Data Visualization

Agenda

1. Data Visualization Examples

2. Data Science Intro

3. Data Science Jobs

4. Analysts Jobs (Data vs Business vs BI)
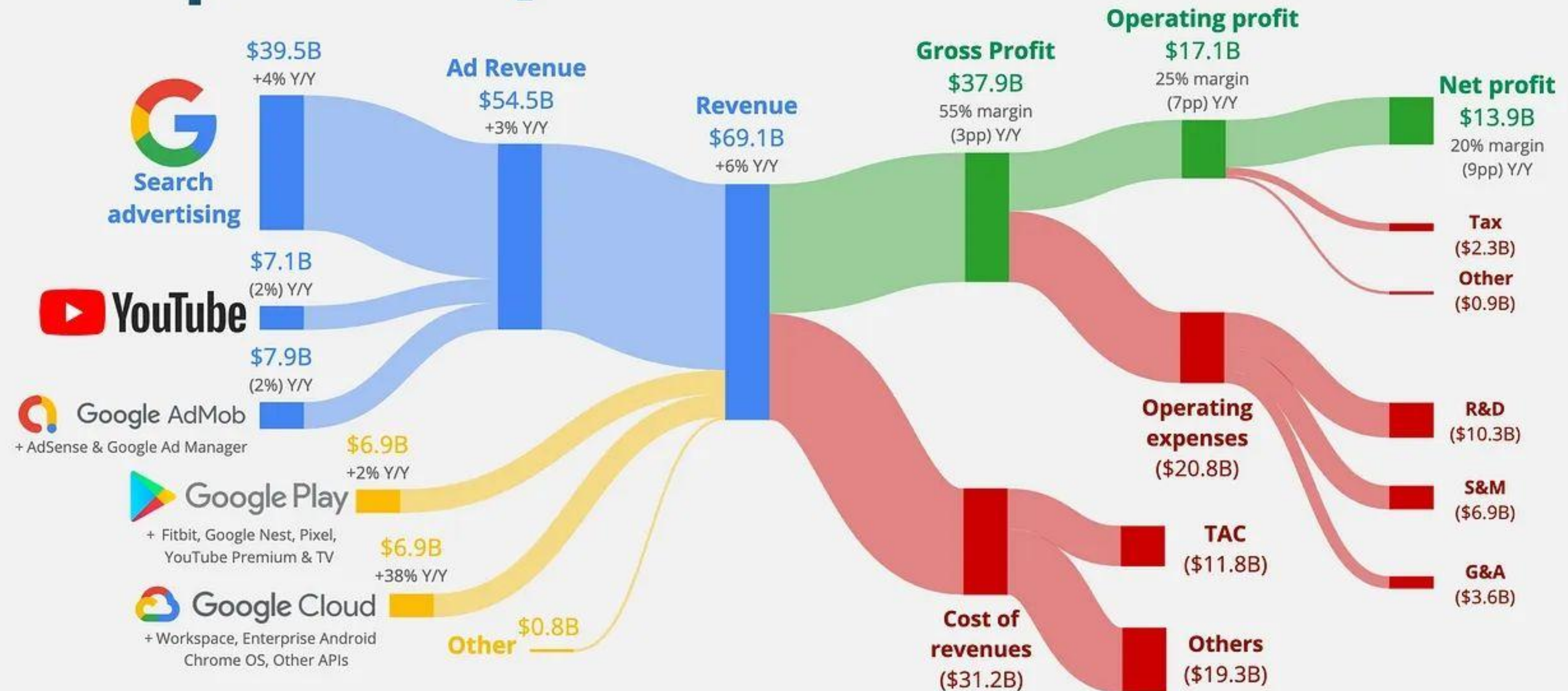
5. Questions

Data Visualization Examples

Alphabet Q3 FY22 Income Statement

Data Visualization Example 2: Dashboard

Data Science Intro
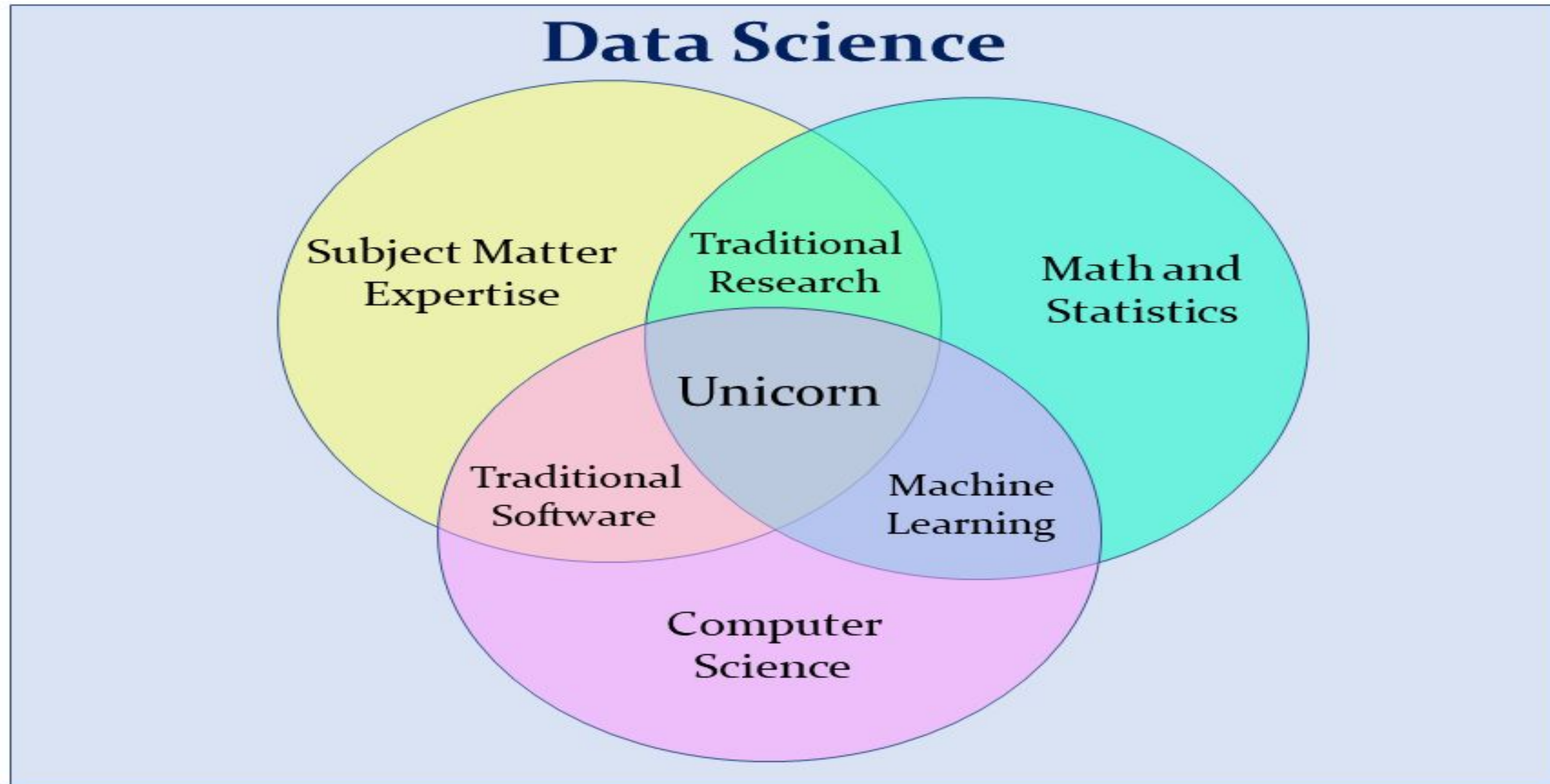
Data Science

- combines several disciplines including:
  a. Math

  b. statistics

  c. computer science

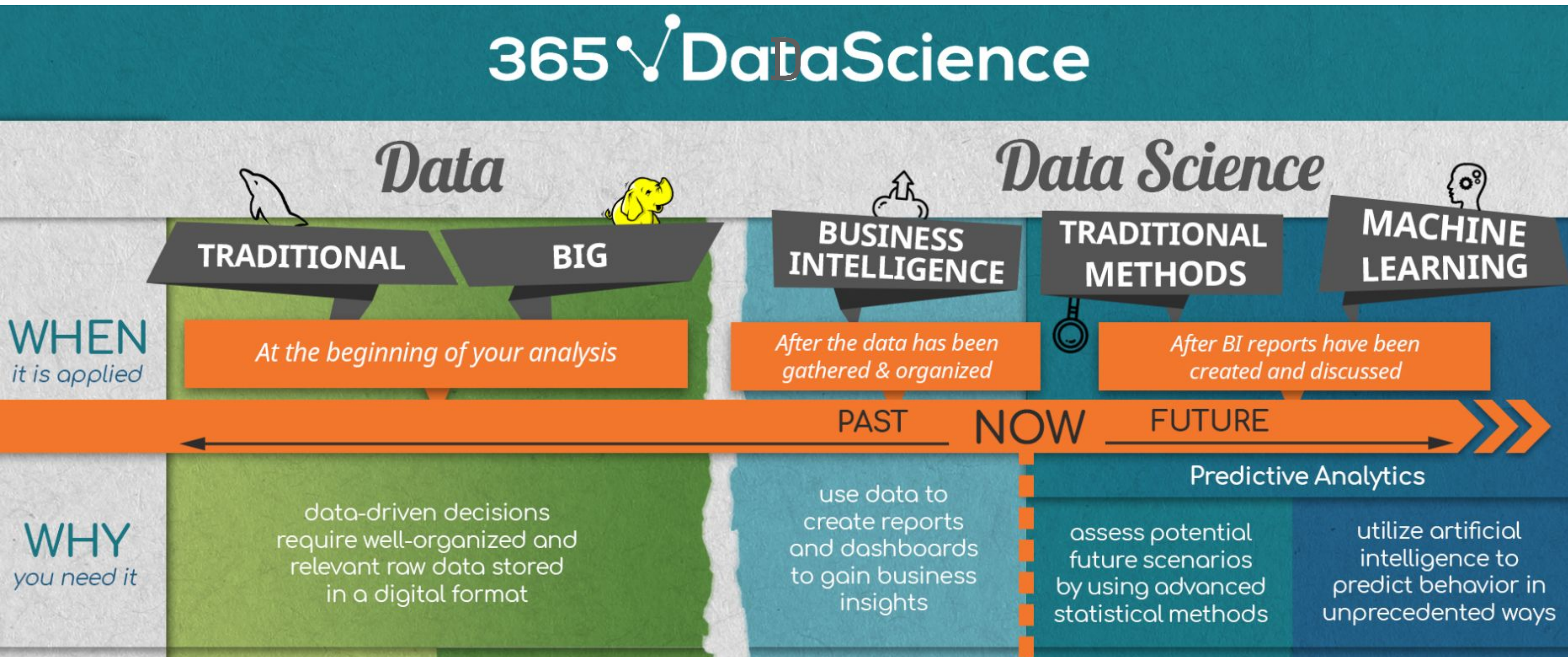- How to become a **Unicorn** in **Data Science**?

Data Science Venn Diagram 2.0

Data Science

- Subject Matter Expertise
- Traditional Research
- Math and Statistics
- Unicorn
- Traditional Software
- Machine Learning
- Computer Science

365 DataScience Infographic (When & Why)

365 DataScience

Data | Data Science

TRADITIONAL | BIG | BUSINESS INTELLIGENCE | TRADITIONAL METHODS | MACHINE LEARNING

WHEN it is applied

At the beginning of your analysis | After the data has been gathered & organized | After BI reports have been created and discussed

PAST — NOW — FUTURE

WHY you need it

Predictive Analytics

data-driven decisions require well-organized and relevant raw data stored in a digital format | use data to create reports and dashboards to gain business insights | assess potential future scenarios by using advanced statistical methods | utilize artificial intelligence to predict behavior in unprecedented ways

365 DataScience Advanced Data Analytics Diagram

Advanced Analytics

Business Case Studies

Qualitative Analytics

Business Analytics

Data Science

Data Analytics

Preliminary Data Report

Business Intelligence

Reporting with Visuals

Creating Dashboards

Sales Forecasting

Optimization of Drilling Operations

Digital Signal Processing

Creating Real-time Dashboards

Client Retention

Fraud Prevention

Machine Learning

AI

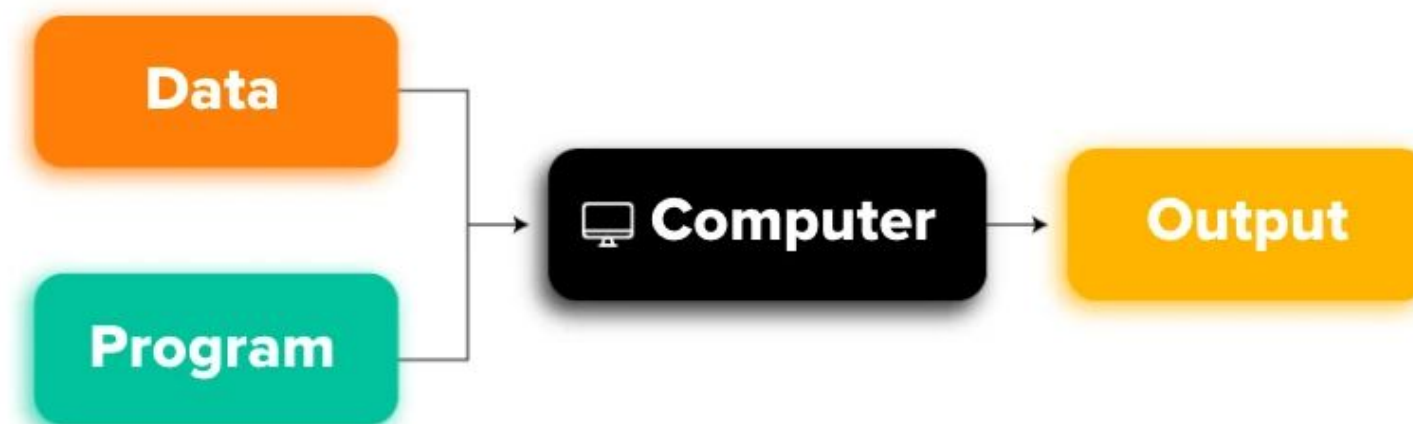Past   Present   Future

Data Science & AI from another Viewpoint
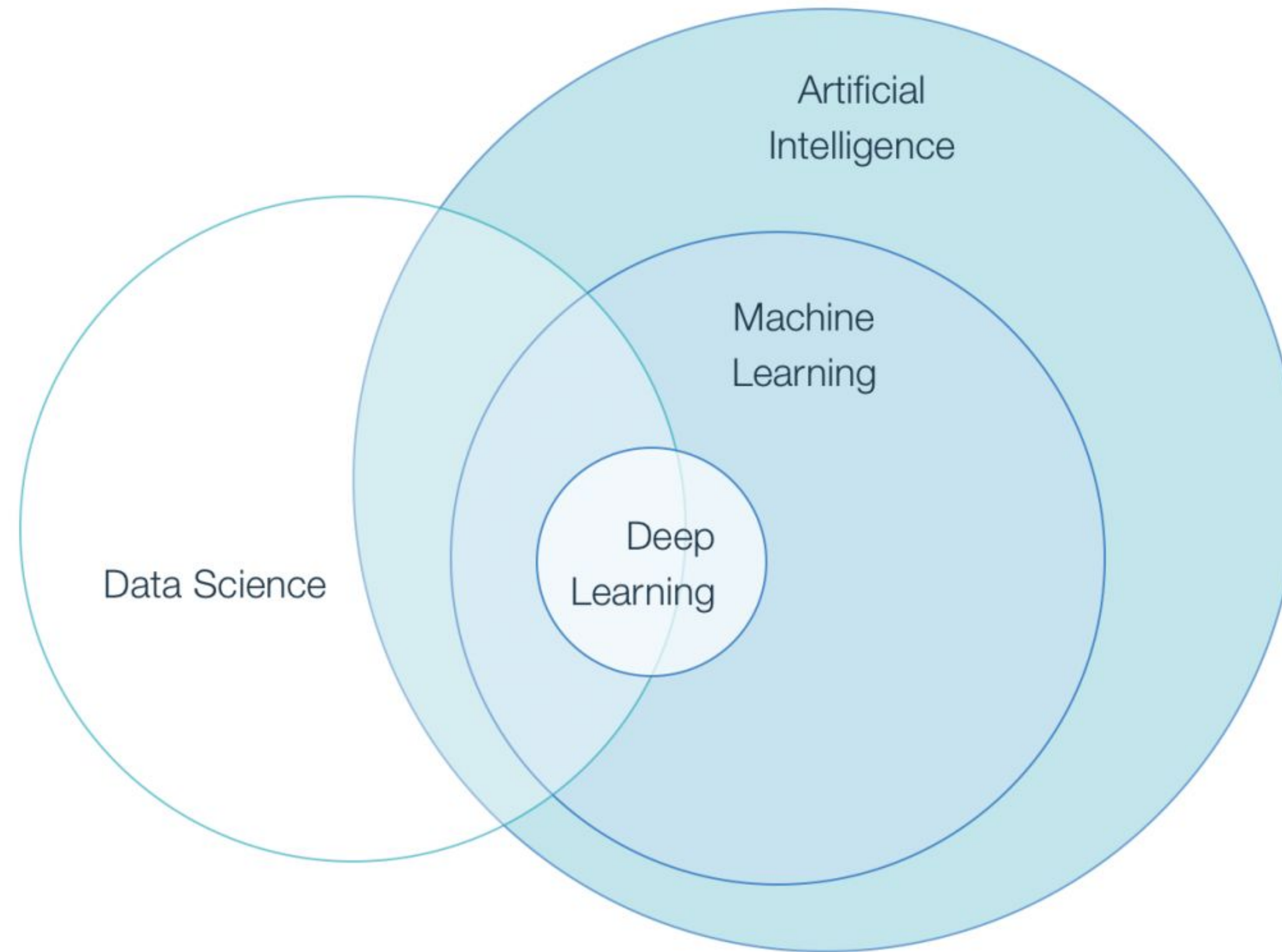
Data Science & AI/ML/DL

TRADITIONAL PROGRAMMING

Data → Program → 🖥 Computer → Output

MACHINE LEARNING

Data → Output → 🖥 Computer → Program
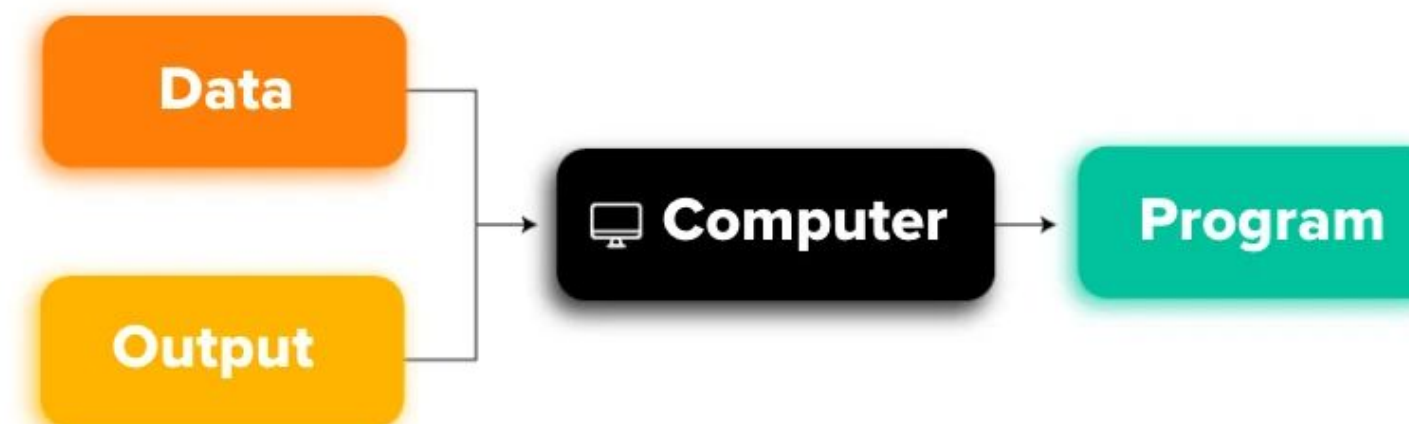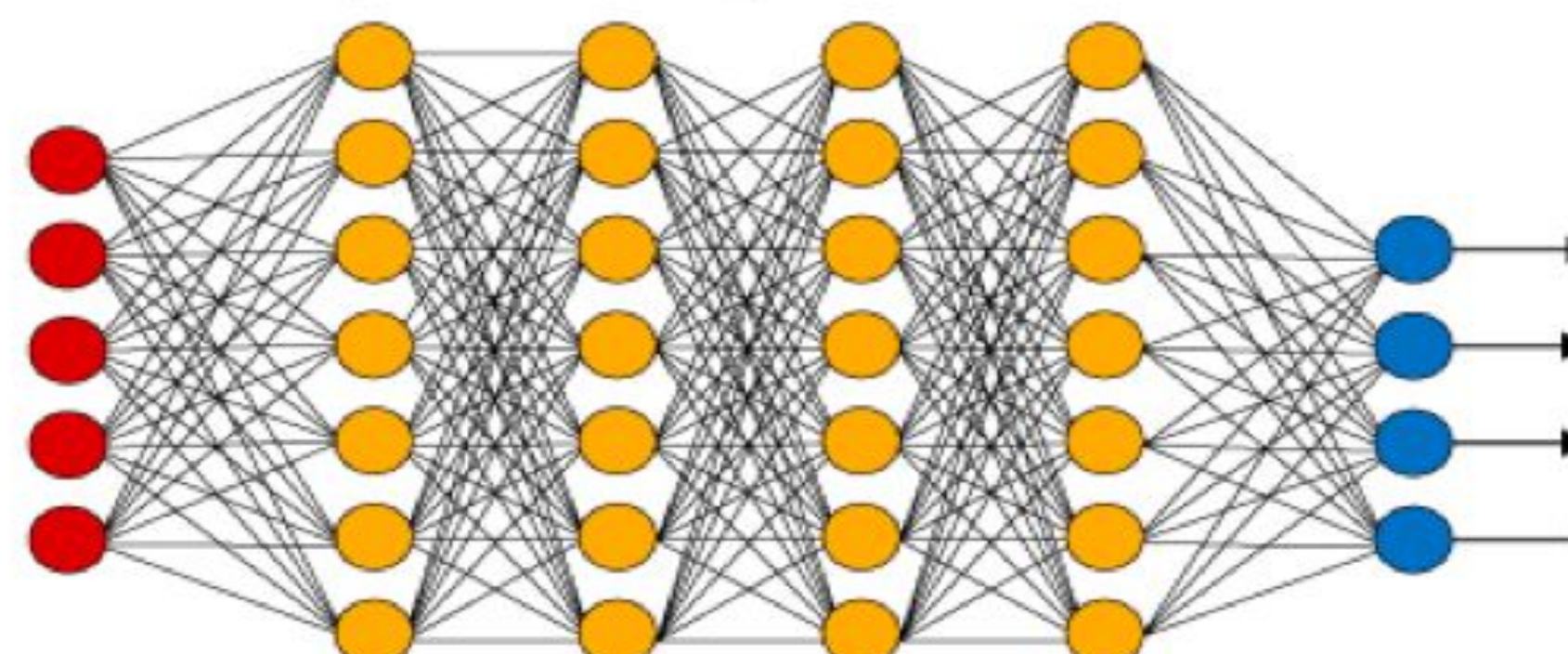
Simple Neural Network
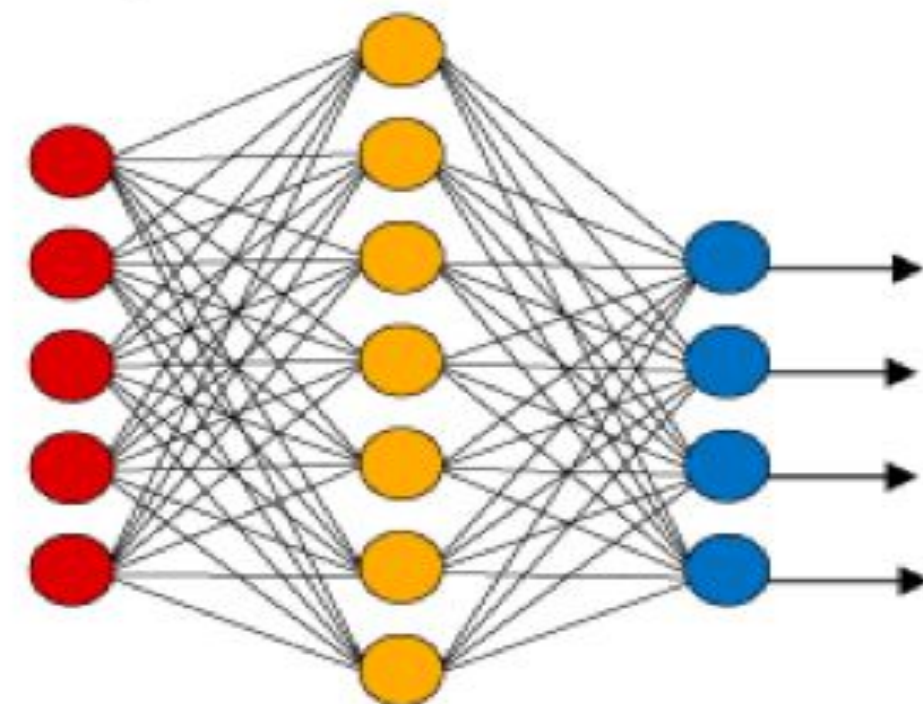
Deep Learning Neural Network

🔴 Input Layer 🟠 Hidden Layer 🔵 Output Layer

Data Science Jobs

Data Science Jobs: Long-lasting Career

	Data Analyst	Machine Learning Engineer	Data Engineer	Data Scientist
Programming Tools	● Very	● Very	● Very	● Very
Data Visualization and Communication	● Very	● Somewhat	● Somewhat	● Very
Data Intuition	● Somewhat	● Very	● Somewhat	● Very
Statistics	● Somewhat	● Very	● Somewhat	● Very
Data Wrangling	● Not that	● Not that	● Very	● Very
Machine Learning	● Not that	● Very	● Not that	● Very
Software Engineering	● Not that	● Somewhat	● Very	● Somewhat
Multivariable Calculus and Linear Algebra	● Not that	● Very	● Not that	● Somewhat

● Not that important   ● Somewhat important   ● Very important

Data Science Jobs: Where is the role of each?
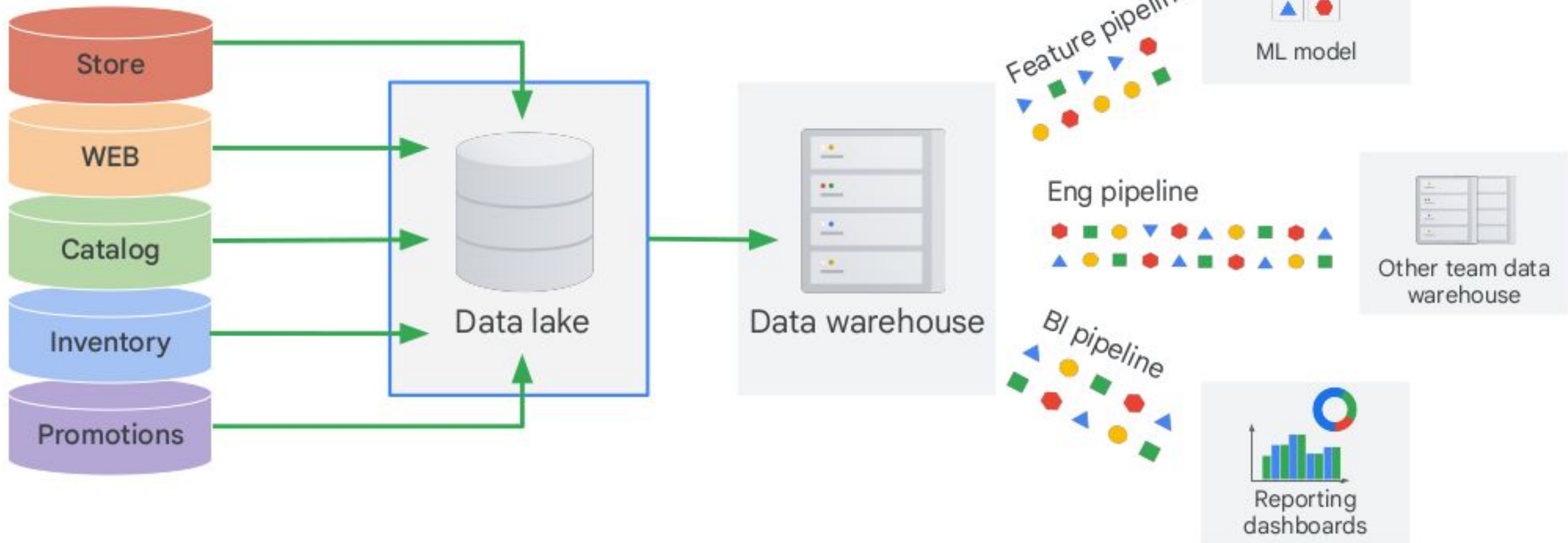
Data Science Jobs: 1) Data Analyst

- Job might consist of tasks like:

  - pulling data out of **SQL** databases

  - becoming an **Excel** or **Tableau** master

  - producing basic **Data Visualizations** and **Reporting Dashboards**

  - On occasion:

    - analyze the results of an **A/B Test**

    - take the lead on company's **Google Analytics account**

- Some companies: **Data Scientist** is synonymous to **Data Analyst**
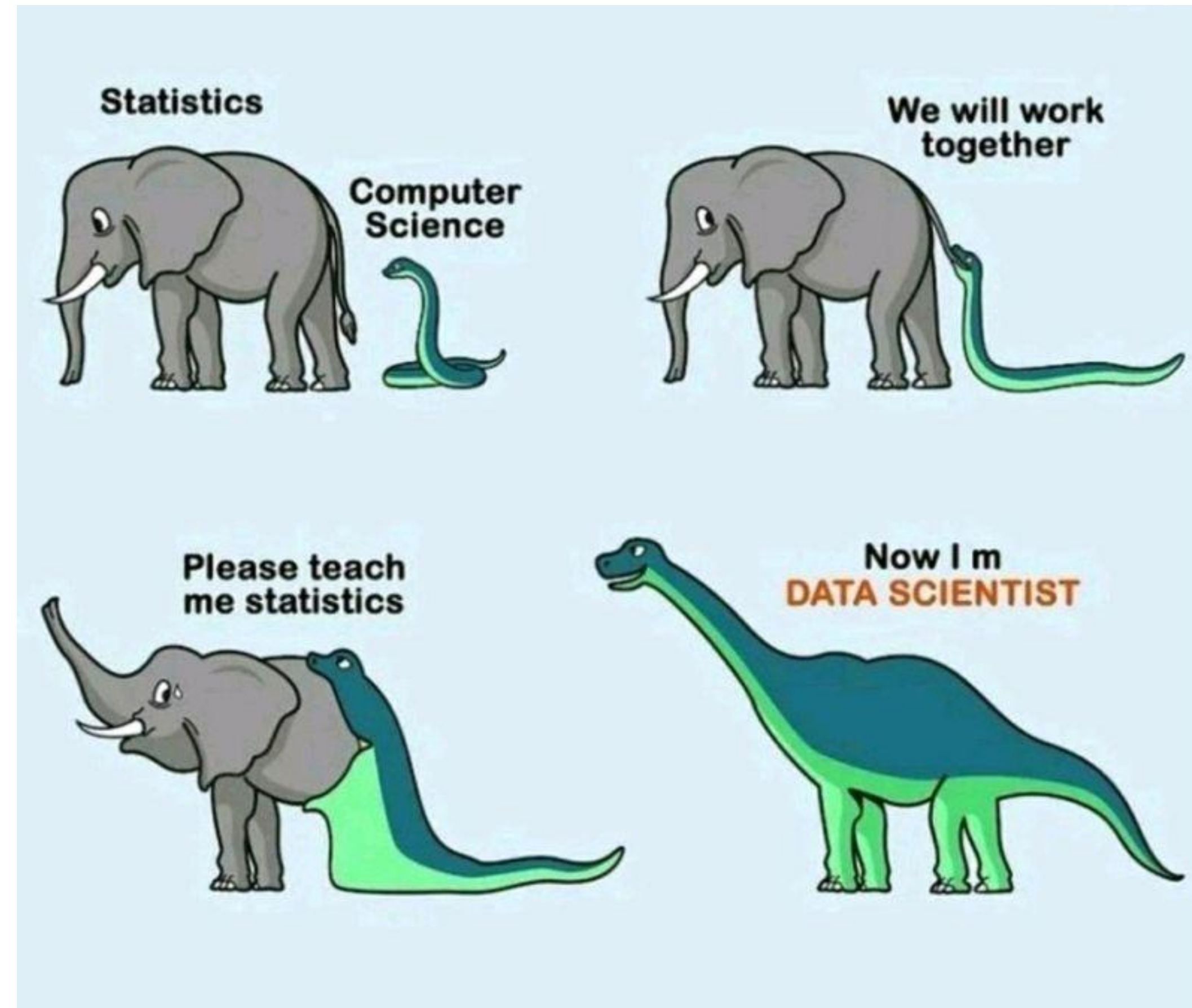
Data Science Jobs: 2) ML Engineer

- Some companies: **data** or **data analysis platform** is the product
  - so, **Data Analysis** or **ML** can be pretty intense
  - so, there is a need for someone who:
    - has a formal mathematics or statistics background
    - is hoping to continue down a more academic path

- **ML Engineers**
  - often focus more on producing great **data-driven products**

Data Science Jobs: 3) Data Engineer

- Some companies: have **lot of traffic** and **large amount of data**

  - so, there is a need for someone who:

    - set up lot of **data infrastructure** that the company will need moving forward

- Job postings listed under **Data Scientist** and **Data Engineer**

  - strong software engineering skills are more important

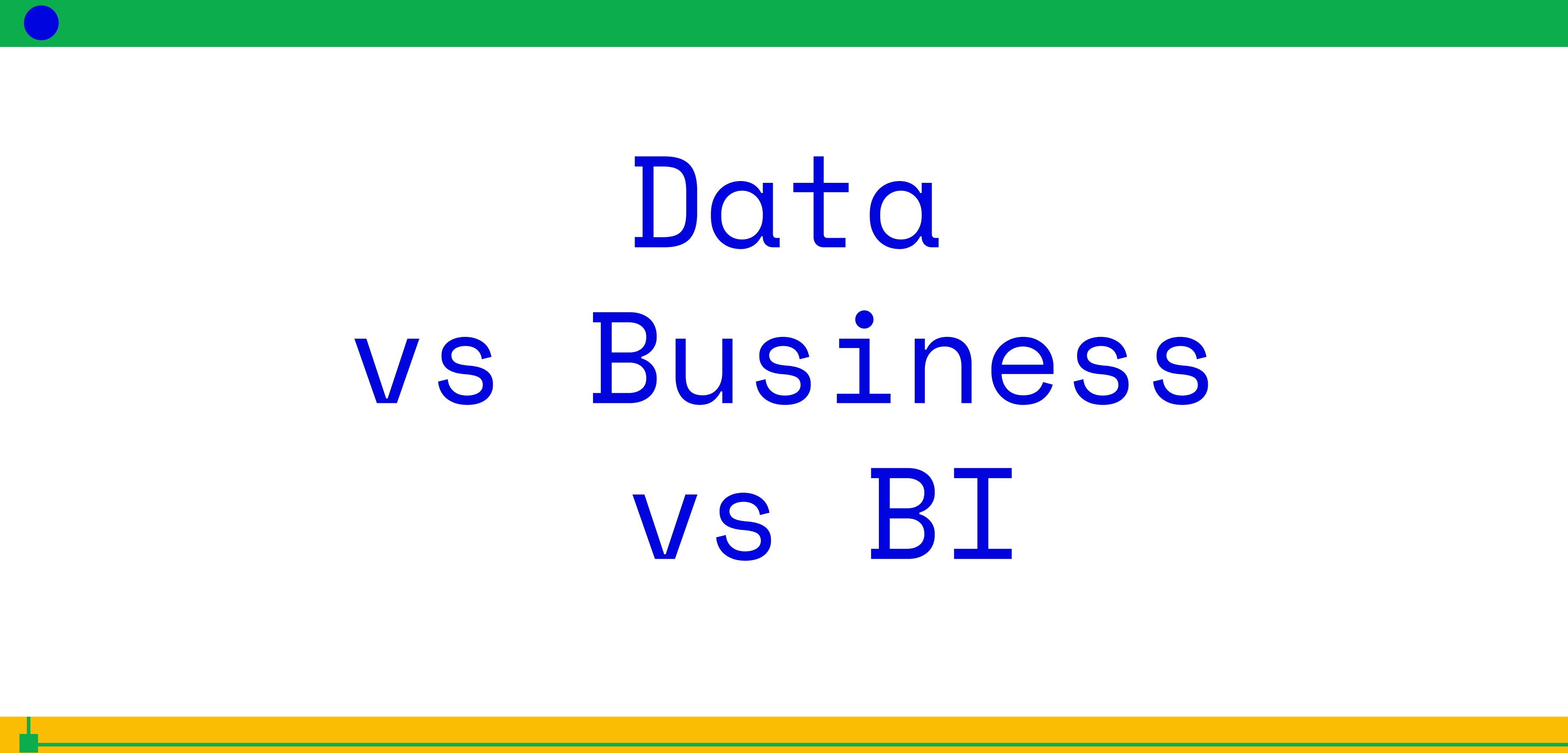 - heavy statistics and ML expertise are less important

Often used as a blanket title
  ○ to describe jobs that are drastically different

Data Science Jobs: 5) Data Generalist

- Some companies: look 4 **Generalist** to join data scientists team
  - these companies cares about data but probably isn't a data company

- **Data Generalist** most important skills:
  - familiarity with tools designed for **Big Data**
  - experience with messy, real-life datasets

- **Data Generalist** can:
  - perform analysis
  - touch production code
  - **Visualize Data**

Data
vs Business
vs BI

Business Case Studies

○ are real-world experiences of how business people and companies succeed or fail

○ examine events that have already happened

○ We do not need a dataset to learn from **business cases**

○ We could learn from them and attempt to prevent making a similar mistake in future

Business Case Studies: Example

Ryanair: `cost-friendly budget airline that sells tickets so cheap`

- travel to less busy airports
  - far from the city
  - outside business hours
- charges for almost every small addition
- tries to keep planes for small times on airfields to save on rent
- operates only one type of aircraft to speed out ground crew processes

Business

Business Case Studies
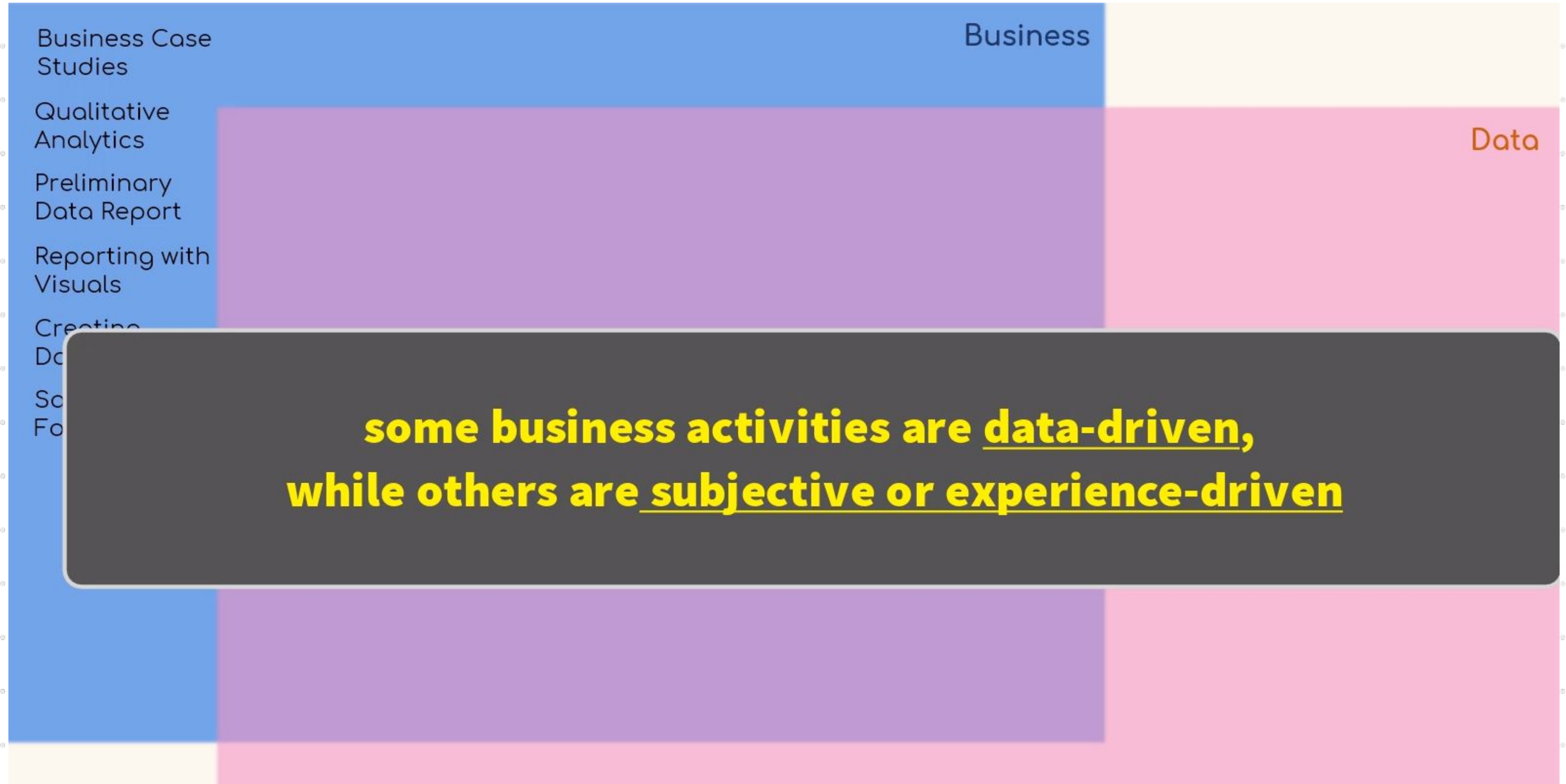
Qualitative Analytics

Preliminary Data Report

Reporting with Visuals

Creating Dashboards

Sales Forecasting

Business

Data?

Business Case
Studies

Qualitative
Analytics

Preliminary
Data Report

Reporting with
Visuals

Creating
D...

S...
Fo...

Business

Data

**some business activities are <u>data-driven</u>,
while others are <u>subjective or experience-driven</u>**

Data

Business Case
Studies

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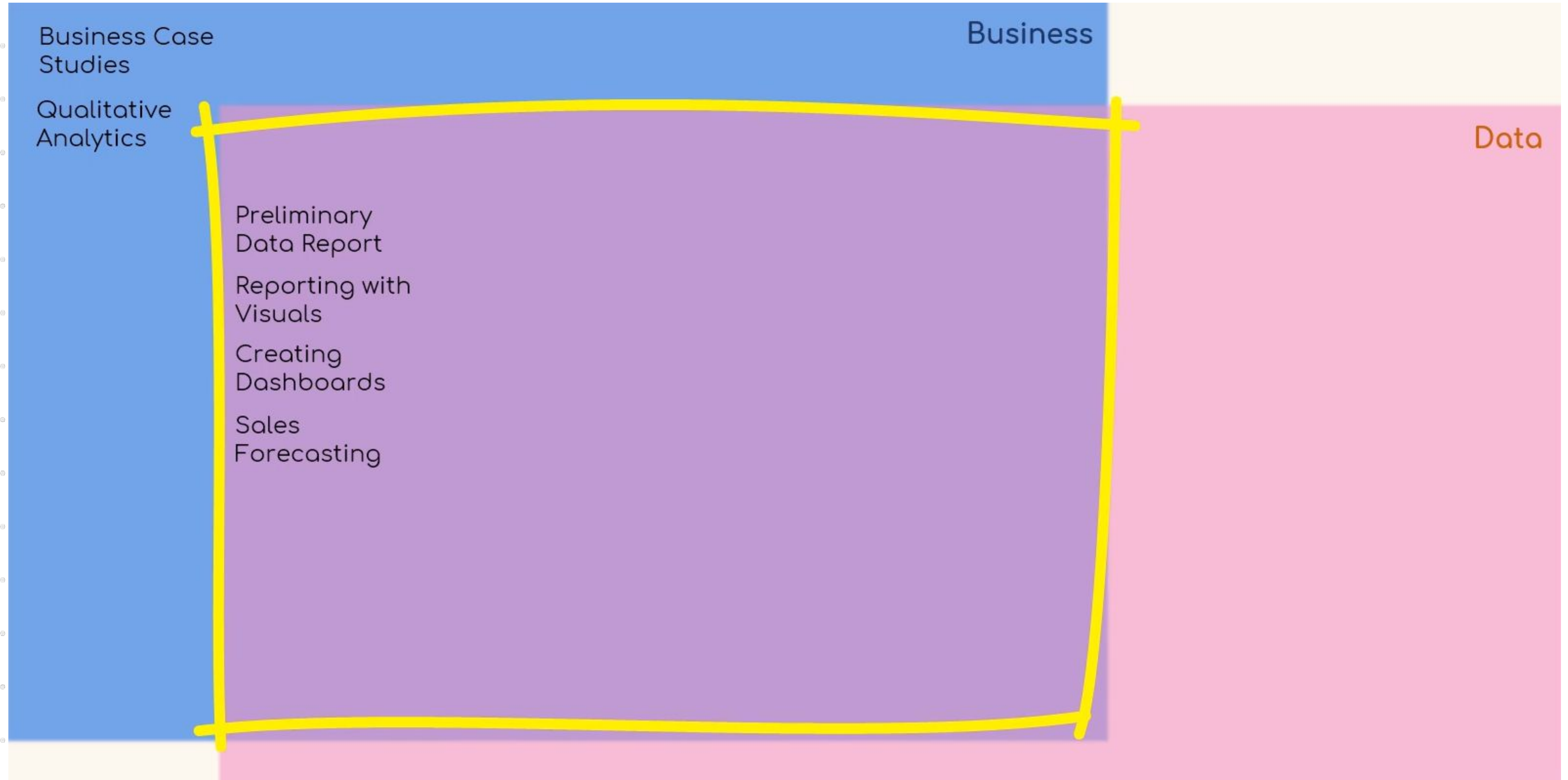
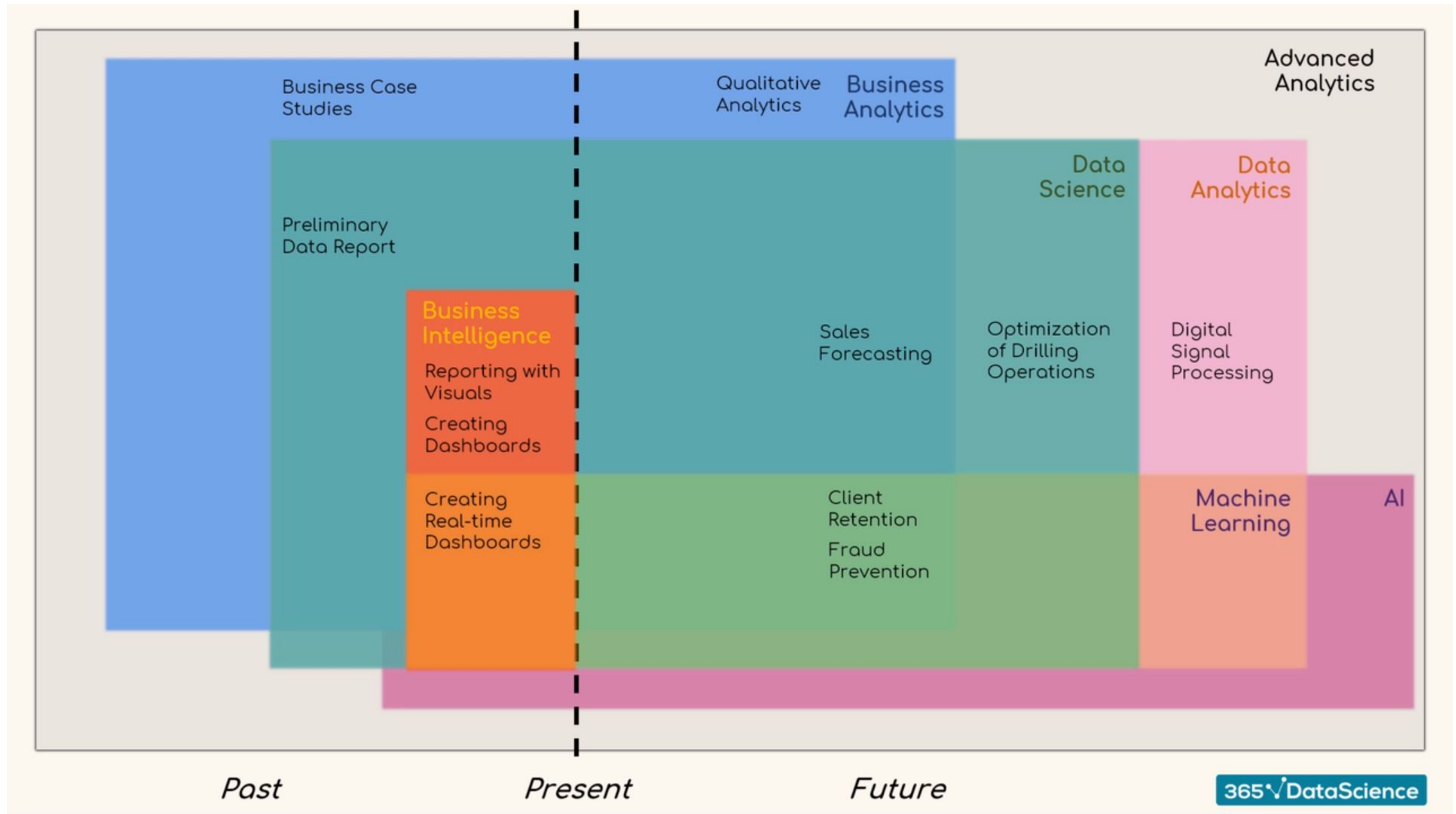# 365 DataScience Advanced Data Analytics Diagram

Advanced Analytics

Business Case Studies

Qualitative Analytics — Business Analytics

Data Science

Data Analytics

Preliminary Data Report

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Optimization of Drilling Operations

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Client Retention

Fraud Prevention

Machine Learning

AI

Past   Present   Future

Data Analysts vs Business Analysts vs BI Analysts

Data Analyst common tasks:

- ○ Working with stakeholders to define a problem or business need
- ○ Identifying and sourcing data
- ○ Cleaning and preparing data for analysis
- ○ Analyzing data for patterns and trends
- ○ **Visualizing data** to make it easier to understand
- ○ Presenting data in such a way that it tells a compelling story

Data Analysts vs Business Analysts vs BI Analysts

Business Analyst common tasks:

- ○ Evaluating a company's current functions and IT structures
- ○ Reviewing processes to identify areas for improvement
- ○ Interviewing team members to identify areas for improvement
- ○ Presenting recommendations/findings to management and other key stakeholders
- ○ **Creating visuals** and financial models to support business decisions
- ○ Training and coaching staff in new systems

Data Analysts vs Business Analysts vs BI Analysts

BI Analyst:

- Somewhat of a hybrid between **Business Analyst** and **Data Analysts**
- They use analysis, modeling, and **visualization** of:
  1. industry trends
  2. competitive landscape
  - to help businesses cut losses and increase profits

Questions

Links

https://github.com/fcai-b/dv

References

1. https://www.udacity.com/blog/2018/01/4-types-data-science-jobs.html
    - ○ 4 Types of Data Science Jobs
2. https://www.coursera.org/articles/data-analyst-vs-business-analyst
    - ○ Data Analyst vs. Business Analyst
3. https://learn.365datascience.com/courses/intro-to-data-and-data-science
    - ○ 365 Data Science - Introduction to Data and Data Science