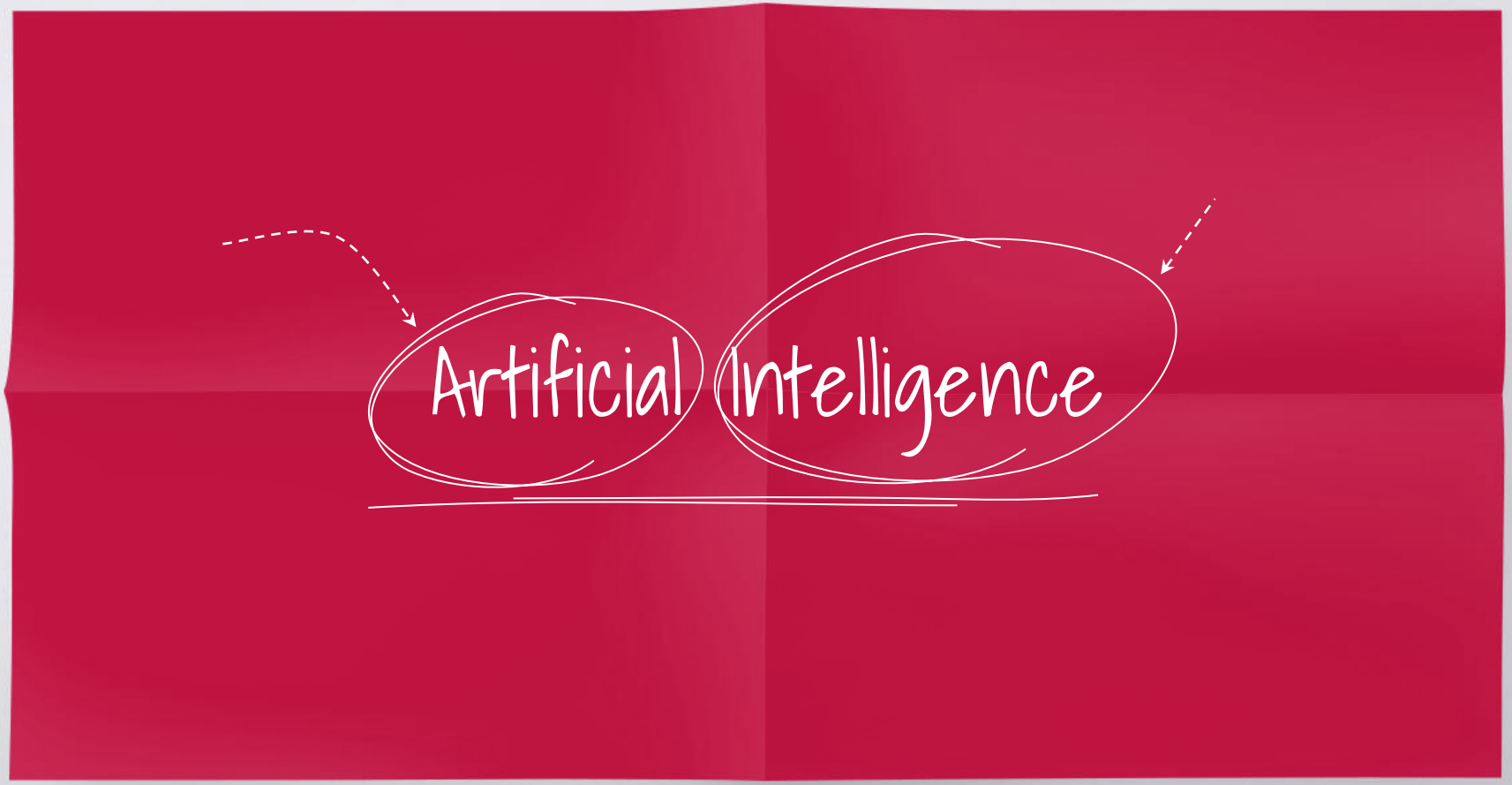
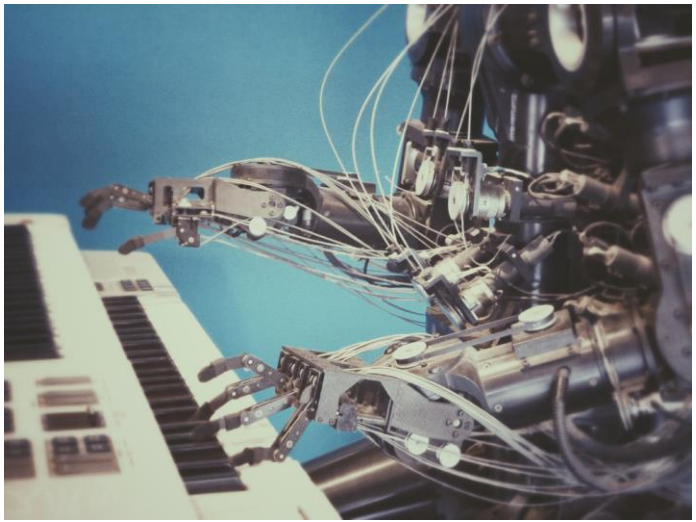

Artificial Intelligence

Types of Intelligence

Natural Intelligence



Artificial Intelligence

Artificial Intelligence

The ability of a machine
to replicate natural intelligence

Artificial Intelligence

The ability of a machine to perceive an enviroment and to choose actions that maximize the expected likelihood of achieving a goal

Applications of A.I

AI in Customer Service

FAQ generators

Customer support chatbots

Telephone voice assistants

AI in Finance

Trading algorithms

Fraud detection

Portfolio management

AI in Healthcare

Diagnostic tools

Treatment recommendation

Prescription Verificaiton

AI in Manufacturing

Product design

Industrial robots

Defect detection

AI in Marketing

Advertisement optimization

Sentiment analysis

Product recommendation

AI in Transportation

Warehouse robots

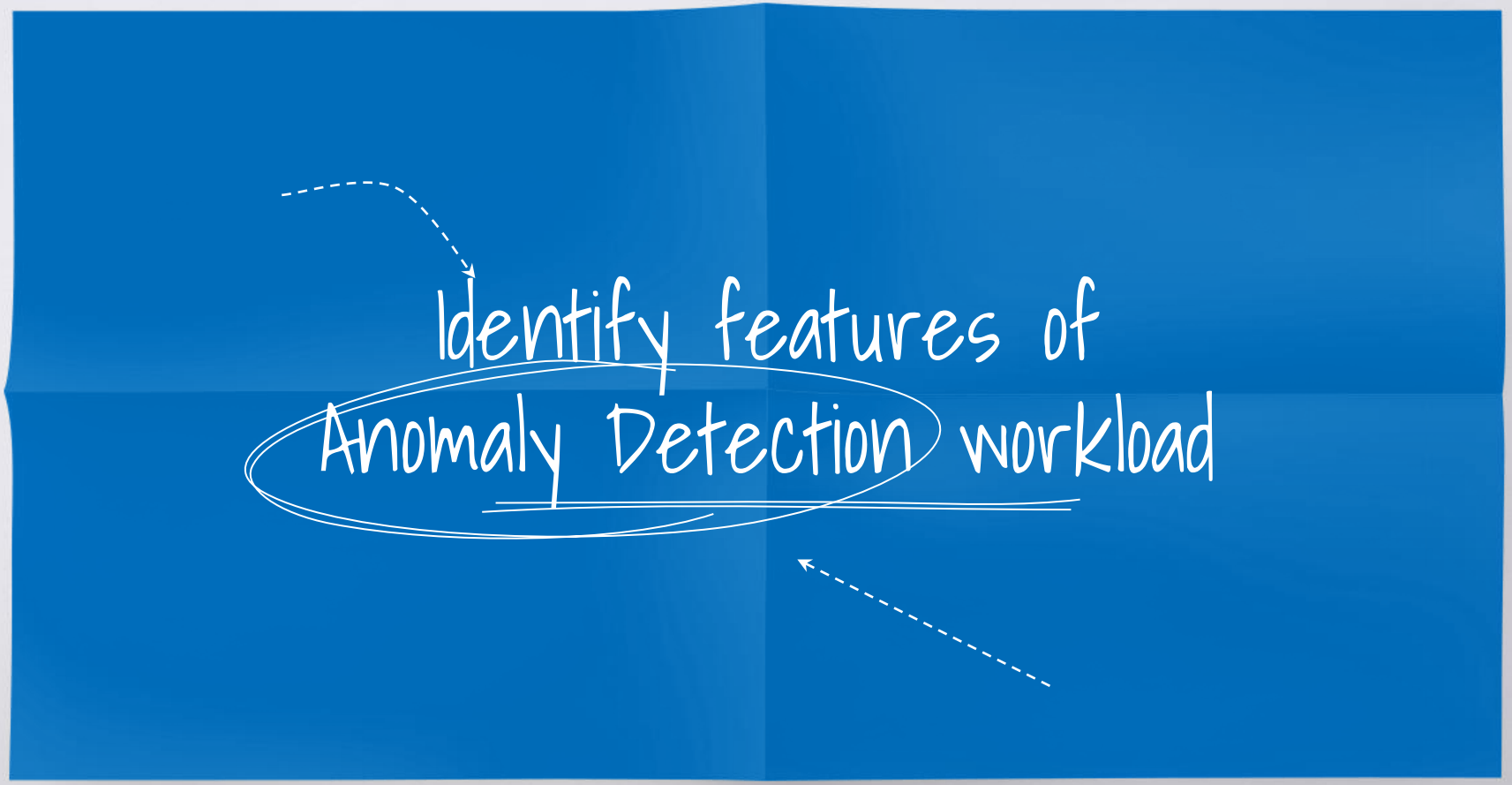
Route optimization

Delivery drones

Prediction and Forecasting

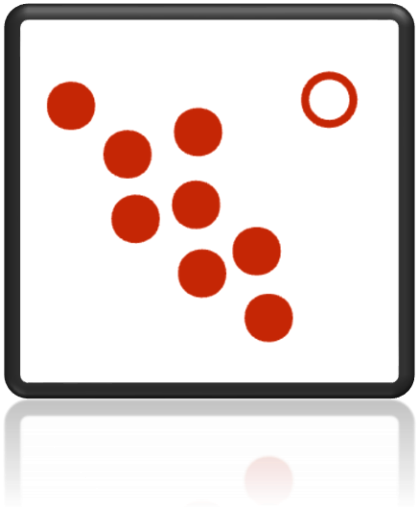
- **Prediction** – Indicating what can happen in future
- **Forecasting** - Prediction which uses data from previous events
- **Exam** – They will give you scenario and you need to figure out if it is Prediction/Forecasting workload.

- Predicting whether an airplane arrives early, on-time, or late
- Determining the likely repair costs for an accident involving a vehicle
- Stock Prices
- Weather Condition
- Electricity Consumption in an house hold
- Total sales in a store
- Azure Monthly Bill


Identify features of
Anomaly Detection workload

Anomaly Detection

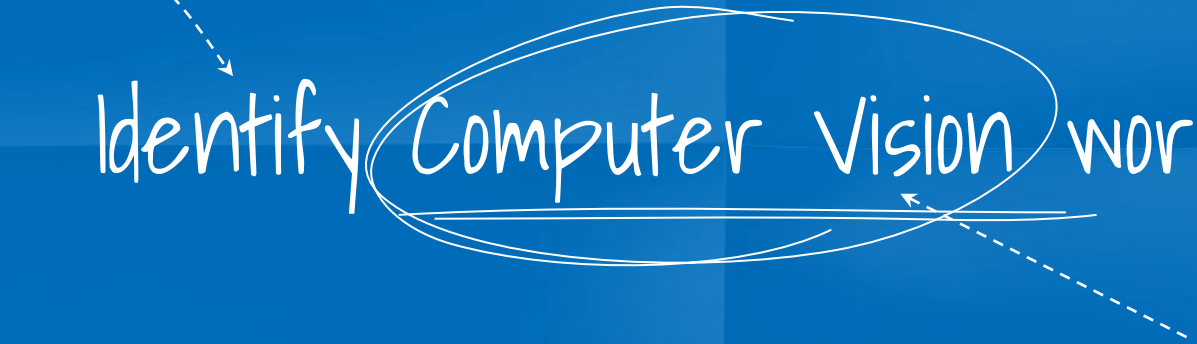
- **Anomaly Detection** is the process of using machine learning to find unexpected values or events
- A machine learning based technique that analyzes data over time and identifies unusual changes.
- **Example**: Unusual usage pattern in credit card transaction
- **Example**: Could be your heartbeat, could be sensor from your IOT device



Anomaly Detection

Statement	True	False
Anomalies can be detected by AI as they occur in real time.		
Anomalies can be detected by AI throughout a historical dataset.		
Anomaly detection boundaries that are automatically created by AI are immutable.		
Anomaly detection enables pre-emptive action to be taken before a problem occurs.		
Anomaly detection predicts when problems will occur.		
Anomaly detection analyzes data over time.		

Identify Computer Vision workload



Computer Vision is an area of AI that extract information from video or images

Computer Vision Workload

Statement	True	False
Computer Vision can be used to analyze static images.		
Computer Vision can be used to analyze live video streams.		
Computer Vision can be used to analyze live audio streams.		

Natural Processing Language

Understand written and spoken language

Natural Processing Language

NPL enables you to:

- Interpret commands and determine appropriate actions.
- Automatically translate spoken or written phrases between languages.
- Interpret spoken language, and synthesize speech responses.
- Analyze and interpret text in documents, email messages, and other sources.

Question: Analyzing customer feedback on an ecommerce website to determine whether it is positive or negative? Is this scenario is an example of the natural language processing AI workload? YES/NO


Knowledge mining workloads

Knowledge Mining

STEP 1

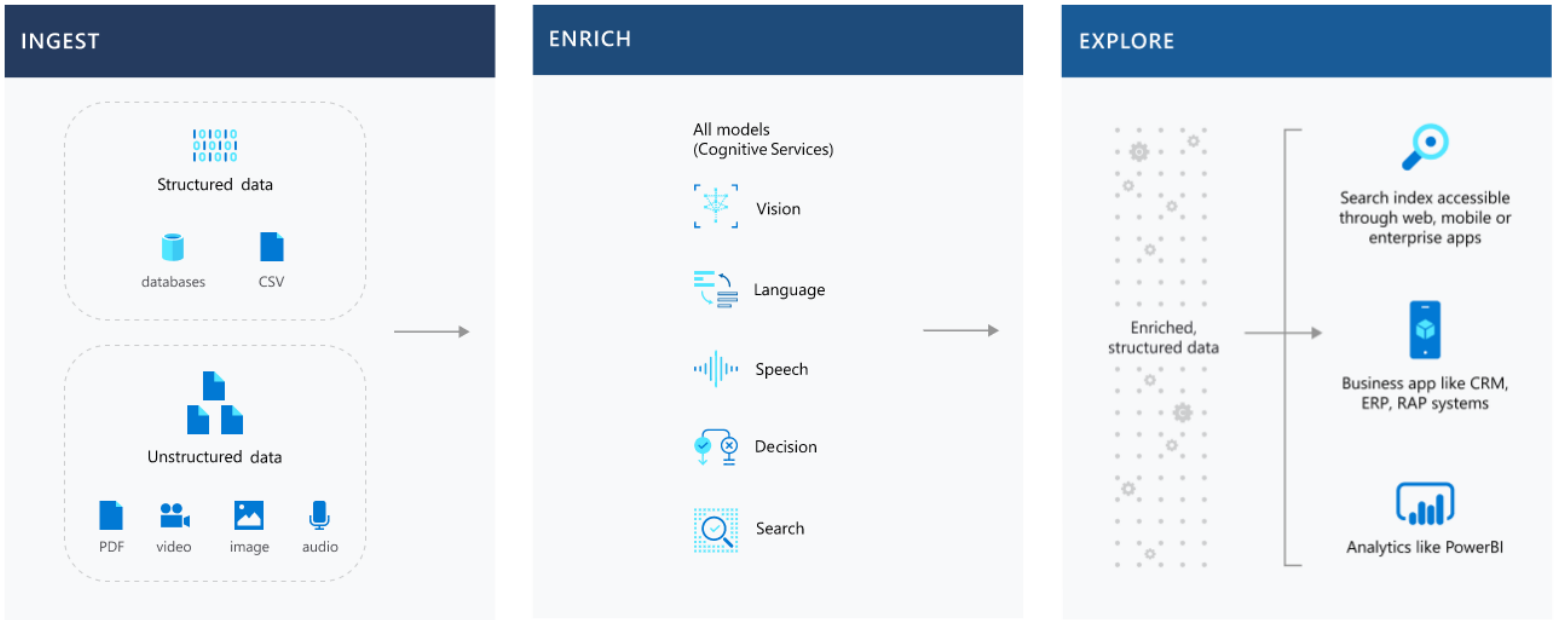
Ingest content from a range of sources, using connectors to first and third-party data stores.

STEP 2

Enrich the content with AI capabilities that let you extract information, find patterns and deepen understanding.

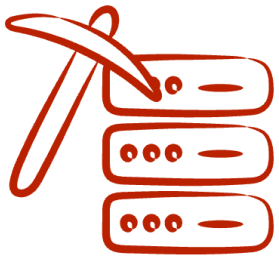
STEP 3

Explore the newly indexed data via search, bots, existing business applications and data visualisations.

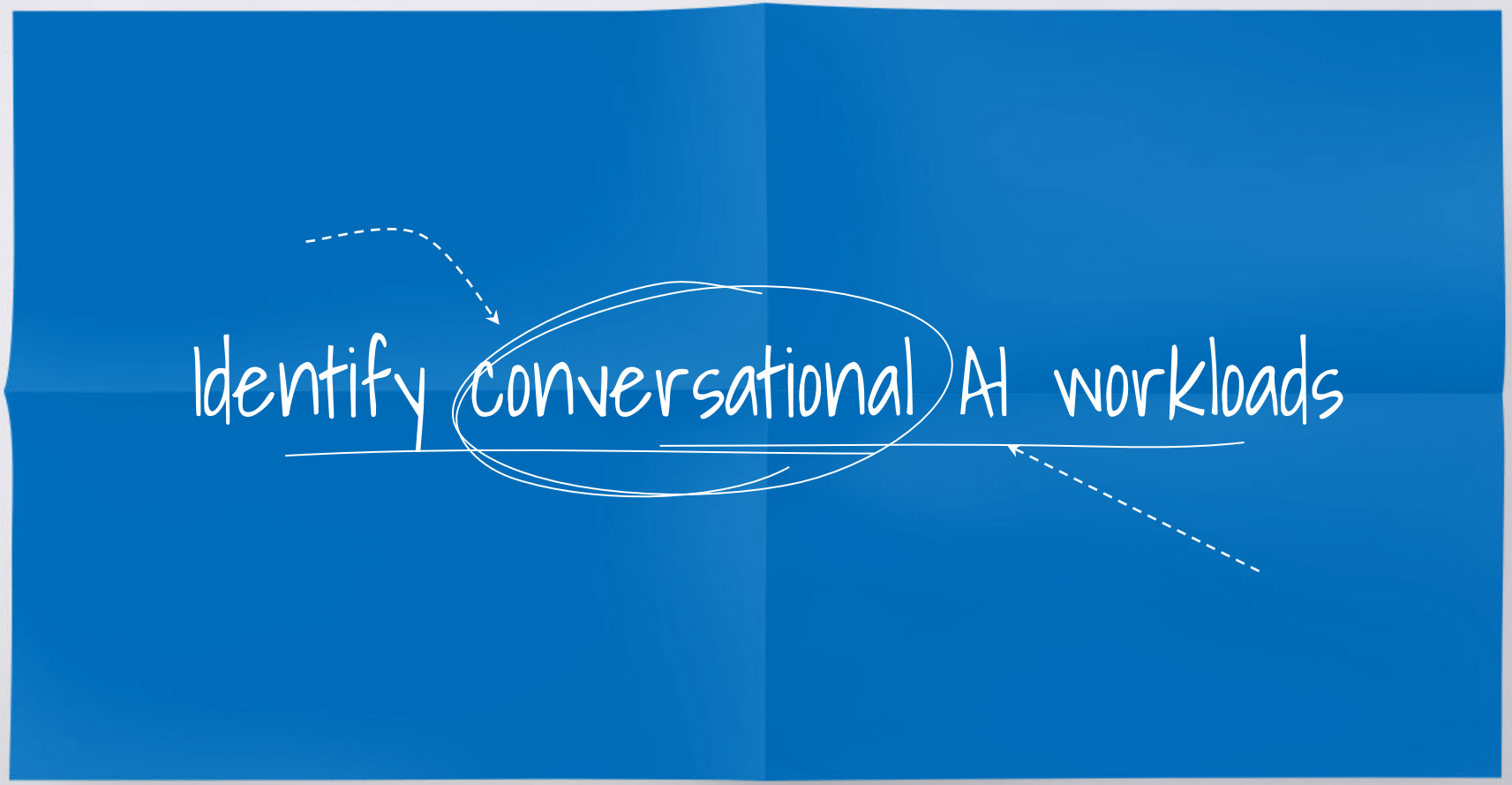


Knowledge Mining

- Knowledge Mining uncovers hidden insights in your data.
- Knowledge Mining uses a combination of AI services to extract meaning and relationships from large amounts of information.
- This information can be held in structured and unstructured data sources, documents, and databases.

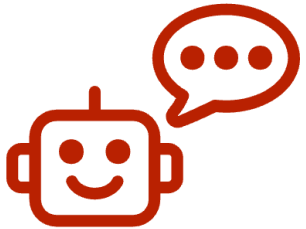


- Question: Extracting key insights from structured and unstructured data sources is a feature of ……..


Identify conversational AI workloads

Conversational AI

- AI based solutions where AI agents participate in conversations with humans.
- Most common example: chatbots to manage dialogs with users

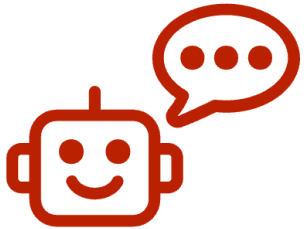


Bots can be the basis of AI solutions for:

- Customer support for products or services.
- Reservation systems for restaurants, airlines, cinemas, and other appointment based businesses.
- Health care consultations and self-diagnosis.
- Home automation and personal digital assistants.

Conversational AI

Question: For which two of these scenarios should you use Conversational AI? Each correct answer presents a complete solution. Choose the correct answers



a) Translating speech from one language to another.

b) Making a travel reservation.

c) Detecting a change in hospital infection rates.

d) Detecting spam in emails.

e) Answering frequently asked questions.

Identify guiding principles for responsible AI

Guiding Principles

- The prevalence of AI causes some ethical and moral challenges
- These six principles are designed to ensure that AI applications provide solutions without any unintended negative consequences
- Decisions that are harmful to society at large
- Decisions that are illegal (or at least, go against social values)

Guiding principles of responsible AI

Fairness

- AI systems should treat all people fairly without incorporating any bias based on gender, ethnicity, or other factors that might result in an unfair advantage or disadvantage to specific groups of applicants.
- Examples:
  - Bank loan approval application
  - Medical treatment
  - Employment

- How to design?
  - Developers should use training datasets that reflect the diversity of society.
  - Developers should also design AI models in ways that allow them to learn and adapt over time without developing biases.
- Question: Deploying an AI service that monitors people of certain ethnicity for closer inspection in a retail store is a violation of which Microsoft responsible AI principle?
- Question: Cultural denigration is a violation of which Microsoft responsible AI principle?

Reliability and safety

- AI systems should operate reliably, safely, and consistently.
- Ensure that AI systems operate as they were originally designed, respond to unanticipated conditions and resist harmful manipulations.
- Unexpected Conditions
  - How does the military unmanned drone operate when the GPS is down?
  - How does the self-driving car operate at night? In a rainstorm? In a snowstorm?
- Developer consideration?
  - Rigorous testing and deployment management processes
  - Operate, maintain, and protect their AI systems over the lifespan of their use

- Question: When developing an AI system for self driving cars, which Microsoft principle for Responsible AI should be applied to ensure consistent performance during unexpected circumstances?
- Question: While developing an AI system you encountered a situation where the AI system should be ingested with unusual and missing values. Which Microsoft guiding principle for responsible AI you should consider?

Privacy and Security

- AI systems should be secure and respect privacy.
- Datasets may contain sensitive personal or business details that must be kept private
- Many countries and regions in the world are developing new standards and laws to try to protect the data of its citizens
  - Provide consumers with information and controls over the collection, use and storage of their data
- Developer consideration?
  - Robust compliance processes to ensure that data collected and used by our AI systems is handled responsibly.
- Question: Fill the Microsoft guiding principles for responsible AI to the appropriate descriptions.

  Provides consumers with information and controls over the collection use and storage of their data

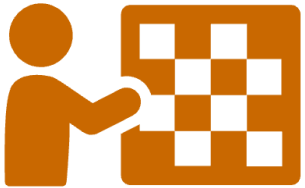
  _____

Inclusiveness

- At Microsoft, we firmly believe everyone should benefit from intelligent technology
- AI should bring benefits to all parts of society, regardless of physical ability, gender, sexual orientation, ethnicity, or other factors.
- Developer consideration?
  - Inclusive design practices can help system developers understand and address potential barriers in a product environment that could unintentionally exclude people.
- Question: Your company is exploring the use of voice recognition techniques in its smart home devices. The company wants to identify any barriers that might unintentionally leave out specific user groups? This is an example of which Microsoft guiding principle for responsible AI?
- Question: A media company is implementing an AI system that entitles everyone including people with disabilities such as vision impairment, deaf or hard of hearing. Identify the Microsoft guiding principle for responsible AI which the company is trying to implement.

Transparency

- It is critical that people understand how AI system has made decisions.
- Users should be made fully aware of the purpose of the system, how it works, and what limitations may be expected.
- For example:
  - If AI application rejected job application, or life insurance or bank loan. You should be able to explain why they were rejected? else system lack transparency.
- Developer consideration?
  - You should design system such that you can overwrite AI decision if required.
- Question: Ensuring users are aware of the limitations of AI-based applications that they are using is an example of _____ responsible AI principle.



Accountability

- People should be accountable for AI systems. Designers and developers of AI-based solution should work within a framework of governance and organizational principles that ensure the solution meets ethical and legal standards that are clearly defined.
- For example:
  - Deny people consequential services like healthcare or employment, create risk of physical or emotional harm, or infringe on human rights.
- Developer consideration?
  - AI systems are not the final authority on any decision that impacts people's lives, humans maintain meaningful control over these autonomous AI systems.
  - Organizations should also have a dedicated internal review process., Regularly improve the model.
- Question: You are developing a solution based on facial recognition. You have to ensure that the AI-based solution meets ethical and legal standards that advocate regulations on people civil liberties and works within a framework of governance and organizational principles. The Microsoft guiding principle for responsible AI considered is?