

# Predictive decisioning

300-level live demo script



## Introduction

Thank you for attending this predictive decisioning demonstration.

Today I'll show how IBM Cloud Pak for Business Automation uses machine learning (ML) to enhance customer retention offers. You will learn how to integrate Watson Studio Machine Learning with the Cloud Pak to predict business outcomes. These predictions are used by automated decision services to customize retention offers, lower customer retention costs, and eliminate many paper-based processes.

Business users can quickly start creating and using predictions to improve their everyday processes.

Let's get started!

# 1 - Reviewing the manual call center process

## 1.1 - Show SkyTalk's current manual process

### Narration

SkyTalk, a telecommunications provider, is losing many of its best customers to competitors. SkyTalk needs to reduce customer churn. Let's review the written customer retention policies call center management implemented.

### Action 1.1.1

- Show SkyTalk's Retention Offer document, which was opened during demo preparation.

The screenshot shows a PDF document titled "Retention Policy.pdf" with two pages visible. The first page is titled "SkyTalk marketing division – 2019 Retention offers". It contains two tables. The first table is for "Eligibility" and "Next Steps", listing conditions like "When eligible retention offer" and steps like "Confirm the customer's email address". The second table is for "Cost" and "Exceptions", listing "US\$ 0" and "Customer has been surveyed in the last 12 months (Refer to customer history)". The second page continues with sections like "Customer upgrade" and "Upgrade conditions", both with tables for "Customer conditions" and "Upgrade to".

### Narration

Call center agents were asked to understand various retention offers and manually pick the 'best' option to retain the client.

Agents could not make insightful real-time decisions based on SkyTalk's existing customer information. The guidelines were also implemented inconsistently.

SkyTalk's customer retention costs skyrocketed, while attrition remained steady. Management decided to create a new call center application leveraging decision automation and machine learning to provide customer retention offers.

## 2 - Modeling the business rules

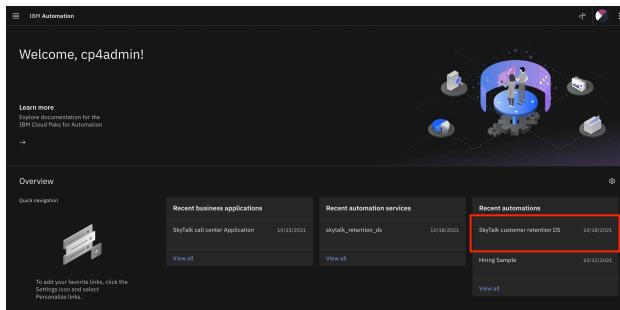
### 2.1 - Review the components of SkyTalk's retention decisions

#### Narration

A business analyst in the customer care division uses machine learning and decision automation technologies to configure the call center's new retention offer application. The business analyst writes the business rules to generate retention offer recommendations.

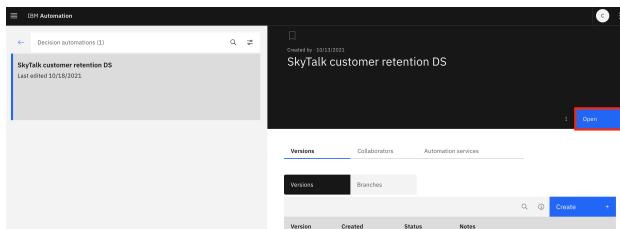
#### Action 2.1.1

- Access the Business Automation Studio on the IBM Automation home page window, opened during demo preparation. Then click **SkyTalk customer retention DS** (DS stands for Decision Service).



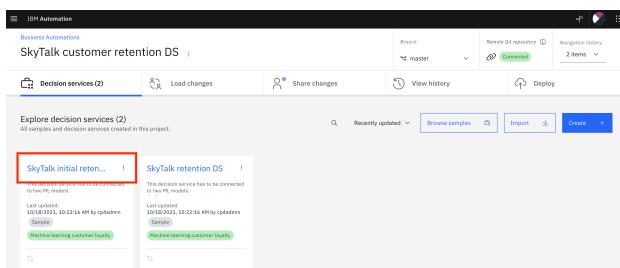
#### Action 2.1.2

- Click **Open**.



#### Action 2.1.3

- Click the **SkyTalk initial retention DS** tile.



## Action 2.1.4

- Click **Retention offer**.

The screenshot shows the JBoss Automation interface with the path 'Business Automations / SkyTalk customer retention DS / SkyTalk initial retention DS'. The 'Models' tab is selected, displaying a list of decision services. One service, 'Retention offer', is highlighted with a red box and has a tooltip: 'Recommend the best offer to make to a customer in order to prevent churn.' The list includes columns for Name, Last updated by, and Last updated at. The 'Retention offer' row shows 'cpAdams' as the last updater and '10/18/2021, 10:22:16 AM' as the last update time. The bottom of the screen shows pagination controls: 'Items per page: 100' and '1-1 of 1 items'.

## Narration

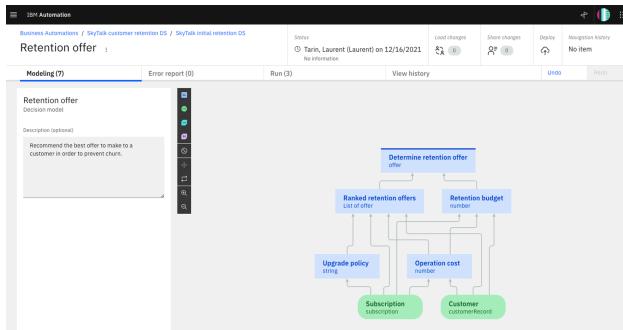
The diagram shows a hierarchical model of SkyTalk's retention offer business rules, which is called a decision service. Each blue box represents a sub-decision. The green rounded boxes represent the input data.

The 'Determine retention offer' decision service requires two sub-decisions: 'Ranked retention offers' and 'Retention budget.'

Let's take a closer look at one sub-decision to see how the decision logic defines decision-making.

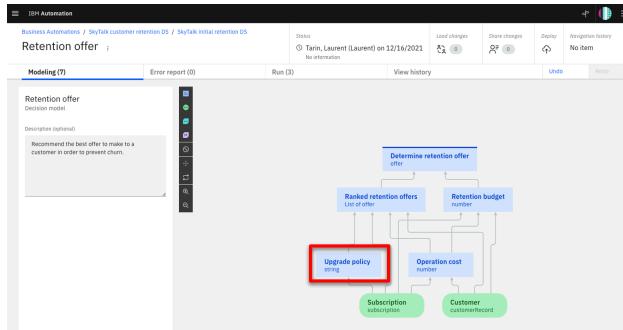
## Action 2.1.5

- Review the **Retention offer** decision model.



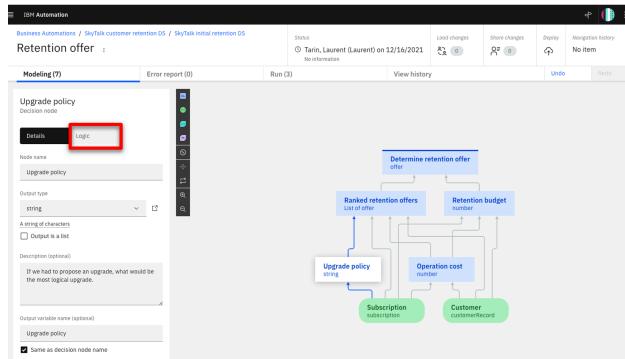
## Action 2.1.6

- Click the **Upgrade policy** box.



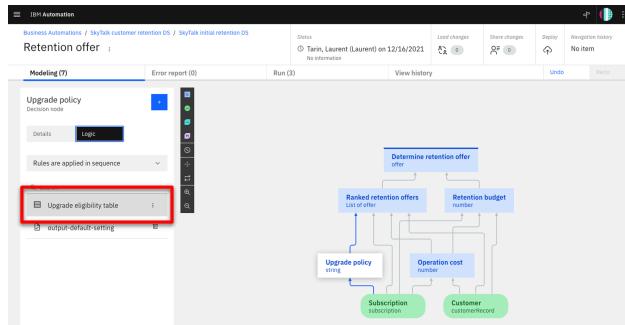
## Action 2.1.7

- Click the **Logic** tab.



## Action 2.1.8

- Click **Upgrade eligibility table**.



## Narration

The upgrade eligibility criteria are expressed in a decision table. Each row corresponds to a specific eligibility business rule.

By hovering the cursor on a row, the analyst can review the business rule in natural language. In this example, a SkyTalk Gold customer must have a subscription amount of at least \$160 USD to be eligible for a Premium upgrade.

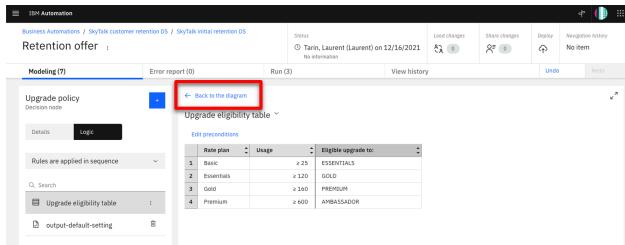
## Action 2.1.9

- Show the **Upgrade eligibility table** decision table. Move the cursor over **row 3** to show the equivalent rule in natural language.

The screenshot shows the IBM Automation interface with the 'Retention offer' decision node selected. The 'Upgrade eligibility table' section is open, showing a decision table with four rows. Row 3 is highlighted with a red arrow. The table has columns for 'Key plan', 'Usage', and 'Eligible upgrade to'. Row 3 contains the following natural language rule:  
1. Basic  
2. IF  
   all of the following conditions are true  
      1. the usage of 'Subscription' is at least 160 ;  
      2. the usage of 'Subscription' is at least 160 ;  
      3. set 'decision' to 'PREMIUM' ;

## Action 2.1.10

- Click **Back to the diagram**.



## Narration

The ‘Ranked retention offers’ top-level decision cycles through the list of eligible offers and selects the least expensive one that does not exceed the calculated retention budget for the given customer.

The analyst will enhance the ‘Retention budget’ sub-decision by incorporating an estimate of the maximum amount SkyTalk should spend to keep the customer. The estimate is calculated using two predictions: (1) the customer’s lifetime value, and (2) the customer’s propensity to churn.

In the next section, the business analyst uses IBM Watson Studio to create these two predictions.

## 3 - Creating the predictive models

### 3.1 - Show the data sources used for prediction

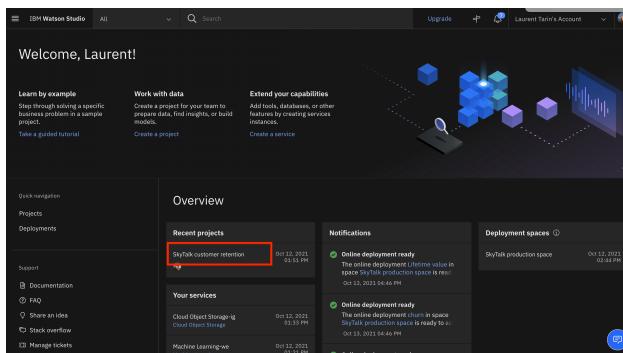
#### Narration

The business analyst creates and deploys the machine learning models used for the predictions.

Five years of data from SkyTalk's customer database has been loaded into IBM Watson Studio. The analyst will use this data to develop predictions for customer lifetime value and churn.

#### Action 3.1.1

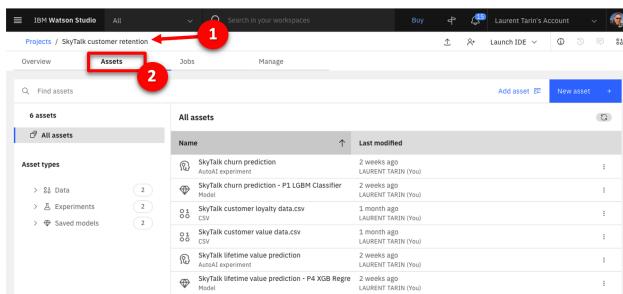
- Click the **SkyTalk customer retention** project on the Watson Studio page opened during demo preparation.



The screenshot shows the Watson Studio interface. In the top navigation bar, there are links for 'Learn by example', 'Work with data', and 'Extend your capabilities'. Below the navigation is a 'Welcome, Laurent!' message and a central 'Overview' section featuring a 3D visualization of data points. On the left, a 'Quick navigation' sidebar lists 'Projects', 'Deployments', 'Support', and various documentation links. The 'Recent projects' section highlights 'SkyTalk customer retention' with a red box around it. The 'Notifications' and 'Deployment spaces' sections also contain some items.

#### Action 3.1.2

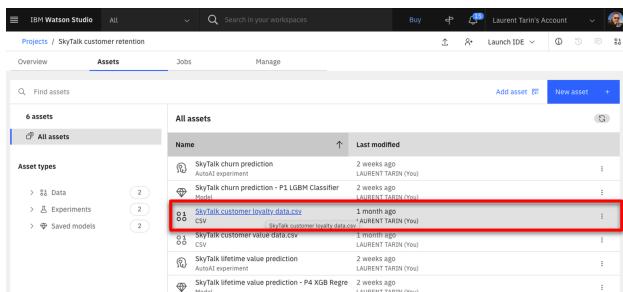
- Click **SkyTalk customer retention** (1) in the breadcrumb navigation. Click the **Assets** tab (2).



The screenshot shows the 'Assets' tab selected in the Watson Studio interface. The breadcrumb navigation at the top shows 'Projects / SkyTalk customer retention'. The main area displays a table of assets, with the first item, 'SkyTalk customer loyalty data.csv', highlighted with a red box. The table includes columns for 'Name', 'Last modified', and a preview icon.

#### Action 3.1.3

- Open the **SkyTalk customer loyalty data.csv** file.



The screenshot shows the 'Assets' tab selected in the Watson Studio interface. The breadcrumb navigation shows 'Projects / SkyTalk customer retention'. The main area displays a table of assets, with the second item, 'SkyTalk customer loyalty data.csv', highlighted with a red box. The table includes columns for 'Name', 'Last modified', and a preview icon.

## Narration

Watson Studio generates models that predict customer churn. Model generation is referred to as an ‘AutoAI experiment.’

The business analyst reviews the uploaded historical data file to make sure it contains the data required to predict customer churn.

T (true) in the Churn column indicates the customer closed their SkyTalk account. F (false) indicates the customer remained with SkyTalk.

### Action 3.1.4

- Review the **SkyTalk customer loyalty data.csv** file.

CHURN (String)	Gender (String)	Status (String)	Household (String)	Est Income (String)	Car Owner (String)	Age (String)	Payment method (String)	Usage (String)	Rate (Rate)
F	S	1	38000	N	24.393333	CC	239.64	3	
F	M	M	2	29616	N	49.426667	CH	75.29	2
F	M	M	0	19728.8	N	50.473333	CC	47.25	3
F	M	S	2	96.33	N	56.473333	CC	59.01	1
F	F	M	2	52004.8	N	25.14	CH	28.14	1
F	M	M	2	53010.8	N	18.84	CC	58.87	1
F	M	M	1	75004.5	N	64.8	CC	58.72	1
F	M	M	0	19745.3	N	60.366667	CC	34.17	3
F	M	S	1	57626.9	Y	43.906667	CC	48.35	2
F	M	M	2	20078	N	32.846667	CC	15.98	4
F	F	M	2	47902	N	26.033333	Auto	72.31	2
T	M	H	1	7545.96	Y	16.753333	CC	200.75	3
T	F	S	0	78851.3	N	48.273333	CC	29.04	4
T	F	S	1	17540.7	Y	62.786667	Auto	36.2	
T	F	H	0	83891.9	Y	63.02	CH	74.4	

### Action 3.1.5

- Click **SkyTalk customer retention** in the breadcrumb navigation.

CHURN (String)	Gender (String)	Status (String)	Household (String)	Est Income (String)	Car Owner (String)	Age (String)	Payment method (String)	Usage (String)	Rate (Rate)
F	M	H	1	38000	N	24.393333	CC	227.64	3
F	H	H	2	29616	N	49.426667	CH	75.29	2
F	H	H	0	19728.8	N	50.473333	CC	47.25	3
F	H	S	2	96.33	N	56.473333	CC	59.01	1

## Narration

The business analyst starts an AutoAI experiment to create models that predict customer churn. Models are referred to as ‘pipelines.’

The AutoAI tool analyzes historical data to generate multiple pipelines.

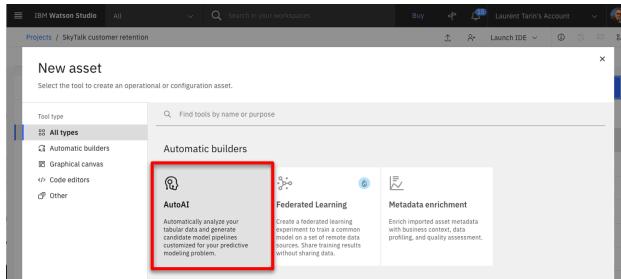
### Action 3.1.6

- Click **New asset**.

Name	Last modified
SkyTalk churn prediction	2 weeks ago LAURENT TARIN (You)
AutoAI experiment	
SkyTalk churn prediction - P1 LGBM Classifier Model	2 weeks ago LAURENT TARIN (You)
SkyTalk customer loyalty data.csv	1 month ago LAURENT TARIN (You)
CSV	
SkyTalk customer value data.csv	1 month ago LAURENT TARIN (You)
CSV	
SkyTalk lifetime value prediction	2 weeks ago LAURENT TARIN (You)
AutoAI experiment	
SkyTalk lifetime value prediction - P4 XGBoost Regre Model	2 weeks ago LAURENT TARIN (You)

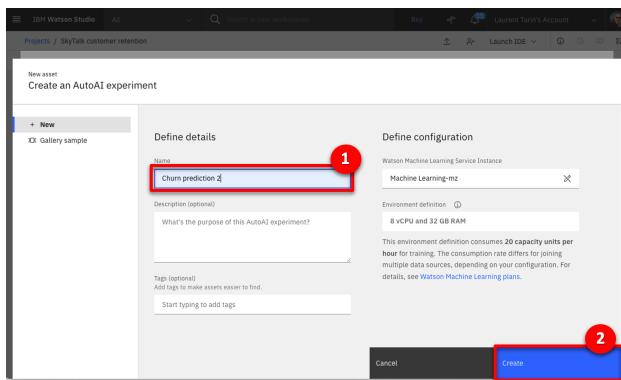
### Action 3.1.7

- Select **AutoAI**.



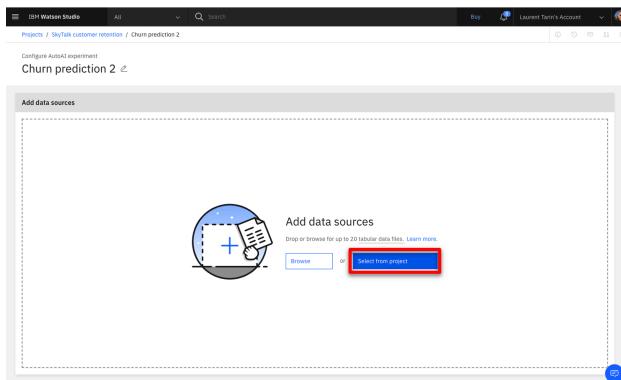
### Action 3.1.8

- Name the experiment **Churn prediction 2** (1) and click **Create** (2).



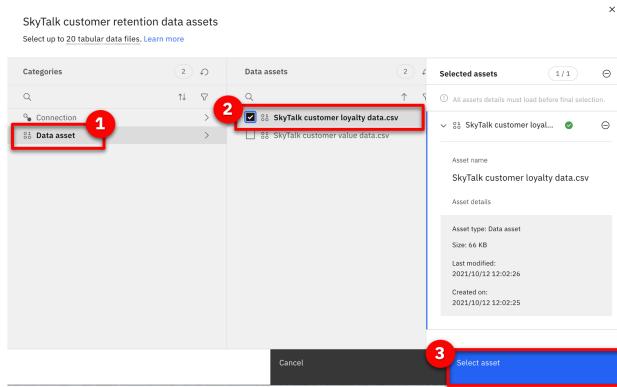
### Action 3.1.9

- Click **Select from project**.



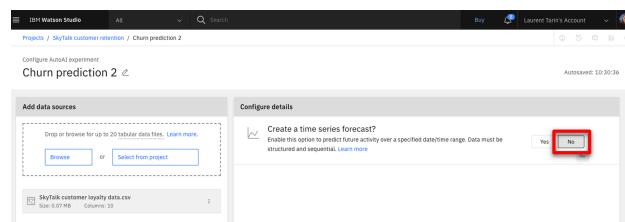
### Action 3.1.10

- Click **Data asset** (1) and select the **SkyTalk customer loyalty data.csv** file (2). Click **Select asset** (3).



### Action 3.1.11

- Click **No** in the **Configure details** section.



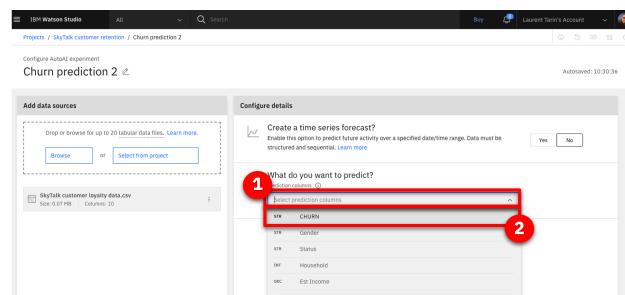
### Narration

The analyst chooses the customer loyalty data file and selects Churn in the ‘What do you want to predict’ dropdown menu.

The AutoAI tool analyzes historical data and automatically generates various pipeline choices. It also tests the pipelines’ predictions so the business analyst can easily compare them across several accuracy measures.

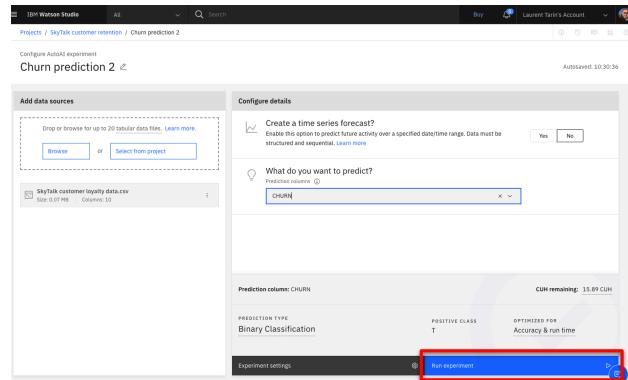
### Action 3.1.12

- Click **Select prediction columns** (1) and select **CHURN** (2) as the measure to predict.



### Action 3.1.13

- Click **Run experiment**.



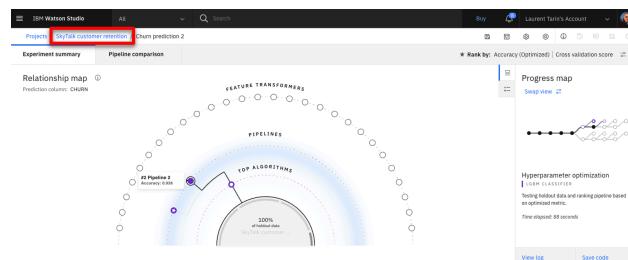
### Narration

The results automatically suggest eight different pipelines. The pipelines use different ML optimization approaches to make predictions.

The business analyst evaluates the pipelines' various prediction accuracy measures.

### Action 3.1.14

- Click **SkyTalk customer retention** in the breadcrumb navigation



### Narration

Let's jump to a finalized experiment corresponding to the same data set.

### Action 3.1.14

- Click the **SkyTalk churn prediction** AutoAI experiment.

A screenshot of the IBM Watson Studio interface showing the 'Assets' tab. The table lists 6 assets under 'All assets':  
1. SkyTalk lifetime value prediction - P4 XGB Regressor Model  
2. SkyTalk lifetime value prediction AutoAI experiment  
3. SkyTalk customer value data.csv  
4. SkyTalk churn prediction - P1 LGBM Classifier  
5. SkyTalk churn prediction - AutoAI experiment  
6. SkyTalk customer loyalty data.csv  
The 'SkyTalk churn prediction - AutoAI experiment' row is highlighted with a red box.

## 3.2 - Choose the best predictive model

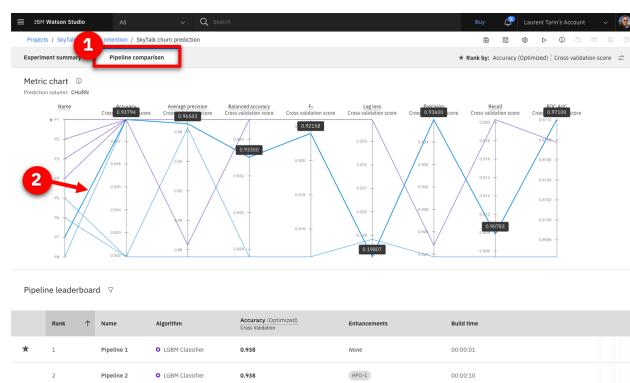
### Narration

On the ‘Pipeline Comparison’ chart, the business analyst examines how each pipeline ranks by various measures of accuracy.

For example, Pipeline 7 has the highest accuracy in differentiating useful data from noise. This is determined by the area under the ROC (receiver operating characteristic) curve and displayed on this chart in the ROC AUC column.

### Action 3.2.1

- Click **Pipeline comparison** (1) and move the cursor over the pipeline 7 line (2) (P7 on the left of the graph) to highlight the different values for this pipeline.

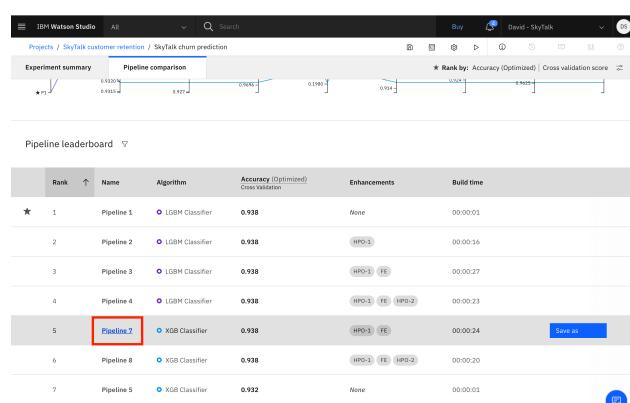


### Narration

Scrolling down and selecting a Pipeline provides additional details.

### Action 3.2.2

- Scroll down and click **Pipeline 7** in the **Pipeline leaderboard**.

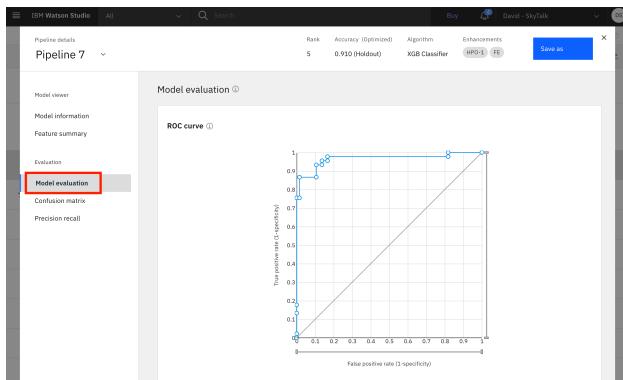


### Narration

The ‘Model evaluation’ view shows Pipeline 7’s actual ROC curve. Pipeline 7’s ROC curve arcs upward, indicating that as more predictions are made during the test, the model becomes increasingly accurate.

### Action 3.2.3

- Click the **Model Evaluation** tab.



### Narration

The 'Confusion matrix' shows a different accuracy measure. It compares the actual attrition data with the pipelines' predictions.

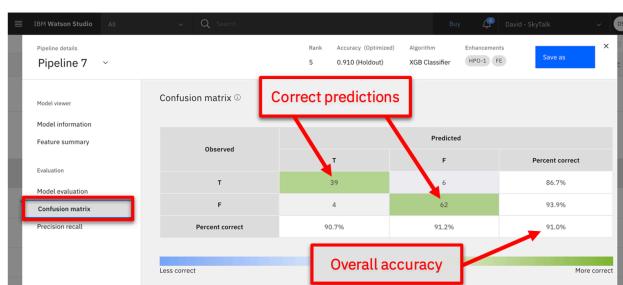
Earlier in the demo, we looked at how customer churn is indicated in SkyTalk's data as T (true) for customers that closed their account and F (false) for customers that remained with SkyTalk.

Correct predictions in the 'Confusion matrix' below are indicated in the green T/T and F/F boxes. There were 39 T/T results and 62 F/F results. Summarizing those results shows us that Pipeline 7 made 101 correct predictions. The six T/F and four F/T represent ten incorrect predictions.

Therefore, Pipeline 7 made 101 correct predictions out of 111 chances. This translates to 91% accuracy, which is displayed in the bottom right box of the matrix.

### Action 3.2.4

- Click the **Confusion matrix** tab.



### Narration

The analyst compares Pipelines 1 and 7 to understand why Pipeline 1 is rated the best overall.

### Action 3.2.5

- Click the **Pipeline details** dropdown menu (1) and select **Pipeline 1** (2).

The screenshot shows the 'Pipeline details' dropdown menu open, with 'Pipeline 7' highlighted. A red arrow labeled '1' points to the dropdown menu, and another red arrow labeled '2' points to the 'Pipeline 1' option in the list.

### Action 3.2.6

- Click **Confusion matrix** on the left.

The screenshot shows the 'Model evaluation' sidebar with 'Confusion matrix' selected. In the main panel, an ROC curve is displayed, showing a diagonal line from (0,0) to (1,1) and a blue curve above it, indicating model performance.

### Action 3.2.7

- Review the **Confusion matrix**. Highlight that the overall correct percentage is higher using Pipeline 1.

The screenshot shows the 'Confusion matrix' table for Pipeline 1. The overall correct percentage is highlighted with a red box in the 'Percent correct' row: 94.6%.

Observed	T	F	Percent correct
T	41	4	91.1%
F	2	64	97.0%
Percent correct	95.3%	94.1%	94.6%

### Narration

Pipeline 1 has a 94.6% accuracy, which is higher than Pipeline 7's 91.0%. The analyst chooses Pipeline 1 as the model to deploy in production.

### Action 3.2.8

- Click the X on the upper right corner to close the **Pipeline details** view.

The screenshot shows the 'Pipeline details' view for 'Pipeline 1'. The left sidebar has a 'Confusion matrix' tab selected, which is highlighted with a blue box. At the top right, there is a 'Save as' button with a red box around it. The main area displays a confusion matrix table:

Observed	Predicted		Percent correct
	T	F	
T	41	4	91.1%
F	2	64	97.0%
Percent correct	95.3%	94.1%	94.6%

A horizontal bar at the bottom indicates the range from 'Less correct' to 'More correct'.

### Action 3.2.9

- Click **Save as** on the right side of the Pipeline 1 row.

The screenshot shows the 'Pipeline leaderboard' view. Pipeline 1 is listed at the top with a rank of 1, an algorithm of 'LGBM Classifier', and an accuracy of 0.938. The 'Save as' button is highlighted with a red box. Other pipelines listed are Pipeline 2, Pipeline 3, and Pipeline 4, all with the same rank, algorithm, and accuracy.

### Narration

The analyst can now generate a machine learning model using the pipeline from the AutoAI experiment. We will click cancel and review the model that was previously created.

### Action 3.2.10

- Select **Model** (1) and then click **Cancel** (2).

The screenshot shows the 'Save as' dialog box. Step 1 (highlighted with a red circle) points to the 'Model' asset type selection in the 'Select asset type' section. Step 2 (highlighted with a red circle) points to the 'Cancel' button at the bottom of the dialog.

### Action 3.2.11

- Click **SkyTalk customer retention** project in the breadcrumb navigation.

The screenshot shows the IBM Watson Studio interface with the breadcrumb navigation bar at the top. The current project is highlighted in red as "SkyTalk customer retention". Below the navigation, there are tabs for "Experiment summary" and "Pipeline comparison". A modal window is open in the center, displaying a success message: "Saved model successfully! SkyTalk churn prediction - P1 LGBM Classifier was successfully saved to SkyTalk customer retention." At the bottom right of the modal is a "View in project" button. Below the modal, the "Pipeline leaderboard" is visible, showing two entries:

Rank	Name	Algorithm	Accuracy (Optimized) Cross Validation	Enhancements	Build time
1	Pipeline 1	LGBM Classifier	0.938	None	00:00:01
2	Pipeline 2	LGBM Classifier	0.938	(PDS-1)	00:00:16

### 3.3 - Prepare the churn prediction model for production use

#### Narration

The analyst has created a churn prediction service for the model. Then, an AutoAI experiment was invoked to automatically generate pipeline options for the churn prediction service. The analyst chose a pipeline for production use and saved it as a churn prediction model in the SkyTalk's customer retention project.

In Watson AI, promoting a prediction model to a production space makes it available for use in production. Let's complete this final step to make SkyTalk's new churn prediction model available in the SkyTalk production space.

#### Action 3.3.1

- Click **Saved models**.

The screenshot shows the 'Saved models' section in the 'Assets' tab of the IBM Watson Studio interface. The sidebar on the left shows 'Asset types' with 'Saved models' selected, indicated by a red box and the number '2'. The main area lists several assets, including 'Churn prediction 2' (AutoAI experiment), 'SkyTalk churn prediction' (AutoAI experiment), 'SkyTalk churn prediction - P1 LGBM Classifier Model', 'SkyTalk customer loyalty data.csv' (CSV), 'SkyTalk customer value data.csv' (CSV), 'SkyTalk lifetime value prediction' (AutoAI experiment), and 'SkyTalk lifetime value prediction - P4 XGB Regressor Model'. The 'SkyTalk churn prediction - P1 LGBM Classifier Model' row has three dots on its right side, which are highlighted with a red box and the number '1'.

#### Action 3.3.2

- Click the three dots on the right-hand side of **SkyTalk lifetime value prediction** row (1) and then select **Promote to space** (2).

The screenshot shows the 'Promote to space' option being selected for the 'SkyTalk lifetime value prediction' model. A red circle labeled '1' points to the three dots on the right side of the row. A red circle labeled '2' points to the 'Promote to space' button in the dropdown menu, which is also highlighted with a red box.

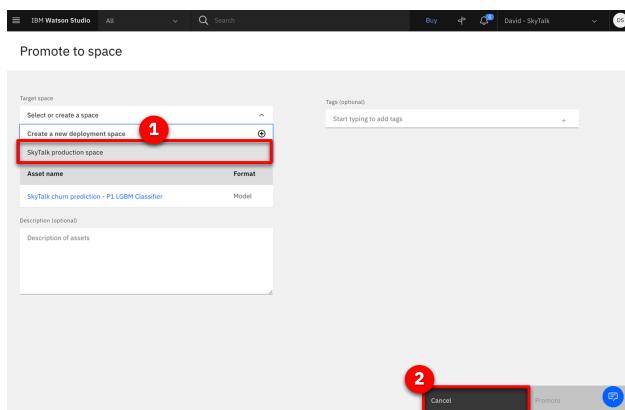
#### Narration

In practice, the analyst would promote the churn model to the deployment environment here. For this demo, it has already been promoted.

### Action 3.3.3

- In the **Target space** dropdown menu, select the **SkyTalk production space** (1) option. Click **Cancel** (2) to avoid promoting the model.

**NOTE:** Do not click **Promote**.

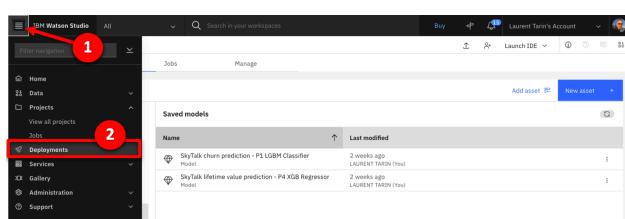


### Narration

The two prediction services are now ready for deployment.

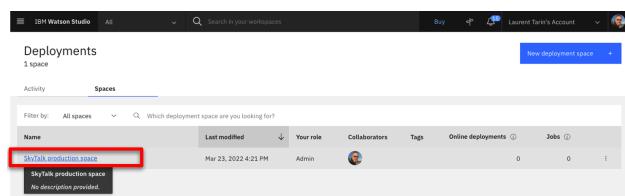
### Action 3.3.4

- Click the **IBM Watson Studio** menu (1), then click **Deployments** (2).



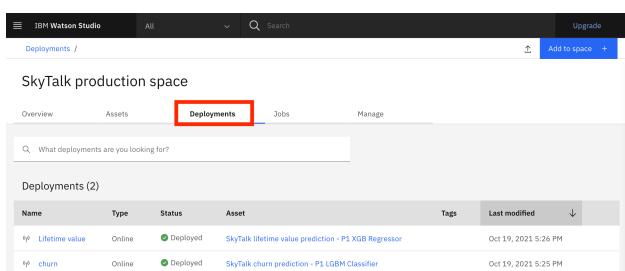
### Action 3.3.5

- Select the **SkyTalk production space**.



### Action 3.3.6

- Click the **Deployments** tab.



## Narration

The two services have been deployed.

Copy and save the service endpoint URL. It will be required to configure a machine learning provider that will establish the link between Watson Studio and the Cloud Pak later in the demo.

### Action 3.3.7

- Click the **Churn** service.

Screenshot of the IBM Watson Studio interface showing the Deployments page for the 'SkyTalk production space'. The 'Deployments' tab is selected. There are two entries in the list:

Name	Type	Status	Asset	Tags	Last modified
tpf Lifetime value	Online	Deployed	SkyTalk lifetime value prediction - P1 XGB Regressor		Oct 19, 2021 5:26 PM
tpf churn	Online	Deployed	SkyTalk churn prediction - P1 LGBM Classifier		Oct 19, 2021 5:25 PM

### Action 3.3.8

- Copy the first portion of the **Endpoint** URL for use later in the demo. Only highlight from the beginning through 'v4,' as shown in the image.

Screenshot of the 'churn' service details page in IBM Watson Studio. The 'Direct link' section displays the endpoint URL:

```
https://eu-de.watson.cloud.ibm.com/v4/deployments/cae0ee45-0fa8-4443-897a-ed3be834d0ff/predictions?version=1
```

## Narration

The deployment space identifier will also be required to configure the machine learning provider.

### Action 3.3.9

- Click the **SkyTalk production space** in the breadcrumb navigation.

Screenshot of the IBM Watson Studio interface showing the breadcrumb navigation at the top with 'SkyTalk production space' selected. Below it, the 'churn' service details page is shown, with the 'Direct link' endpoint URL partially visible:

```
https://eu-de.watson.cloud.ibm.com/v4/deployments/cae0ee45-0fa8-4443-897a-ed3be834d0ff/predictions?version=1
```

### Action 3.3.10

- Click the **Manage** tab (1). Copy and save the **Space GUID** (2) for use later in the demo.

The screenshot shows the IBM Watson Studio interface for a 'SkyTalk production space'. The 'Manage' tab (1) is highlighted with a red circle. The 'Space Details' section (2) contains the Space GUID: 'ee74b517-0407-4e2e-b006-978220727...'. A file upload area is visible at the top right.

**Space Details**

Name: SkyTalk production space

Description: No description provided.

Space GUID: ee74b517-0407-4e2e-b006-978220727...

Date created: Aug 31, 2021 12:43 PM by Laurent TARIN

Last updated: Aug 31, 2021 12:43 PM

**Cloud Object Storage**

Storage used: 177.13 KB used

Name: Cloud Object Storage-io

Bucket: 3d67c385-af52-4db3-8d15-cc0cebc4d7f1

## 4 - Calling the prediction services from the business rules

### 4.1 - Configure the customer retention decision service to use the new predictive

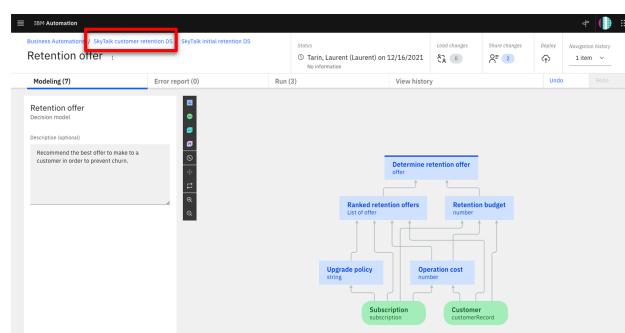
#### Narration

The ‘Retention budget’ sub-decision uses the ‘churn’ and ‘lifetime value’ predictive services. A machine learning provider establishes the link between the sub-decision and the predictive services.

The business analyst now sets up a machine learning provider for the SkyTalk ‘customer retention decision service.’

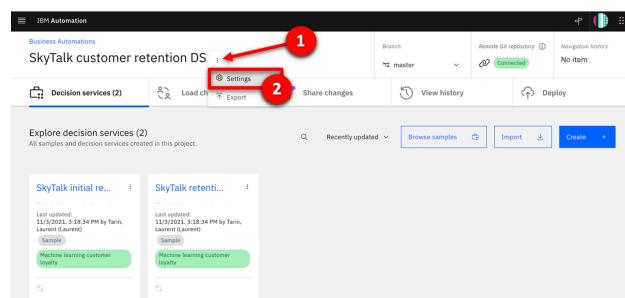
#### Action 4.1.1

- Return to the **SkyTalk customer retention DS** using the breadcrumb navigation.



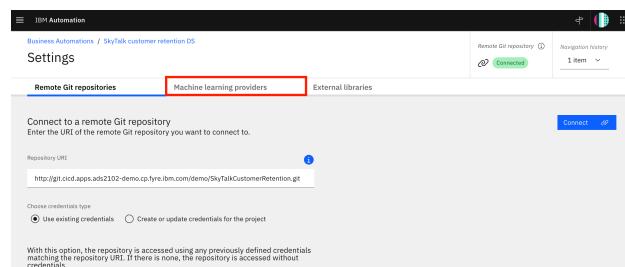
#### Action 4.1.2

- Click the three dots on the right-hand side of **SkyTalk customer retention DS** (1) and then select **Settings** (2).



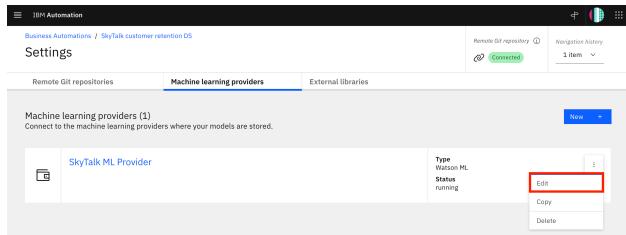
#### Action 4.1.3

- Click the **Machine learning providers** tab.



#### Action 4.1.4

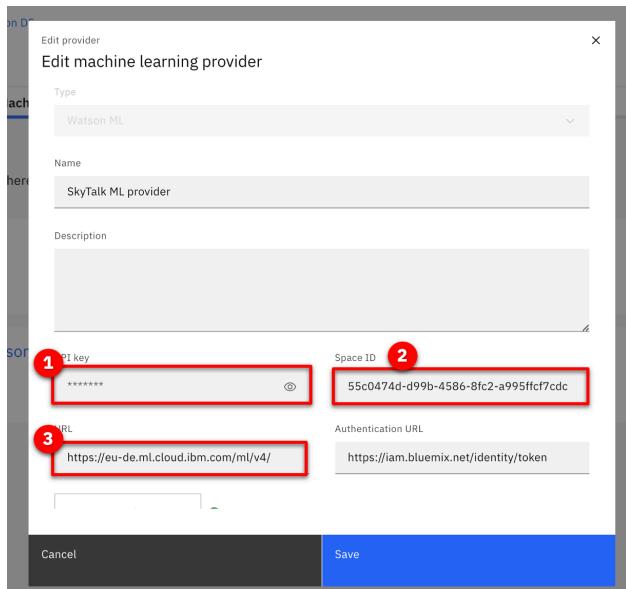
- Click **Edit** on the right side of the **SkyTalk ML Provider** box.



#### Action 4.1.5

- Enter the **API key** (1), the **Space ID** (2), and the **Endpoint URL** (3) obtained during the demo.

**NOTE:** The Space GUID saved earlier in the demo is called the Space ID on this interface. The API key is the same one you saved in Step 4.10 of demo preparation.

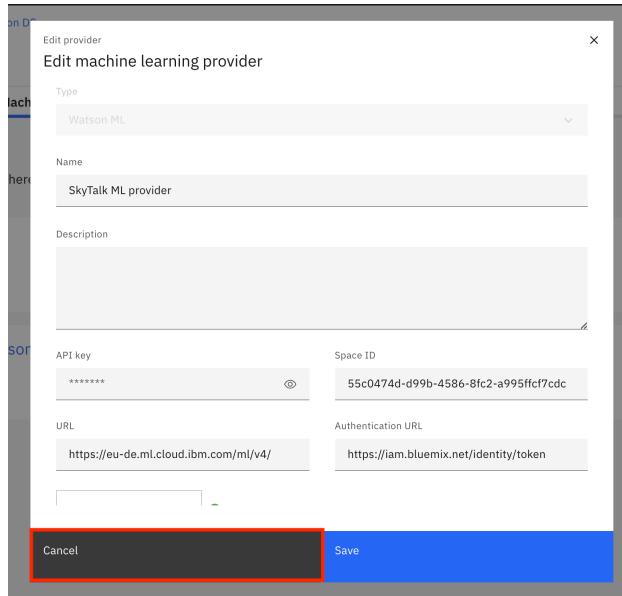


#### Narration

Now that the interface between the Cloud Pak and Watson Studio is set up, the analyst can create two predictive models and make the predictions available for use within business rules.

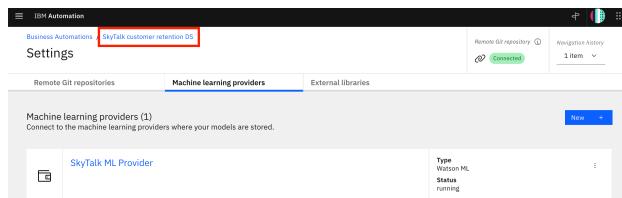
### Action 4.1.6

- Click **Cancel** and explain that the provider has been pre-configured during demo preparation.



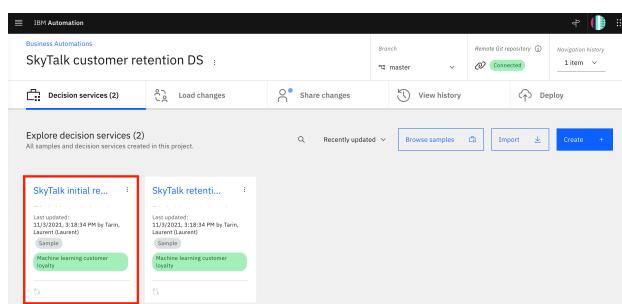
### Action 4.1.7

- Return to the **SkyTalk customer retention DS** using the breadcrumb navigation.



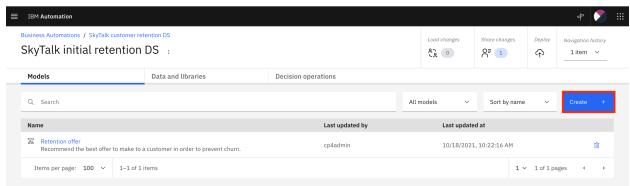
### Action 4.1.8

- Click the **SkyTalk initial retention DS** tile.



## Action 4.1.9

- Click **Create**.



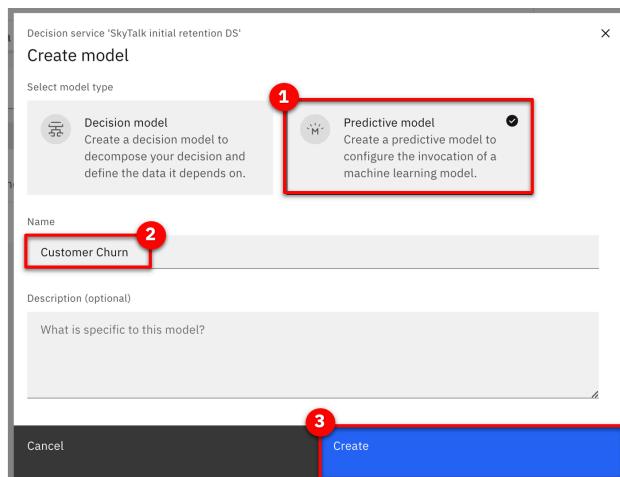
The screenshot shows the 'Models' section of the D365 Automation interface. At the top, there are buttons for 'Load changes', 'Share changes', 'Deploy', and 'Navigation history'. Below that is a search bar and a dropdown for 'Sort by name'. A red box highlights the 'Create' button in the top right corner of the list header. The main area displays a table with one item: 'Retention offer' (Last updated by: cpadmin, Last updated at: 10/18/2021, 10:32:16 AM). At the bottom, there are pagination controls for 'Items per page: 100' and '1-1 of 1 items'.

## Narration

The business analyst creates a predictive model to map the customer churn prediction parameters.

## Action 4.1.10

- Select **Predictive model** (1) and name it **Customer Churn** (2). Click **Create** (3).



The screenshot shows the 'Create model' dialog box for a decision service named 'SkyTalk initial retention DS'. It has two options: 'Decision model' and 'Predictive model'. The 'Predictive model' option is highlighted with a red box and a red circle labeled '1'. The 'Name' field contains 'Customer Churn' and is also highlighted with a red box and a red circle labeled '2'. The 'Create' button at the bottom is highlighted with a red box and a red circle labeled '3'.

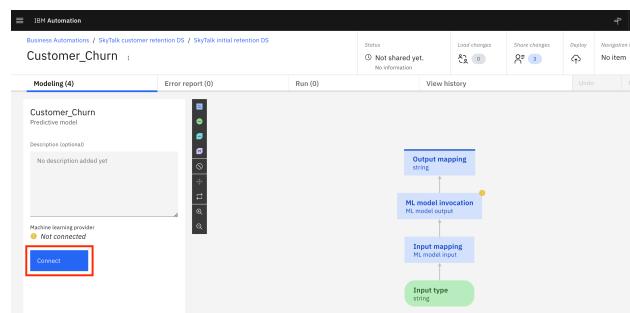
## 4.2 - Map the predictive service to the predictive model

### Narration

A new predictive model is automatically created. This model needs to be configured to map the churn prediction parameters.

#### Action 4.2.1

- Click **Connect**.

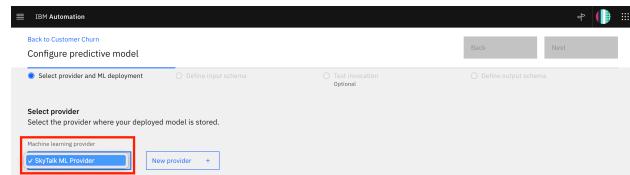


### Narration

The analyst selects the SkyTalk machine learning provider to establish the link to the deployed prediction service.

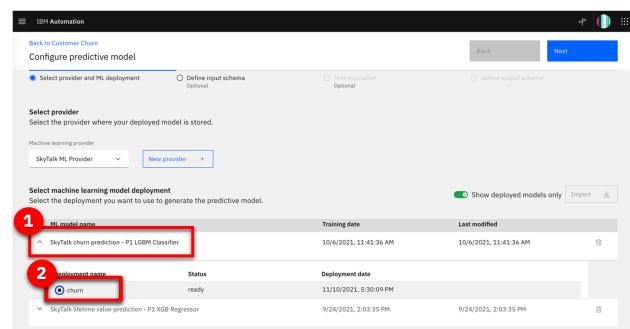
#### Action 4.2.2

- Using the **Machine learning provider** dropdown menu, select **SkyTalk ML Provider**.



#### Action 4.2.3

- Expand the **SkyTalk churn prediction** machine learning model (1). Select the **churn** deployment name (2). The prediction is now connected to the customer lifetime value.

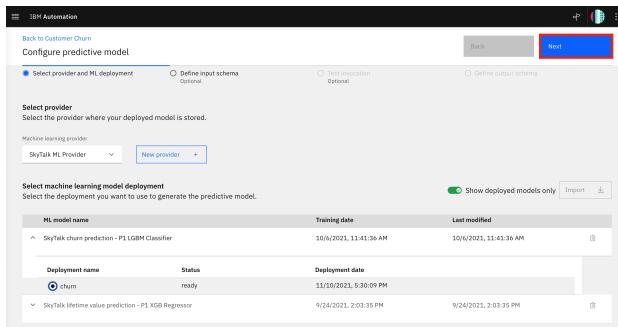


### Narration

Now we will complete the predictive model. A wizard is used to complete the mapping.

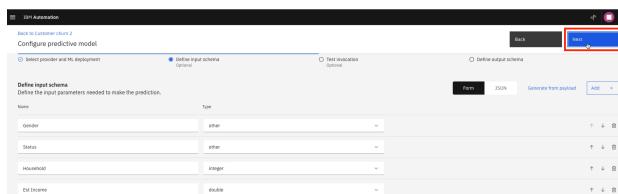
## Action 4.2.4

- Click **Next**.



## Action 4.2.5

- Click **Next** again.

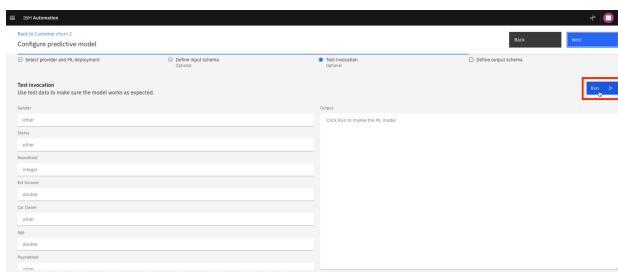


## Narration

The input data structure is automatically created.

## Action 4.2.6

- Click **Run**.

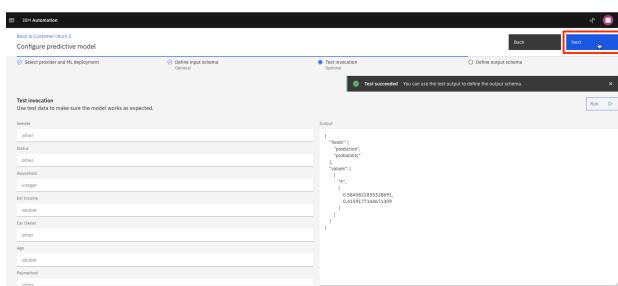


## Narration

The connection is tested to ensure the predictive service is working.

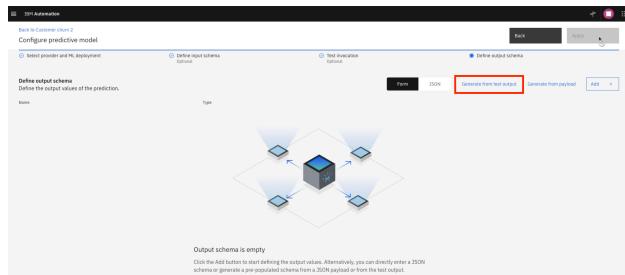
## Action 4.2.7

- Click **Next**.



## Action 4.2.8

- Click **Generate from test output**.



## Narration

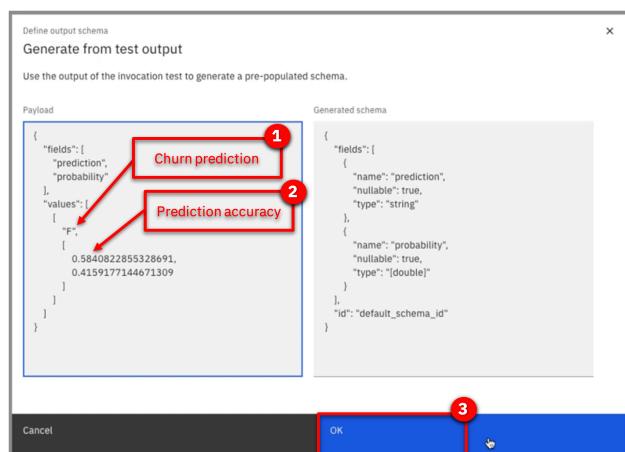
The churn predictive service returns true or false and the prediction accuracy.

In this example, the prediction result is F (false), meaning the customer will not leave SkyTalk. The prediction accuracy results are expressed as a probability out of 1. It is shown below the prediction. In this case the accuracy is 58.4% for this model.

This is working as expected. The predictive model is now mapping the input and output parameters of the 'Retention budget' sub-decision.

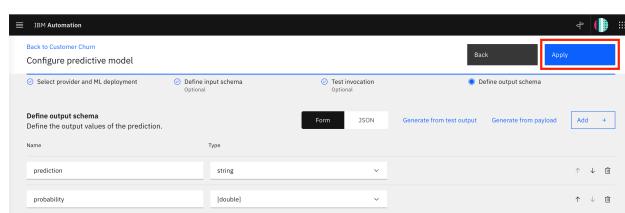
## Action 4.2.9

- Indicate the **F** (false) prediction (1) and the **probability that the prediction is correct** (2) in the prediction output. Click **OK** (3).



## Action 4.2.10

- Click **Apply**.

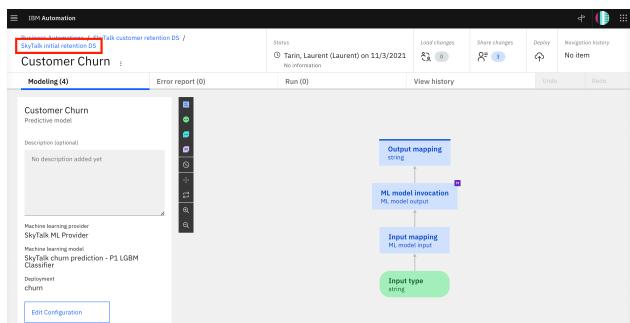


## Narration

Now let's return to the SkyTalk initial retention DS using the breadcrumb navigation.

### Action 4.2.11

- Click **SkyTalk initial retention DS** using the breadcrumb navigation.



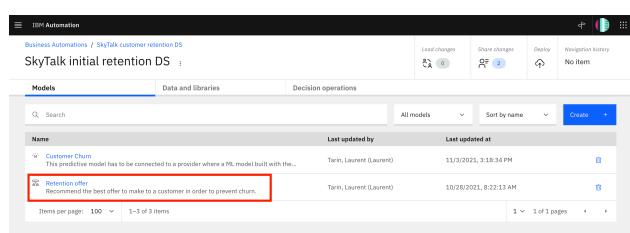
## 4.3 - Assign the predictive model to the 'Retention budget' sub-decision

## Narration

Let's improve the 'Retention budget' sub-decision by incorporating the churn predictive model.

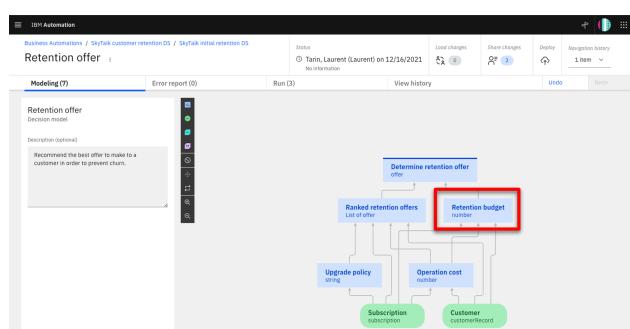
### Action 4.3.1

- Click **Retention offer**.



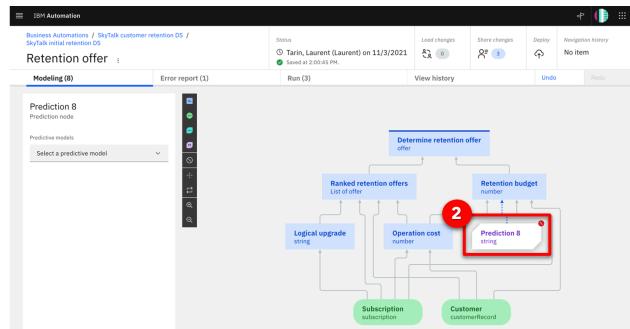
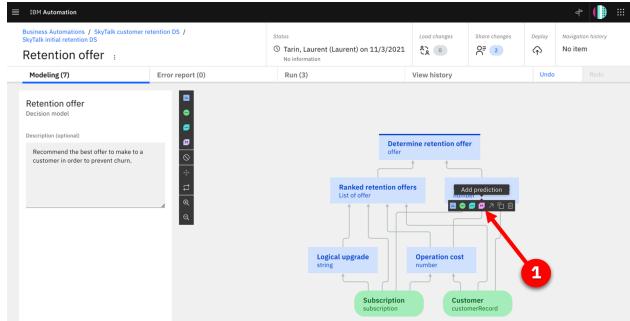
### Action 4.3.2

- Hover your cursor over the **Retention budget** decision box.



### Action 4.3.3

- A black choice box appears over the ‘Retention budget’ sub-decision. Click the **purple box** to **Add prediction (1)**. **Prediction 8 (2)** will be added to your model.

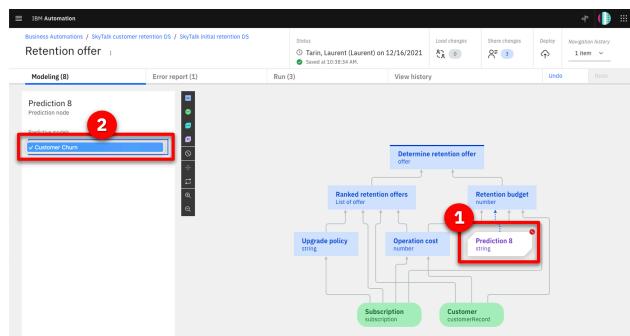


### Narration

The analyst assigns the churn predictive model to the newly-created predictive node.

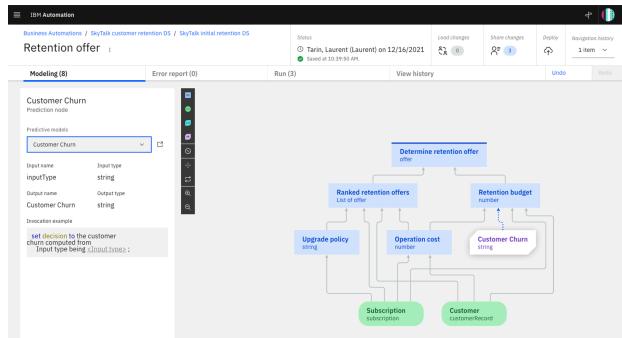
### Action 4.3.4

- Click the **Prediction 8** node (1) and then select the **Customer churn** predictive model (2).



### Action 4.3.5

- Review the **SkyTalk initial retention DS** decision model that opens.



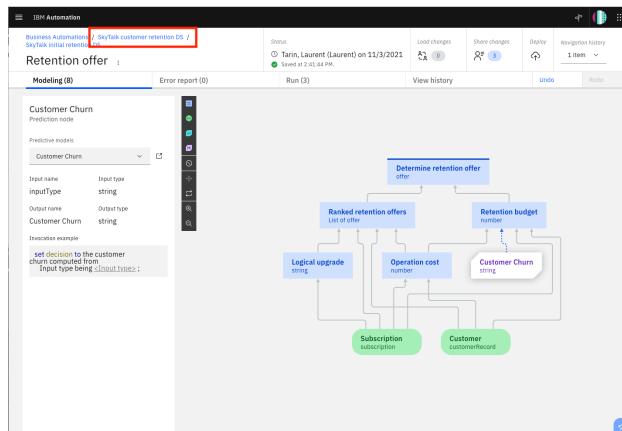
### Narration

In practice, the same steps would be repeated to create another prediction service for the customer lifetime value predictive model. For our demo, this has already been created.

Let's look at the final decision model.

### Action 4.3.6

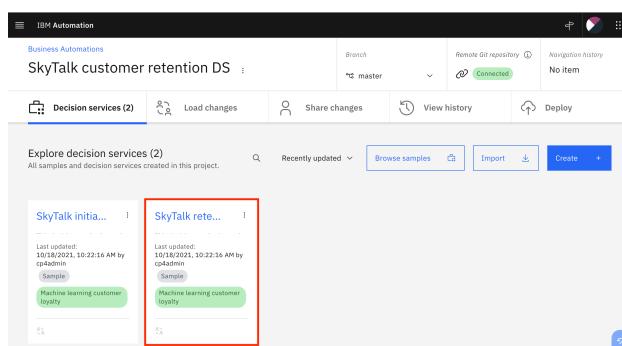
- Return to **SkyTalk customer retention DS** using the breadcrumb navigation.



### Action 4.3.7

- Click the **SkyTalk retention DS** tile.

**NOTE:** The SkyTalk initial retention DS tile will not be used any more during the demo.



## Action 4.3.8

- Click **Retention offer**.

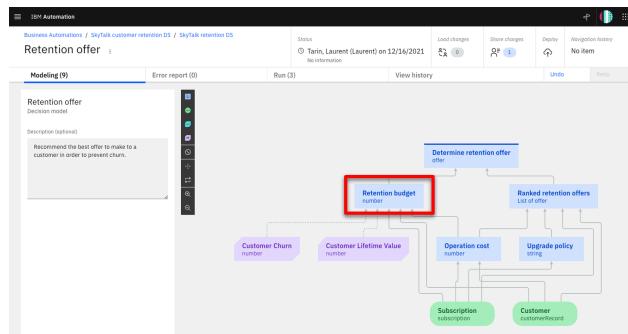
The screenshot shows the 'Models' tab of the 'SkyTalk retention DS' dataset in the IBM Automation interface. The 'Retention offer' model is highlighted with a red box. Its description is: 'Recommended the best offer to make to a customer in order to prevent churn'.

## Narration

The analyst can now review the 'Retention offer' business logic.

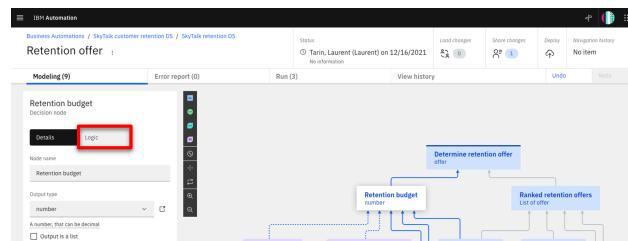
## Action 4.3.9

- Click the **Retention budget** box.



## Action 4.3.10

- Select the **Logic** tab.

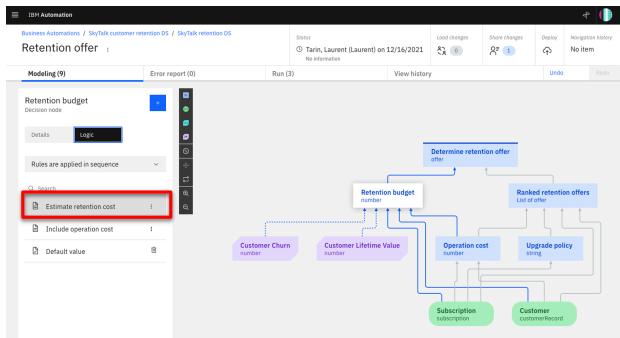


## Narration

The retention budget is calculated using the three sequential rules, which are applied in the order shown in the dropdown menu. The 'Estimated retention cost' rule calculates how much we are willing to spend to keep this customer.

### Action 4.3.11

- Click **Estimated retention cost** to review the retention budget rule.



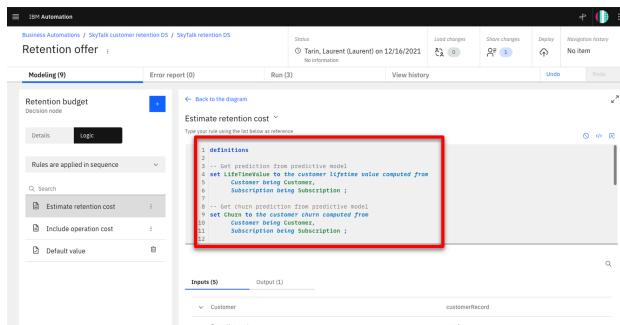
### Narration

These are the business rules used to calculate the retention cost.

At the start of the rules the definition of the 'LifeTimeValue' variable, which is used in many calculation rules below, includes invoking the customer lifetime value predictive service. Similarly, the Churn variable definition includes invoking the churn predictive service.

### Action 4.3.12

- Review the **Estimated retention cost** business rule.

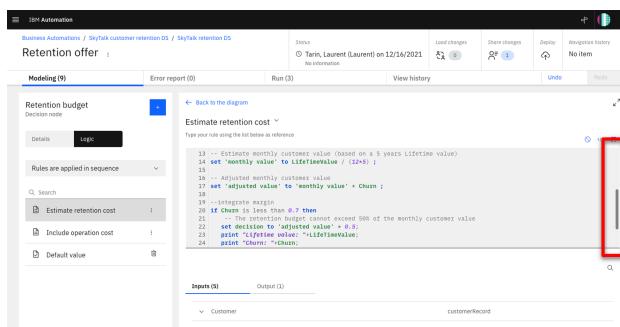


### Narration

Scrolling further down in the definition, the analyst can review how the results are calculated using the predictions.

### Action 4.3.13

- Scroll down in the business rule pane to show more detail.



## **Narration**

Before deployment, the decision logic can be tested to ensure the results are as expected. Let's review the final application to see how it works in the call center.

## 5 - Using the automated call center application

### 5.1 - Generate a real-time retention offer that best allocates SkyTalk's retention budget

#### Narration

SkyTalk developed an automated call center application. The application provides agents with customer-specific retention offers in real time.

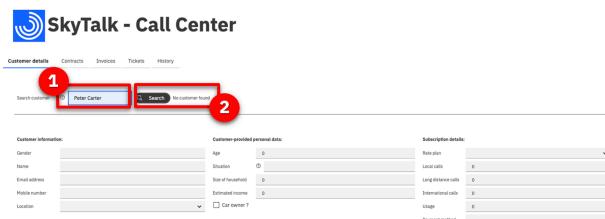
Let's look at how an agent now handles a customer call using this application.

#### Action 5.1.1

- Show the **SkyTalk call center Application** preview window opened during demo preparation.

#### Action 5.1.2

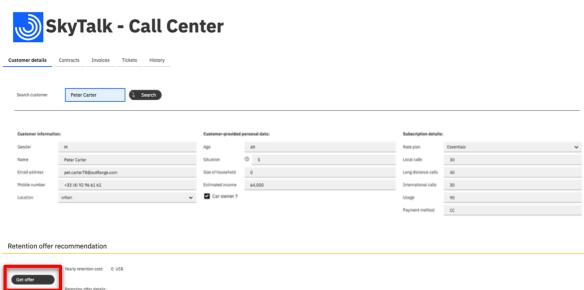
- Enter "Peter Carter" in the **Search Customer** field (1) and click **Search** (2).



The screenshot shows the 'Customer Details' tab selected in the top navigation bar. Below it, there are tabs for Contracts, Invoices, Tickets, and History. The main area has a search bar with 'Peter Carter' typed in, followed by a 'Search' button. A message 'No customer found' is displayed below the search bar. The page is divided into three sections: Customer information (Gender: M, Name: Peter Carter, Email address: peter.carter@bluecollar.com, Mobile number: +31 61 50 42 61, Location: uten), Customer-provided personal data (Age: 41, Situation: 1, Size of household: 2, Estimated income: \$4,000, Is car owner?: checked), and Subscription details (Plan: Essentials, Local calls: 30, Long distance calls: 40, International calls: 30, Usage: 90, Payment method: CC). There is also a checkbox for 'Show offer'.

#### Action 5.1.3

- Click **Get offer**.



The screenshot shows the same application interface as the previous one, but the 'Retention offer recommendation' section is now visible. It displays a retention offer for Peter Carter with a value of '\$ 100'. Below this, there is a link 'Retention offer details'.

#### Narration

A customer-specific retention offer displays. The agent suggests this offer to the customer in real time.

### Action 5.1.4

- Display and explain the **Retention offer details**.

The screenshot shows the SkyTalk - Call Center software interface. At the top, there's a navigation bar with tabs: Customer details, Contracts, Invoices, Tickets, and History. Below the navigation bar, a search bar displays "Peter Carter" and shows "1 customer found". The main area is divided into three sections: Customer information, Customer-provided personal data, and Subscription details. Under Customer information, there are fields for Name (Peter Carter), Gender (M), Age (41), and Status (S). Personal data includes Email address (pet.carter@skytalkings.com) and Mobile number (+31 01 98 45 45). Subscription details show a plan named "Essentials" with usage statistics: Local calls (30), Long distance calls (40), International calls (30), and Usage (N/A). Payment method is listed as "CC". Below these sections, a "Retention offer recommendation" section is shown. It includes a "Get offer" button, a note about "Nearly retention cost: 9 USD", and a message: "Offer Peter Carter a 10% discount on his current subscription". At the bottom, there are "Customer response" buttons for "Accepted" and "Rejected".

## Summary

In this demo, I showed how business users can easily build business rules that incorporate predictive decisions. The predictions help retain SkyTalk's profitable customers by providing customized offers at the lowest cost to SkyTalk.

The new retention process also improved productivity by eliminating manual procedures. Customer satisfaction will increase with speedier and more relevant service.

Thank you for attending today's presentation.