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Azure ML Webservice Deployment

Citizen Analytics – An Initiative by Data Science Team

START ▶

Learning Objectives

By the end of this module, you will be able to:

01 Describe the steps to deploy Azure web-service

02 Describe the steps to deploy machine learning model as a web-service

03 Describe ways to consume Azure web-services

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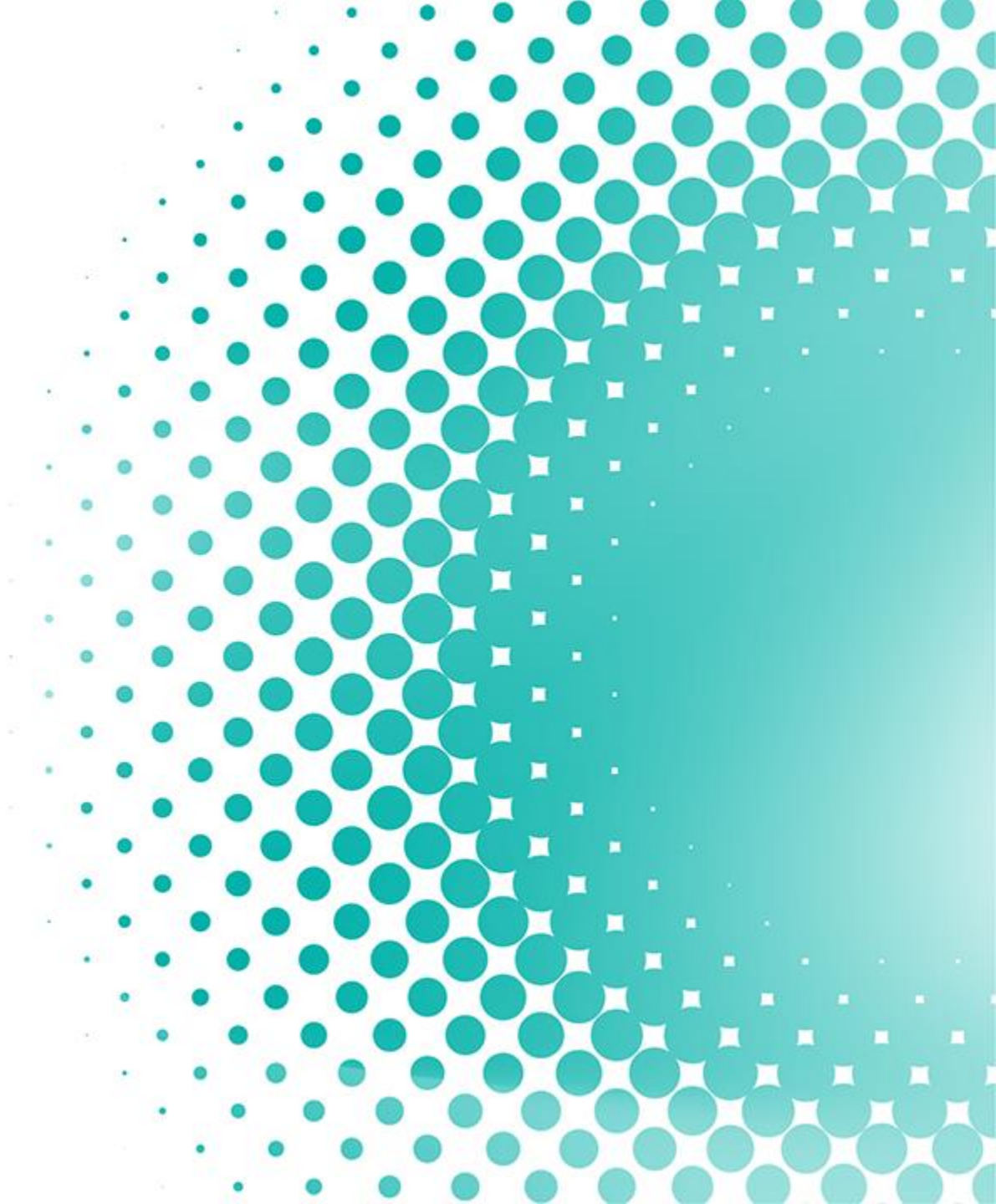
Azure ML Webservice Deployment Steps



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Azure ML Webservice Deployment Steps

Create a Training Experiment

Convert to Predictive experiment

Deploy it as a web-service

Consume the web-service

Here are the stages that a typical solution follows as you develop and deploy it using Machine Learning Studio (classic):

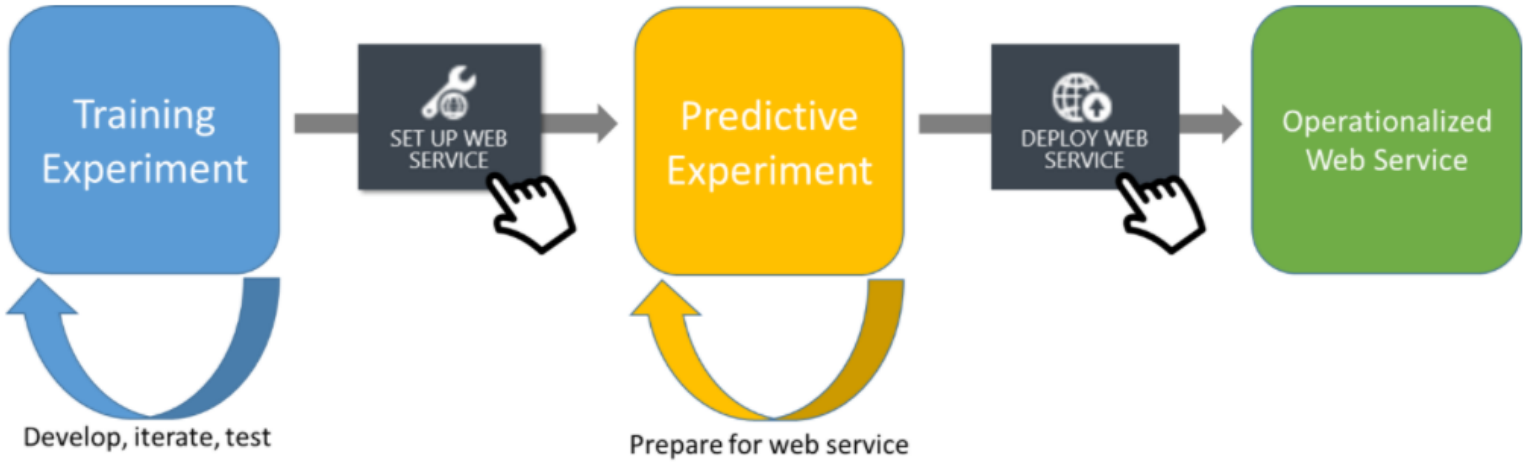
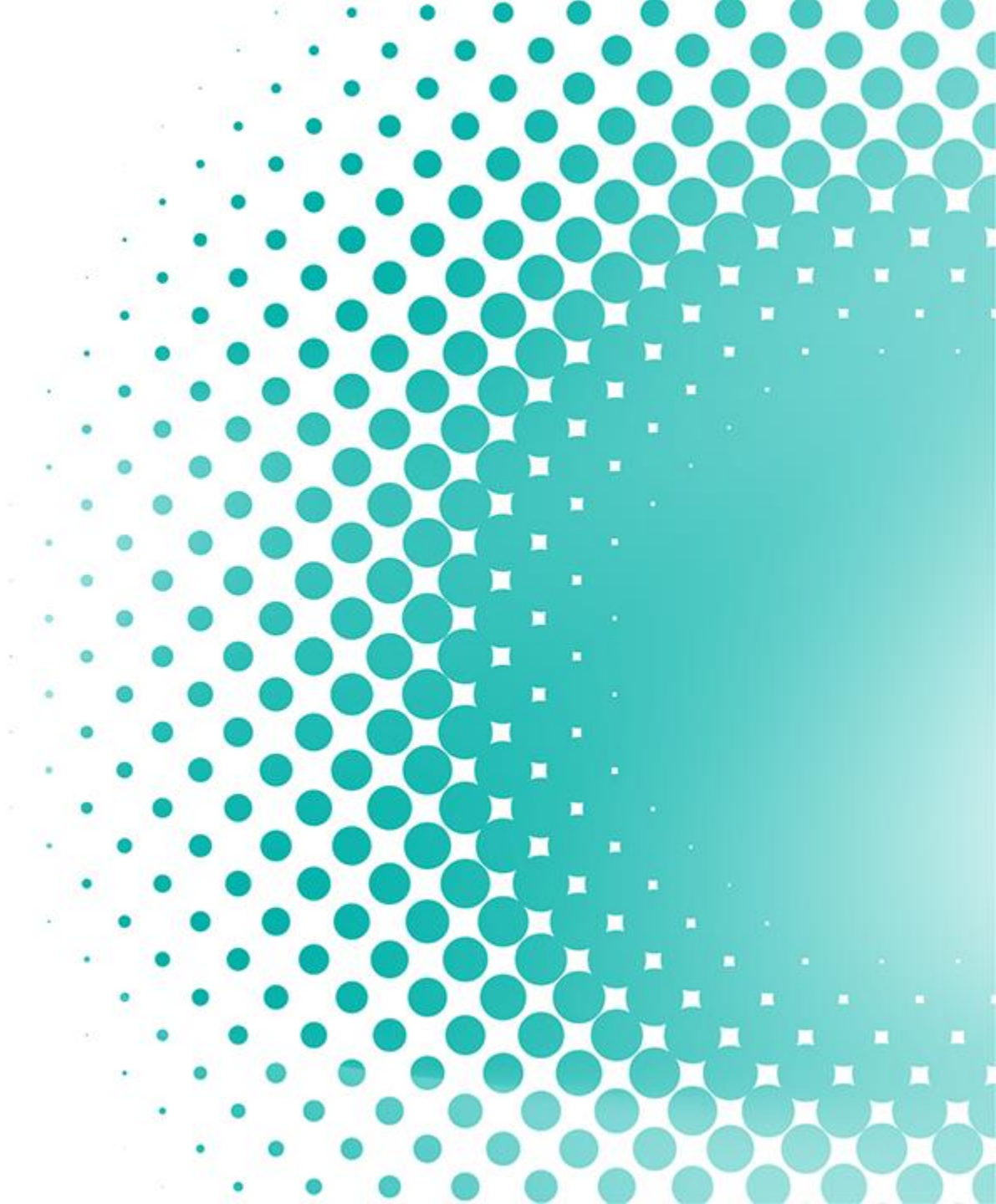


Figure 1 - Stages of a typical predictive analysis model

Source: https://docs.microsoft.com/en-us/azure/machine-learning/classic/model-progression-experiment-to-web-service

Deploy Machine Model as Webservice



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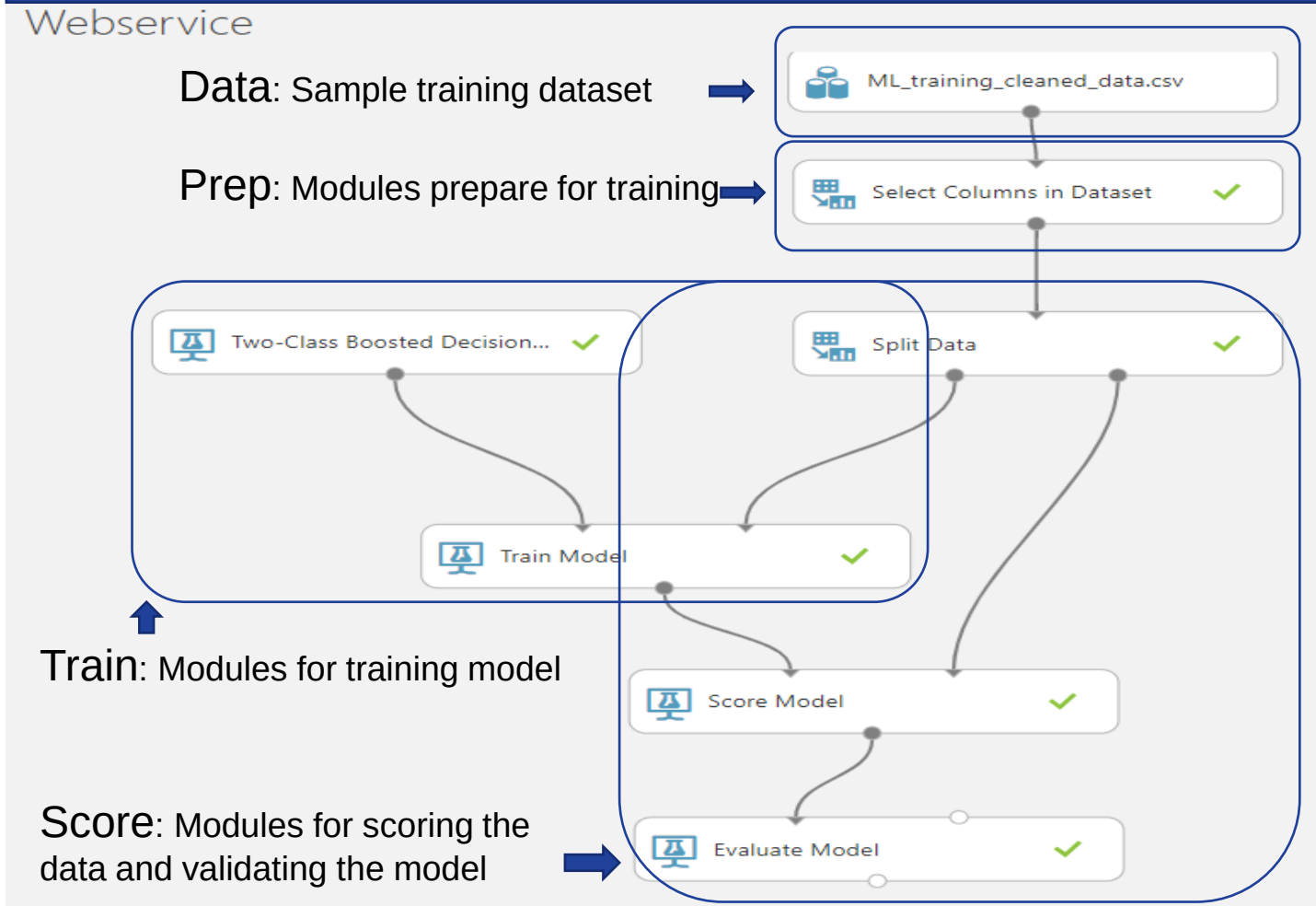
Setting up the experiment to train and evaluate a model

When converting training experiment to a predictive experiment, some of these modules are no longer needed

- **Data** - The data in this sample dataset is not used during scoring. However, the metadata from this dataset is used by the trained model.
- **Prep** - these modules may or may not be necessary to process the incoming data.
- **Train** - These modules are used to train the model.
- **Score** - In the predictive experiment, Split Data module can be removed. Score Model module is needed to return a score result through the web service.

Setting up an experiment to train and evaluate the model



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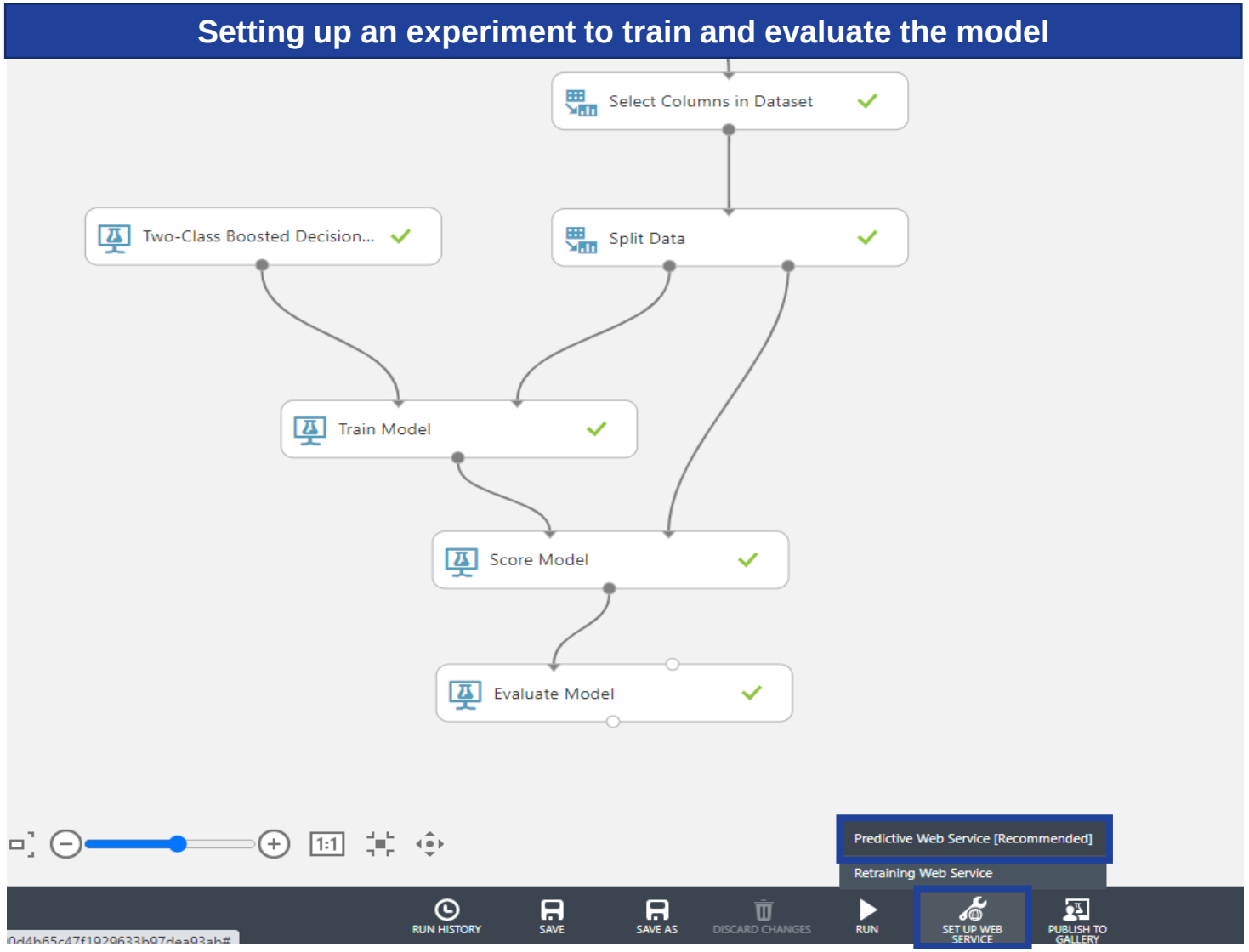
Setting up the web service

- Hover over ‘SETUP WEB SERVICE’ tab at the bottom pane
- Select ‘Predictive Web Service (Recommended)’ option



Setting up the web service continued...

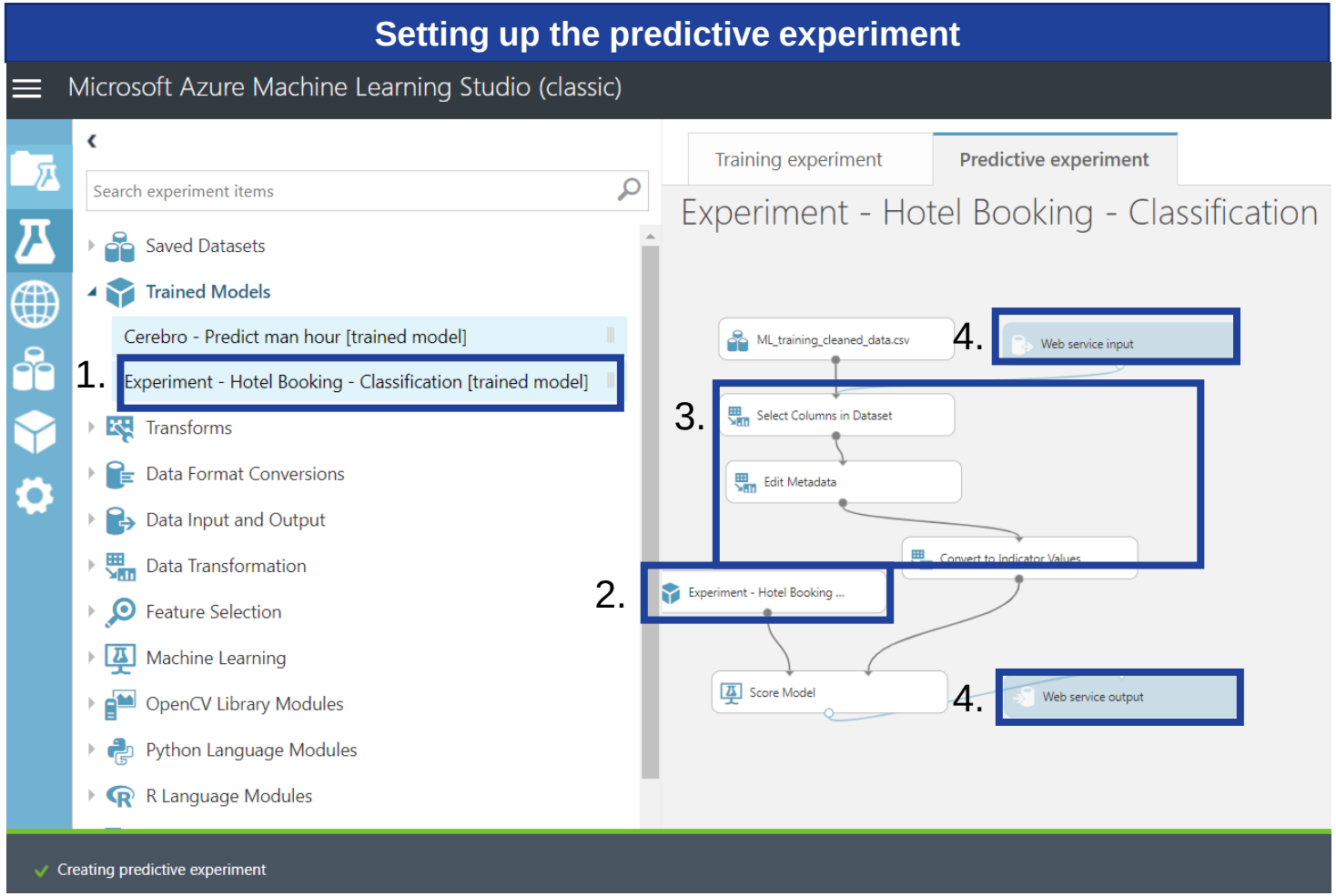
Set Up Web Service performs below steps of converting training experiment to a predictive experiment:

1. It saves trained model in the **Trained Models** section of the module palette.

2. It then replaces the machine learning algorithm and Train Model modules with the saved trained model.

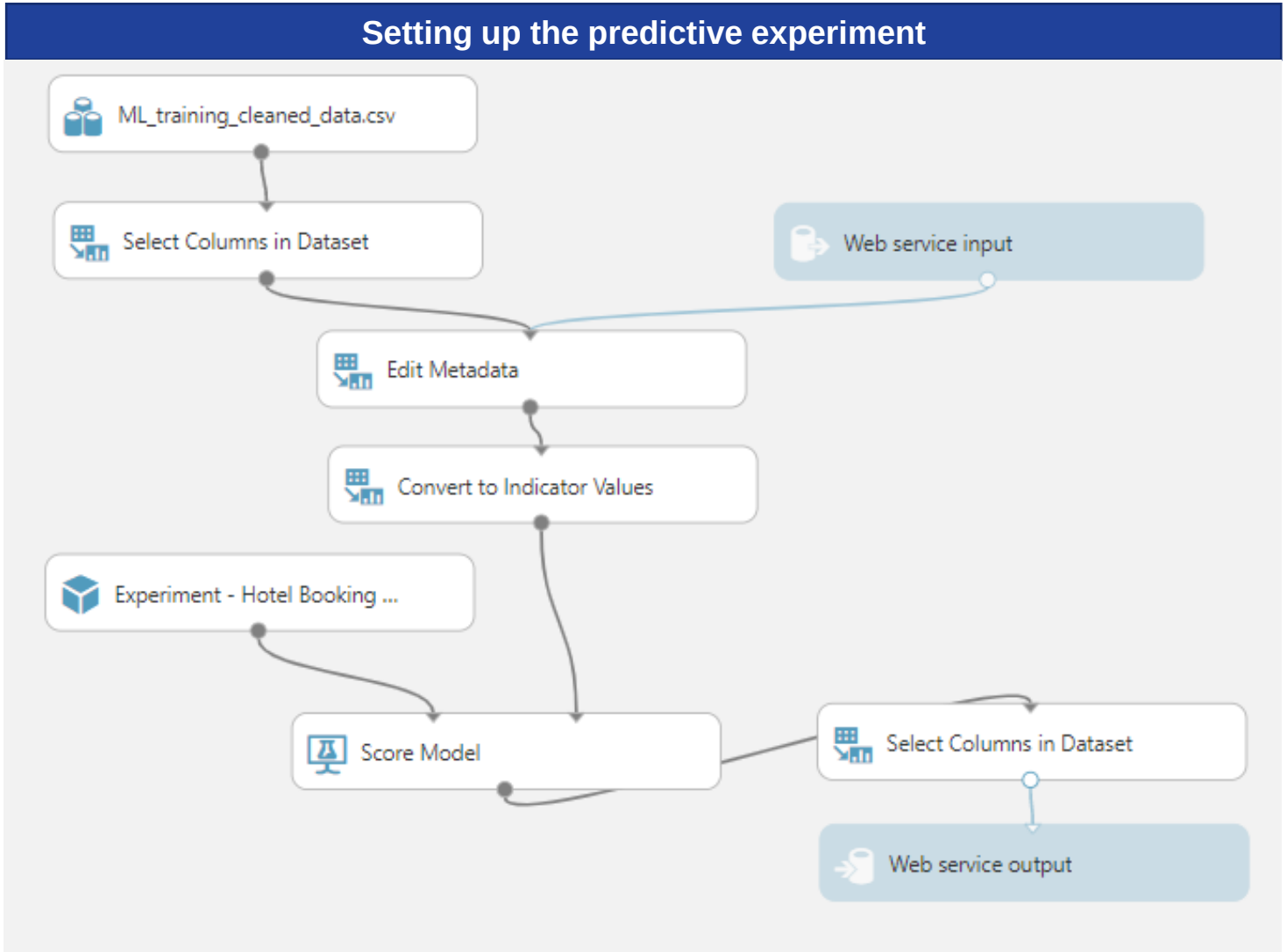
3. It analyzes experiment and removes modules that were clearly used only for training and are no longer needed.

4. It inserts *Web service input* and *output* modules into default locations in your experiment.



Adjust input and output modules

- Connect the output of the **Web service input module** to a different module in the experiment.
- to return only the scoring results, add a Select Columns in Dataset module to exclude all columns except the scoring results. Then move the **Web service output module** to the output of the Select Columns in Dataset module.
- If there are more modules in experiment that will not be needed during scoring, these can be removed



Selection of required columns for web service output

- Right Click on the ‘Score Model’ module and select ‘Visualize’
- Let's say we want only the columns ‘Scored Labels’ and ‘Scored Probabilities’ as the web service output

Selection of required columns

Webservice [Predictive Exp.] › Score Model › Scored dataset

rows	columns
130820	27

days_in_waiting_list	customer_type	required_car_parking_spaces	total_of_special_requests	reservation_status	Add(children_adults)	Total_guest	Scored Labels	Scored Probabilities
0	Transient	0	0	Check-Out	2	2	false	0.000018
0	Transient	0	0	Check-Out	2	2	false	0.000018
0	Transient	0	0	Check-Out	1	1	false	0.000024
0	Transient	0	0	Check-Out	1	1	false	0.000024
0	Transient	0	1	Check-Out	2	2	false	0.000022
0	Transient	0	1	Check-Out	2	2	false	0.000022
0	Transient	0	0	Check-Out	2	2	false	0.00003
0	Transient	0	1	Check-Out	2	2	false	0.00003
0	Transient	0	1	Canceled	2	2	true	0.999988
0	Transient	0	0	Canceled	2	2	true	0.999988
0	Transient	0	0	Canceled	2	2	true	0.999988

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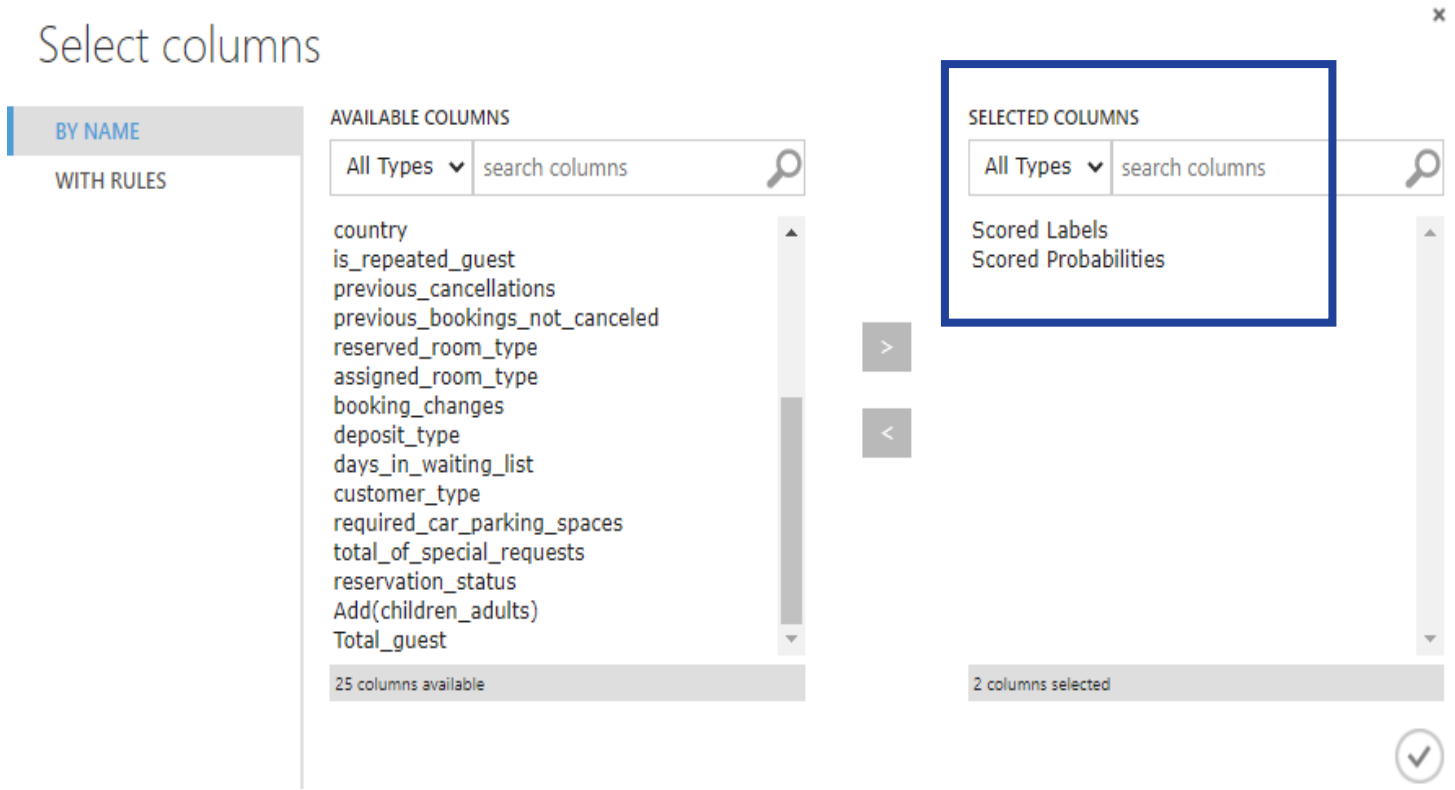
Selection of required columns for web service output

- Add ‘Select Columns in Dataset’ module and connect to ‘Score Model’
- Connect the ‘Score Model’ to the ‘Web service output’ module
- Select ‘Launch column selector’ in the properties tab of ‘Select Columns in Dataset’ module
- Select the columns ‘Scored Labels’ and ‘Scored Probabilities’ as shown in the figure

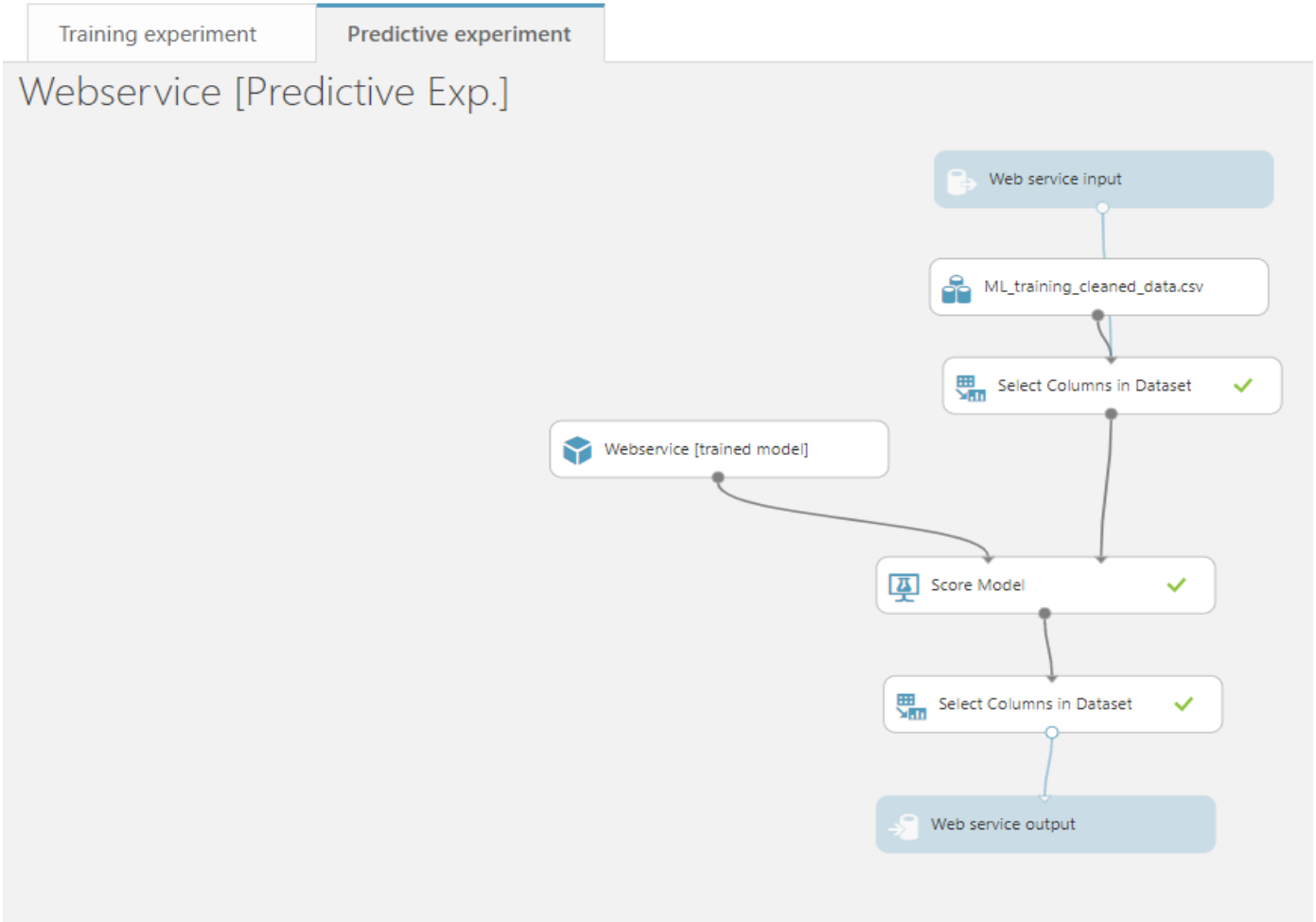
Selection of required columns



Selection of required columns for web service output

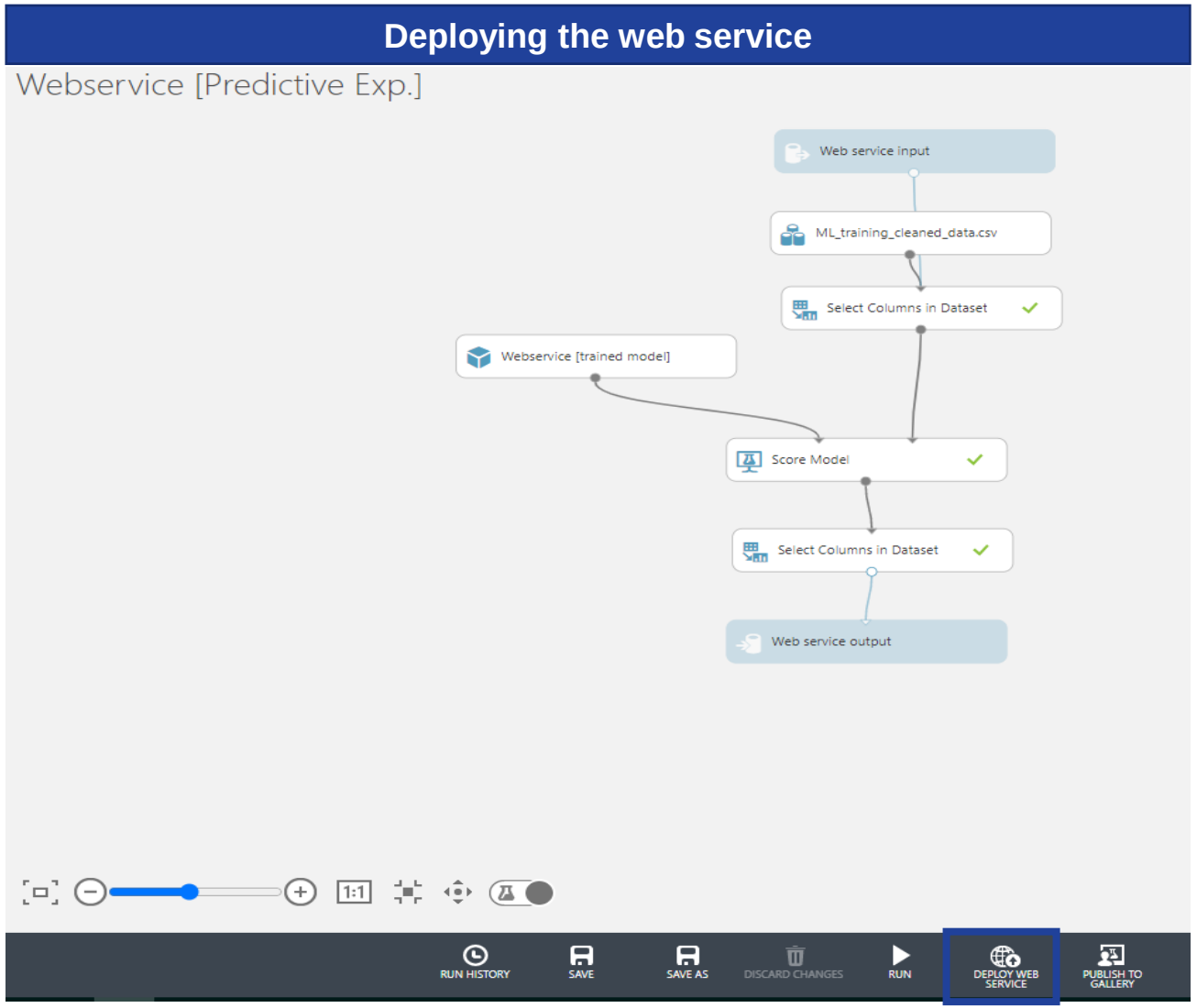
- The experiment should be as shown in the figure
- RUN the experiment

Running the create web service experiment



Deploy the web service

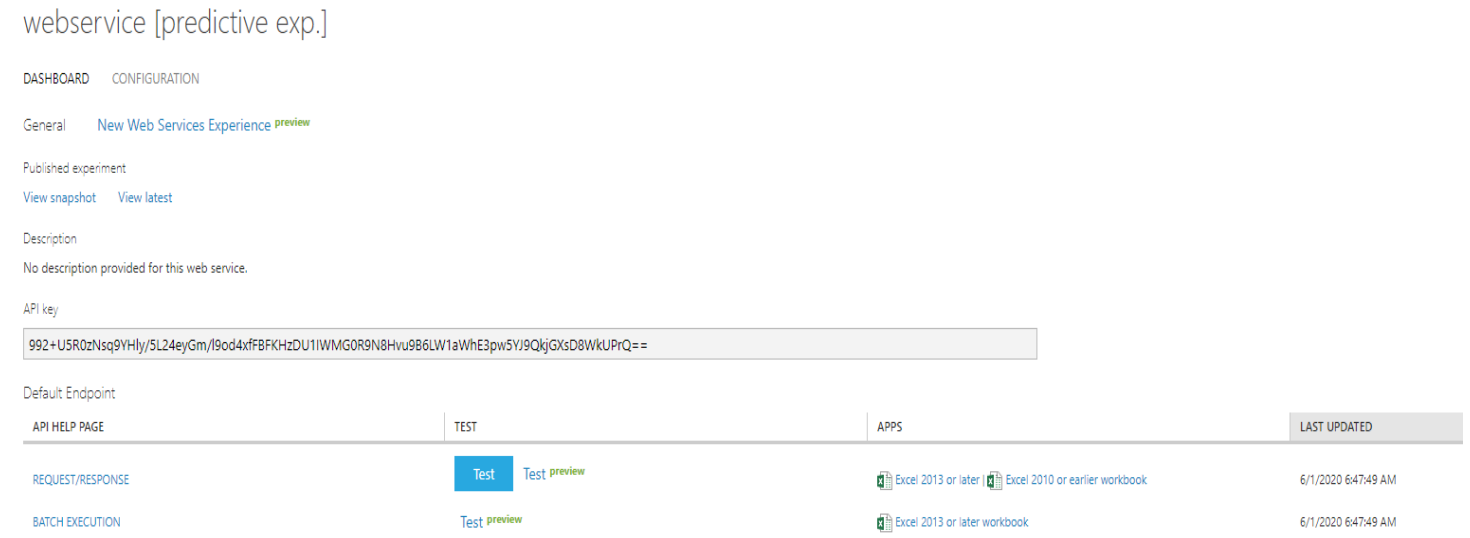
- Deploy the web service by clicking the ‘DEPLOY WEB SERVICE’ option at the bottom pane as highlighted in the figure



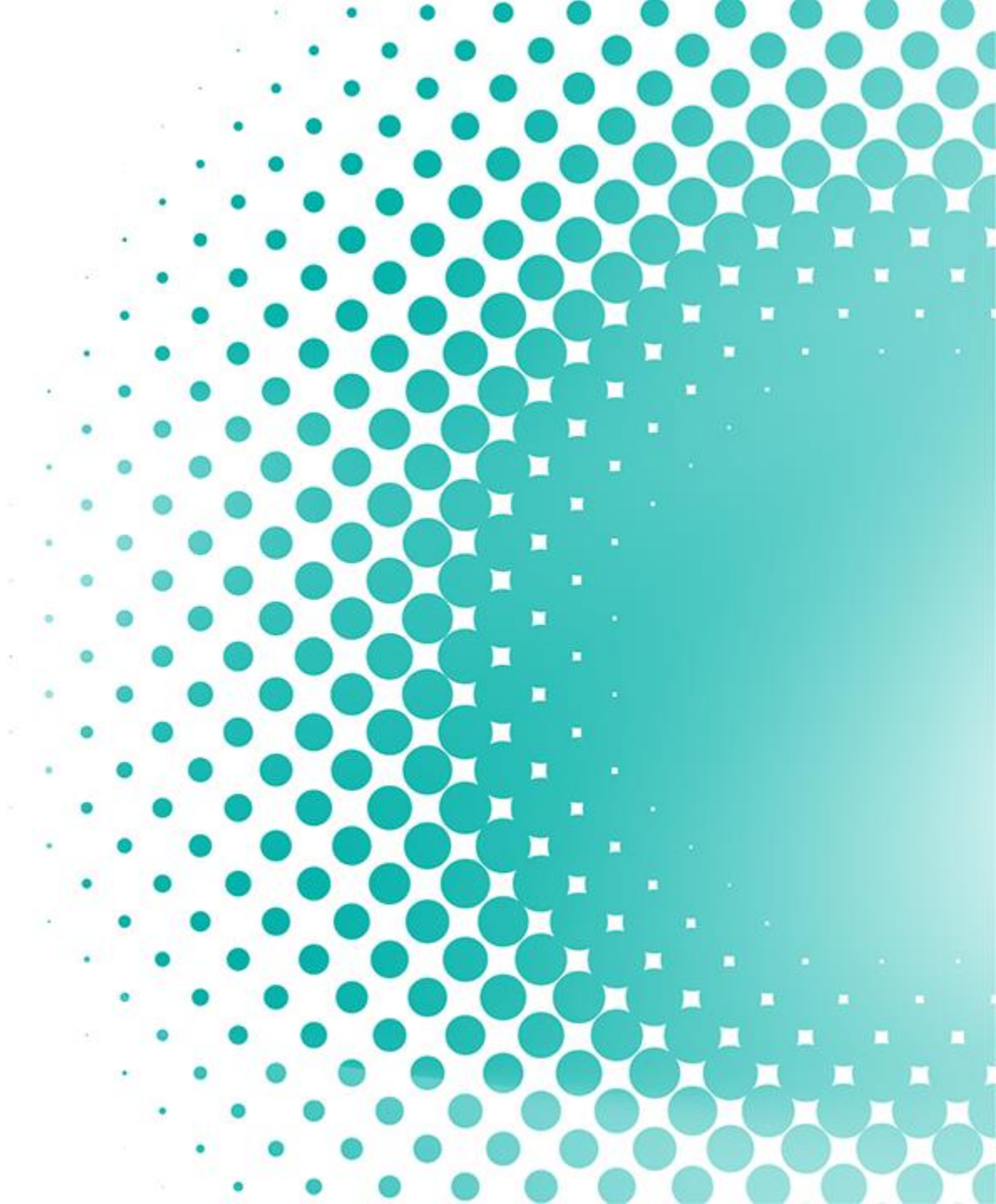
Deploy the web service

- A web service is created as shown in the figure
- We can call it using an application or excel sheet

Creation of the web service



Access Webservice in Excel



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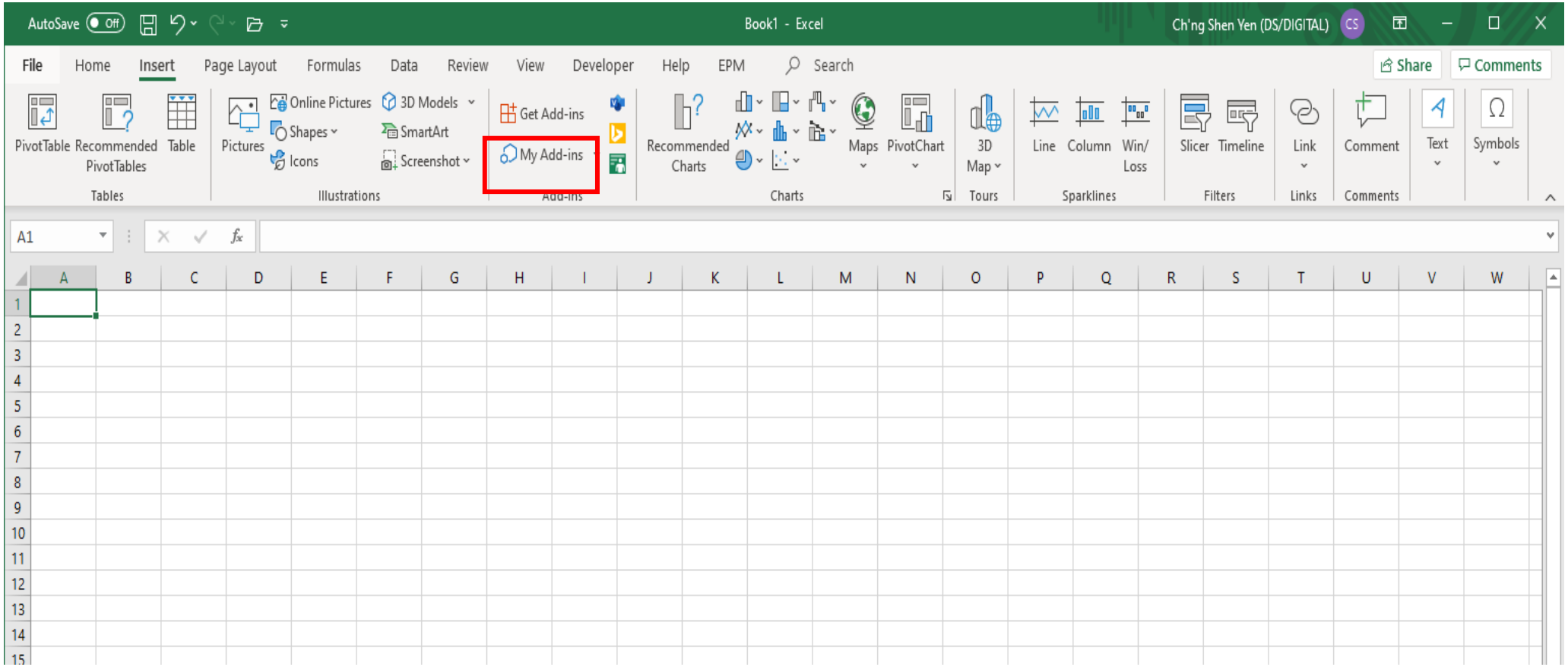
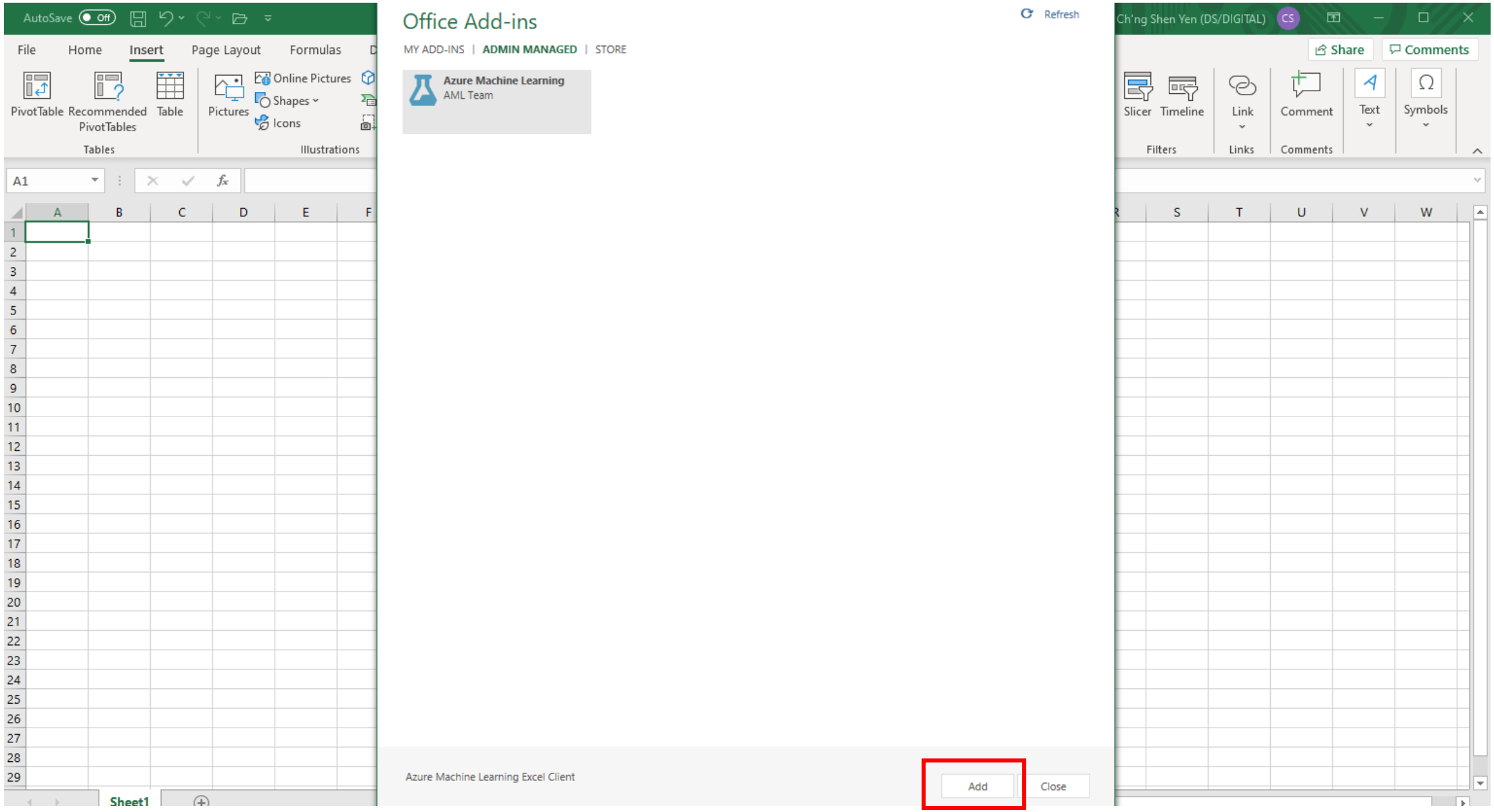
Set up Excel Add-in to consume Azure ML Webservice

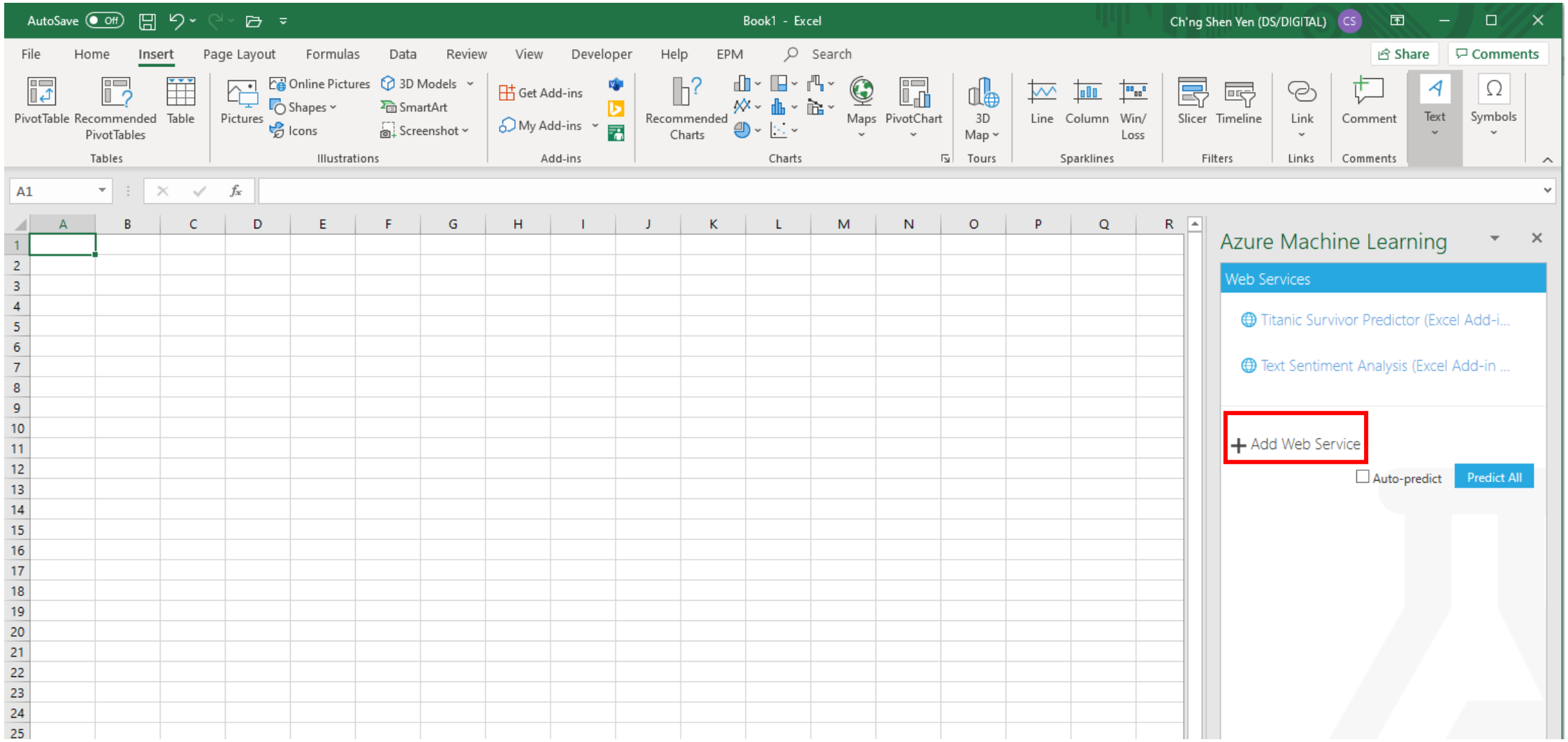


1. Click on Insert
2. Click on My Add-ins

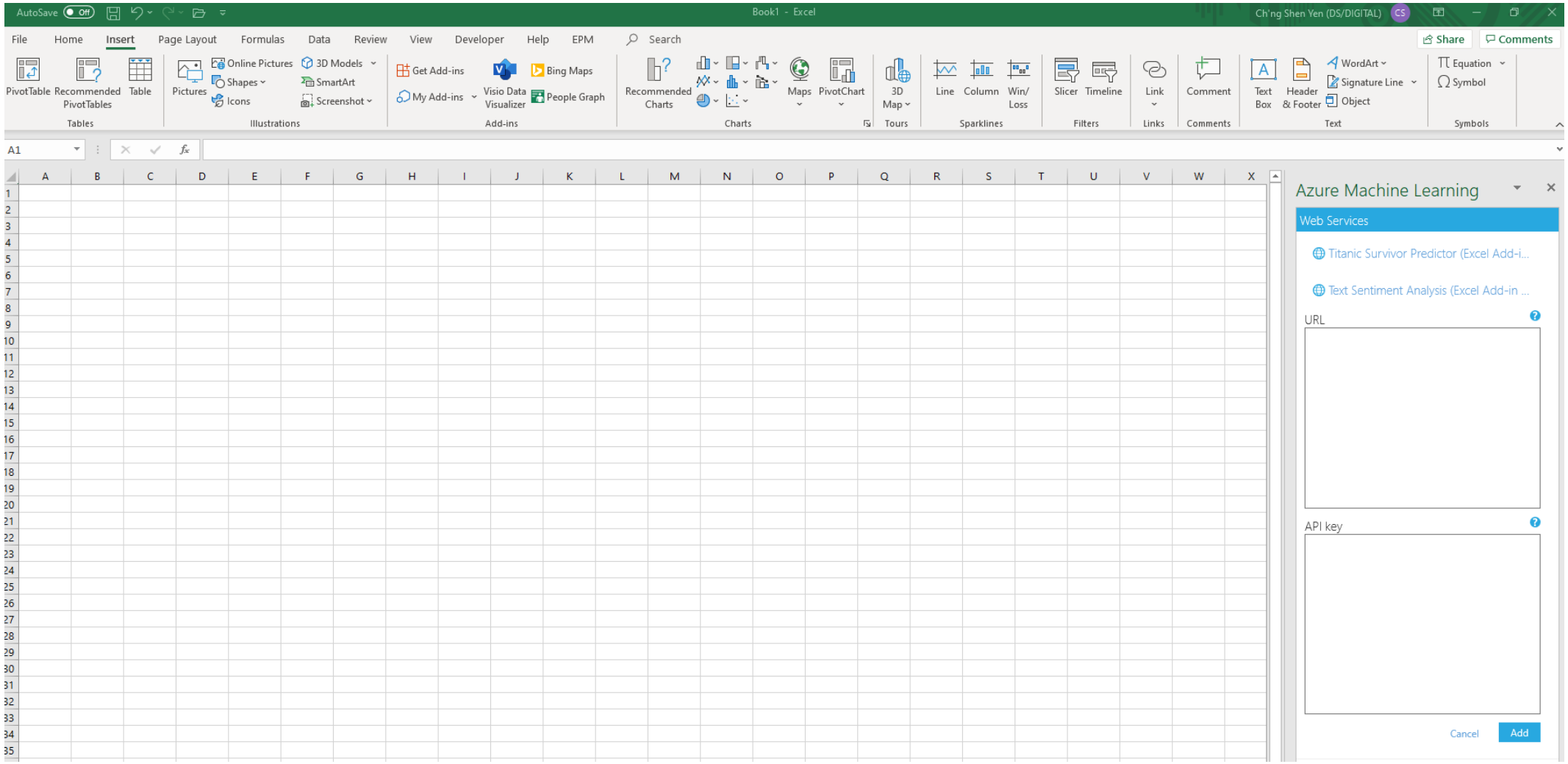
Select ML Studio and click on Add



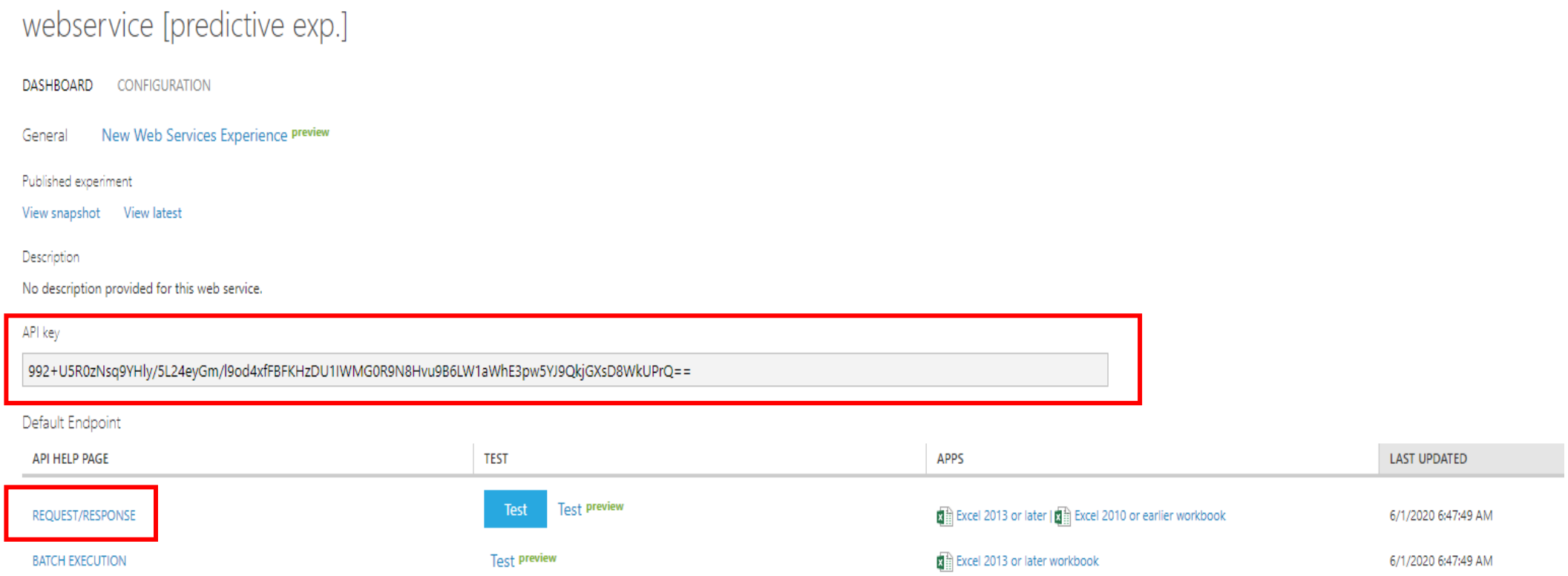
Add Web Service



Requirement : URL and API Key



Copy API Key from here and click on Request/Response



On Request/Response, copy the URI.

Updated: 07/02/2020 09:06

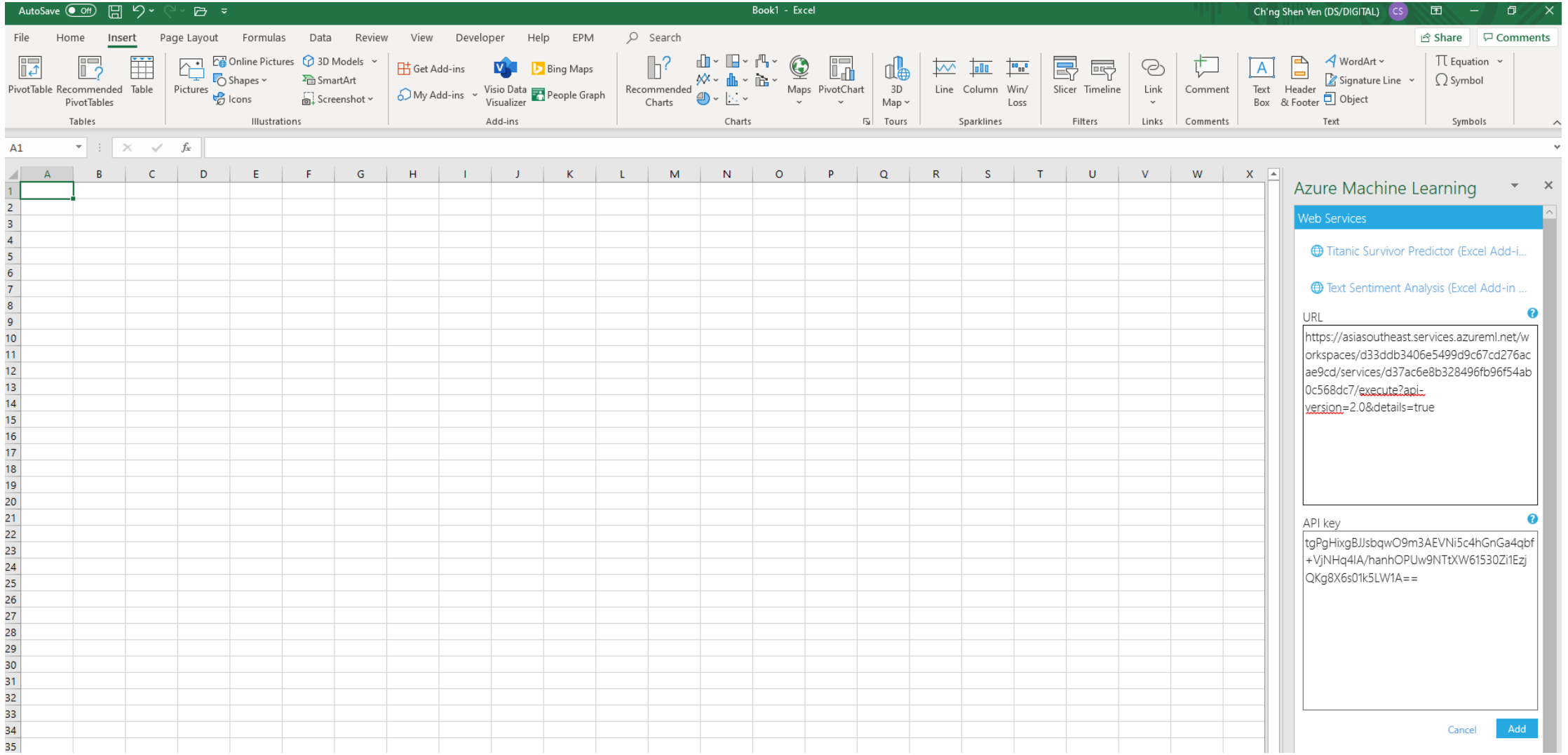
No description provided for this web service.

- Previous version of this API
- Submit a request
- Input Parameters
- Output Parameters
- Web App Template for RRS
- Sample Code
- API Swagger Document
- Endpoint Managment Swagger Document

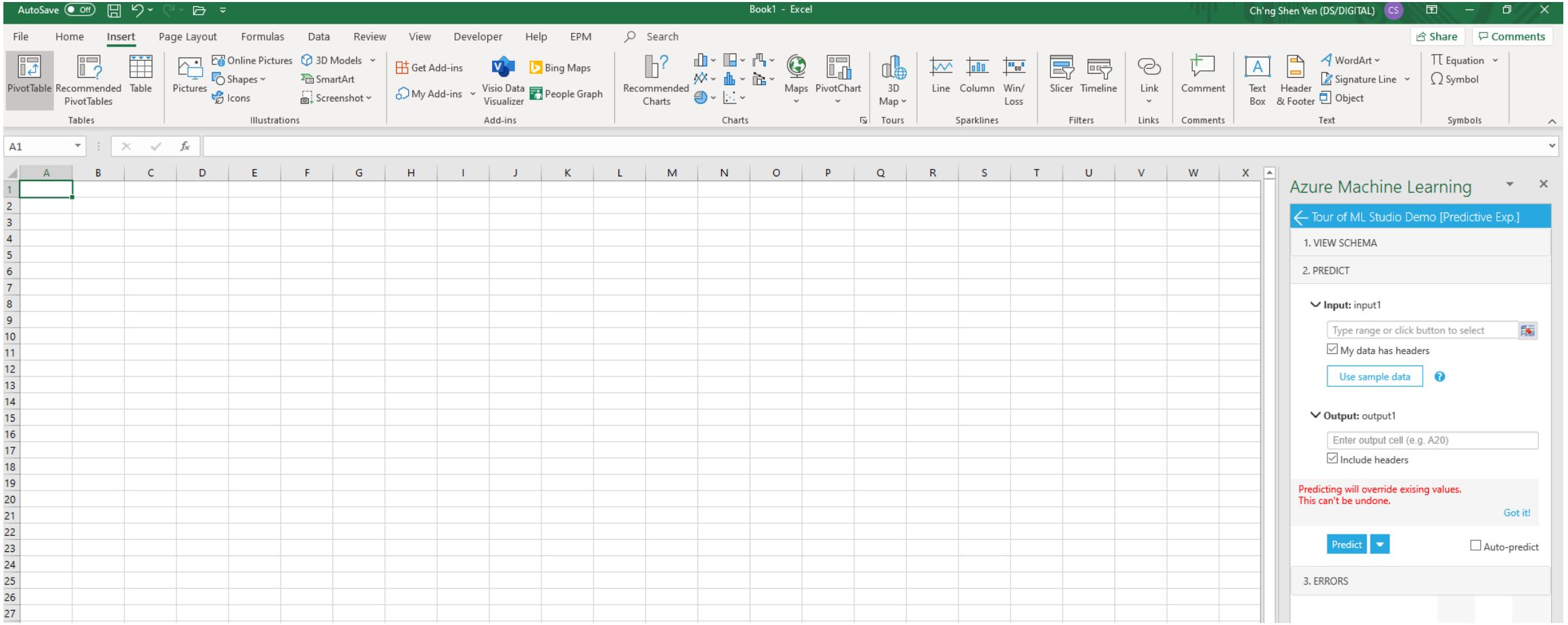
Request

Method	Request URI	HTTP Version
POST	https://asiasoutheast.services.azureml.net/workspaces/d33ddb3406e5499d9c67cd276acae9cd/services/d37ac6e8b328496fb96f54ab0c568dc7/execute?api-version=2.0&details=true	HTTP/1.1

Fill API Key with Primary Key and URL with Request-Response



API Connection Successful



Summary

Summary

1

Steps involved in the deployment of Azure ML web-service

- Create a training experiment, convert to a predictive experiment, deploy and consume as web-service

2

Deploy machine learning model as web-service

- The Machine Learning model created can be used to predict on the new data without retraining using the Web-service

3

Azure web-service consumption

- Azure web-service can be accessed by using excel or an application

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References

References

Deploy a machine learning	https://docs.microsoft.com/en-us/azure/machine-learning/classic/deploy-a-machine-learning-web-service
Web Service Parameters	https://docs.microsoft.com/en-us/azure/machine-learning/classic/web-service-parameters
Model progression to web service	https://docs.microsoft.com/en-us/azure/machine-learning/classic/model-progression-experiment-to-web-service
Web services with import/export	https://docs.microsoft.com/en-us/azure/machine-learning/classic/web-services-that-use-import-export-modules
Web service enable logging	https://docs.microsoft.com/en-us/azure/machine-learning/classic/web-services-logging
Manage web service	https://docs.microsoft.com/en-us/azure/machine-learning/classic/manage-new-webservice
Model Deployment	https://docs.microsoft.com/en-us/azure/machine-learning/classic/tutorial-part3-credit-risk-deploy#access-the-web-service

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Thank you for your passion!