Why are you learning AI ?

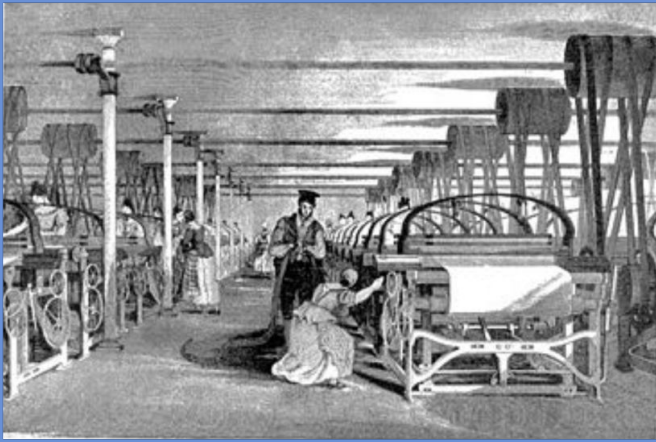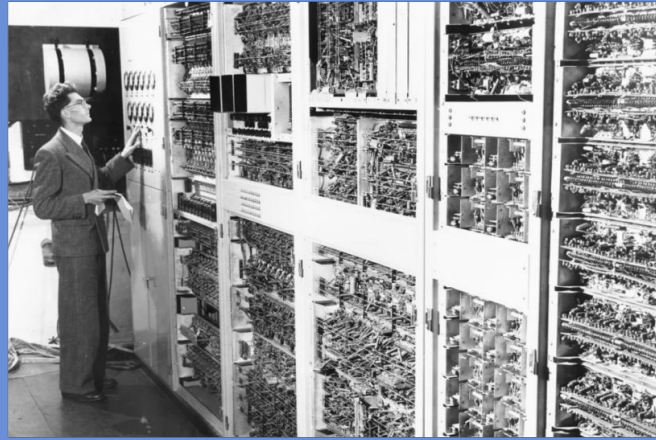# What fascinates you the most about AI?

AI
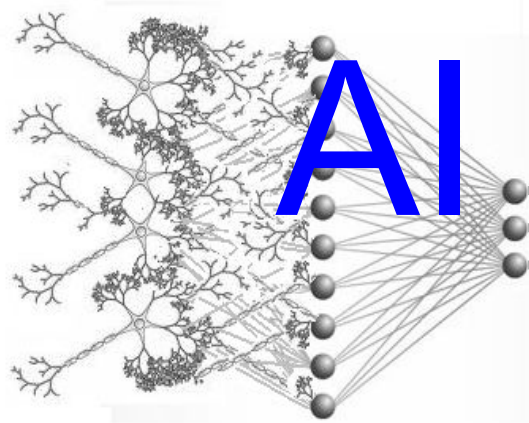
Understanding the need

Industrial Revolution - 1760

Computer Revolution - 1970
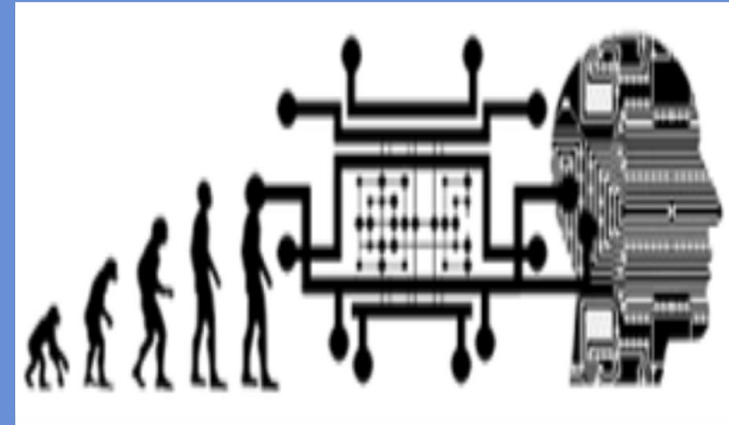
The AI Revolution - 2010
Rise of machines fueled by Data

Successful AI Demands Data Driven Mindset

Why AI?

AI powered businesses can ensure upto 40% improvement in revenues and productivity

AI Reality 2021

Apparently, 95% of all enterprise AI projects do not reach Production Deployment

Enterprise AI PROJECTS / Production Deployment
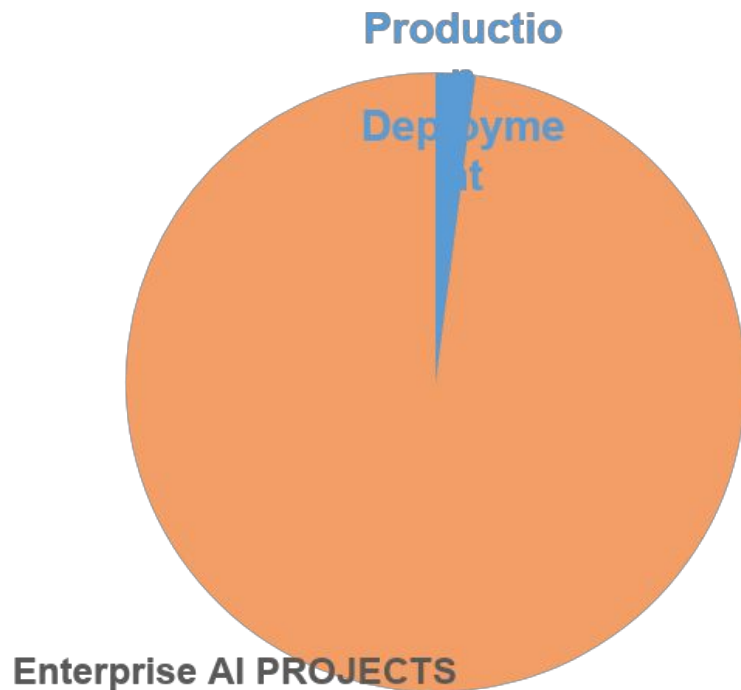
Primary causes of Failure-to-Deploy

- **Unreliable & Disconnected Data**

- **Unexplainable Recommendations**

- **Lack of Automated Life-Cycle-Management**

- **Lack of Expertise !**

AI Levels

- Artificial Narrow Intelligence (Weak AI)
  - to complete a job successfully but not necessarily recreate human thought, solving specific problems without general capabilities
  - Alexa, Face Recognition (iPhone), Autopilot (Tesla), Humanoid (Sophia), Google Maps

- Artificial General Intelligence (Strong AI)
  - to use human reasoning as a model but not as the ultimate goal, can perform intellectual tasks like humans, could surpass most human capabilities

- Artificial Super Intelligence
  - systems that may surpass humans capabilities and take over the world - Science fiction., "I, Robot"!

Landscape of AI
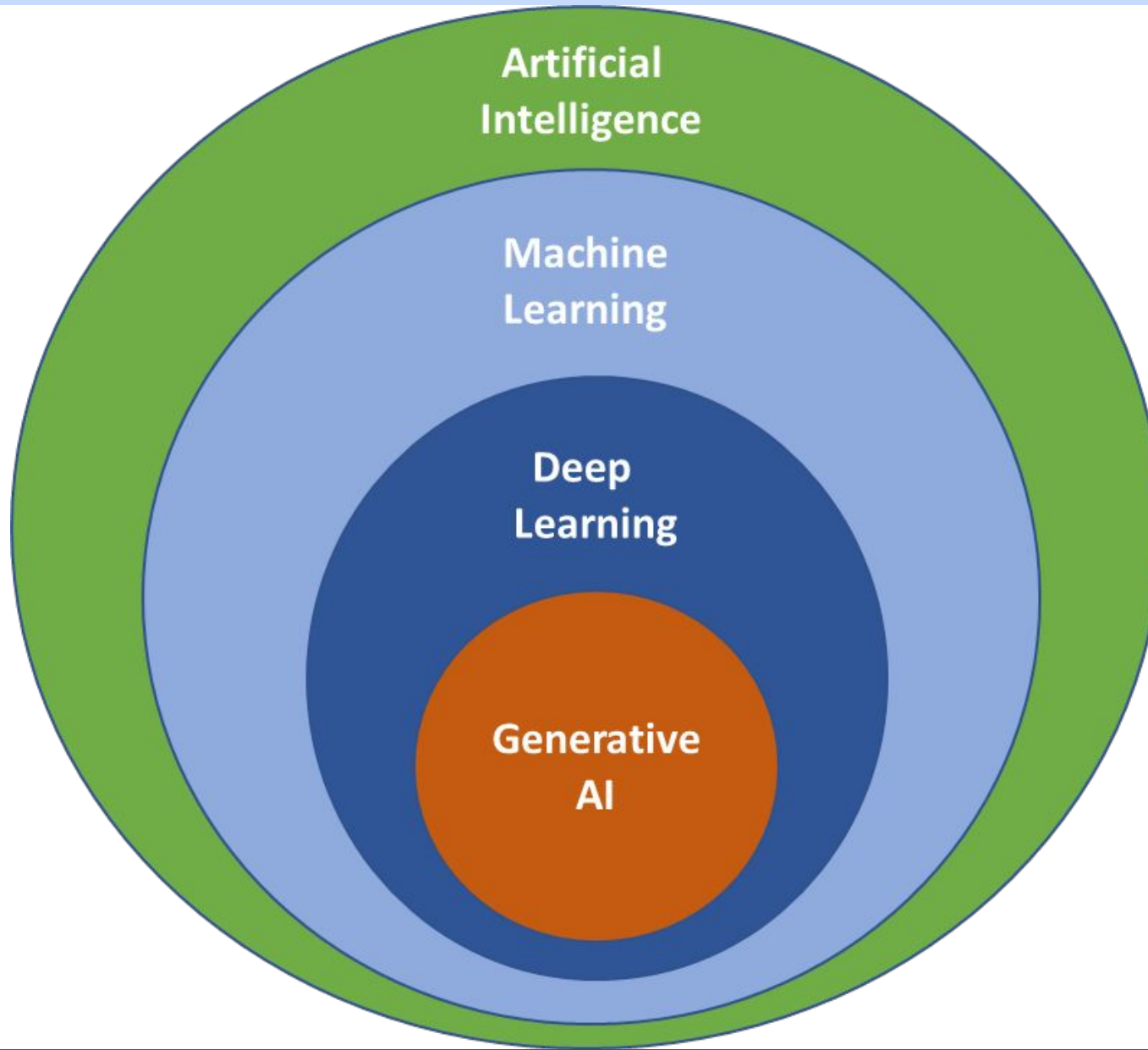
What role can you play in AI revolution?

- Users of AI Products

- Developers of AI Tools/Solutions

AI tools for developers

These 10 tools utilize AI and automation to help developers build software, from code creation and analysis to documentation and even incorporate audio and artwork.

Beatoven.ai*	ChatGPT	Fireflies.ai	GitHub Copilot	Jasper.ai
Generates royalty-free music to match the mood and energy a web designer wants to portray. *CURRENTLY IN BETA	Writes code or even explains how a given piece of code works.	Listens in on standup meetings and daily scrums to gauge the development team's sentiment and mood.	Uses the OpenAI Codex to write methods, functions and entire classes.	Generates content, including blogs, for website mockups as an alternative to standard Lorem ipsum entries.
Krisp.ai	Midjourney*	PaperCup	Stenography.dev	Synk Code
Removes echo, voices and background noise from sound files.	Creates high-quality artwork based on user prompts and keywords. *CURRENTLY IN BETA	Translates audio and creates a voice file to dub over video files.	Examines classes and methods and automatically generates documentation.	Detects bugs and security holes, and reduces false positives.

www.dattamsh.com

Skill set for AI

Domain Knowledge

Analytical Skills   Technical Skills
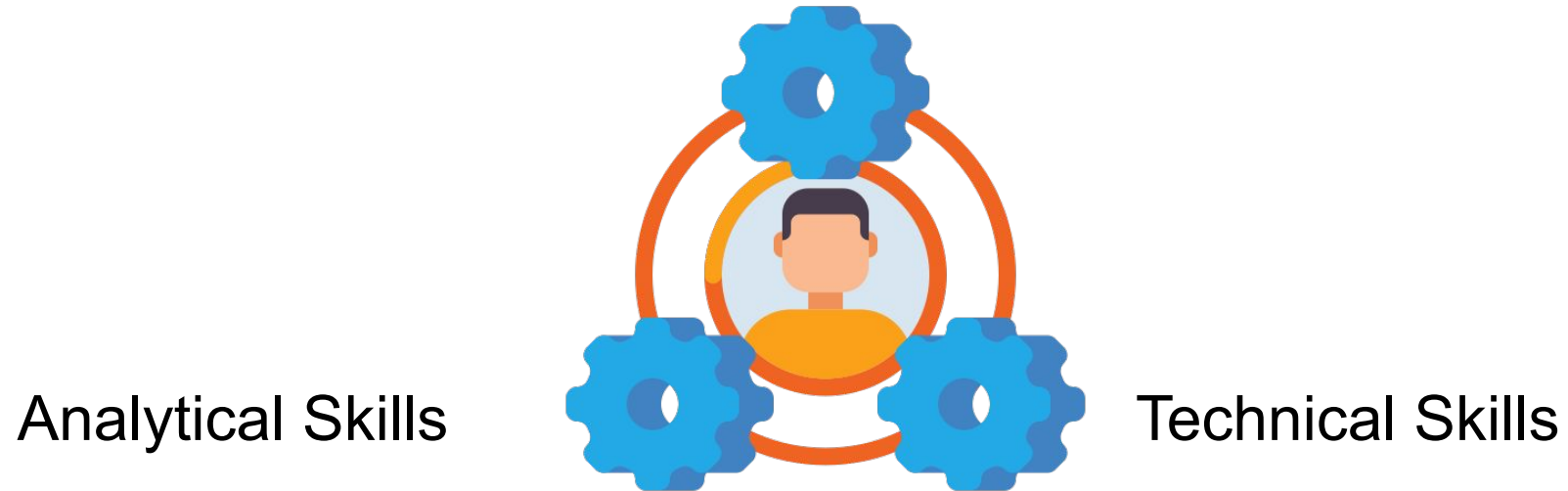
10 Business Functions using AI

Marketing

Target ads

Sorting Customers

Suggesting Products

Recommendation Engine

Chat bots

Analyzing data on consumer behavior faster and more accurately than humans

Sales

- sales forecasting, predict customer needs, and improve communication

- help sales professionals manage their time and identify

R & D

-Research problems and develop solutions

-Novel Discoveries

- Ways of improving products and services as well as accomplishing tasks

- R&D activities be more strategic and effective.

Accounting and Finance

- Human finance professionals will be freed-up from repetitive tasks to be able to focus on higher-level activities while the use of AI in accounting will reduce errors.

- Provide real-time status of financial matters to organizations because it can monitor communication through natural language processing

Customer Experience

- Enhance sales and customer relationships
- Automated loyalty and reward programs

Building Maintenance

- Building resource management
- Security and efficient occupancy management

Manufacturing

-Supply chain to tracking inventory

-Predict maintenance needs

-Support the quality control process at manufacturing facilities

Contact Centers

-Learn more about customers

-Predict customer intent, and improve the "next best action" for the customer for better customer engagement.

- Uncover customer trends and then improve products and services.

Human Resources

-AI bots to phone and interview candidates for open sales positions

-Automate candidate screening and the recruitment process

-Chatbots can also be used to answer many common questions about company

-Job and candidate recommendation system

IT Operations

-IT system log file error analysis

- Automate many routine processes in IT System Management functions .

-Help identify issues and proactively fix them before any IT systems go down.

AI Hype 2022
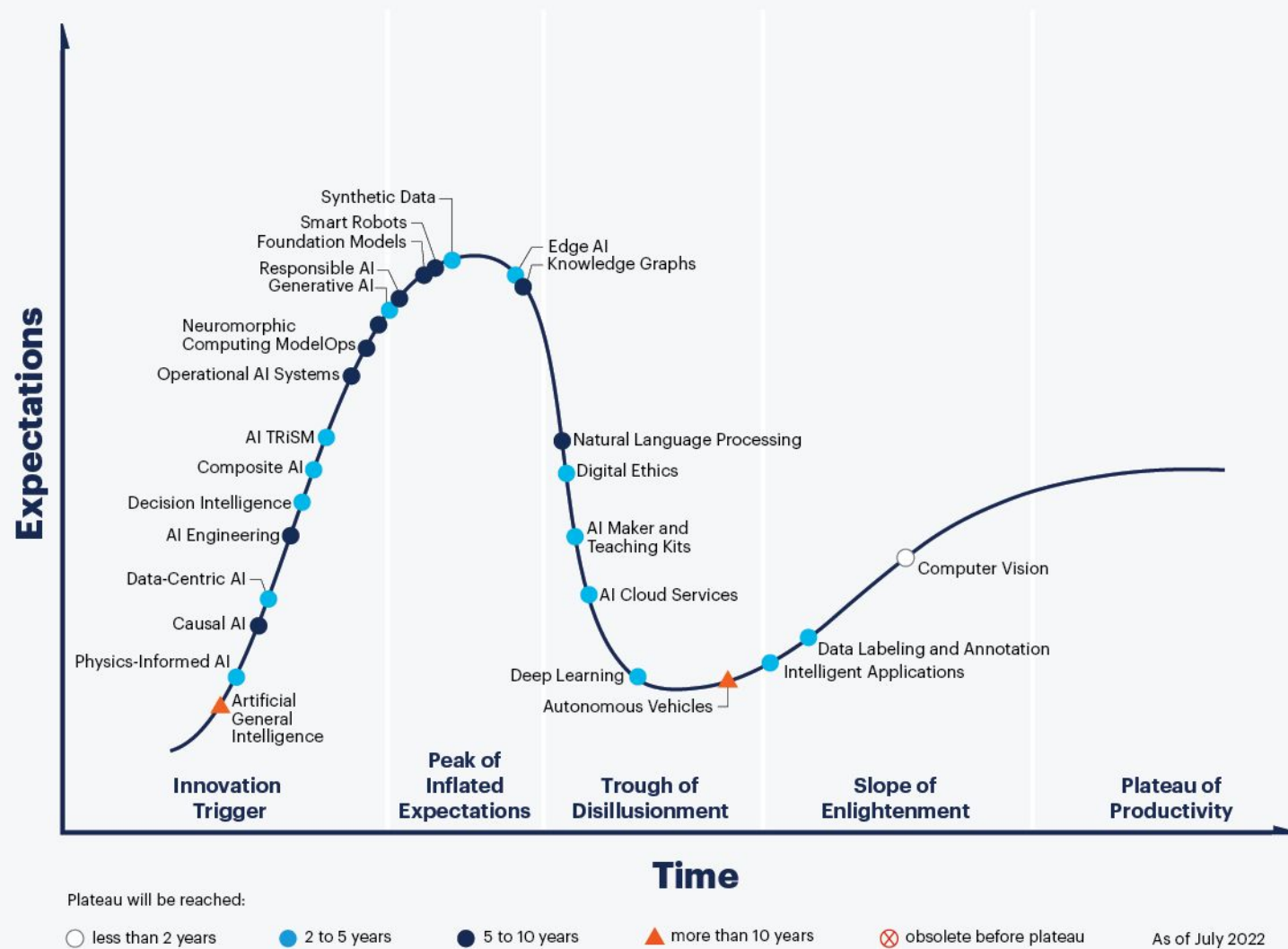
Gartner Hype Cycle for Artificial Intelligence 2022

AI Market Size

Artificial Intelligence Revenue by Region, World Markets: 2015-2024

Legend:
- North America
- Western Europe
- Eastern Europe
- Asia Pacific
- Latin America
- Middle East
- Africa

Y-axis: ($ Millions) — $-, $2,000, $4,000, $6,000, $8,000, $10,000, $12,000

X-axis: 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024

Source: Tractica

AI Industry Case Studies
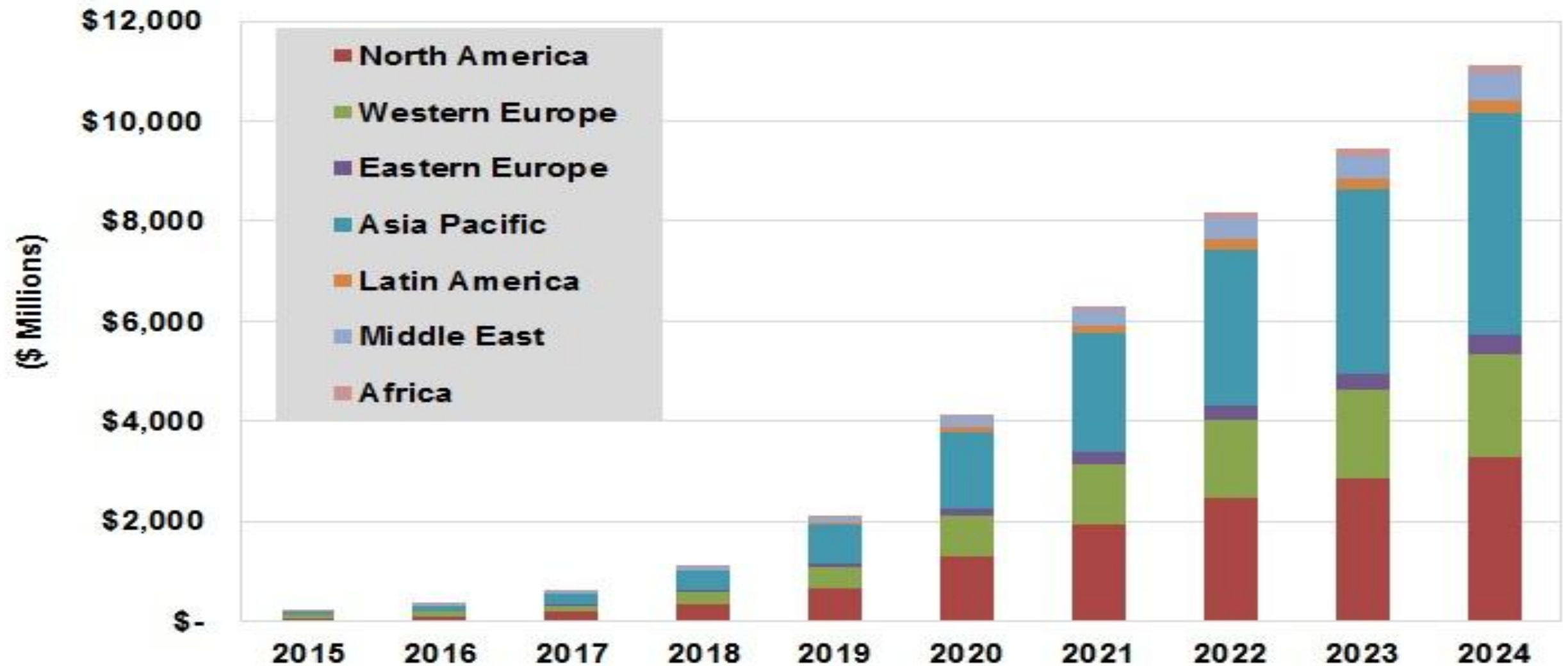
- "Can you build a Predictive Model for Steel Making Process and Optimize Charging ?"
- "Can you build an Intelligent System for Breakout Prediction & Control in real-time?"
- "Can you help build a Lead Qualification solution on Salesforce data?"
- "Can you help us improve ROI on Digital Marketing of our eLearning App?"
- "Can you develop a Good Short-term Forecasting Solution for CPG/FMCG?"
- "Can you develop an Optimization Engine for Programmatic TV Ad-Marketplace?"
- "Can you help Measure Scheme-Effectiveness in CPG/B2B trading ?"
- "Can you Predict the Probability and Timing of a Prospect buying our Car?"
- "Can you Improve the Efficacy of our AdRel Model for Mobile Gaming Apps?"
- "Can you develop an Anomaly Detection system with Auto-Baseline from Energy-IOT data?"

AI Industry Case Studies

- "Can you develop a Real-Time Plugload Identification System with Subsample Data?"
- "Can you help reduce MVNO/pre-paid Customer Churn by 10% in 6 months?"
- "Can you help us improve Efficacy of Manual process of Visual Classification?"
- "Can you Predict Stem Water Potential to feed Optimal Irrigation & Detect Events & Anomalies?"
- "Can you help us execute PoC of our Price-Promo Driver Solution for a Specialty Category Mfgr?"
- "Can you Automatically Categorize Software Issues from Description and Comments ?"
- "Can you help discover Consumer Personae from 360 degree view survey data?"
- "Can you Predict Defaulters & Frauds in Utility Billing, Forecast Consumption & Collections and Reco Outages?"
- "Can you Predict Churn and LifeTime Value of online games player, asap in lifecycle?"
- "Can you Automatically Categorize SMS into Ham or Spam categories with 99% accuracy & <200ms/1000sms?"

AI/DM Project Lifecycle

- Business **understanding**
  - What does the business need?
- Data understanding
  - What data do we have / need? Is it clean?
- Data preparation
  - How do we organize the data for modeling?
- Modeling
  - What modeling techniques should we apply?
- Evaluation
  - Which model best meets the business objectives?
- Deployment
  - How do stakeholders access the results?

CRISP-DM

DM Problem definition

Data requirements, "raw" data

BUSINESS UNDERSTANDING

DATA UNDERSTANDING

Actionable DM outcome(s)*

DEPLOYMENT

DATA PREPARATION

Dataset(s)

MODELING

Model(s)

EVALUATION

Model(s) Performance Metrics

* various complexity levels ranging from one-time or repeatable report and up to complex DM components integrated into enterprise IS systems

AI Foundation: *Machine Learning Algorithms*

Machine Learning Algorithms

Deep Learning
- Deep Boltzmann Machine (DBM)
- Deep Belief Networks (DBN)
- Convolutional Neural Network (CNN)
- Stacked Auto-Encoders

Ensemble
- Boosting
- Bootstrapped Aggregation (Bagging)
- AdaBoost
- Stacked Generalization (blending)
- Gradient Boosting Machines (GBM)
- Gradient Boosted Regression Trees (GBRT)
- Random Forest

Neural Network
- Perceptron
- Back-Propagation
- Hopfield Network
- Radial Basis Function Network (RBFN)

Regularization
- Ridge Regression
- Least Absolute Shrinkage and Selection Operator (LASSO)
- Elastic Net

Association
- Apriori algorithm
- Eclat algorithm

Regression
- Ordinary Least Squares Regression (OLSR)
- Linear Regression
- Logistic Regression
- Stepwise Regression
- Multivariate Adaptive Regression Splines (MARS)
- Locally Estimated Scatterplot Smoothing (LOESS)

Other
- Computational intelligence (Evolutionary etc.)
- Computer Vision (CV)
- Natural Language Processing (NLP)
- Recommender Systems
- Reinforcement Learning
- Graphical Models

Bayesian
- Multinomial Naïve Bayes
- Averaged One-Dependence Estimators (AODE)
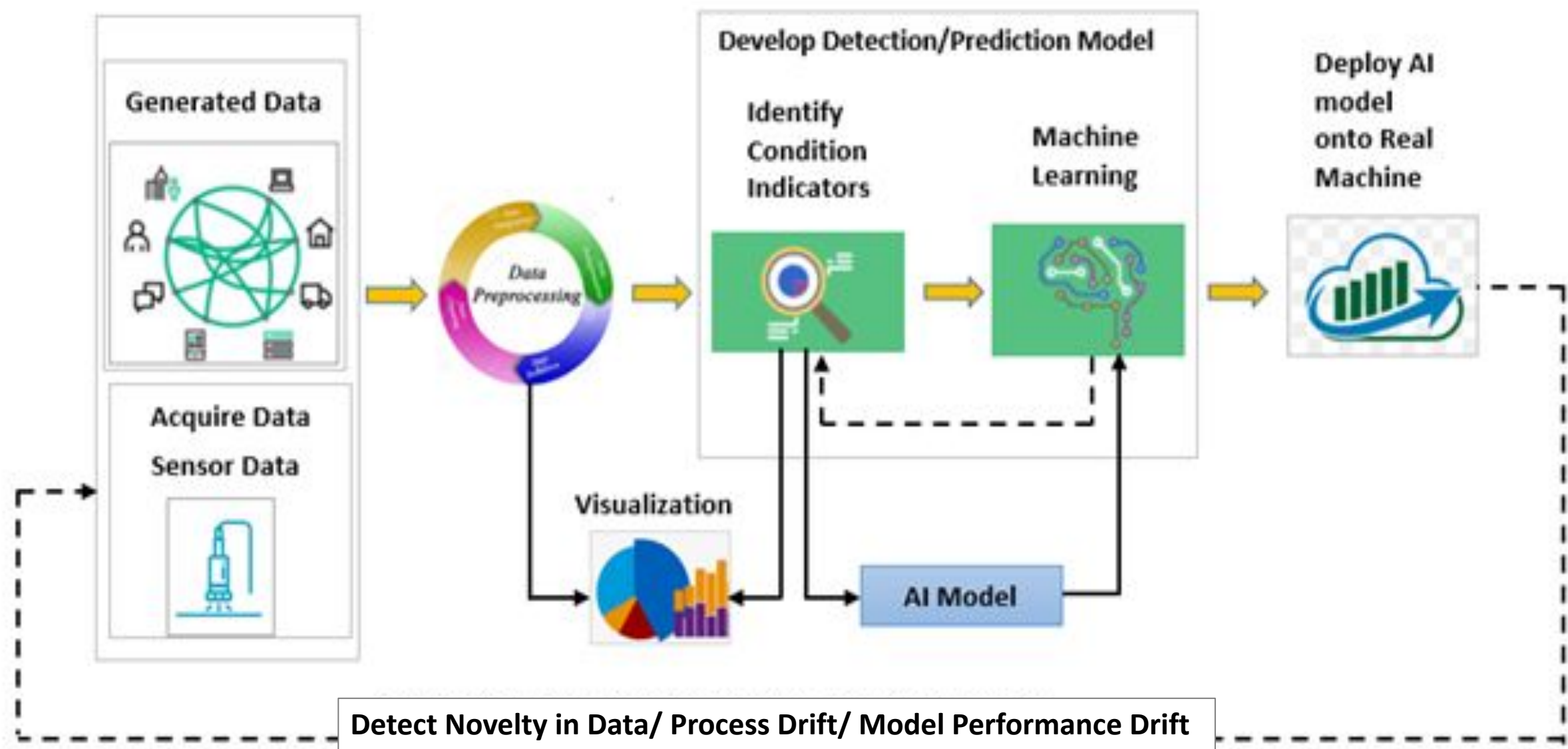- Bayesian Belief Network (BBN)
- Bayesian Network (BN)

Decision Tree
- Classification and Regression Tree (CART)
- Iterative Dichotomiser 3 (ID3)
- C4.5 and C5.0
- Chi-squared Automatic Interaction Detection (CHAID)
- Decision Stump
- M5
- Conditional Decision Trees

Dimensionality Reduction
- Principal Component Analysis (PCA)
- Principal Component Regression (PCR)
- Partial Least Squares Regression (PLSR)
- Sammon Mapping
- Multidimensional Scaling (MDS)
- Projection Pursuit
- Linear Discriminant Analysis (LDA)
- Mixture Discriminant Analysis (MDA)
- Quadratic Discriminant Analysis (QDA)
- Flexible Discriminant Analysis (FDA)

Instance-based
- k-Nearest Neighbour (kNN)
- Learning Vector Quantization (LVQ)
- Self-Organizing Map (SOM)
- Locally Weighted Learning (LWL)

Clustering
- k-Means
- k-Medians
- Expectation Maximisation (EM)
- Hierarchical Clustering

Detect Novelty in Data/ Process Drift/ Model Performance Drift

Need for Cloud based AI

Cloud Services Stack

SERVICES	aws	Azure	Google Cloud Platform
Virtual Servers	Elastic Cloud Compute	Virtual Machines	Google Compute Engine
Serverless Computing	Lambda	Azure Functions	Cloud Functions
Kubernetes Management	Elastic Kubernetes Service	Kubernetes Service	Kubernetes Engine
Object Storage	Simple Storage Service	Azure Blob	Cloud Storage
File Storage	Elastic File Storage	Azure Files	Filestore
Block Storage	Elastic Block Storage	Azure Disk	Persistent Disk
Relational Database	Relational Database Service	SQL Database	Cloud SQL
NoSQL Database	DynamoDB	Cosmos DB	Firestore
Virtual Network	Virtual Private Cloud	Azure VNet	Virtual Private Network
Content Delivery Network	CloudFront	Azure CDN	Cloud CDN
DNS Service	Route 53	Traffic Manager	Cloud DNS
Authentication and Authorization	IAM	Azure Active Directory	Cloud IAM
Key Management	KMS	Azure Key Vault	KMS
Network Security	AWS WAF	Application Gateway	Cloud Armor

AI Caveats

AI Warnings

- Capabilities much greater than visible
- Job displacements
- Digital Power Center
- Unscrupulous use by Dictators/ Military/ Crime Syndicates
- Addiction to AI driven technologies, viz., smartphones, has already rendered Humans into Superhumans
- ASI/ Super AI could be an unintended, emergent phenomena much closer to reality than fiction

Thank You

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