

Power BI with AI and Beyond!

Artificial Intelligence (AI) and Machine Learning (ML)
with Microsoft Technologies

Cincinnati Data and Analytics
Meetup - May 2023

Eric Frayer MPA, MBA
www.ThinkDataAnalysis.com
info@ericfrayer.com



Introduction

Audience Composition

30+ years Enterprise Data and Analytics Experience

10 years at Miami University – SPSS Statistics

10 years working with the Microsoft BI stack –
SSAS, SSIS, SSRS, DW

5 years as a Senior Principal Technical Architect at
Qlik – QlikView and Qlik Sense

5 years in other technical and analytics roles

Show of Hands! – Old School!

Building a Data Driven Organization

Key Components

- People
- Processes - Best Practices
- Technology

Why is Strategic Analytics so hard?

Thomas Davenport – Competing on Analytics

From Descriptive to Predictive Analytics



Enabling Self Service - building Data Models and organizing visualizations to support end-users creating their own dashboards and finding their own insights.



Storytelling with Data – Insights on how to be most effective with visualizations of data.



Citizen Data Scientists – BI professionals who have mastered one of the Modern Analytics and BI toolkits could be looking to adopt data science skills.



Advanced Analytics – solid Descriptive Statistics are required so the underlying data supports the ability to effectively develop and deploy AI and ML models.



Data Literacy Programs – building business user's abilities to analyze data and practices.

Agenda:

I. Gartner Essential Skills for Citizen Data Scientists

II. Microsoft Technologies

- Power BI add-ins for R and Python
- Azure Machine Learning Studio
- Microsoft ML.NET – Visual Studio
- Microsoft Data Science Server

III. Environment and Demos

Discussion and Questions

Essential Skills for Citizen Data Scientists

- Experienced Business Intelligence (BI) Analyst.
- Exploit Modern Analytics and Business Intelligence (A&BI) Platforms
- Technical professionals can revamp career growing into Citizen Data Scientist role.
- Often are business Subject Matter Experts (SME's) with exceptional Soft Skills.

Key Takeaways and Insights

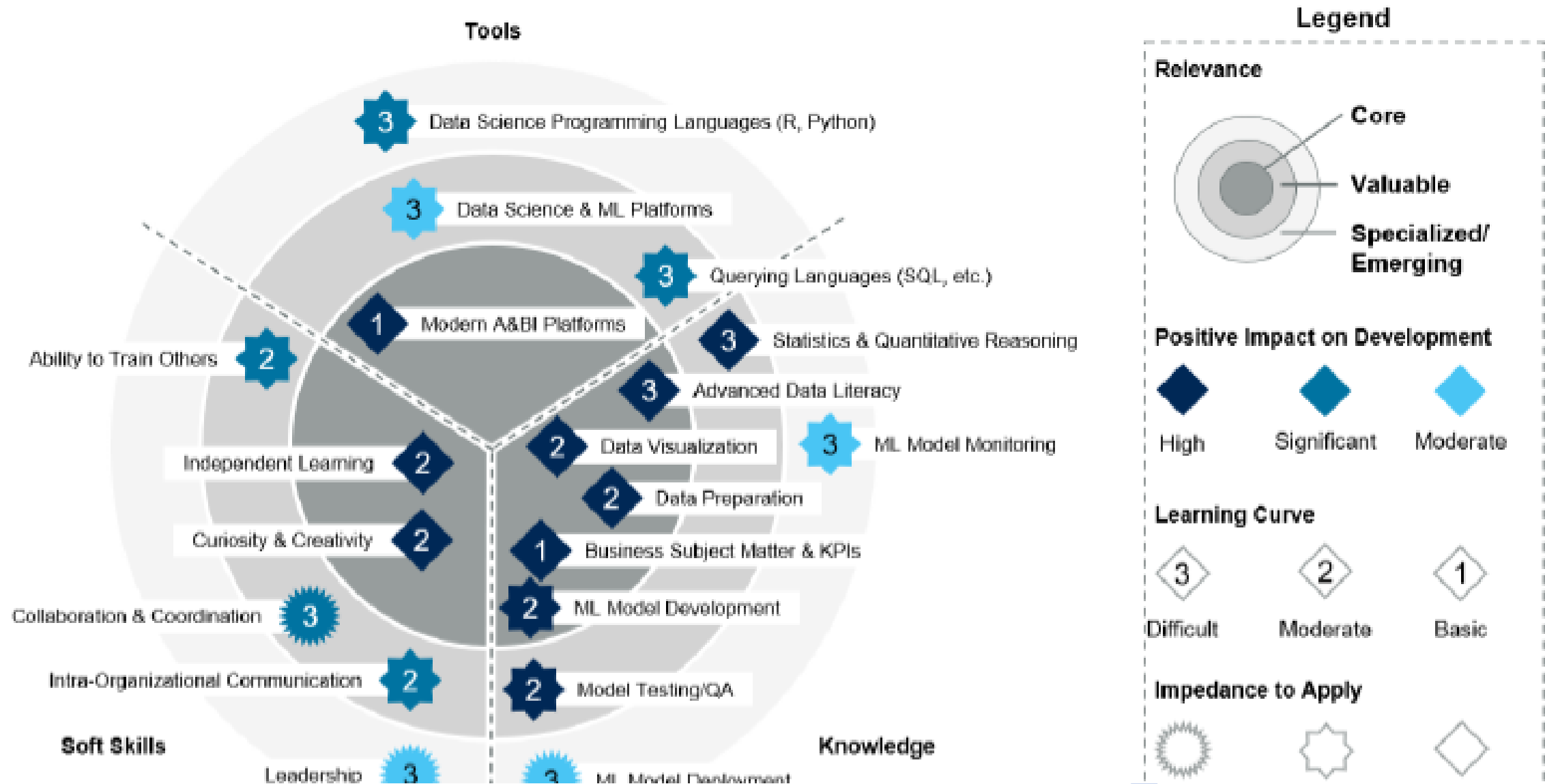
A Citizen Data Scientist extracts predictive and prescriptive insights from data while not being as technically skilled as an expert data scientist. Citizen data scientists occupy a hybrid, boundary-spanning role, not a distinct stand-alone position in the organization.

Citizen data scientists exploit modern analytics and business intelligence (A&BI) platforms, which increasingly have augmented analytics capabilities and integrations with data science and data preparation tools.

Technical professionals hoping to revamp their careers can grow into the citizen data scientist roles via independent learning, intuitive augmented analytics platforms and the support of a community of practice.

Technical skills are not enough. Citizen data scientists must develop deep business subject matter expertise, collaboration skills, intellectual curiosity and an ability to learn independently.

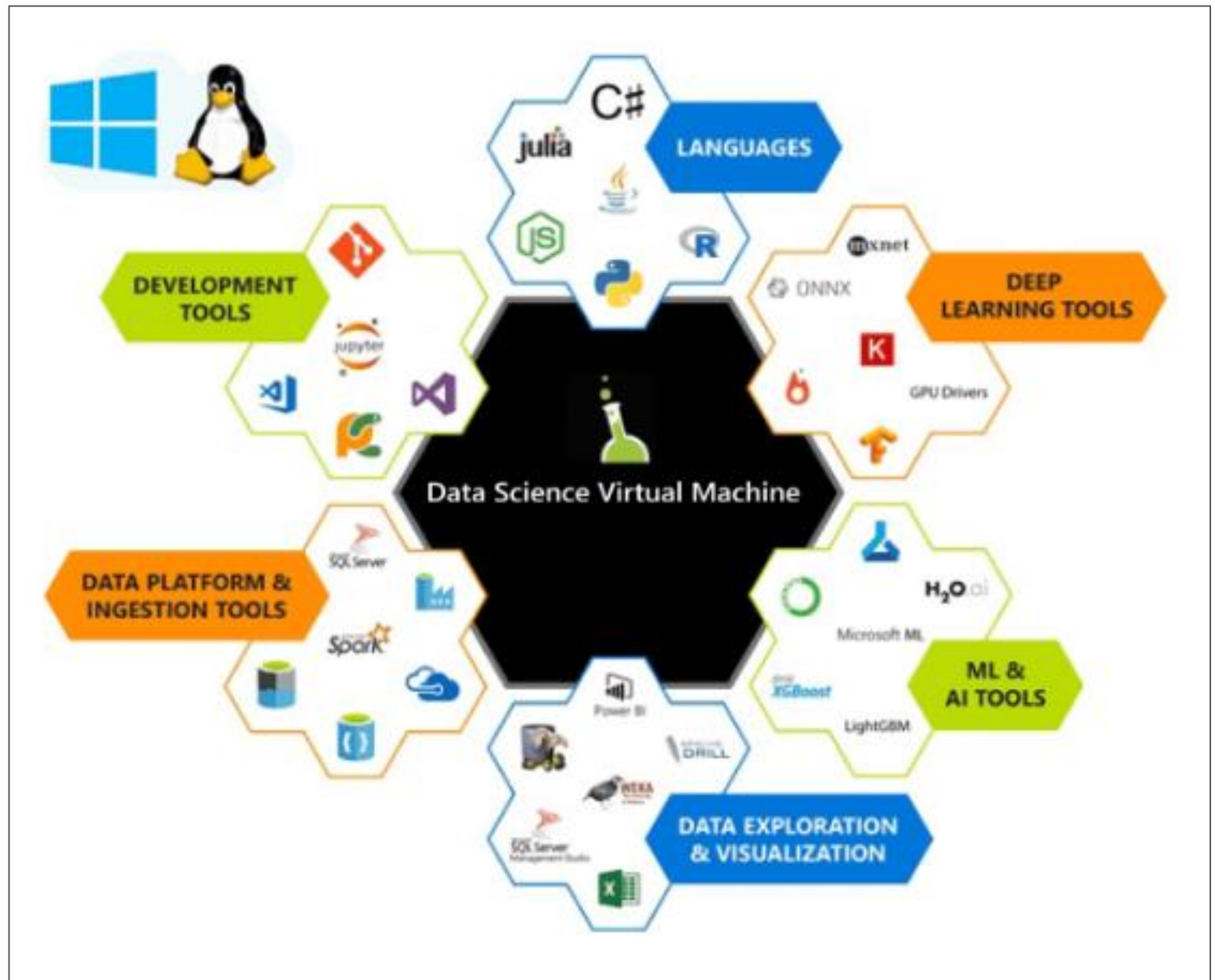
Figure 1: Citizen Data Scientist Skills Scope



Core Skills	Focus Area
Modern A&BI Platforms	Tools
Business Subject Matter and Key Performance Indicators (KPIs)	Knowledge
Data Visualization	Knowledge
Data Preparation	Knowledge
ML Model Development	Knowledge
Advanced Data Literacy	Knowledge
Independent Learning	Soft Skills
Curiosity and Creativity	Soft Skills
Valuable Skills	Focus Area
Querying Languages (SQL, etc.)	Tools
Data Science and ML Platforms	Tools
Model Testing/QA	Knowledge
Statistics and Quantitative Reasoning	Knowledge
Ability to Train Others	Soft Skills
Intraorganizational Communication	Soft Skills
Collaboration and Coordination	Soft Skills
Specialized and Emerging Skills	Focus Area
Data Science Programming Languages (R, Python)	Tools
ML Model Monitoring	Knowledge
ML Model Deployment	Knowledge
Leadership	Soft Skills

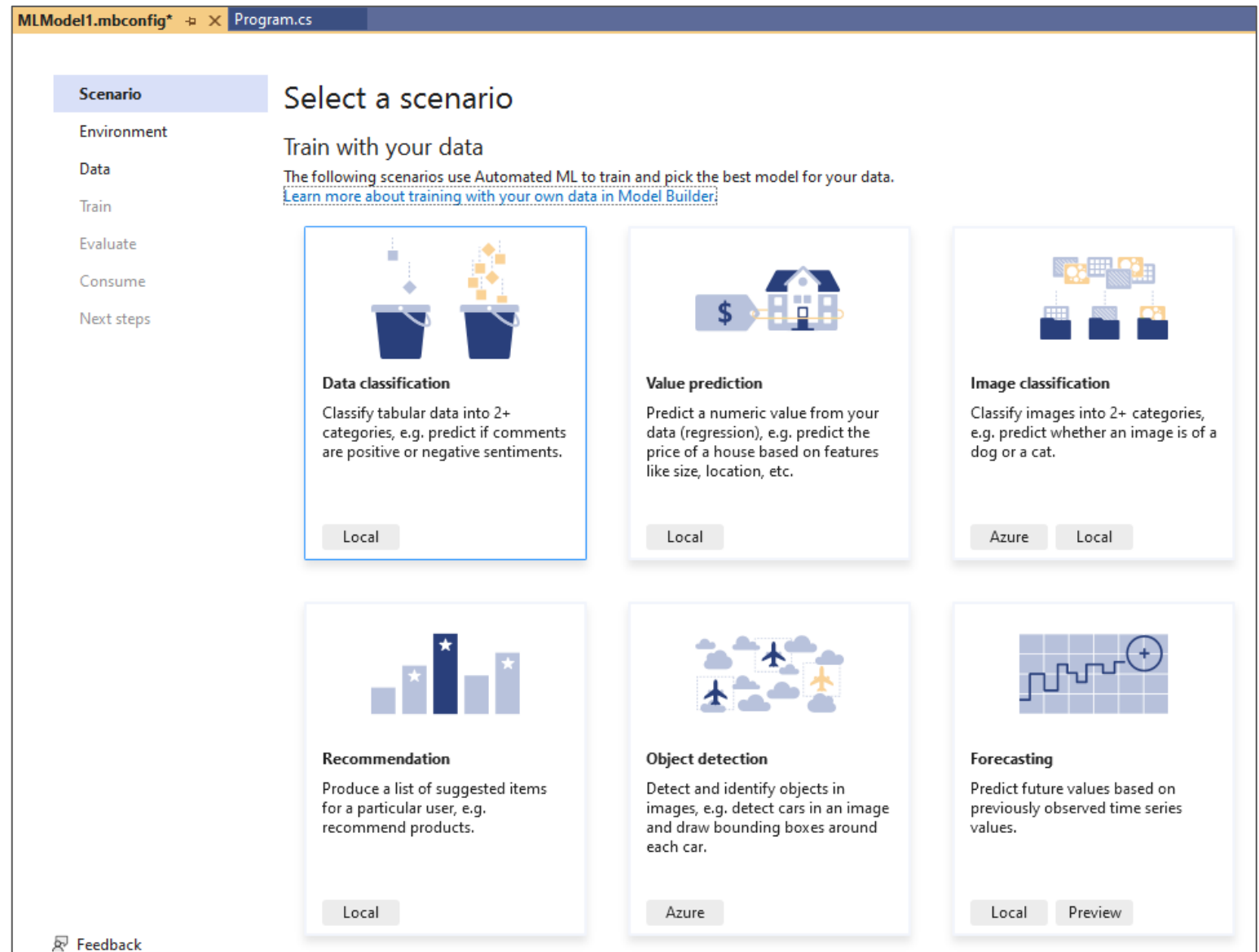
Knowledge
Advanced Data Literacy
Business Subject Matter and Key Performance Indicators (KPIs)
Data Preparation
Data Visualization
ML Model Deployment
ML Model Development
ML Model Monitoring
Model Testing/QA
Statistics and Quantitative Reasoning
Soft Skills
Ability to Train Others
Collaboration and Coordination
Curiosity and Creativity
Independent Learning
Intraorganizational Communication
Leadership
Tools
Data Science and ML Platforms
Data Science Programming Languages (R, Python)
Modern A&BI Platforms
Querying Languages (SQL, etc.)

Microsoft
Data Science
Virtual
Machine
Server



<https://azure.microsoft.com/en-us/products/virtual-machines/data-science-virtual-machines>

ML.NET with Visual Studio 2022 & Visual Studio Code



The screenshot shows the Microsoft ML.NET Model Builder interface. The top navigation bar includes "MLModel1.mbconfig*" and "Program.cs". The left sidebar lists the workflow steps: Scenario, Environment, Data, Train, Evaluate, Consume, and Next steps. The main area is titled "Select a scenario" and "Train with your data". Below this, there is a link: "The following scenarios use Automated ML to train and pick the best model for your data. [Learn more about training with your own data in Model Builder.](#)"

The interface displays six scenario cards, each with an icon, a title, a description, and deployment options:

- Data classification:** Classify tabular data into 2+ categories, e.g. predict if comments are positive or negative sentiments. (Local)
- Value prediction:** Predict a numeric value from your data (regression), e.g. predict the price of a house based on features like size, location, etc. (Local)
- Image classification:** Classify images into 2+ categories, e.g. predict whether an image is of a dog or a cat. (Azure, Local)
- Recommendation:** Produce a list of suggested items for a particular user, e.g. recommend products. (Local)
- Object detection:** Detect and identify objects in images, e.g. detect cars in an image and draw bounding boxes around each car. (Azure)
- Forecasting:** Predict future values based on previously observed time series values. (Local, Preview)

A "Feedback" icon is located at the bottom left of the interface.

<https://learn.microsoft.com/en-us/dotnet/machine-learning/automate-training-with-model-builder>

Microsoft Azure Machine Learning Studio

The screenshot displays the Microsoft Azure Machine Learning Studio interface. The top navigation bar includes the text "Microsoft Azure Machine Learning Studio", a search bar, and the workspace name "aml-workspace01". The left sidebar contains a navigation menu with options: New, Home, Author, Notebooks, Automated ML, Designer (selected), Assets, Data, Jobs, Components, Pipelines, Environments, Models, Endpoints, Manage, Compute, Linked Services, and Data Labeling. The main area, titled "ERICFRAYER > aml-workspace01 > Designer", shows a grid of 12 machine learning templates. Each template includes a representative image and a title with an information icon.

Template Title	Thumbnail Description
Regression - Automobile Price Prediction (Basic)	Line graph showing price fluctuations over time.
Regression - Automobile Price Prediction (Compare algorithms)	Scatter plot with a regression line and data points.
Binary Classification with Feature Selection - Income...	Diagram of a neural network structure.
Binary Classification with custom Python script - Cre...	Document icon with a magnifying glass over a "RISK" section.
Binary Classification - Customer Relationship Prediction	Diagram showing two campaigns (A and B) leading to customer profiles.
Use custom R script - Flight Delay Prediction	Computer monitor displaying the R logo.
Text Classification - Wikipedia SP 500 Dataset	Document icon labeled "TEXT" pointing to a box with "class A" and "class B".
Cross Validation for Binary Classification - Adult Inco...	Diagram of a data flow from "TEST" to "TRAIN" with a scatter plot.
Permutation Feature Importance	Horizontal bar chart titled "Variable Importance" showing importance for Title, Gender, Title_Mr, TicketNumber, and Age_scaled.
Recommendation - Movie Rating Tweets	Three movie icons with "Recommendations for you" text and star ratings.
Tune Parameters for Binary Classification - Adult Inco...	Line graph showing multiple curves representing different parameter settings.
Multiclass Classification - Letter Recognition	Diagram showing letters A, B, and C being classified into a single "ABC" category.

<https://learn.microsoft.com/en-us/power-bi/transform-model/dataflows/dataflows-machine-learning-integration>

Microsoft Power BI with R and Python

New to machine learning models? Here's what you'll be doing:

1. Create and train your model

2. Improve it

3. Apply it



Select training data

Select your base data and related inputs to train your model.



Choose a model type

We'll help you pick the best model to achieve your business goals.



Train your model

The model will train on your data and report on its performance.



Iterate and retrain

Evaluate, customize and retrain your model until it's optimized



Apply the model

Apply your model to future data for predictive insights.

Get started

<https://learn.microsoft.com/en-us/power-bi/transform-model/dataflows/dataflows-machine-learning-integration>

AI/ML Considerations

Models and Algorithms Available

Model Design

Data Security and Considerations

Infrastructure and Security

Ease of Use/Difficulty

Interpretability

Costs

Predictive Analytics Options - January 2022							
Options and Alternatives:	Models Available	Model Design	Data Security and Considerations	Infrastructure and Security	Ease of Use/Difficulty	Interpretability	Costs
1. Power BI Add-ins for R and Python:	Medium - leverages shared and pre-tuned models	UI Design First	Data Models required	Uses dataflows for "design driven" regression, classification and clustering models	Easy to Medium	Easy to Medium	Low - already included in Power BI with Premium Capacity
2. ML.NET with Visual Studio 2022 & Visual Studio Code:	High	Code-First	Provides highest degree of flexibility in VDI using R and Python engines	Visual Studio 2022 could not be installed - VS Code is working	Medium to Hard	Medium to Hard depending on model	Low - runs on existing hardware
3. Azure Machine Learning Studio:	High - provides several out of the box models and can be customized	UI Design First	Secured in Microsoft Azure environment	Azure Portal based	Medium to Hard	Easy to Medium - built into Machine Learning Studio	Low to High depending on usage and demand
4. Microsoft Data Science Virtual Machine Server:	High	Supports both UI Design and Code-First approaches	Specific Instance in isolated environment. Very Secure. Will need some assistance to implement	VM running in CoreCivic Azure Cloud with the ability to scale up (server resources) or out (number of VM's) to support multiple use cases	Easy to Hard	Medium to Hard depending on model	Low to Medium - less expensive than Machine Learning Studio
Recommendation:							
Power BI with R and Python	Regression, Classification and Clustering - uses PBI Service and Azure ML for calculations and data mining process	Can be implemented on workstation or server with dependencies on R and Python Packages.	Can be governed by Microsoft Purview or related technologies. Can adopt "sensitivity labels"	Requires some use of R and Python in Power BI Desktop design environment	Easy to Medium	Easy to Medium	Low - already included in Power BI with Premium Capacity
Power BI: Integrating AI and Machine Learning	Leverages DAX and AI/ML addins to meet visualization requirements	Uses combination of Design and Code with dependencies on DAX calculations and function calls to Azure ML	Can be governed by Microsoft Purview or related technologies. Can adopt "sensitivity labels"	Uses visualizations to provide and support insights and analysis	Easy to Medium	Easy to Medium	Low - already included in Power BI with Premium Capacity



Microsoft
Data Science
Virtual
Machine
Server

	Data Science Virtual Machine Server
Models Available	High
Model Design	Supports both UI Design and Code-First approaches
Data Security and Considerations	Specific Instance in isolated environment. Very Secure. Will need some assistance to implement
Infrastructure and Security	VM running in secured Azure Cloud with the ability to scale up (server resources) or out (number of VM's) to support multiple use cases
Ease of Use/Difficulty	Easy to Hard
Interpretability	Medium to Hard depending on model
Costs	Low to Medium - less expensive than Machine Learning Studio

<https://azure.microsoft.com/en-us/products/virtual-machines/data-science-virtual-machines>

ML.NET with
Visual Studio
2022 &
Visual Studio
Code

	ML.NET with Visual Studio 2022 & Visual Studio Code
Models Available	High
Model Design	Code-First
Data Security and Considerations	Provides highest degree of flexibility in VDI using R and Python engines
Infrastructure and Security	Visual Studio 2022 could not be installed - VS Code is working
Ease of Use/Difficulty	Medium to Hard
Interpretability	Medium to Hard depending on model
Costs	Low - runs on existing hardware

<https://learn.microsoft.com/en-us/dotnet/machine-learning/automate-training-with-model-builder>



Microsoft
Azure
Machine
Learning
Studio

	Azure Machine Learning Studio
Models Available	High - provides several out of the box models and can be customized
Model Design	UI Design First
Data Security and Considerations	Secured in Microsoft Azure environment
Infrastructure and Security	Azure Portal based
Ease of Use/Difficulty	Medium to Hard
Interpretability	Easy to Medium - built into Machine Learning Studio
Costs	Low to High depending on usage and demand

<https://learn.microsoft.com/en-us/power-bi/transform-model/dataflows/dataflows-machine-learning-integration>

Microsoft
Power BI
with R and
Python

	Power BI Add-ins for R and Python
Models Available	Medium - leverages shared and pre-tuned models
Model Design	UI Design First
Data Security and Considerations	Data Models required
Infrastructure and Security	Uses dataflows for "design driven" regression, classification and clustering models
Ease of Use/Difficulty	Easy to Medium
Interpretability	Easy to Medium
Costs	Low - already included in Power BI with Premium Capacity

<https://learn.microsoft.com/en-us/power-bi/transform-model/dataflows/dataflows-machine-learning-integration>



Sorry I'm not giving
you a definitive answer,



Environments and Demos

Environments and Demo's

- Data Science Virtual Machine Server – from the Azure Portal
- ML.NET - Visual Studio Community 2022 – Visual Studio Code
- Azure Machine Learning Server Studio - look and feel
- Power BI with R and Python - EDA example
- Helen Wall – LinkedIn Learning

Data Science Virtual Machine Server

The image shows a Remote Desktop Connection window titled "168.62.174.181:3389 - Remote Desktop Connection". The desktop environment includes several application icons on the left: Azure ML Studio, Azure Portal, DSVM Documenta..., Jupyter, PyCharm Communi..., R 4.2.3, and RStudio. The taskbar at the bottom contains icons for Windows, search, File Explorer, Edge, Visual Studio Code, JupyterLab, and RStudio.

The main window is a web browser displaying the Azure Machine Learning Studio interface. The browser tabs include "Home - Microsoft Azure", "Microsoft Azure Machine Learnin...", and "JupyterLab". The address bar shows the URL: <https://ml.azure.com/home?tid=9dc76f7b-8f4d-469b-9d53-ea5bc4b213d0>. The page title is "Machine Learning Studio".

The interface features a blue header with the text "Machine Learning Studio" and a "Create workspace" button. Below the header, the main content area displays a welcome message: "Welcome to the Azure Machine Learning Studio" and "Create a new workspace, or open one of your recent workspaces to pick up where you left off." A "View all workspaces" link is visible to the right.

The "Recent workspaces" section lists two workspaces:

- aml-workspace01**: Subscription: Microsoft Partner Network
- Azureml-SDK-WS01**: Subscription: Microsoft Partner Network

The "Learning components" section includes three cards:

- Build AI solutions with Azure Machine Learning**
- Introduction to the Azure Machine Learning SDK**
- Train a machine learning model with Azure ML**

A "View all learning components" link is located at the bottom right of this section. The "Tutorials" section is partially visible at the bottom of the page.

ML.Net and Visual Studio Code/Community 2022

The screenshot displays the Visual Studio Code interface for a project named 'TaxiFarePrediction'. The main window shows the 'Train' scenario in the 'MLModel1.mbconfig' file. The training setup summary indicates a time to train of 600 seconds. The training results are summarized as follows:

- Best quality (RSquared): 0.8778
- Best model: FastForestRegression
- Training time: 5.03 seconds
- Models explored (total): 2

The 'Output' window shows the training process details, including the available trainers (LGBM, RF, FASTTREE, LBFGS, SDCA) and the training time in seconds (600). The output table lists the results for two models:

	Trainer	RSquared	Duration
0	FastForestRegression	0.8778	3.0630
1	FastTreeTweedieRegression	-0.8926	1.9660

The Solution Explorer on the right shows the project structure, including files like 'Index.cshtml.cs', 'Privacy.cshtml', 'appsettings.json', 'Program.cs', 'Dependencies', 'Properties', 'data', 'MLModel1.mbconfig', 'MLModel1.consumption.cs', 'MLModel1.training.cs', 'MLModel1.zip', 'MLModel1_Notebook1.ipynb', and 'MLModel1_Notebook1-MLModel1.zip'. The Browser Link Dashboard at the bottom right shows connections for 'TaxiFare_API' and 'TaxiFare_Web'.

ML.Net and Visual Studio Code/Community 2022

The screenshot displays the Visual Studio interface for a project named 'TaxiFarePrediction'. The main window shows the 'MLModel1.mbconfig' file with the following code:

```
//Load sample data
var sampleData = new MLModel1.ModelInput()
{
    Vendor_id = @"CMT",
    Rate_code = 1F,
    Passenger_count = 1F,
    Trip_distance = 1.5F
}
```

Below the code, the 'Project templates' section offers three options for using the model:

- Console app**: A .NET console application that uses your model to make predictions. [Add to solution](#)
- Web API**: An ASP.NET Core web API that consumes your model. [Add to solution](#)
- Notebook**: An interactive Notebook with code for re-training your model and visuals for data exploration and model explainability. Requires a notebook extension. [Add to solution](#)

The 'Solution Explorer' on the right shows the project structure:

- Solution 'TaxiFarePrediction' (3 of 3 projects)
 - TaxiFare_API
 - TaxiFare_Web
 - TaxiFarePrediction**
 - Dependencies
 - Properties
 - data
 - MLModel1.mbconfig
 - MLModel1.consumption.cs
 - MLModel1.training.cs
 - MLModel1.zip
 - MLModel1_Notebook1.ipynb
 - MLModel1_Notebook1-MLModel1.zip
 - Program.cs

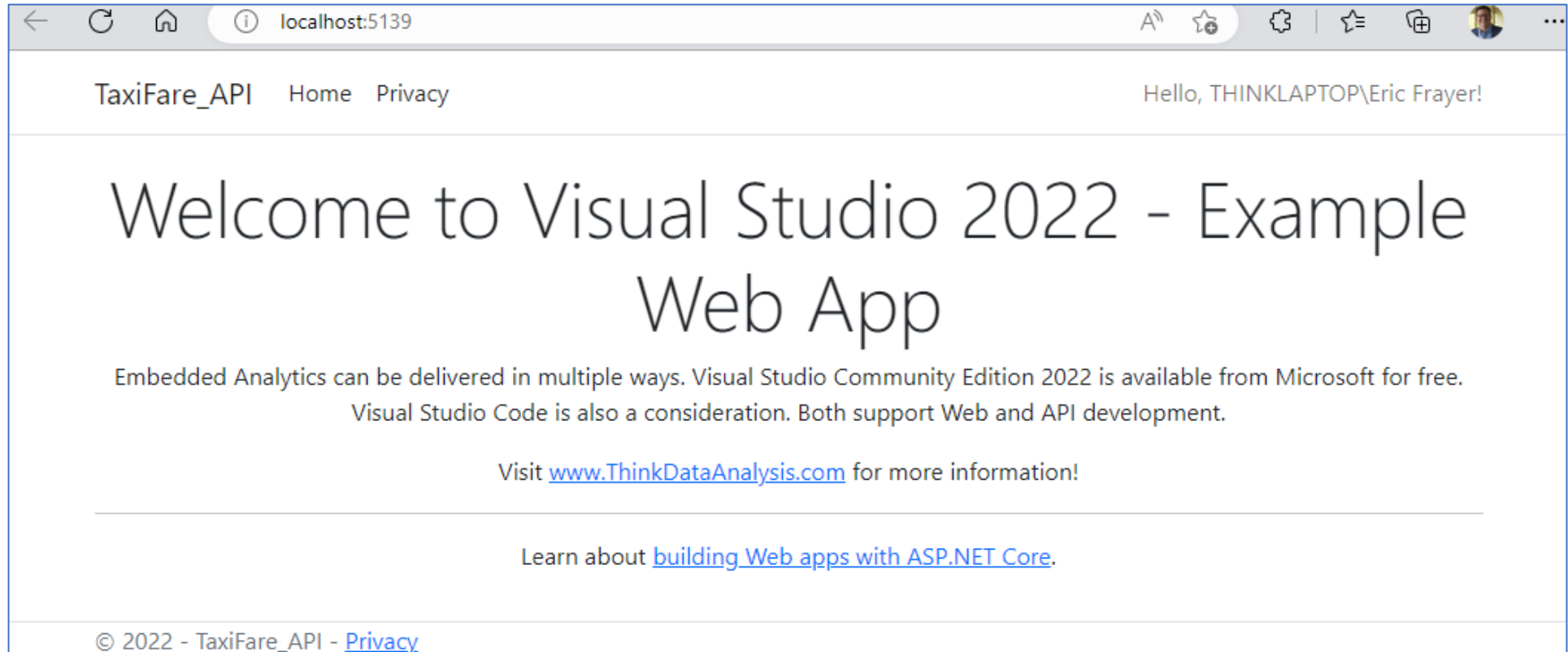
The 'Output' window at the bottom shows the following log:

```
Updating nuget dependencies...
Starting update NuGet dependencies async.
Installing nuget package, package ID: Microsoft.ML, package Version: 1.7.1
Installing nuget package, package ID: Microsoft.ML.LightGbm, package Version: 1.7.1
COMPLETED
```

The 'Properties' window shows the project properties for 'TaxiFarePrediction':

TaxiFarePrediction Project Properties	
Misc	
File Name	TaxiFarePrediction.csproj
Full Path	C:\Users\Eric Frayer\source\code\TaxiFarePrediction
Project Folder	C:\Users\Eric Frayer\source\code\TaxiFarePrediction
File Name	
Name of the project file.	

ML.Net and Visual Studio Code/Community 2022



Azure Machine Learning Studio

Microsoft Azure Machine Learning Studio

ERICFRAYER > aml-workspace01 > Notebooks

Notebooks

Files Samples

- Users
 - info
 - azureml-getting-started
 - azureml-sdk-for-r
 - Keras
 - ml-basics
 - challenges
 - data
 - models
 - .gitignore
 - 01 - Data Exploration.ipynb
 - 01-Data Exploration ERF.ipynb
 - 02 - Regression.ipynb
 - 03 - Classification.ipynb
 - 04 - Clustering.ipynb

02 - Regression.ipynb

Edit in VS Code Compute: info... Python 3.8 - AzureML

Regression

Supervised machine learning techniques involve training a model to operate on a set of *features* and predict a *label* using a dataset that includes some already-known label values. The training process *fits* the features to the known labels to define a general function that can be applied to new features for which the labels are unknown, and predict them. You can think of this function like this, in which y represents the label we want to predict and x represents the features the model uses to predict it.

$$y = f(x)$$

In most cases, x is actually a *vector* that consists of multiple feature values, so to be a little more precise, the function could be expressed like this:

$$y = f([x_1, x_2, x_3, \dots])$$

The goal of training the model is to find a function that performs some kind of calculation to the x values that produces the result y . We do this by applying a machine learning *algorithm* that tries to fit the x values to a calculation that produces y reasonably accurately for all of the cases in the training dataset.

There are lots of machine learning algorithms for supervised learning, and they can be broadly divided into two types:

- Regression algorithms:** Algorithms that predict a y value that is a numeric value, such as the price of a house or the number of sales transactions.

Azure Machine Learning Studio

The screenshot displays the Microsoft Azure Machine Learning Studio interface. The browser address bar shows the URL: <https://ml.azure.com/visualinterface/authoring/Normal/a0fbac7f-365a-422c-bdc4-da86902b30b5?wsid=/s...>. The page title is "Microsoft Azure Machine Learning Studio".

The interface is divided into several sections:

- Left Navigation Panel:** Contains "All workspaces", "Home", "Model catalog (PREVIEW)", "Authoring" (Notebooks, Automated ML, Designer), and "Assets" (Data, Jobs, Components, Pipelines, Environments).
- Top Bar:** Shows the user "ERICFRAYER" in workspace "aml-workspace01". It includes navigation icons for Undo, Redo, Validate, Show lineage, Clone, and a "Configure & Submit" button.
- Search and Filter:** A search bar "Search by name, tags and description" and a filter section with "Tags: All" and "Add filter".
- Component Catalog:** A list of components under the "Component" tab, including Data Transformation (19), Computer Vision (6), Model Scoring & Evaluation (6), Machine Learning Algorithms (19), Text Analytics (7), Python Language (2), Data Input and Output (3), Recommendation (5), R Language (1), and Feature Selection (2).
- Authoring Canvas:** Displays a pipeline named "LoanApplicationsPrediction01". The pipeline consists of:
 - A "Two-Class Logistic Regression" component (two_class_logistic_regression) receiving an "Untrained_model" input.
 - A "Train Model" component (train_model) receiving "Untrained mod..." and "Dataset" inputs, producing a "Trained model".
 - A "Score Model" component (score_model) receiving "Trained model" and "Dataset" inputs, producing a "Scored dataset".
 - Two "Results datas..." components at the top, which are connected to the "Scored dataset" output.
- Bottom Bar:** Includes a "Navigator" icon, a zoom level of "100%", and other utility icons.

Power BI and AI/ML

The screenshot displays the Power BI Desktop interface for a dataset named 'PBI_and_EDA'. The interface is divided into several panes:

- Dataset Summary:** A table providing an overview of the data, including the number of unique values, frequency of valid values, and the percentage of missing data for each variable.
- Descriptive Statistics for Numeric Variables:** A table showing statistical measures for numeric variables such as mean, standard deviation, minimum, quartiles, maximum, median, interquartile range, coefficient of variation, skewness, and kurtosis.
- Basic Dataset Info:** A table listing dataset attributes like the number of columns, rows, and missing values.
- Dataset Sample:** A table showing a sample of data rows with columns for Name, Pclass, Sex, Age, SibSp, Parch, Ticket, Fare, Cabin, Embarked, and Survived.
- Visualizations:** A pane on the right offering various chart and table visual options for the selected data.
- Fields:** A pane on the right showing the list of available data fields for selection.

The bottom of the interface features a navigation bar with tabs for different analysis types: Summary, Missing Values Analysis, Univariate Analysis, Multivariate Analysis, and Association Analysis. The current view is set to 'Summary'.

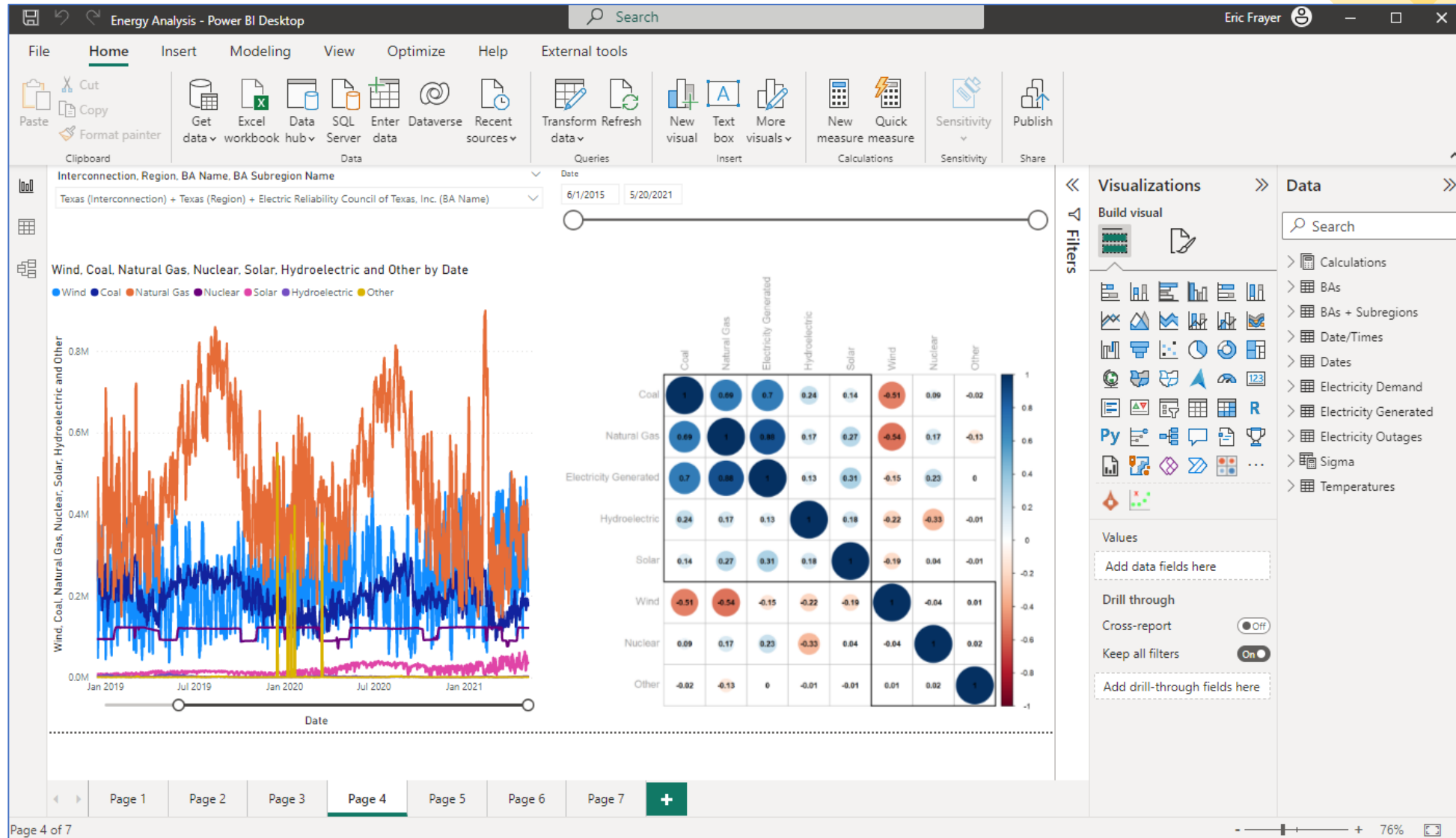
Variable	Stats Values	Unique Valid	Freq of Valid	Valid	Missing
Age [numeric]	Mean (sd) : 29.7 (14.5) min < med < max: 0.4 < 28 < 80 IQR (CV) : 17.9 (0.5)	88 distinct values	88 distinct values	714 (80.1%)	177 (19.9%)
Cabin [factor]		147 distinct values	1 (0.5%) 1 (0.5%) 1 (0.5%) 1 (0.5%) 1 (0.5%) 1 (0.5%) 1 (0.5%)	204 (22.9%)	687 (77.1%)

variable	mean	sd	min	q1	med	q3	max	mad	irq	cv	skewness	kurtosis
Survived	0.38	0.49	0.00	0.00	0.00	1.00	1.00	0.00	1.00	1.27	0.48	-1.77
SibSp	0.52	1.10	0.00	0.00	0.00	1.00	8.00	0.00	1.00	2.11	3.68	17.73
Pclass	2.31	0.84	1.00	2.00	3.00	3.00	3.00	0.00	1.00	0.36	-0.63	-1.28
Parch	0.38	0.81	0.00	0.00	0.00	0.00	6.00	0.00	0.00	2.11	2.74	9.69
Fare	32.20	49.69	0.00	7.90	14.45	31.00	512.33	10.24	23.09	1.54	4.77	33.12
Age	29.70	14.53	0.42	20.00	28.00	38.00	80.00	13.34	17.88	0.49	0.39	0.16

attribute	value
all_missing_columns	0
columns	11
complete_rows	183
continuous_columns	6
discrete_columns	5
duplicated_rows	0
memory_usage	184456
rows	891
total_missing_values	866
total_observations	9801

Name	Pclass	Sex	Age	SibSp	Parch	Ticket	Fare	Cabin	Embarked	Survived
Ahlin, Mrs. Johan (Johanna Persdotter Larsson)	3	female	40.00	1	0	7546	9.48	S		0
Allen, Mr. William Henry	3	male	35.00	0	0	373450	8.05	S		0
Andersson, Miss. Erna Alexandra	3	female	17.00	4	2	3101281	7.93	S		1
Andersson, Mr. Anders Johan	3	male	39.00	1	5	347082	31.28	S		0
Andreasson, Mr. Paul Edvin	3	male	20.00	0	0	347466	7.85	S		0
Arnold-Franchi, Mrs. Josef (Josefine Franchi)	3	female	18.00	1	0	349237	17.80	S		0
Asplund, Mrs. Carl Oscar (Selma Augusta Emilia Johansson)	3	female	38.00	1	5	347077	31.39	S		1
Backstrom, Mrs. Karl Alfred (Maria Mathilda Gustafsson)	3	female	33.00	3	0	3101278	15.85	S		1
Beesley, Mr. Lawrence	2	male	34.00	0	0	248698	13.00	D56	S	1
Bing, Mr. Lee	3	male	32.00	0	0	1601	56.50	S		1
Bonnell, Miss. Elizabeth	1	female	58.00	0	0	113783	26.55	C103	S	1
Braund, Mr. Owen Harris	3	male	22.00	1	0	A/5 21171	7.25	S		0
Caldwell, Master. Aiden Gates	2	male	0.83	0	2	248738	29.00	S		1
Cann, Mr. Ernest Charles	3	male	21.00	0	0	A/5. 2152	8.05	S		0
Carrau, Mr. Francisco M	1	male	28.00	0	0	113059	47.10	S		0
Celotti, Mr. Francesco	3	male	24.00	0	0	343275	8.05	S		0
Chaffee, Mr. Herbert Fuller	1	male	46.00	1	0	W.E.P. 5734	61.18	E31	S	0

Power BI and AI/ML



Power BI and AI/ML

The screenshot displays a LinkedIn Learning video player. The video title is "Power BI: Integrating AI and Machine Learning" with a subtitle "The power of Power BI". The video has 6,085 likes and 54,843 views. A text overlay on the video reads "machine learning in a way that generates insights". The video content shows a Power BI dashboard with violin plots and a grid of charts. The violin plots show the distribution of Megawatt Hours Generated by Date and Energy Source. The grid of charts shows the Count of Megawatt Hours Generated by Electricity Generated (MWH in 1000's) and Energy Source. The video player includes a progress bar at 0:19 / 0:57 and a "Give feedback" button.

Contents

- 3m 6s
- ✓ Configuring R in Power BI Desktop 3m 14s
- ✓ Introducing the course project 2m 47s
- ✓ Chapter Quiz 3 questions
- 1. Configuring Power Query and the Data Model
- 2. Analyzing a Single Variable
- ✓ Configuring aggregations and dimensionality 5m 17s
- ✓ Filtering options 6m 11s
- ✓ Calculating DAX measures 6m 25s
- ✓ Challenge: Single variable 1m 46s


Power BI: Integrating AI and Machine Learning
The power of Power BI

619 active




machine learning in a way that generates insights

Overview Q&A Notebook Transcript

INSTRUCTOR

 **Helen Wall**
Data analytics and business analysis expert
[Following on LinkedIn](#)

RELATED TO THIS COURSE

-  Learning Groups · [Show all](#)
-  Exercise Files · [Show all](#)
-  Certificates · [Show all](#)

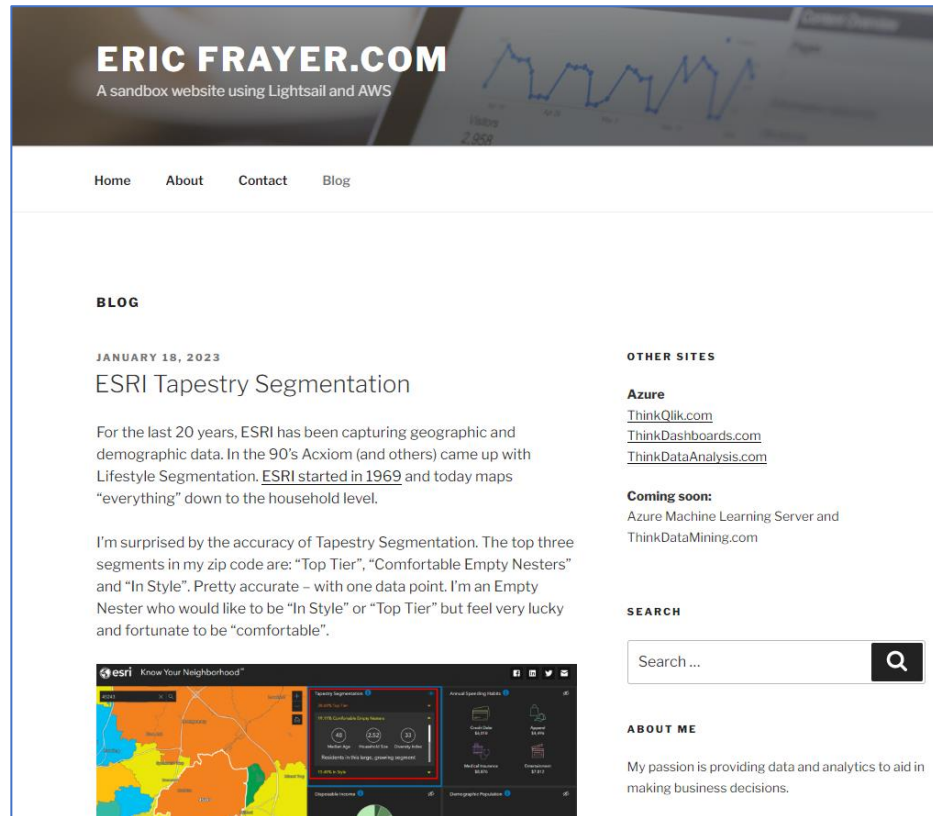
[Give feedback](#)



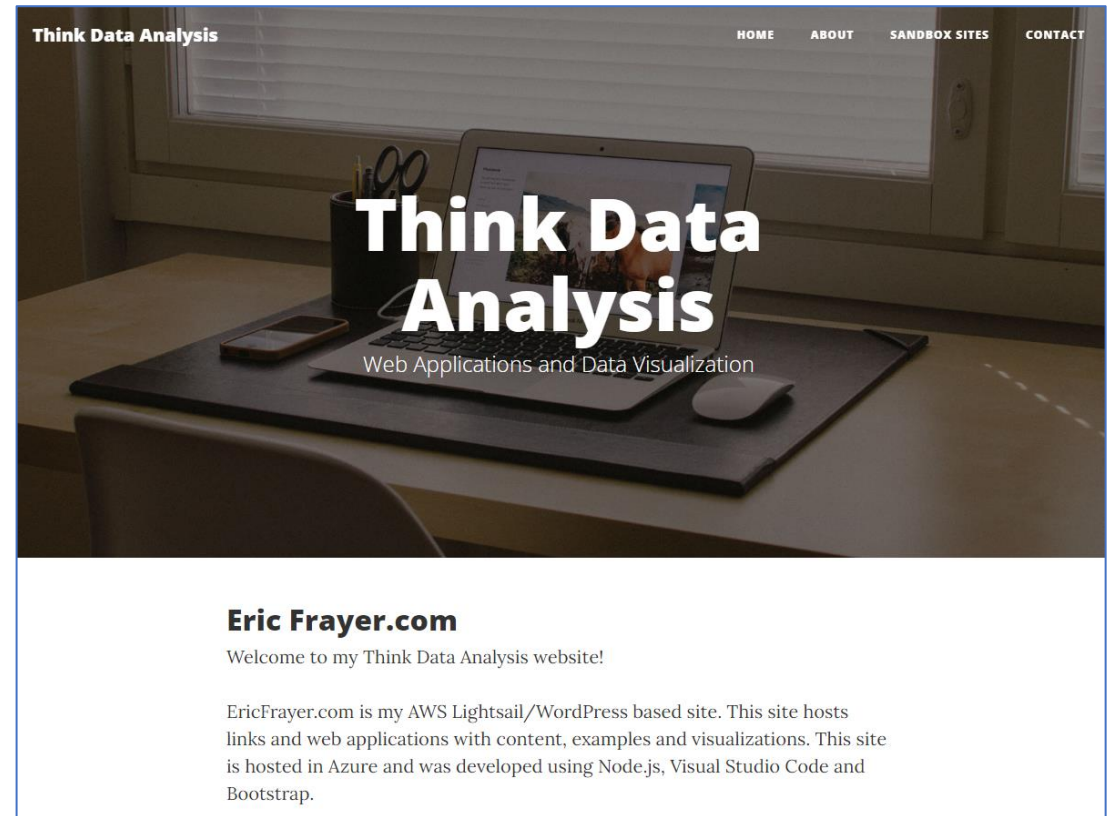
Resources



Questions?



<https://www.ericfrayer.com/>



<https://www.thinkdataanalysis.com/>

Thank You!

MEETUPS @ UNION HALL

DATA & ANALYTICS MEETUP

Informal monthly meetups at Union Hall in OTR featuring subject matter experts and enthusiasts of data and analytics in Cincinnati

Bridging the Gap Between Analytics and Value

Customers invest in products and services that create value for them. Value can be most effectively illustrated through stories that connect the dots of performance data, insights and visualization with the customer's perception of value at a given moment. Assembling and evolving these stories requires nuanced playbooks that connect and empower analytics, product, sales and customer teams. In this session, Jen will introduce a framework to expose and overcome common value story pitfalls.

6.21

Wednesday, June 21st

Union Hall, 1311 Vine St
4-5pm talk, 5-6pm networking



Jen Seale

Vice President of Analytics
Olive

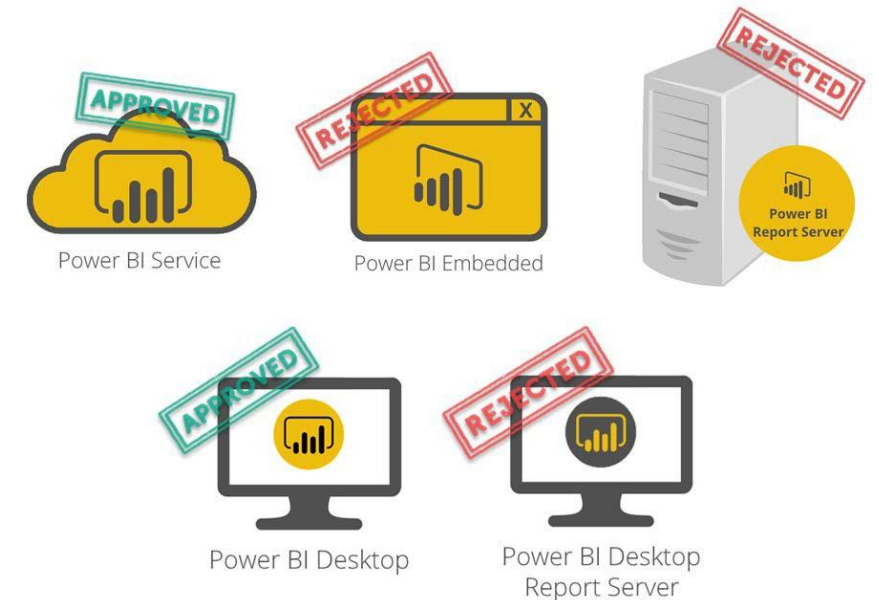
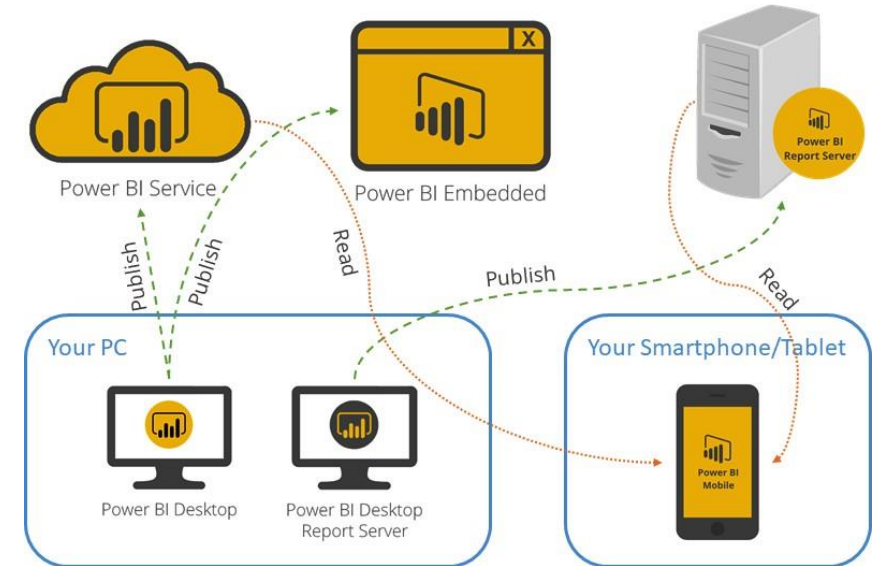


Appendix



R and Python limitations in Power BI

- **Power BI Service:** This is sometimes called **Power BI Online**, and it's the **Software as a Service (SaaS)** declination of Power BI. It was created to facilitate the sharing of visual analysis between users through Dashboards and Reports.
- **Power BI Report Server:** This is the on-premises version of Power BI and it extends the capabilities of **SQL Server Reporting Services**, enabling the sharing of reports created in **Power BI Desktop (for Report Server)**.
- **Power BI Embedded:** A Microsoft Azure service that allows dashboards and reports to be embedded in an application for users who do not have a Power BI account.
- **Power BI Desktop:** A free desktop application for Windows that allows you to use almost all of the features that Power BI exposes. It is not the right tool for sharing results between users, but it allows you to share them on Power BI Service and Power BI Report Server. The desktop versions that allow publishing on the two mentioned services are distinct.
- **Power BI Mobile:** A mobile application, available on Windows, Android, and iOS, that allows secure access to Power BI Service and Power BI Report Server, and that allows you to browse and share dashboards and reports, but not edit them.





What is the difference between AI and ML?



AI (Artificial Intelligence) is a broad field that encompasses many different subfields, including machine learning (ML). ML is a specific type of AI that involves the use of algorithms to learn patterns in data and make predictions or decisions without being explicitly programmed to do so. In other words, AI is the overarching concept of machines being able to perform tasks that would typically require human intelligence, while ML is a specific method of achieving AI, through training models on data.



What are good examples of Supervised versus Unsupervised learning?



Supervised learning is a type of machine learning where the model is trained on labeled data, meaning that the desired output or label is provided along with the input data. The goal of the model is to learn a mapping from inputs to outputs, and it is then applied to new, unseen data to make predictions.



Examples of supervised learning include:

- Image classification, where a model is trained to identify objects in an image (e.g. "dog,"



What is the difference between Principal Component Analysis and Exploratory Data Analysis



Principal Component Analysis (PCA) and Exploratory Data Analysis (EDA) are two different techniques used for analyzing data, but they have different goals and applications.



Principal Component Analysis (PCA) is a dimensionality reduction technique that is used to reduce the number of features in a dataset while preserving as much of the variance in the data as possible. It does this by identifying the directions in the data (i.e. the "principal components") that account for the most variance, and projecting the data onto these directions. PCA is typically used to improve the performance of machine learning models or to make data visualization easier.

Exploratory Data Analysis (EDA) is a technique used to understand the patterns and relationships in a dataset. It is an iterative process of visualizing and summarizing the data in order to gain insights and identify potential issues or areas of interest. EDA is typically used at the beginning of a data analysis project to get a better understanding of the data and to inform the development of more formal models or hypotheses.

In summary, PCA is a technique used to simplify and understand the underlying structure of the data by reducing the number of features, and EDA is a technique used to understand the patterns and relationships in a dataset for gaining insights and identify potential issues.