

Predictive Decisioning



Introduction

Narration

Thank you for attending this predictive decisioning demonstration.

Today I'll show how IBM Cloud Pak for Business Automation uses machine learning 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

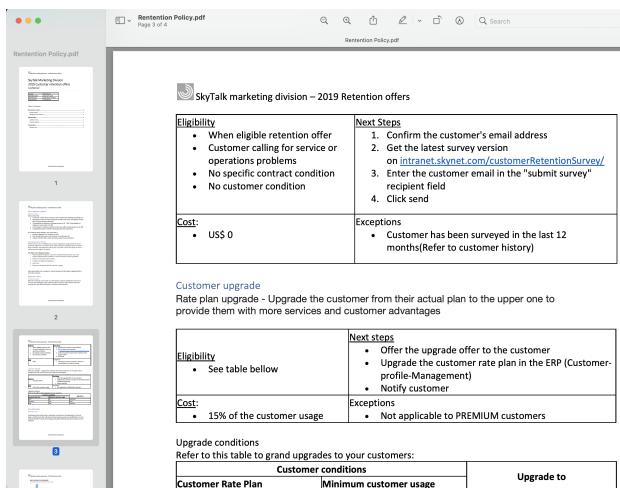
1.1 - Show SkyTalk's current manual process

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 that call center management implemented.

Action 1.1.1

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



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

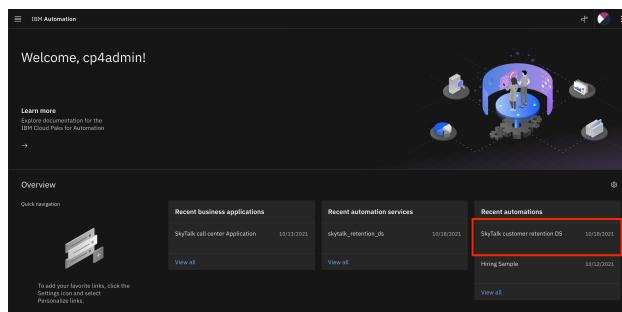
2.1 - Review the components of SkyTalk's retention decisions

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.

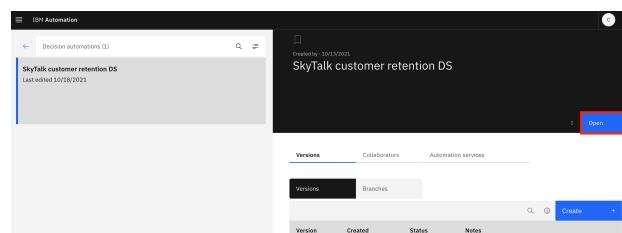
Action 2.1.1

- 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).



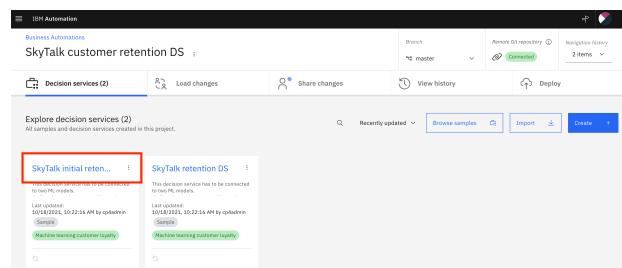
Action 2.1.2

- Click **Open**.



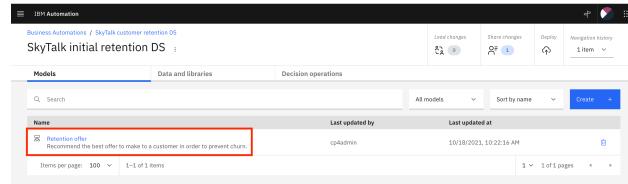
Action 2.1.3

- Click **SkyTalk Initial retention DS**.



Action 2.1.4

- Click **Retention offer**.



Narration

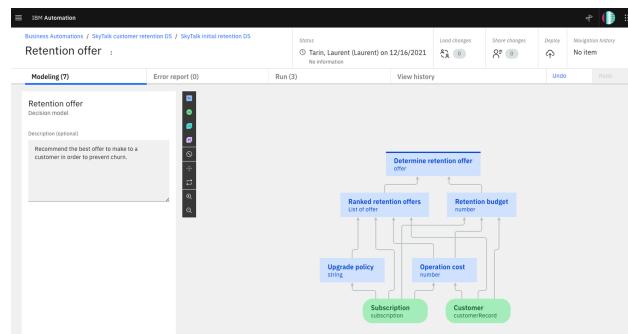
The business analyst creates an automated decision, called a decision service, using a hierarchical model of business rules. Each blue box represents a sub-decision. The green rounded boxes represent the input data.

The 'Determine retention offer' decision service requires two sub-decisions: 'Ranked retention offers' and 'Retention budget'. The retention budget decision will be enhanced with predictions to customize retention offers.

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

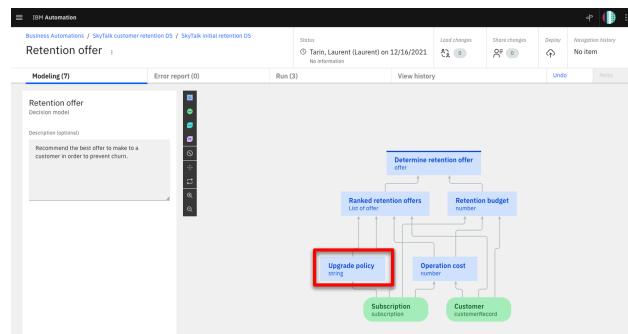
Action 2.1.5

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



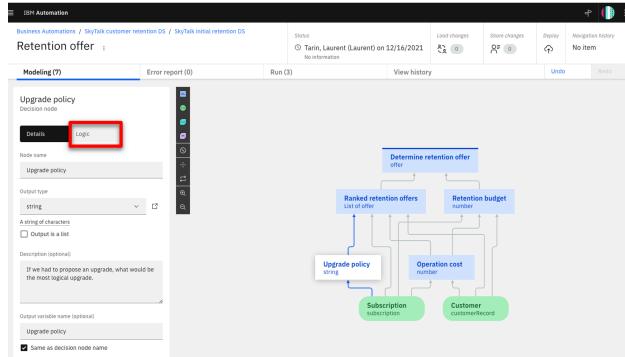
Action 2.1.6

- Click the **Upgrade Policy** box.



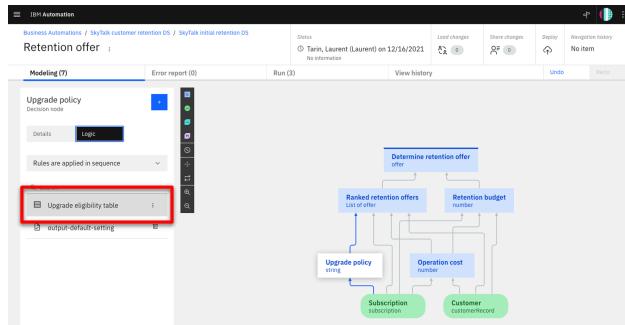
Action 2.1.7

- Click the **Logic** tab.



Action 2.1.8

- Click **Upgrade eligibility table**.



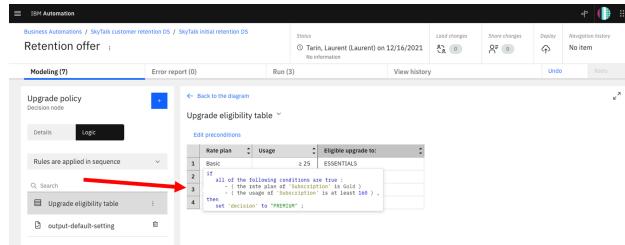
Narration

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 usage of at least \$160 USD to be eligible for a Premium upgrade.

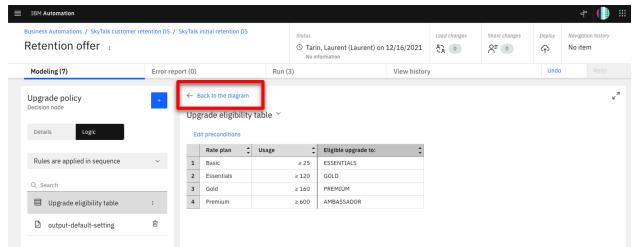
Action 2.1.9

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



Action 2.1.10

- Click **Back to the diagram**.



The screenshot shows the IBM Automation interface with the following details:

- Top navigation bar: IBM Automation, Business Automation / SkyTalk customer retention DS / SkyTalk initial retention DS, Status: Tarin, Laurent (Laurent) on 12/16/2021, Load changes, Share changes, Display, Navigation history.
- Left sidebar: Modeling (7), Error report (0), Run (3), View history, Undo, Redo.
- Main content area:
 - Upgrade policy: Decision node.
 - Upgrade eligibility table: A table titled "Edit preconditions" with columns: Rate plan, Usage, Eligible upgrade to. It lists four rows:

Rate plan	Usage	Eligible upgrade to
1 Basic	≤ 25	ESSENTIALS
2 Essentials	≤ 120	GOLD
3 Gold	≤ 140	PREMIUM
4 Premium	≤ 600	AMBASSADOR
 - Rules are applied in sequence.
 - Search.
 - Upgrade eligibility table.
 - output-default-setting.

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 ‘Retention budget’ sub-decision estimates the maximum amount SkyTalk should spend to keep the customer. The retention budget is calculated using two predictions: (1) the customer’s lifetime value, (2) and 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, opened during demo preparation.

The screenshot shows the IBM Watson Studio interface. On the left, there's a sidebar with links like 'Learn by example', 'Work with data', 'Extend your capabilities', 'Quick navigation', 'Projects', 'Deployments', 'Support', and 'Documentation'. The main area is titled 'Overview' and contains sections for 'Recent projects', 'Notifications', and 'Deployment spaces'. A red box highlights the 'Recent projects' section where the 'skyTalk-customer-retention' project is listed. Below it, under 'Your services', there are entries for 'Cloud Object Storage', 'Cloud Direct Storage', and 'Machine Learning-wc'.

Action 3.1.2

- Click on **Skywalk customer retention** (1), then click the **Assets** tab (2).

This screenshot shows the 'SkyTalk customer retention' project page. The top navigation bar includes 'Overview', 'Assets' (which is highlighted with a red box and labeled 2), 'Environments', 'Jobs', 'Access control', and 'Settings'. A red arrow labeled 1 points to the project name 'SkyTalk customer retention' in the breadcrumb. The main content area shows a search bar and a table for 'Data assets'. Two CSV files are listed: 'SkyTalk customer value data.csv' and 'SkyTalk customer loyalty data.csv'.

Action 3.1.3

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

This screenshot shows the same project page as the previous one, but with the 'Assets' tab selected. The table now shows two rows: 'SkyTalk customer value data.csv' and 'SkyTalk customer loyalty data.csv'. The 'SkyTalk customer loyalty data.csv' row is highlighted with a red box.

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 displayed **SkyTalk customerloyaltydata.csv** file.

The screenshot shows the IBM Watson Studio interface with the breadcrumb navigation bar: Projects / SkyTalk customer retention / SkyTalk customer loyalty data.csv. The main area displays a table titled 'Schema: 10 Columns' with 10 columns: CHURN, Gender, Status, Household, Est Income, Car Owner, Age, Paymentmethod, Usage, and Rate. Below the table, there is a preview of the first 1000 rows. To the right, there is an 'Information' panel for the data asset, which includes a 'Data Asset' section with a link to 'SkyTalk customer loyalty data.csv' and a note that no description is available for this asset.

Action 3.1.5

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

The screenshot shows the IBM Watson Studio interface with the breadcrumb navigation bar: Projects / **SkyTalk customer retention** / SkyTalk customer loyalty data.csv. The main area displays a table titled 'Schema: 10 Columns' with 10 columns: CHURN, Gender, Status, Household, Est Income, Car Owner, Age, Paymentmethod, Usage, and Rate. Below the table, there is a preview of the first 1000 rows. To the right, there is an 'Information' panel for the data asset, which includes a 'Data Asset' section with a link to 'SkyTalk customer loyalty data.csv' and a note that no description is available for this asset.

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.

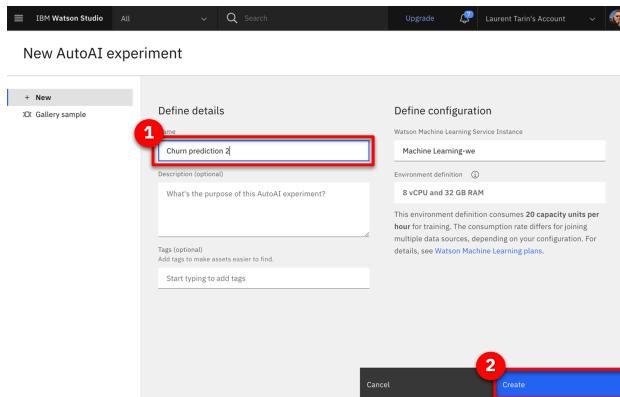
Action 3.1.6

- Click **New AutoAI experiment**.

The screenshot shows the IBM Watson Studio interface with the breadcrumb navigation bar: Projects / SkyTalk customer retention. The main area shows the 'Assets' tab selected, displaying a list of data assets: 'SkyTalk value prediction' (CSV, Data Asset, LAURENT TARIN, Oct 12, 2021, 02:15 PM) and 'SkyTalk churn prediction' (CSV, Data Asset, LAURENT TARIN, Oct 12, 2021, 02:02 PM). Below this, the 'AutoAI experiments' section is shown with two entries: 'SkyTalk lifetime value prediction' (Completed, Regression, Oct 12, 2021, 02:20 PM) and 'SkyTalk churn prediction' (Completed, Binary Classification, Oct 12, 2021, 02:07 PM). A red box highlights the 'New AutoAI experiment' button in the top right corner of the AutoAI experiments section.

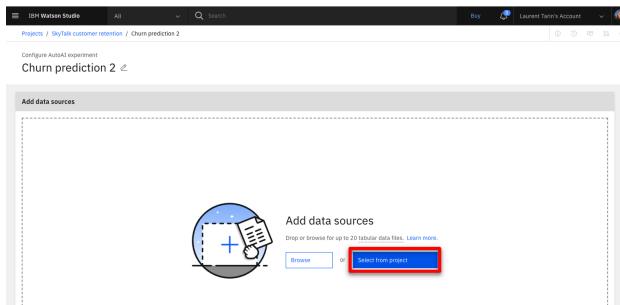
Action 3.1.7

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



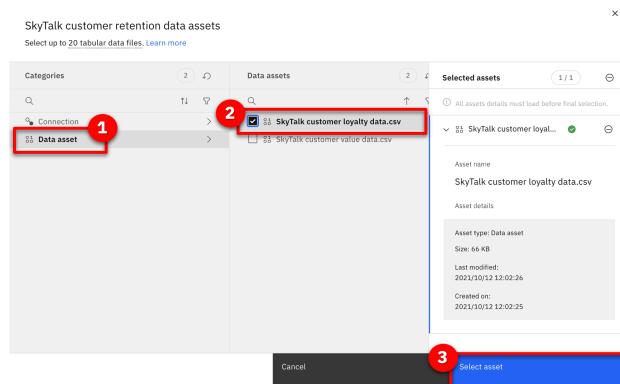
Action 3.1.8

- Click **Select from Project**.



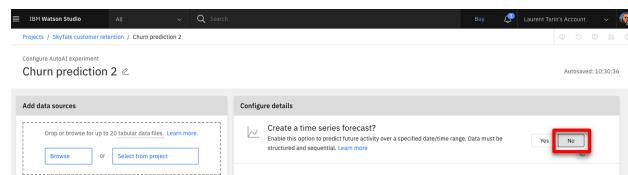
Action 3.1.9

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



Action 3.1.10

- Select **No** in the **Create a time series forecast**.



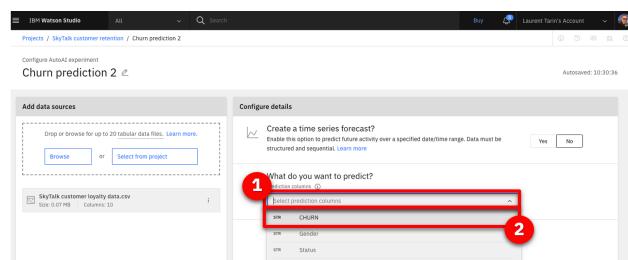
Narration

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 3.1.11

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



Action 3.1.12

- Click **Run experiment**.

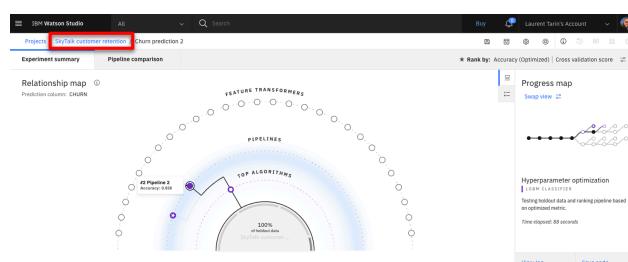
Narration

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 3.1.13

- Click on **SkyTalk Customer Retention** in the breadcrumb menu.



Narration

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

Action 3.1.14

- Click on **SkyTalk Customer Retention** in the AutoAI Experiment list.

The screenshot shows the IBM Watson Studio interface. In the top navigation bar, 'Project' / 'SkyTalk customer retention' is selected. Below the navigation, there are tabs for 'Assets', 'Environments', 'Jobs', 'Access control', and 'Settings'. A search bar is present at the top right. The main content area has two sections: 'Data' and 'AutoAI experiments'. The 'Data' section shows two data assets: 'SkyTalk customer value.csv' and 'SkyTalk customer loyalty.csv'. The 'AutoAI experiments' section lists three experiments: 'Churn prediction 2' (Running, Binary Classification), 'SkyTalk lifetime value prediction' (Completed, Regression), and 'SkyTalk churn prediction' (Completed, Binary Classification). The last experiment is highlighted with a red box.

3.2 - Choose the best predictive model

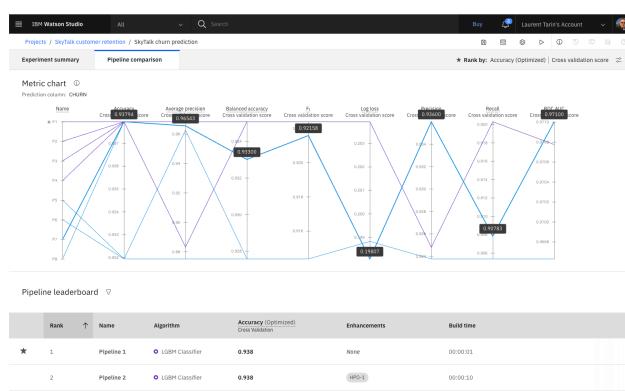
Narration

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 (P7 on the left of the graph) to highlight the different values for this pipeline.



Narration

Scrolling down and clicking on a Pipeline provides additional details.

Action 3.2.2

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

The screenshot shows the 'Pipeline leaderboard' section of the IBM Watson Studio interface. The table lists eight pipelines, each with its rank, name, algorithm, accuracy, enhancements, and build time. Pipeline 7 is highlighted with a red border. The table has columns for Rank, Name, Algorithm, Accuracy (Optimized), Enhancements, and Build time. Pipeline 7's row includes a 'Save as' button.

Rank	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
1	Pipeline 1	LGBM Classifier	0.938	None	00:00:01
2	Pipeline 2	LGBM Classifier	0.938	HPO-1	00:00:16
3	Pipeline 3	LGBM Classifier	0.938	HPO-1 (E)	00:00:27
4	Pipeline 4	LGBM Classifier	0.938	HPO-1 (E) HPO-2	00:00:23
5	Pipeline 7	XGB Classifier	0.938	HPO-1 (E)	00:00:24
6	Pipeline 8	XGB Classifier	0.938	HPO-1 (E) HPO-2	00:00:20

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.

The screenshot shows the 'Model evaluation' tab for Pipeline 7. On the left, there is a sidebar with options like Model viewer, Model information, Feature summary, Evaluation, Model evaluation (which is selected and highlighted with a red box), Confusion matrix, and Precision recall. The main area displays an ROC curve graph with the x-axis labeled 'false positive rate' and the y-axis labeled 'true positive rate'. The curve starts at (0,0), goes up to approximately (0.1, 0.9), then to (0.2, 1.0), and finally to (1,1).

Narration

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

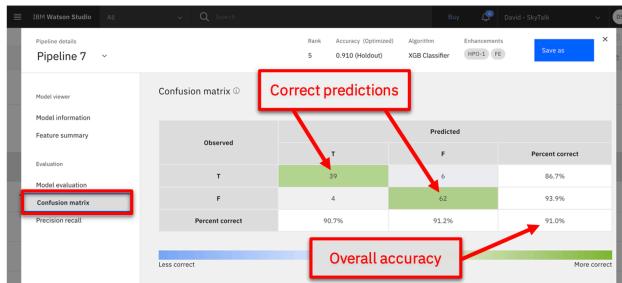
Earlier in the demo, we looked at how customer churn is indicated in SkyTalk’s data as T (true) for customers that closed their account and F (false) for customers that remained with SkyTalk.

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.

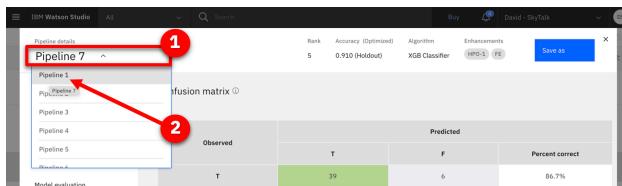


Narration

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

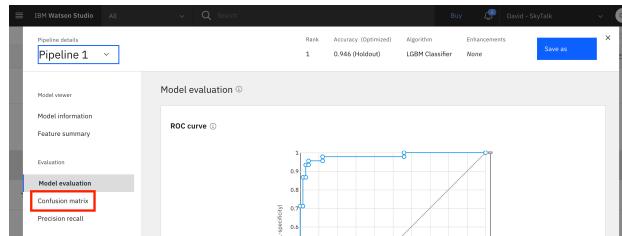
Action 3.2.5

- Click the **Pipeline details** drop-down list (1) and select **Pipeline 1** (2).



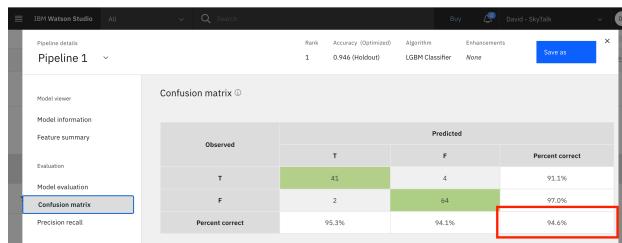
Action 3.2.6

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



Action 3.2.7

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



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.

Observed		Predicted		Percent correct
T	F	T	F	
41	4	2	62	93.1%
				93.04%

Action 3.2.9

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

Rank	Name	Algorithm	Accuracy (Optimized)	Enhancements	Build time
1	Pipeline 1	LGBM Classifier	0.938	None	0:00:01
2	Pipeline 2	LGBM Classifier	0.938	HPD-L	0:00:16

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).

Save as

Select asset type

Model

Notebook

Define details

Name: SkyTalk churn prediction - P1 LGBM Classifier

Description (optional): Enter description here

Tags

Add tags to make assets easier to find.

Add a tag

Cancel Create

Action 3.2.11

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

Projects / SkyTalk customer retention / SkyTalk churn prediction

Experiment summary Pipeline comparison

* Rank by: Accuracy (Optimized) | Cross validation score

Pipeline leaderboard

Saved model successfully. SkyTalk churn prediction LGBM Classifier asset successfully saved to SkyTalk customer retention.

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

- Scroll down and show the two machine learning models.

Name	Type	Software specification	Last modified
SkyTalk churn prediction - P3 LGBM Classifier	wml-hybrid_0.1	hybrid_0.1	Oct 19, 2021
SkyTalk lifetime value prediction - P3 XGB Regressor	wml-hybrid_0.1	hybrid_0.1	Oct 24, 2021

Action 3.3.2

- Display the menu on the right side of the model row and click **Promote**.

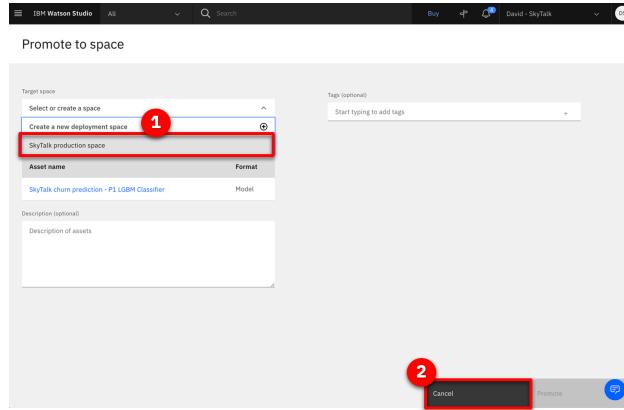
Name	Type	Software specification	Last modified
SkyTalk churn prediction - P3 LGBM Classifier	wml-hybrid_0.1	hybrid_0.1	Oct 19, 2021
SkyTalk lifetime value prediction - P3 XGB Regressor	wml-hybrid_0.1	hybrid_0.1	Oct 24, 2021

Narration

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

Action 3.3.3

- Show the **SkyTalk production space** (1) option. Click **Cancel** (2) to avoid promoting the model.
- **Note:** Do not click **Promote**.

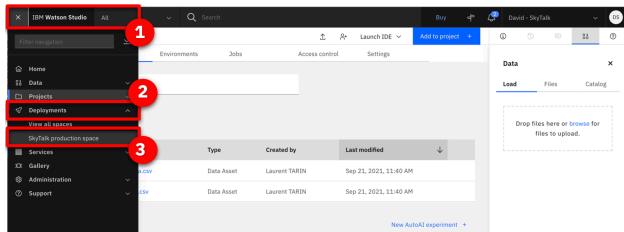


Narration

The two prediction services are now ready for deployment.

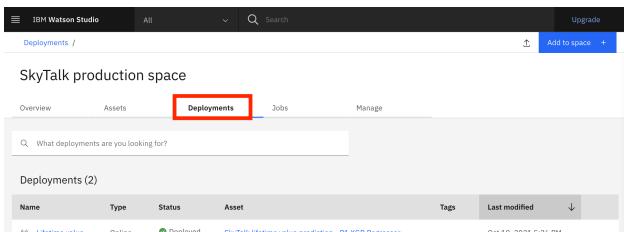
Action 3.3.4

- Click the **IBM Watson Studio** menu (1), then click **Deployments** (2), then click the **SkyTalk production space** (3).



Action 3.3.5

- 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 Cloud Pak later in the demo.

Action 3.3.6

- Click the **Churn** service.

The screenshot shows the IBM Watson Studio interface with the title bar "IBM Watson Studio" and a search bar. Below it, a navigation bar includes "Deployments /", "Add to space +", "Upgrade", "Search", and a user icon. The main area is titled "SkyTalk production space" and has tabs for "Overview", "Assets", "Deployments" (which is selected), "Jobs", and "Manage". A search bar is present. The "Deployments" section shows two entries: "Lifetime value" and "churn", both listed as "Online" and "Deployed". The "churn" entry is highlighted with a red box. A table below lists "Name", "Type", "Status", "Asset", "Tags", and "Last modified".

Action 3.3.7

- Highlight 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.

This screenshot shows the "churn" service details page. The top navigation bar includes "API reference" (which is selected) and "Test". Below it, the "Direct link" section shows the "Endpoint" URL: <https://eu-de.watson.cloud.ibm.com/v4/deployments/caedee5-86a8-4443-897a-ed33ee834dff/predictions?version=v4>. The URL is partially highlighted with a red box, starting from the beginning up to "v4".

Narration

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

Action 3.3.8

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

This screenshot shows the breadcrumb navigation bar with "Deployments" and "SkyTalk production space" highlighted with a red box. Below the navigation bar, the "churn" service details page is visible, showing the "API reference" tab and the "Direct link" endpoint URL.

Action 3.3.9

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

This screenshot shows the "SkyTalk production space" management page. The top navigation bar includes "Deployments /", "Add to space +", and "Manage" (which is highlighted with a red box). The main area shows the "General" tab selected. It displays "Space Details" with the name "SkyTalk production space" and a "Space GUID" field containing "Space GUID: 9e748612-8907-4e2e-bd06-97822d7272...". A red circle labeled "2" highlights this GUID field. To the right, there's a "Cloud Object Storage" section with a "Manage" button and a file upload area.

4 -Calling the prediction services from the business rules

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

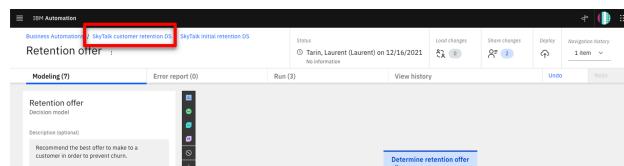
Narration

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 has set up a machine learning provider for the SkyTalk ‘customer retention decision service’.

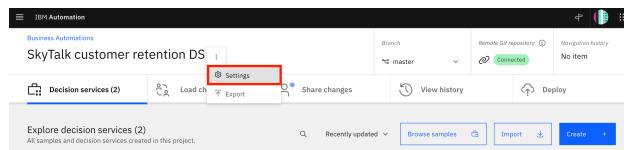
Action 4.1.1

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



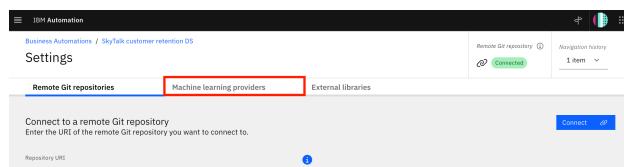
Action 4.1.2

- Open the **Settings** menu.



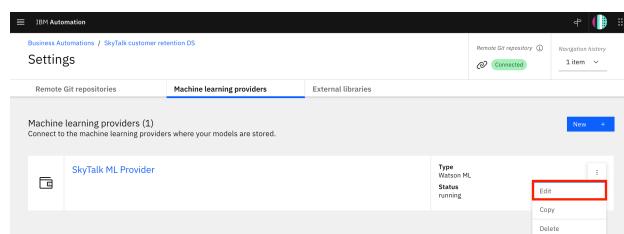
Action 4.1.3

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



Action 4.1.4

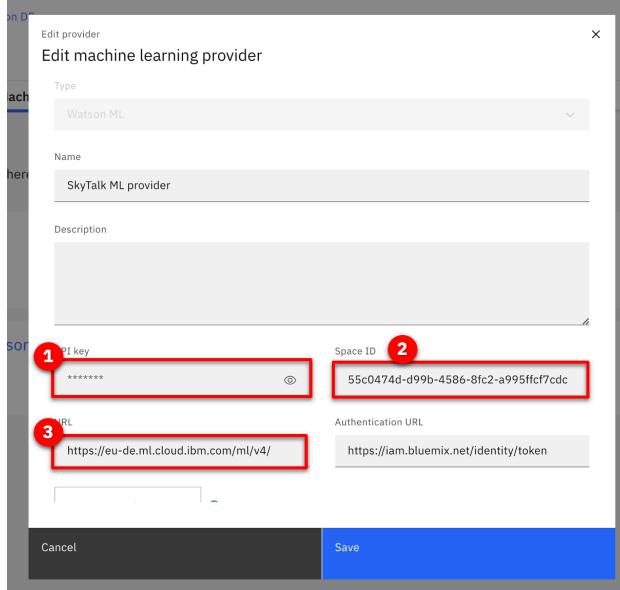
- Click **Edit** on the right side of the **SkyTalk ML Provider** box.



Action 4.1.5

- Show 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.

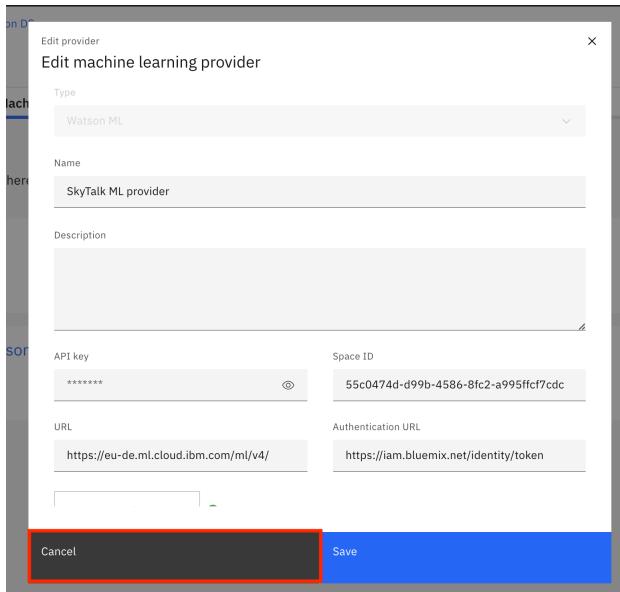
Narration



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.

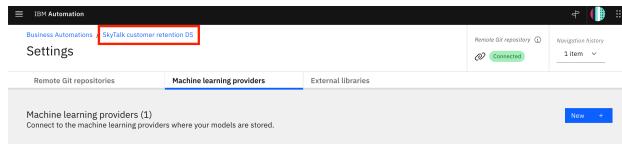
Action 4.1.6

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



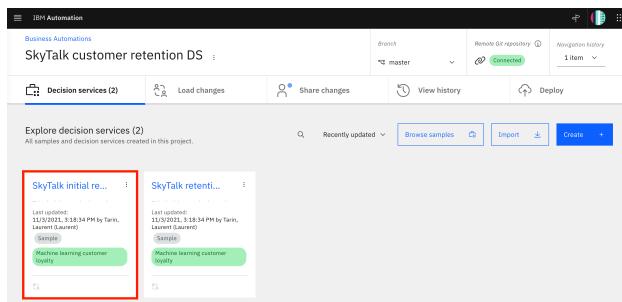
Action 4.1.7

- 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**.

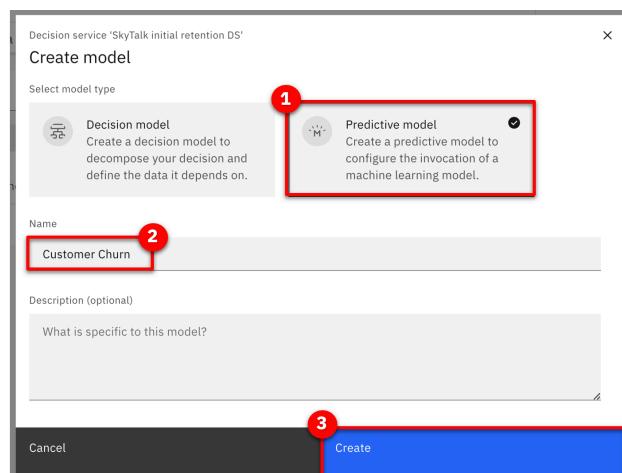


Narration

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). Then click **Create** (3).



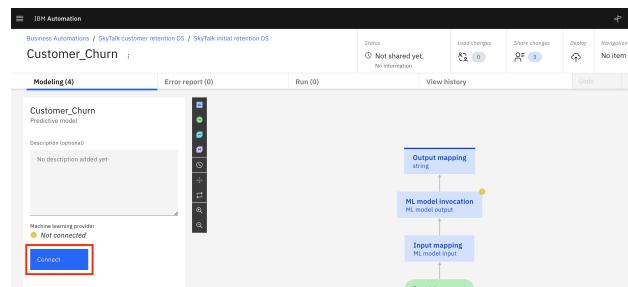
4.2 - Map the predictive service to the predictive model

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

- Select the **SkyTalk ML provider**.

The screenshot shows the 'Configure predictive model' step with the 'Select provider and ML deployment' tab selected. A red box highlights the 'SkyTalk ML Provider' option in the dropdown menu. There are also tabs for 'Define input schema' and 'Define output schema'.

Action 4.2.3

- Expand the **SkyTalk churn prediction - P1 LGBM Classifier** machine learning model (1). Then select the **churn** deployment name (2). The prediction is now connected to the customer lifetime value.

The screenshot shows the 'Configure predictive model' step with the 'Select provider and ML deployment' tab selected. A red box highlights the 'SkyTalk churn prediction - P1 LGBM Classifier' entry in the list. Another red box highlights the 'churn' deployment name in the list. There are tabs for 'Define input schema', 'Test invocation', and 'Define output schema'.

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.

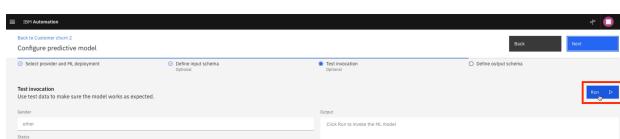


Narration

The input data structure is automatically created.

Action 4.2.6

- Click **Run**.

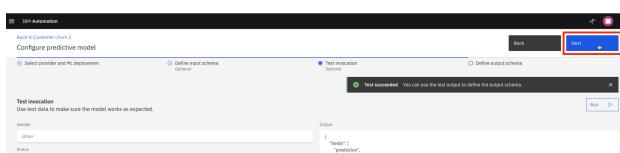


Narration

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

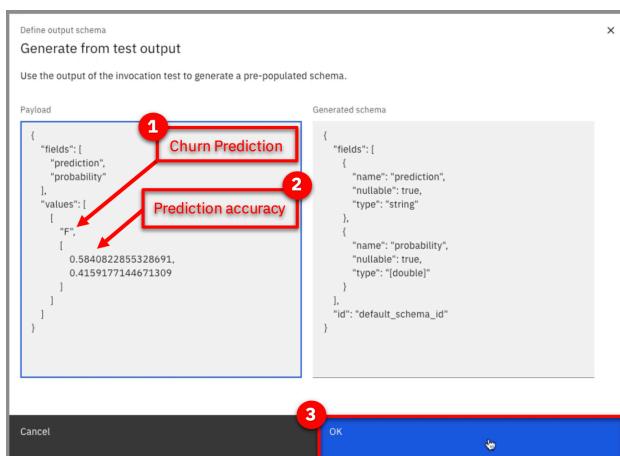
The churn predictive service returns true or false and the prediction accuracy.

In this example, the prediction result is F (false), meaning the customer will not leave SkyTalk. The prediction accuracy results 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**.

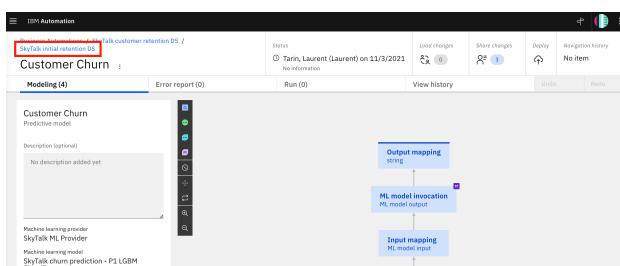


Narration

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

Action 4.2.11

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



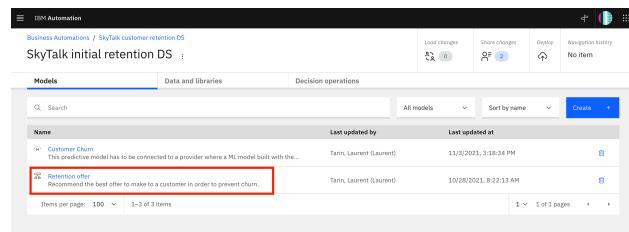
4.3 - Assign the predictive model to the ‘Retention budget’ sub-decision

Narration

Let's improve the ‘Retention budget’ sub-decision by using the churn predictive model.

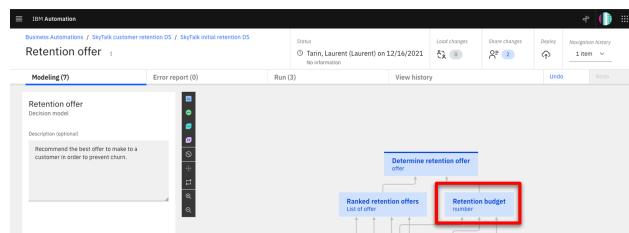
Action 4.3.1

- Click **Retention offer**.



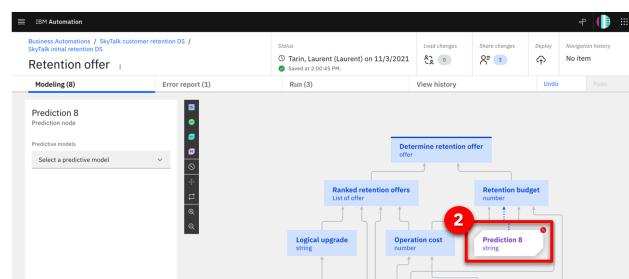
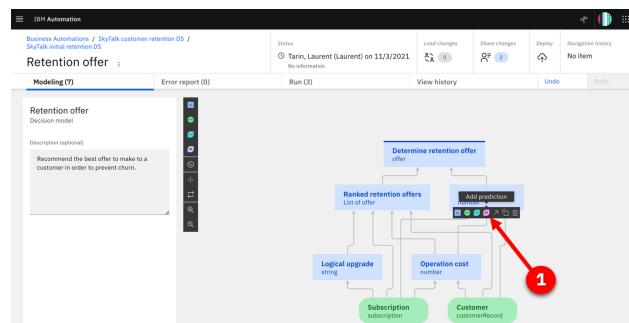
Action 4.3.2

- Hover the mouse over the **Retention budget** decision box on the screen.



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.

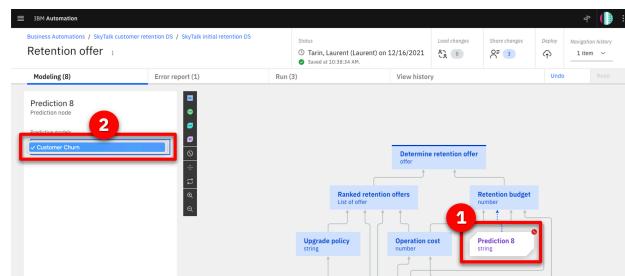


Narration

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

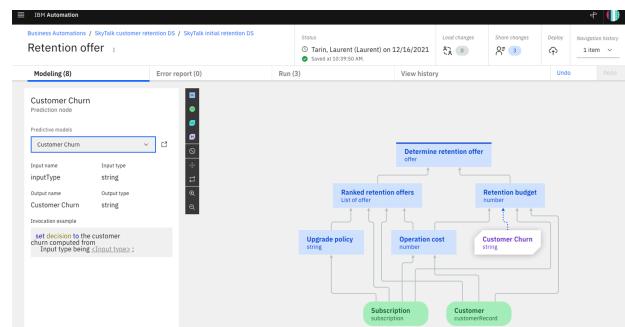
Action 4.3.4

- Select 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 menu.



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.

The screenshot shows the 'Decision services (2)' section of the IBM Automation interface. There are two items listed:

- 'SkyTalk initial...' (Last updated: 10/18/2021, 10:22:16 AM by cpadmin)
- 'SkyTalk retent...' (Last updated: 10/18/2021, 10:22:16 AM by cpadmin)

The second item, 'SkyTalk retent...', has a red box drawn around it.

Action 4.3.8

- Click **Retention offer**.

The screenshot shows the 'Models' tab of the 'SkyTalk retention DS' page. A table lists three models:

Name	Last updated by	Last updated at
Customer Churn	cpadmin	10/18/2021, 10:22:16 AM
Customer Lifetime Value	cpadmin	10/18/2021, 10:22:16 AM
Retention offer	cpadmin	10/18/2021, 10:30:20 AM

The 'Retention offer' row is highlighted with a red box.

Narration

The analyst can now review the ‘Retention offer’ business logic.

Action 4.3.9

- Click the **Retention budget** box.

The screenshot shows the 'Modeling' tab of the 'Retention offer' page. A diagram illustrates the flow of the decision logic:

```
graph LR; A[Retention offer<br>Decision node] --> B[Determine retention offer<br>(info)]; B --> C[Ranked retention offers<br>(list of offers)];
```

The 'Retention budget' box is highlighted with a red box.

Narration

The retention budget is calculated using the three sequential rules that will be applied in the order shown in the dropdown menu.

Action 4.3.10

- Select the **Logic** tab.

The screenshot shows the 'Logic' tab of the 'Retention offer' page. A diagram illustrates the flow of the decision logic:

```
graph LR; A[Retention budget<br>Decision node] --> B[Determine retention offer<br>(info)]; B --> C[Ranked retention offers<br>(list of offers)];
```

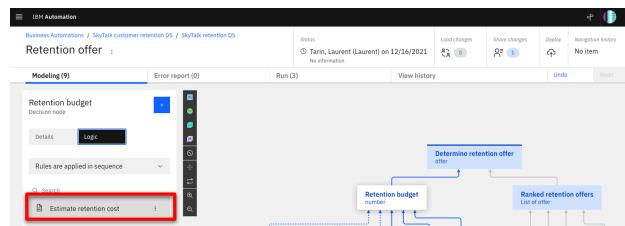
The 'Logic' box is highlighted with a red box.

Narration

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.

The screenshot shows the 'Estimate retention cost' rule definition. The code block is as follows:

```
1 definitions
2   ...
3   -- Get prediction from predictive model
4   ext LIFETIMEVALUE to get customer lifetime value computed from
5   customer being Customer;
6   Subscription being Subscription;
7   ...
8   -- get churn prediction from predictive model
9   ext CHURN to get churn value computed from
10  customer being Customer;
11  Subscription being Subscription;
```

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 to show more detail.

The screenshot shows the 'Estimate retention cost' rule definition with a vertical scroll bar on the right side of the code editor, indicating there is more code than what is currently visible.

```
13 -- Estimate monthly customer value (based on a 3 years Lifetime value)
14 set "monthly value" to LIFETIMEVALUE / (3*12); 
15 
16 adjusted monthly customer value = monthly value * (1 - CHURN);
17 set "adjusted monthly value" to "monthly value" + CHURN;
18 
19 -- Aggregate results
20 if Churn is less than 8.7 then
21   if adjusted monthly customer value exceed 600 of the monthly customer value
22     set decision to "adjusted value" + 600;
23   set decision to "adjusted value" + LIFETIMEVALUE;
24   print "LIFETIME value: " + LIFETIMEVALUE;
25   print "Churn: " + CHURN;
```

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

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

Let's look at a 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 (see step 10 in the Demo prep instructions).

Action 5.1.2

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

The screenshot shows the 'Customer details' tab of the SkyTalk - Call Center application. At the top, there are tabs for 'Customer details', 'Contracts', 'Invoices', 'Tickets', and 'History'. Below the tabs, there is a search bar with the placeholder 'Search customer...'. Inside the search bar, the name 'Peter Carter' is typed. To the right of the search bar is a red box containing the number '1'. Next to the search bar is a button labeled 'Search' with a red box containing the number '2'. Below the search bar, a message says '1. Search No customer found'. The main area of the screen contains sections for 'Customer information', 'Customer-provided personal data', and 'Subscription details', each with various input fields like gender, age, and rate plan.

Narration

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

Action 5.1.3

- Click **Get offer.**

The screenshot shows the SkyTalk - Call Center interface. At the top, there's a navigation bar with tabs: Customer details, Contracts, Invoices, Tickets, and History. Below the navigation is a search bar with the placeholder "Search customer" and a dropdown menu showing "Peter Carter". A "Customer hand" icon is also present. The main content area is divided into three sections: Customer information, Customer-provided personal data, and Subscription details. Under "Customer information", fields include Name (Peter Carter), Age (47), and Location (urban). Under "Customer-provided personal data", fields include Email address (pet.carter@skytalkorange.com) and Estimated income (\$4,000). Under "Subscription details", fields include Plan (Essentials), Local calls (24), Long distance calls (48), International calls (32), Usage (90), and Payment method (CC). Below these sections is a "Retention offer recommendation" section. It shows a button labeled "Get offer" with a red box around it, and a note below it stating "Offer Peter Carter a 50% discount on his current subscription".

This screenshot shows the same interface as the previous one, but the "Retention offer recommendation" section is more prominent. The "Get offer" button is highlighted with a red box, and a note below it says "Offer Peter Carter a 50% discount on his current subscription". At the bottom, there are two buttons: "Accept" (green) and "Reject" (red).

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.