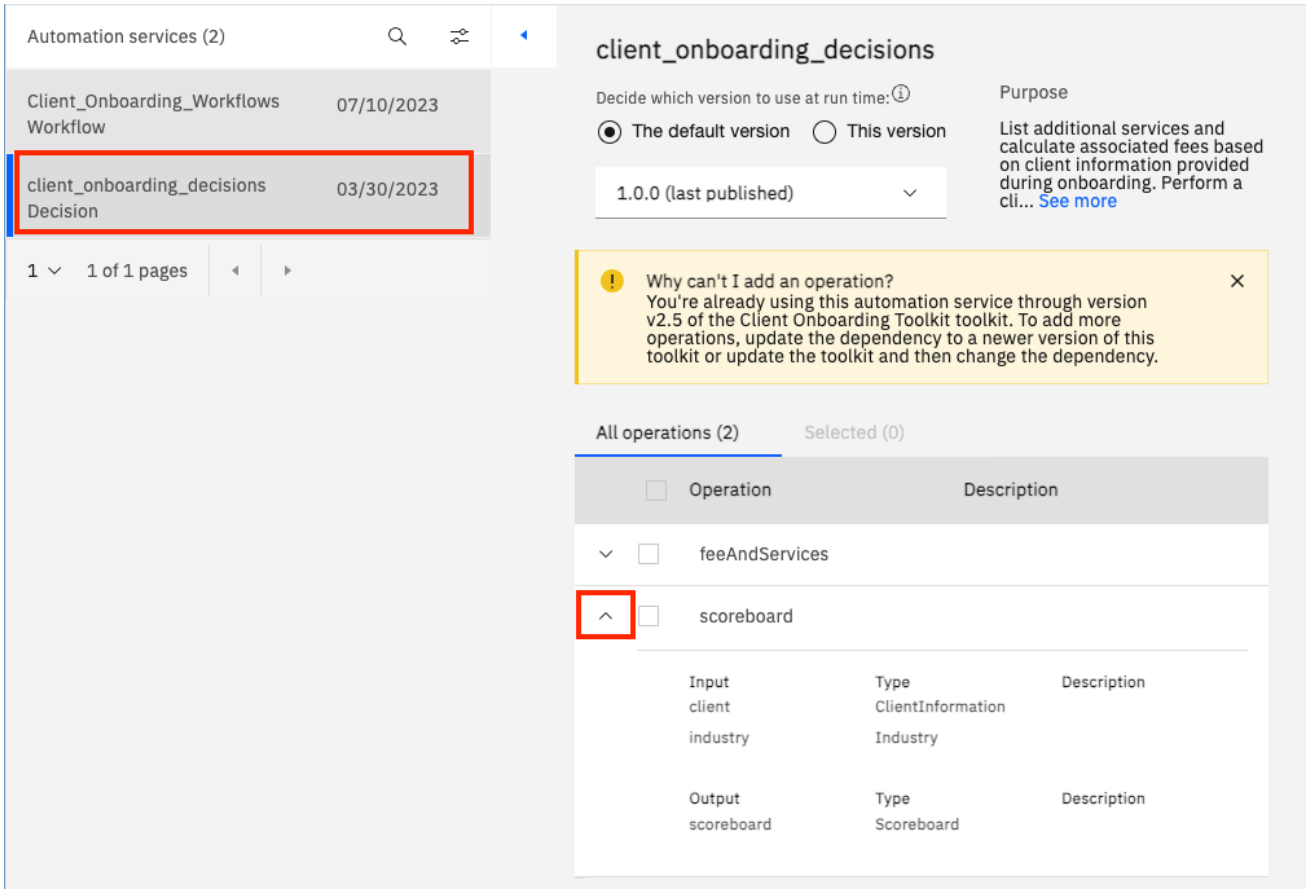
On the left of the definition, you will see the library pane that lets you work with artifacts in your solution.

Next, we will add a task to the definition so that the decision automation service is called between the **Start** and **Review Client Request** tasks.

2. In the library pane on the left, hover over **Services,** click on the **+ button**, and then select **Automation Service**.



3. Select the **client_onboarding_decision** Automation Service that was published by the Decision capability.
4. Expand the **scoreboard** operation.

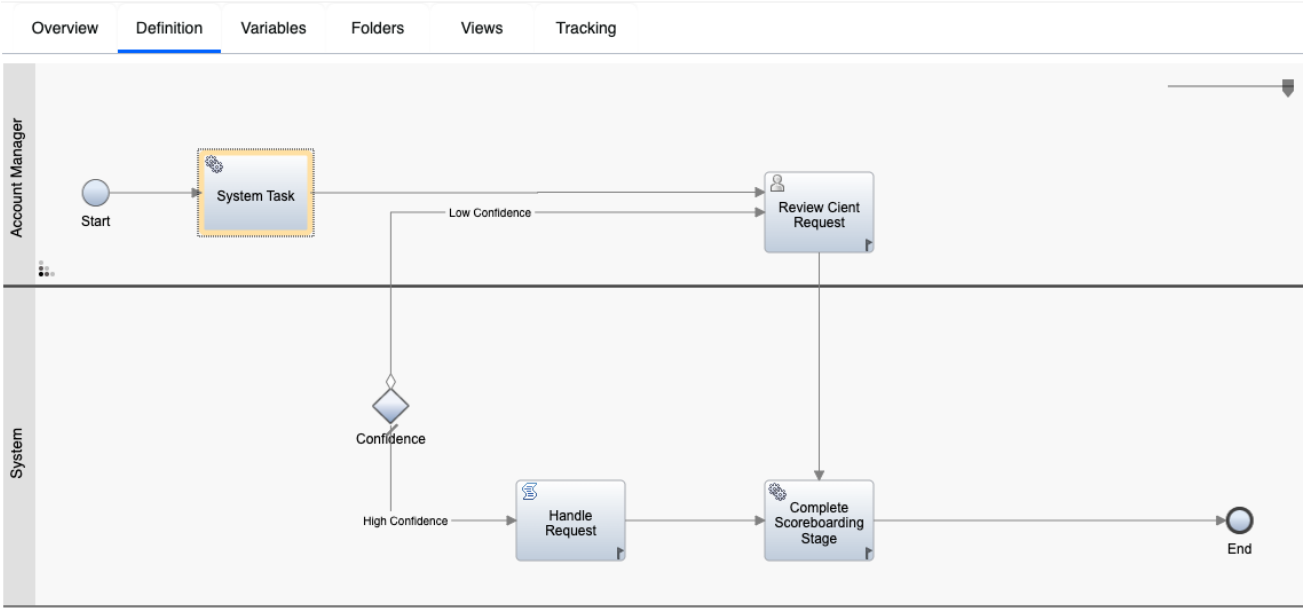


Here you can see that the automation service provides two operations – **feeAndServices** and **scoreboard**. We are only interested in scoreboard as that is the operation that performs the risk assessment. Expanding the operation shows us the Inputs and Outputs of this service. The business data required to invoke the selected operations is automatically imported to your solution when you add the automation service.

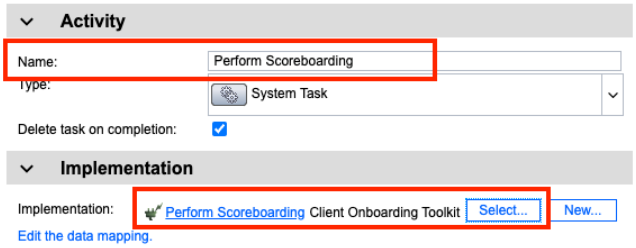
For this lab, we have already added the operation to your solution (as mentioned in the yellow info box).

5. Click on **Cancel** to close the dialog.
6. From the palette on the right-hand side, select the dropdown on the 2nd icon and drag the **System Task** task on the line between the **Start** and **Review Client Request** tasks.

Your definition should now look as follows:



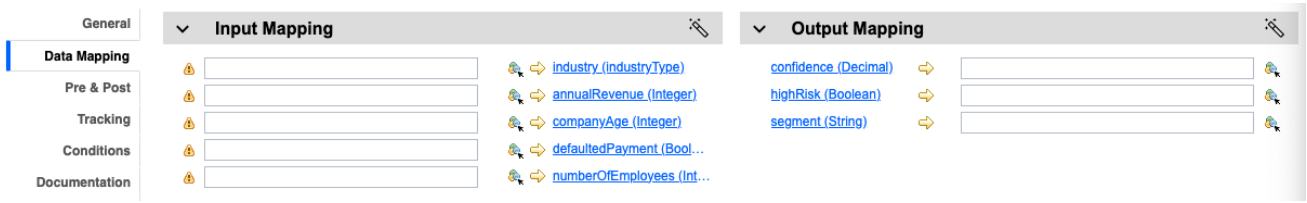
7. In the properties pane at the bottom, change the **name** of the activity to **Perform Scoreboarding**.
8. For the **Implementation** field, click on the **Select** button, enter **Perform** in the search field and select the **Perform Scoreboarding** service. This service contains the operation added from the automation service.



Next, we have to map the data from the Process to the service we are calling.

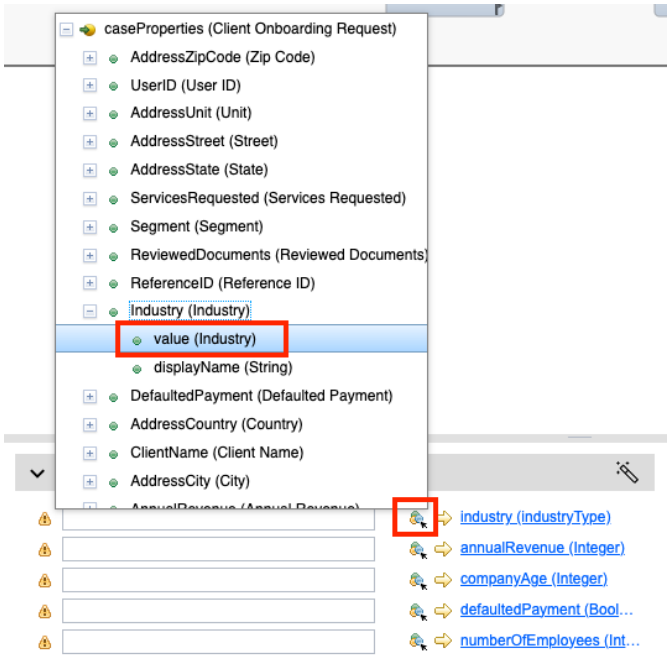
9. Click on the **Edit the data mapping** link at the bottom of the Implementation field.

   This displays the Data Mapping tab showing you the inputs and outputs of the service being invoked (Perform Scoreboarding).



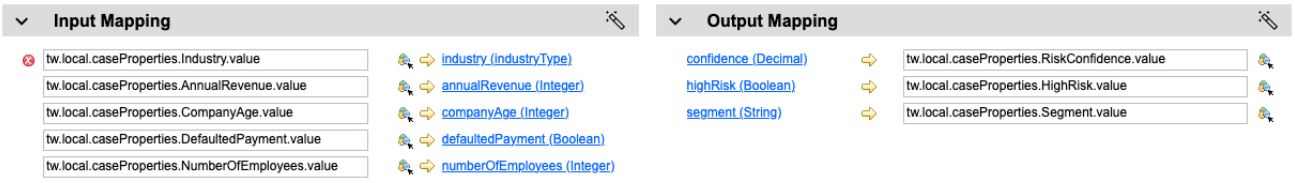
We now need to take the value from the properties in our case solution and map it to the service being invoked.

10. Click on the **variable picker** icon for the **industry** field, expand the **caseProperties** variable, expand the **Industry** variable and select **value**.



   Note: Ignore the error you see for the industry field once the value is selected.

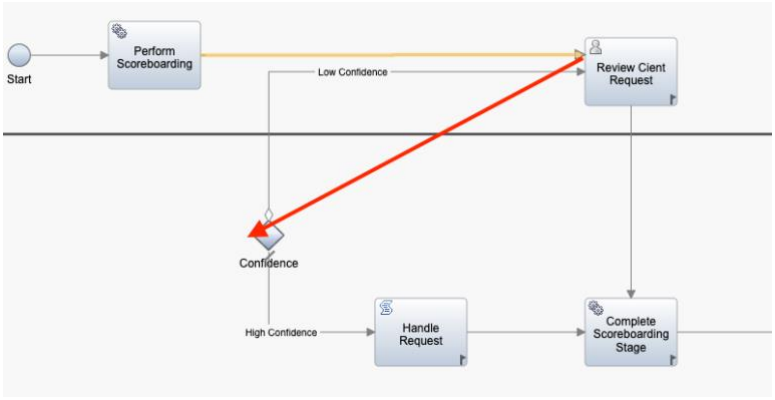
11. Similarly, map the other inputs and outputs as follows:



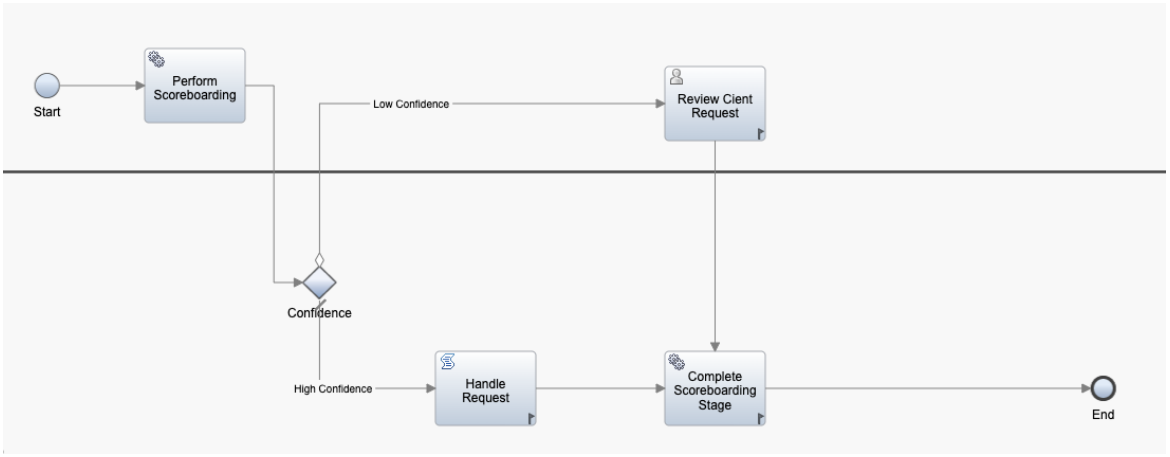
   Note: In the latest release of IBM Business Automation Workflow, significant improvements have been made to auto-map these variables and provide a graphical mapper to simplify this experience.

Next, to improve the efficiency of the Workflow, we want to only send the review request to the Account Manager for a prediction that is low in confidence. We will update the definition accordingly.

12. Drag the end of the line going from **Perform Scoreboarding** to **Review Client Request** and drop it to the left of the **Confidence** gateway.

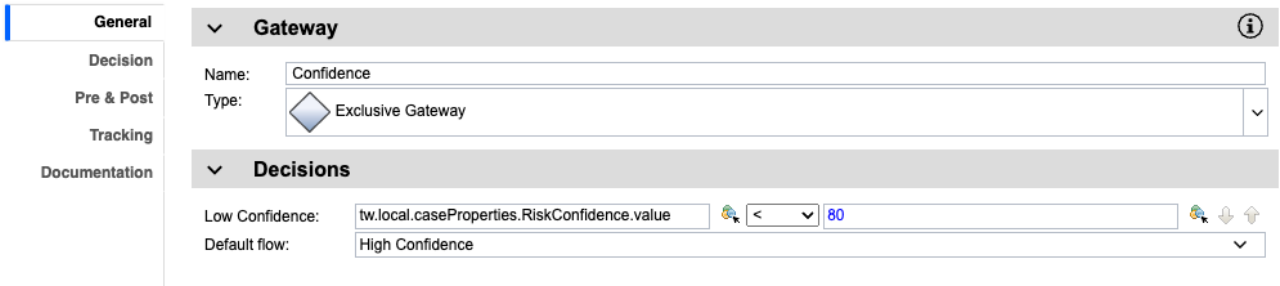


Your definition should now look as follows:



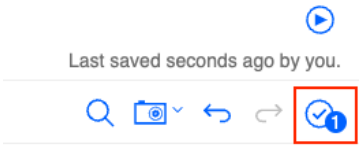
Looking at the flow of the definition, you can now see that once the scoreboarding is performed, a gateway uses the value of the confidence to decide if the review request needs to be handled by the account manager manually or if the system can handle it automatically.

13. Click on the **Confidence** gateway in the definition.



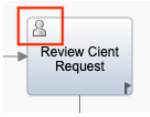
You can see here that for a risk confidence with a value less than 80, the path with “low confidence” is followed which leads to a manual review and the default flow (high confidence) leads the system handling the request automatically.

14. Click on the **Finish Editing** icon in the top-right corner.



Next, we will update the user interface of the **Review Client Request** task to display the confidence to the Account Manager and make the task look a little nicer.

15. Double-click on the **user** icon on the Review Client Request task.

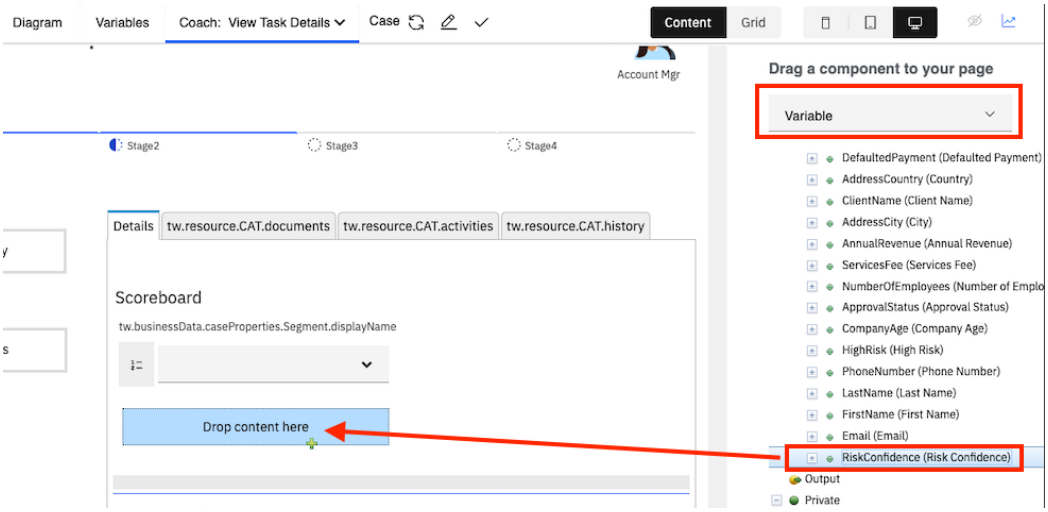


This opens the implementation of the user task.

16. Click on **Coach** in the list of tabs at the top.

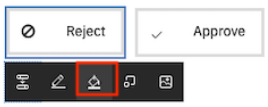
A coach lets you design the user interface as seen by the end-user which in this case would be the Account Manager. The palette on the right contains several feature-rich views that can be used to create the user interface. Several out-of-the-box views are provided with the product and users can also create custom views to use across their Workflows for a unified look. You can also use the palette on the right to select variables and the appropriate view will be added to the user interface based on the type of the variable.

17. Click on the **Details** tab within the user interface. We want to add the confidence field to the area where it says **Drop content here** below the **Segment** field.
18. In the palette on the right, select the dropdown that says **All views** and select **Variable**.
19. Drag and drop the **RiskConfidence** variable onto the area where it says **Drop content here**.



This adds the label and a text field to display the value of the risk confidence to the account manager. Next, we will add color to the Reject and Approve buttons on the page so they are easier to distinguish.

20. Scroll down in the user interface to go to the Reject and Approve buttons at the bottom.
21. Click on the **Reject** button to bring up the view specific context menu, select the paint bucket icon and select the red color.



22. Similarly, change the **Approve** button to green.

The context menu is different for each view and lets users easily customize the appearance of views on the page. Once the buttons are updated, they should look as follows:

23. Click on the **Finish editing** button  in the top-right corner.

The changes to include the risk confidence as a part of the scenario are now done. Next, we will invoke a REST service using a no-code mechanism so an email is sent to the client once the review is complete.

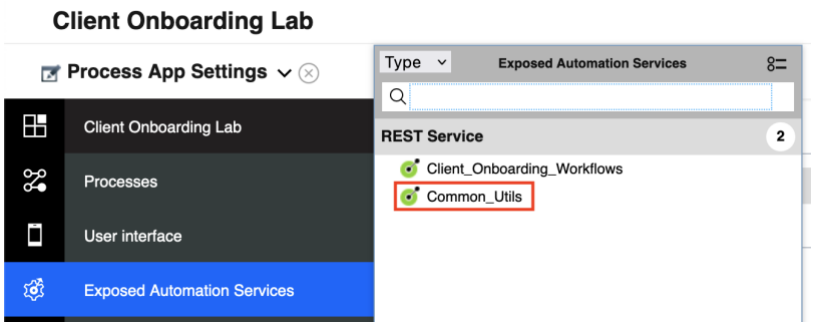
4 Exercise: Invoke a REST API using No-Code Tools

4.1 Introduction

REST is one of the most common ways to integrate with external services. Several service providers use RESTful APIs to let applications interface with their services. IBM Business Automation Workflow provides a feature called External Services that lets you use a no-code/low-code approach to integrating with these REST APIs. External Services can also invoke Web Services and custom Java libraries. In this exercise, we will invoke a REST API that sends an email using a local SMTP server.

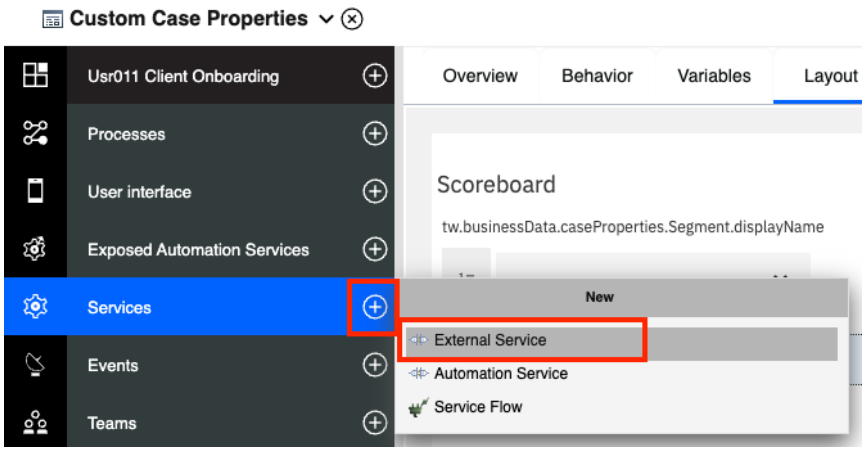
4.2 Exercise Instructions

1. In the navigation pane on the left, click on the **Exposed Automation Services** section and open the **Common_Utils** REST Service



Note: In this lab, we are using IBM Business Automation Workflow as the REST server but this method will work with any REST server for which an OpenAPI file is available.

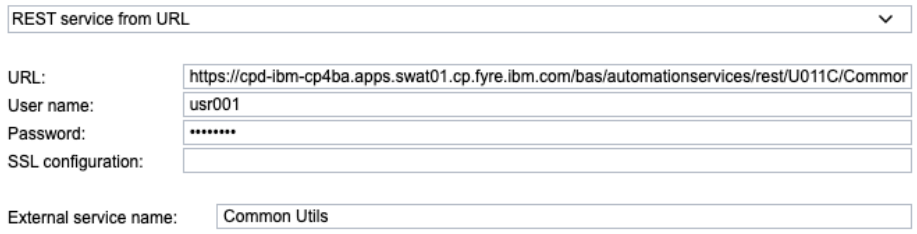
2. In the editor that opens, copy the URL to the OpenAPI spec under **OpenAPI Definition URL**.
3. In the navigation pane on the left, hover over the **Services** section, click on the **+** button and select **External Service**.



In the dialog that opens, **Java, REST or Web Service** is selected by default. Since we want to invoke a REST service, we will leave the default value as-is.

4. Click **Next**.
5. In the dropdown for **Select a method to discover the service**, select **REST service from URL**.
6. In the URL field, enter the URL copied in step 2.
7. In the username and password field, enter the credentials provided to you.

8. For the **External Service name** field, enter **Common Utils**.



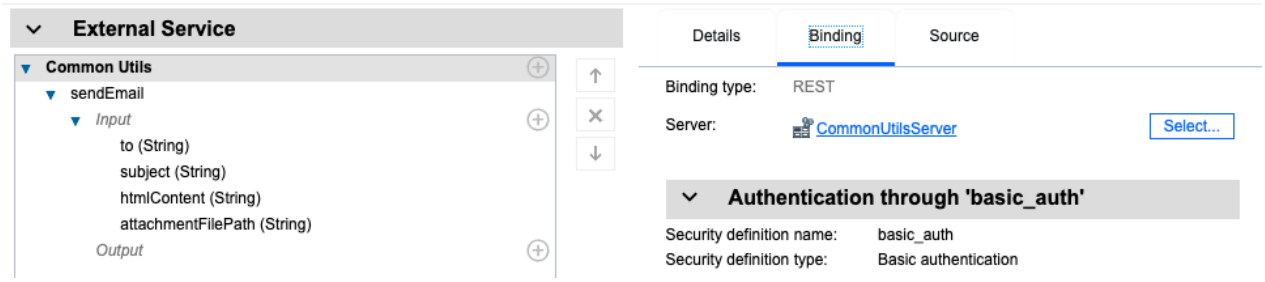
9. Click **Next**.

   This lists the operations provided in the OpenAPI spec.

10. Since we are only interested in sending emails, deselect the **invokeRPABot** operation.

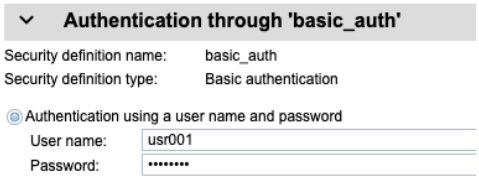
11. Click **Next**. This part of the dialog tells you that a new server will be created in the Workflow that can be re-used by other external services. Since we don't have a server created for this external service, we will leave the default option to create a new one. The advantage of creating a server is that the URL and credentials can be updated outside of the Workflow without having to change the Workflow itself.
12. Click **Finish** to create the external service.

    This opens the External Service editor that contains the operations defined within the OpenAPI spec. Each operation has its own signature (inputs and outputs) which is translated into the external service for no-code/low-code integration in Workflow.

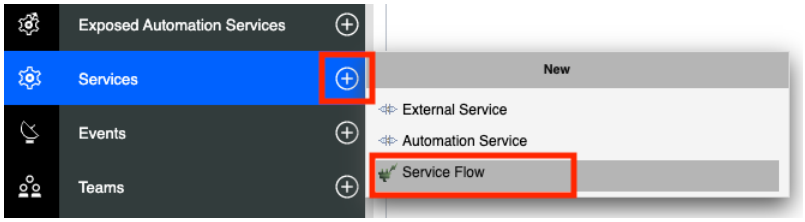


    As the sendEmail operation has no outputs, the output section is empty. Next, we will create a service flow to be able to invoke the operation. Service flows let you invoke different types of services and integrations from Workflow. To make the service flow re-usable, it can be published as an automation service or be put in a toolkit where other Workflows can consume it. In the next exercise, we will see how to publish an automation service so that it can be re-used.

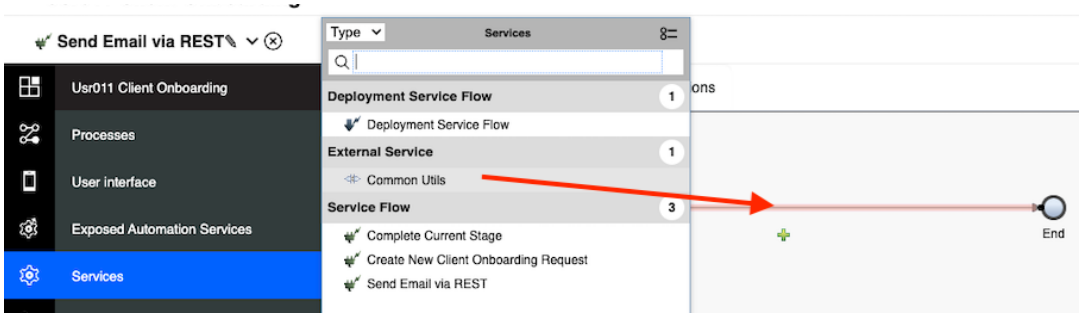
13. Select the **Binding** tab on the right and enter your credentials again under the authentication section.



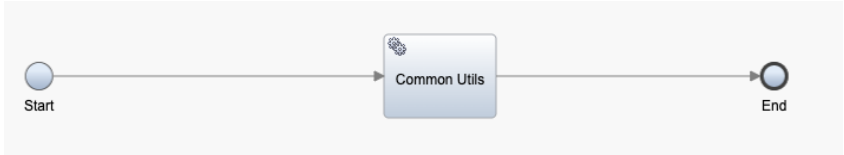
14. In the library pane on the left, hover over **Services**, click on the **+** button and select **Service Flow**.



15. In the New Service Flow wizard, enter Send Email via REST as the name.
16. Click on **Finish** to open the service flow editor. Note that this editor only contains the System lane as service flows are meant to be straight-through flows performed on the system.
17. In the library pane on the left, click on **Services** and drag the **Common Utils** external service on the line connecting the **Start** and **End** node.

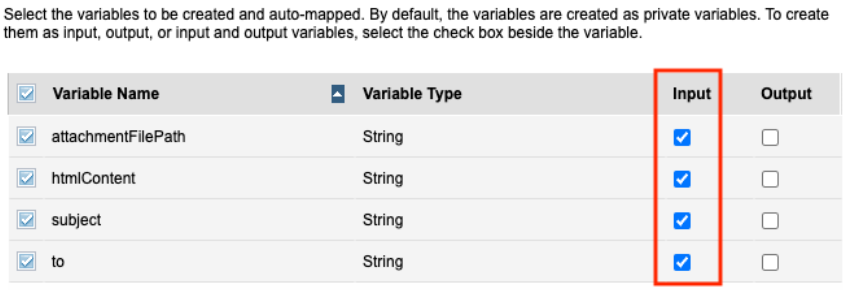


18. Your diagram should now look as follows:



19. Click on **Common Utils** in the diagram.
20. In the property pane at the bottom, for the **Operation** field, select **sendEmail**.

21. Switch the **Data Mapping** tab.
22. Click on the **auto-map** button to create the variables required to invoke the email.
23. In the Variable Creation wizard, select the **Input** checkboxes for all variables.



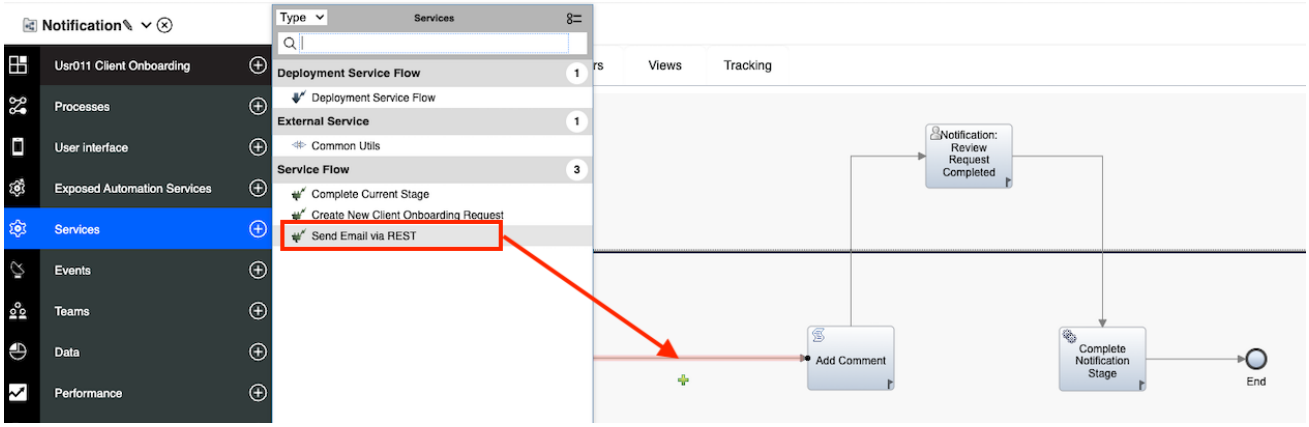
We select the input option as we can input the values of these variables from any process that calls this service flow. For example, in our case, we can take the value of the client's email and input it to the **to** variable of this service.

24. Click **Finish**.

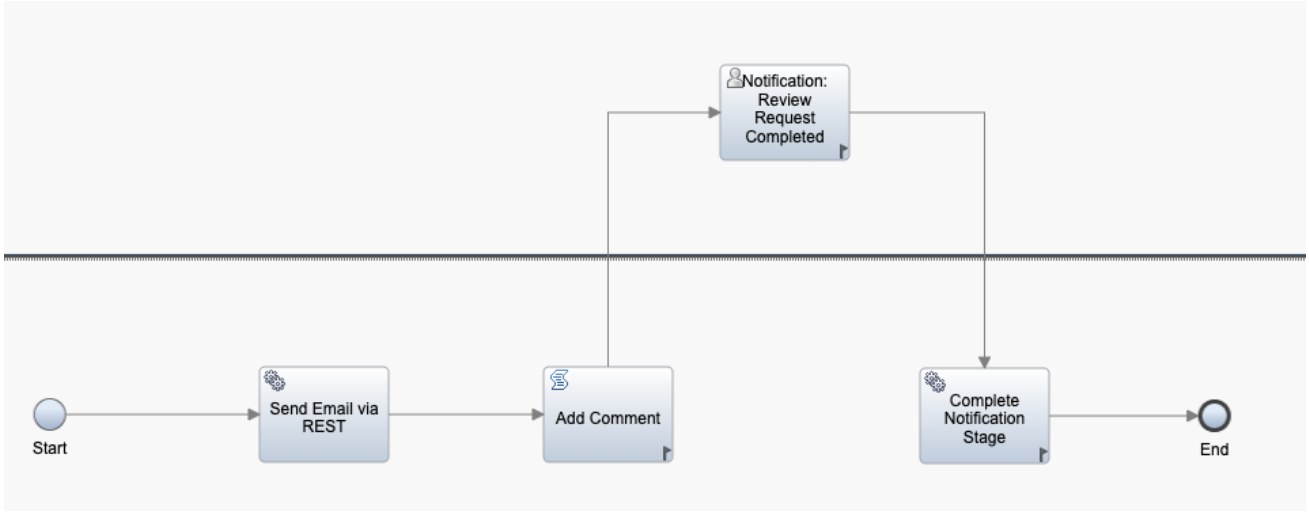
    This service can now be published as an Automation Service when the Workflow is published. This will make the service available to selected users across the platform and allow users outside this Workflow to send emails in their applications or workflows. We will skip the publish step in this lab. Next, we will update the **Notification** task to notify the client of their approval status.

25. Open the **Notification** process by using the navigation pane on the left. Click on **Processes → Notification.**

26. Next, open the list of **Services** in the navigation pane on the left, select **Send Email via REST** and drag and drop the service on the line connecting **Start** and **Add Comment**.



Your process definition should now look as follows:



27. Click on **Send Email via REST** to update its properties and data mapping.

28. Click on the Data Mapping tab in the properties pane at the bottom.

29. For the **attachmentFilePath** mapping, enter the value **null**.

30. For the **htmlContent** mapping, enter the string:

```
"Hello " + tw.local.caseProperties.FirstName.value + ",<br/><br/>This is with
reference to your onboarding application with reference ID: " +
tw.local.caseProperties.ReferenceID.value + "<br/><br/>Your onboarding request has
been " + tw.local.caseProperties.ApprovalStatus.value.toLowerCase() + ". For any
questions, please use our live chat.<br/><br/>Regards,<br/>Focus Corp"
```

    You can also save HTML templates as files in Workflow and use its contents as the value of this mapping instead of manually typing it in. We will skip that for this lab.

31. For the **subject** mapping, enter:

```
"Your request has been " + tw.local.caseProperties.ApprovalStatus.value.toLowerCase()
+ " [Reference ID: " + tw.local.caseProperties.ReferenceID.value + "]"
```

32. For the **to** mapping, enter tw.local.caseProperties.Email.value.

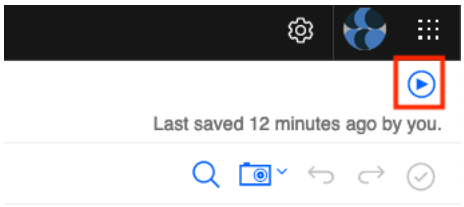
    The changes we needed to make to the Workflow are now complete. We will now test the changes as the end-user.

33. Click on the **Finish editing** icon in the top-right corner.

34. In the navigation pane on the left, select **Processes → Sample Client Onboarding Request**.

    This process has been prepared for you to automatically kick off a sample client onboarding request with some default values so that you can test your changes.

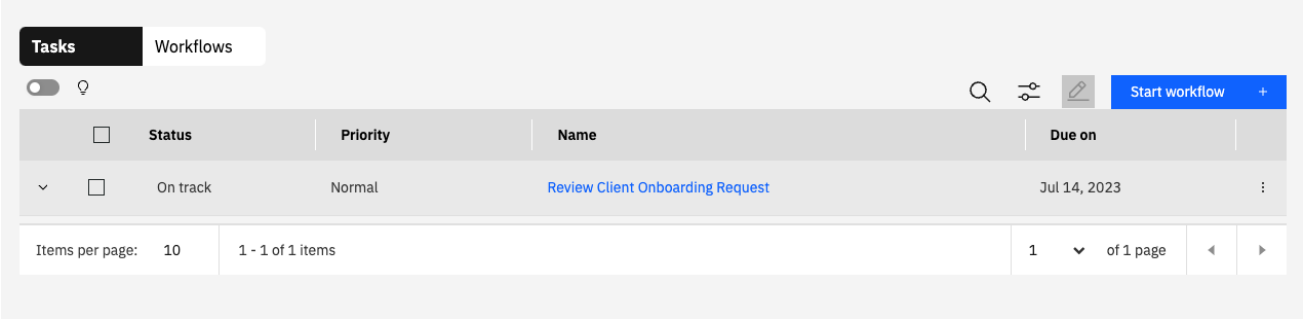
35. In the top-right corner, click on the **Run** button to run the Process.



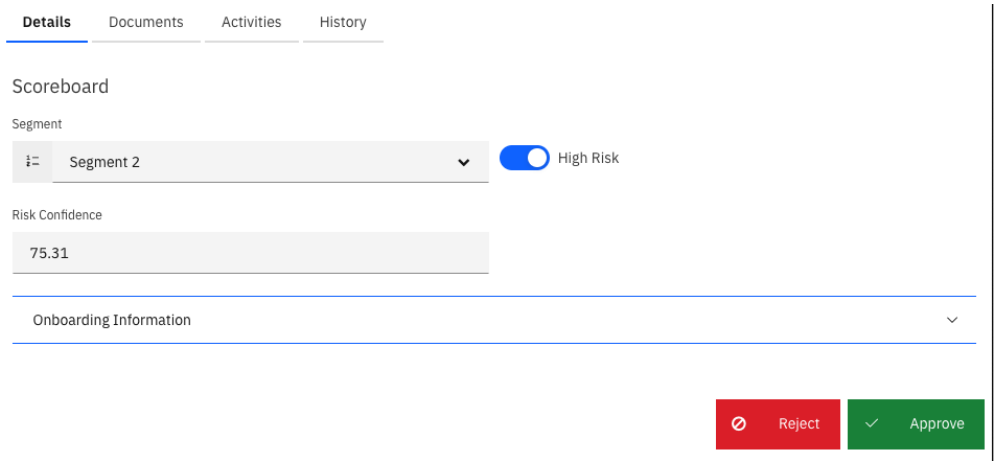
36. In a new browser tab, open the **Workplace** bookmark.

    Workplace is an application that lets end-users work on their tasks and provides a 360-degree view of your work and lets you orchestrate, prioritize, track, and complete your tasks. Workplace can also be federated to be used with multiple IBM Business Automation Workflow systems so tasks across your organization are visible in one place.

37. In Workplace, you will have one task in your task list: **Review Client Onboarding Request**.



38. Click on the name of the task **Review Client Onboarding Request** to open it.



Here we can see the newly added value for the **Risk Confidence** and that the **Segment** and **High Risk** values are filled in automatically based on the prediction made by the Decision. Since the confidence is below 80, the Account Manager still must review the request manually as we configured earlier.

The **Reject** and **Approve** buttons are also now colored and easily distinguishable.

39. Explore the user interface and different tabs of this task. For example, the **Activities** tab lets the account manager start optional activities like **Create New Proposal** as defined in the case part of the solution.
40. Click on the **Reject** button to reject the onboarding request.

    A new task should show up in Workplace called **Notification: Review Request Completed**. You can ignore this task as we did not make any changes to its user interface.
41. In a new tab, open the **Local Mail** bookmark and verify that you received an email showing that the onboarding request was rejected. The credentials to login to the local mail are the same user ID and password you used throughout the lab.

CONGRATULATIONS ON COMPLETING THE LAB!

In this lab, you learned how to:

- Create a case solution with non-sequential activities and integrate it with a sequential process.
- Consume an automation service published by another capability.
- Create no-code/low-code user interfaces.
- Invoke a REST service using no-code mechanisms.