HKUSPACE
香港大學專業進修學院
HKU School of Professional and Continuing Education

Business Process Automation with VBA and Python

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- What is Process Automation, RPA, IPA?
- Overview of the technological building blocks related to process automation
- Contemporary tools for process automation
- Challenges and opportunities of business process automation
- Business implications of process automation

Intended Learning Outcomes

1. describe the contemporary trends of process automation and explain the opportunities and challenges of business process automation;
2. outline key steps in process automation project management and illustrate the significance of each step;
3. apply computational tools to implement process automation;
4. discuss the development of process automation and practical cases for business.

Agenda

1. How to Manage Your Budget with a Simple Python Script
2. Financial Forecasting with Machine Learning using Python
3. Introduction to Project Management in Business Process Automation
4. Methodologies in Project Management
5. Key Steps in Project Management
6. Understanding Business Process Automation
7. Integration of Project Management and Business Process Automation
8. Organizational Issues in Business Process Automation Projects 7 Project Scope and Requirements Gathering
9. Risk Management in Automation Projects
10. Change Management Best Practices
11. Performance Measurement and Key Performance Indicators (KPIs)
12. Case Studies of Successful Automation Projects
13. Conclusion and Future Directions

How to Manage Your Budget with a Simple Python Script

1. Getting User Input

```
import pandas as pd
import matplotlib.pyplot as plt

def get_user_input():
    """Get user input for income and expenses."""
    income = float(input("Enter your income: "))
    # Expecting expenses to be a dictionary input
    expenses = {}
    while True:
      category = input("Enter expense category (or 'done' to finish): ")
      if category.lower() == 'done':
            break
      amount = float(input(f"Enter amount for {category}: "))
      expenses[category] = amount
    return income, expenses
```

How to Manage Your Budget with a Simple Python Script

2. Calculating the Budget

```
def calculate_budget(income, expenses):
    """Calculate total expenses and balance."""
    total_expenses = sum(expenses.values())
    balance = income - total_expenses
    return total_expenses, balance
```

How to Manage Your Budget with a Simple Python Script

3. Displaying the Budget Summary

```
def display_budget_summary(income, total_expenses, balance):
    """Display the budget summary."""
    print(f"Income: ${income:.2f}")
    print(f"Total Expenses: ${total_expenses:.2f}")
    print(f"Balance: ${balance:.2f}")
```

How to Manage Your Budget with a Simple Python Script

4. Plotting the Expenses

```
def plot_expenses(expenses):
    """Plot the expenses as a bar chart."""
    df = pd.DataFrame(list(expenses.items()), columns=['Category', 'Amount'])
    df.plot(kind='bar', x='Category', y='Amount', legend=False)
    plt.ylabel('Amount ($)')
    plt.title('Expense Distribution')
    plt.show()
```

How to Manage Your Budget with a Simple Python Script

4. Main Function

```
income, expenses = get_user_input()
total_expenses, balance = calculate_budget(income, expenses)
display_budget_summary(income, total_expenses, balance)
plot_expenses(expenses)
```

How to Manage Your Budget with a Simple Python Script

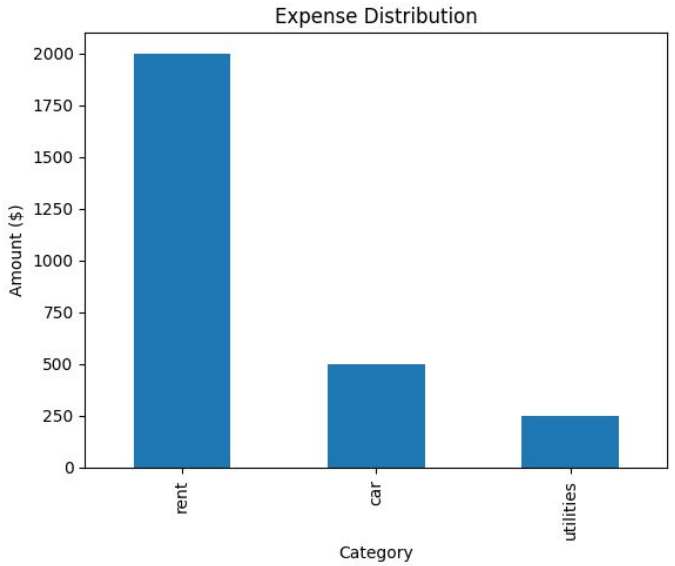
4. Main Function

Main Input

Enter your income: 10000
Enter expense category (or 'done' to finish): rent
Enter amount for rent: 2000
Enter expense category (or 'done' to finish): car
Enter amount for car: 500
Enter expense category (or 'done' to finish): utilities
Enter amount for utilities: 250
Enter expense category (or 'done' to finish): done

Result

Income: $10000.00
Total Expenses: $2750.00
Balance: $7250.00



Financial Forecasting with Machine Learning using Python (Numpy, Pandas, Matplotlib and Scikit-learn)

Step 1. Import the required libraries:

```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
from sklearn.preprocessing  import MinMaxScaler
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
from keras.models  import Sequential
from keras.layers import Dense, LSTM
Import requests
```

Step 2: Load the finance data from https://www.alphavantage.co:

```
api_key = 'demo‘
symbol = 'IBM‘
url =
      f'https://www.alphavantage.co/query?function=TIME_SERIES_DAILY_ADJUSTED&symbol={symbol}&outputsize=f
      ull&apikey={api_key}‘
response = requests.get(url)
data = response.json()
df = pd.DataFrame(data['Time Series (Daily)']).transpose()
df.index = pd.to_datetime(df.index)
df = df.sort_index()
```

Financial Forecasting with Machine Learning using Python (Numpy, Pandas, Matplotlib and Scikit-learn)

Step 3 – Preprocess the data:

```
# Extract the closing prices
y = df['4. close'].values.astype(float)
# Normalize the closing prices
scaler = MinMaxScaler(feature_range=(0, 1))
y = scaler.fit_transform(y.reshape(-1, 1))
# Create the feature matrix
X = []
for i in range(60, len(df)):
      X.append(y[i-60:i, 0])
X = np.array(X)# Split the data into training and validation sets
X_train, X_val, y_train, y_val = train_test_split(X, y[60:], test_size=0.2, shuffle=False)
```

Step 4 – Define the model:

```
model = Sequential()
model.add(LSTM(units=50, return_sequences=True, input_shape=(X_train.shape[1], 1)))
model.add(LSTM(units=50))
model.add(Dense(units=1))
model.compile(optimizer='adam', loss='mean_squared_error')
```

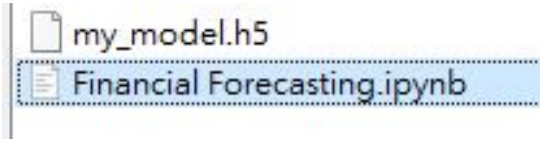
Financial Forecasting with Machine Learning using Python (Numpy, Pandas, Matplotlib and Scikit-learn)

Step 5 – Train the model with 100 steps:

```
model.fit(X_train, y_train, epochs=100, batch_size=32, validation_data=(X_val, y_val))
```

Step 6 – Save the model in h5 format:

```
model.save('my_model.h5')  # Save the model in HDF5 format
```

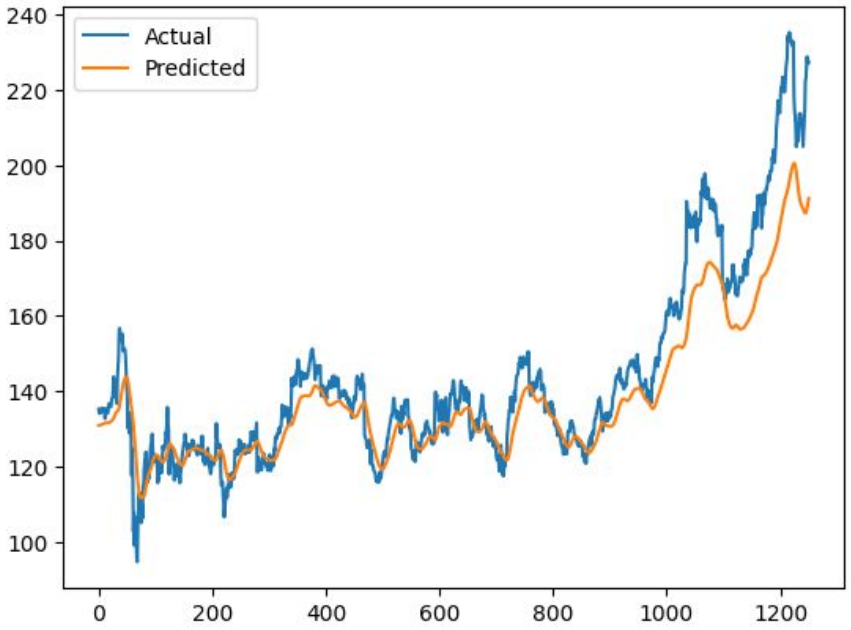


Step 7 – Evaluate the model:

```
# Evaluate the model on the validation set
y_pred = model.predict(X_val)
rmse = np.sqrt(mean_squared_error(y_val, y_pred))
print('Root Mean Squared Error:', rmse)
```

Step 8 – Visualize the results:

```
# Visualize the results
y_pred = scaler.inverse_transform(y_pred)
y_val = scaler.inverse_transform(y_val)
plt.plot(y_val, label='Actual')
plt.plot(y_pred, label='Predicted')
plt.legend()
plt.show()
```



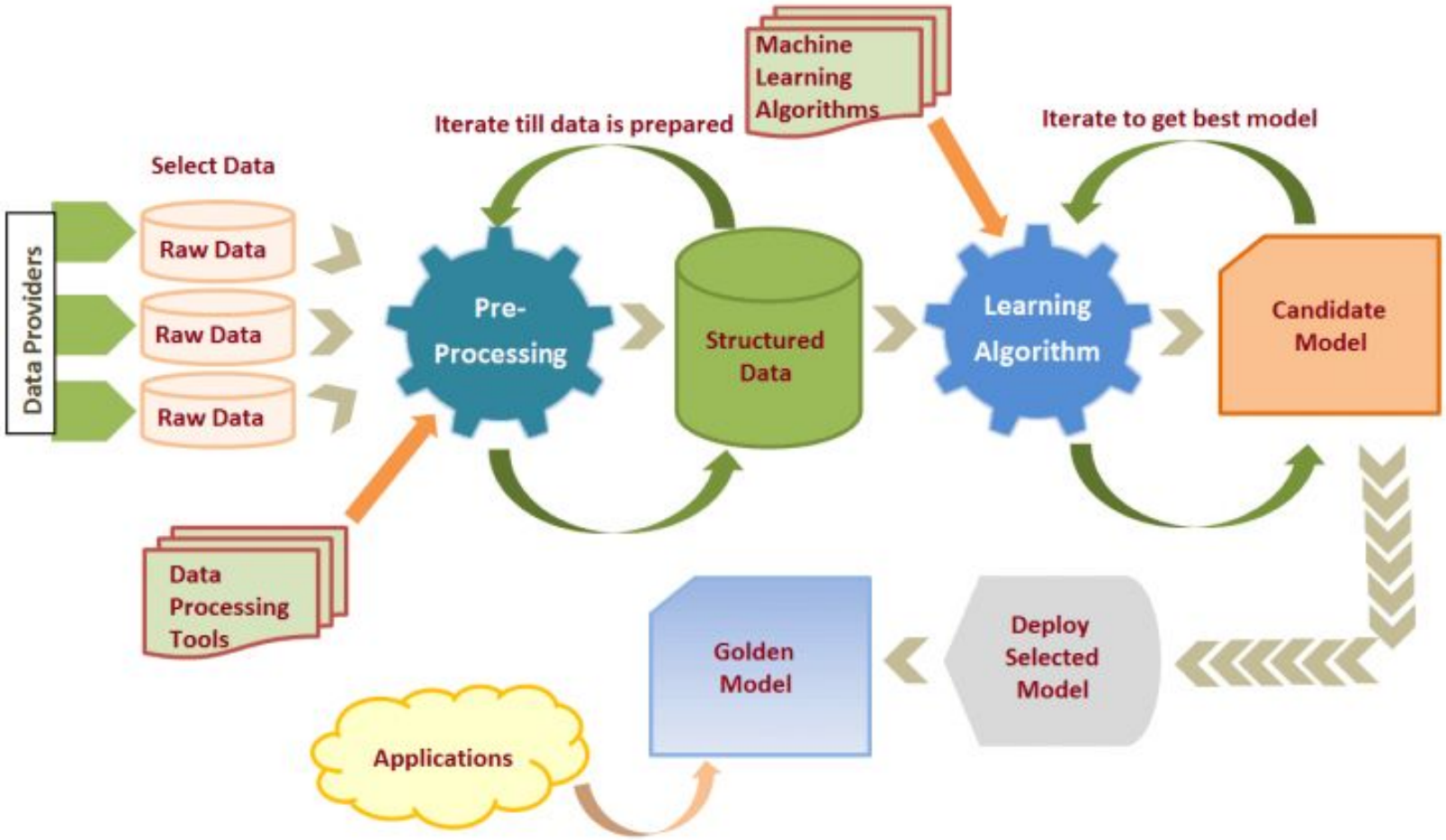
Financial Forecasting with Machine Learning using Python (Numpy, Pandas, Matplotlib and Scikit-learn)

Step 9 – Make predictions:

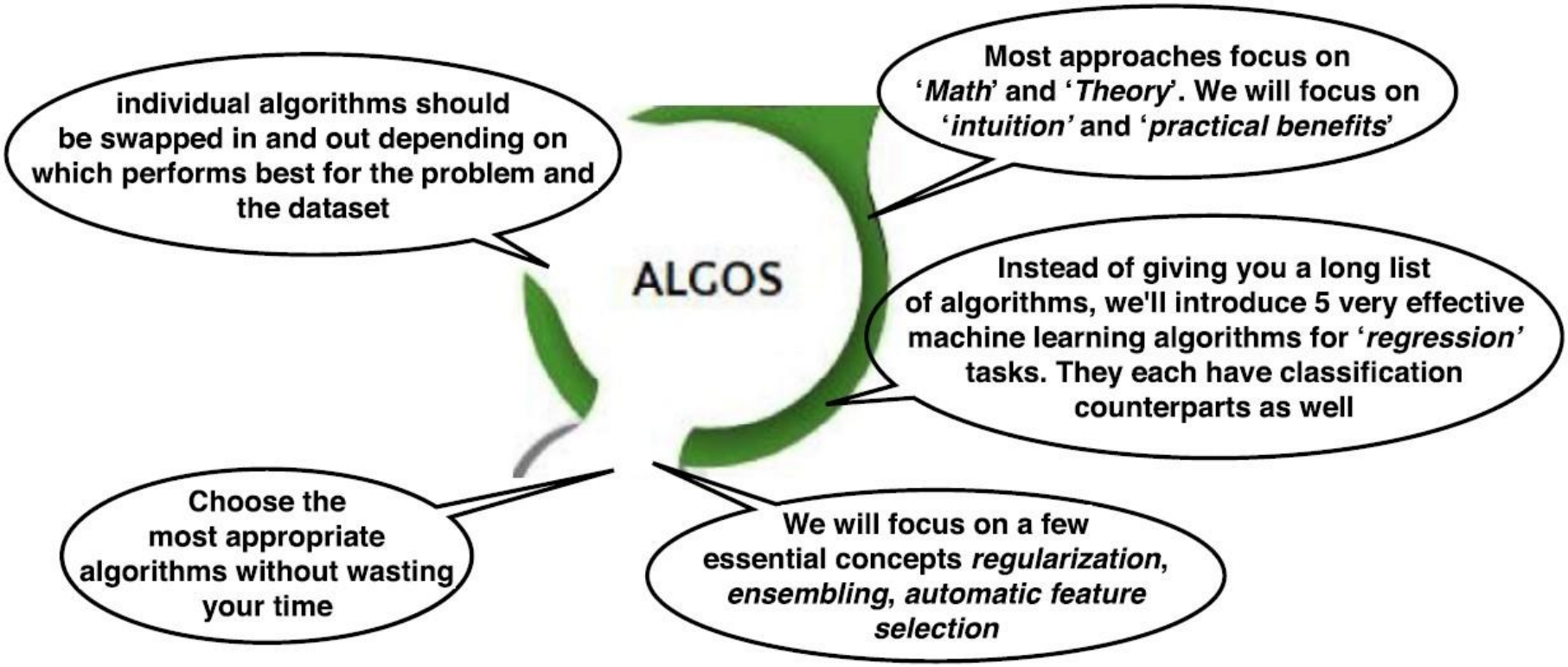
```
last_60_days = y[-60:]
last_60_days_scaled = scaler.transform(last_60_days.reshape(-1, 1))
X_test = []
X_test.append(last_60_days_scaled)
X_test = np.array(X_test)
X_test = np.reshape(X_test, (X_test.shape[0], X_test.shape[1], 1))
y_pred = model.predict(X_test)
y_pred = scaler.inverse_transform(y_pred)
print('Predicted price:', y_pred[0][0])
```

```
1/1 [==============================] - 1s 675ms/step
Predicted price: 40.51613
```

Applied Machine Learning Pipeline Overview

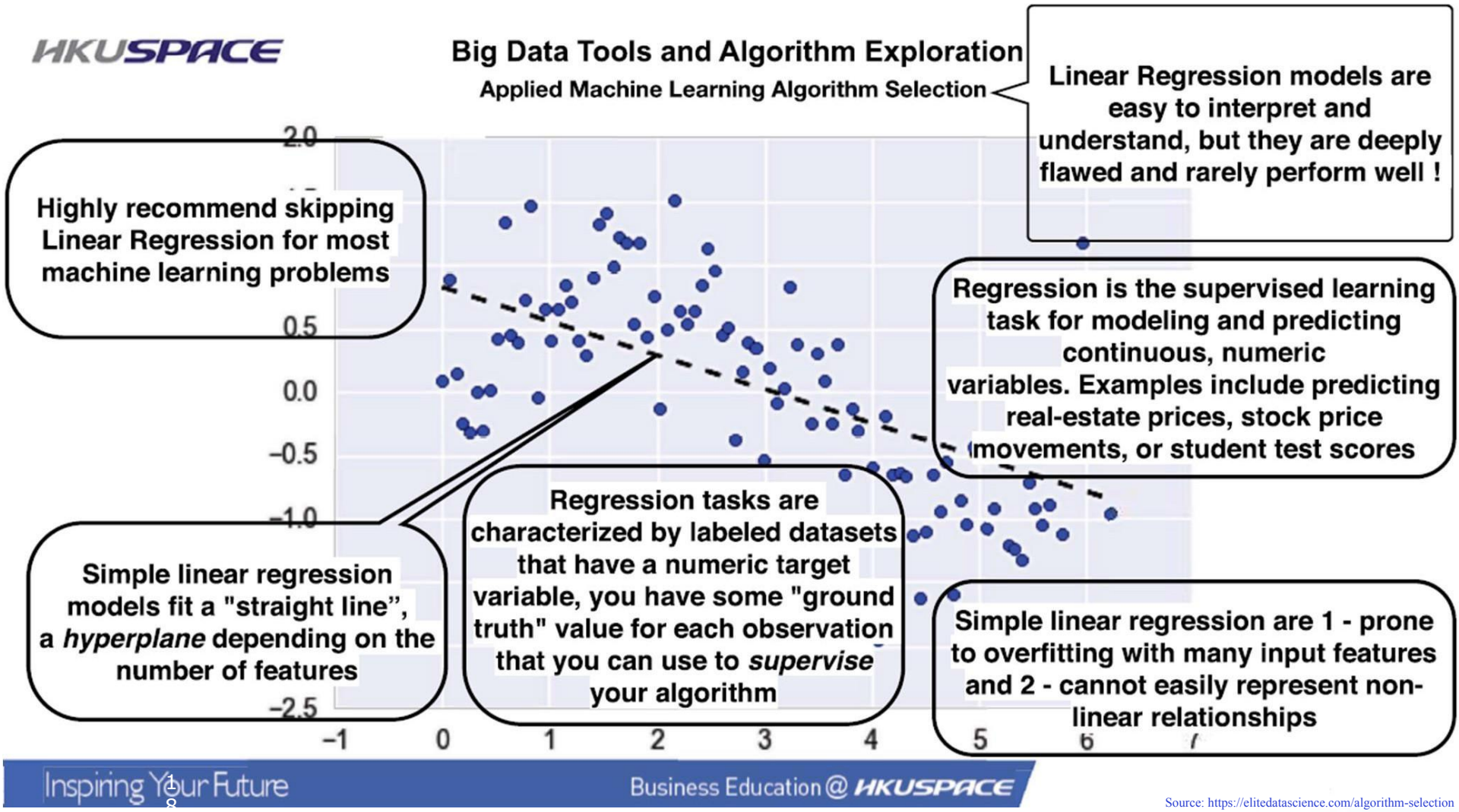


Applied Machine Learning Algorithm Selection Overview



Source: https://elitedatascience.com/algorithm-selection

Applied Machine Learning Algorithm Selection



Source: https://elitedatascience.com/algorithm-selection

Applied Machine Learning Algorithm Selection

Random forests train a large number of "strong" decision trees and combine their predictions through bagging

Each tree is only trained on a random subset of observations (a process called resampling)

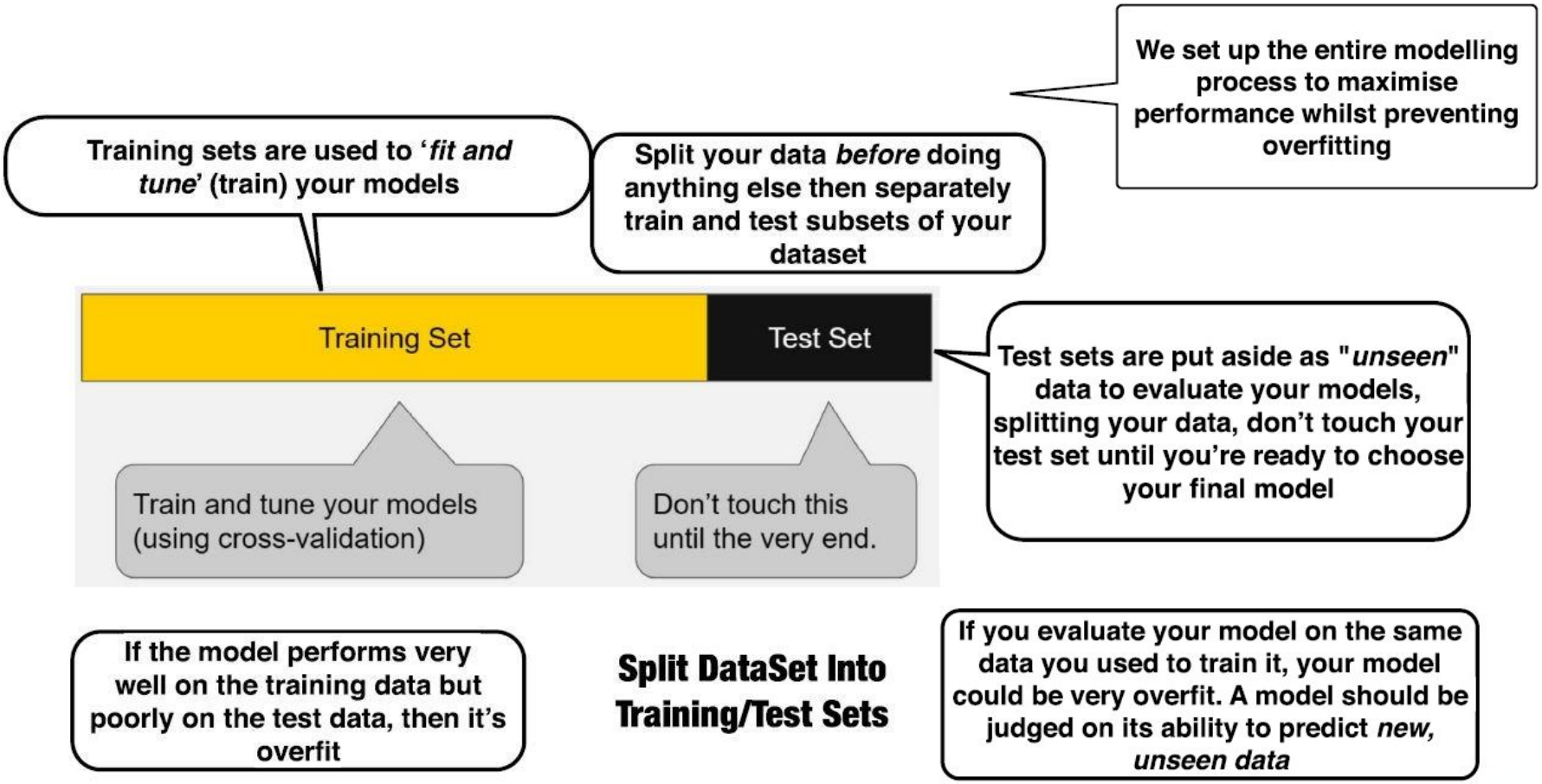
Random Forests

Each tree is only allowed to choose from a random subset of features to split on (leading to feature selection)

random forests tend to perform very well right out of the box often beat many other models that take up to weeks to develop, and are the perfect "*swiss-army-knife*" algorithm that almost always gets good results

Source: https://elitedatascience.com/algorithm-selection

Machine Learning Model Training

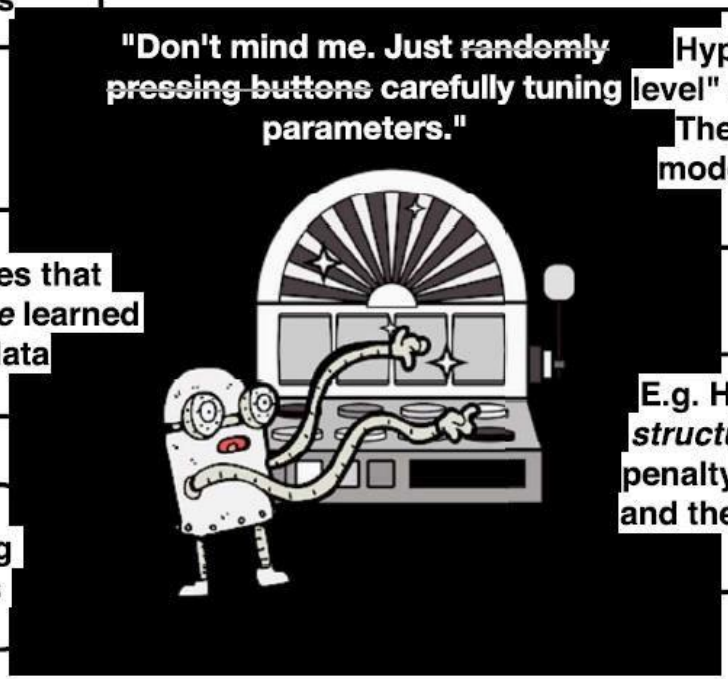


Source: https://elitedatascience.com/model-training

Machine Learning Model Training

Examples of Model parameters include regression coefficients, decision tree split locations

Hyperparameters: When we talk of tuning models, we specifically mean tuning hyperparameters



Hyperparameters express "higher-level" *structural settings* for algorithms. They are decided before fitting the model because they can't be learned from the data

Model parameters are attributes that define *individual models, and are* learned directly from the training data

E.g. Hyperparameters "higher-level" *structural settings* are strength of the penalty used in regularized regression and the number of trees to include in a random forest

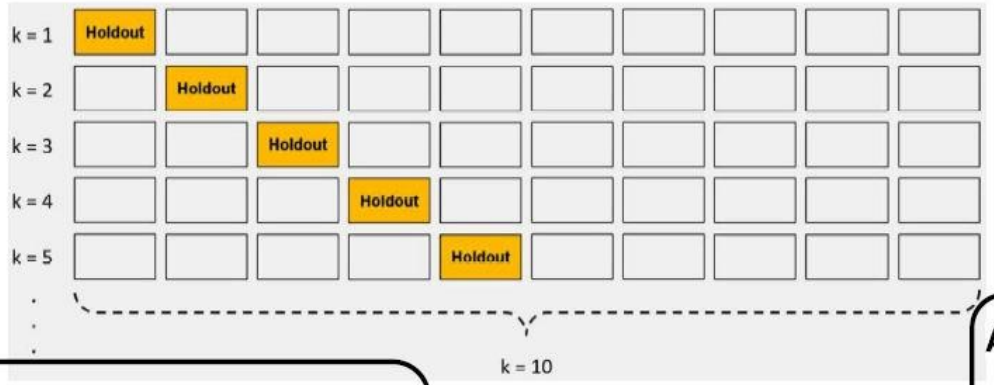
There are two types of parameters in machine learning algorithms: Model Parameters and hyperparameters

Source: https://elitedatascience.com/model-training

Machine Learning Model Training

Cross-validation is a tuning method for getting a reliable estimate of model performance using only training data

1- Split your data into 10 equal parts, or "folds", 2- Train your model on 9 folds (e.g. the first 9 folds)



3 - Evaluate it on the 1 remaining "hold-out" fold, Perform steps (2) and (3) 10 times, each time holding out a different fold

10-fold cross-validation, breaks your training data into 10 equal parts (or *folds*), essentially creating 10 miniature train/test splits

Average the performance across all 10 hold-out folds, average performance across the 10 hold-out folds is your final performance estimate, also called your *cross-validated* score

Source: https://elitedatascience.com/model-training

Machine Learning Model Training

We've split our dataset into training and test sets, and we've learned about hyperparameters and cross-validation, we're ready fit and tune our models

perform the entire cross-validation loop detailed above on each set of hyperparameter values using a high-level pseudo-code

```
For each algorithm (i.e. regularized regression, random forest, etc.):
  For each set of hyperparameter values to try:
    Perform cross-validation using the training set.
    Calculate cross-validated score.
```

At the end of this process, you will have a cross-validated score for each set of hyperparameter values... for each algorithm

Elastic-Net		
Penalty Ratio	Penalty Strength	CV-Score
75/25	0.01	0.63
75/25	0.05	0.64
75/25	0.10	**0.67**
50/50	0.01	0.62
50/50	0.05	0.63
50/50	0.10	0.66

Source: https://elitedatascience.com/model-training

Machine Learning Model Training

By now, you'll have 1 "best" model *for each algorithm* that has been tuned through cross-validation. Most importantly, you've only used the training data so far

Keep the set of hyperparameter values with best cross-validated score. Re-train the algorithm on the entire training set (without cross-validation)

For classification tasks, we recommend Area Under ROC Curve (AUROC). *Higher values are better*

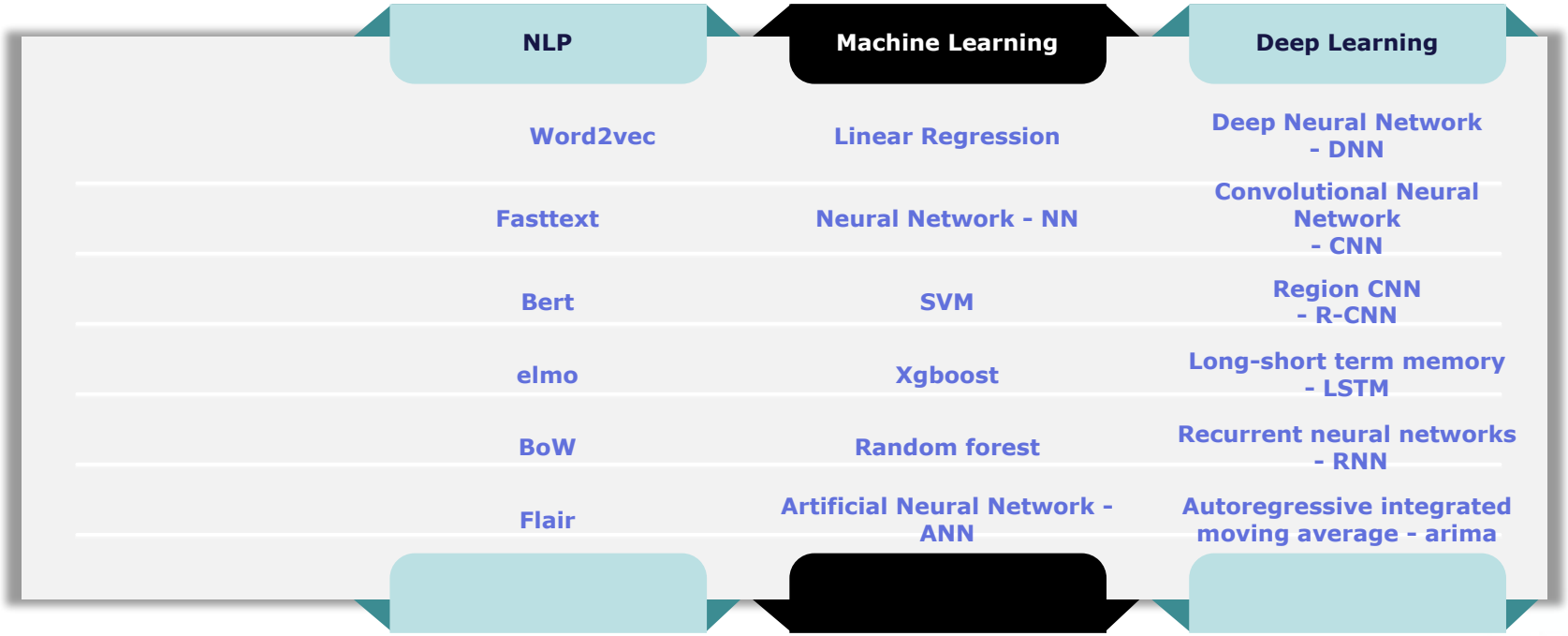
Because you've saved your test set as a truly unseen dataset, you can now use it get a reliable estimate of each models' performance.There are a variety of performance metrics you could choose from

For regression tasks, we recommend Mean Squared Error (MSE) or Mean Absolute Error (MAE). *(Lower values are better)*

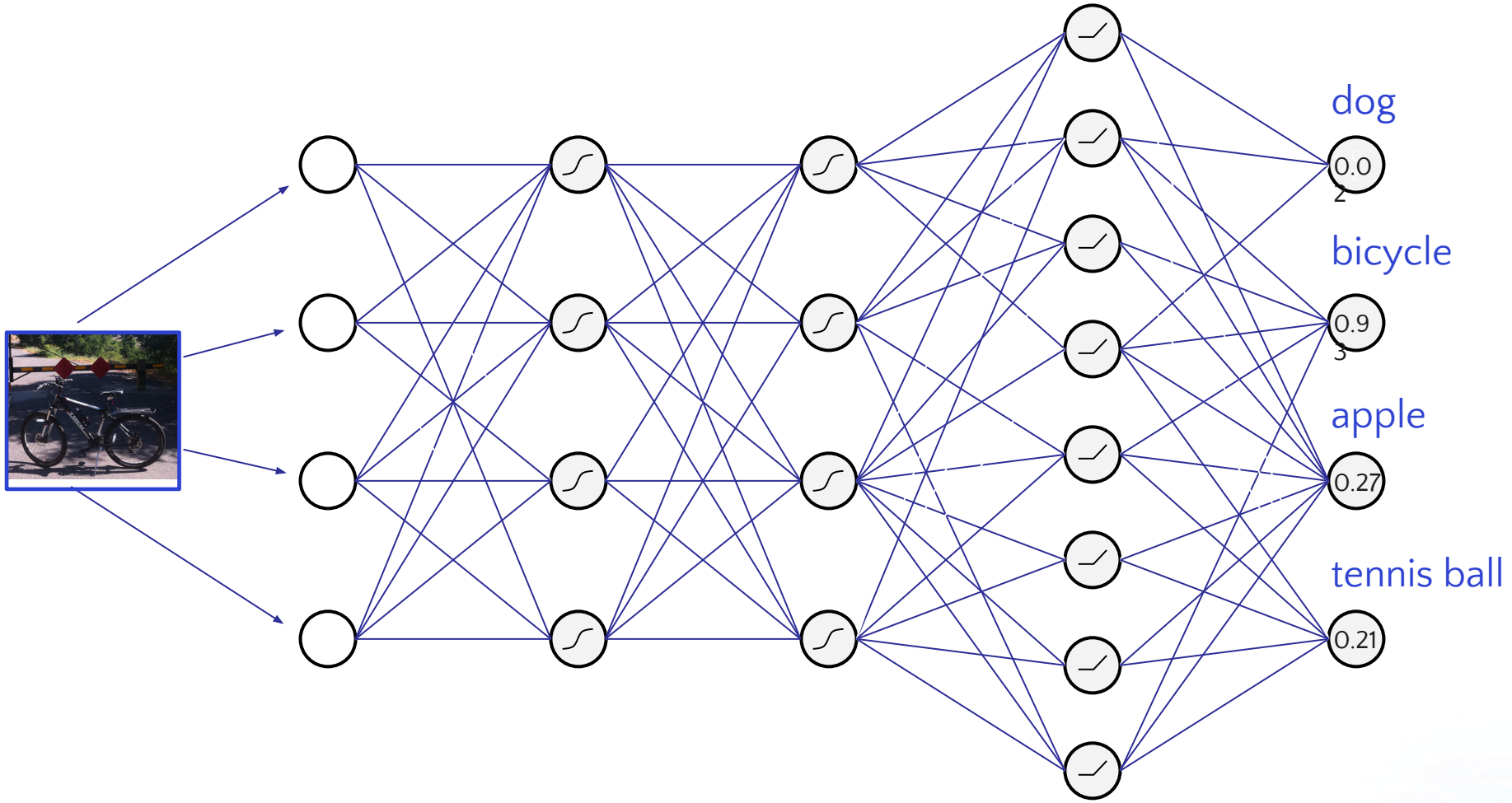
like the Hunger Games... each algorithm sends its own "representatives" (i.e. model trained on the best set of hyperparameter values) to the final selection

Source: https://elitedatascience.com/model-training

Modelling Techniques



Trained Convolutional NN

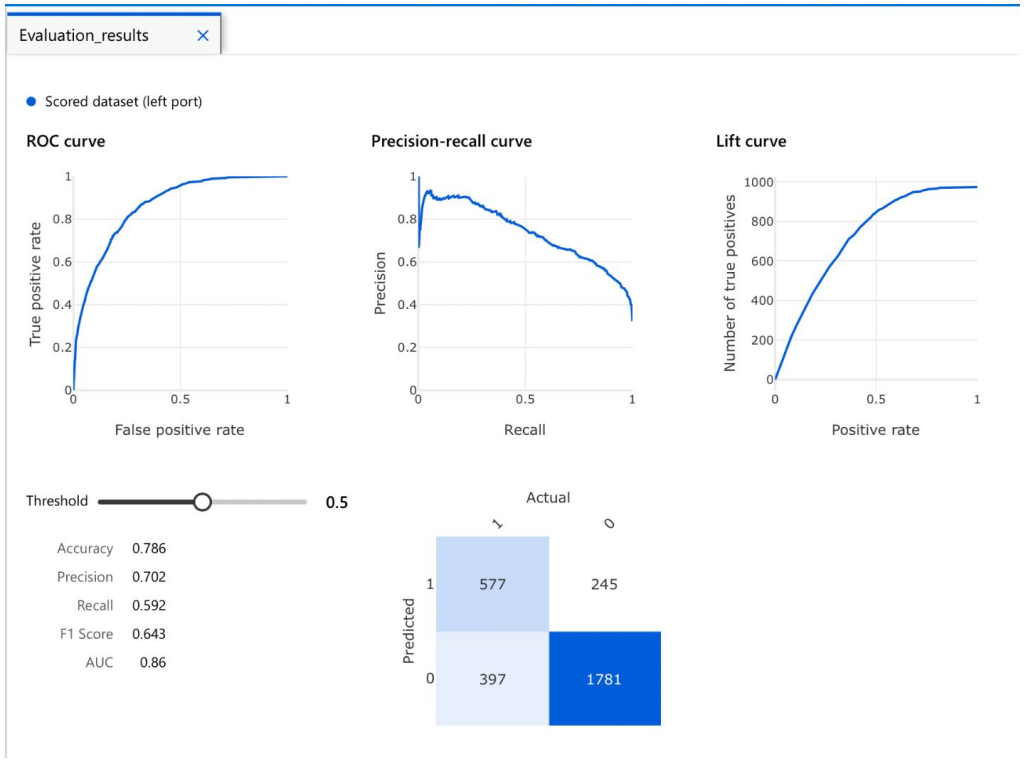


Machine Learning Model Training Visulisation

Select a metric to see a visualization or table of the data.

Search

- Accuracy
- AUC
- Confusion matrix
- F1 Score
- Lift curve
- Precision
- Precision-recall curve
- Recall
- ROC curve
- Scored bins



Score bin ↓	Positive exam...	Negative exam...	Fraction above thres...	Accura...	F1 Score	Precisi...	Recall	Negative precis...	Negative recall	Cumulative AUC
(0.900,1.000]	95	11	0.035	0.703	0.176	0.896	0.098	0.696	0.995	0.000
(0.800,0.900]	149	21	0.092	0.746	0.390	0.884	0.251	0.732	0.984	0.002

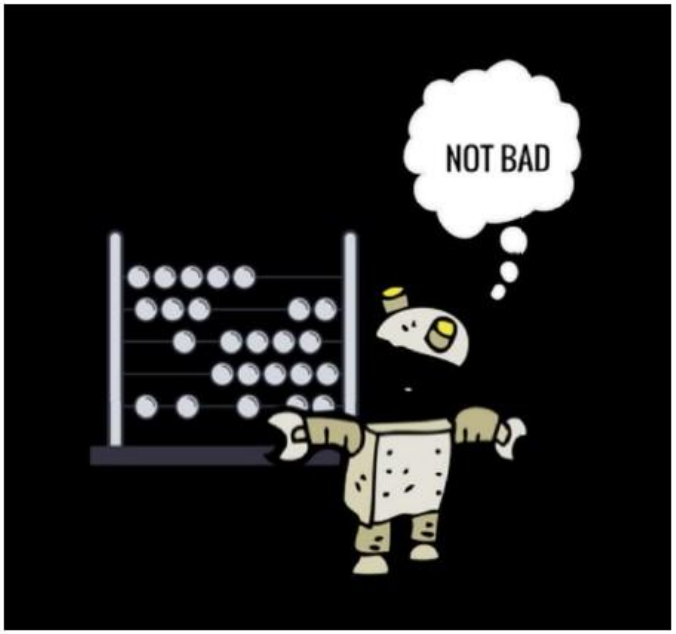
https://www.analyticsvidhya.com/blog/2021/09/a-comprehensive-guide-on-using-azure-machine-learning/

Machine Learning Model Training Conclusion

Pick the winning model by asking: Which model had the best performance on the test set? (performance)

Calculate performance metrics using those predictions and the "ground truth" target variable from the test set

For each of your models, make predictions on your test set



Pick the winning model by asking: Does it perform well across various performance metrics? (robustness)

Pick the winning model by asking: Did it also have (one of) the best cross-validated scores from the training set? (consistency)

Pick the winning model by asking: Does it solve the original business problem? (win condition)

Source: https://elitedatascience.com/model-training

What is a Project?

"**Unique process** consisting of a set of coordinated and controlled **activities** with **start** and **finish** dates, undertaken to achieve an objective conforming to specific requirements, including constraints of **time**, **cost**, **quality** and **resources**"

A Project is a planned set of activities
A Project has a scope
A Project has time, cost, quality and resource constraints

What is Project Management?

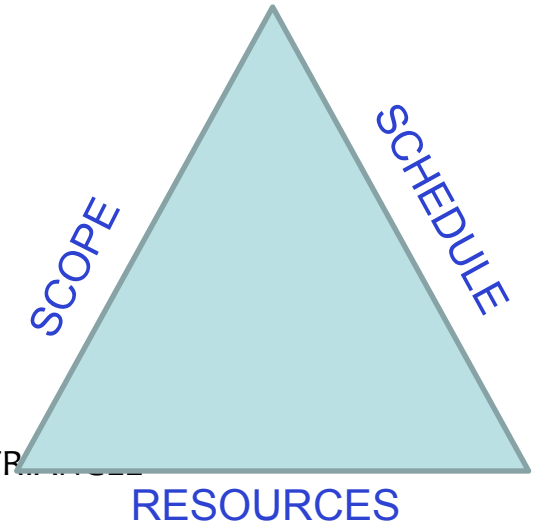
The art of organising, leading, reporting and completing a project through people

What is Project Management?

A project is a planned undertaking
A project manager is a person who causes things to happen
Therefore, project management is causing a planned undertaking to happen.

Project Management
The "Triple Constraint"

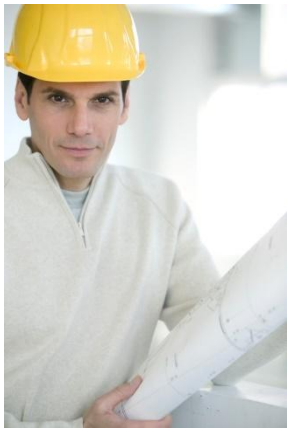
- The Project Manager / the researcher has certain constraints to battle with in delivering a project. These are referred to as "The Triple Constraint". They include:
  - Scope Management
  - Cost Management
  - Time Management
  - Quality Assurance
  - Human Resource Management
  - Communication Management
  - Risk Management
  - Conflict Management among others.



PROJECT CONSTRAINT TR

Project Manager Role

A Good Project Manager



- Takes ownership of the whole project
- Is proactive not reactive
- Adequately plans the project
- Is Authoritative (**NOT** Authoritarian)
- Is Decisive
- Is a Good Communicator
- Manages by data and facts not uniformed optimism
- Leads by example
- Has sound Judgement
- Is a Motivator
- Is Diplomatic
- Can Delegate

Stakeholder Engagement process

Identify Stakeholders

Assess needs

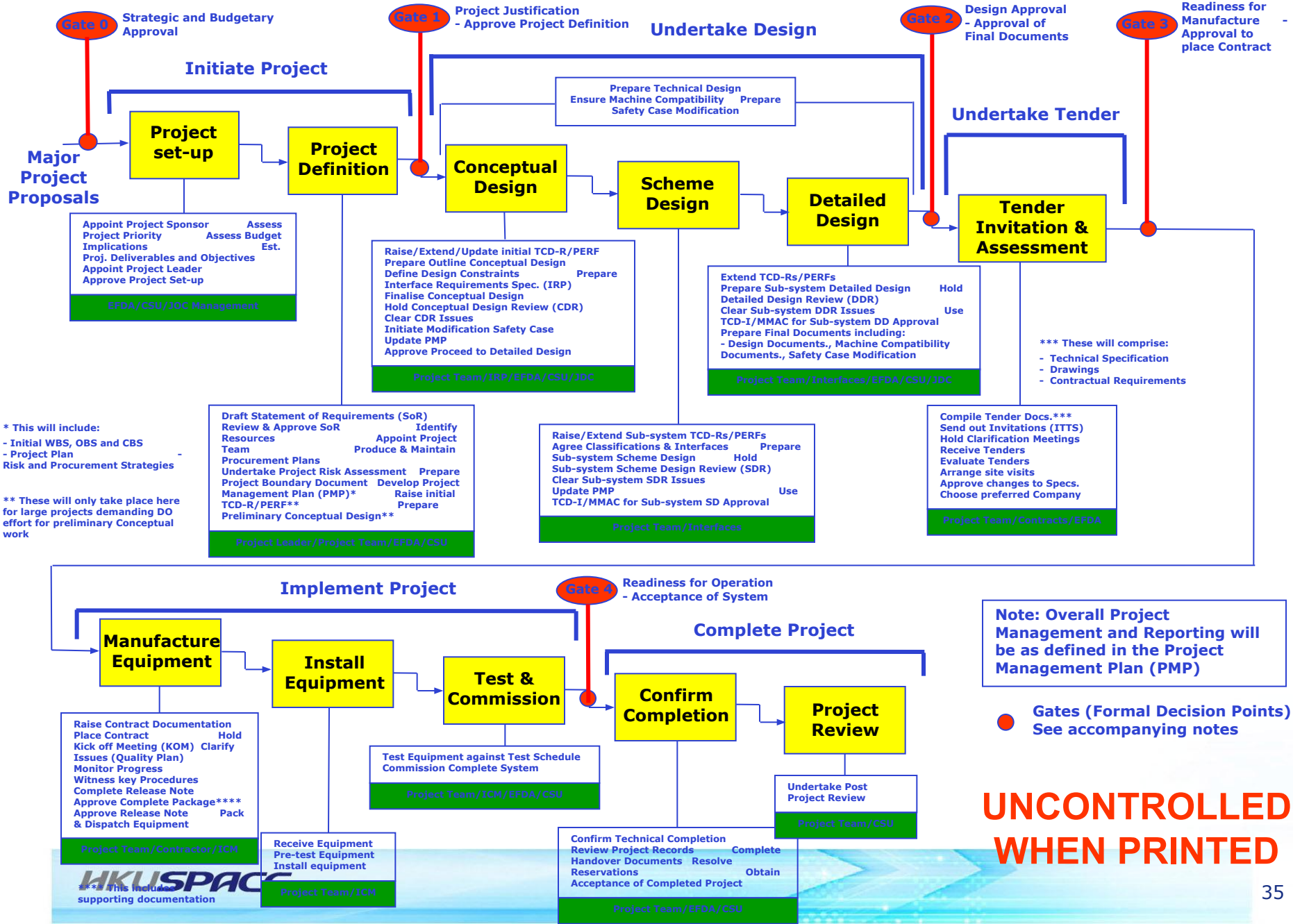
Define actions

Establish communication channels

Gather feedback

Monitor and review

The Project Process



Key Points in Project Set-up and Definition

- Create Project Management Plan (PMP)
- Be clear of scope and objectives
- Establish clear statement of what is to be done (WBS)
- Establish Risks to be Managed
- Establish Costs and Durations
- Establish Resources Required

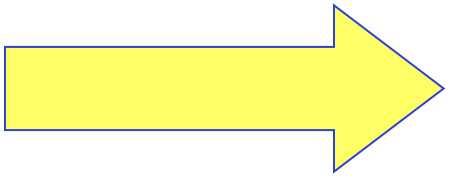
Project management Plan - PMP

- Master Document for Project
- Defines the following:-
  - Project Objectives, Scope, Deliverables
  - Stakeholders (Internal & External)
  - Work to be done (WBS)
  - Project Organisation and Resources (OBS)
  - Project Costings (CBS)
  - Project Schedule
  - Procurement/Contract Strategy
  - Risk Management
  - Quality management
  - Change Management

Project Planning

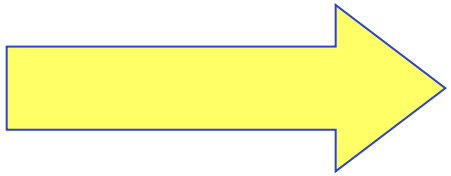
Project Planning

Adequate planning leads to the correct completion of work



Plan

Inadequate planning leads to frustration towards the end of the project & poor project performance



Project Start

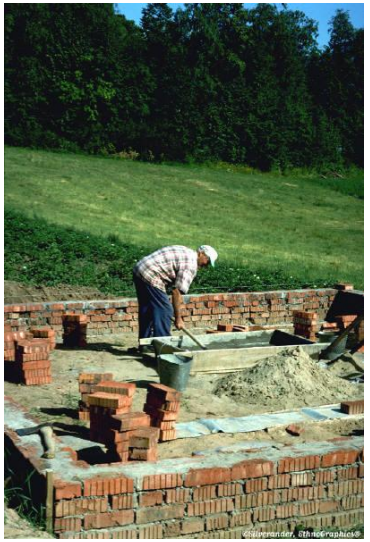
Project End

Work Breakdown Structure (WBS)

The Work Breakdown Structure is the foundation for effective project planning, costing and management.

It is the most important aspect in setting-up a Project

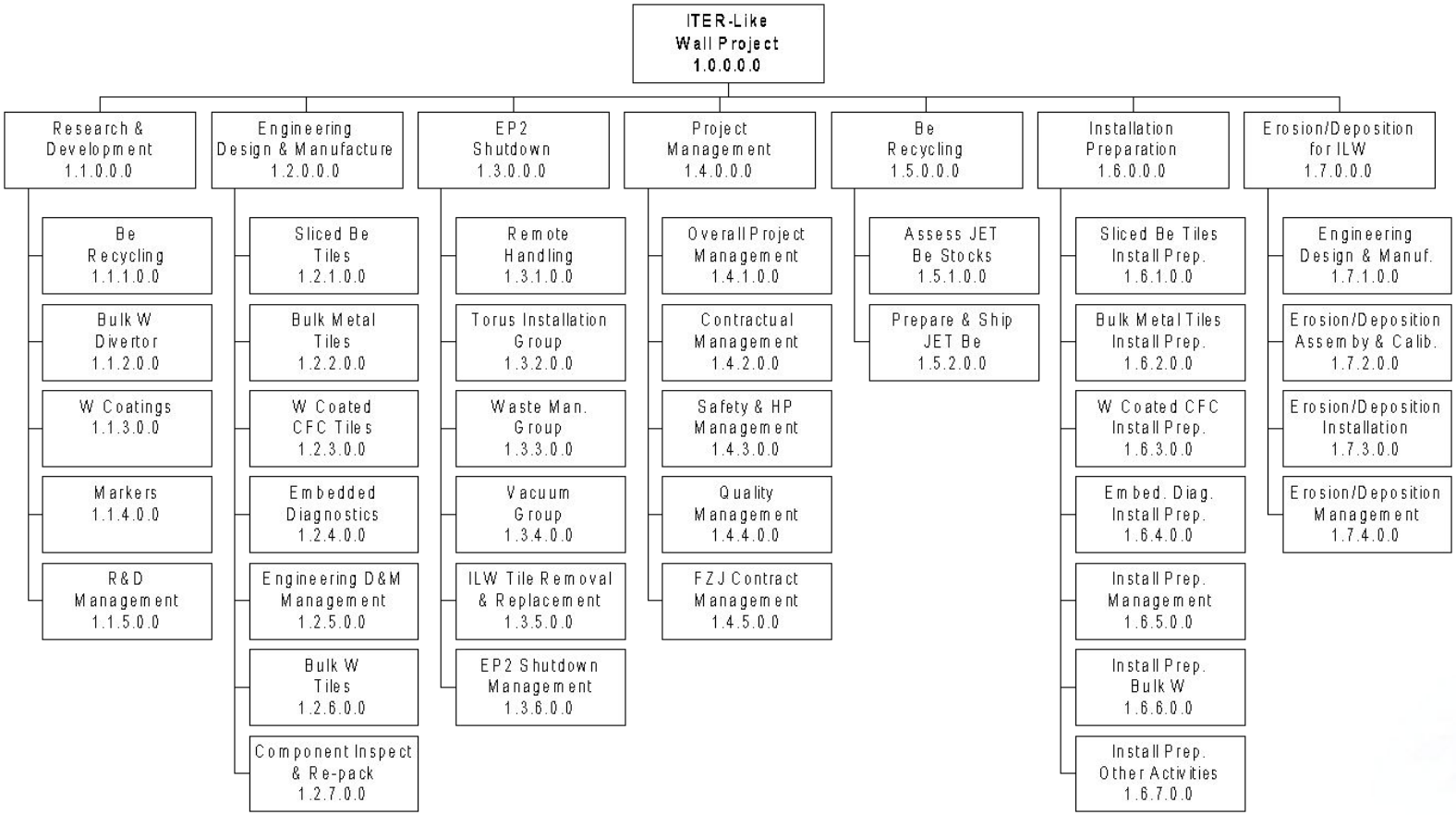
- It is the foundation on which everything else builds



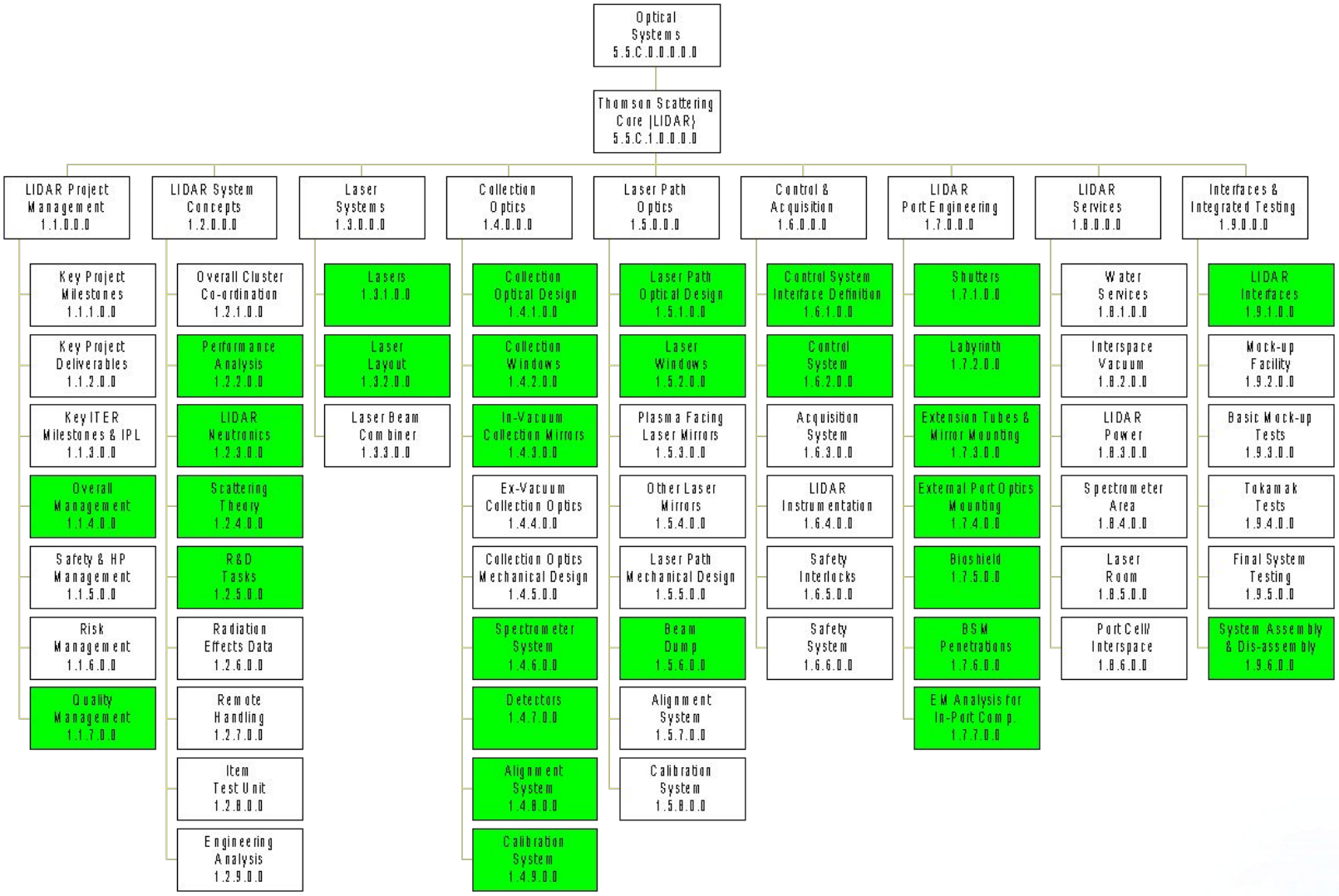
Work Breakdown Structure - Definition

"A Work Breakdown Structure (WBS) is a hierarchical (from general to specific) tree structure of deliverables and tasks that need to be performed to complete a project."

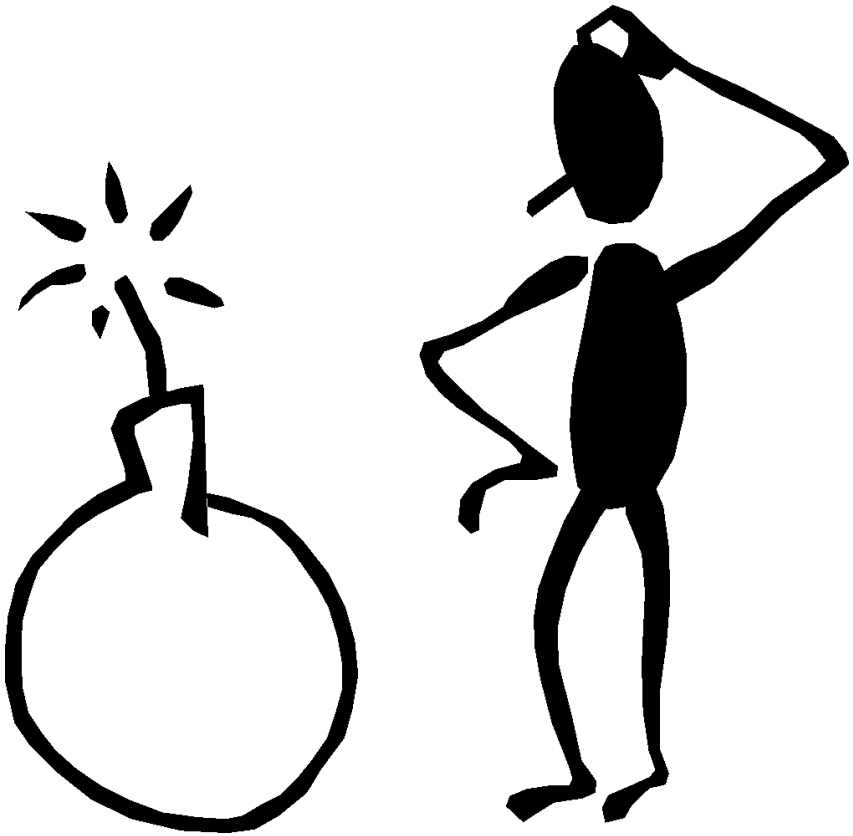
Example WBS - Top Level ILW Project



Example WBS - Top Level TSCL Project



Project Risk Management



Project Risk – Definition

"Project risk is an uncertain event or condition that, if it occurs, has a positive or negative effect on a project objective"

"A combination of the probability of a defined **threat** or **opportunity (Likelihood)** and the magnitude of the consequences of the occurrence (Impact) defines a Risk Index"

Risk Impact

Threat → Scope → **Poor Quality Product**

Threat → Schedule → **Late Delivery**

Threat → Cost → **Overspend**

In addition there are health, safety and environmental threats that **must** be managed

Risk Management Process

Identify Risks
Assess likelihood and impact
Rank risks and prioritize
Define risk management approach & actions
Implement actions
Monitor & review

Risk Management – Key Points

Make the management of risk integral to the way the project is managed
Ensure that cost and time contingencies are consistent with identified risks
Focus on the “significant few” – don’t try to manage too many risks
Be vigilant (be ready for possible problems and diffuculties)and proactive

Project Monitoring and Control

Project Monitoring

Typical Monitoring Activities

- regular reviews of progress against schedule using WBS as basis (Plan against Baseline)
- regular review of actual costs (O/P from SAP) against budgeted costs and Earned Value at WBS level
- regular review of resource loading
- regular progress meetings with project team
- regular meetings with contractors
- production of periodic progress reports
- risk reviews
- inspections/ audits

Project Control

Typical Control Activities

- assign responsibilities at Work Package level
- staged authorisation of work to be done
- staged release of budgets (staged release of WBS(e) numbers)
- ensure PM has a ‘Management Reserve’ under his control
- seek corrective action reports when WPs go ‘off track’ (overrunning or overspending)
- release Management Reserve carefully

Project Monitoring and Control Summary

Monitor against the plan – status regularly
Take a factual approach to decisions
Identify management action early
Check that defined controls are being applied – correct if necessary
Apply change control

Automation on Stakeholder Engagement process

1. **Identify Stakeholders**
   - Mapping Stakeholders: Begin by identifying all relevant stakeholders, both internal (employees, management) and external (customers, partners, investors). Create a comprehensive stakeholder map to visualize their roles and influence.
   - Prioritization: Classify stakeholders based on their level of interest and influence. This will help prioritize engagement efforts and tailor strategies accordingly
2. **Assess Needs**
   - Conduct Surveys and Interviews: Gather information on stakeholders' needs, expectations, and concerns through surveys or one-on-one interviews. This qualitative data is essential for understanding what stakeholders value most.
   - Analyze Data: Use analytics tools to interpret the data collected. Identify common themes and specific requirements that can guide your engagement strategy.
3. **Define Actions**
   - Develop Engagement Strategies: Based on the assessed needs, define specific actions tailored to each stakeholder group. This could include personalized communication plans, involvement in decision-making processes, or targeted information sessions.
   - Set Clear Goals: Establish measurable objectives for each action to ensure accountability and track progress over time.

Automation on Stakeholder Engagement process

4. **Establish Communication Channels**
   - Choose Appropriate Platforms: Select the most effective communication channels for engaging with different stakeholders. Options may include email newsletters, social media updates, webinars, or dedicated project management tools
   - Automate Communication: Utilize automation tools to streamline communication efforts. For example, set up automated email campaigns or notifications to keep stakeholders informed without manual effort
5. **Gather Feedback**
   - Implement Feedback Mechanisms: Create structured methods for collecting feedback from stakeholders after key interactions or milestones. This could involve follow-up surveys or feedback forms.
   - Encourage Open Dialogue: Foster an environment where stakeholders feel comfortable sharing their thoughts and concerns. Use tools like online forums or chatbots to facilitate ongoing conversations.
6. **Monitor and Review**
   - Track Engagement Metrics: Regularly monitor key performance indicators (KPIs) related to stakeholder engagement, such as response rates, satisfaction levels, and participation in events.
   - Evaluate and Adjust Strategies: Conduct periodic reviews of your engagement strategies based on the feedback received and the metrics tracked. Make necessary adjustments to improve effectiveness and ensure alignment with stakeholder needs

Methodologies in Project Management

1. Waterfall Project Management
   - Waterfall project management follows a linear and sequential process where each phase must be completed before the next begins. It suits projects with fixed requirements and clear objectives.
2. Agile Project Management
   - Agile project management is an iterative approach that emphasizes flexibility, customer collaboration, and rapid delivery through short cycles called sprints, allowing teams to adapt quickly to changing requirements
3. Hybrid Project Management
   - Hybrid project management combines Agile and Waterfall methodologies, allowing teams to use structured planning while maintaining flexibility for iterative development, making it ideal for projects needing both predictability and adaptability.
4. Other Notable Methodologies
   - Other methodologies include Scrum, an Agile framework focusing on short cycles and team roles, and Lean, which maximizes value by minimizing waste and improving processes throughout the project lifecycle.

Successful Automation Projects: Case Studies

- **UiPath Automation Case Studies**

1. Enerjisa (Energy): Improved internal processes and customer service, leading to enhanced operational efficiency and customer satisfaction.
2. Suncoast Credit Union (Financial Services): Utilized AI and automation to improve member trust and accelerate growth, streamlining banking processes.
3. MongoDB (Technology): Saved over 150,000 working hours and $1.5 million by automating time-consuming data management tasks.

- **Kawasaki Robotics Case Studies**

1. German Brewery (Food & Beverage): Implemented robotic palletizing systems to reduce labor costs and increase production capacity.
2. Automated Bottle Production Line (Food & Beverage): Enhanced material handling and palletizing processes, resulting in streamlined operations and reduced production times.

- **Itransition RPA Use Cases**

1. Heritage Bank (Banking): Automated 80 processes across departments, significantly improving operational efficiency and reducing customer interaction processing times.
2. Thermo Fisher Scientific (Biotechnology): Achieved a 70% reduction in invoice processing time for 824,000 invoices annually, enhancing accuracy in financial operations.

Successful Automation Projects: Case Studies

- **Nividous RPA Case Studies**

1. Manufacturer Invoice Processing: Automated data extraction from invoices, saving over $90,000 annually and speeding up processing times
2. Healthcare Patient Claims Processing: Reduced handling time by 70% through automation of data extraction and claims submission, improving cash flow management.

- **Industrial Automation Insights**

1. JR Automation & Advanced Drainage Systems (Manufacturing): Developed a flexible pipe sorting system that improved operational efficiency while reducing manual labor needs.
2. Snowboard Manufacturing Digital Transformation: Streamlined manufacturing processes using automation technologies, increasing productivity and reducing time-to-market.

Tools for doing Project Management Plan

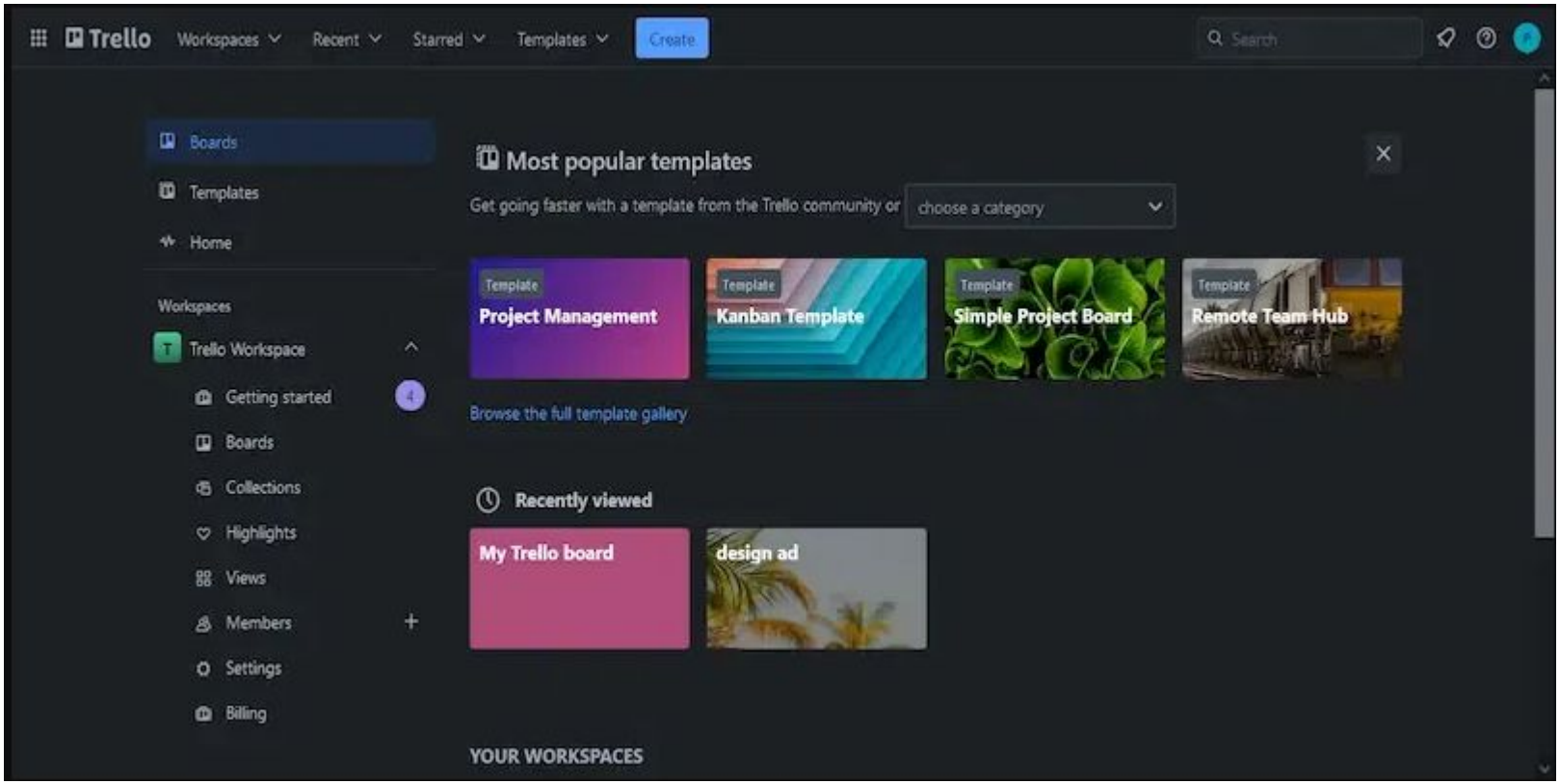
1. Gantt Charts: visualize timelines, track progress, and manage tasks effectively.
2. Asana: Offers flexible task management with various visualization options like lists, Kanban boards, and Gantt charts
3. Jiro : Jira is amongst the most established, powerful, and feature-complete project management tools available. It is straightforward to set up and available both on the cloud and on premises.
4. Trello: A visual tool that organizes projects into boards and cards, ideal for agile workflows
5. Notion: Maintaining an internal database, collaborating, and managing tasks such as Creating project plans, Building roadmaps, Creating and storing important documents, guides, etc.
6. Monday.com : monday.com is a highly visual and intuitive project management tool that offers a range of customization options.
7. Wrike: Features task assignment, collaboration tools, and multiple viewing formats (list, board, Gantt) to manage workflows efficiently

10 Ways to Use Trello for Project Management

1. Use Trello boards
2. Using Trello Cards
3. Calendar Planning
4. Email Replacement
5. Productivity Metrics
6. Automate Repetitive Email Tasks
7. CRM Tool
8. Arranging Meetings
9. Project Chat Channels
10. Time Tracking

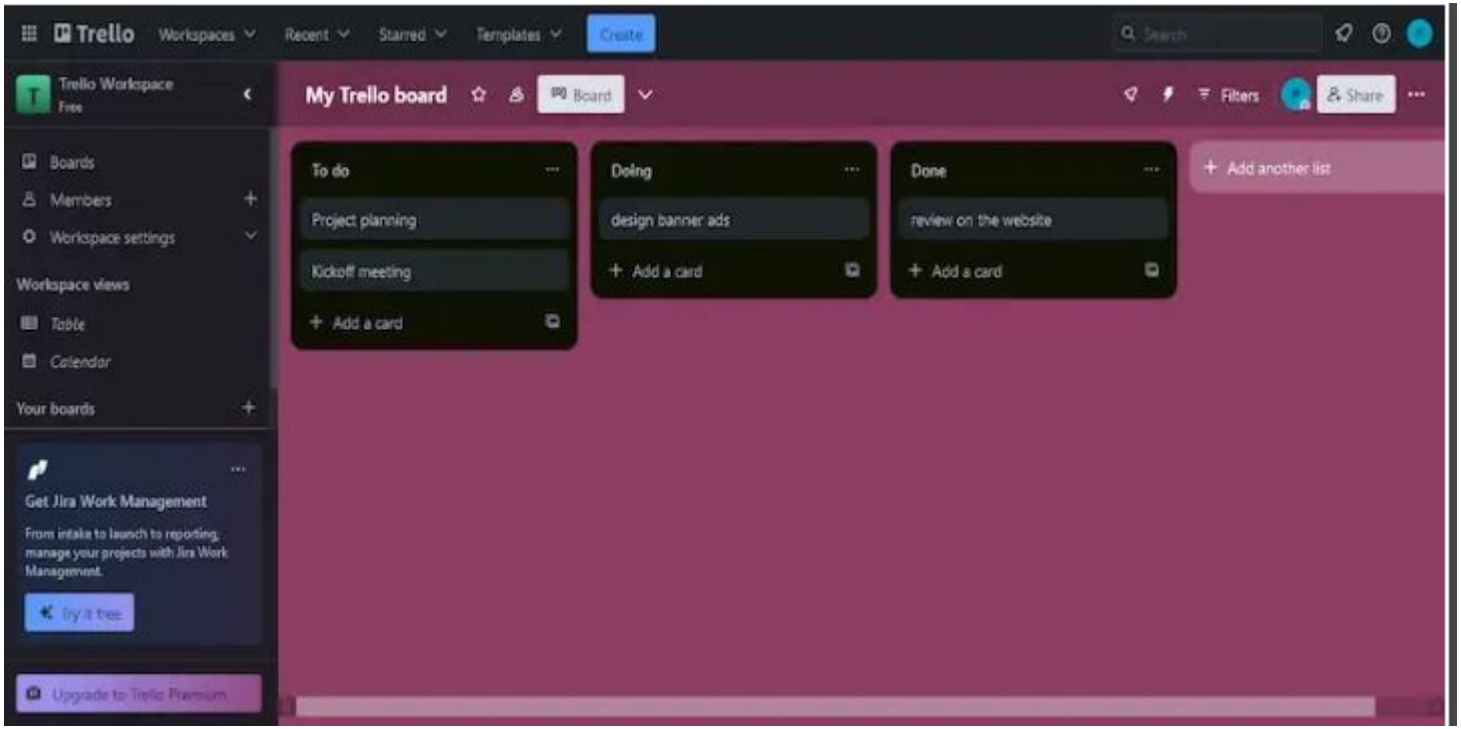
What is Trello?

Trello is a task and project management tool that's comprised of Boards, Lists, and Cards.



Trello Board

Trello boards are the advanced version of bulletin boards that are used to organize thoughts. The specialty of Trello is that you are not restricted to using a single board and can use multiple boards as complex projects will require multiple boards. It also provides different privacy options: **personal**, **private**, **team**, **organization**, and **public visibility**. Your board will show you **what is planned to be done**, and **task statuses,** and help you indicate capacity limitations.

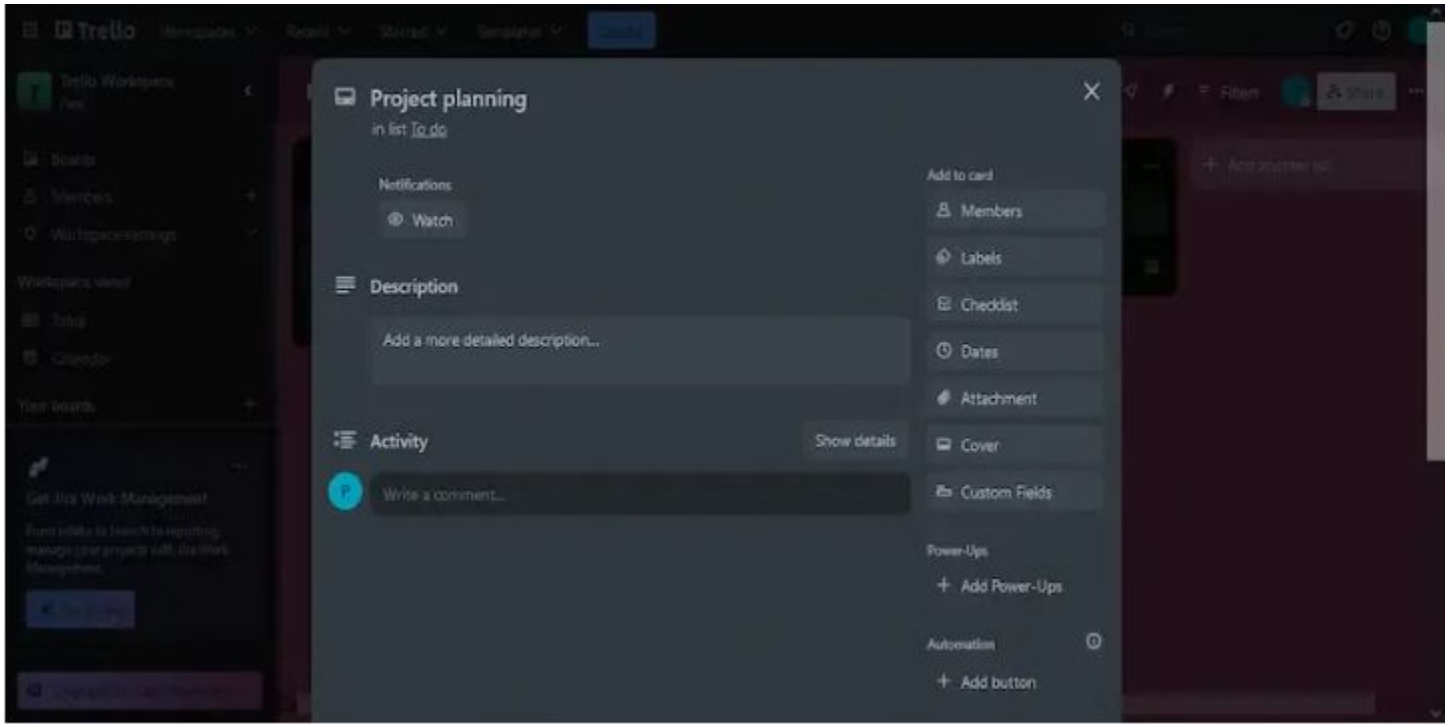


Exercise 1

1. **Sign Up and Create an Account**: Go to Trello's website and sign up for a free account.
2. **Create a Board**: Click on the "**Create new board**" button and give your board a name.
3. **Add Lists**: Inside your board, create lists to represent different stages of your workflow (e.g., To Do, In Progress, Done).
4. **Create Cards**: Add cards under each list for individual tasks. Click on a card to add details, due dates, attachments, and comments.
5. **Collaborate**: Invite team members by clicking on the "**Invite**" button and assigning them to specific cards.
6. **Move Cards**: Drag and drop cards between lists to reflect the progress of tasks.
7. **Use Power-Ups**: Enhance your board with **Power-Ups** (integrations and additional features) for added functionality.

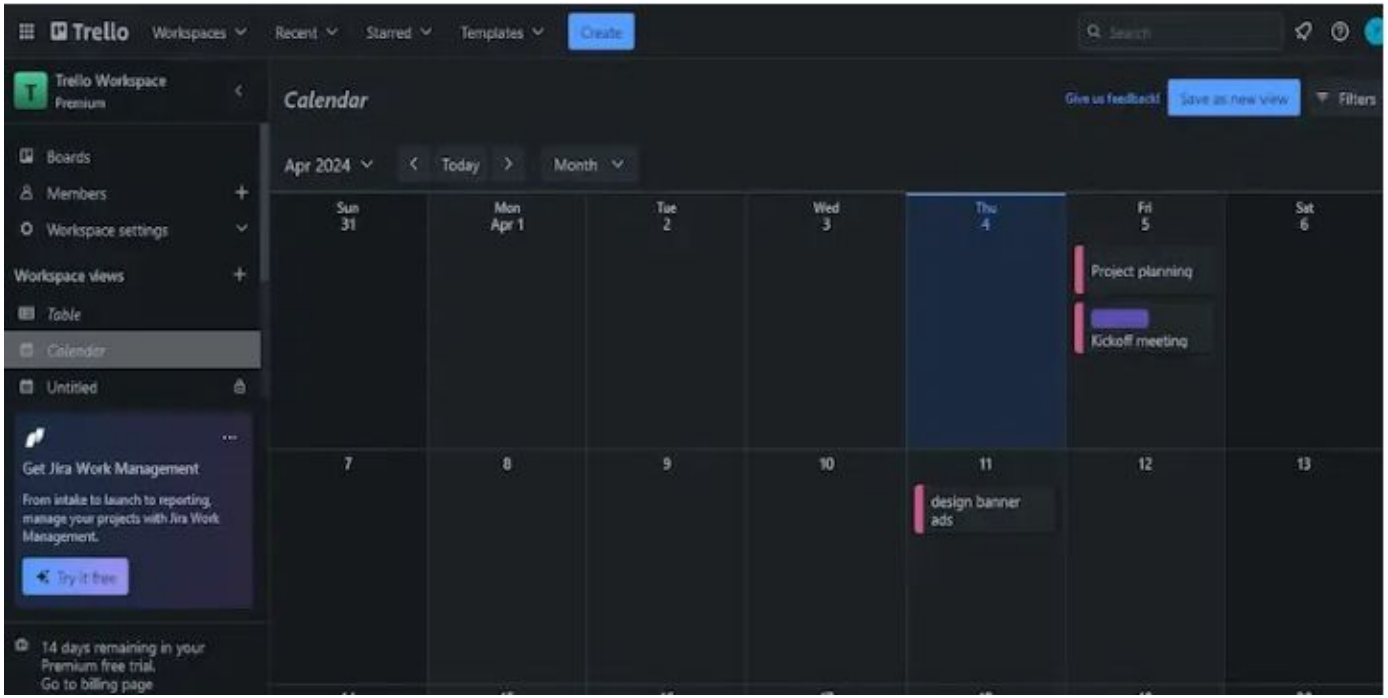
Using Trello Cards

Once the lists on the board are **completed**, cards need to be added. These Cards are the **building block of Trello** which provides details of the tasks within the project. Clicking a card expands to show detailed information like the example shown below.



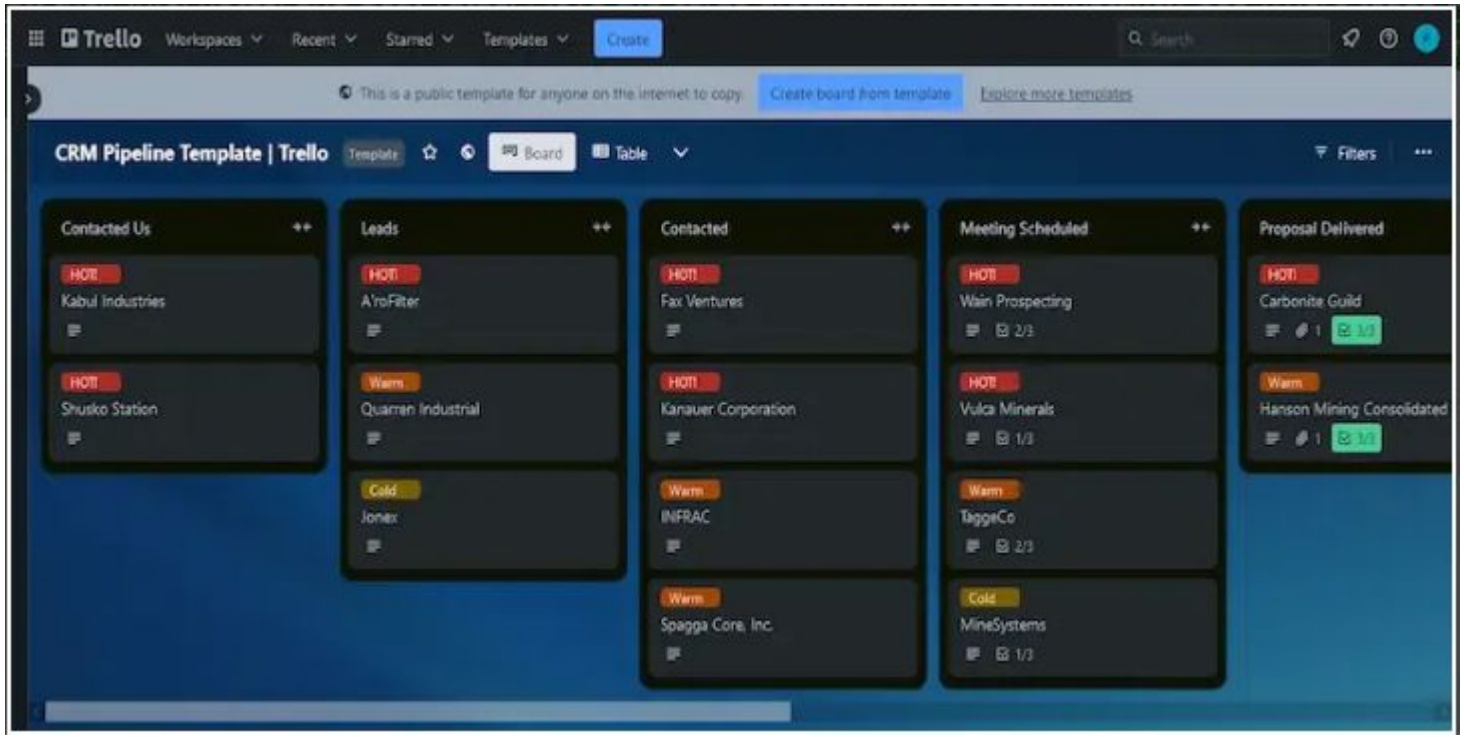
Calendar Planning

Trello's built-in view makes it a calendar planner, allowing you to see your deadlines visually, organized by due date. Lists act as timeframes ("**This Week**"), while color-coded labels highlight priorities. Optional Power-Ups further enhance functionality, letting you sync with external calendars. This makes Trello a powerful yet flexible way to manage your time, no matter how complex your schedule gets. By leveraging these features, you can effectively use Trello for project management, ensuring that all tasks are tracked and completed on time.



CRM Tool

Trello can be an essential tool in managing Customer relationships. Each customer has a Trello card, similar to a digital folder holding all their info, notes, and deal value. Move the cards around, and you can instantly see where leads are within the pipeline - easy, at first glance, to understand what's in the queue for your team. And it's flexible for your team to work together on pushing these deals forward.



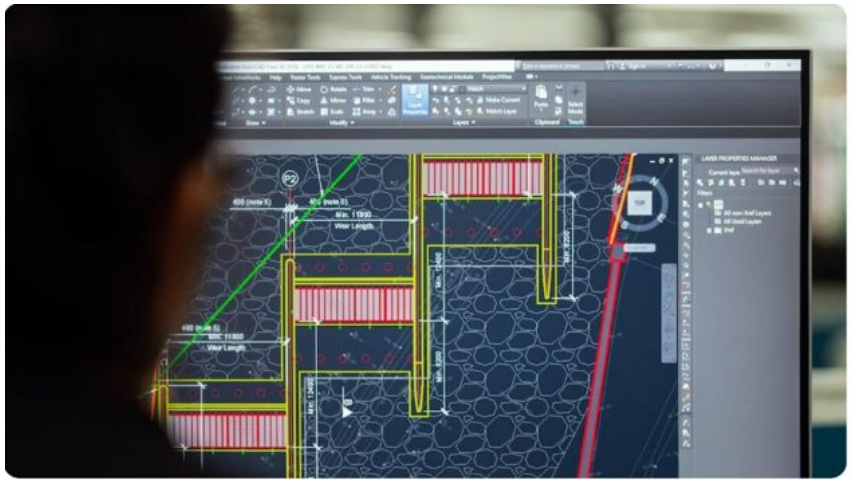
Benefits of Using Automation in Project Management

1. **Establishing Risks to be Managed**
   - Real-Time Risk Monitoring: Automation allows for continuous monitoring of project parameters, enabling teams to identify potential risks as they arise rather than after the fact. This proactive approach enhances the ability to mitigate risks effectively before they escalate
   - Data Analysis and Predictive Insights: Automated systems can analyze large volumes of data to identify trends and patterns that may indicate emerging risks. This predictive capability allows project managers to prepare for potential challenges and implement strategies accordingly
2. **Establishing Costs and Durations**
   - Accurate Cost Estimation: Automation tools can analyze historical data and current project metrics to provide more accurate cost estimations. This helps in budgeting and financial planning by reducing guesswork and improving reliability
   - Streamlined Reporting: Automated reporting features generate cost and duration reports quickly, providing stakeholders with timely insights into project status without manual compilation efforts. This enhances transparency and facilitates informed decision-making
3. **Establishing Resources Required**
   - Resource Optimization: Automation helps in tracking resource allocation and utilization across projects. By analyzing resource usage patterns, organizations can optimize their workforce and materials, ensuring that resources are used efficiently
   - Scalability: Automated systems can easily scale to accommodate changes in resource requirements as projects grow or shrink. This adaptability ensures that organizations do not overcommit or underutilize their resources

Understanding Business Process Automation

Defining the Future of Efficiency

- Definition: Business process automation (BPA) refers to the use of technology to automate repetitive, manual tasks in business operations to increase efficiency and accuracy.
- Benefits: The advantages of BPA include reduced operational costs, increased speed and accuracy of processes, and the ability to reallocate human resources to more strategic tasks.
- Tools: Various tools such as workflow automation software, robotic process automation, and AI are instrumental in facilitating BPA by removing bottlenecks in business operations.
- Examples: Common applications include automating invoice processing, customer relationship management (CRM), and supply chain management, demonstrating BPA's versatility across industries.



Integration of Project Management and Business Process Automation

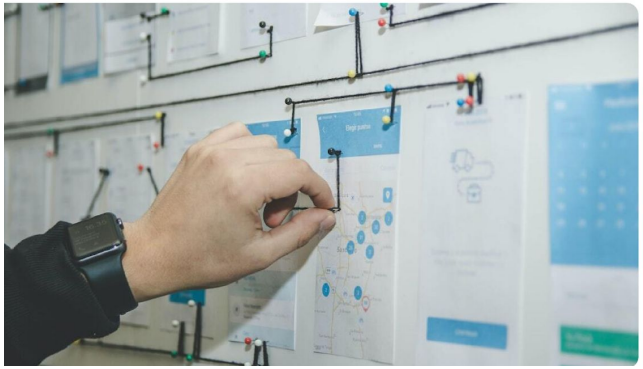
Creating Cohesion for Success

Scope	Description
Synergy	The integration of project management with BPA leads to improved planning, execution, and monitoring of initiatives, enhancing overall project success.
Process Mapping	Visualizing workflows and processes aids in identifying inefficiencies and opportunities for automation, aligning project management initiatives with business objectives.
Best Practices	Employing best practices such as stakeholder engagement, risk management, and iterative development can significantly improve project outcomes in automation.
Alignment	Ensuring that project management frameworks align with automation goals fosters a culture of continuous improvement and operational excellence within the organization.

Integration of Project Management and Business Process Automation

Understanding the Fundamentals

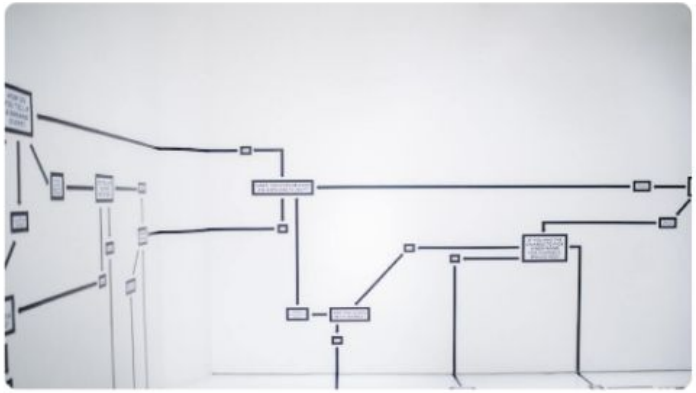
- Definition: Project management is the discipline of planning, organizing, and overseeing the successful execution of projects in the context of business process automation, which aims to optimize workflows and improve efficiency.
- Importance: The significance of project management in business process automation lies in its ability to streamline processes, enhance productivity, and ensure resources are effectively utilized to meet business objectives.
- Goals: The primary objectives encompass enhancing efficiency, reducing costs, improving quality and ensuring successful project delivery that meets stakeholder expectations.
- Overview: An effective project management approach integrates all phases of automation projects, from inception through to evaluation, thus providing a comprehensive roadmap for implementation.



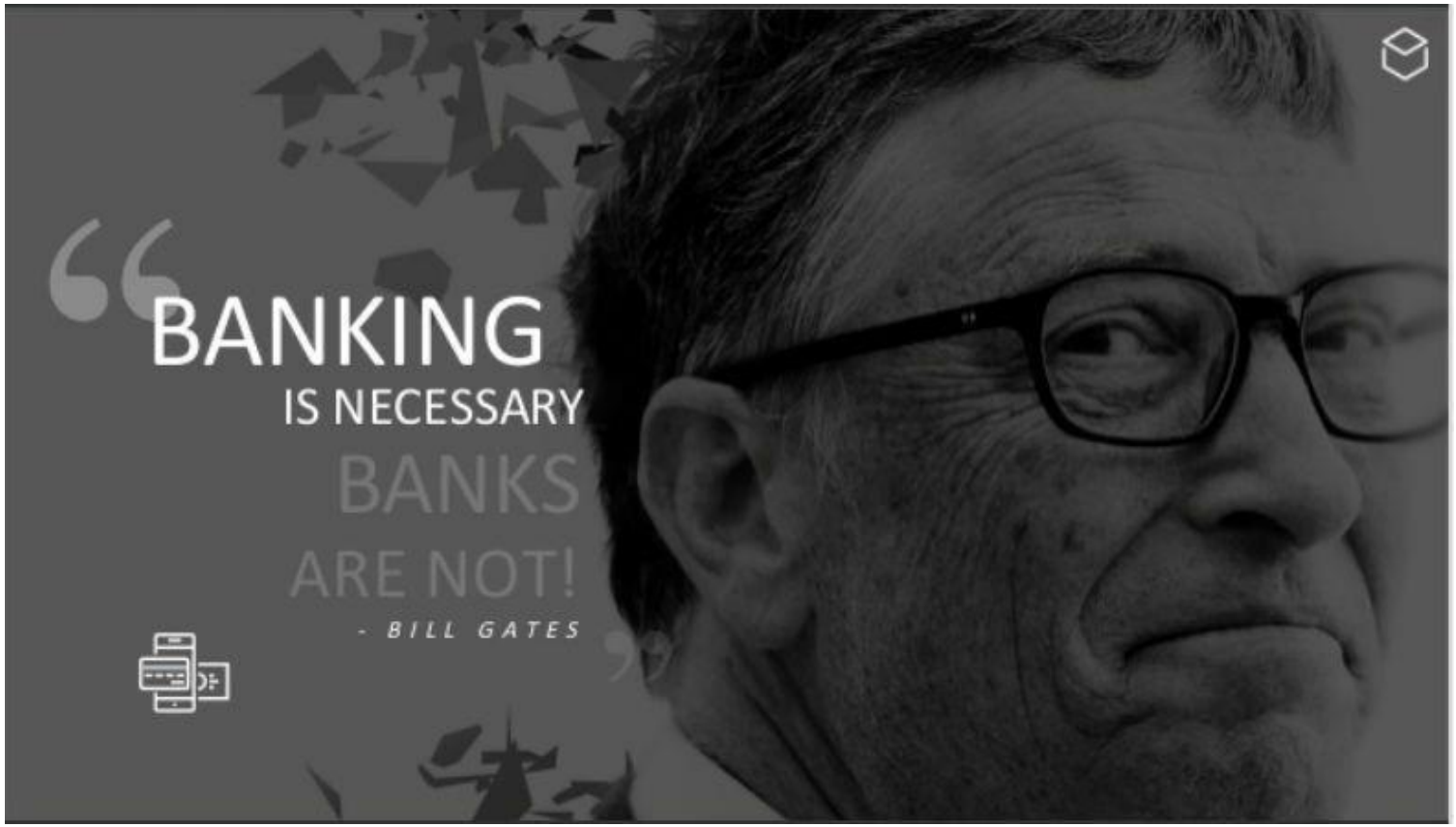
Key Steps in Project Management

The Phases of Project Execution

- Initiation: Defining the project scope, objectives, and stakeholders to establish a shared understanding of the project goals and outcomes.
- Planning: Creating a detailed project plan that outlines tasks, timelines, resources, and budget, ensuring a clear pathway toward project completion.
- Execution: Implementing the project plan, coordinating teams, and managing resources to deliver the project output effectively.
- Monitoring: Continuous oversight of project progress, ensuring alignment with goals, addressing any deviations, and making necessary adjustments to stay on track.
- Closing: Finalizing all project elements, conducting evaluations, and documenting lessons learned to inform future projects and ensure comprehensive closure.



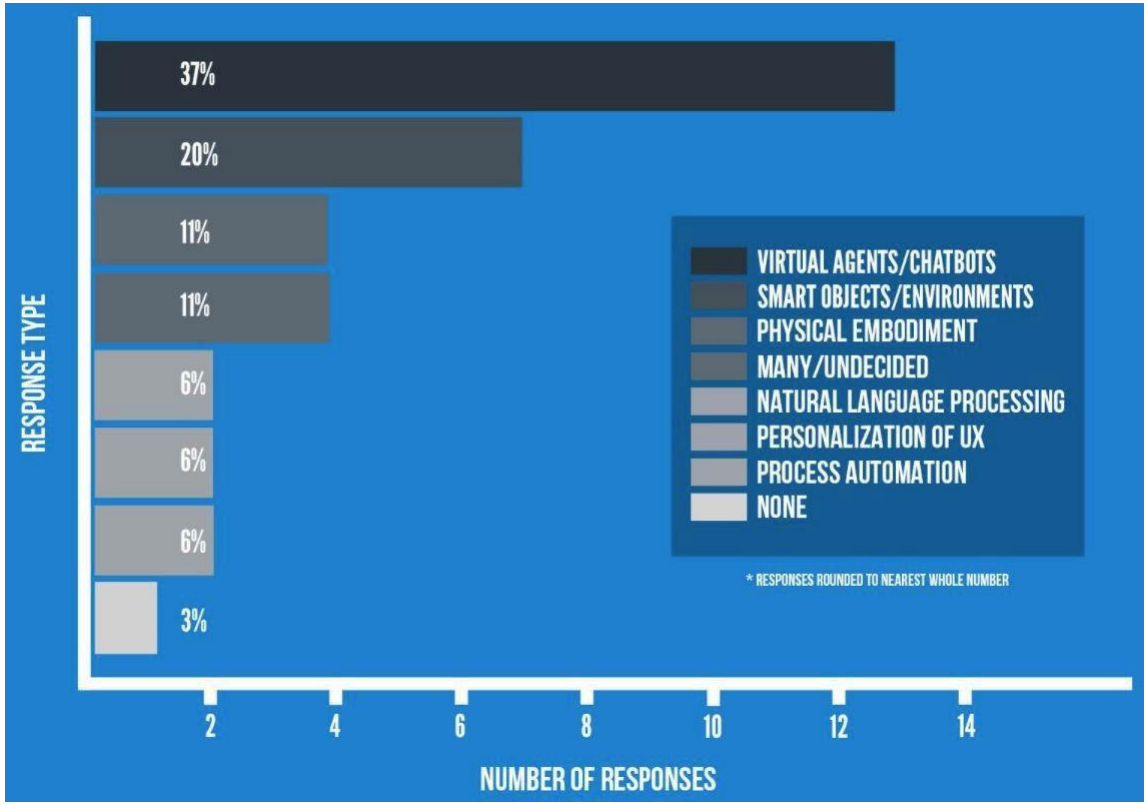
Worldwide Open Banking Movement



Worldwide Open Banking Movement

https://www.slideshare.net/CAinc/case-study-open-banking-apis-and-digital-transformationthe-banco-original-story

Application of AI In Banking: A Case Study



https://www.techemergence.com/ai-in-banking-analysis/ October 24, 2017 by Kumba Sennaar

Application of AI In Banking: A Case Study JPMorgan Chase Bank

https://www.techemergence.com/ai-in-banking-analysis/ October 24, 2017 by Kumba Sennaar

Application of AI In Banking: A Case Study Wells Fargo Bank Startup Accelerator

WELLS FARGO | *Startup Accelerator*

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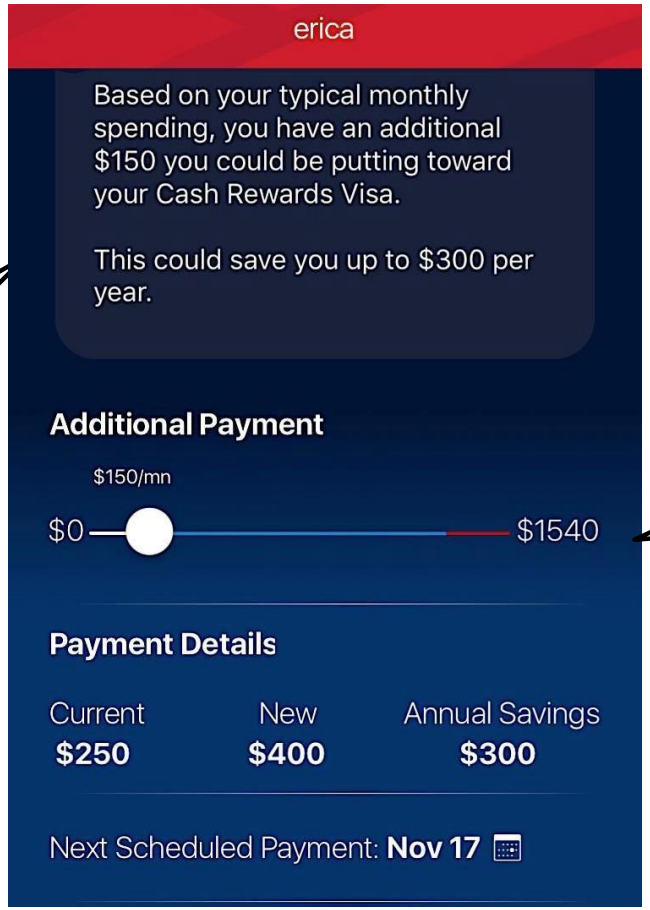
https://accelerator.wellsfargo.com/

Application of AI In Banking: A Case Study

Bank of America Merrill Lynch

https://twitter.com/_/status/790943639933366274

Chatbot enabled mobile banking has seen steady growth from 12 million customers in 2012 to nearly 22 million in 2016



Erica - **Chatbot** is designed to be accessible to clients 24/7 and perform "day-to-day transactions" in addition to **anticipating the unique financial needs of each customer** and helping them reach their financial goals by providing **smart recommendations**

https://www.cnbc.com/2016/10/24/bank-of-america-launches-ai-chatbot-erica--heres-what-it-does.html

https://www.bofaml.com/en-us/content/technology-innovation-summit-2017.html

Application of AI In Banking: A Case Study
Bank of New York Melon Bank: Software Automation Using Robots

blueprism®

Helped build/deploy 220 software robots to handle repetitive tasks, such as “data requests from external auditors” and “funds transfer bots” which help “correct formatting and data mistakes in requests for dollar funds transfers.

- 100 percent accuracy in account-closure validations across five systems
- 88 percent improvement in processing time
- 66 percent improvement in trade entry turnaround time
- ¼-second robotic reconciliation of a failed trade vs. 5-10 minutes by a human

“funds transfer bots” alone is responsible for $300,000 in annual savings

https://www.blueprism.com/news/automation/bny-mellon-became-pioneer-software-robots

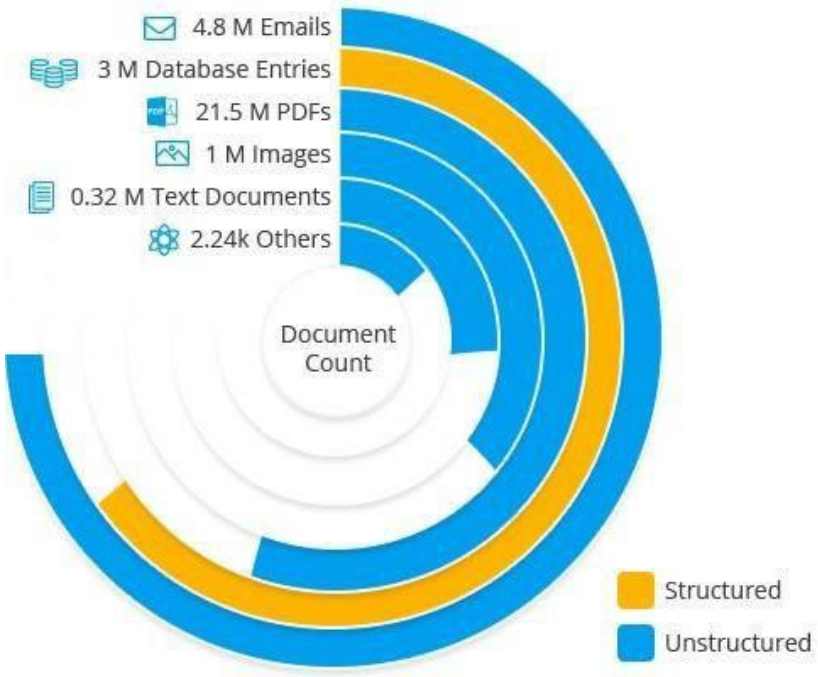
Application of AI In Banking: A Case Study Royal Bank of Scotland: Chabots

Luvo chatbot pilot is accessible to 50,000 Bank of Scotland iOS mobile customers

answer common queries, such as unknown account transactions, how to make payments and what to do about lost or stolen cards

https://www.rbs.com/rbs/news/2016/03/rbs-installs-advanced-human-ai-to-help-staff-answer-customer- que.html

Predictive Analytics Case Study: Mossack Fonseca 'Panama Papers' Leak



Hackers stole 40 years worth of client information and gave it to a German newspaper who then shared it with the ICIJ.

Sit with your group mates and research The Panama Papers Leak using the URLs given below;

https://www.sparrho.com/p/hiding-billions-in-massive-datasets/295324/
http://bit.ly/2ydCENP

Answer the following questions

- What data science tools were used to create the complex relationships?

Source: http://www.softwebsolutions.com/resources/the-panama-papers-its-all-about-the-data.html

Hottest Application of Predictive Analytics?

Fraud/Spam Detection

NLP

Speech Recognition

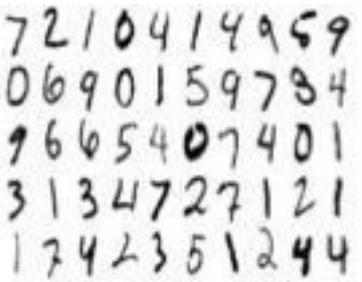


Image Recognition

Partners choose Microsoft for Data & AI

Accelerate time to value with best in class platform & services


Pretrained AI Services


Global Data Services


Comprehensive Platform

Innovate with AI everywhere – in the cloud, at edge and on-premises


Cloud


Edge


On-premises

Use any language, any development tool and any framework

python PYTORCH ONNX

TensorFlow Spark

Benefit from industry-leading security, privacy, compliance, transparency, and AI ethics standards

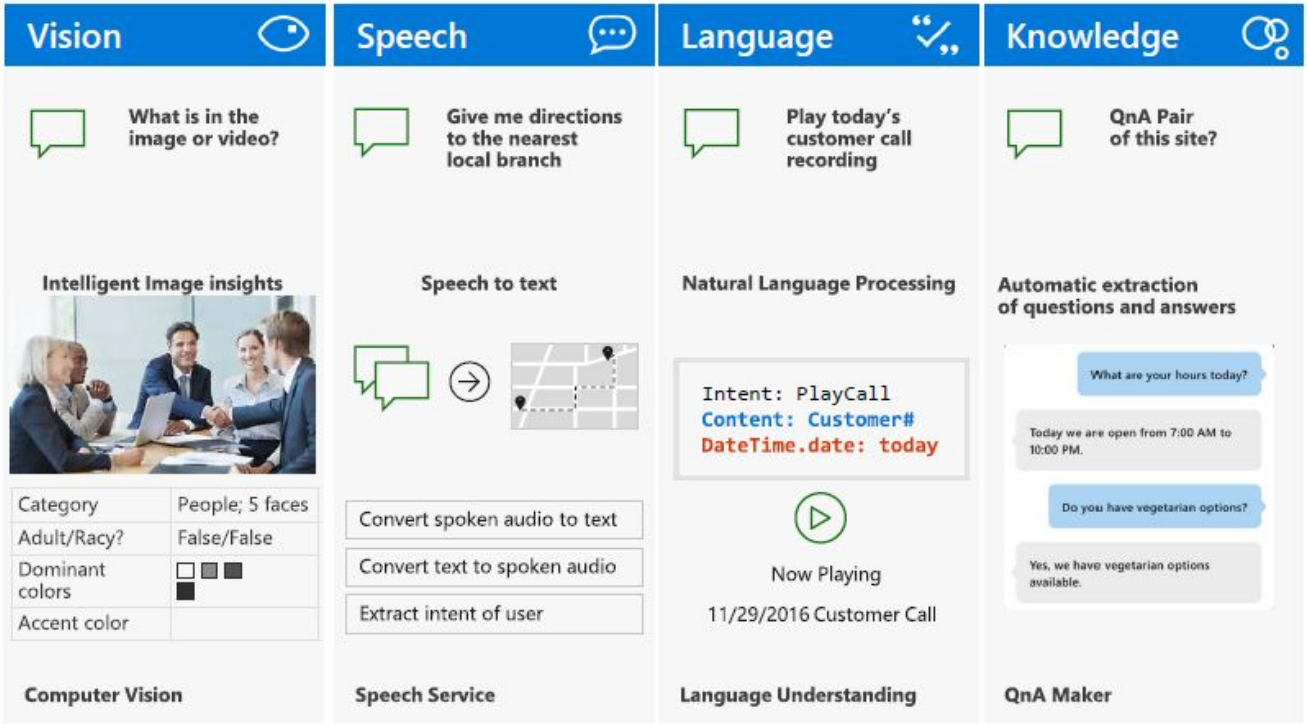
>90% of Fortune 500 companies use Microsoft Cloud

AI “Accelerators” – Cognitive Services

AI “Accelerators”

Solution specific AI services and patterns

- Azure Bot Service
- Cognitive Services



AI “Accelerators” – Cognitive Services

AI “Accelerators”

Solution specific AI services and patterns

- Azure Bot Service
- Cognitive Services

Example: Industry leading neural text to speech

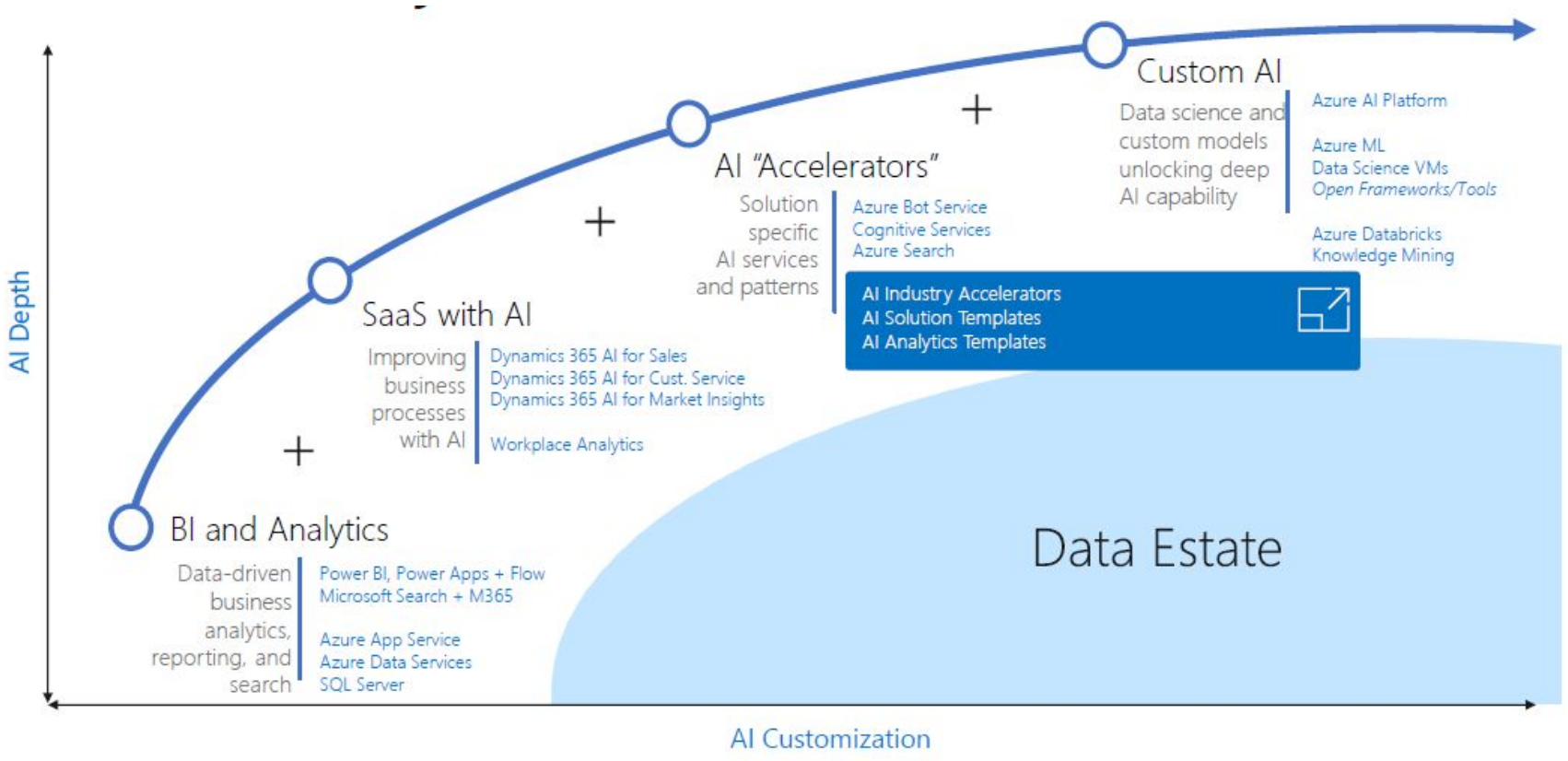
Azure AI is built with a focus on customer centricity. We don’t pretend to beat champions at games or design toys to attract attention. We build technology to help customers leverage AI to create life-changing experiences. If you’ve paid proper attention to this talk, you know how to leverage Azure AI to drive more ACR. But wait, there’s more to come.

Sample 1

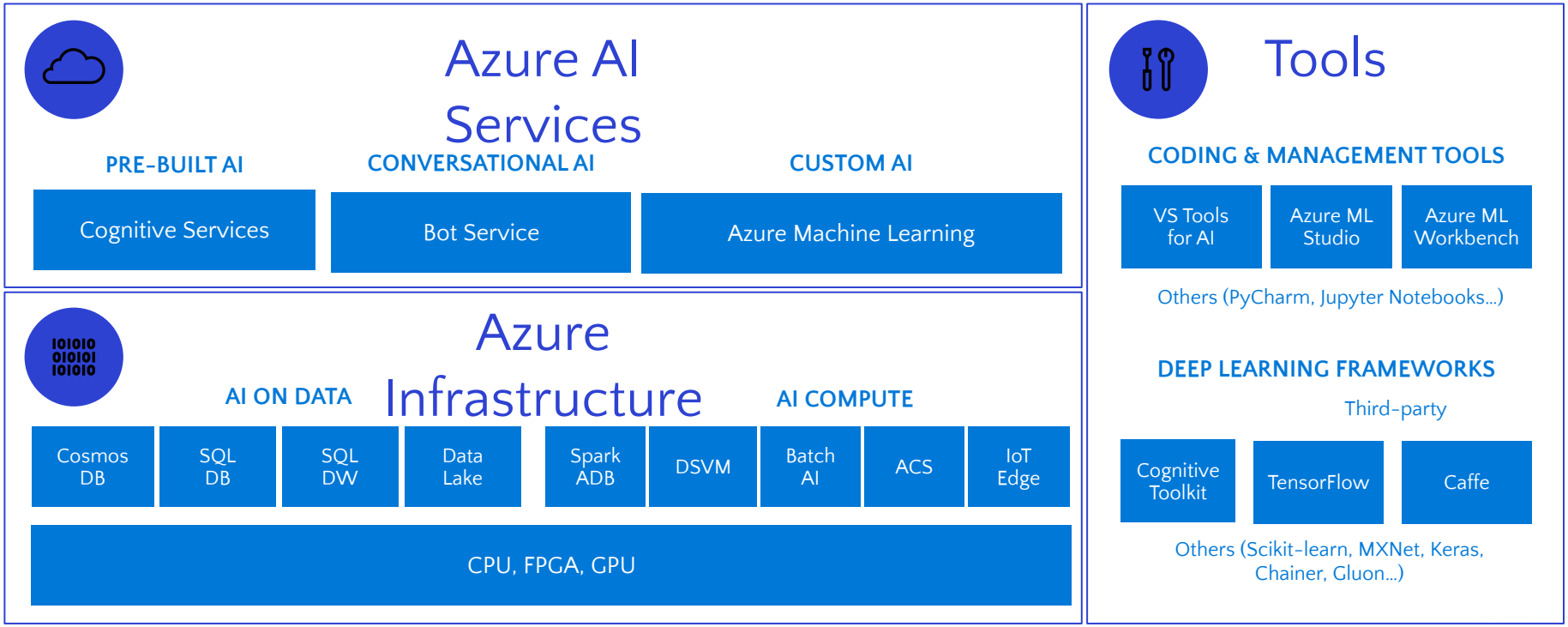
Sample 2

Get started today: http://aka.ms/NeuralTTSPreview

The AI Journey – Where to Start



Microsoft AI Platform



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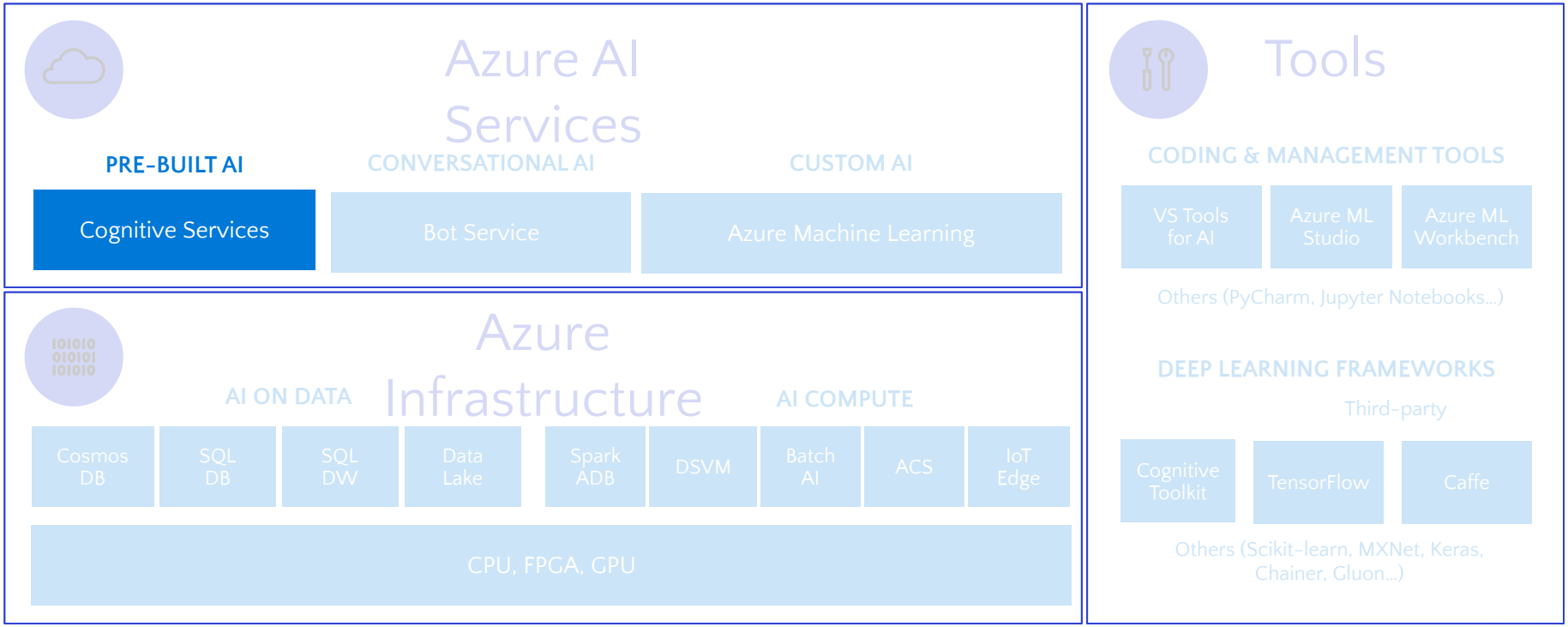
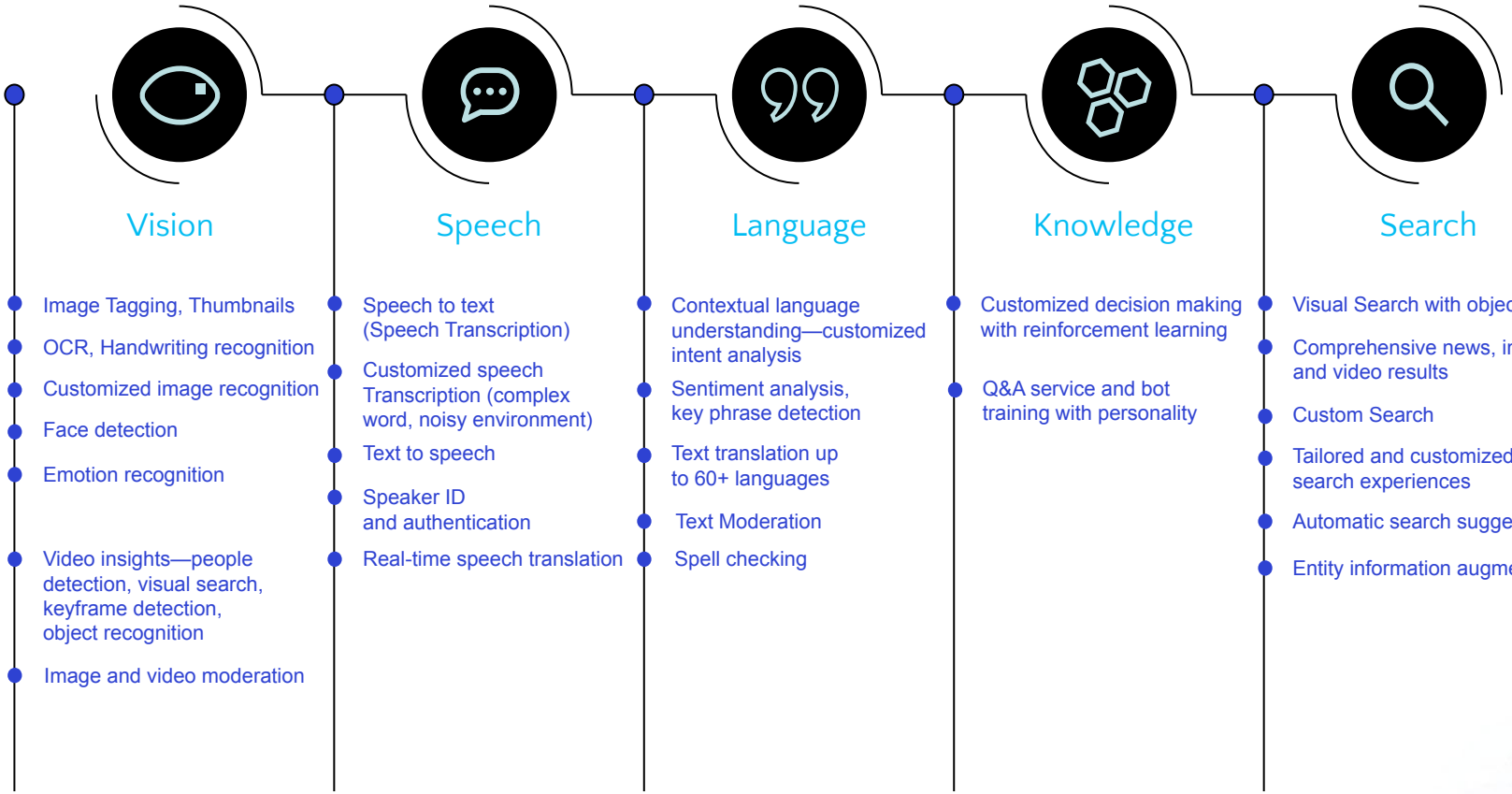


Azure Cognitive Services

A set of **simple APIs** that harness **Machine Learning**
so you can add AI (without needing a deep understanding of AI)

Azure Cognitive Services



Comments from customers

- You lost the details of my product return and refuse to replace it!
- Your website search function is terrible.
- Ich musste die Handschuhe zurückgeben, die ich gekauft hatte. Der Austausch hat lange gedauert.
- Ich liebe deine Website, sie ist wunderschön.
- Este martillo está etiquetado como un juguete.
- 我不喜欢这把螺丝刀。
- 両刃を売っていますか。

Computer Vision

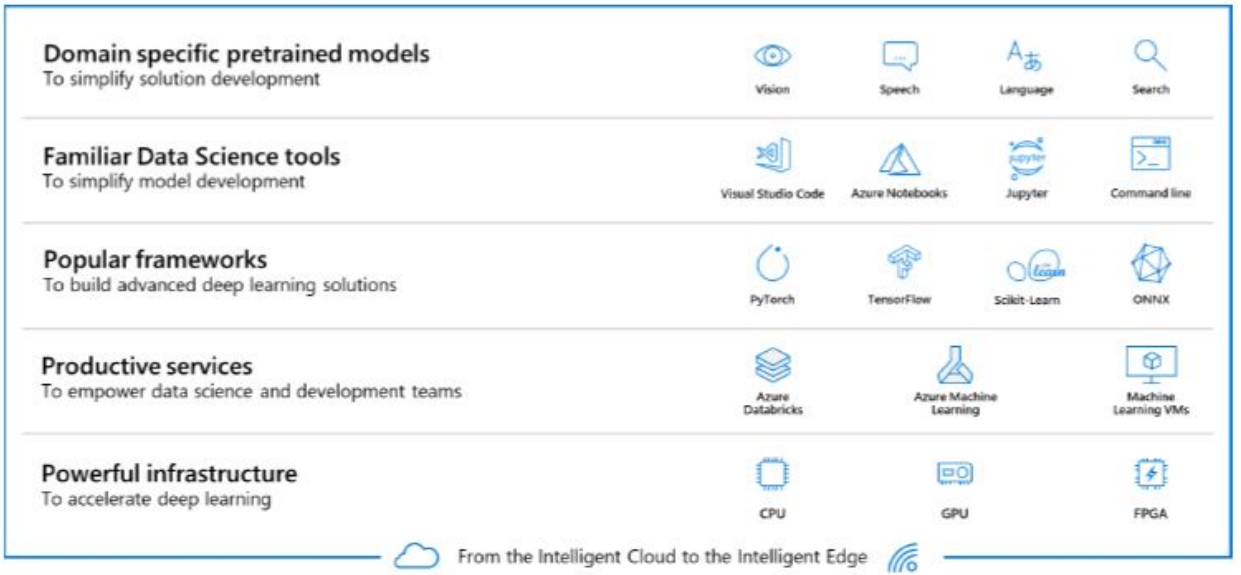
FEATURE NAME:	VALUE
Description	{ "tags": ["indoor", "table", "sitting", "black", "pair", "laying", "white", "remote", "sink"], "captions": [{ "text": "a pair of black headphones on a table", "confidence": 0.307312727 }] }
Tags	[{ "name": "indoor", "confidence": 0.9374284 }, { "name": "tool", "confidence": 0.9374284 }, { "name": "brush", "confidence": 0.4960692 }, { "name": "design", "confidence": 0.4172834 }, { "name": "key", "confidence": 0.29472214 }, { "name": "artisan", "confidence": 0.136394173 }, { "name": "knife", "confidence": 0.1352209 }]

Custom AI – Knowledge Mining

Custom AI

Data science and custom models unlocking deep AI capability

- Azure AI Platform
- Azure ML
- Knowledge Mining



Custom AI – Azure ML

Custom AI

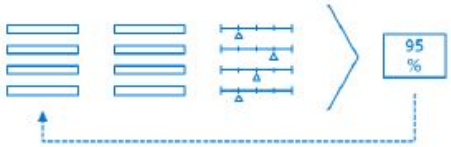
Data science and custom models unlocking deep AI capability

- Azure AI Platform
- Azure ML
- Knowledge Mining

Machine learning DevOps

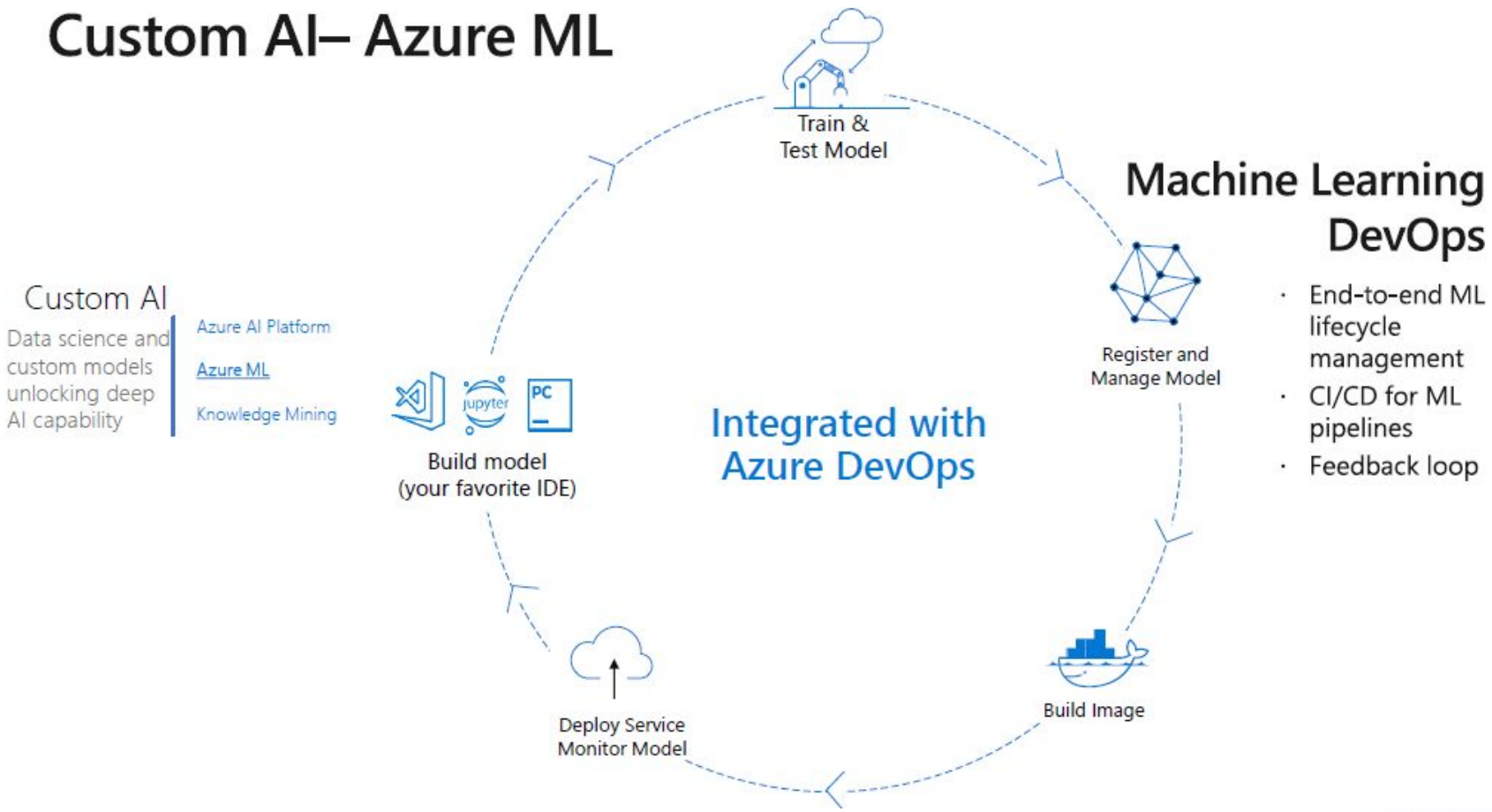
Azure DevOps integration for CI/CD

Automated machine learning

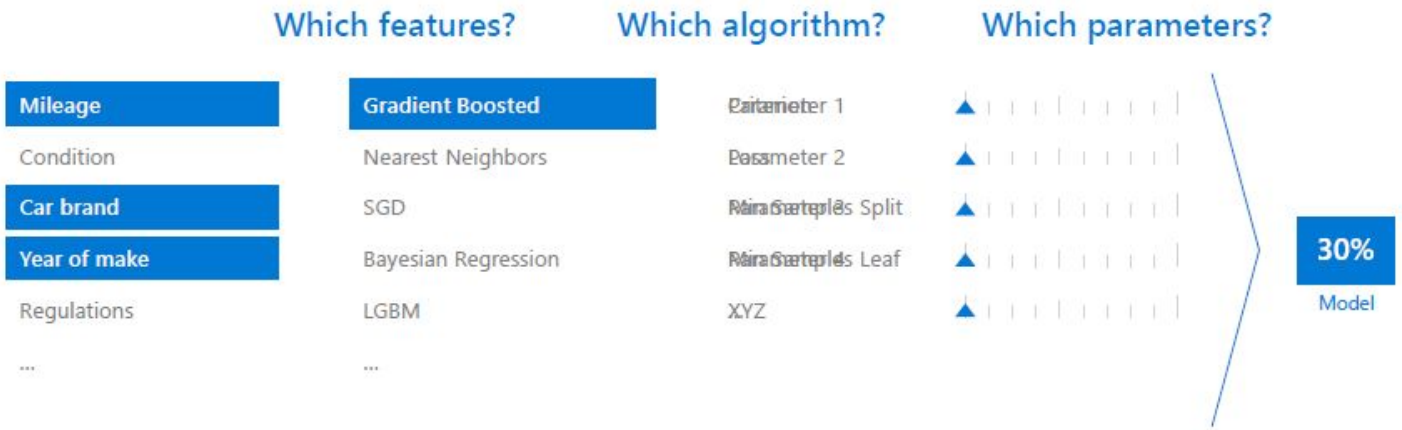


Accelerated model building

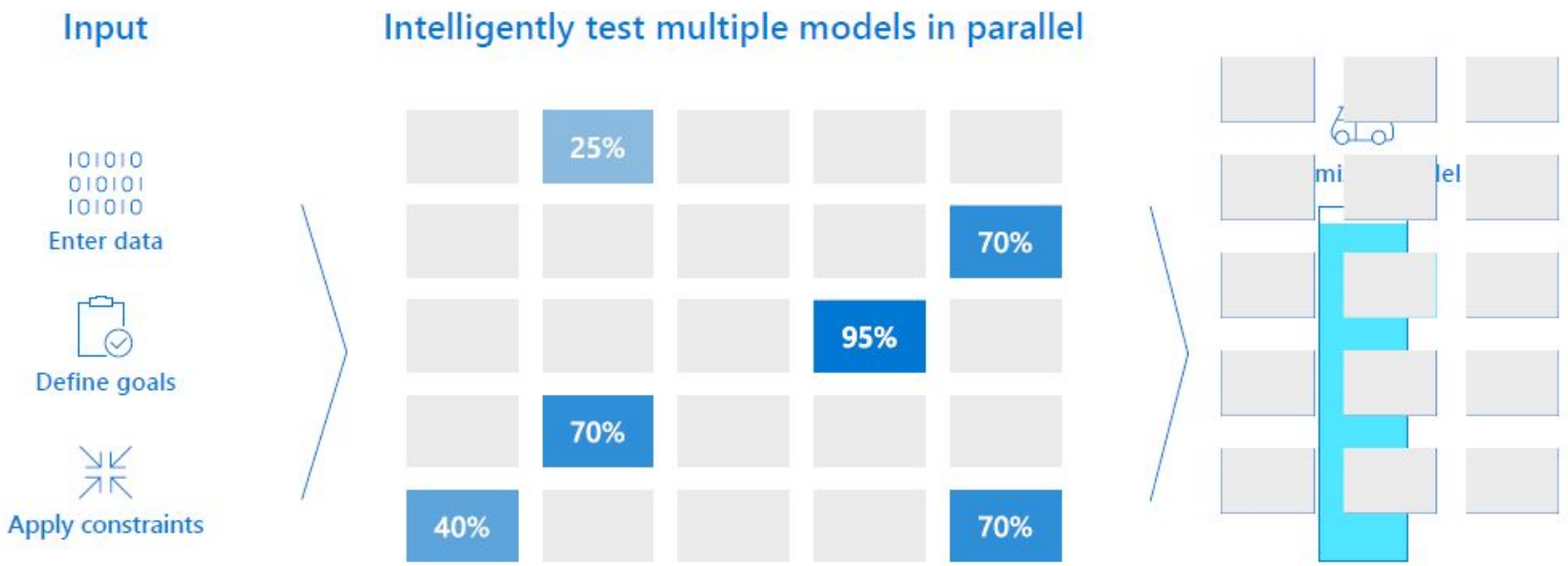
Custom AI – Azure ML



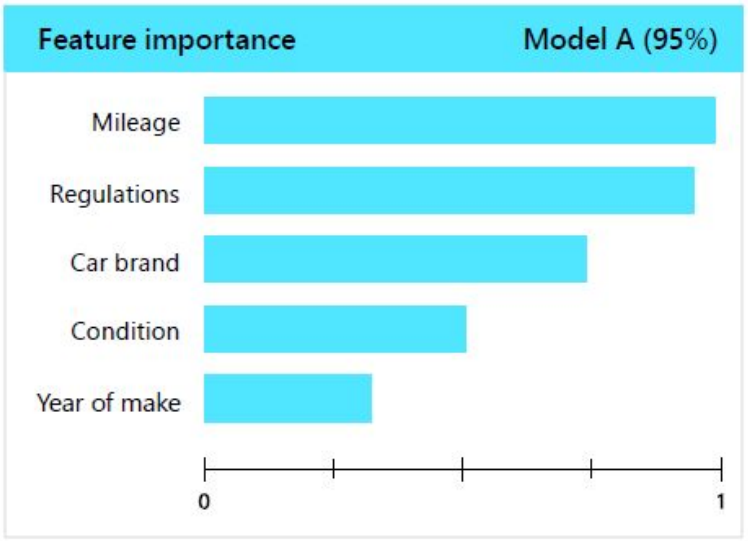
Model Creation is typically a time consuming process

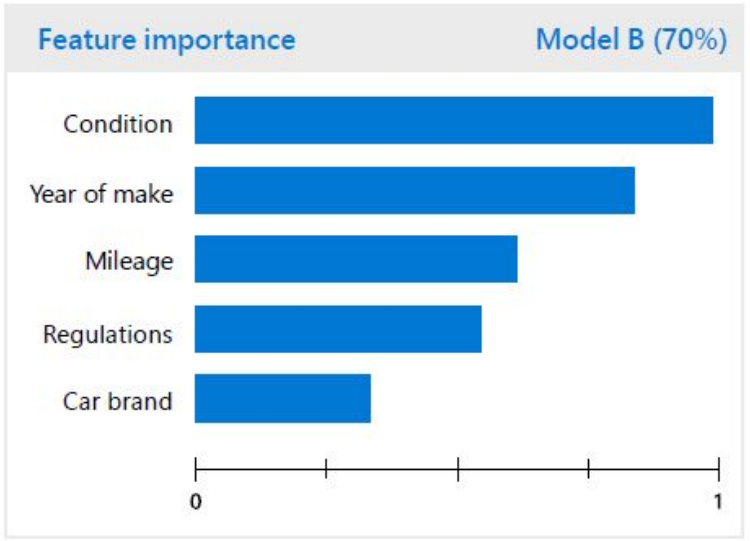


Azure Machine Learning accelerates model development with automated machine learning



Azure Machine Learning accelerates model section with model explainability



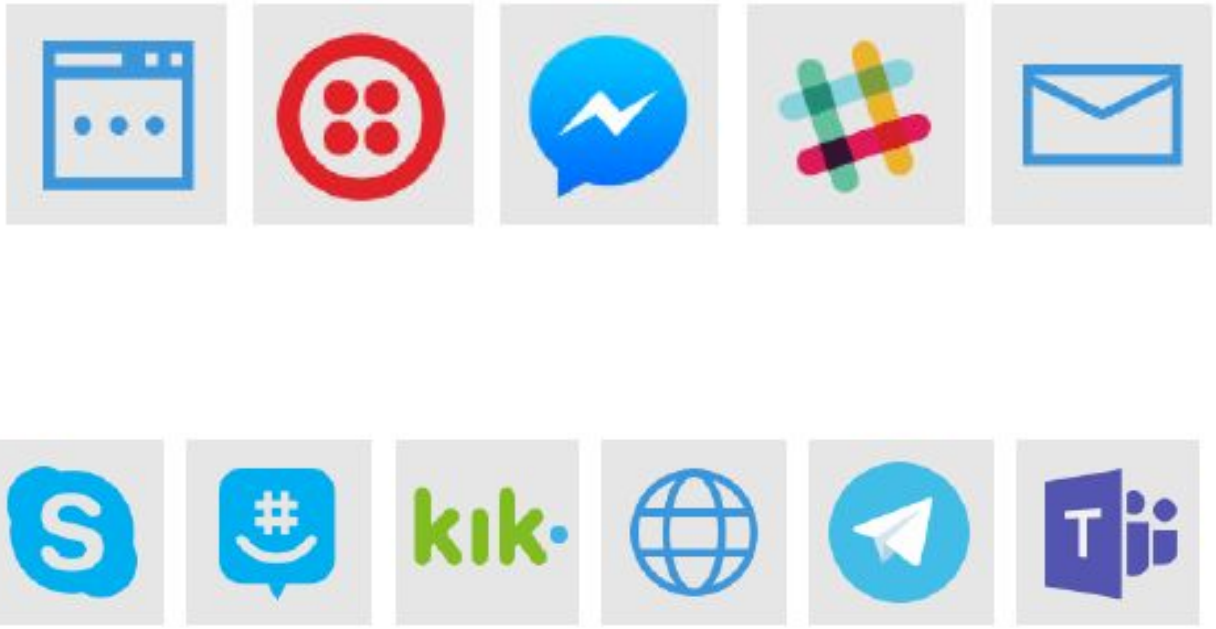


Bots Case Story – 1000+ Companies Engaging us

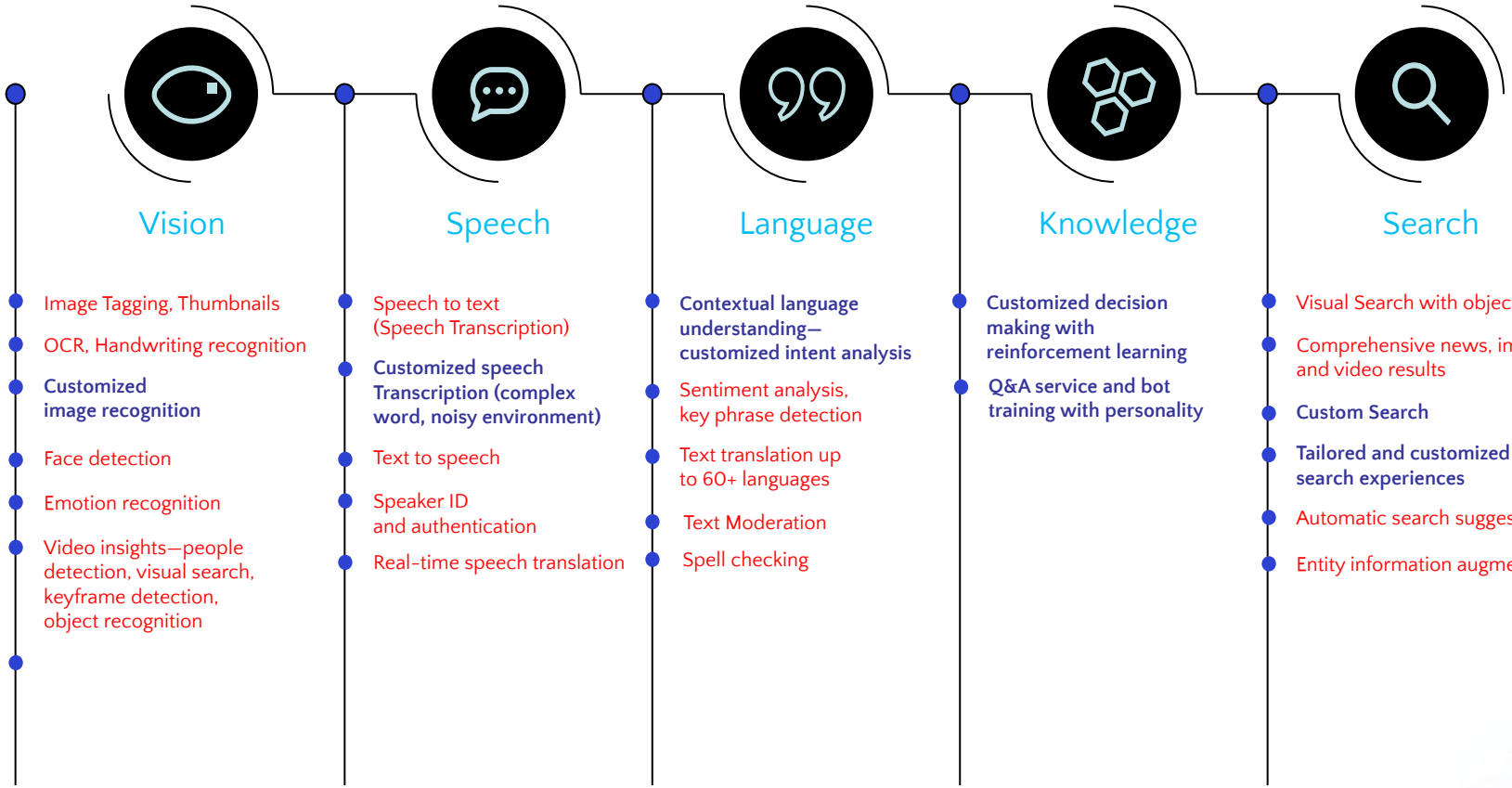
Scenario	Retail	Finance	Insurance	Telecoms	Government	Automotive	Manufacturing	Healthcare	Media	Events
Customer service	✔	✔	✔	✔	✔	✔	✔	✔		✔
Customer retail	✔	✔	✔	✔				✔		
Audio/speech analysis	✔	✔	✔	✔	✔				✔	
Translation		✔	✔							
Surveillance		✔			✔					
Knowledge extraction		✔	✔	✔			✔			
Video/photo analysis		✔			✔				✔	
Product identification	✔						✔	✔		
Digital assistant						✔				
Footfall analysis	✔									✔
HD maps and object detection						✔				

Bot Highlights – Improvements Everywhere

New Channels – Improvement Everywhere



Azure Cognitive Services



Microsoft Learning - AI

https://www.microsoft.com/en-us/ai/ai-school

Conversational AI

Add intelligent chat to your apps and channels with AI-powered bots that incorporate features like natural language processing, intent recognition, and more.

Create bots with Azure Bot Service

Bots allow customers to interact with applications in a conversational way using text, graphics, or speech. From a simple question and answer dialog, to sophisticated pattern matching and state tracking, learn how to build a chat bot with QnA Maker and LUIS.

Start the course >

Create interactive conversational bots for Microsoft Teams

Learn how to create bots for custom Microsoft Teams apps, allowing users to interact with your web service through text, interactive cards, and task modules. Bots can be a few simple commands, or complex virtual assistants powered by AI and natural language.

Start the course >

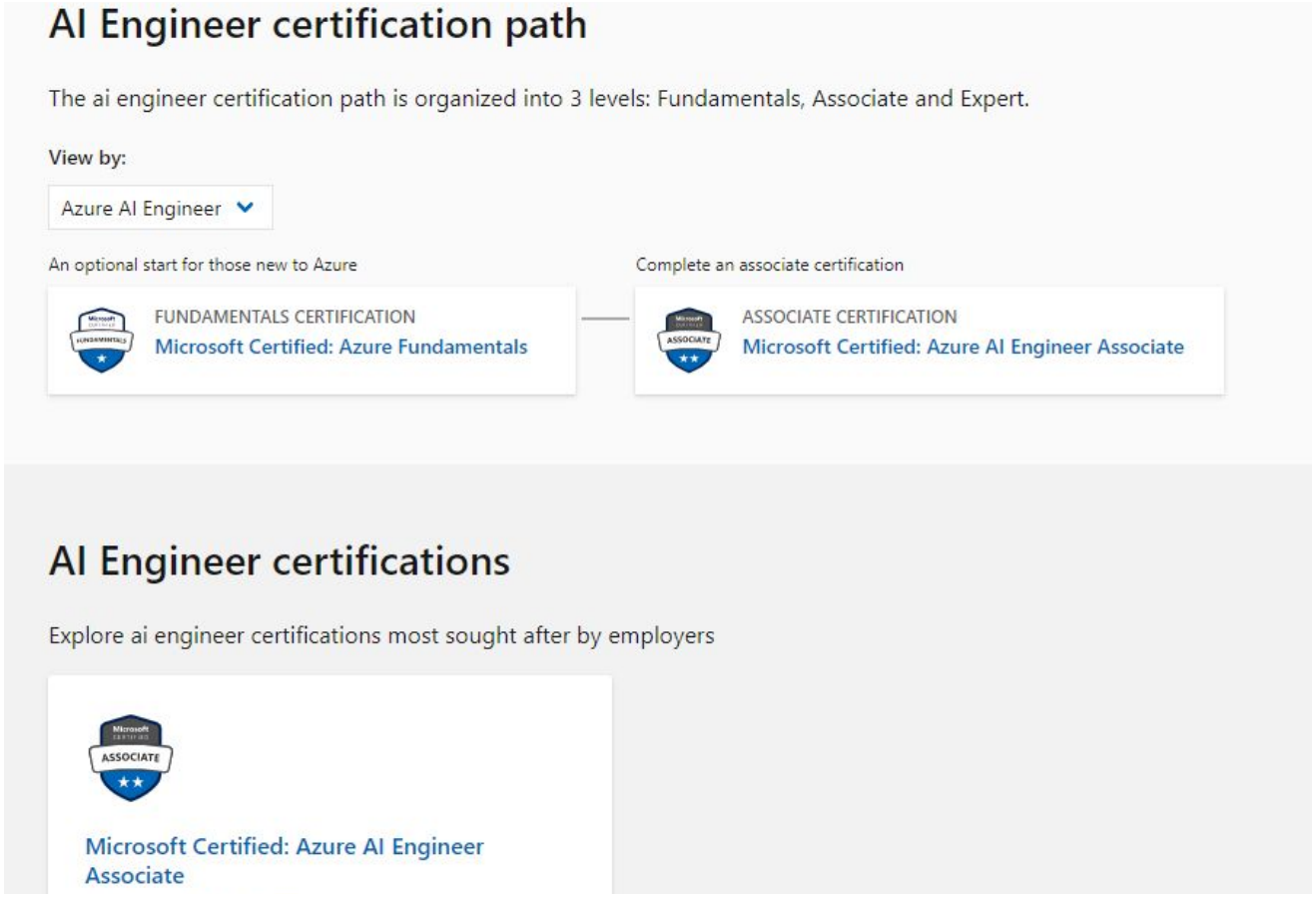
Building bots with REST

Most Bot Framework bots are built using the Bot Framework SDK, which organizes your bot and handles all conversations for you. An alternative to the SDK is to send messages directly to the bot using a REST API. You can send and receive messages with users on any channel.

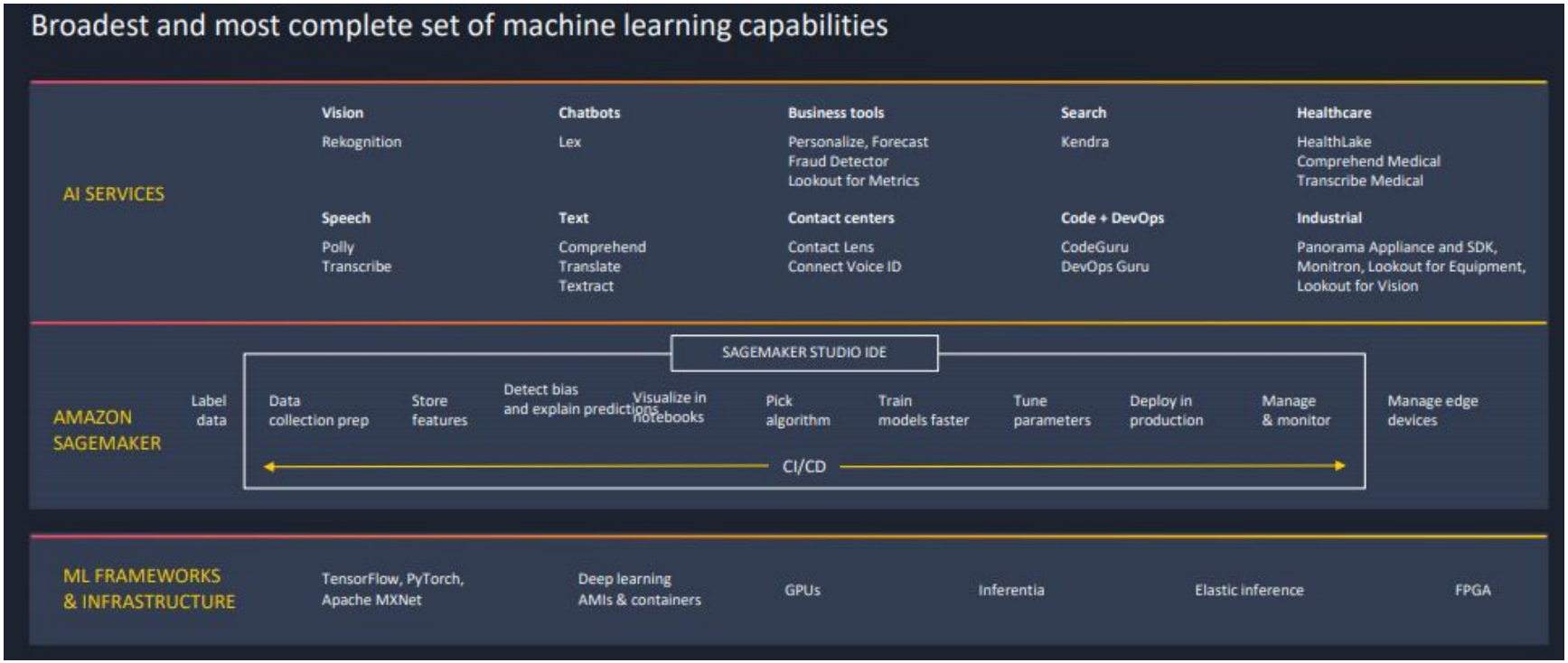
Learn about building bots >

Azure Cognitive Services

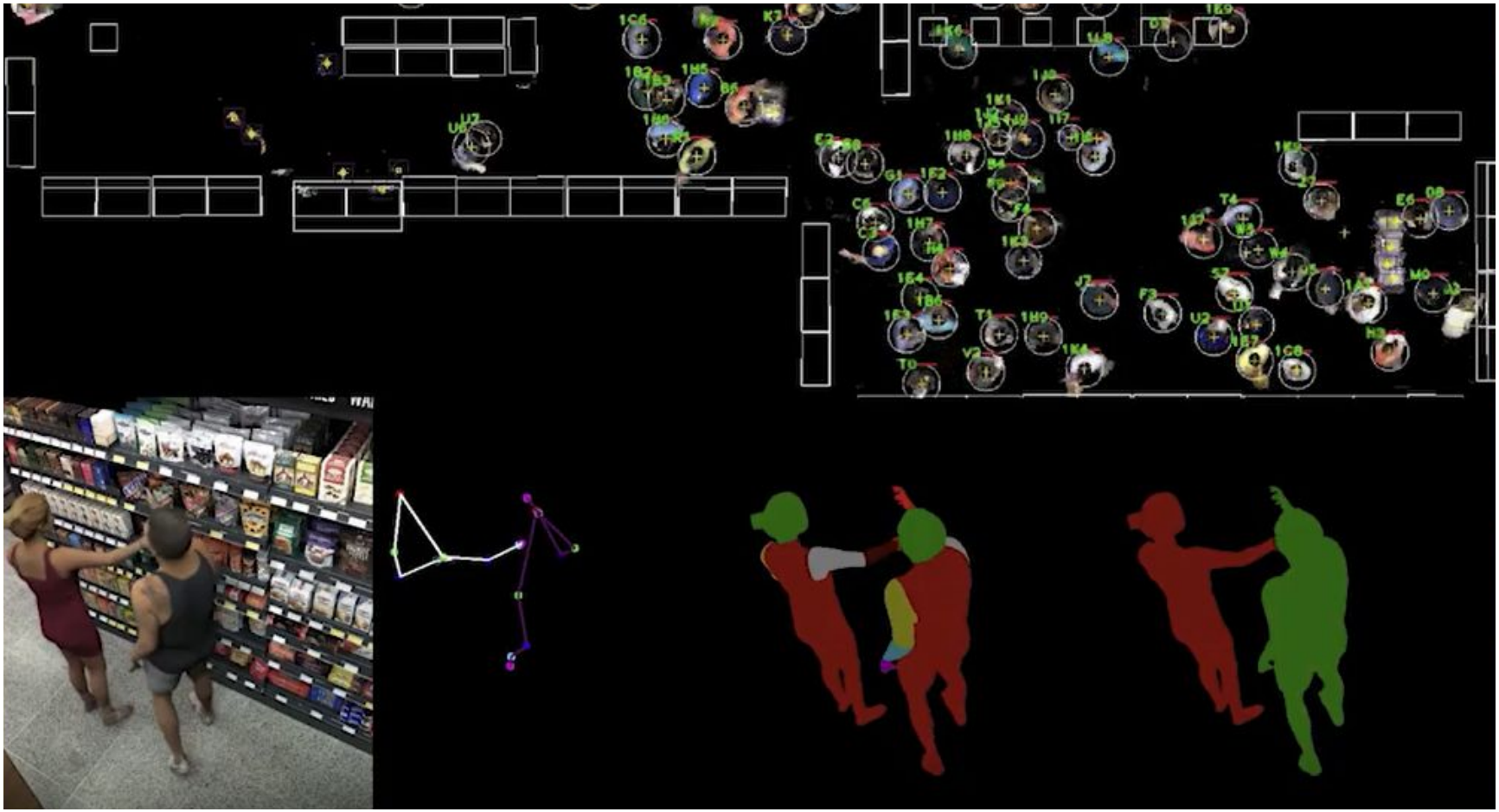
https://docs.microsoft.com/en-us/learn/certifications/roles/ai-engineer



The AWS ML Stack

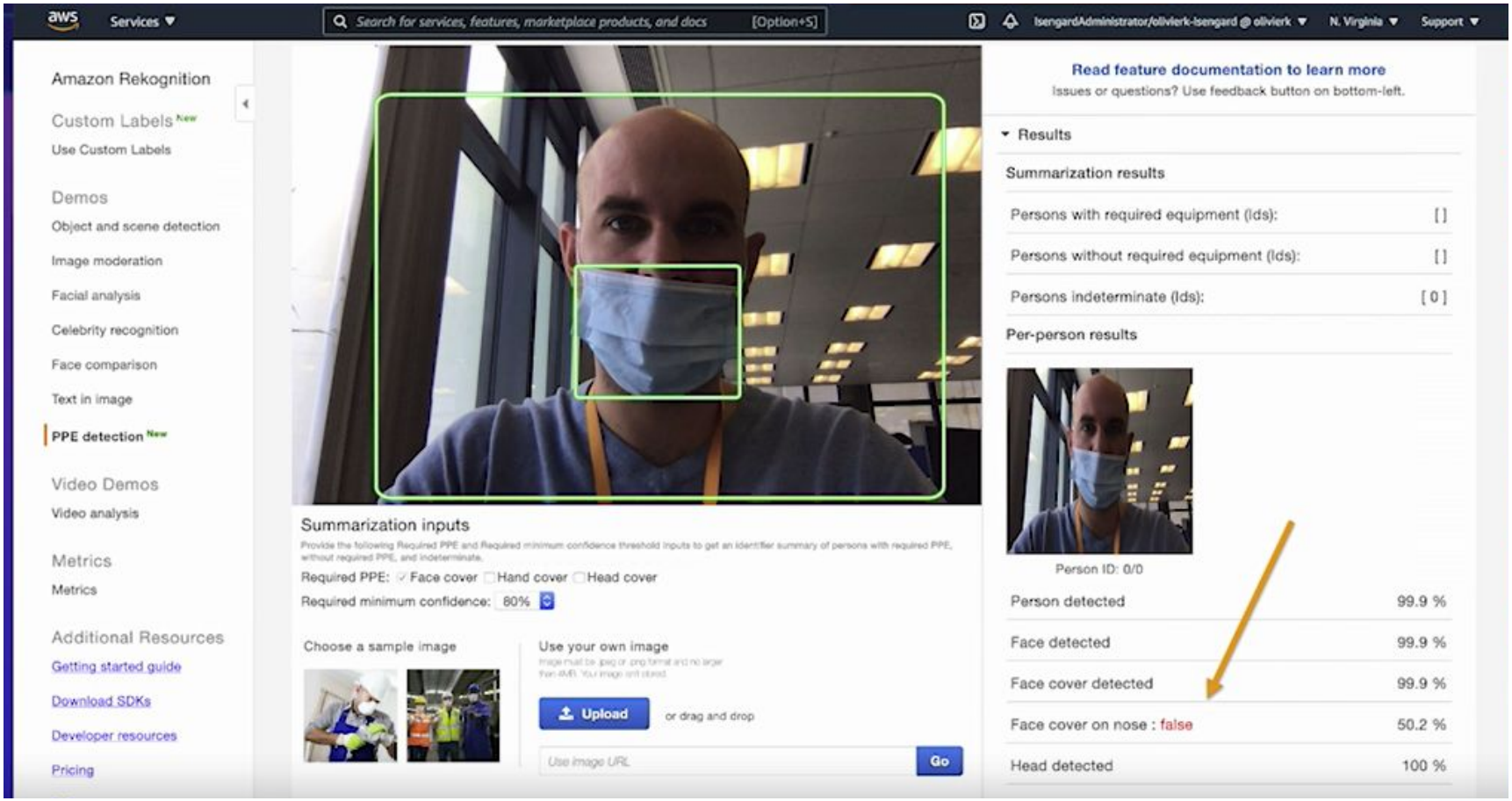


AWS AI and ML Cases Study

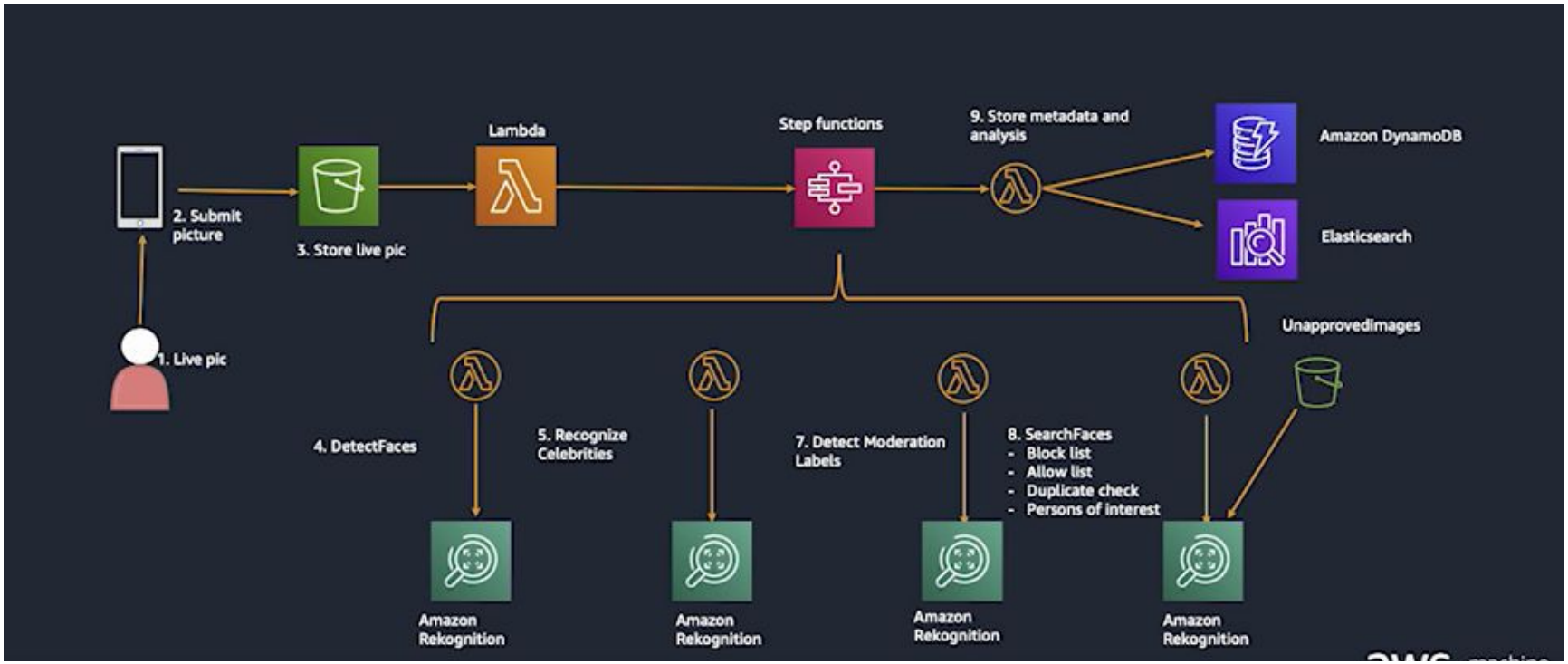


AWS AI and ML Services

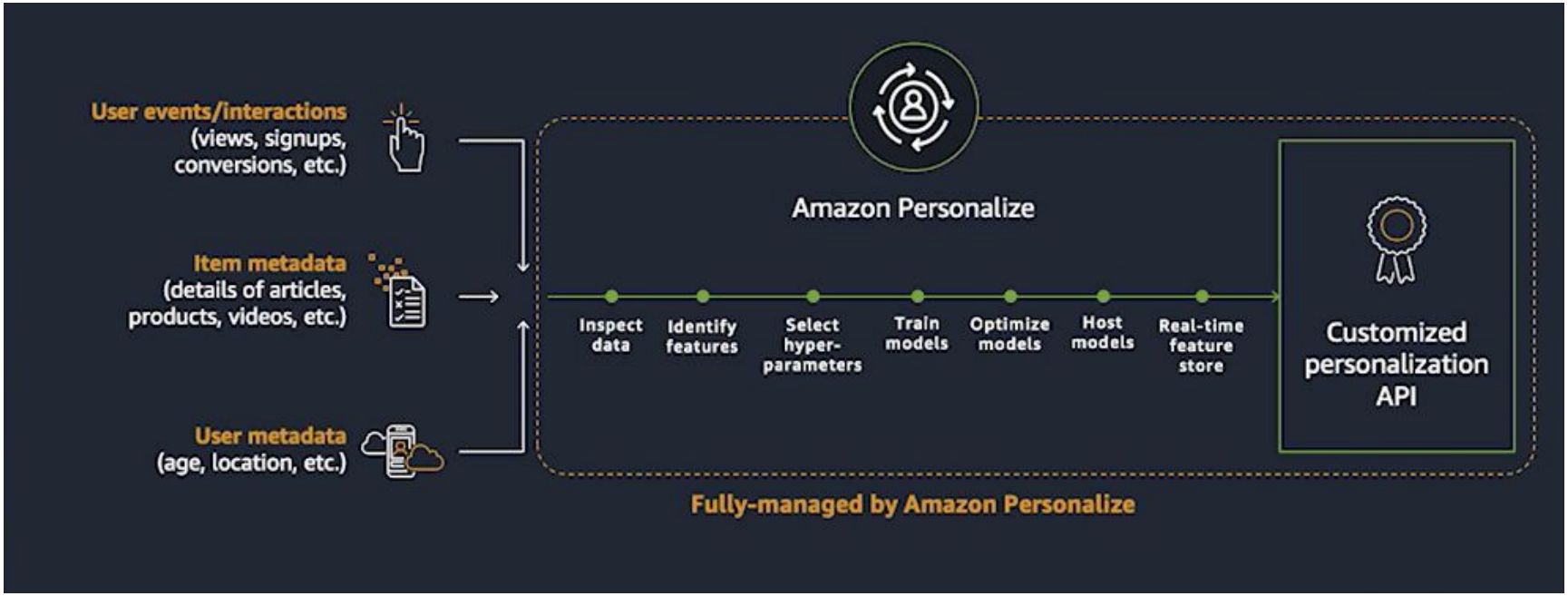
AWS AI and ML Cases Study



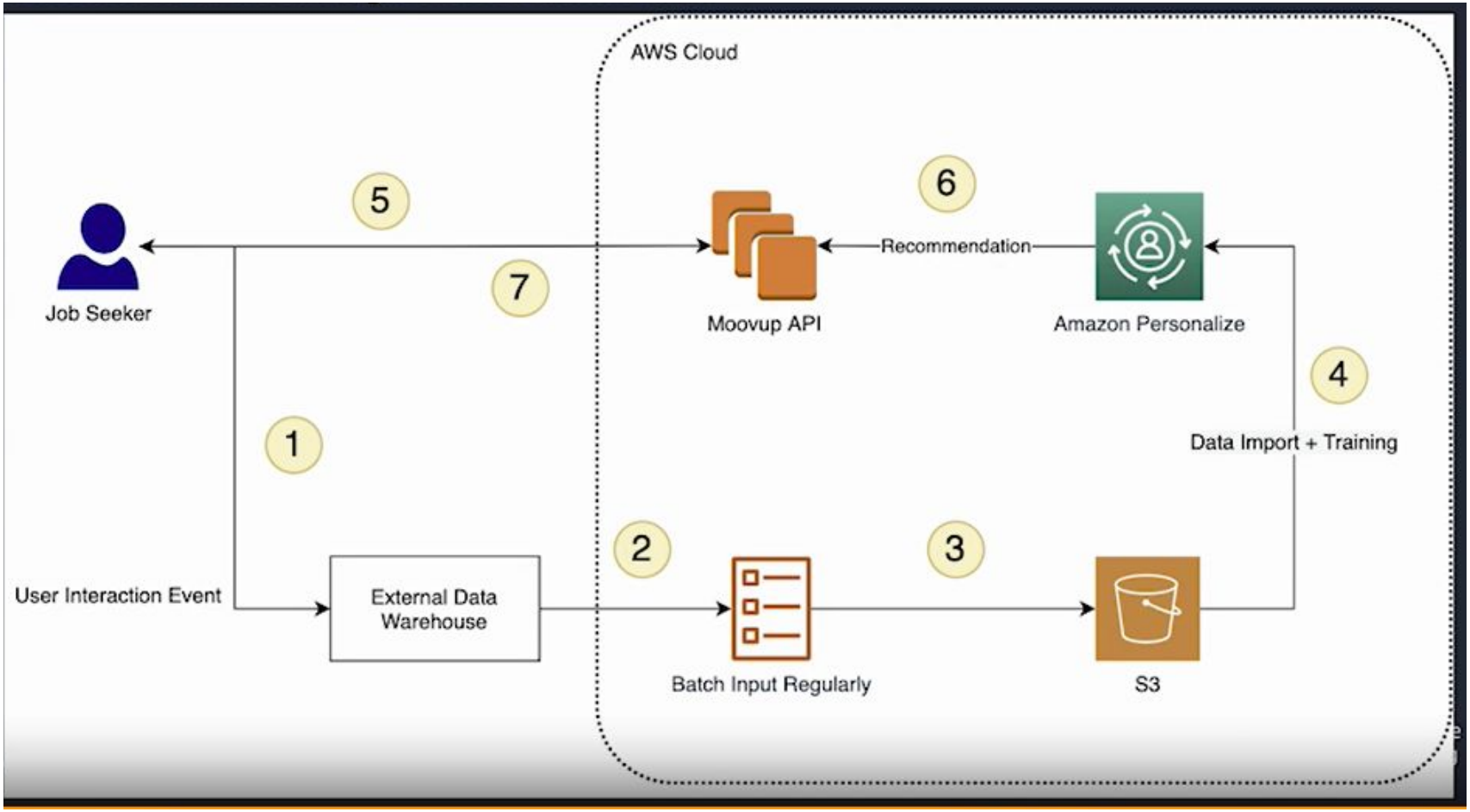
AWS Solution



HOW IT Works – Amazon Personalise

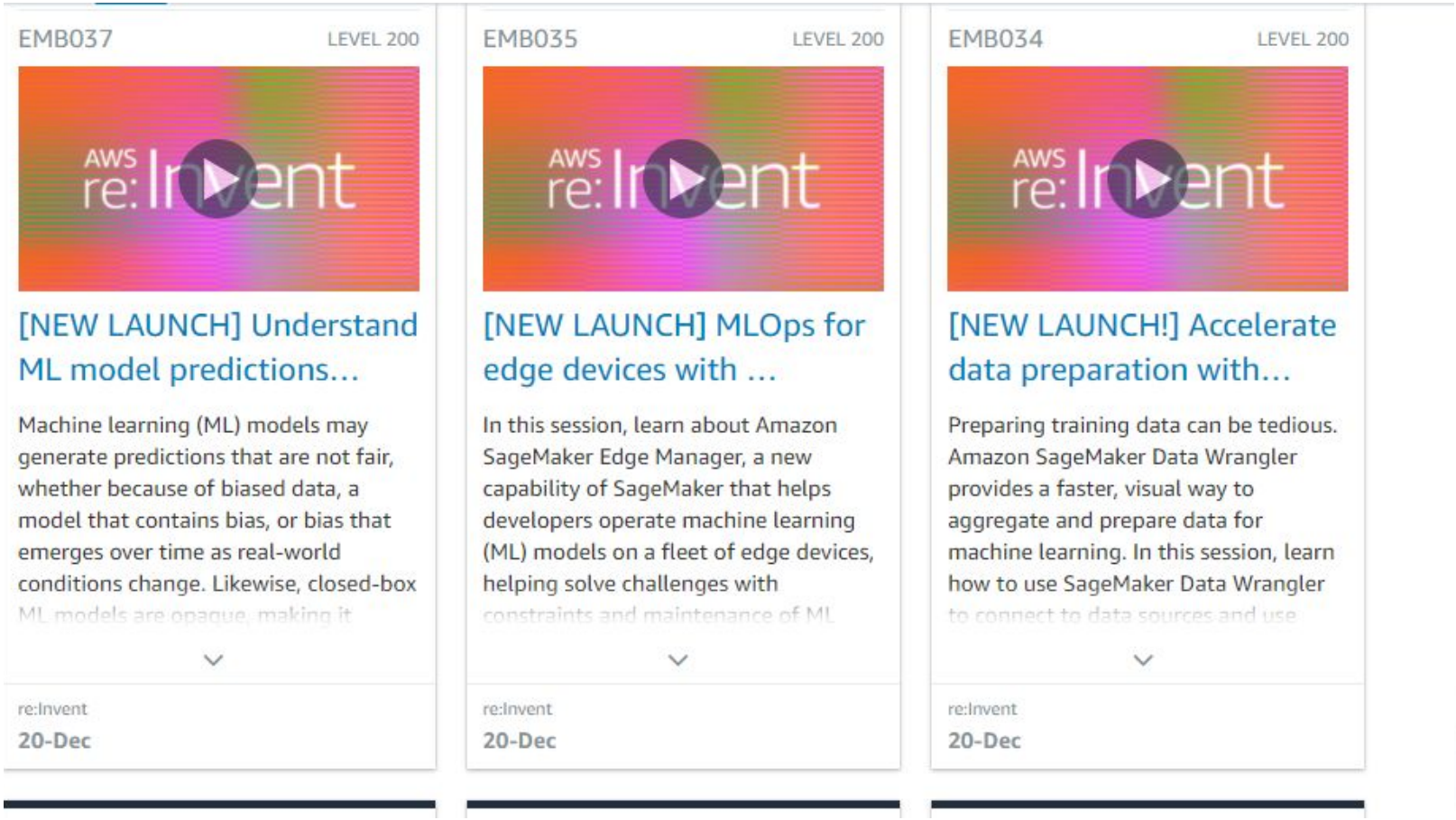


Recommendation System Architecture



Amazon Learning - AI

https://aws.amazon.com/events/events-content/?awsf.filter-language=language%23english&awsf.filter-topic=event-topic%23ai-ml



Case Study

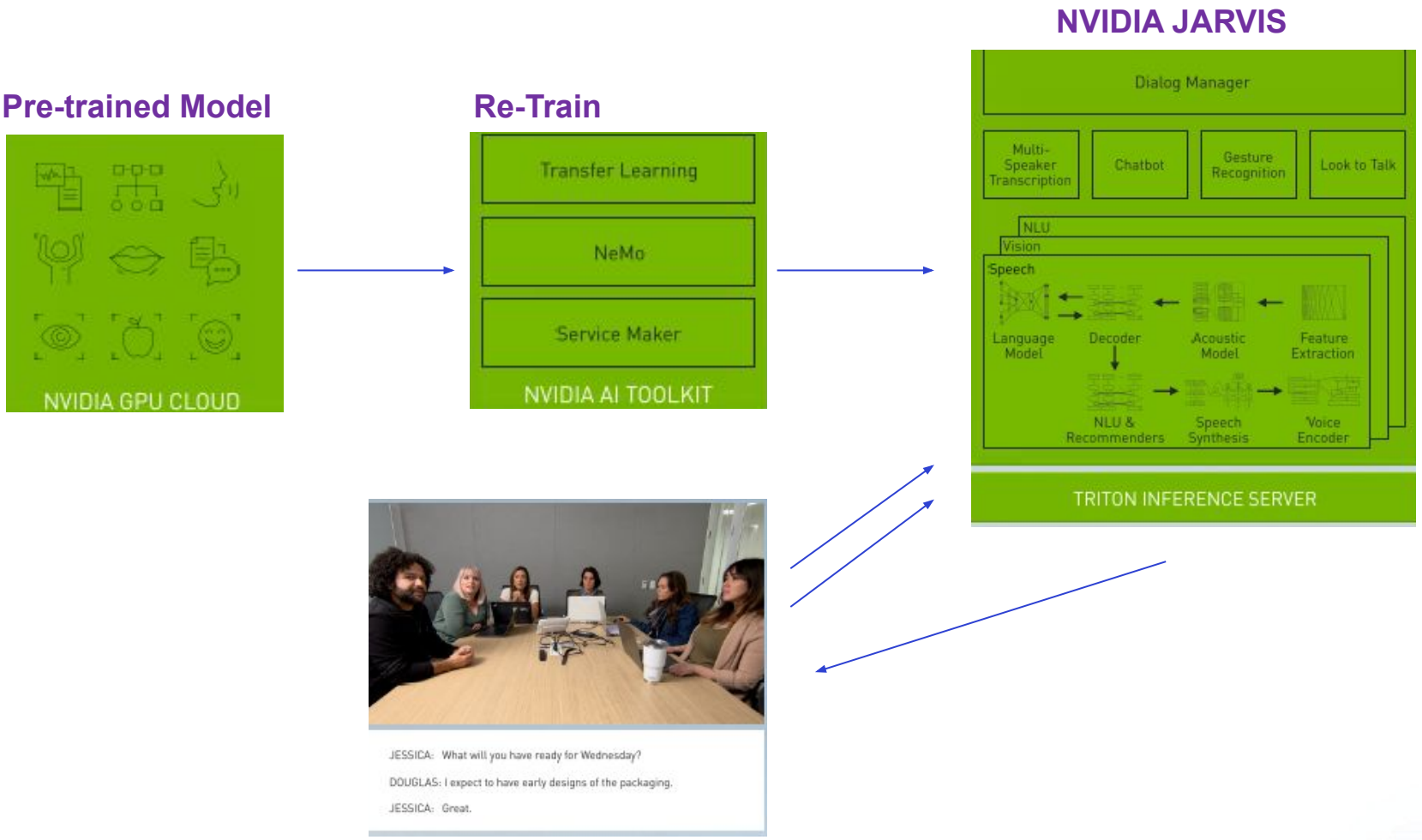
Opening Keynote - Building a smarter and more effective business using AIML on AWS (English Session)

https://hktw-resources.awscloud.com/ai-machine-learning-web-day/opening-keynote-building-a-smarter-and-more-effective-business-using-aiml-on-aws

Improving the customer experience of your applications with AWS AI Services (Cantonese session)

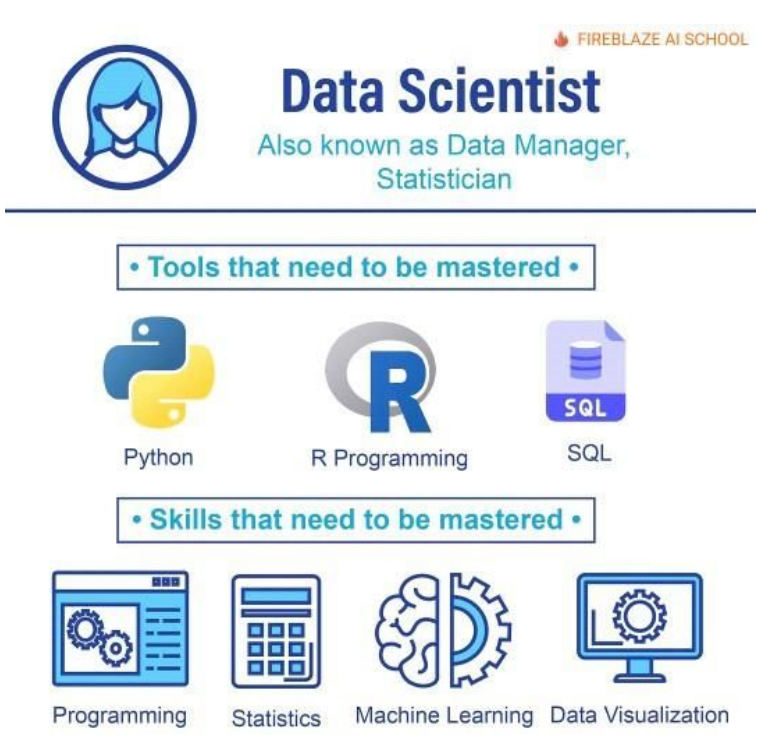
https://hktw-resources.awscloud.com/ai-machine-learning-web-day/improving-the-customer-experience-of-your-applications-with-aws-ai-services

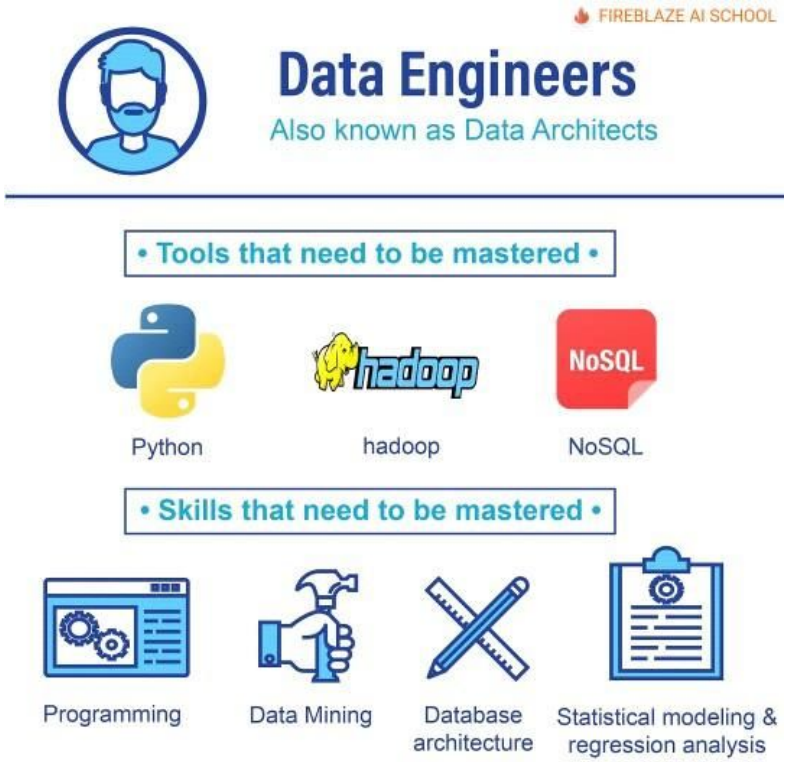
NVIDIA JARVIS – MULTIMODAL CONVERSATIONAL AI SERVICES FRAMEWORK



CONVERSIONAL AI IS TRANSFORMING INDUSTRIES

Data Scientist Jobs





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THANK YOU