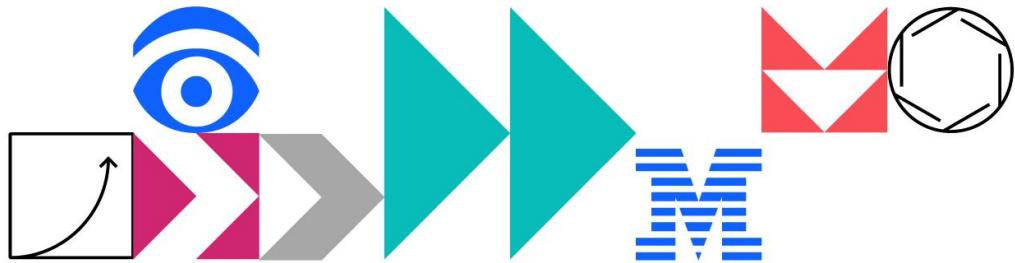


IBM



Mastering the Art of Digital Labor

Lab Exercise Guide

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1 Introduction

In this lab, you will learn about IBM's platform for AI Assistants, IBM watsonx Orchestrate. You will learn how Orchestrate automates and streamlines our daily tasks as a personal AI Assistant powered by hundreds of pre-built skills.

This lab will cover how you can create custom skills, how to prepare (or enhance) skills to be used by your business users, and how to combine skills into skill flows that govern a sequence of steps to run more complex tasks. Additionally, in this lab you will learn how to use out-of-the-box generative AI based automation in watsonx Orchestrate.

The final chapter of this lab is dedicated to how you can build new automations and expose them as skills using the market leading automation capabilities of IBM watsonx Orchestrate. The chapter will also provide an overview of the AI Assistant builder in watsonx Orchestrate – a next-generation builder studio that leverages the power of generative AI and digital skills.

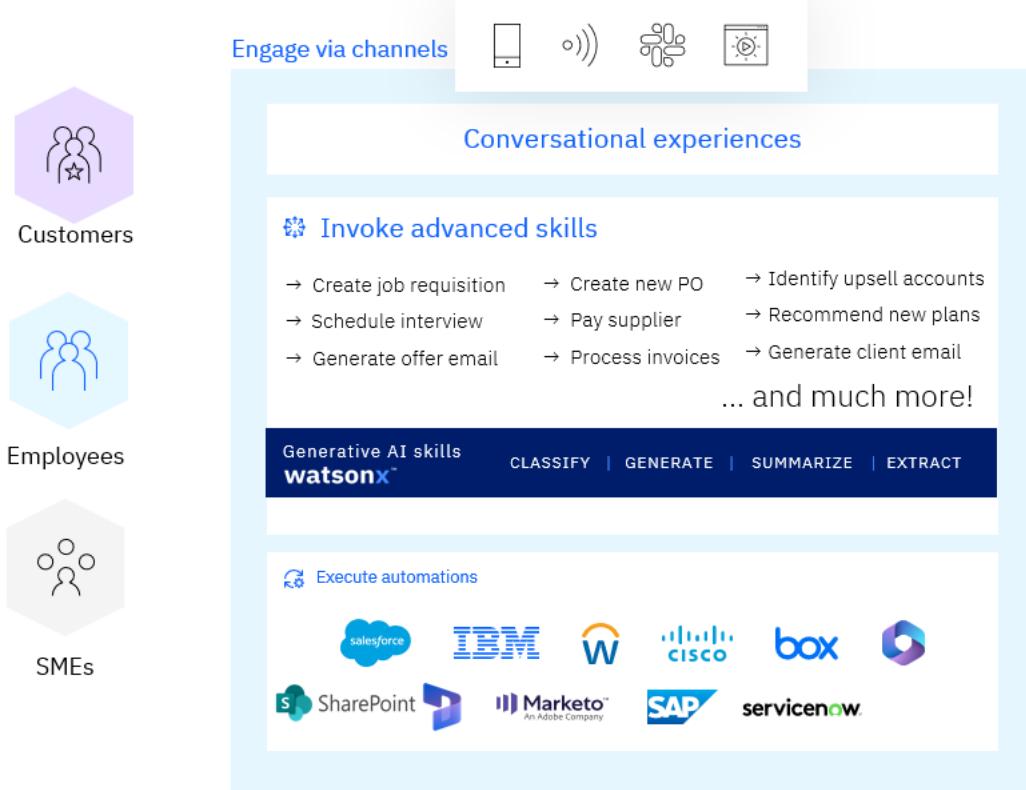
1.1 IBM watsonx Orchestrate

With IBM watsonx Orchestrate, you have access to a broad range of skills that can help you get your work done. It brings together multiple business automation capabilities into a powerful, unified experience designed to empower users with self-service functions and employees with productivity gains that simplify one-off tasks and speed up repetitive ones. It is also extendable as you can create your own skills to handle repetitive tasks in your own organizations custom business applications and processes.

IBM watsonx Orchestrate is built to democratize the availability of automations through **natural language** and **AI Assistants**. Users interact with Orchestrate using natural language to complete tasks and processes across your existing systems using the pre-built or custom skills published to the skill catalog.

The AI assistant builder in watsonx Orchestrate is a next-generation builder studio that leverages the power of generative AI and digital skills to empower organizations and domain experts to quickly and easily create new and compelling AI assistants through a powerful low-code experience. Leveraging purpose-built AI assistants, customers and employees can seamlessly complete tasks and complex processes facilitated by a highly engaging natural language experience.

The AI assistant builder experience in watsonx Orchestrate provides builders with access to a low-code generative AI and automation studio to stand-up large language model (LLM) powered assistants that are grounded in business context, data, and automation.



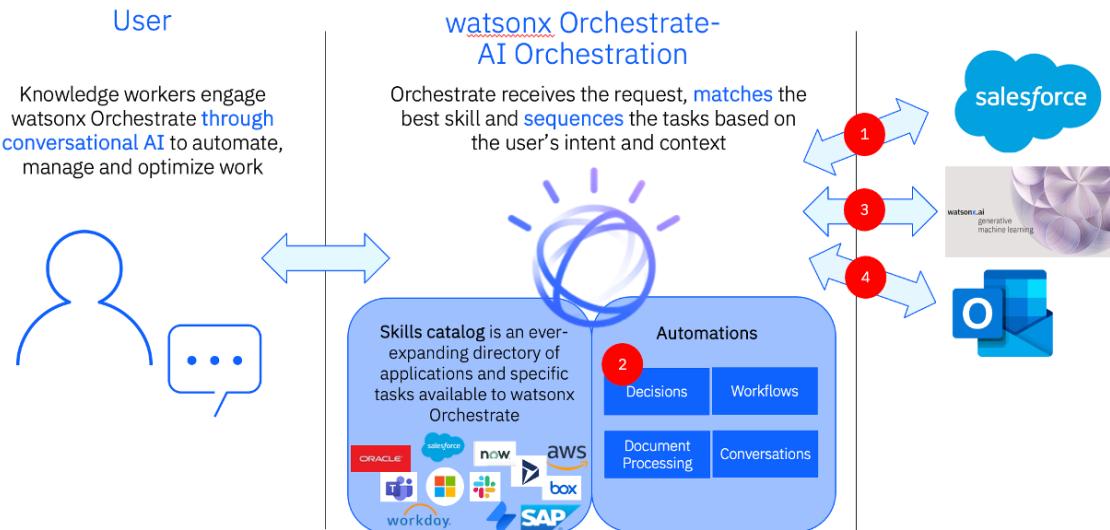
To learn more, follow the links below:

- Official product site: <https://www.ibm.com/products/watsonx-orchestrate>
- Product documentation: <https://www.ibm.com/docs/en/watson-orchestrate>
- Case studies, videos and blogs: <https://www.ibm.com/products/watsonx-orchestrate/resources>
- Community: <https://community.ibm.com/community/user/automation/communities/community-home?CommunityKey=3ad46381-9535-462e-85c9-568b21f4b067>

1.2 Lab Overview

This lab shows how IBM watsonx Orchestrate can be used by sales representatives to assist with the upsell / cross-sell process. To illustrate this, an insurance seller uses Orchestrate to retrieve a list of customers from Salesforce and automatically send a customized offer. The scenario is based on a skill flow that uses the following custom skills:

- 1) data retrieval from Salesforce,
- 2) decision automation to determine the best products to upsell,
- 3) watsonx.ai generative AI to create the offer email to the customer
- 4) send as an email to the selected customer



You will first run through the user scenario using Team Skills (pre-published and managed by your tenant admin) and then explore how to build and configure such a scenario as an Orchestrate builder.

In the second part of the lab you will learn how to use out-of-the-box generative AI based automation in watsonx Orchestrate.

1.3 Log in to watsonx Orchestrate

First, you must log in to watsonx Orchestrate.

1. Enter the URL <https://dl.watson-orchestrate.ibm.com/> into the browser within your lab environment.
2. Enter the username and password **your instructor provided** to login.



3. When you first login, you will likely get a warning to provide a code for two-factor authentication.

Enter code sent to your email

For added security, we sent a 6-digit code to use***@mailinator.com.
Please enter the code below within 20 minutes

Enter email code

5727-

Verify

4. Open another tab in your web browser and navigate to <https://www.mailinator.com>. Use the same username (email address) you used to login to Orchestrate and **type it in to the input field** at the top left corner of the screen. Click **GO** (do **not** click Login).



5. You should see a new email from IBM Security on the top of the received emails list. **Click it to open it** and notice **the second part of the verification code**.



6. **Type it in to the verification form** still open in your other browser tab and click **Verify**.

Enter code sent to your email

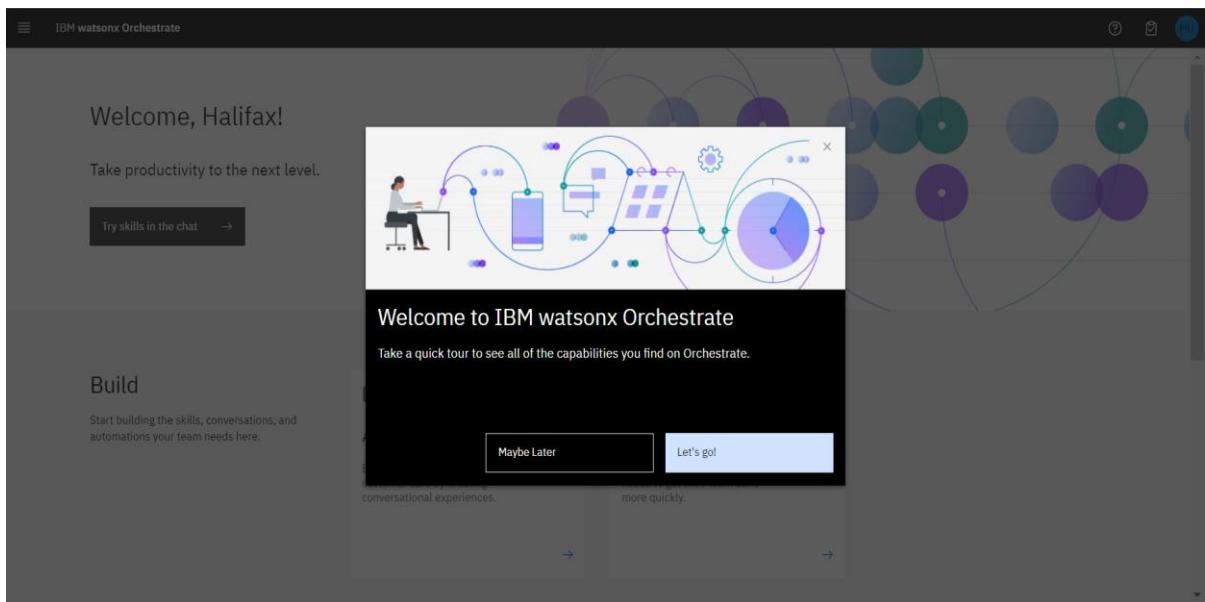
For added security, we sent a 6-digit code to use***@mailinator.com.
Please enter the code below within 20 minutes

Enter email code

5727-

Verify

7. Once logged in, the landing page of Orchestrate opens and a **What's new** guide may appear. If you want, you can see a little tour by clicking the **Let's go!** button, or you can close the pop up by clicking the **Maybe later** button.



Congratulations, you are now ready to start the lab exercises!

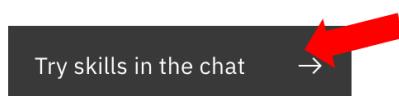
2 Run through the preconfigured scenario

A common task for an insurance sales representative is to periodically search the Salesforce CRM for customers with recent life changes to whom they can make upsell / cross-sell offers. Traditionally, this task involves creating custom Salesforce reports and downloading them for manual review by the representative.

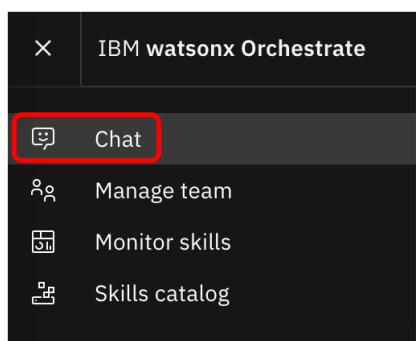
In Orchestrate, the agent invokes the Salesforce task using the simple natural language phrase: “*Write upsell email to customers*”. Orchestrate uses AI to understand the sales representative’s intent and performs the correct action, even when the language used is ambiguous.

1. From the landing page, click the **Try skills in the chat** button.

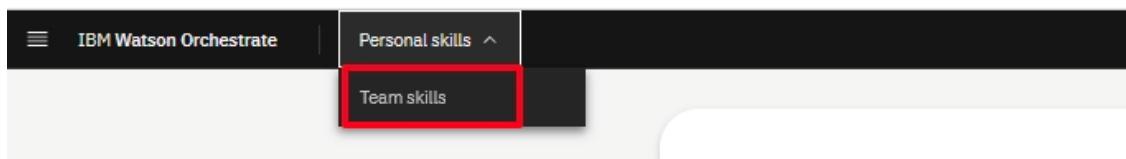
Take productivity to the next level.



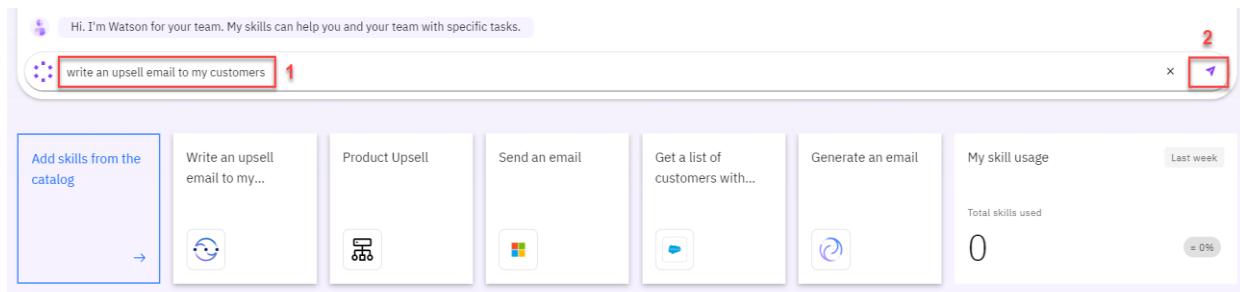
If you already moved away from the landing page to explore other views, click on the menu at the top left and click **Chat**.



2. Switch the view to **Team skills**.



3. Type the natural language command “***Write an upsell email to my customers***” (1) and click the Send arrow (2) or hit ENTER in the chat window.



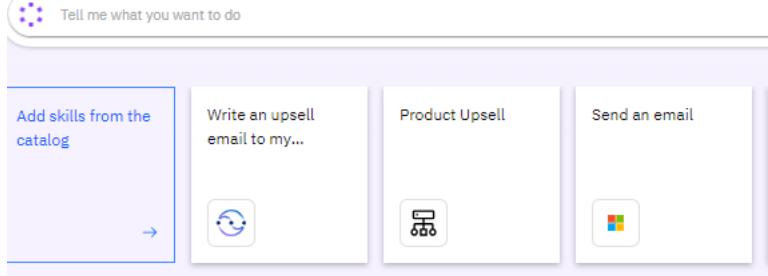
Orchestrate runs the Salesforce task by connecting to a backend API that retrieves a list of customers with recent life changes. The returned customer data is neatly displayed in a table within Orchestrate's chat interface.

The agent reviews the list of customers and pursues a cross-sell opportunity with **John Collins**, who has a child that is about to turn twenty-six. In the US, twenty-six is a milestone requiring children to acquire independent health insurance coverage (other countries set different age limits for various family milestones).

4. Select **John Collins** (1) from the table and click **Apply** (2) in the chat window.

The screenshot shows a modal window titled "List of Customers with Recent Life Changes". It contains a table with columns: Customer Name, Email, and Recent Change. The table lists five customers: Janet Thomas, John Collins, Oliver Paul, Mary Green, and Sam Anthony. John Collins is highlighted with a red box and a red number "1". The "Apply" button at the bottom is also highlighted with a red box and a red number "2".

Customer Name	Email	Recent Change
Janet Thomas	janethomas@gmail.com	Recently turned 64
<input checked="" type="radio"/> John Collins	johncollins@xyzcompany.com	Child recently turned 25
Oliver Paul	oliverpaul@gmail.com	Purchased new vehicle
Mary Green	marygreen@abcinsurance.com	Recently moved to new home
Sam Anthony	samanthony@xyzcompany.com	Dental coverage upgraded



5. The next task is to determine which products to recommend for the selected customer. The customer details from Salesforce are automatically submitted into Orchestrate's built-in *decision engine* and the upsell recommendations are displayed.

Behind the scenes, the decision engine applied business logic using many different factors specific to this customer, such as the child's age, pre-existing conditions, and current coverage.

In the case of John Collins, the decision engine recommends the health insurance plans suitable for his child: Silver-level Marketplace Plan.

The screenshot shows a 'Product Recommendation' card. It includes a user icon, the title 'Product Recommendation', a section for 'Product' containing 'Silver-level Marketplace Plan', and a 'Prompt' section with the following text:

You are an insurance salesman and you have a client named John Collins. Write a marketing email to the client. Do not include the subject in the response. The customer has a child that recently turned 25. In the USA, every young adult is required to purchase independent health by the age of 26. Recommend the silver plan as it is very cost effective. We will give a 15% discount as a loyalty bonus if the child takes out a policy with us.

Review the recommendation from the decision engine and Click **Apply**.

6. Personalized emails increase the likelihood of sales conversion. IBM WatsonX Orchestrate uses one of IBM's Large Language Models (LLMs) via the WatsonX.ai platform to generate a targeted email for the selected customer.

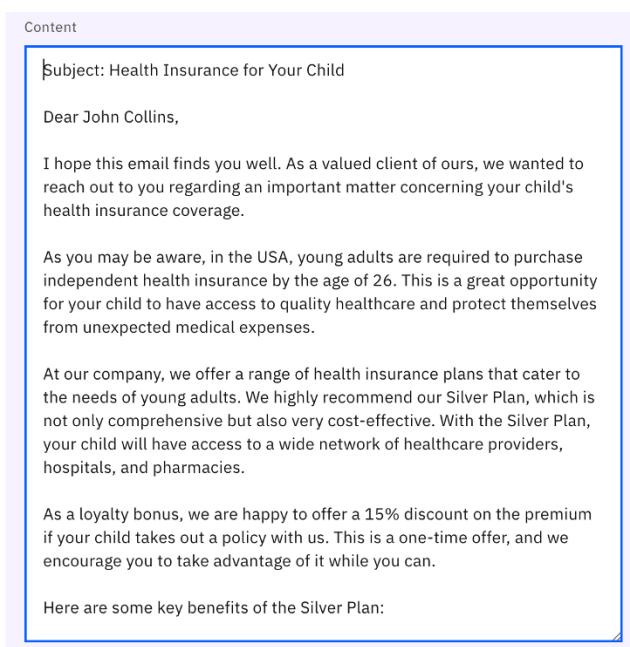
In the prompt field, see the default input text with the suggested prompt (1) to see how Orchestrate engineered the prompt using data taken from the decision engine and Salesforce. Click **Apply** (2).

The screenshot shows a form for generating an upsell email. It includes a message 'You just need to complete this form first.', a text area with a placeholder 'Write an upsell email for my customers', a 'Prompt *' section with the same marketing text as the previous screenshot, and a 'Show all fields' link. At the bottom are 'Cancel' and 'Apply' buttons.

NOTE! Perfecting the AI prompt to generate a properly formatted email is typically a time-consuming activity. To make this quicker, Orchestrate automatically inserts a pre-written AI prompt that includes dynamically inserted customer data in the prompt input field. This step is also something that we might choose not to show to the user, but we again want to show it here for you to see what's going on behind the scenes.

Orchestrate launches its pre-built Microsoft Outlook skill to send an email without the sales representative leaving the Orchestrate user interface to use an email client. In addition to pre-populating the **To** and **Subject** fields, Orchestrate automatically inserts the AI-generated text into the **Content** field.

7. Review the email text generated by IBM watsonx.ai.



Generative AI did a good job generating the email, don't you think? Note that your text will likely be a bit different than shown in the picture above.

8. Change the email address in the **To** (1) field to your own email address (one that you can access to verify the email sending). Scroll down and click **Apply** (2) in the watsonx Orchestrate chat window.

You just need to complete this form first.

 Write upsell email to customers

To 1

A semi-colon (;) separated list of the recipients.

Cc

A semi-colon (;) separated list of the Cc recipients.

Bcc

A semi-colon (;) separated list of the Bcc recipients.

Subject

Priority

The priority of the email. A high priority email might be seen faster.

Content type

The content type of the message body. Possible values include: Text or HTML.

Cancel 2 Apply

Give it a moment and you should be able to see the email sent by Orchestrate in your inbox.

Subject: Health Insurance for Your 25-Year-Old Child

Dear John Collins,

I hope this email finds you well. As a valued client of ours, we wanted to reach out to you regarding an important matter concerning your child's health insurance coverage. As you may be aware, in the USA, young adults are required to purchase independent health insurance by the age of 26.

We understand that finding the right health insurance plan for your child can be overwhelming, which is why we're excited to offer our Silver Plan, which we believe is the best option for your child's needs. The Silver Plan offers comprehensive coverage at an affordable price, making it a cost-effective solution for young adults.

What's more, as a loyalty bonus, we're happy to offer a 15% discount on the policy if your child takes out a policy with us. This is a one-time offer, and we're confident that you'll find the Silver Plan to be an excellent choice for your child's health care needs.

Here are some key benefits of the Silver Plan:

- * Comprehensive coverage, including doctor visits, hospital stays, and prescription medication
- * Low out-of-pocket costs, including copays and deductibles
- * Access to a large network of healthcare providers and hospitals
- * 24/7 customer support

We believe that the Silver Plan is an excellent option for your child, and we're confident that you'll find it to be a valuable investment in their health and well-being.

To take advantage of this offer, simply reply to this email or give us a call at [insert phone number]. We'll be happy to answer any questions you may have and guide you through the enrollment process.

Don't miss out on this opportunity to ensure that your child has the health insurance coverage they need. Contact us today to learn more about the Silver Plan and to take advantage of our 15% loyalty bonus discount.

Thank you for your continued trust in our services. We look forward to providing your child with the best possible health insurance coverage.

Best regards,

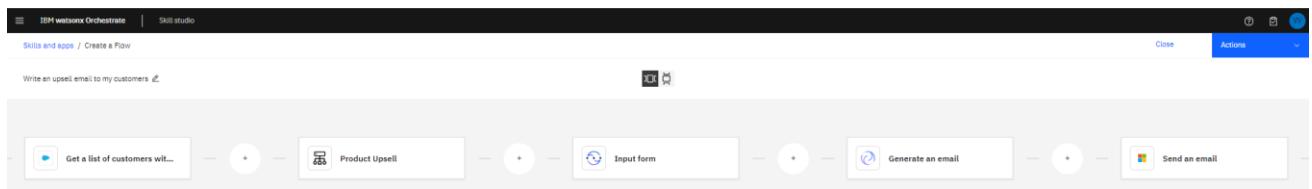
This concludes section two of this lab. Good job!

Next, we will look closer at how to build and configure one part of the scenario using the skills in Orchestrate's skill catalogue.

3 Combine skills into skill flows

IBM WatsonX Orchestrate provides access to a broad range of skills that help users perform their daily tasks. It comes with a collection of ready-to-use, built-in skills that range from working with productivity tools to providing deep analytical insights. Users can immediately access and use these skills.

Developers, called “builders”, can import and create all kinds of custom skills like the ones used by the insurance sales representatives in our lab scenario. Builders can also create **skill flows**, or a sequence of individual skills. When a skill flow is created, it becomes a new “composite” skill that can be used just like an individual skill. The skill flow for the scenario you just ran through is presented in the picture below.



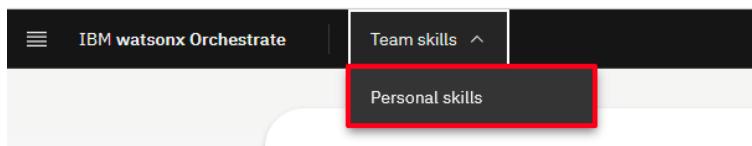
Skill flows perform tasks composed of multiple steps. For example, in our scenario we use a skill flow that combined *Salesforce*, a *product recommendation engine* (decision automation), a *watsonX.ai generative AI service*, and *sending email using Outlook*.

We'll now look at how builders create skill flows by sequencing the first two steps of the upsell task performed by the agent. We'll combine the Salesforce and recommendation engine skills to build a new composite skill flow that searches Salesforce for target customers and then makes product recommendations for a selected customer.

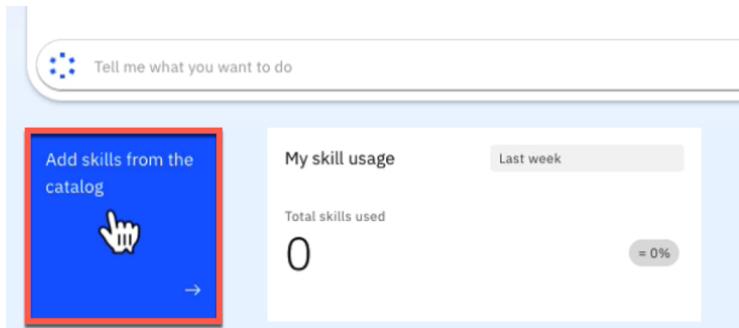
3.1 Adding custom skills to your personal skills

Before we can start building the skill flow, we need to add all the skills to our personal skills list. The custom skills we're using for this part of the lab are already imported and published to the skill catalog, but to use them you need to connect them with your credentials and add them to your personal skills list. Let's get to it!

1. Make sure to select **Personal skills** at the top of the Chat view.



2. Click the **Add skills from the catalog** tile.



3. Search for **life** in the search panel.

A screenshot of the "Skill catalog" page in IBM Watsonx Orchestrate. The header says "IBM watsonx Orchestrate". The search bar has "life" typed into it, with the input field highlighted by a red box. Below the search bar, there is a section titled "Apps" containing a single card: "VV - Salesforce - Get customers ... 1 skill".

4. The list of apps is filtered to only those that contain skills containing the word “life”. Click the **VV – Salesforce – Get customers with recent life changes** tile.

IBM watsonx Orchestrate

Skill catalog

Skills are grouped by app. Select an app to see all the skills that use that app.

Personal skills

life

Apps

VV - Salesforce - Get customers ...
1 skill

5. Click **Add skill +** (1) on the skill tile, then click **Connect app** (2).

IBM watsonx Orchestrate

Skill catalog /

VV - Salesforce - Get customers with recent life changes (1)

2 Connect app

Personal skills

Search skills

VV - Salesforce - Get customers with recent life changes

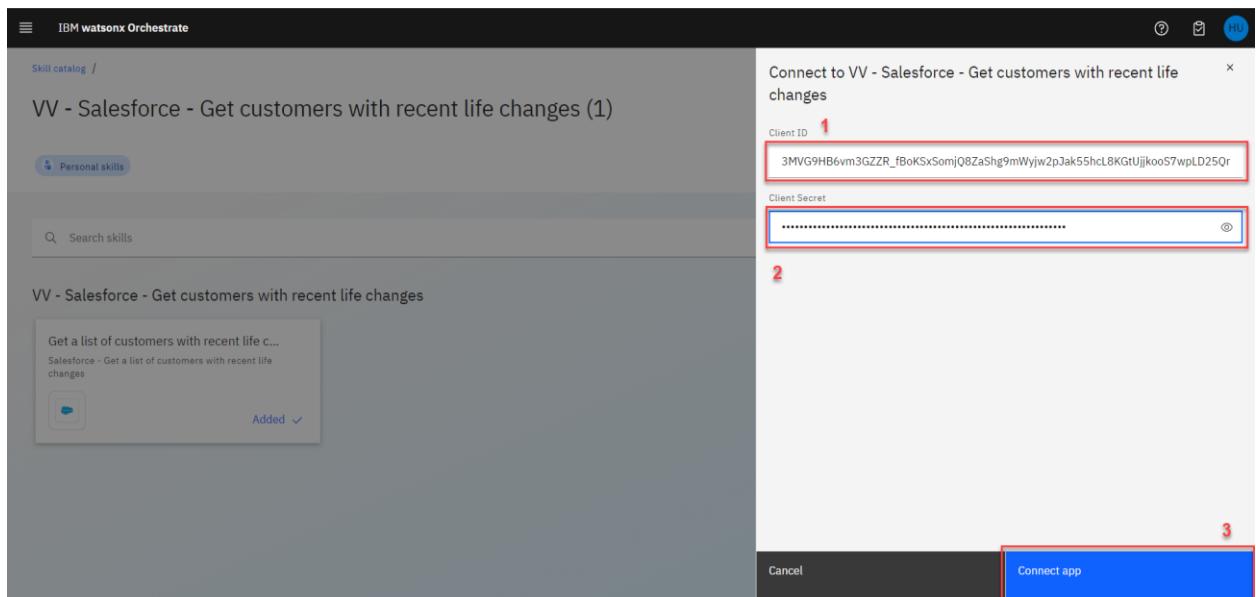
Get a list of customers with recent life c...
Salesforce - Get a list of customers with recent life changes

Add skill + 1

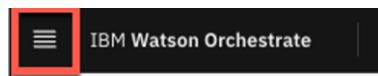
6. Use the following credentials:

- **Client ID** (1): 3MVG9HB6vm3GZZR_fBoKSxSomjQ8ZaShg9mWyjw2pJak55hcL8KGtUjjkooS7wpLD25QraIBxop4ThrTPK237
- **Client Secret** (2): 34CB8CCE1E4495C0CAE6A921A5FC7D17CC6CE614152175D20F5B00F8B250626C

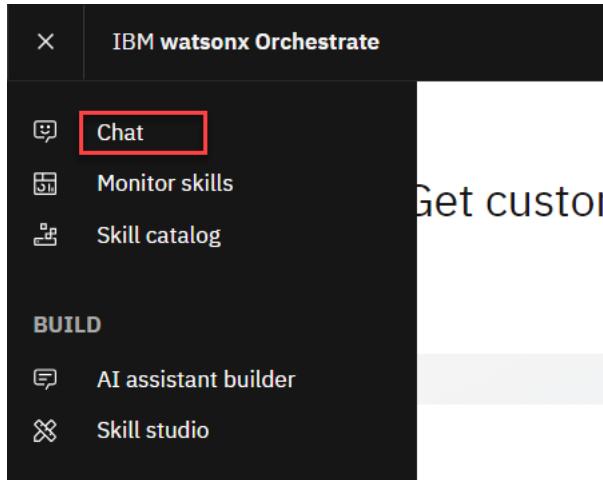
Click **Connect app** (3).



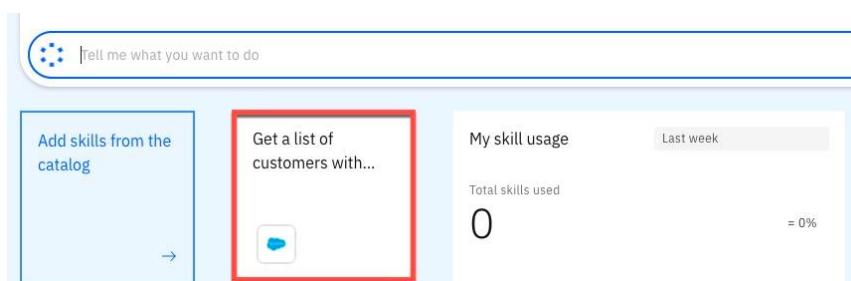
- Click the main menu at top left.



- Click **Chat** from the expanded menu.



- You can now test the skill. Click the tile for the skill in your personal skills list under the chat input area.



10. After a couple of seconds, a table should be shown containing the data from Salesforce.

The screenshot shows a web-based application interface. At the top, there are two tabs: "Salesforce - Get a list of customers with recent life changes" and "List of Customers with Recent Life Changes". Below the tabs, there is a header with the title "List of Customers with Recent Life Changes" and a sub-header "Salesforce - Get a list of customers with recent life changes". The main content area is titled "Records". A table displays the following data:

Name	Age	Id	Accountid	Email	Recent Change	Current Products
John Collins	42	I72652	A43212	johncollins@xyzcompany.com	Child recently turned 25	[empty]
Janet Thomas	64	I19273	A23454	janetthomas@gmail.com	Recently turned 64	[empty]
Oliver Paul	42	I61492	A43321	oliverpaul@gmail.com	Purchased new vehicle	[empty]
Mary Green	46	I18624	A27629	marygreen@abciinsurance.com	Recently moved to new home	[empty]
Sam Anthony	42	I92675	A85279	samanthony@xyzcompany.com	Dental coverage upgraded	[empty]

At the bottom of the table, there are controls for "Items per page:" (set to 5), a page number "1 - 5 of 5 items", and navigation arrows.

Congratulations! Let's add another skill to your personal skills list, a decision automation authored using Orchestrate's Automation Builder. This is the skill responsible of making the upsell suggestion for the selected customer.

11. Click **Add skills from the catalog**.

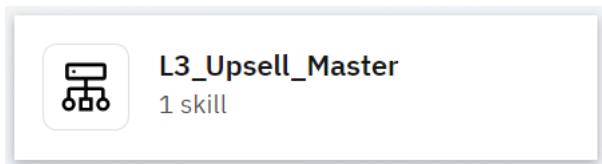
The screenshot shows the "Skill catalog" section of the IBM Watsonx Orchestrate interface. At the top, there is a table with columns "Customer Name", "Email", and "Recent Change". The data in the table is identical to the one in the previous screenshot. Below the table, there is a search bar with the placeholder "Tell me what you want to do". Underneath the search bar, there are three cards:

- "Add skills from the catalog" (highlighted with a cursor icon)
- "Get a list of customers with..." (with a small cloud icon)
- "My skill usage" (with a "Last week" button and a count of "5" total skills used, accompanied by a green circular icon with the number "1")

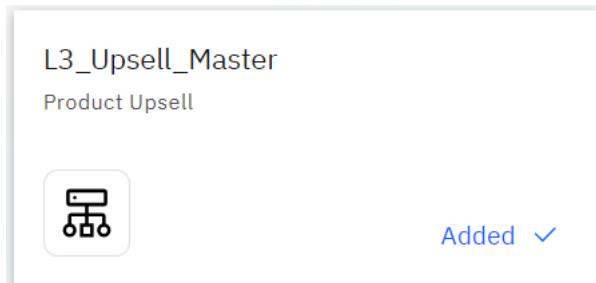
12. Search for **Upsell** in the search panel.

The screenshot shows the "Skill catalog" search interface. The search bar at the top contains the word "Upsell", which is highlighted with a red rectangular box. Below the search bar, there is a list of skills grouped by app. The "Personal skills" tab is selected, showing a list of skills. The "Upsell" skill is visible in the list.

13. Click **L3_Upsell_Master**.



14. Click **Add skill +**. Since the skill is an automation (decision) created on Orchestrate platform, we do not need to connect to it like we do with most other pre-built or custom skills.



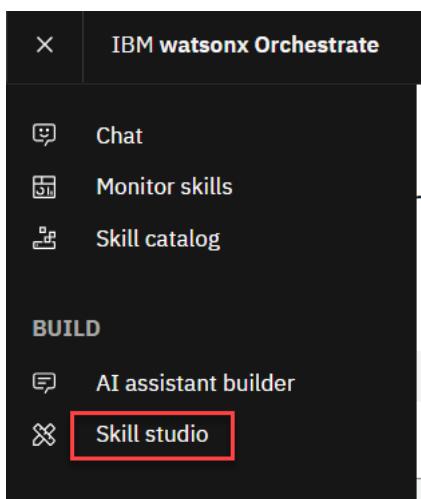
Good! You're now ready to start creating the skill flow.

3.2 Creating a skill flow

1. Click the menu at top left.



2. Under the Build section, click **Skill studio**. These options are only shown to users with the builder role.



- Click the arrow next to the **Create skill** button (1), and then **Skill flow** (2).

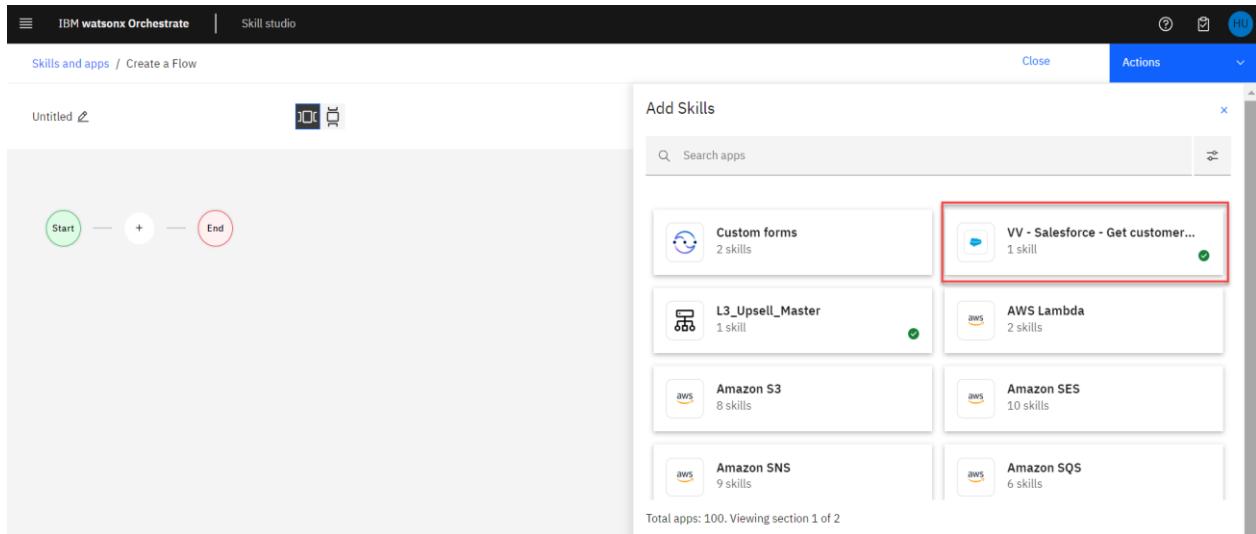
To build skill flows, we can use any skill added to your personal skills list from the skill catalog. You can toggle between horizontal and vertical views based on your preference.

First, we'll add the Salesforce skill that returns the list of clients who experienced recent life changes.

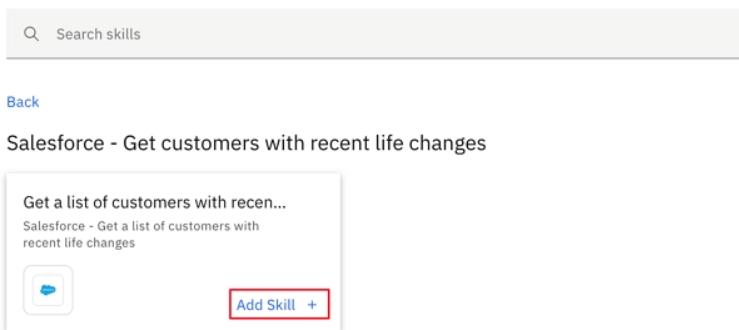
- Click the **+** button in the skill flow editor.

The list of available apps shows the *L3_Upsell_Master* and *VV – Salesforce – Get customers with recent life changes* tiles. These are shown at the top of the list as they are the skills you connected and added to your personal skills list earlier.

- Click the **VV – Salesforce – Get customers with recent life changes** tile.



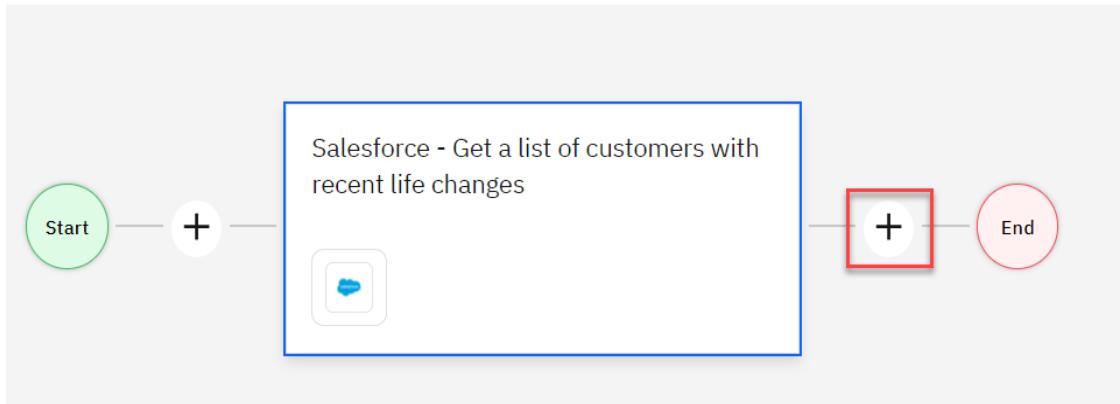
6. Click **Add Skill +**.



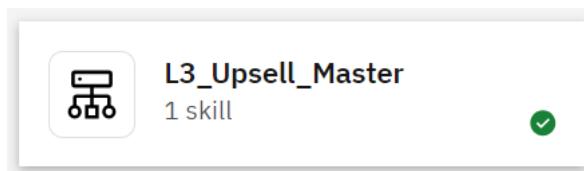
The next step in the flow is to invoke the decision that determines the best product recommendation based on the customer situation. Let's add the recommendation skill to the flow.

7. Click the **+** button on the right-hand side of the just added Salesforce skill.

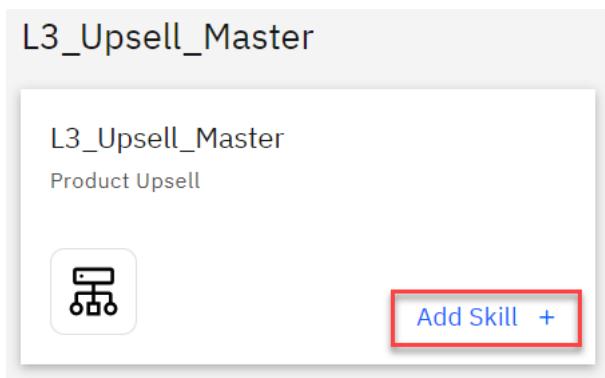
Untitled



8. Click the **L3_Upsell_Master** tile.

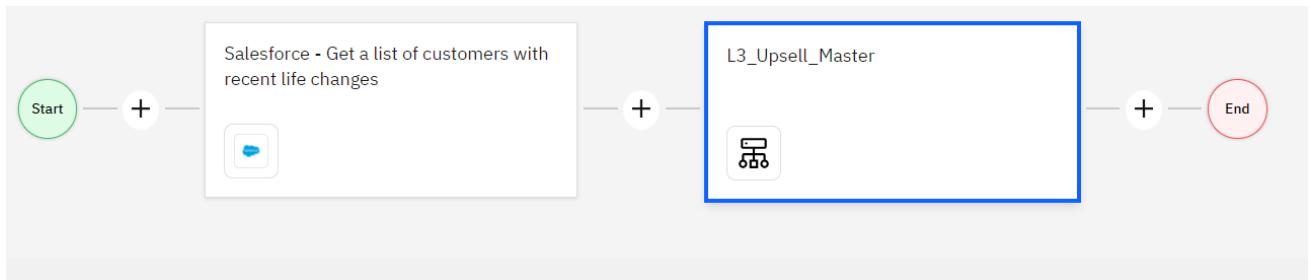


9. Click **Add Skill +**.



Each skill can have one or more inputs and outputs. The skill flow editor allows builders to easily map the output retrieved from a previous skill in the flow to the input of a subsequent skill. For example, the attributes of the selected customer are available as inputs to the product recommendation decision engine.

10. Click the **L3_Upsell_Master** box within the flow. The property sheet for the skill will appear under the flow.



L3_Upsell_Master
Product Upsell

Repeat this skill

Input **Output** [Clear all mappings](#) [Generate mapping suggestions](#)

Hide this form from the user

theCustomer.age

theCustomer.name

The ‘Input’ and ‘Output’ tabs are used to assign the values. Output values from preceding skills are displayed in the ‘Input’ tab.

11. Click the **Input** tab and then click inside the **theRecentChange** field.

Repeat this skill

Input **Output** [Clear all mappings](#) [Generate mapping suggestions](#)

Hide this form from the user

theCustomer.age

theCustomer.name

theCustomer.listOfCurrentProducts

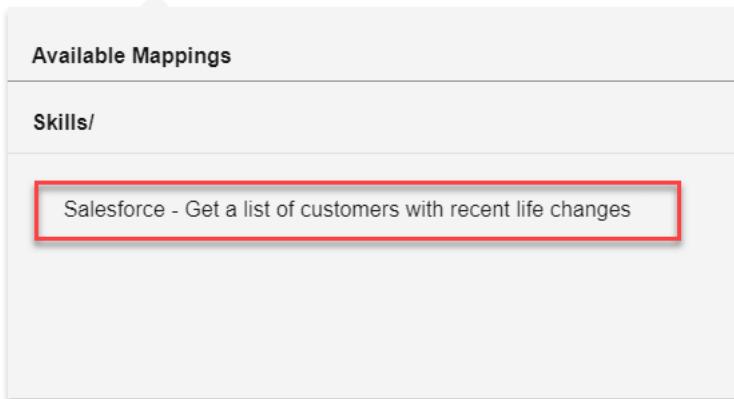
theRecentChange

12. Within the **Available Mappings** panel, click the skill that contains the value we need as an input.

Available Mappings

Skills/

Salesforce - Get a list of customers with recent life changes



13. Scroll through the available values and select **Recent_Change__c**.

Mapping data for "theRecentChange"

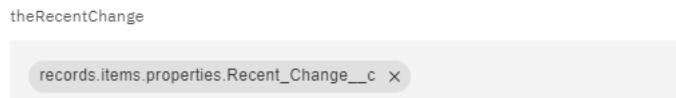
Skills/VV - Salesforce - Get customers with recent life changes-Get a list of customers with recent life changes from Salesforce

- records {#}
 - items {#}
 - EventType__c abc
 - records {#}
 - items {#}
 - Child_Name__c abc
 - records {#}
 - items {#}
 - Recent_Change__c abc

14. The path to the value is now mapped and shown in the field.

theRecentChange

records.items.properties.Recent_Change__c



15. Repeat this exercise to map the other two values – **theCustomer.age** and **theCustomer.name**. Do NOT select any Operators for the mappings.

theCustomer.age

records.items.properties.Child_Age__c ×

theCustomer.name

records.items.properties.Name ×

You can also use “Generate mapping suggestions” feature to let watsonx Orchestrate map values for you.

L3_Upsell_Master
Execute L3_Upsell_Master

Repeat this skill

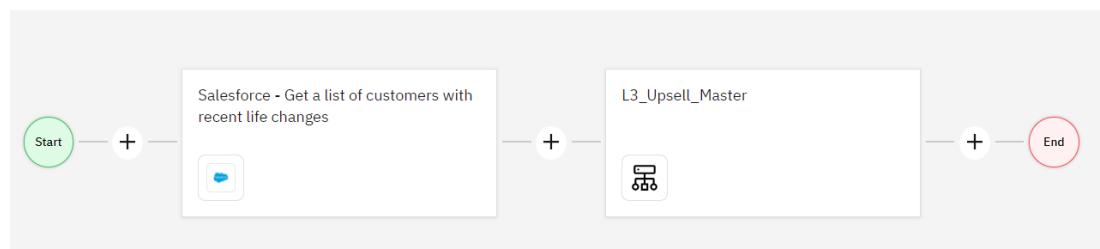
< Output >

Clear all mappings ↻ Generate mapping suggestions >

Now we'll name our new composite skill flow and save it.

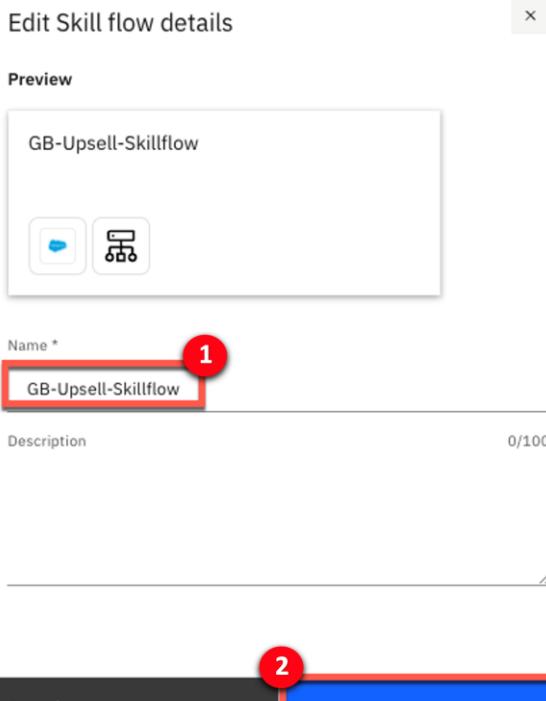
16. Click the pencil icon next to **Untitled**.

Untitled 

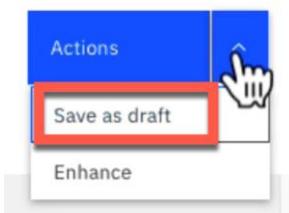


17. In the **Edit Skill flow details**, provide a **Name** for your skill flow, such as “[**YOUR INITIALS**]-Upsell-Skillflow” (1), as an example “GB-Upsell-Skillflow”, and click **Save** (2).

NOTE! Be sure to use your initials as an identifier in your skill flow name. The Orchestrate environment is shared with other lab participants and you want to find your skill flow with ease.

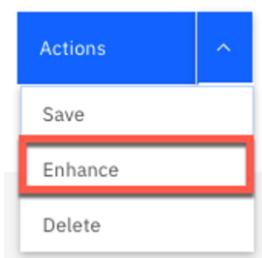


18. Click the arrow next to the **Actions** button (1), and then click **Save as draft** (2).



After building the skill flow, we'll now train the AI model used to trigger the skill from the chat interface. Once the skill is fully trained, we'll publish it to the watson^x Orchestrate skill catalog.

19. Click the arrow next to the **Actions** button (1), and then click **Enhance** (2).



Phrases are used to train the AI model. From the chat interface, watson^x Orchestrate can understand the user's intents, and will ask for clarification and give users choices if it isn't sure which skill to run.

NOTE! As this is a shared environment, it is possible there are many duplicate phrases related to product upsell. Try to provide an original phrase, such as something that includes a name or unrelated term.

20. Enter a phrase into the first field on the **Phrases** tab, such as **get <YOUR NAME>s upsell hints for customers**, like “get gerrys upsell hints for customers”.

The screenshot shows the 'Enhance the “GB-Upsell-Skillflow” skill' page. The 'Phrases' tab is selected. A red box highlights the input field containing the phrase 'get gerrys upsell hints for customers'. Below the input field is a button with a trash icon. At the bottom of the page is a text input field labeled 'Enter new train phrase'.

Next, we'll publish the new flow to the watsonx Orchestrate skill catalog, so the insurance sales representatives can use it.

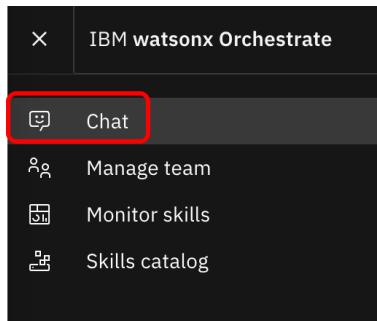
21. Click **Publish**.

The screenshot shows the same skill enhancement page. The 'Publish' button at the bottom right is highlighted with a red box. The other buttons are 'Cancel' and 'Save as draft'.

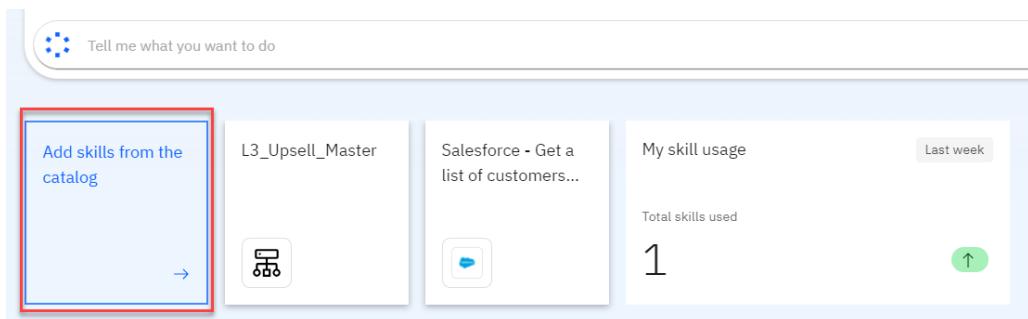
3.3 Using your personal skills list to add and run the skill flow

Since we finished creating and publishing the skill flow, all the insurance sales representatives in the company can now add the skill to their personal skills list.

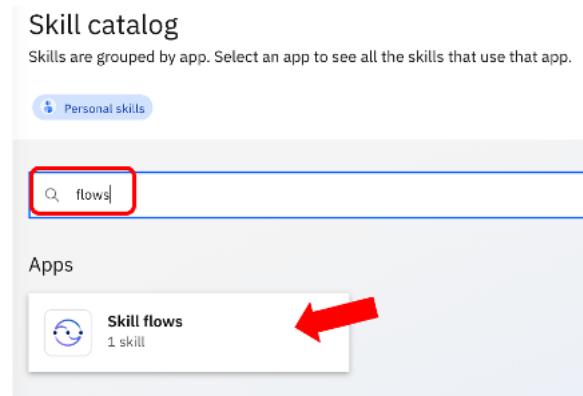
1. Click the menu and then click **Chat** to return to your main chat view.



2. Click **Add skills from the catalog**.



3. Search the catalog with **flows** and click the **Skill flows** tile.



4. In the **Skill flows** view, type **upsell** to find your recently created skill flow, and click **Add skill +** on your skill flow you just created.

Skill catalog /

Skill flows (2)

Personal skills

The screenshot shows the 'Skill flows' section of the IBM Watsonx Orchestrate interface. There are two skill flows listed:

- GB-Upsell-Skillflow**: Description: Write an upsell email for my customer. Action: Add skill +
- Write an upsell email for my cust...**: Description: Write an upsell email for my customer. Action: Add skill +

You're now ready to run your new skill flow by asking watsonx Orchestrate to find upsell candidates and make product recommendations for the selected customer.

5. Navigate back to your **Chat** view (menu → Chat).
6. Enter the **phrase with your name in it** to run your skill.

The screenshot shows the 'Chat' interface. A message is typed into the input field: "get gerrys". Below the input field, a preview of the message is shown: "get gerrys upsell hints for customers".

The list of customers is returned, and we'll select one.

7. Select **John Collins** (1) and click **Apply** (2). Note that when a skill that returns a list of items is defined as part of a skill flow, Orchestrate automatically enables by default selections for the list.

The screenshot shows a modal dialog titled "List of Customers with Recent Life Changes". The table contains the following data:

Customer Name	Email	Recent Change
Janet Thomas	janethomas@gmail.com	Recently turned 64
John Collins	johncollins@xyzcompany.com	Child recently turned 25
Oliver Paul	oliverpaul@gmail.com	Purchased new vehicle
Mary Green	marygreen@abcinsurance.com	Recently moved to new home
Sam Anthony	samanthony@xyzcompany.com	Dental coverage upgraded

At the bottom of the dialog, there are buttons for "Cancel" and "Apply". The "Apply" button is highlighted with a red box and labeled with a red circle containing the number 2. The "Customer Name" column for John Collins has a red circle with the number 1.

8. The data for Johns Collins is then automatically mapped into the input fields of the product recommendation skill. Review and then click **Apply** to run the second skill in your skill flow.

You just need to complete this form first.

VV-Upsell-Skillflow

theRecentChange
Child recently turned 25

age
25

current products

name
John Collins

Cancel **Apply**

9. Review the result of the upsell decision service.

Decision execution success

GB-Upsell-Skillflow

maxTokens
500

minTokens
400

prompt
You are an insurance salesman and you have a client named John Collins. Write a marketing email to the client. Do not include the subject in the response. The customer has a child that recently turned 25. In the USA, every young adult is required to purchase independent health by the age of 26. Recommend the silver plan as it is very cost effective. We will give a 15% discount as a loyalty bonus if the child takes out a policy with us.

recommendation
Silver-level Marketplace Plan

Feel free to explore your skill flow and attached decision skill by selecting users other than John Collins. You should see different recommendations based on customer's recent change in life situation.

Nice! As a builder, you created and published new skill flow. The skill flow ran successfully and made a product upsell recommendation for the selected customer.

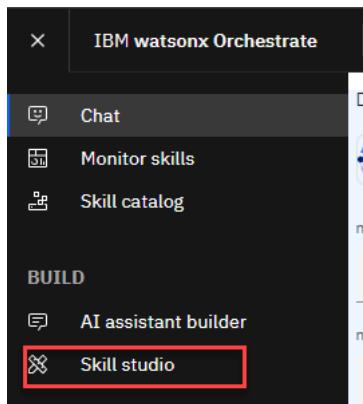
Next, we will have a closer look at the options to import your own custom skills into Orchestrate.

4 Import custom skills

As mentioned in the introduction, builders can import custom skills into IBM WatsonX Orchestrate in a few different ways. All available skills – pre-built and custom skills that are already published – can be accessed through the Skills catalog.

To import existing services as skills, you have several options. You’re not going to use them in this lab, but let’s explore them briefly!

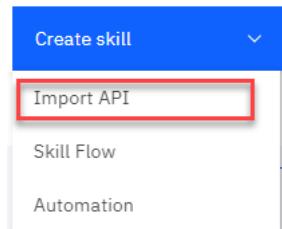
1. In the menu, click **Skill studio**.



The “Skills and apps” view shows you all the custom skills imported or created (including *skill flows* and published *automations*). Let’s start with the imported ones.

Skills					
Name	Description	Step in the process	Status	Skill type	⋮
GB-Upsell-Skillflow		Ready to use	Published	Skill flow	⋮
Insurance Upsell	Execute Insurance-Upsell	Ready to use	Published	Automation	⋮
Content Generation (greedy) - Preview	A WatsonX.ai skill for generating text	Ready to use	Published	Imported	⋮
Get a list of customers with recent life change...	Skill to retrieve customer information from Sal...	Ready to use	Published	Imported	⋮
Write an upsell email to customers	Skill flow that combines 4 skills to send an off...	Ready to use	Published	Skill flow	⋮

2. Click the **Create skill** button and select **Import API** from the menu.



This opens the **Add skills** view and shows you the current options for importing new skills.

The first option allows you to discover available automation services from IBM Cloud Pak for Business Automation (CP4BA) on-premises or SaaS, from IBM RPA or UiPath (more information is available [here](#)), as well as from IBM Business Automation Workflow SaaS and IBM Operational Decision Manager SaaS. IBM plans to add support to discover services from other 3rd party platforms in upcoming releases.

The screenshot shows a user interface for discovering automation services. At the top, there are three tabs: "From an app" (selected), "From a file", and "OpenAPI builder (experimental)". Below the tabs, there are five service cards:

- IBM Cloud Pak for Business Automation - On premises**
which includes Automation Decision Services, Business Automation Workflow, and Operational Decision Manager on premises.
- IBM Cloud Pak for Business Automation as a service**
which includes Business Automation Workflow as a service and includes Operational Decision Manager as a service.
- UiPath**
UiPath RPA & Business Automation
- IBM Robotic Process Automation (RPA)**
- IBM Business Automation Workflow as a service**

The second option is to import skills using OpenAPI definition files. If you have a service endpoint description as an OpenAPI, you can import it directly to Orchestrate (more information is available [here](#)).

Choose the source

To discover new skills, connect to an app or refer to an OpenAPI file.

From apps From files OpenAPI builder (ex...)

Import a skill file

Ensure your file is in the .json, or yaml format and no larger than 50 MB.

Drag and drop files here or click to upload

The third option is the **embedded OpenAPI builder** (beta in the current version). A Builder can use it to do the following:

- 1) have AI generate a new OpenAPI specification from a documentation web page,
- 2) view and edit an existing OpenAPI specification, or
- 3) create an OpenAPI specification from scratch (more information is available [here](#)).

Welcome!

Build, edit, and generate OpenAPI specs.



To launch the builder, pick one of the following options. After that, you can edit the specification and enhance it using AI (see [documentation](#)).

AI generate a new OpenAPI spec

Generate an OpenAPI specification from a documentation web page using AI. Currently limited to documentation pages containing cURL requests and JSON responses. May take a few minutes.

AI

Open an existing spec

Open an existing OpenAPI specification (3.0 or later) from a .json file that is no more than 500kB.

→

Create a spec

Create an OpenAPI specification from scratch.

→

→

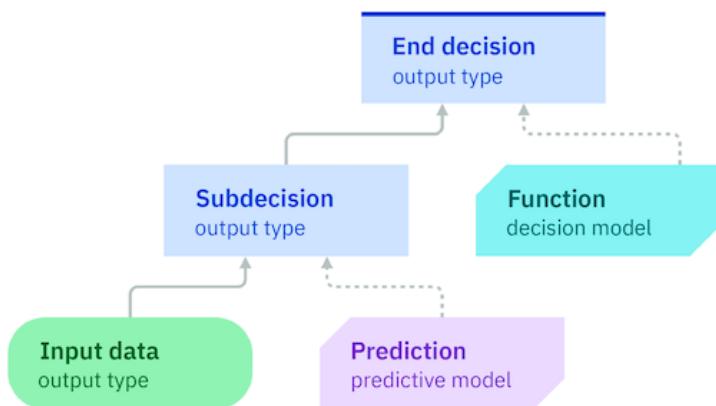
5 Build automations

IBM Watson Orchestrate also includes embedded tools to create new automations and publish them as skills to provide support for more complex scenarios and further automate work.

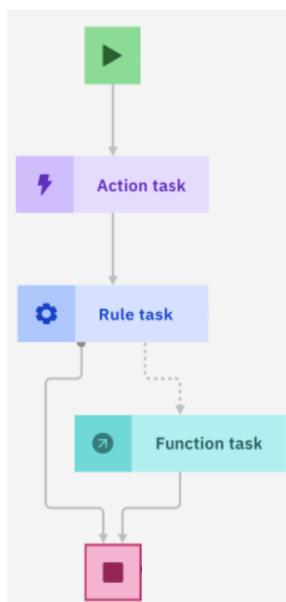
5.1 Decisions

Decisions are an automation type that capture and automate repeatable intelligent **business decisions**. For example, a business decision to authorize a loan, based on established rules and policies. A decision can be implemented with *decision models*, *ruleflow models*, and *prediction models*.

Decision models offer a straightforward and low-code approach to modeling business decisions through a structured, visual representation of a decision. Orchestrate provides low-code tooling to create, test, deploy, and publish decision models as skills. More information about creating decision models [here](#).



Ruleflow models offer a more advanced way to define decisions with control over the order of steps and branching of your decision logic.



Prediction models offer insights from historical data to help you make more informed decisions. Use prediction models to compute a prediction that you can use as part of a decision or ruleflow model. Three

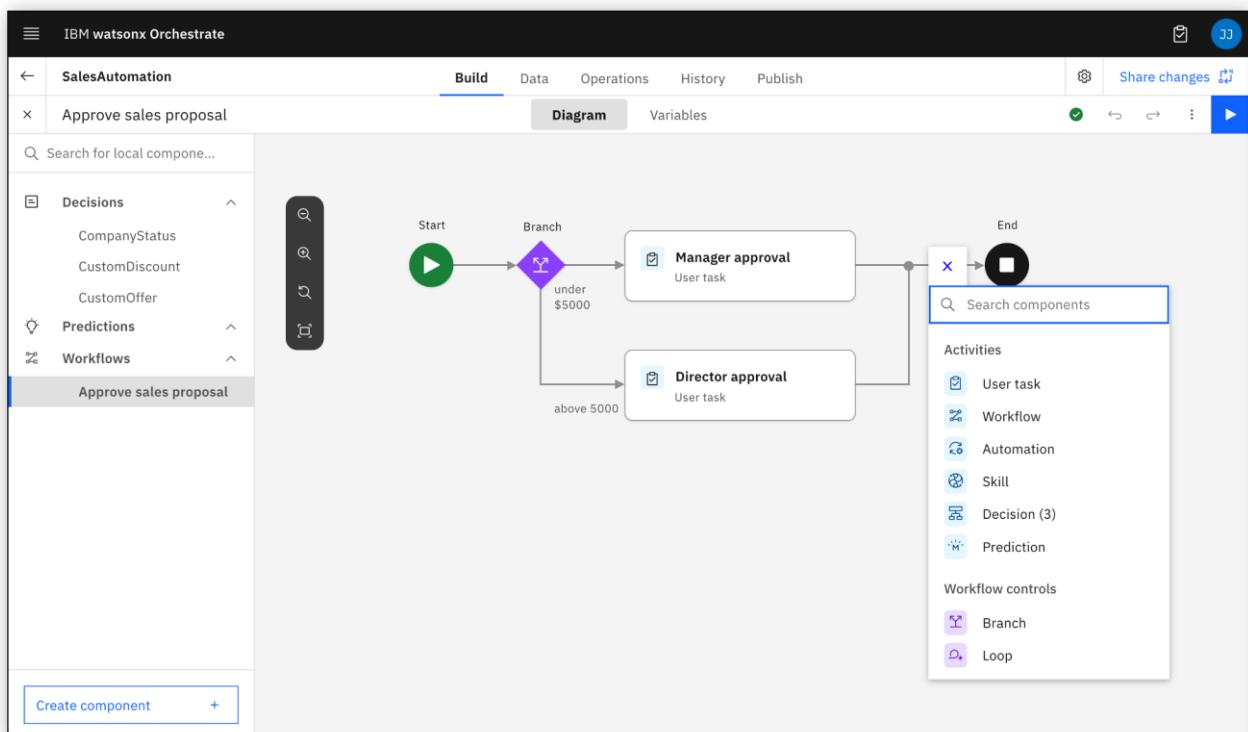
remote providers are supported: IBM Watson® Machine Learning, Amazon® SageMaker, and IBM® Open Prediction Service.

Open Prediction Service is an extension framework that allows you to connect to machine learning providers that are not natively supported. This includes custom machine learning services and third-party machine learning tools, such as Microsoft® Azure Machine Learning. For more information about Open Prediction Service, see the [Open Prediction Service Hub repository](#).

An **embedded machine learning provider** is also supported. This provider allows you to import Predictive Model Markup Language (PMML) files and run them directly in Orchestrate. More about building and using prediction models [here](#).

5.2 Workflows

Workflow is an automation component that models a **business process**. For example, a process to find and hire candidates for a job. A workflow is composed of a sequence of activities and tasks. These activities can be other workflows, decisions, automations, or skills, which you can put together to create powerful automations and **publish as skills** in the Orchestrate skills catalog.



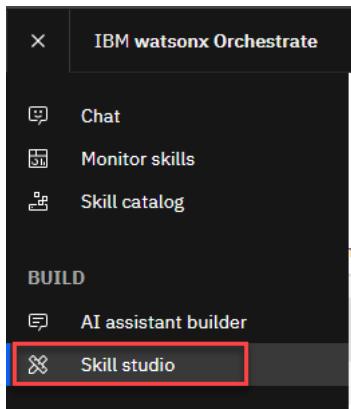
You can think of the workflow capability as more advanced skill flow editor, where you can branch out to different activities and create collaborative flows by assigning user tasks to different Orchestrate users. More about using workflows [here](#).

5.3 Generative AI

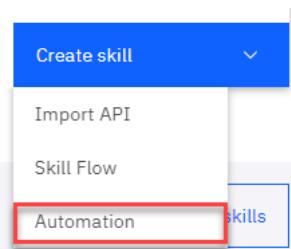
In this lab you will learn how to use an out-of-the-box generative AI based automation in Watsonx Orchestrate. For example, to create a summary of customer support tickets, you can leverage Watsonx.ai with few-shot prompting. This can be configured as a generative AI automation skill in IBM Watsonx Orchestrate.

5.3.1 Creating Generative AI Automation in Watsonx Orchestrate

1. Click on the hamburger menu in Watsonx Orchestrate and select **Skill studio**.



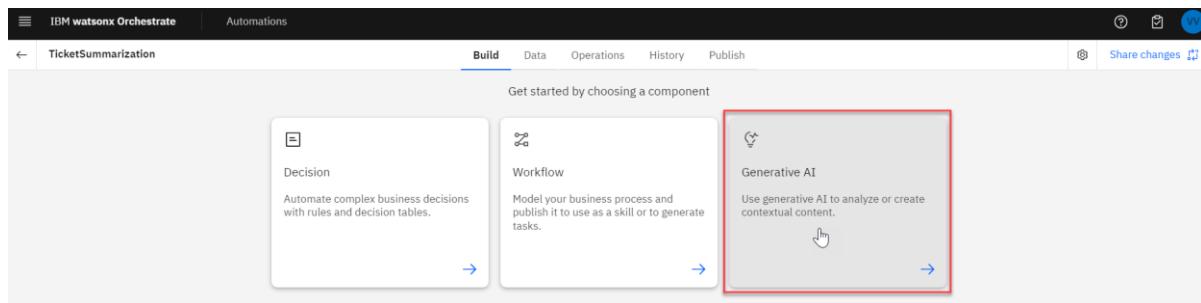
2. Then click on **Create skill** and select **Automation** from the drop-down menu.



3. Provide the **Name** for your automation ("TicketSummarization") and an optional **Description**, then click **Create**.

A screenshot of the "New automation" dialog box. On the left, there's a sidebar with options: Create automation (highlighted with a red box), Import automation, Discovery tutorials, and Industry samples. The main area is titled "Create automation" with the sub-instruction "Create an empty automation and build it from scratch." It has two input fields: "Name" (containing "TicketSummarization") and "Description (optional)" (containing "Gen AI skill to summarize support tickets"). At the bottom right are "Cancel" and "Create" buttons, with the "Create" button highlighted with a red box.

- Select **Generative AI** component for your new automation in the next screen.



- Provide the **Name** for your new component in the format "Your Initials - Ticket Summarization", optional **Description**, and click **Create** to create it.

Create a generative AI

Name
VV - Ticket Summarization

Note: This is a symbolic name that must be unique and cannot be changed later.

Description (optional)
Support ticket summarization

Cancel Create

5.3.2 Implementing and Customizing Generative AI Automation

- Once you create the Generative AI component, you will be presented with the default **Prompt Builder** layout where you can implement and customize your new Generative AI automation skill. Take a minute to study the layout which allows you to:
 - Select the **LLM Model** the skill will be using
 - Provide **Context**, i.e. instructions for summarization
 - Use **Training examples** to improve results
 - Experiment with **Prompt input**
 - Add **Variables** to be used as Input for the new skill
 - Test** your new automation before publishing it as a skill

The screenshot shows the IBM Watsonx Orchestrate interface with the 'Build' tab selected. On the left, there's a sidebar with 'Decisions', 'Workflows', and 'Generative AI' sections. The main area has a 'Prompt' section containing 'Context' and 'Prompt input' fields, and a 'Generated output' field. To the right are sections for 'Variables' (with a 'topic' variable set to 'nature'), 'Parameters' (with 'Min generated tokens' at 1 and 'Max generated tokens' at 50), and 'Training examples' (which are currently empty). Red numbers 1 through 5 point to specific UI elements: 1 points to the 'Model:' dropdown in the Prompt input; 2 points to the 'Variables' section; 3 points to the 'Parameters' section; 4 points to the 'Training examples' section; and 5 points to the 'New variable' button.

- Start by creating new variables that will be used as input to the new Generative AI automation skill. To do so, click on New variable button and define the following variables:

- Prompt Input** (no default value)
- Instructions** (no default value)

Variables

Add variables and insert them into your prompt to dynamically take inputs from users and workflows.

Variable	Default value	
Prompt Input	Default value	
Instructions	Default value	
New variable		

- Update **Context** and **Prompt input** sections to leverage the new input variables. The variables are referenced using **{variable}** format. More specifically, enter the following values as shown in the screenshot below:

- `{}{Instructions}{} in Context section`
- `{}{Prompt Input}{} in Prompt input section`

Prompt

Create a prompt to analyze or produce contextual content.

Model: granite-13b-chat-v2

Generate

Variables

Add variables and insert them into your prompt to dynamically take inputs from users and workflows.

Variable	Default value
Prompt Input	Default value
Instructions	Default value
New variable	+

Parameters

Constrain the length of the generated output.

Min generated tokens	Max generated tokens
1	50

Context: {{Instructions}}

Prompt input: {{Prompt Input}}

Generated output: The model generates an output here.

- Refer to the following table for training examples and enter them in the **Training examples** section.

Input	Output
Title: Bad Keyboard Description: Mary Williams said some of the keys on her laptop are sticking. When she types the H or K keys the output is multiple of the letter	Name: Mary Williams. Summary: Laptop keys are sticking possibly due to coffee spill. Issue with H and K keys
Title: Battery loses charge after one hour Description: Bill Jones says his laptop battery dies after one hour of use. This makes it difficult for him to work while he is commuting. He would like a replacement battery.	Name: Bill Jones. Summary: Laptop battery dies after one hour.
Title: Laptop crashing Description: Susan Taylor says her laptop crashes every few hours. She has lost work because of this. She updated to the latest OS but its still happening. Its been going on for 1 week. She tried re-installing the OS but her laptop keeps crashing not just one instance of the letter. Mary spilled coffee on her laptop 3 days ago.	Name: Susan Taylor. Summary: Laptop crashes every few hours. Has re-installed OS but issue continues.

IBM Watson Orchestrate

Automations

Build Data Operations History Publish

Share changes

Variables

Add variables and insert them into your prompt to dynamically take inputs from users and workflows.

Variable	Default value
Prompt Input	Default value
Instructions	Default value
New variable	+

Parameters

Constrain the length of the generated output.

Min generated tokens	Max generated tokens
1	50

Create component

New example

Training examples

Improve results of the prompt by providing examples of prompts and expected outputs.

Example	Input	Expected output
1	updated to the latest OS but its still happening. Its been going on for 1 week. She tried re-installing the OS but her laptop keeps crashing not just one instance of the letter. Mary spilled coffee on her laptop 3 days ago.	Name: Susan Taylor. Summary: Laptop crashes every few hours. Has re-installed OS but issue continues.
2		
3		

- Change LLM model to **granite-13b-instruct-v2** in the "Model" section. You can also explore other models that are available out-of-the-box.

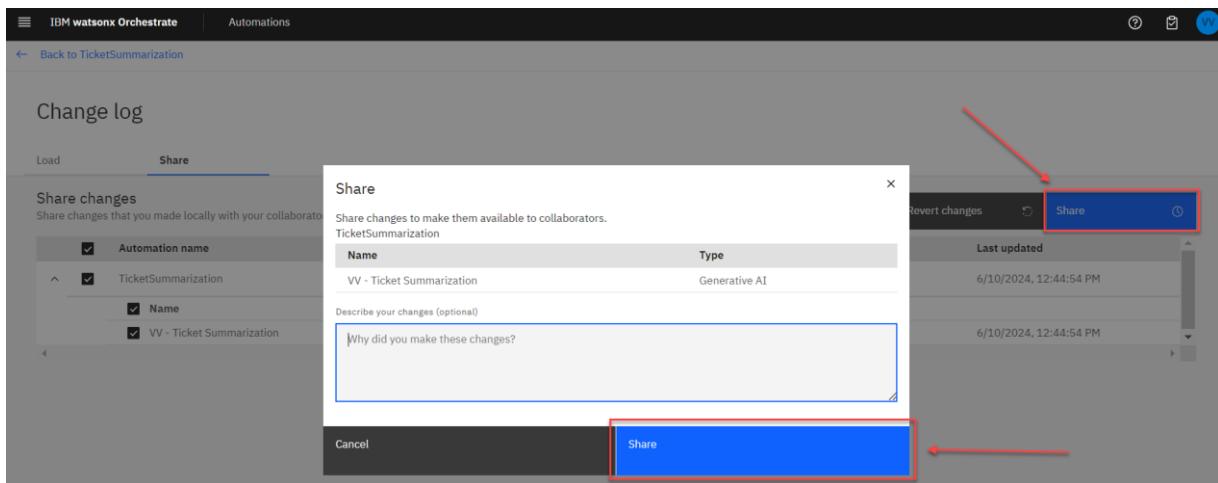
5.3.3 Deploying and Publishing Generative AI Automation as a Skill

- The first step is to create a new operation under **Operations** tab. Click on **Operations** tab, then on **Create operation** button.

- Provide a name for the operation in the **Operation name** field (make sure to use your initials for it to be unique e.g. **YourInitialsTicketSummarization**), select **Component** from the dropdown menu, and click on the **Save** button. The new operation will be available in the list under the Operations tab.

- The next step during the deployment is to share the changes done to the Generative AI automation. Click on **Share changes** button in the top right corner of the screen:

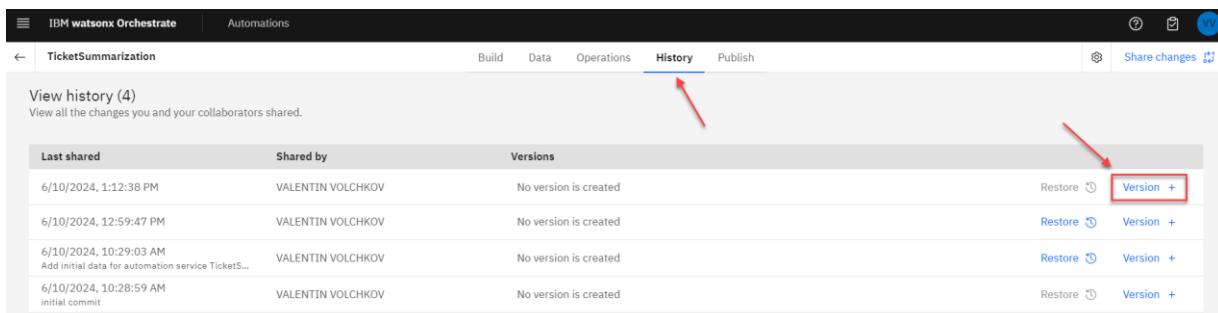
- Review the changes and click on **Share** button, and then **Share** again.



- When the changes have been shared, click on **Back to TicketSummarization** link to return to the Build interface.



- Next, click on **History** tab and then on **Version +** link for the most recent version of your automation.



- Specify **1.0.0** as the new version number in the **Name** field, and then click **Create** button. A new version of the automation will be created.

Create a version

Create a version to tag a specific point in the change history.

[View documentation](#)

Name
1.0.0

Description (optional)
What changes were made in this version?

This version will be based on the following set of shared changes:
6/10/2024, 1:12:38 PM by VALENTIN VOLCHKOV
No message
To create a version from another set of shared changes, go to the History tab.

[Cancel](#) [Create](#)

- Lastly, click on **Publish** tab, expand the section corresponding to the most recent Version that has just been created, click **Publish** link, and then Publish button in the new dialog box to confirm. Wait until publishing is complete.

Version	Shared on	Shared by
1.0.0	6/10/2024, 1:19:07 PM	VALENTIN VOLCHKOV

Automation: TicketSummarization

Publish status: Published on 6/10/2024, 1:22:03 PM

... Publish

5.3.4 Enhancing Generative AI Skill

- Now that the new Generative AI automation has been added into the IBM Watsonx Orchestrate catalog, the next step is to enhance the skill with expected inputs, adjust outputs, and provide initial phrases to be used in conversational UI. Click on the hamburger menu in the top left corner of the screen and select **Skill studio** in the menu.

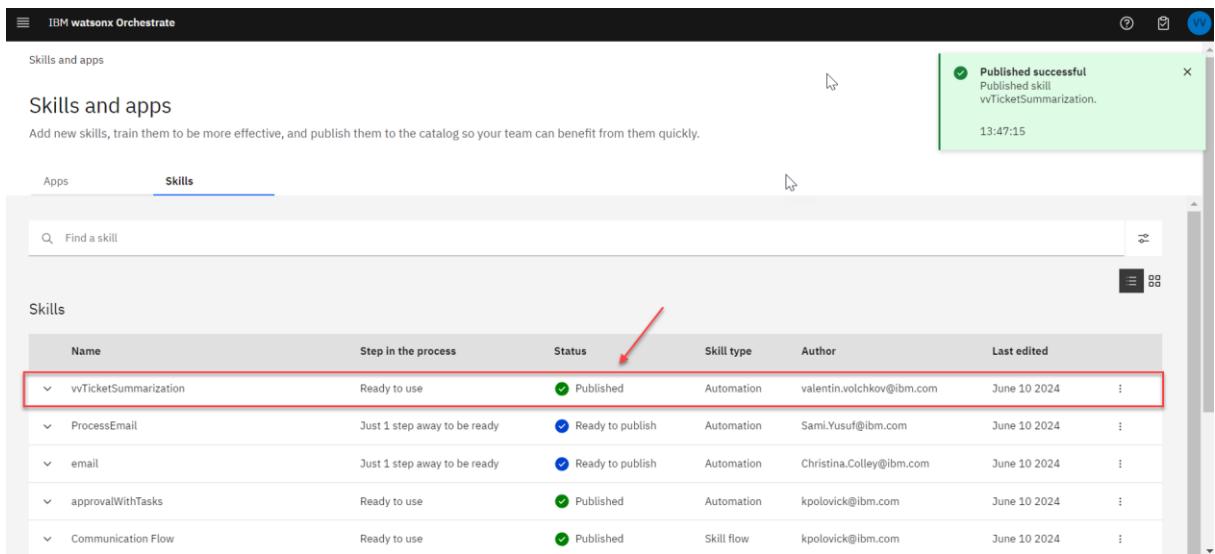
2. Under **Skills and apps** tab (**Skills** subtab), locate the skill that you have just added to the catalog (note that its status is **Ready to publish**), click on three dots and select **Enhance this skill** from the dropdown menu.

Name	Step in the process	Status	Skill type	Author	Last edited
vvTicketSummarization	Just 1 step away to be ready	Ready to publish	Automation	halifax-user17@mailinator.com	July 15 2024
VV-Upsell-Skillflow	Ready to use	Published	Skill flow	halifax-user17@mailinator.com	July
Write an upsell email to my customers	Ready to use	Published	Skill flow	valentin.volchkov@ibm.com	July
Product Upsell	Ready to use	Published	Automation	valentin.volchkov@ibm.com	July

3. In the **Phrases** tab make sure to provide a couple phrases that a user may type to invoke this skill, e.g. "summarize ticket" or "summarize support ticket", and click on **Publish** once done:

Name	Input	Output	Phrases	Next best skills
vvTicketSummarization			summarize a ticket summarize support ticket ticket summarization	

4. Note that when publishing is complete, the status of the skill changes to **Published** in the list.



The screenshot shows the 'Skills and apps' section of the IBM Watsonx Orchestrate interface. A modal window titled 'Published successful' is open, indicating that a skill named 'vvTicketSummarization' has been published at 13:47:15. The main table lists several skills, with the first one, 'vvTicketSummarization', highlighted by a red box and a red arrow pointing to its 'Status' column, which shows 'Published'. Other skills listed include 'ProcessEmail', 'email', 'approvalWithTasks', and 'Communication Flow', each with their respective details like 'Step in the process', 'Skill type', 'Author', and 'Last edited'.

Name	Step in the process	Status	Skill type	Author	Last edited
vvTicketSummarization	Ready to use	Published	Automation	valentin.volchkov@ibm.com	June 10 2024
ProcessEmail	Just 1 step away to be ready	Ready to publish	Automation	Sami.Yusuf@ibm.com	June 10 2024
email	Just 1 step away to be ready	Ready to publish	Automation	Christina.Colley@ibm.com	June 10 2024
approvalWithTasks	Ready to use	Published	Automation	kpolovick@ibm.com	June 10 2024
Communication Flow	Ready to use	Published	Skill flow	kpolovick@ibm.com	June 10 2024

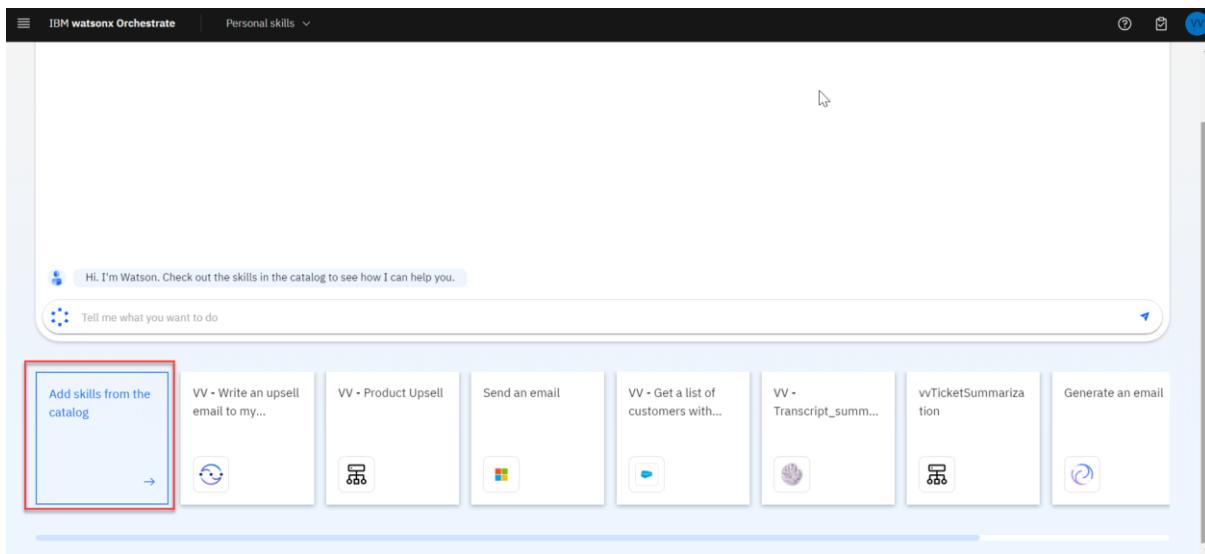
5.3.5 Adding and Testing the Generative AI Skill

1. Now that the new Gen AI skill is published into the IBM Watsonx Orchestrate catalog, the next step is to add it to the list of **Personal Skills** and test it in conversational UI of Watsonx Orchestrate. Click on the hamburger menu in the top left corner of the screen and select **Chat** in the menu.

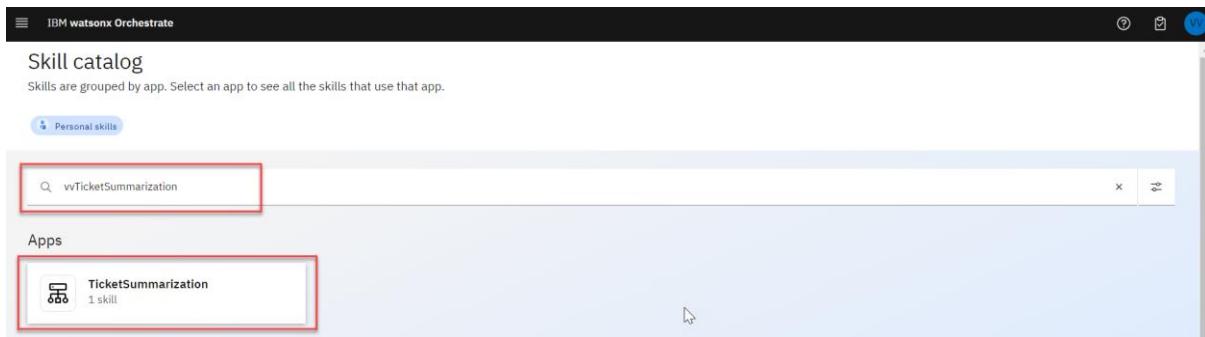


The screenshot shows the 'Skill studio' interface with the 'Chat' option selected in the sidebar menu. A red arrow points to the 'Chat' button. The main area displays a 'Create skill' button and a 'Configure prebuilt skills' button.

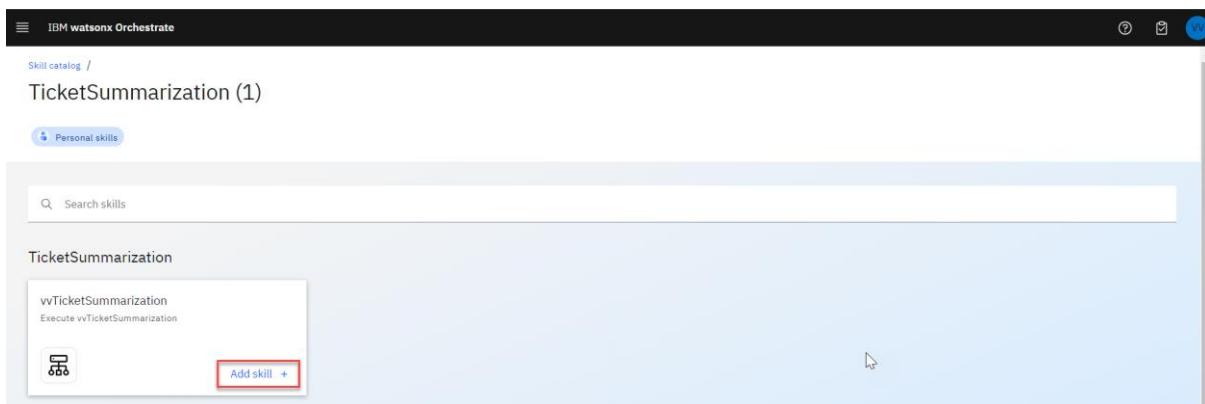
2. Click on Add skills from the catalog button.



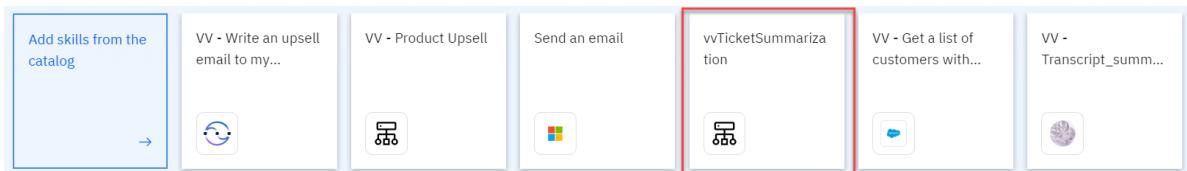
3. Search and locate your new skill in the catalog.



4. Click on "TicketSummarization" group and click on **Add skill** link to add it to the list of your Personal Skills.



5. Return back to the conversational UI by selecting **Chat** in the hamburger menu in the top left corner of the screen. Notice that the new skill is available now.



6. Click on the skill tile. Using the example in the table below, provide the input data and prompt instruction for the skill as shown below. Then click on **Apply**.

Input	Instruction
Title: Printer not working Description: James Miller says printers on 5th floor, building D do not work. He has tried printing from all 3 printers on the floor and only one works but it prints in black and white only. James needs to print documents in color. This is an urgent request. James has client meeting in 4 days.	You are a summarization tool for customer support tickets. You receive a Title and Description for a support ticket and write a concise summary. Be sure to include a person's name in the output.

Add skills from the catalog	VV - Write an upsell email to my...	VV - Product Upsell	Send an email	vvTicketSummarization	VV - Get a list of customers with...	VV - Transcript_summ...
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7. The new Generative AI automation will be executed. Validate the results.

The screenshot shows the IBM Watsonx Orchestrate interface. At the top, there's a navigation bar with 'IBM Watsonx Orchestrate' and 'Personal skills'. Below it, a message box says 'instructions' and 'You are a summarization tool for customer support tickets. You receive a Title and Description for a sup...'. A success message 'Decision execution success' is shown for 'vvTicketSummarization'. A red box highlights the 'generated_text' output: 'Name: James Miller. Summary: Printer on 5th floor building D not working.' Below this, a 'generated_token_count' message is partially visible. At the bottom, a text input field says 'Tell me what you want to do' and a button says 'Add skills from the catalog'. A row of skill cards includes 'VV - Write an upsell email to my...', 'VV - Product Upsell', 'Send an email', 'vvTicketSummarization', 'VV - Get a list of customers with...', 'VV - Transcript_summ...', and 'vvTicketSummariza...'.

Notice that the ticket summary has been generated using the format provided in the instructions, i.e.:

Name: James Miller **Summary:** Printer on 5th floor building D not working.

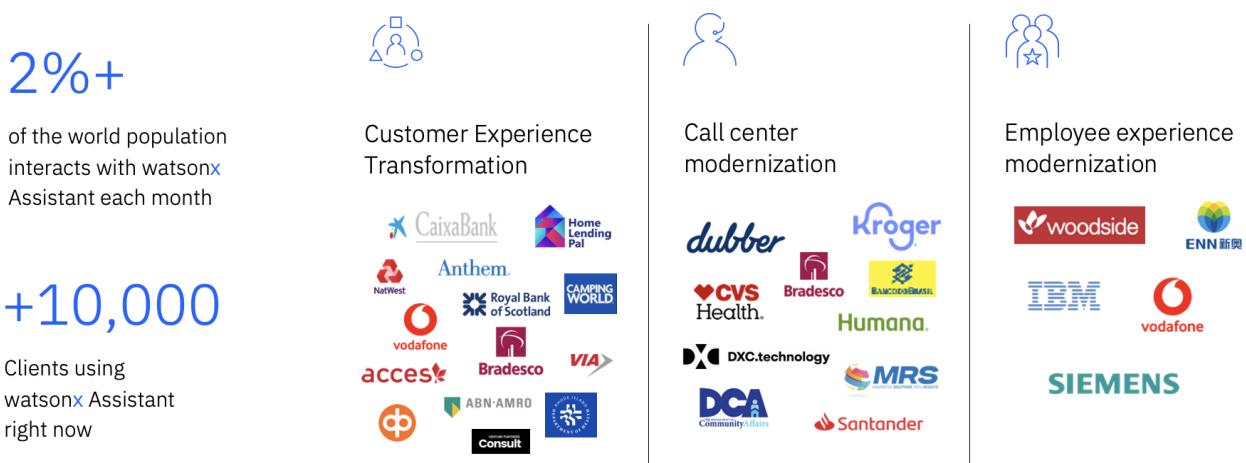
You have just successfully created and invoked a Generative AI based automation skill which takes as input instructions and test input and returns a summary of the input using the instructions. The Generative AI based automation implements a few-shot prompt to an LLM, using several examples of customer support ticket summarization.

This concludes the lab. Thank you for your participation!

5.4 Assistants (embedded IBM watsonx Assistant capability)

IBM Watsonx Orchestrate can also build **virtual assistants** by using the Assistant builder to create and deploy conversational Artificial Intelligence (AI) interfaces. These assistants can be tailored to fit both internal employee and external customer care use cases.

IBM has been delivering conversational AI for 10+ years and IBM Watsonx Assistant is a leader in the market.



Now, when combining the advanced conversational AI capabilities of Watson Assistant with the skill-based approach of Watson Orchestrate, IBM opens a new scene for enterprise productivity.

There is a lot of public information on Watson Assistant, but to get started using it as part of Orchestrate, refer to these [instructions](#).

This concludes the lab exercise, congratulations! We hope you enjoyed it and would love to hear your feedback and any questions you might have. Your instructors are happy to answer your questions and help you to get started with IBM Watson Orchestrate. Thank you!