# Professional Training Program in Large Language Models

## Day 1

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Saudi Data & AI Authority

# Agenda

- Why do on Earth do we need to change?
- Retro to Machine Learning
- NLP Overview
- Gen AI Landscape
- Problem Identification - Huddle

# What can Gen AI do for you and your organization?


amazon
zoom
Customer Experience
NETFLIX
slack
Products
1970s
Product + Services
1990s
Customer Centric
2000s
Experience Centric
Today

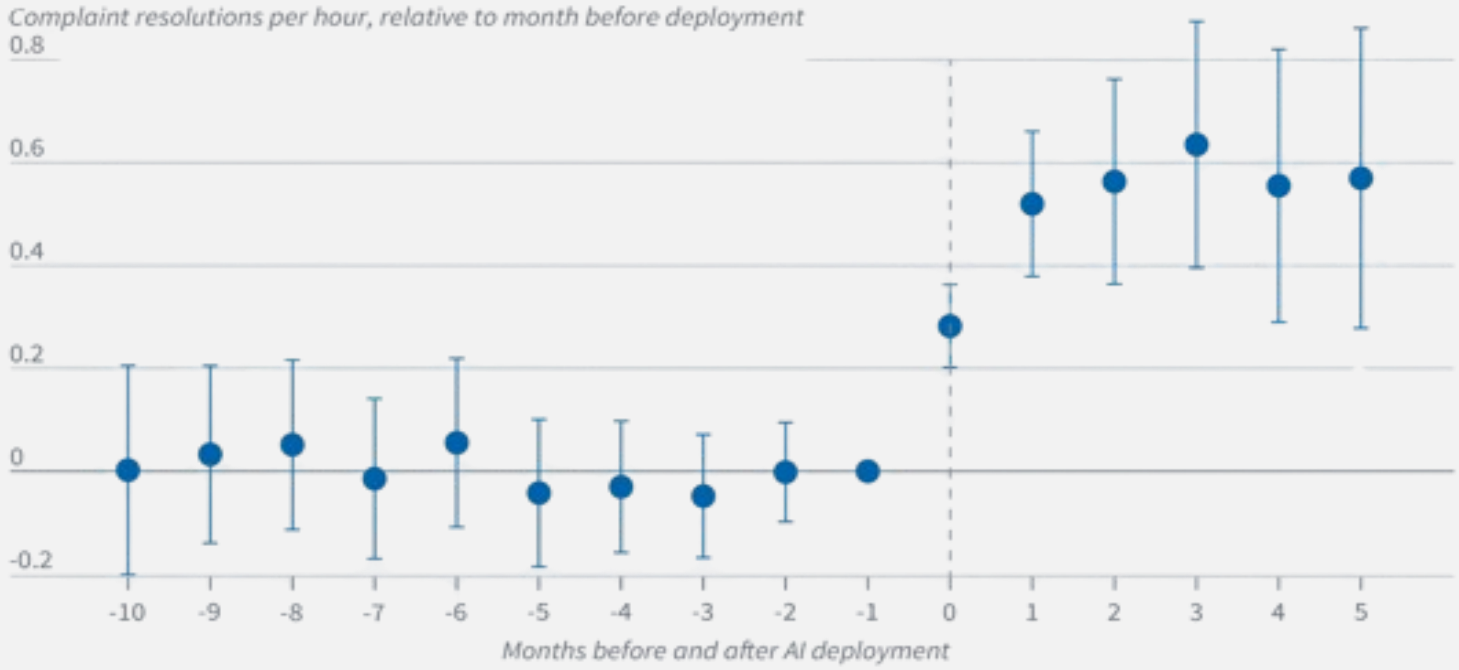
Source

# What can Gen AI do for you and your organization?

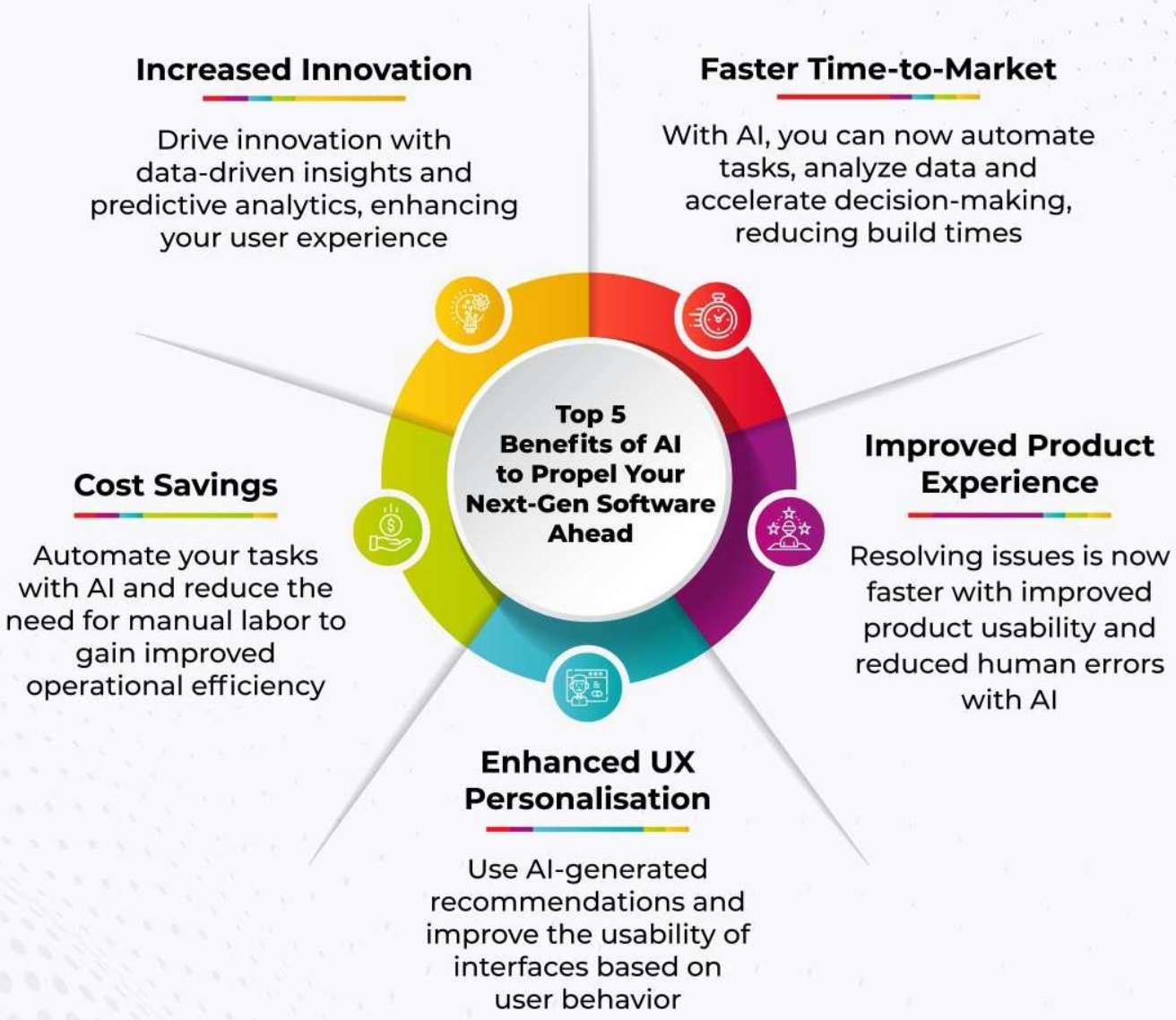
# What can Gen AI do for you and your organization?

## One word: Productivity

# AI Assistance and Customer Complaint Resolutions




*Thin bars represent 95% confidence intervals*
*Source: Researchers' calculations using data from customer support agents provided by a Fortune 500 enterprise software company*


Increased Innovation
Drive innovation with data-driven insights and predictive analytics, enhancing your user experience
Faster Time-to-Market
With AI, you can now automate tasks, analyze data and accelerate decision-making, reducing build times
Top 5 Benefits of AI to Propel Your Next-Gen Software Ahead
Cost Savings
Automate your tasks with AI and reduce the need for manual labor to gain improved operational efficiency
Improved Product Experience
Resolving issues is now faster with improved product usability and reduced human errors with AI
Enhanced UX Personalisation
Use AI-generated recommendations and improve the usability of interfaces based on user behavior

Source

# من سار على الدرب .....

# What is a language model?

A language model refers to a type of model specifically designed to generate human-like text or predict the probability of a sequence of words. Language models learn patterns and statistics from large amounts of text data, enabling them to generate sensible and contextually appropriate sentences.

# What is a language model?

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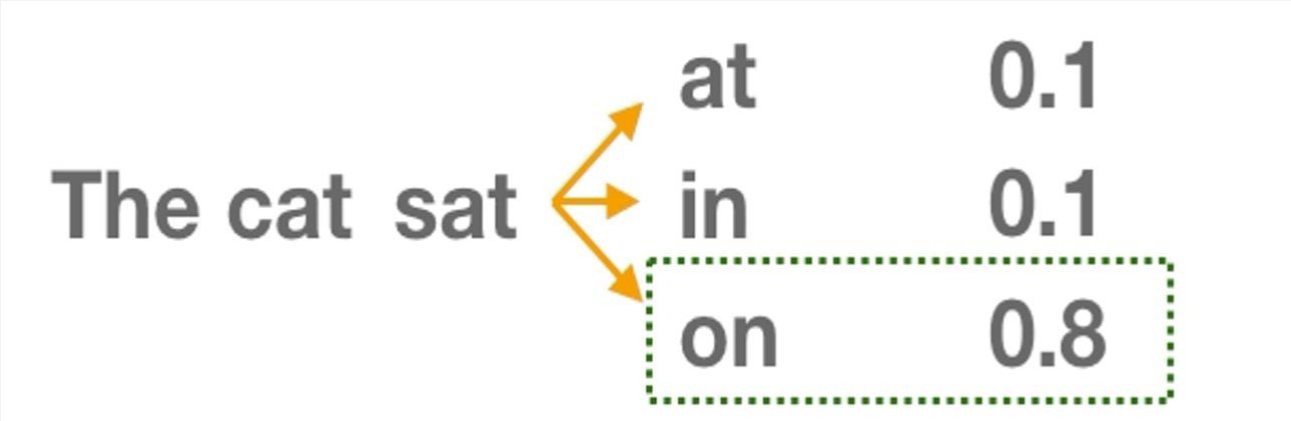

# What is a language model?

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The cat sat on the mat

# Large Language Models?

Extensive Training Data: Large language models are trained on vast amounts of text data, often comprising billions or even trillions of words. This extensive training data helps the models learn patterns, grammar, context, and a wide range of language nuances, enabling them to generate coherent and contextually appropriate responses.

Complex Architectures: Large language models employ complex architectures, such as transformer networks, that contain numerous layers and millions or even billions of parameters. These architectures enable the models to capture intricate language structures, understand semantics, and generate high-quality text by leveraging the vast amount of training data they have been exposed to. The large number of parameters allows the models to learn fine-grained details and provide nuanced responses.

# Let's explore a concrete example

Find me a stylish Nike blue t-shirt specifically designed for golf, with a comfortable fit and moisture-wicking fabric, in size medium and at a reasonable price point

Search

# Let's explore a concrete example

- Query 1: Find me a Nike t-shirt.
- Query 2: Find me a blue t-shirt.
- Query 3: Find me a t-shirt specifically designed for golf.
- Query 4: Find me a stylish t-shirt.
- Query 5: Find me a t-shirt with a comfortable fit.
- Query 6: Find me a t-shirt with moisture-wicking fabric.
- Query 7: Find me a t-shirt in size medium.
- Query 8: Find me a t-shirt at a reasonable price point.
- Combine Results:
  - "Find me a stylish Nike blue t-shirt specifically designed for golf, with a comfortable fit and moisture-wicking fabric, in size medium and at a reasonable price point."


PROMPT ENGINEERING

FINE TUNING, LLM

RETRIEVAL AUGMENTED GENERATION (RAG)

RAG + FT EMBEDDING MODEL

RAG + FT EMBEDDING + LLM

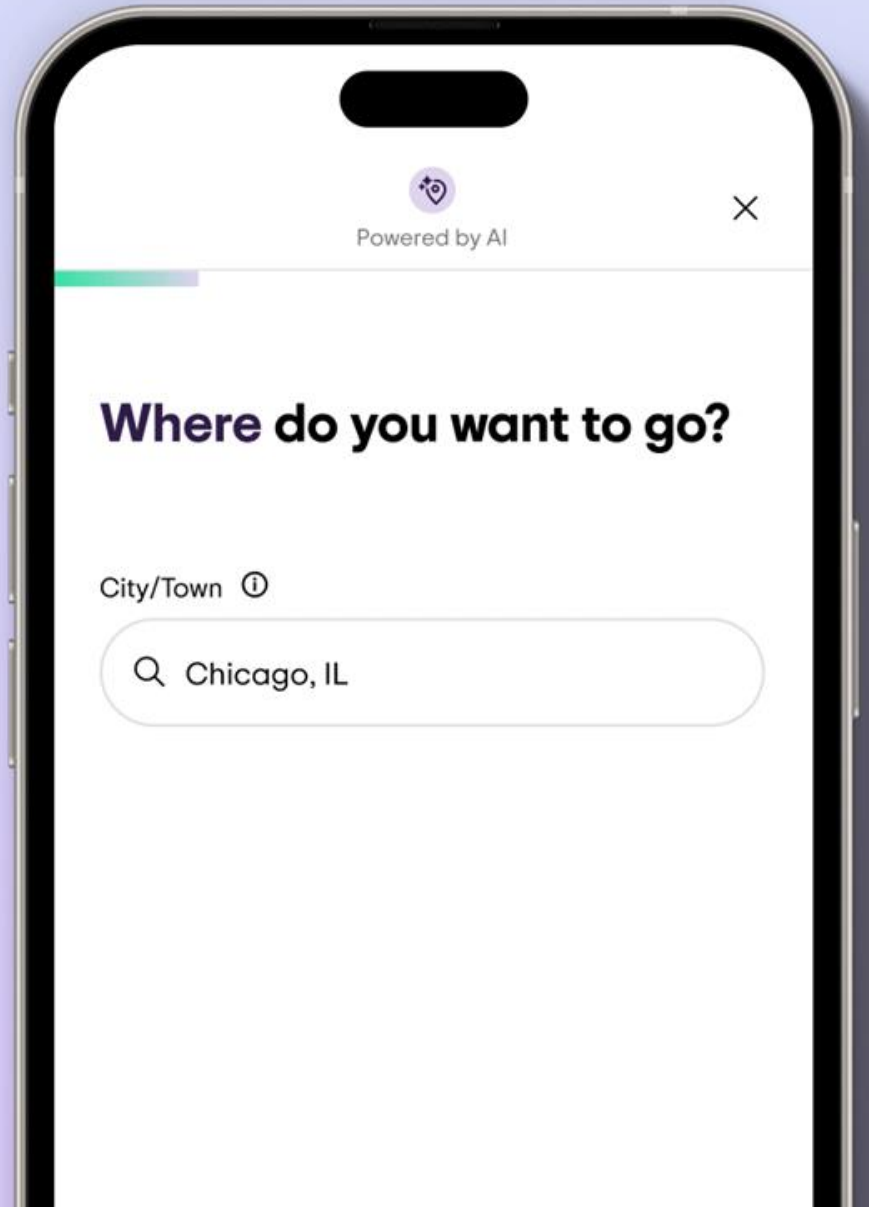
# What is RAG

Retrieval-Augmented Generation (RAG) is the process of optimizing the output of a large language model, so it references an authoritative knowledge base outside of its training data sources before generating a response.

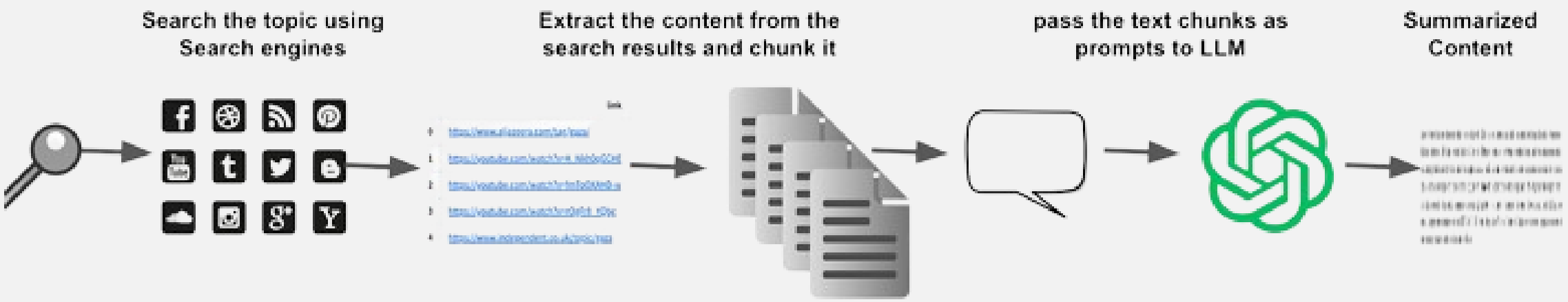
# Perplexity Example

Tripadvisor

# Kick-start your travel planning

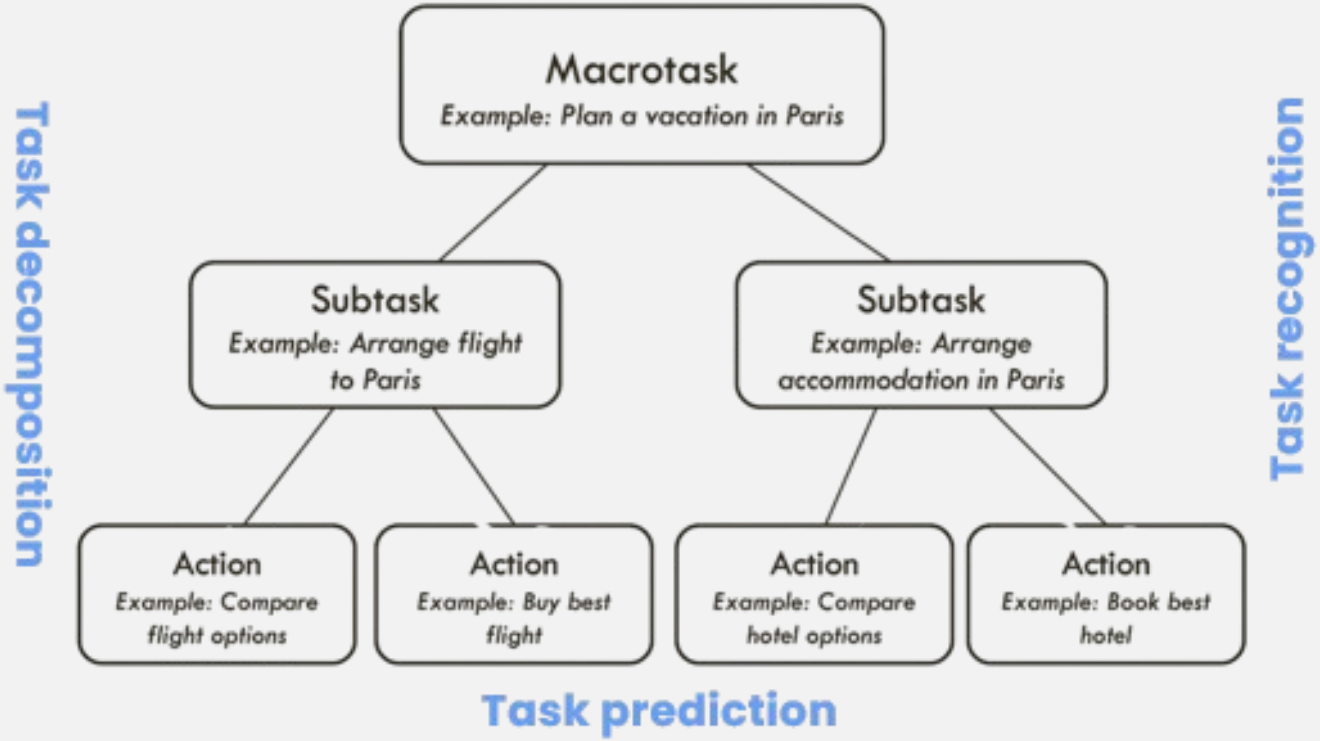


# Perplexity Example



# Perplexity Example

Dividing a complex search into subtasks, to then retrieve the results from them, and combine them into one answer, by searching the internet is quite a hard task

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# Perplexity Example

Complex search is difficult, multi-faceted and requires deeper engagement

- There are 10 billion search queries a day, **an estimated half of them go unanswered.**
- That's because, **people are using search to do things it wasn't originally designed to do.**
- It's great for finding a website, but **for more complex questions or tasks, too often it falls short.**
- Complex search tasks involve **multiple queries, multiple sessions or requires deep engagement with search**

# Let's revisit some basic terminologies

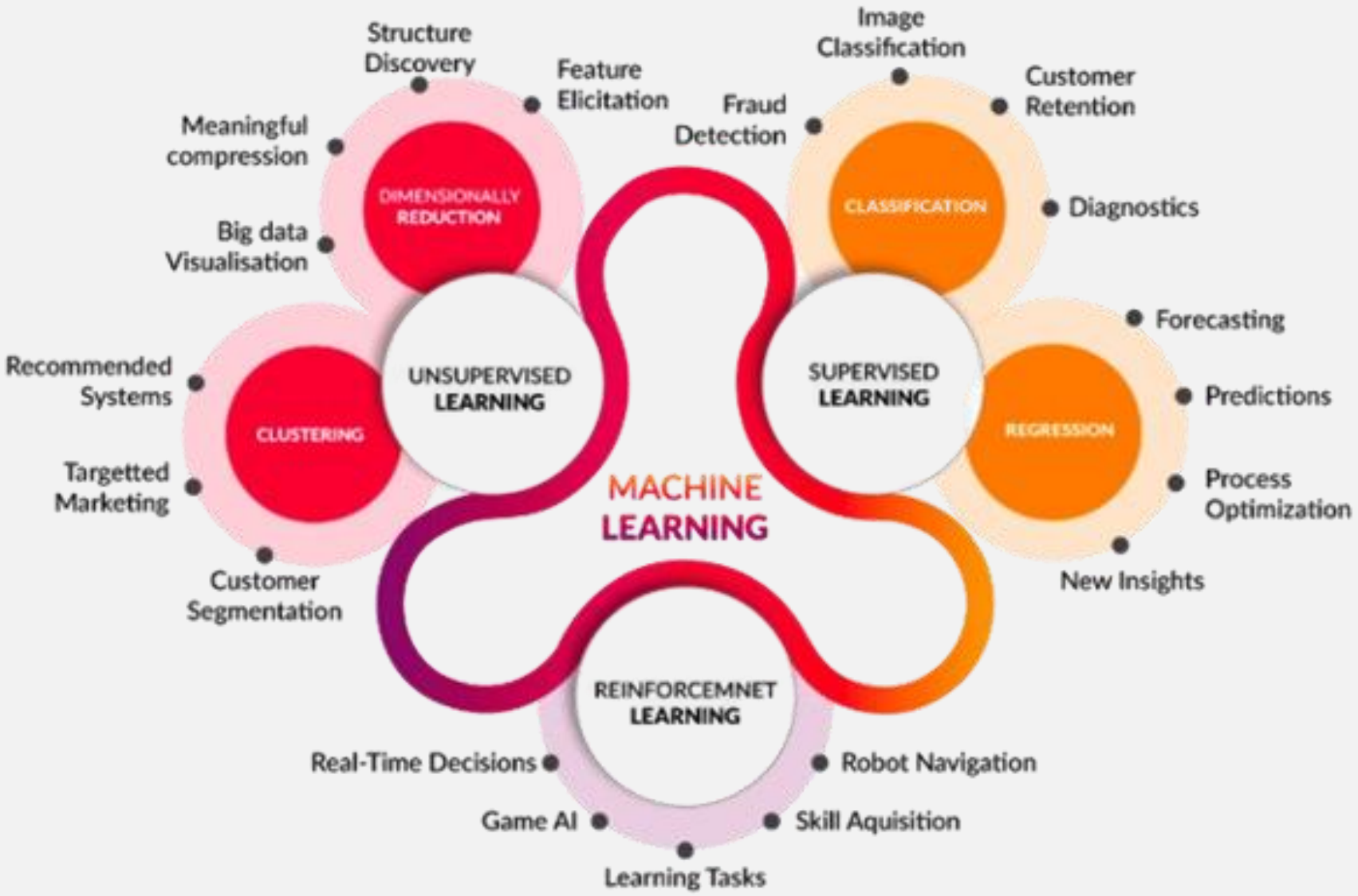
# Machine Learning Models

Machine learning is a discipline that focuses on creating algorithms and software capable of “learning” from the information we provide, and effectively perform specific types of tasks, as a result of this training.

Some examples:

- Netflix Recommendation Models
- Sales Prediction
- Self-Driving Cars

# Machine Learning Models



# Generative AI

Generative artificial intelligence (generative AI) is a type of AI that can create new content and ideas, including conversations, stories, images, videos, and music.

AI technologies attempt to mimic human intelligence in nontraditional computing tasks like image recognition, natural language processing (NLP), and translation.

# Generative AI market in focus

## Use case

## Applications

### Text

#### Marketing

ChatGPT, Jasper, WordAI, anyword, copy.ai, frase, Writesonic, copysmith, Hypotenuse AI, articleforge, Rytr, QuillBot, SE Ranking, byword_

#### Creative writing

wordtune, neuraltext, AI-WRITER, ShortlyAI, Scrivener, AI DUNGEON

#### Sales

Smartwriter.ai, LAVENDER, DRIFT, Outplay, Twain, exceed, people.ai, regie.ai

### Video

#### Generation & editing

runway, Fliki, PICTORY, descript, invideo, lumen5, OPUS

#### Personalized video

tavus, synthesia, Colossyan

### Image

#### Generation & editing

Midjourney, plask, alpaca, Picsart, Playground, DALL·E, Jasper Art, Photosonic

#### Design

maket, INTERIOR AI, Looka, uizard, SWAPP

### Code

#### Code generation

GitHub Copilot, tabnine, seek, mutable.ai, Enzyme, Moderne

#### App building

appypie, mendix, Debuild, DURABLE

pixelplex

## Use case

## Applications

### Music

#### Generation & editing

splash
amper
Aiva
ecrett music
soundful
beatoven.ai
boomy

#### Music customization

SOUNDRAW
moises
LALAL.AI
audioshake
LANDR

### Speech

#### Text-speech / speech-text

WELLSAID
coqui
RESEMBLE.AI
Speechify
LISTNR
REPLICA
PODCASTLE
LOVO
MURFAI

### 3D

#### Art

mirage
Spline
LUMA AI
DEEPMOTION

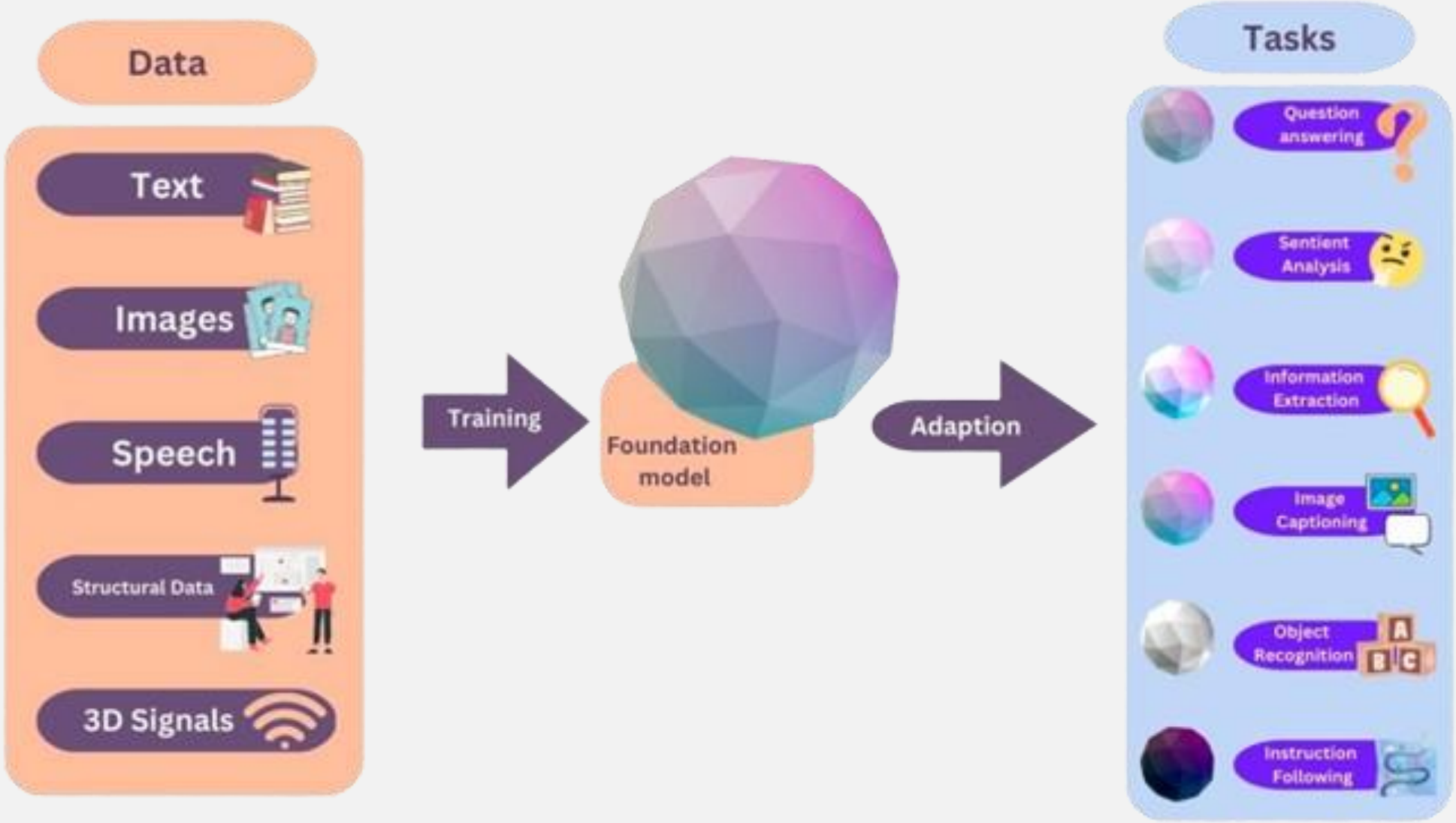
#### Gaming

Leonardo.AI
ROSEBUD.AI
Move AI

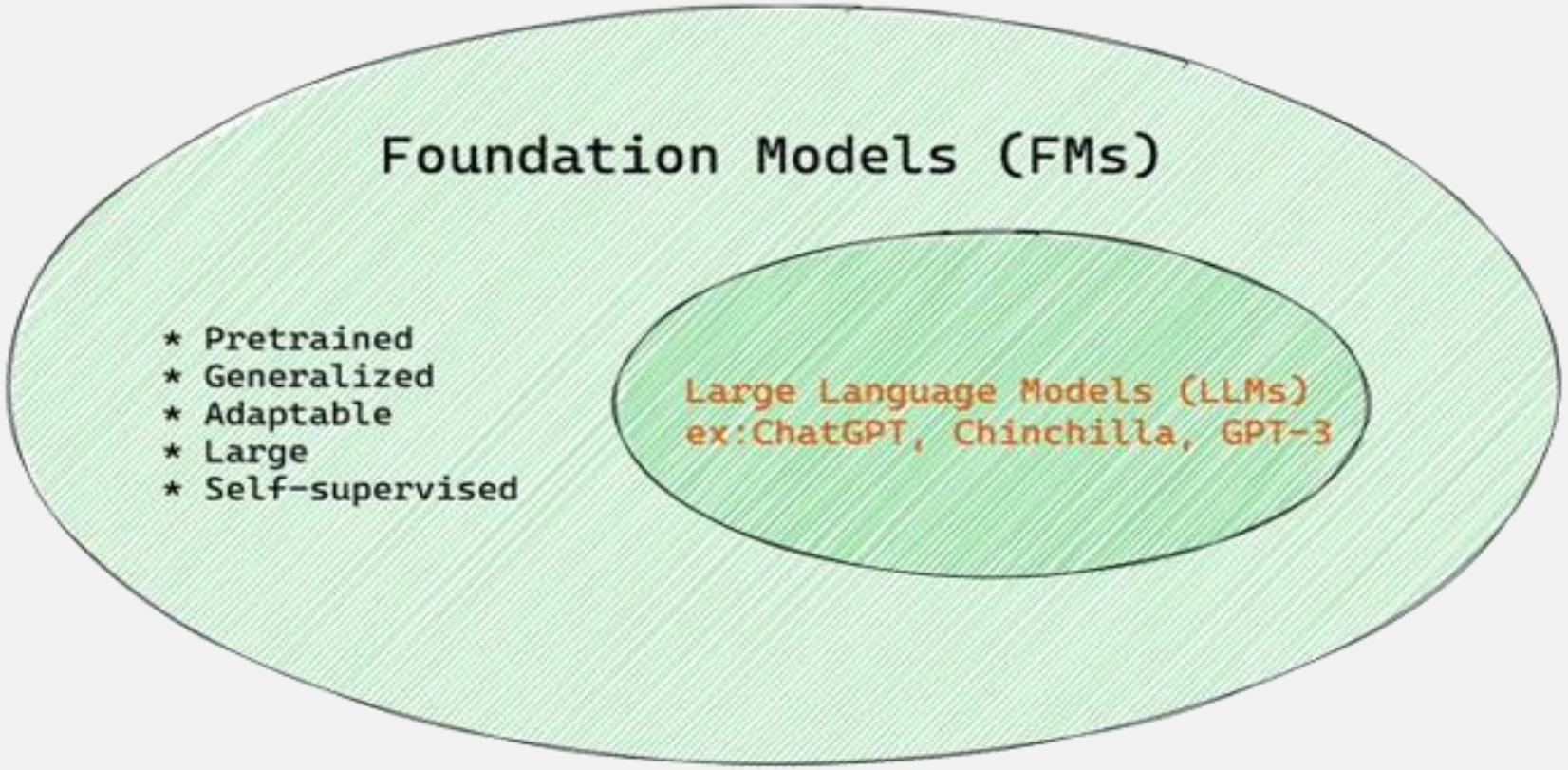
# Foundational Models

Foundation Model : A foundation model (also called base model) is a large machine learning (ML) model trained on a vast quantity of data at scale (often by self-supervised learning or semi-supervised learning), such that it can be adapted to a wide range of downstream tasks.

# Generative AI



# Generative AI

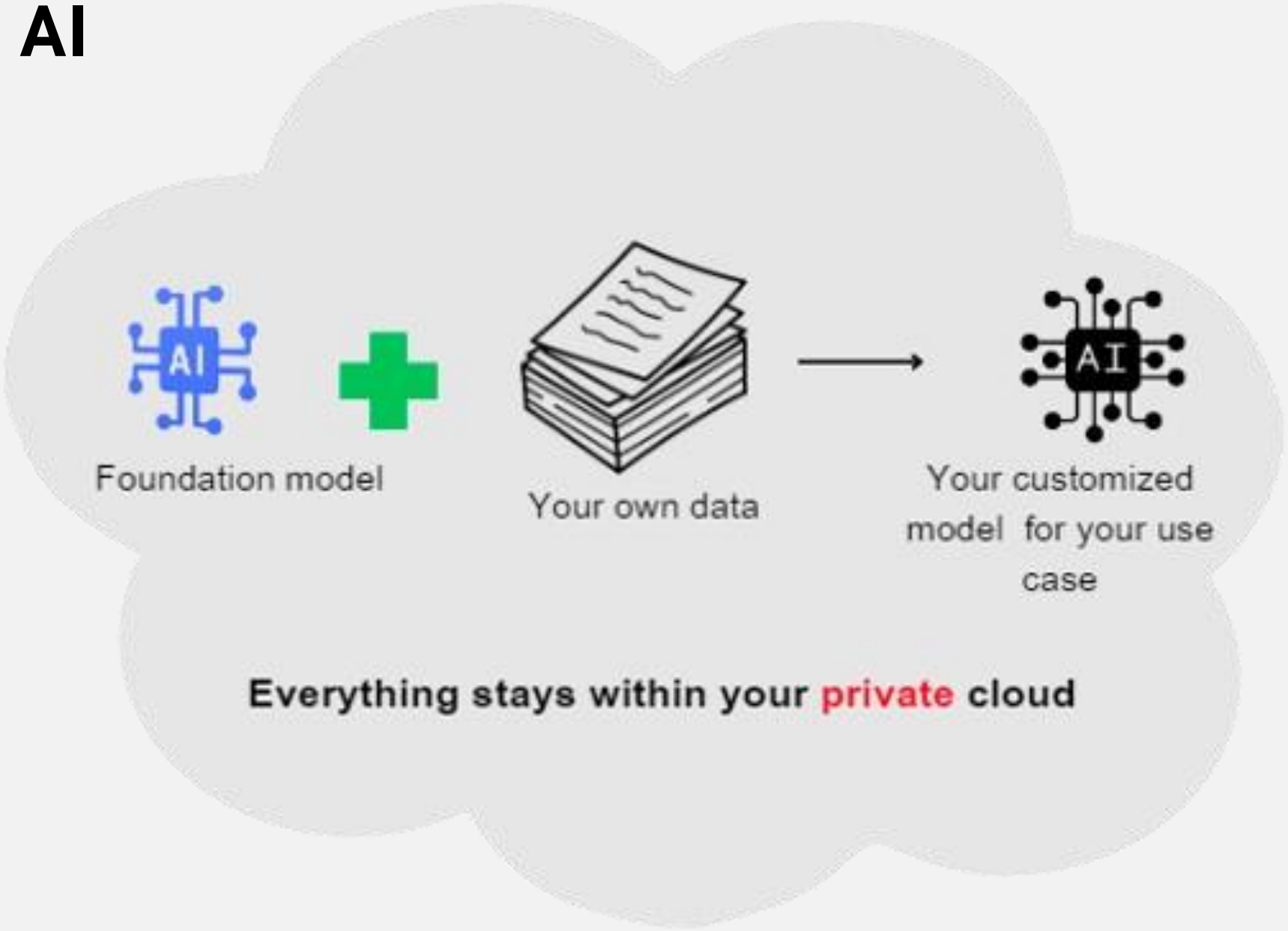



FMs are models trained on broad data (using self-supervision at scale) that can be adapted to wide range of downstream tasks.

https://hai.stanford.edu/news/reflections-foundation-models

# Generative AI

## Fine-tuning



# Foundational Models VS LLM

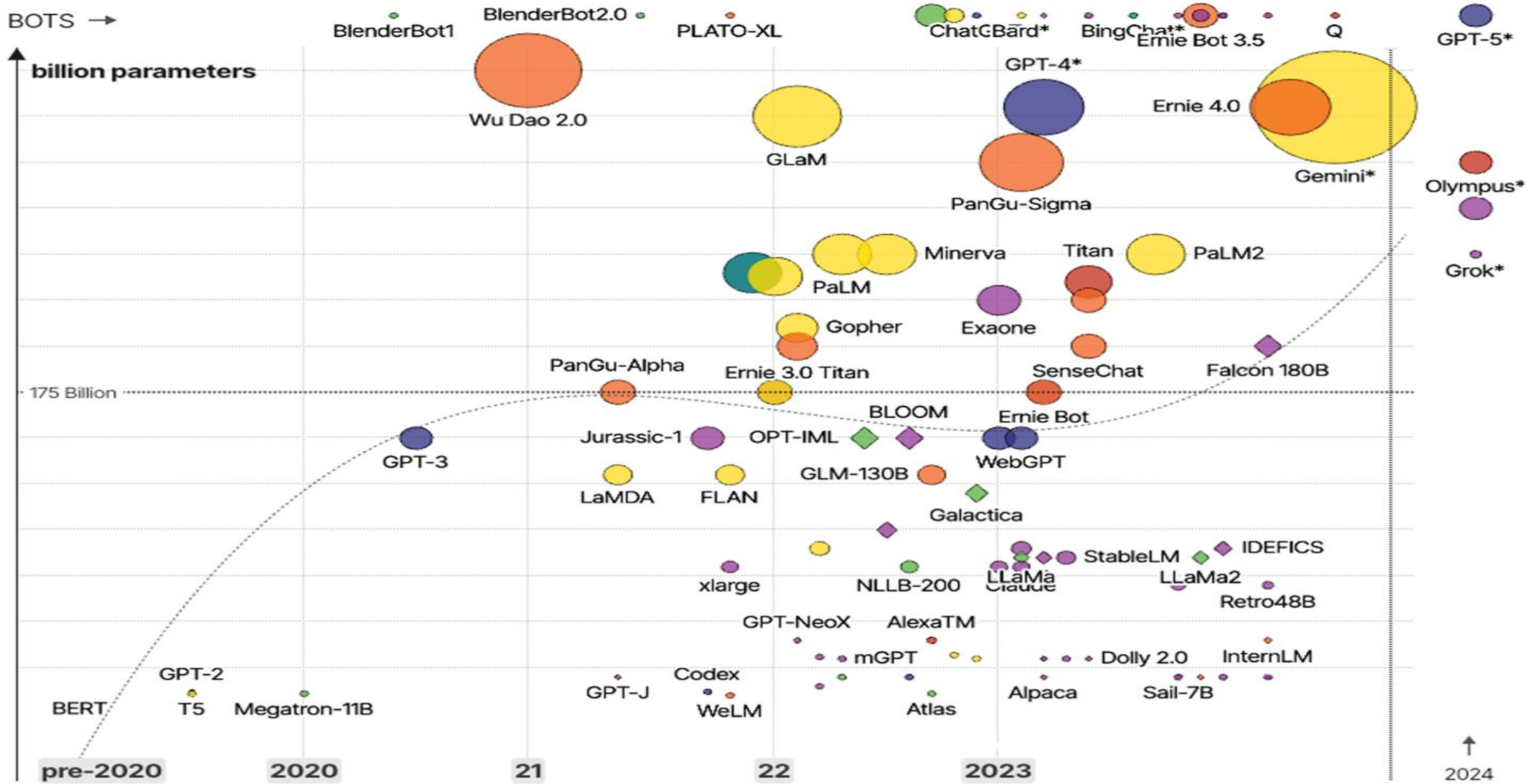
Large Language Models (LLMs) differ from Foundational Models in their scope of language understanding.

LLMs are specifically focused on language-related systems, while Foundational Models are attempting to stake out a broader function-based concept, which could accommodate new types of systems in the future

# The Rise and Rise of A.I. Large Language Models (LLMs) & their associated bots like ChatGPT

size = no. of parameters  open-access

Amazon-owned  Chinese  Google  Meta / Facebook  Microsoft  OpenAI  Other




David McCandless, Tom Evans, Paul Barton
**Information is Beautiful //** UPDATED 6th Dec 23

source: news reports, LifeArchitect.ai
* = parameters undisclosed // see the data


LLM APPLICATIONS IN TOP INDUSTRIES
Marketing & Advertising
Customized Consumer Outreach
Virtual Assistants
Content Generation
Ad Campaign Precision
Efficacy Assessment
Multifaceted Text Constructs
Retail & ECommerce
Trend Analysis
Intelligent Customer Interaction
Guided Buying Processes
Fraudulent Activity Recognition
Education Industry
Curated Learning
Intelligent Query Resolution
Automated Generation
Supplemental Applications
Healthcare
New Wave In Diagnostics
Health Monitoring
Turbocharging Drug Development
Tailoring Treatments
Practicing Medicine Virtually
Finance
Unlocking Syntax Of Finance
Dynamic Risk Profiling
Tactical Market Entries
Fraud Landscape Cartography
Mastering Regulatory Fluidity
Legal Industry
Advanced Legal Research
Automated Drafting
Legal Analytics
Litigation Support
Compliance Monitoring
Media
Tailor-Made Content
Smarter Content
Next-Level Engagement
Data-Driven Advertising
Defense & Strategic Services
Data Augmentation
Semantic Text Mining
Multilingual NLP
Dialog Systems
Anomaly Detection
Human Resources
Candidate Procurement
Accelerated Integration
Performance Metrics Analysis
Customized Skill Augmentation
Employee Sentiment Assessment
Fashion
Customized Apparel Guidance
Customized Apparel Guidance
Design Processes Optimized
Virtual Apparel Fitting
Customer Relationship Management

# LLM REAL-WORLD USE-CASES

## Content Generation

Examples: Marketing platforms, social media management tools, content creation platforms, advertising agencies

## Language Translation

Examples: Translation services, global communication platforms, international business applications

## Text Summarization

Examples: Research tools, news aggregators, content curation platforms


## Question Answering and Chatbots

Examples: Customer support systems, chatbots, virtual assistants, educational platforms

## Information Retrieval

Examples: Search engines, database systems, knowledge management platforms

## Content Moderation

Examples: Social media platforms, online forums, community management tools.

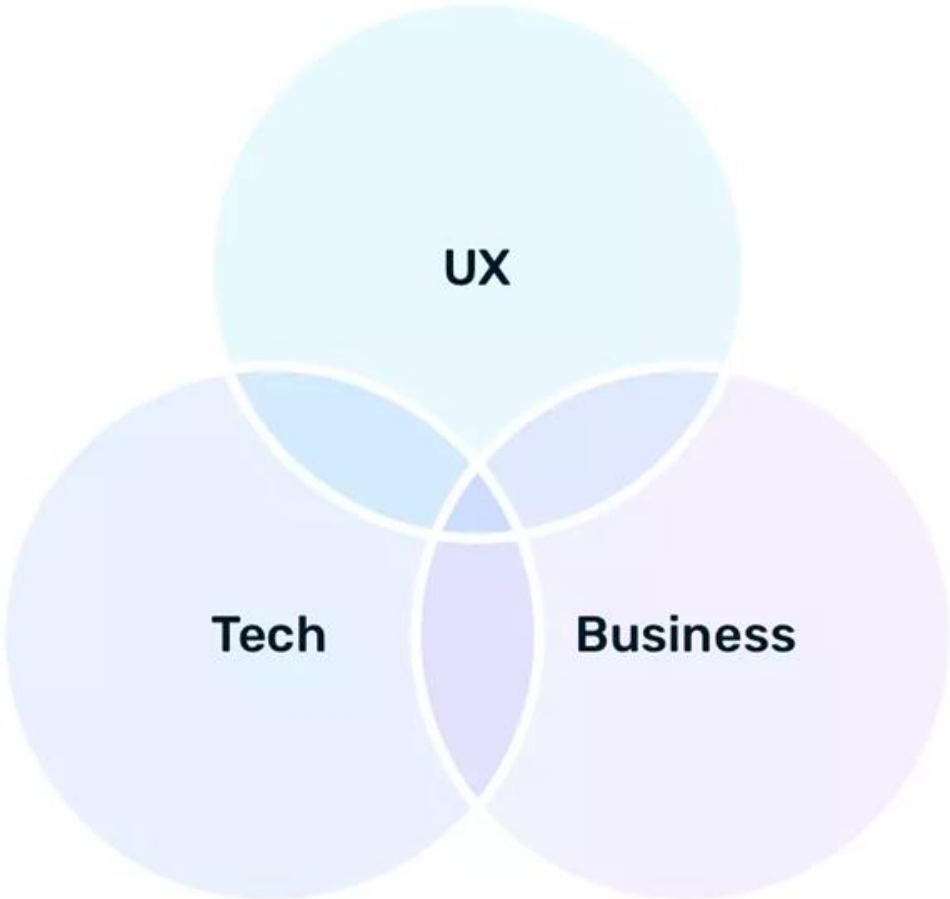
## Educational Tools

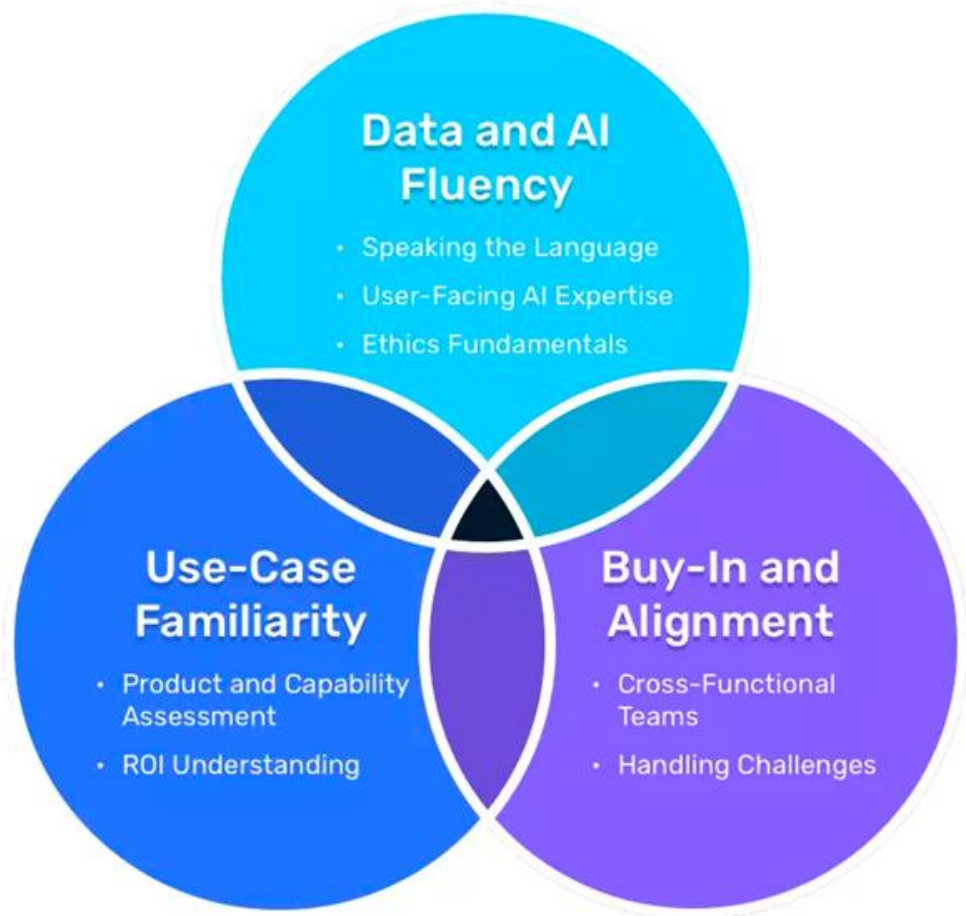
Examples: E-learning platforms, educational chatbots, interactive learning applications

The LevelUp Org

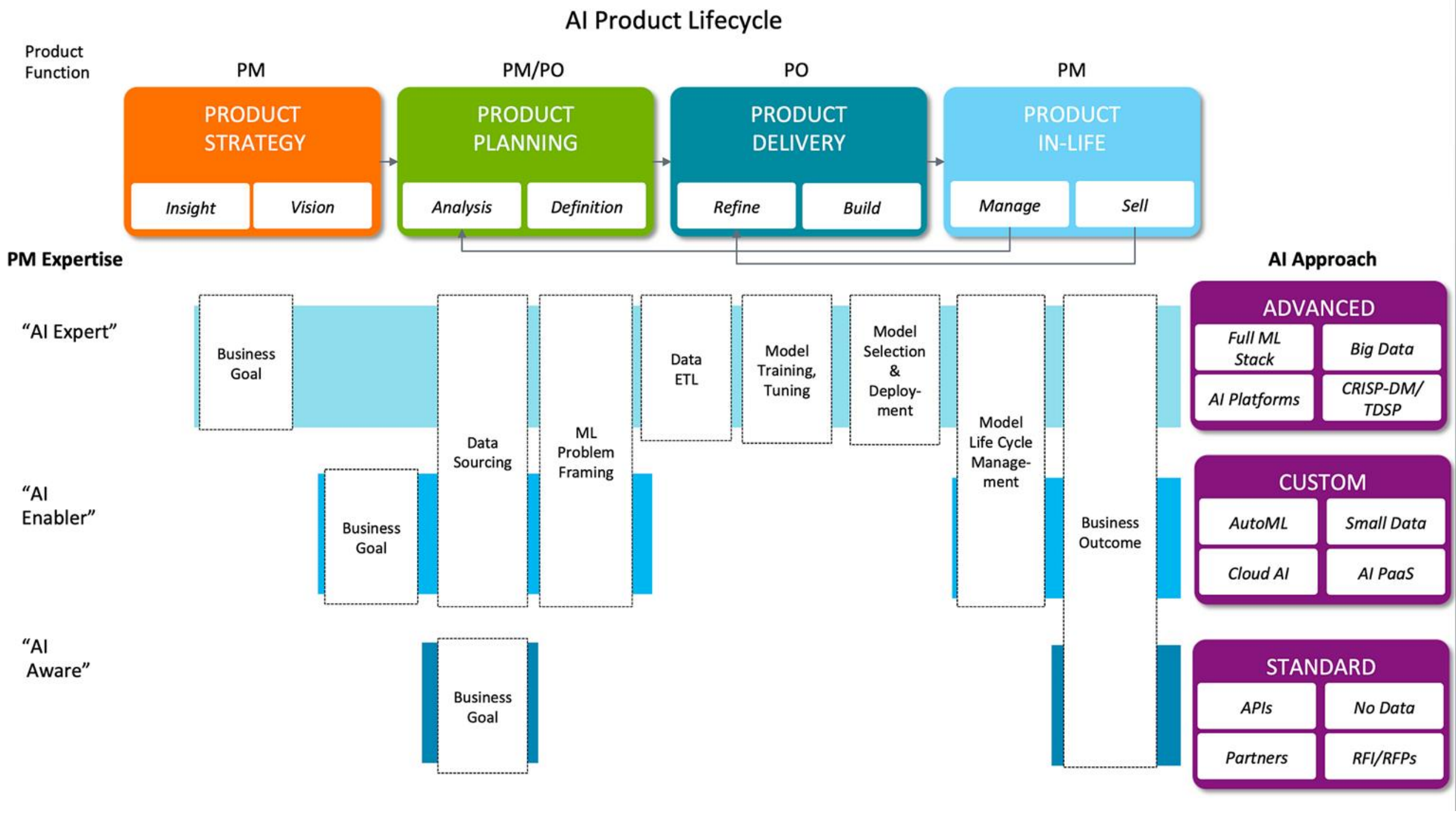
Created By: Aishwarya Naresh Reganti

# How can things change for you?


UX
Tech
Business


Data and AI Fluency
• Speaking the Language
• User-Facing AI Expertise
• Ethics Fundamentals
Use-Case Familiarity
• Product and Capability Assessment
• ROI Understanding
Buy-In and Alignment
• Cross-Functional Teams
• Handling Challenges

# AI Product Lifecycle



# Break

# Let's Exercise

Team Exercise

# THANK YOU

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Saudi Data & AI Authority