Analytics 101

WHERE EVERY STEP COUNTS

widya analytic

itsmecevi.github.io
widyaanalytic.com
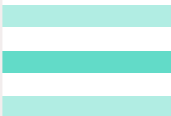
To empower entire organization goals...

Basics:
discovering, interpreting, and communicating significant patterns in data using tools in any environment on any device

More:
to drive desired outcomes, such as optimization, cost savings, and customer engagement

IGNORING AN INSTINCTS AND CHOSE THE RESULTS BASED ON WHAT THE DATA REVEALS...

THE NEW OIL OF THE WORLD
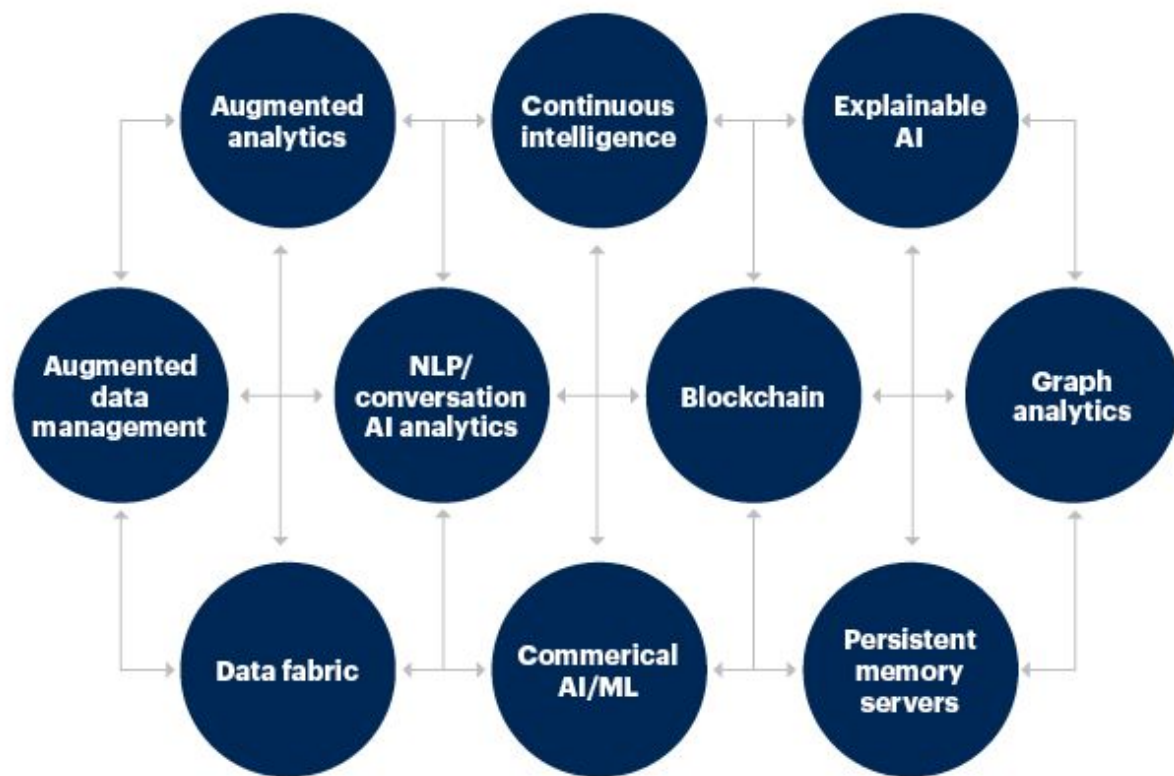
DATA

TOOLS

IMPACT

THE BUSINESS VALUE OF ANALYTICS

A New Way to Work:
Data-Driven Strategist

Uncover New Opportunities:
Uncover hidden data patterns

Visualize:
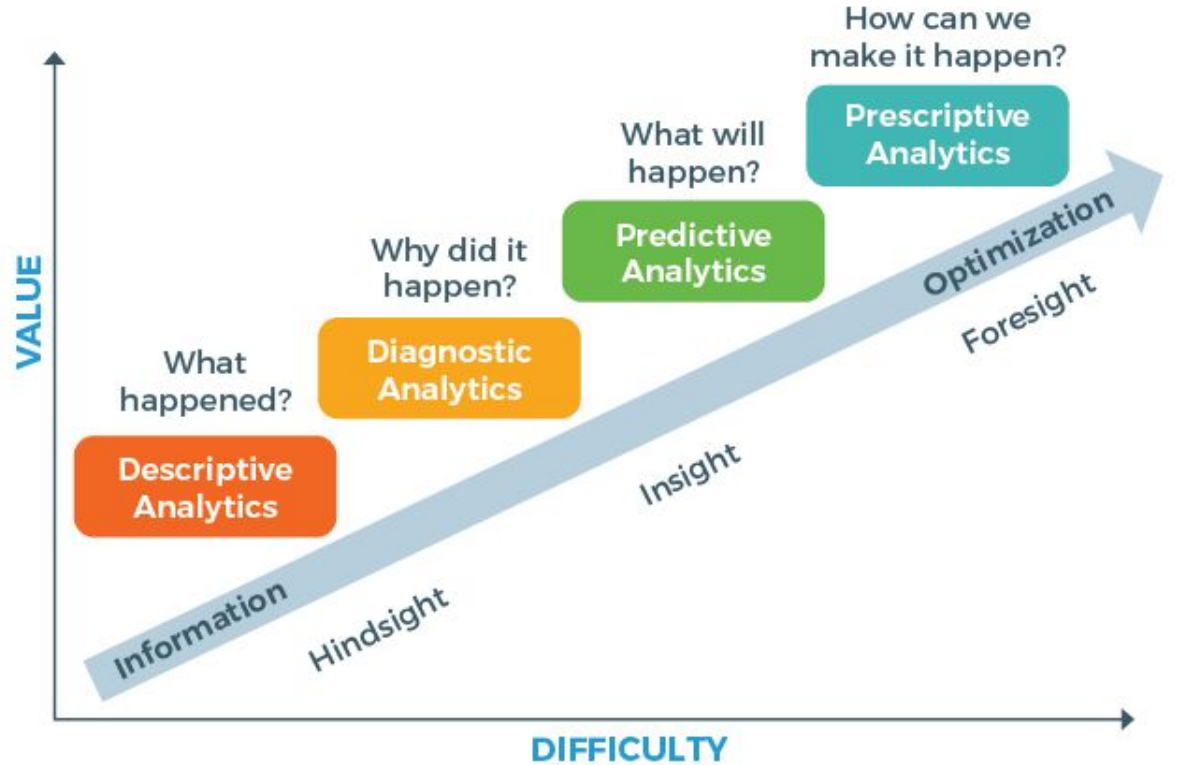**The ability to see a high-definition image of the business landscape**

Top 10 technology trends in data and analytics

https://itsmecevi.github.io/future-analytics/

Analytic Value Escalator

Effort

Time

Complexity

VALUE

How can we make it happen?

Prescriptive Analytics

What will happen?

Predictive Analytics

Why did it happen?

Diagnostic Analytics

What happened?

Descriptive Analytics

Optimization

Foresight

Insight

Information

Hindsight

DIFFICULTY

Gartner

Descriptive Diagnostic Predictive and Prescriptive Data Types

Value

Prescriptive

Predictive

Diagnostic

Descriptive

Complexity
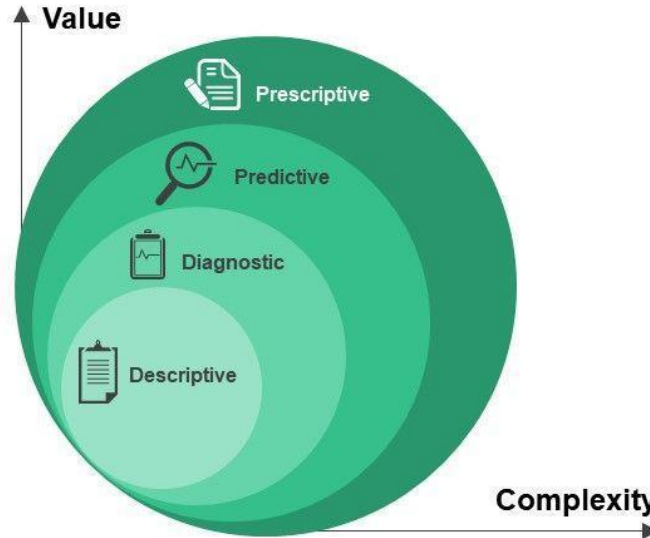
What is the data telling you?

Descriptive: What's happening in my business?

This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

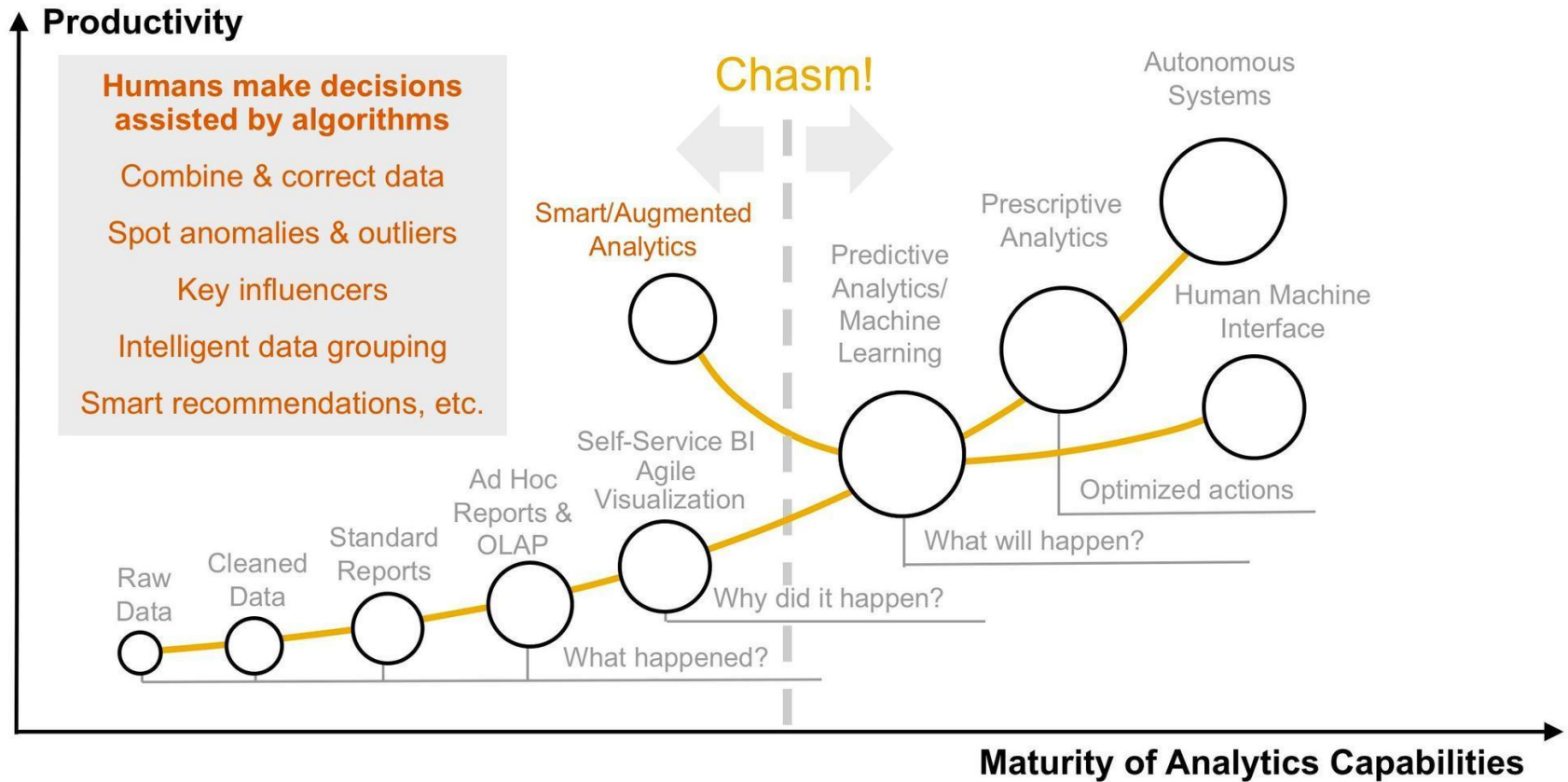**Diagnostic:** Why is it happening?

This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

Predictive: What's likely to happen?

This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

Prescriptive: What do I need to do?

This slide is 100% editable. Adapt it to your needs and capture your audience's attention.

Productivity

Humans make decisions assisted by algorithms

Combine & correct data

Spot anomalies & outliers

Key influencers

Intelligent data grouping

Smart recommendations, etc.

Chasm!

Autonomous Systems

Smart/Augmented Analytics

Predictive Analytics/ Machine Learning

Prescriptive Analytics

Human Machine Interface

Self-Service BI Agile Visualization

Ad Hoc Reports & OLAP

Standard Reports

Cleaned Data

Raw Data

Optimized actions

What will happen?

Why did it happen?

What happened?

Maturity of Analytics Capabilities

How to build company that best idea wins by Ray Dalio

The Gartner Analytic Continuum

THE ANALYTICS CONTINUUM

Source : GARTNER
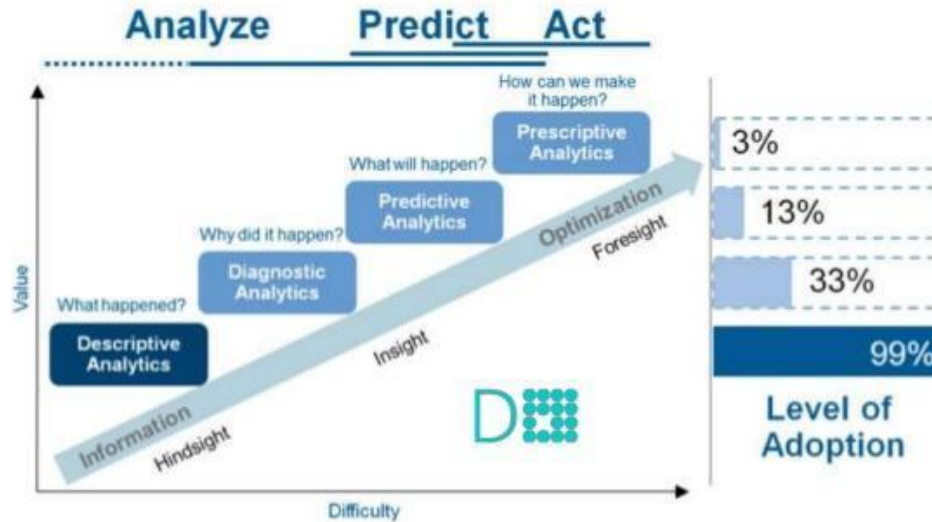
Statistics

Collection, organization, analysis, interpretation and presentation of data. Populations and Sample minded...
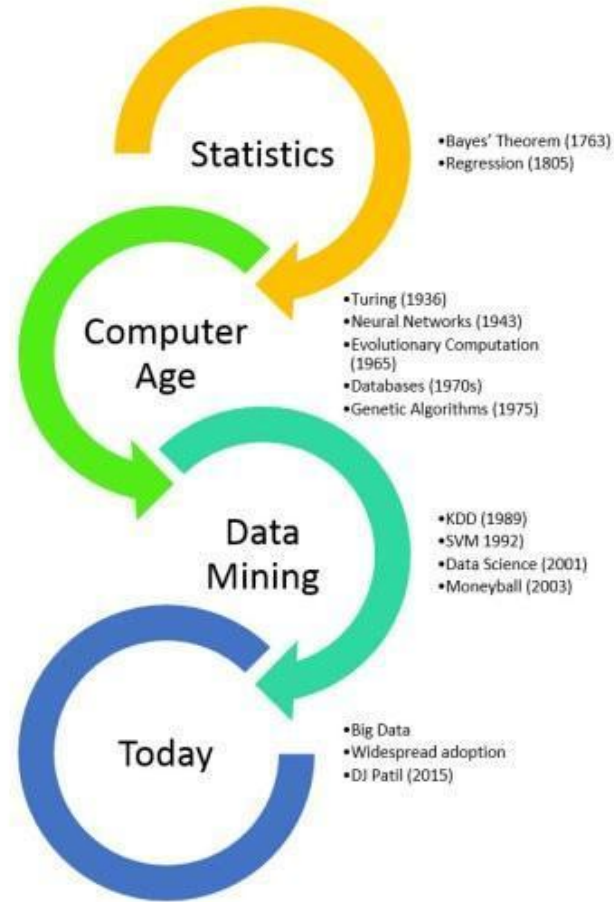
Descriptive

Probability

Inferential

Stochastics

Time Series (Forecasting)

Data Mining

Knowledge Discovery in Data (KDD). Exploration and analysis of large data to discover meaningful patterns and rules...

Data Mining

Statistics
- Bayes' Theorem (1763)
- Regression (1805)

Computer Age
- Turing (1936)
- Neural Networks (1943)
- Evolutionary Computation (1965)
- Databases (1970s)
- Genetic Algorithms (1975)

Data Mining
- KDD (1989)
- SVM 1992
- Data Science (2001)
- Moneyball (2003)

Today
- Big Data
- Widespread adoption
- DJ Patil (2015)

KEY FEATURES OF DATA MINING

Automatic pattern predictions based on trend and behaviour analysis.

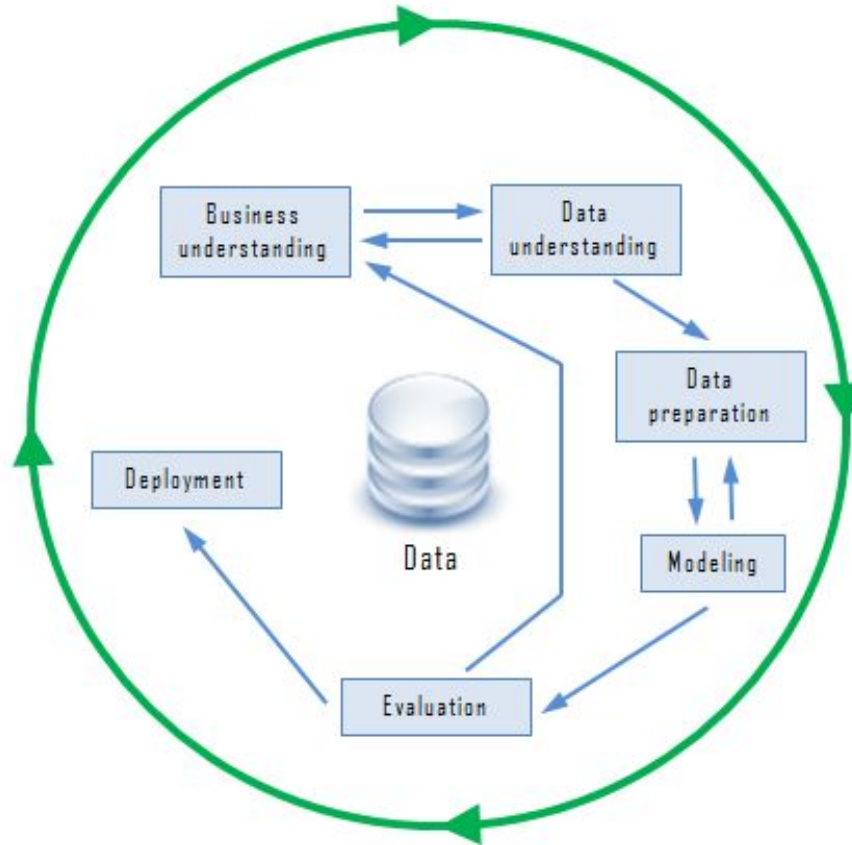Prediction based on likely outcomes

Creation of decision-oriented information.

Focus on large data sets and databases for analysis.

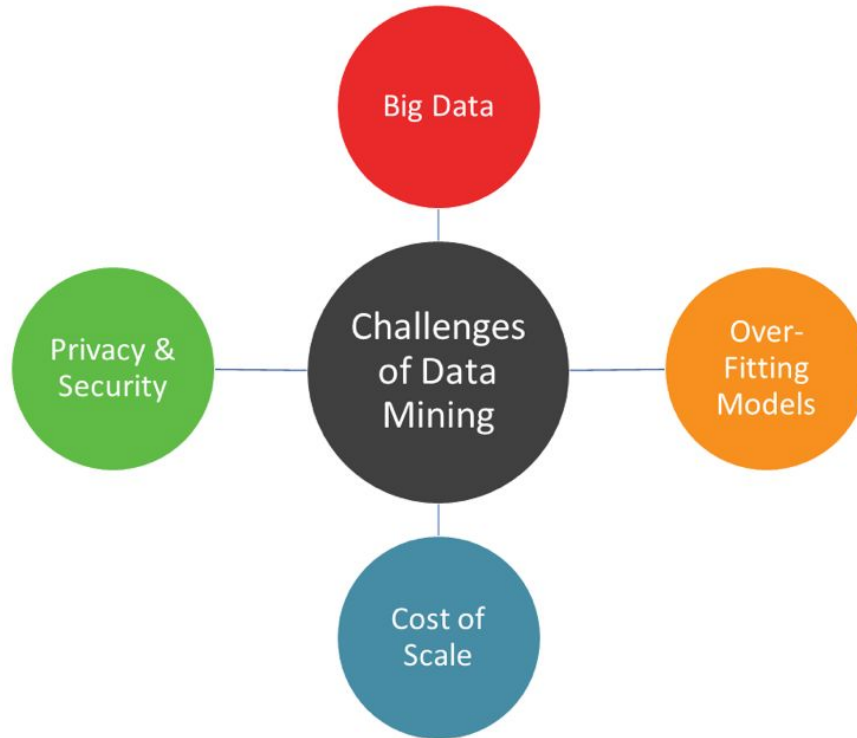Clustering based on finding and visually documented groups of facts not previously known.

Data-Mining Process

Business Understanding → Data Understanding → Data Preparation → Data Modeling → Evaluation → Deployment

Data-Mining Process

Business understanding → Data understanding

Data understanding → Data preparation

Data preparation ↔ Modeling

Modeling → Evaluation

Evaluation → Deployment

Evaluation → Business understanding
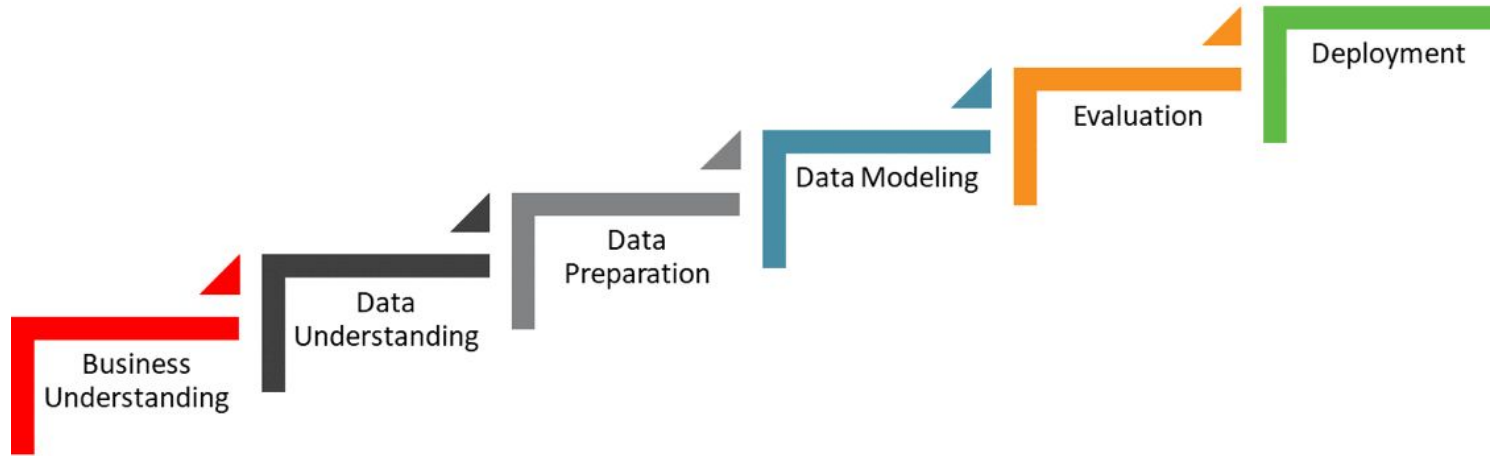
Data

Data-Mining Challenges

Data-Mining

Types

Supervised Learning

- Linear Regressions
- Logistic Regressions
- Time Series
- Classification of Regression Trees
- Neural Networks
- K-Nearest Neighbor

Unsupervised Learning

- Clustering
- Association Analysis
- Principal Component Analysis

Data-Mining Trends

Language Standardization

Scientific Mining

Complex Data Objects

Increased Computing Speed
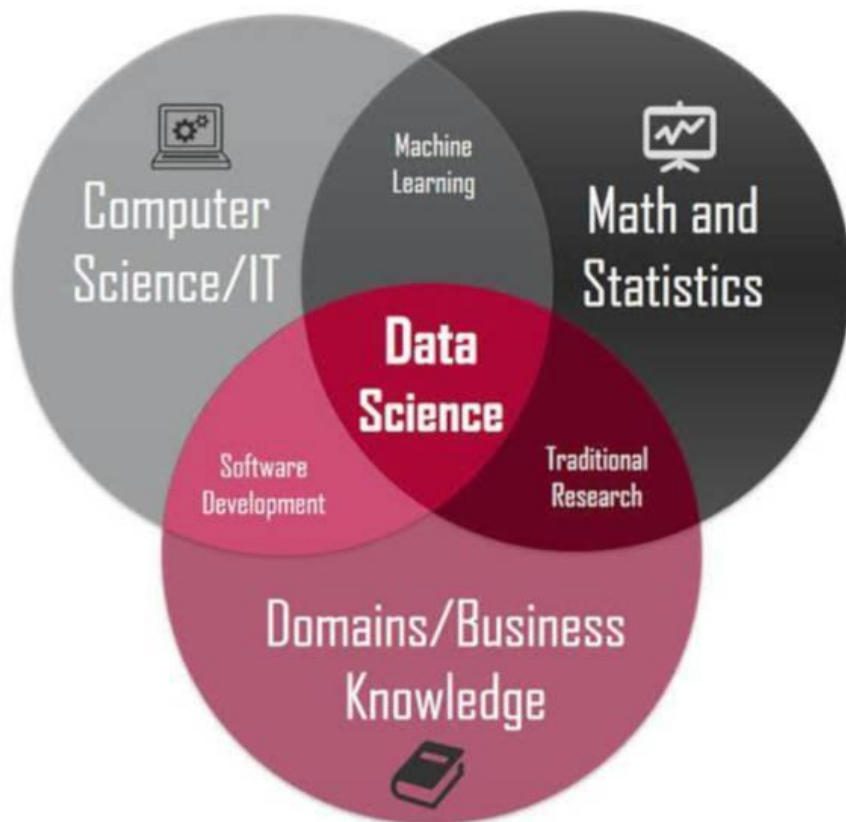
Web mining
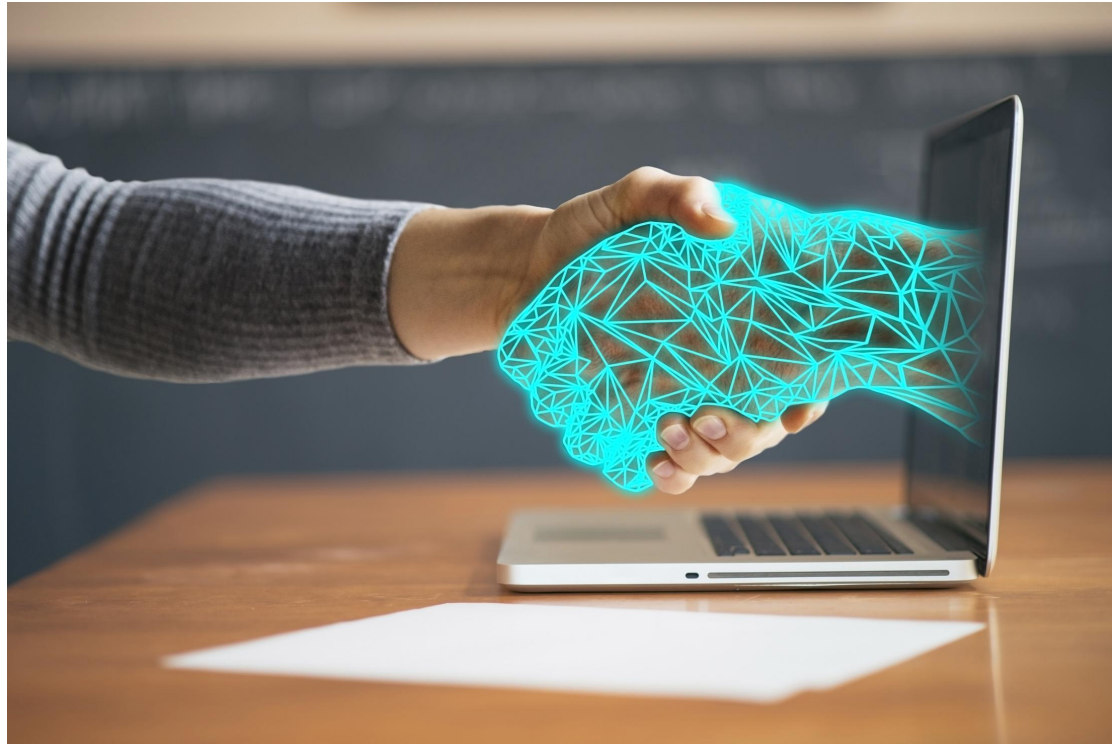
Tools

Tools
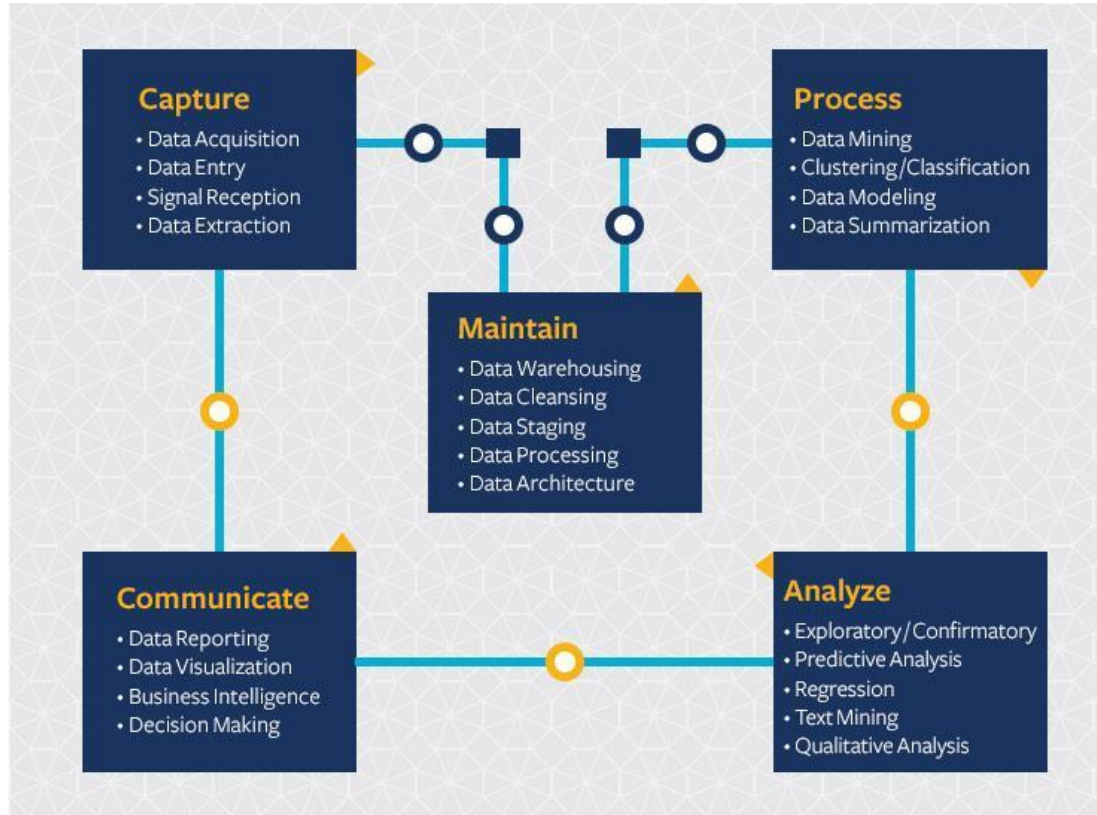
Data-Mining Example

Data Science

An Inter-disciplinary field to unify statistics, data analysis, machine learning, and domainrelated methods to extract knowledge from structural and **unstructured data**…
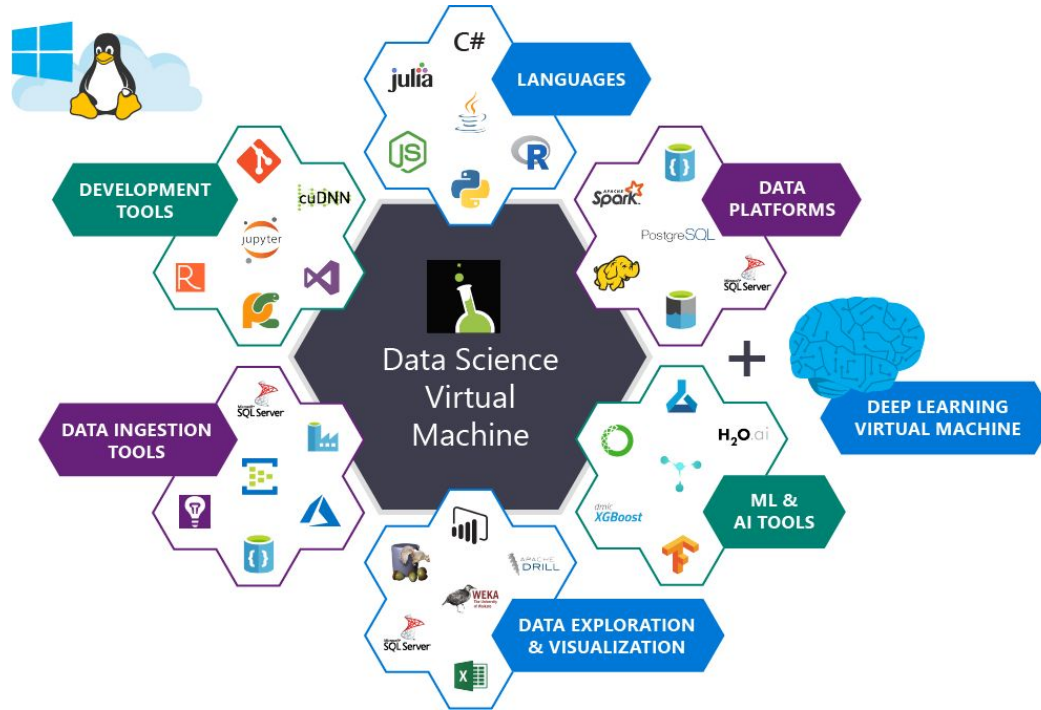
Data Science Process

Capture
- Data Acquisition
- Data Entry
- Signal Reception
- Data Extraction

Process
- Data Mining
- Clustering/Classification
- Data Modeling
- Data Summarization

Maintain
- Data Warehousing
- Data Cleansing
- Data Staging
- Data Processing
- Data Architecture

Communicate
- Data Reporting
- Data Visualization
- Business Intelligence
- Decision Making

Analyze
- Exploratory/Confirmatory
- Predictive Analysis
- Regression
- Text Mining
- Qualitative Analysis

Data Science Tools

AI, ML, DL, NN

Systems that think and act like humans...

Artificial Intelligence	Machine Learning	Neural Networks	Deep Learning
An attribute of machines that embody a form of intelligence, rather than simply carrying out computations that are input by human users.	An approach to AI in which an algorithm learns to make predictions from data that is fed into the system.	A machine learning approach in which algorithms process signals via interconnected nodes called artificial neurons.	A form of machine learning that often uses a network with many layers of computation—a deep neural network—enabling an algorithm to powerfully analyze the input data.
Early applications of AI included machines that could play games such as checkers and chess and programs that could analyze and reproduce language.	From personalized news feeds to traffic prediction maps, most people in developed countries use machine learning–based technologies every day.	Because they mimic the architecture of biological nervous systems, artificial neural networks are the obvious method of choice for modeling the brain.	Deep neural networks are responsible for self-driving vehicles, which learn to recognize traffic signs, as well as for voice-controlled virtual assistants.

ARTIFICIAL INTELLIGENCE

MACHINE LEARNING

NEURAL NETWORKS

DEEP LEARNING
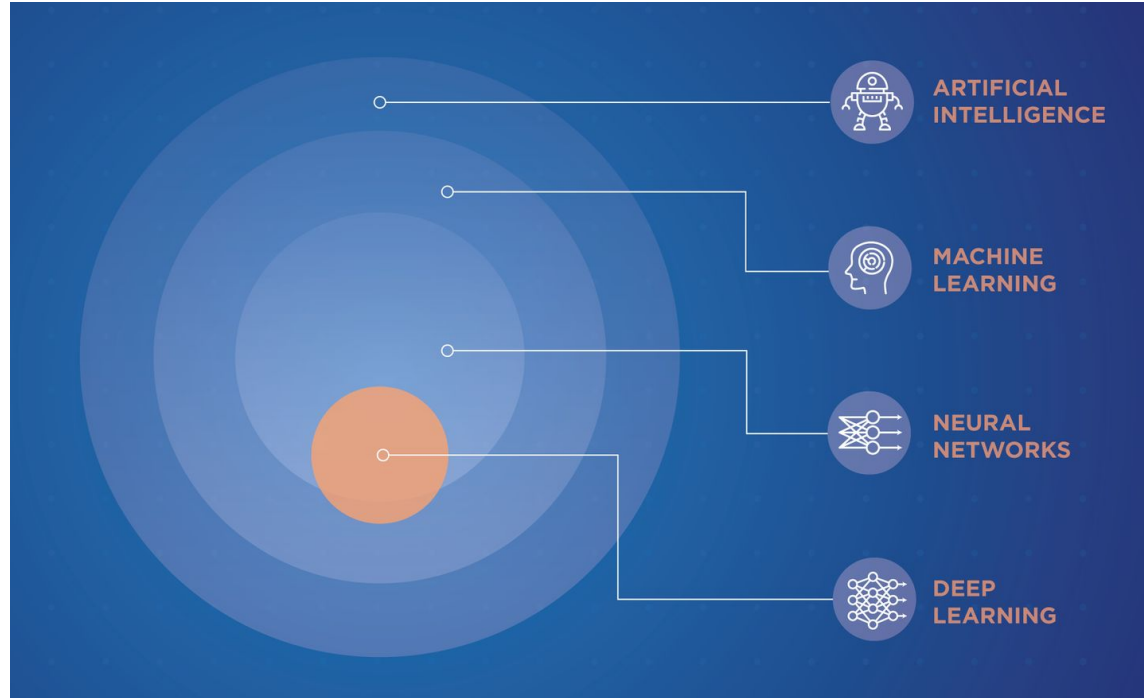
MACHINE LEARNING

SUPERVISED LEARNING	UNSUPERVISED LEARNING	REINFORCEMENT LEARNING
The algorithm learns the relationship between specific inputs and outputs based on training data and human feedback	The algorithm analyzes the data for trends and patterns without being given a specific output variable or human feedback	The algorithm learns over time to maximize returns based on the rewards it receives for performing certain actions

REGRESSION	CLASSIFICATION	CLUSTERING	DIMENSION REDUCTION	MODEL-FREE	MODEL-BASED

A simple neural network

input
layer

hidden
layer

output
layer

Figure 5: Difference between the simple neural network and the Deep learning neural network
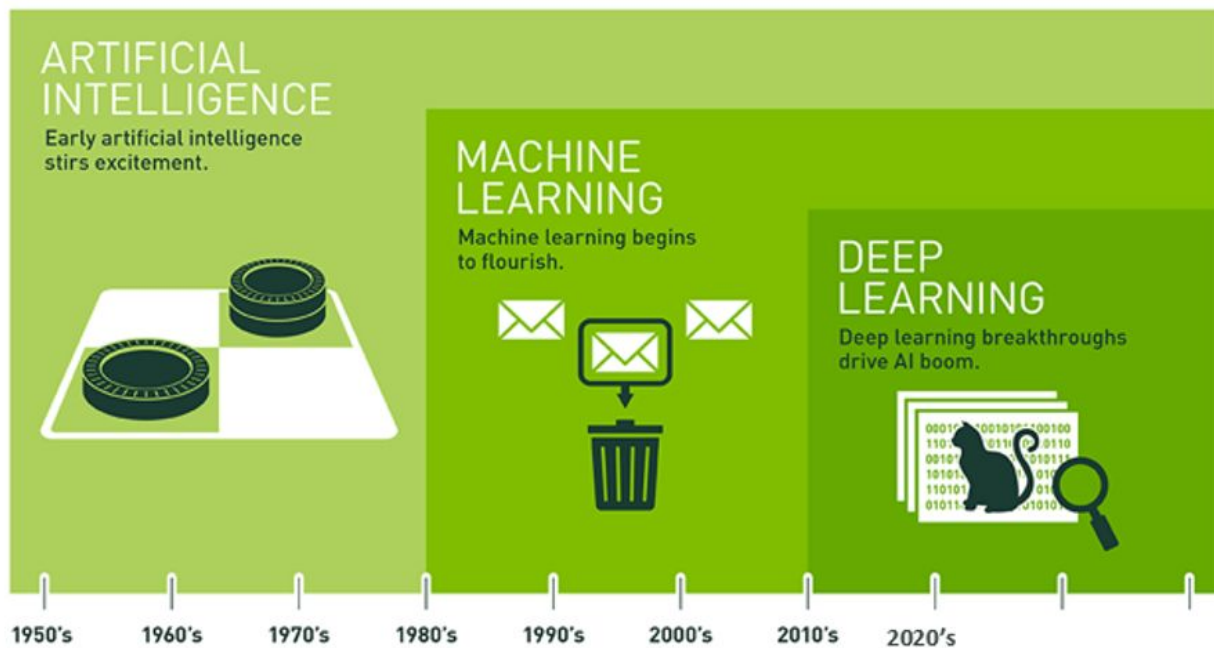
ANN

CRN

RNN

Figure 2: Artificial intelligence, machine leaning and deep learning Source: www.nvdia.com
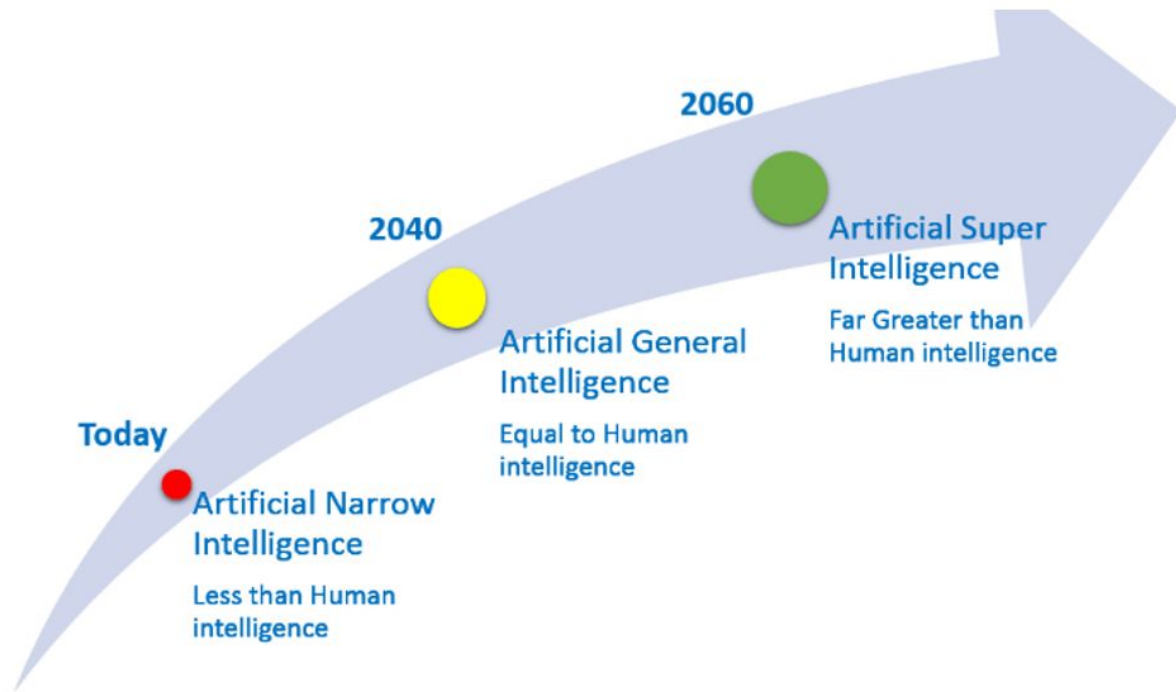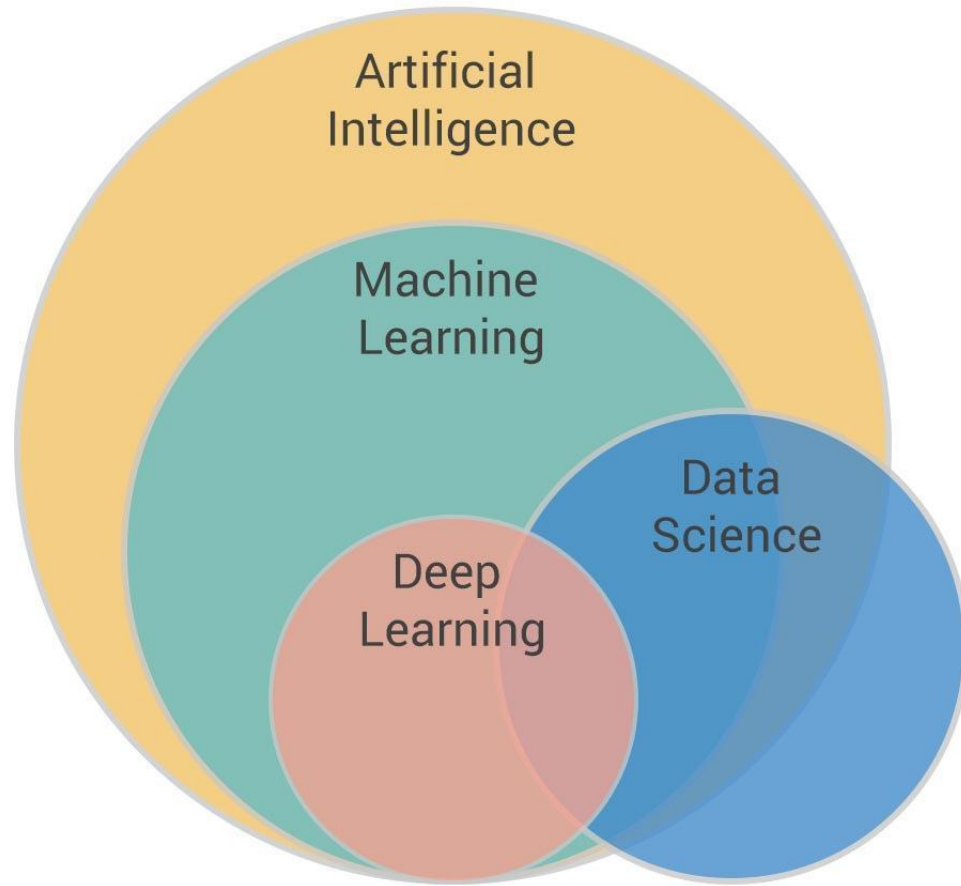
Figure 4: Future evolution of Artificial Intelligence

DEEP LEARNING USE CASE

Customer experience (Chatbots)

Translations

Image or Video Filters

Autonomous vehicles

Translations

Suggestion systems

Thanks