

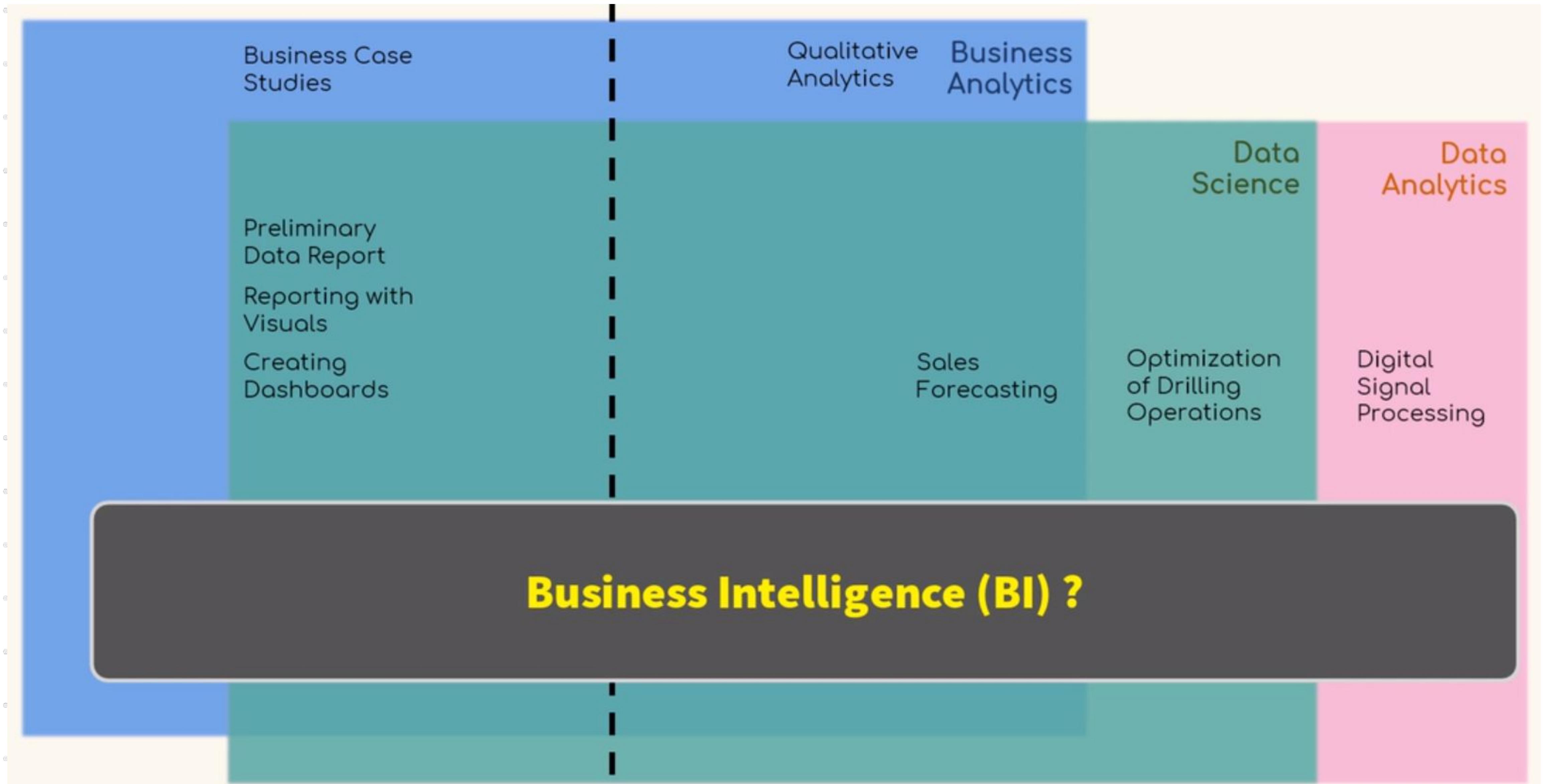
# Advanced Data Analytics

# Agenda

1. Business Intelligence (BI)
2. Artificial Intelligence (AI)
3. A Vision for Advanced Analytics
4. 365 Data Science Infographic
5. Questions

**BI**

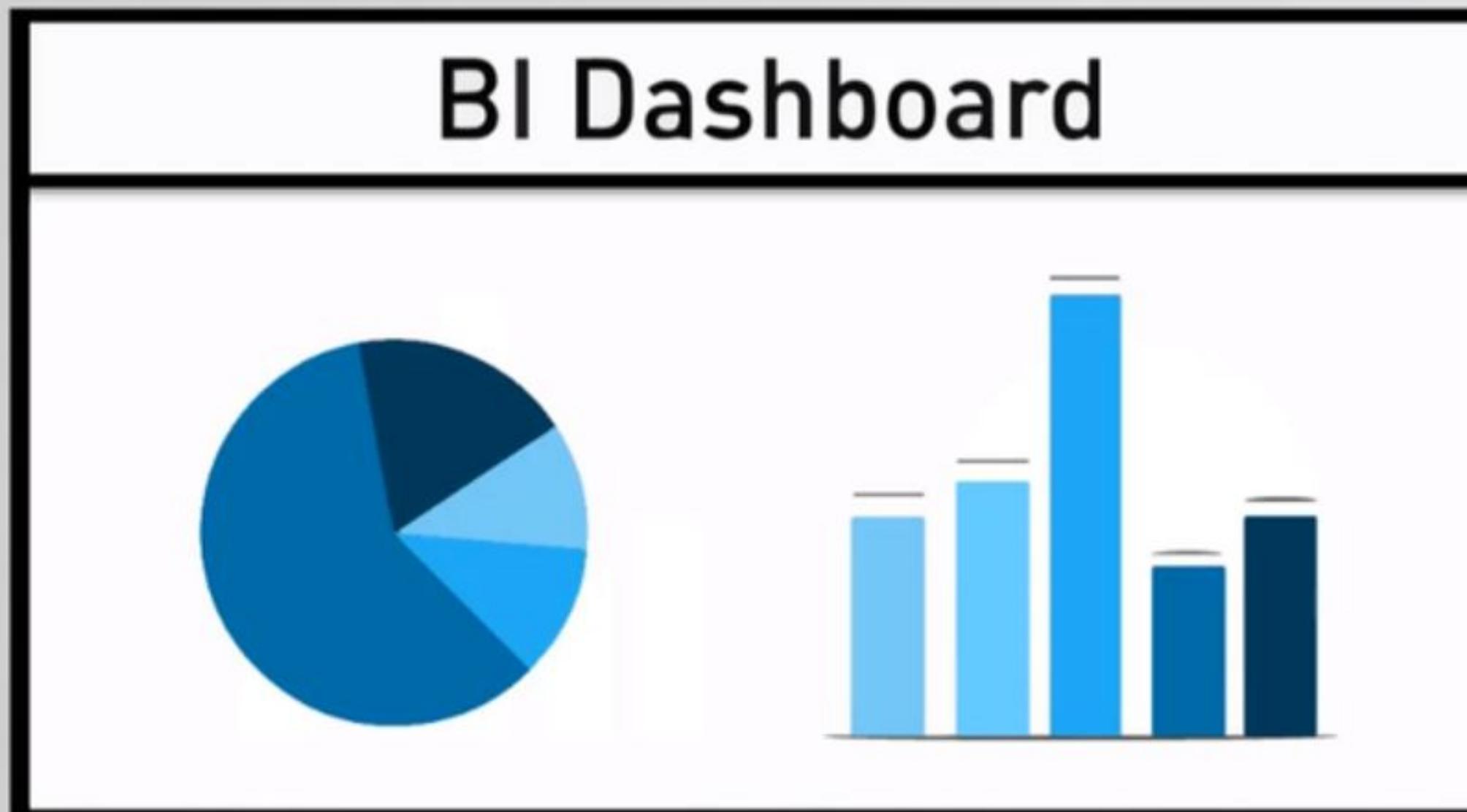
# Business Intelligence (BI) ?



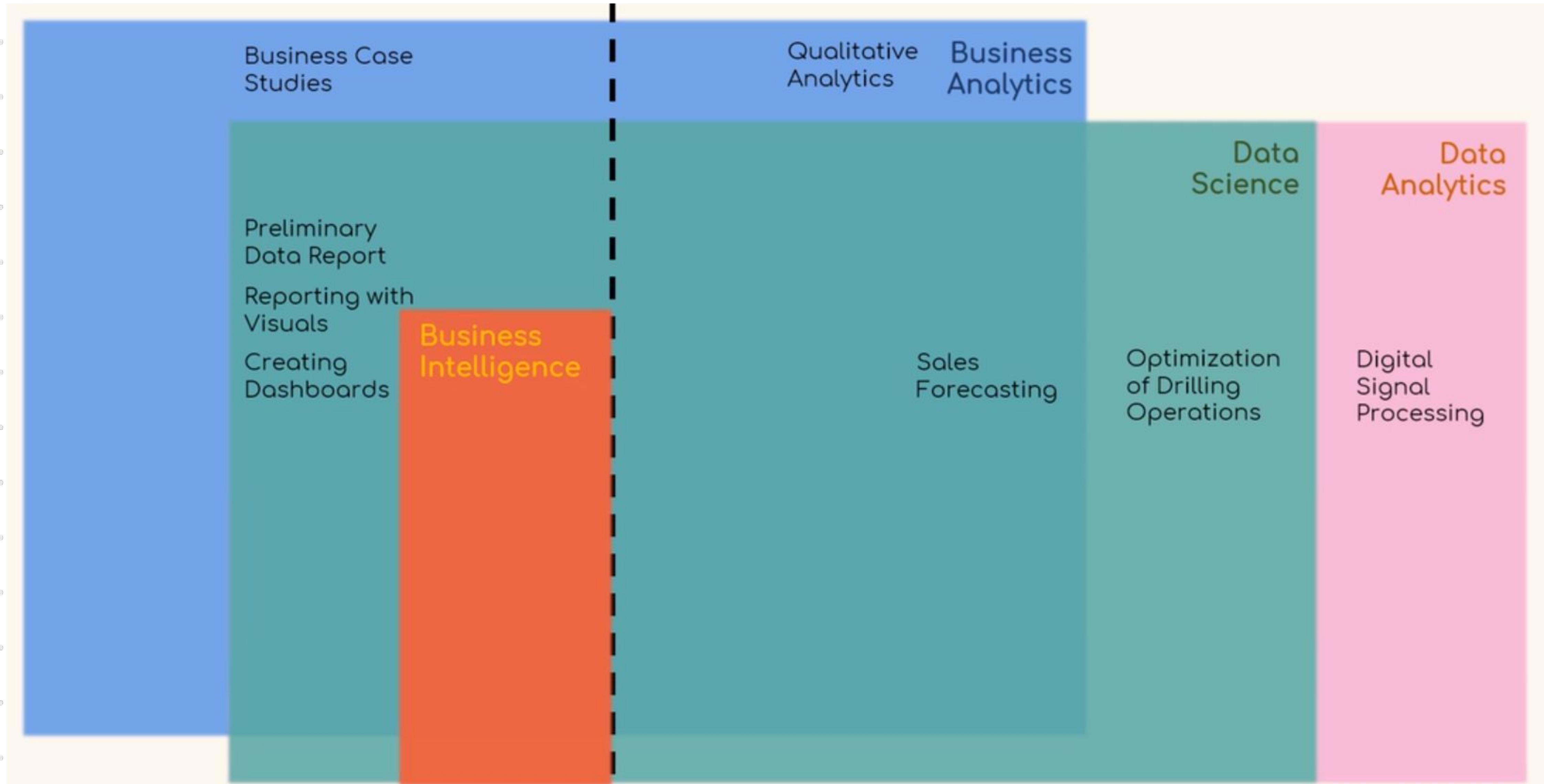
# Business Intelligence (BI) - 1

**business intelligence (BI):** the process of analysing and reporting historical business data

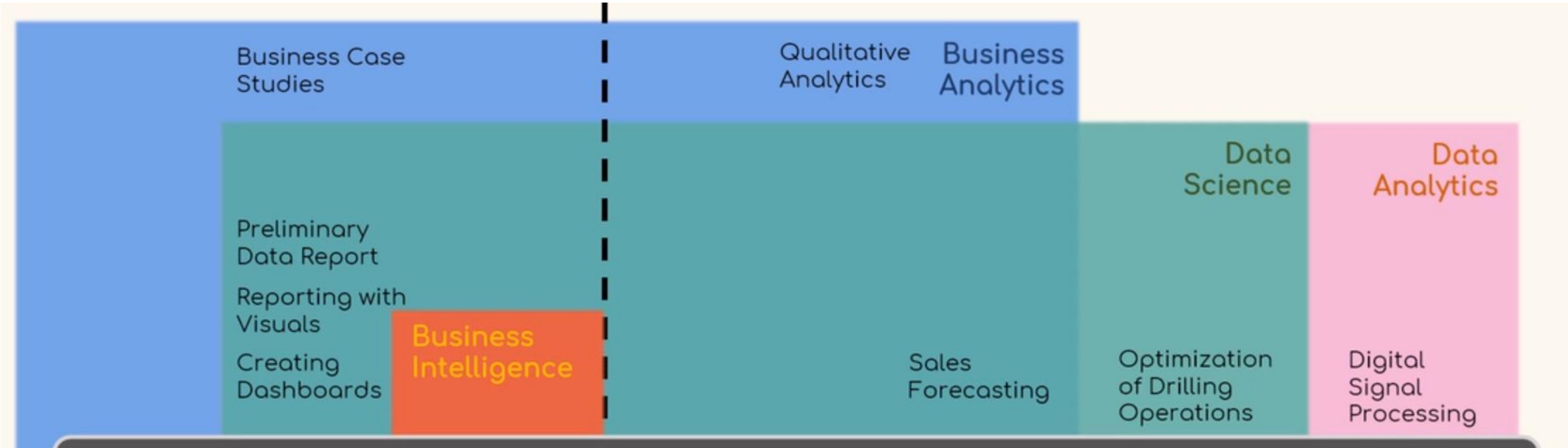
**aims to explain past events using business data**



# Business Intelligence (BI) - 2



# Business Intelligence (BI) - 3



**Business intelligence is the preliminary step of predictive analytics**

**1. analyse past data and extract useful insights**

**2. create appropriate models**

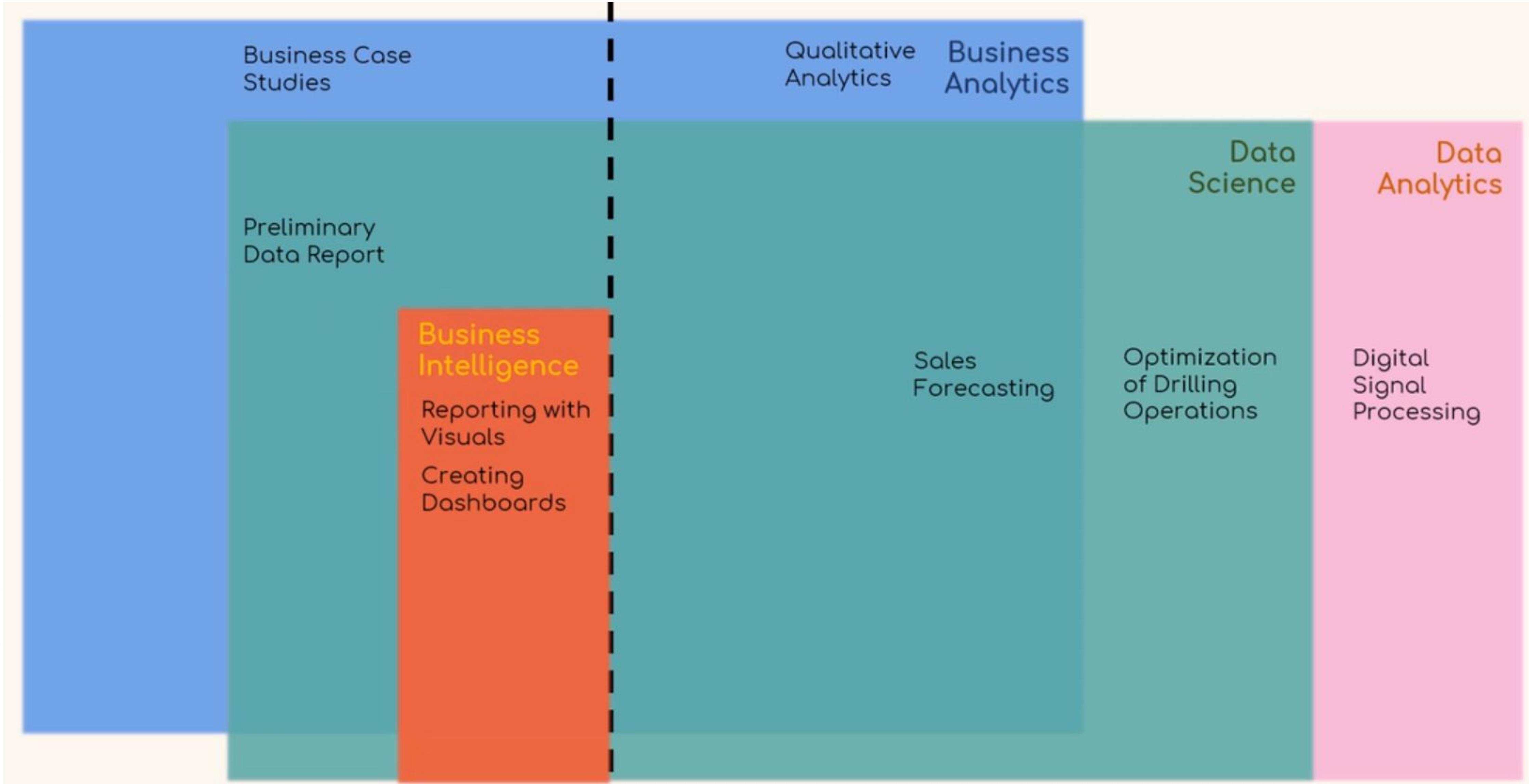
# Business Intelligence (BI) - 4

- analyse the **past** that you acquired (analyse past data)
- allows to make decisions, extract insights, and extract ideas
- includes all technology-driven tools involved in the process of:
  - analysing
  - understanding
  - reporting available past data

# Business Intelligence (BI) - 5

- After preparing Reports & Dashboards:
  - They can be used to make strategic/tactical business decisions
    - by end-users (such as general manager)
  - Using these inferences will allow to
    - create appropriate models that could predict the future of business accurately

# Business Intelligence (BI) - 6



# Preliminary Data Report - 1



# Preliminary Data Report - 2

## Preliminary Data

- are data that do not have 12 months of reporting delay
- can apply to both annual and cumulative quarterly data



23 January 2023  
ESMA70-446-775

### Reasons for publication

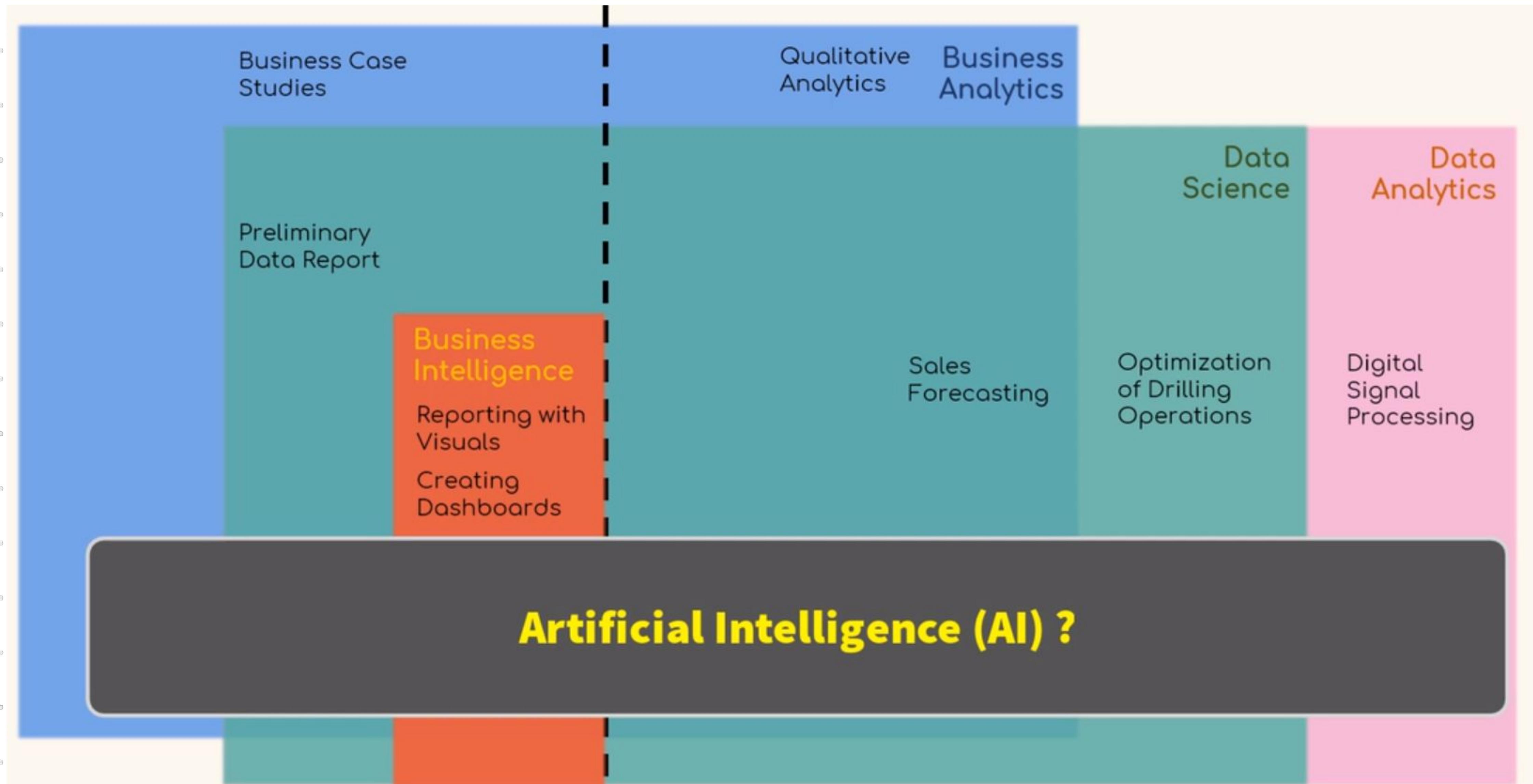
On 22 December 2022, the European Council adopted Regulation (EU) 2022/2578 (the Regulation) establishing a market correction mechanism (MCM) to protect Union citizens and the economy against excessively high prices. The Regulation will enter into force on 1 February with application from the same day while the MCM only starts applying on 15 February 2023. Under Article 8(5) of the Regulation, ESMA is required to publish a preliminary data report concerning the introduction of the MCM by 23 January 2023 to be followed by an effects assessment by 1 March 2023. This report is the ESMA preliminary data report. ACER is also required to publish such a data report and ACER and ESMA have produced their respective reports in close cooperation.

# Preliminary data report

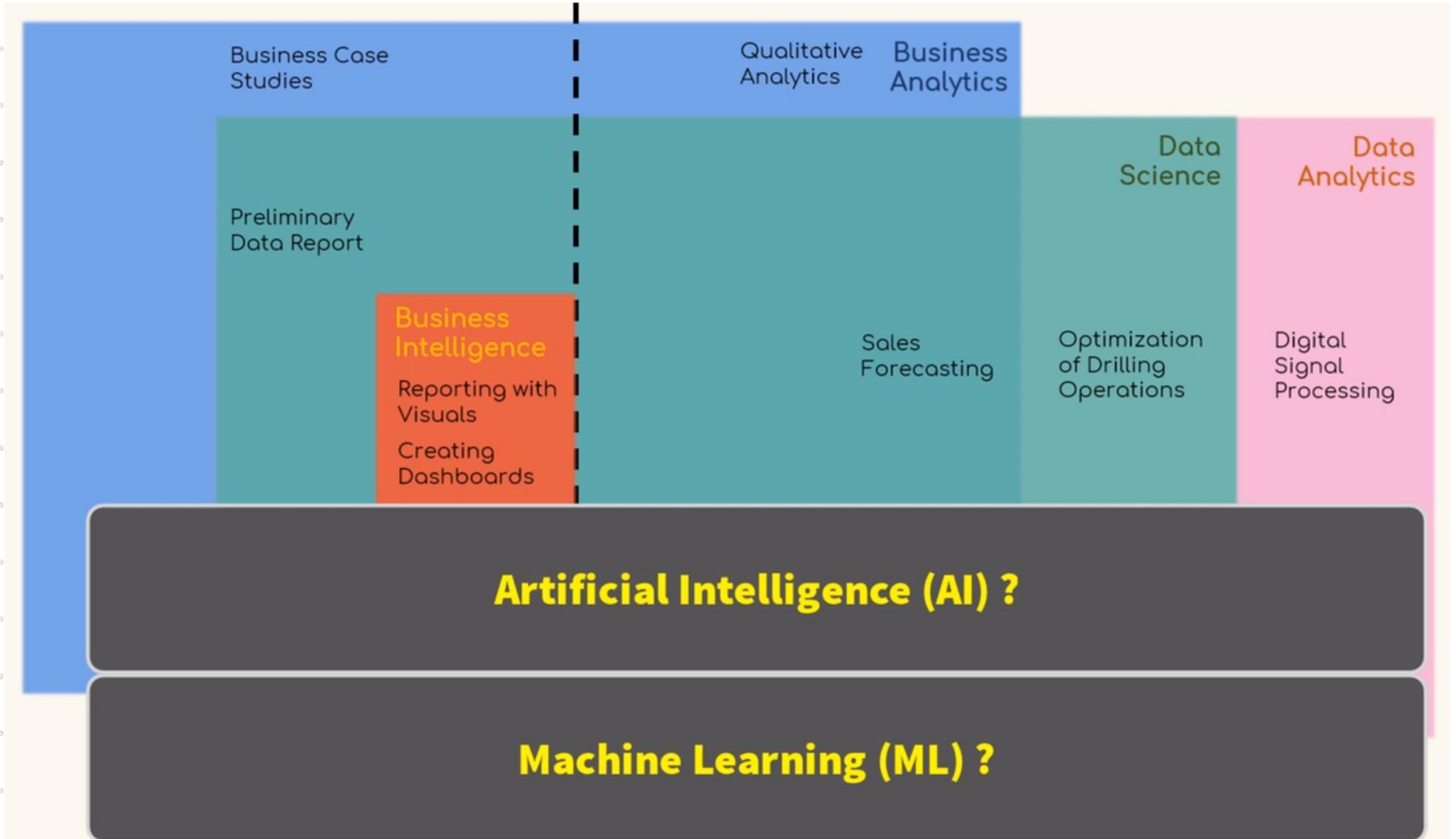
On the introduction of the market correction mechanism

**AI**

# Artificial Intelligence (AI)?



# Machine Learning (ML)?



# Machine Learning (ML) - 1

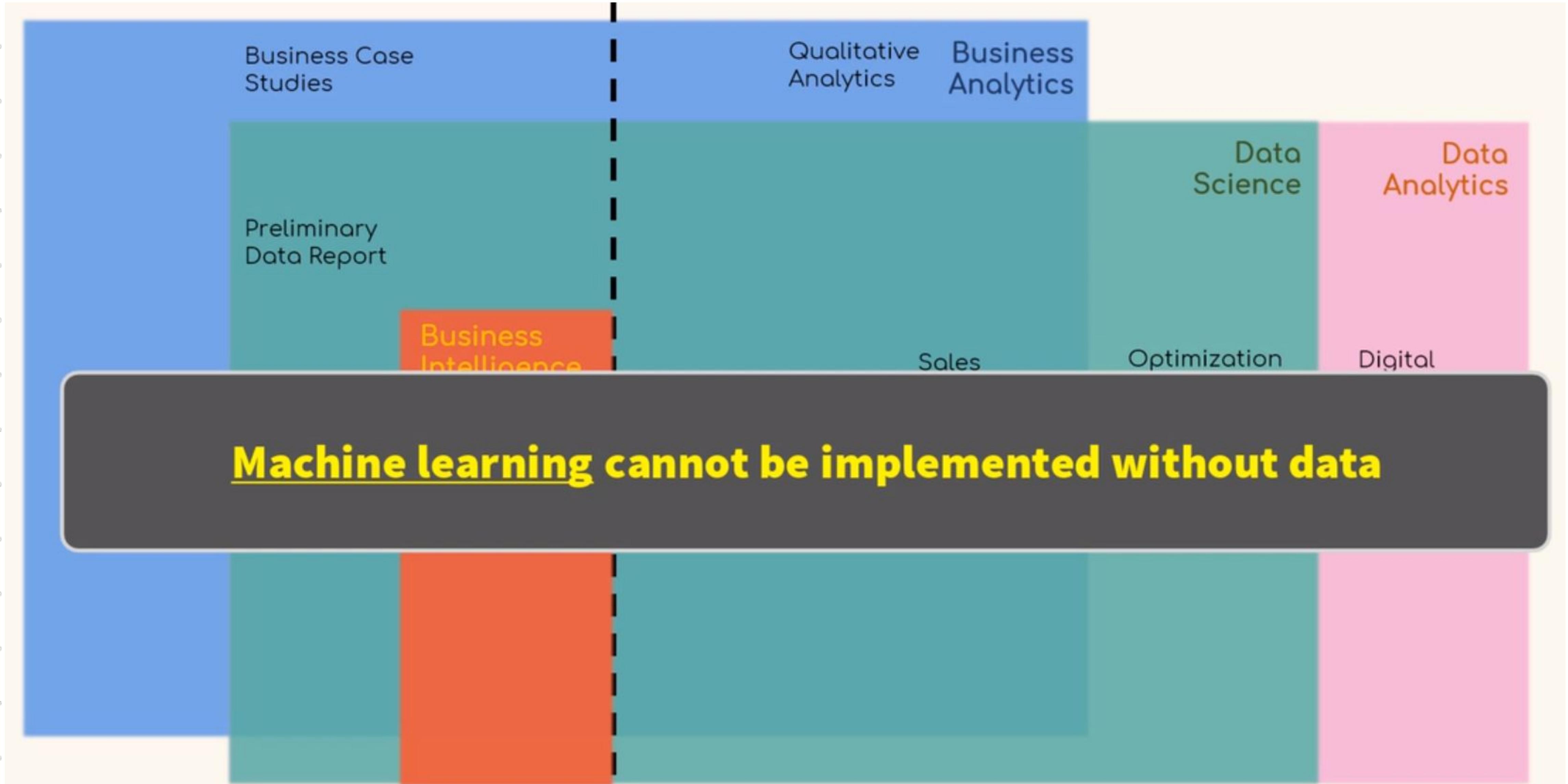
**machine learning:** *The ability of machines to predict outcomes without being explicitly programmed*



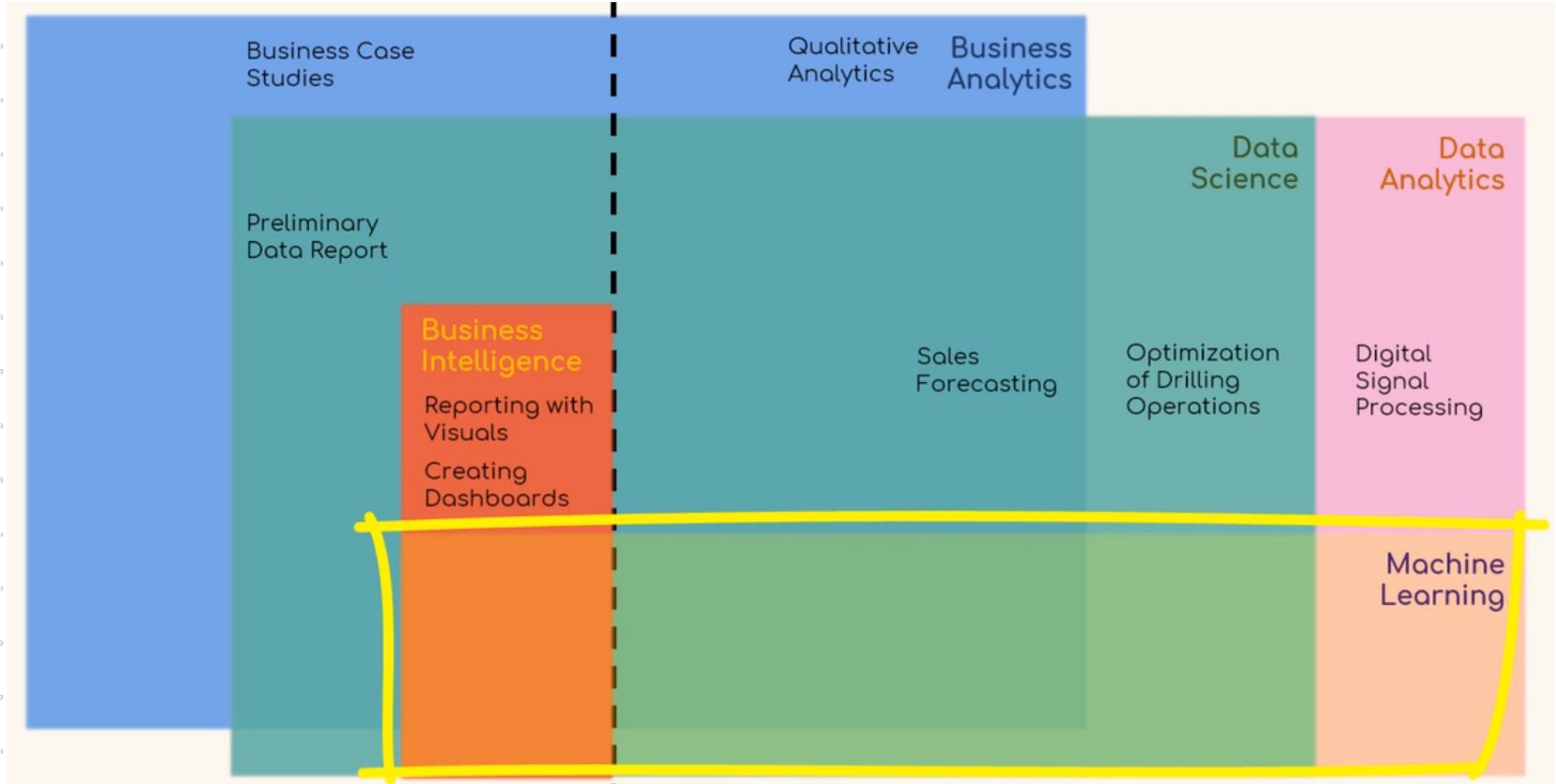
**ML is about creating and implementing algorithms that let machines receive data and use this data to:**

- make predictions
- analyse patterns
- give recommendations

# Machine Learning (ML) - 2

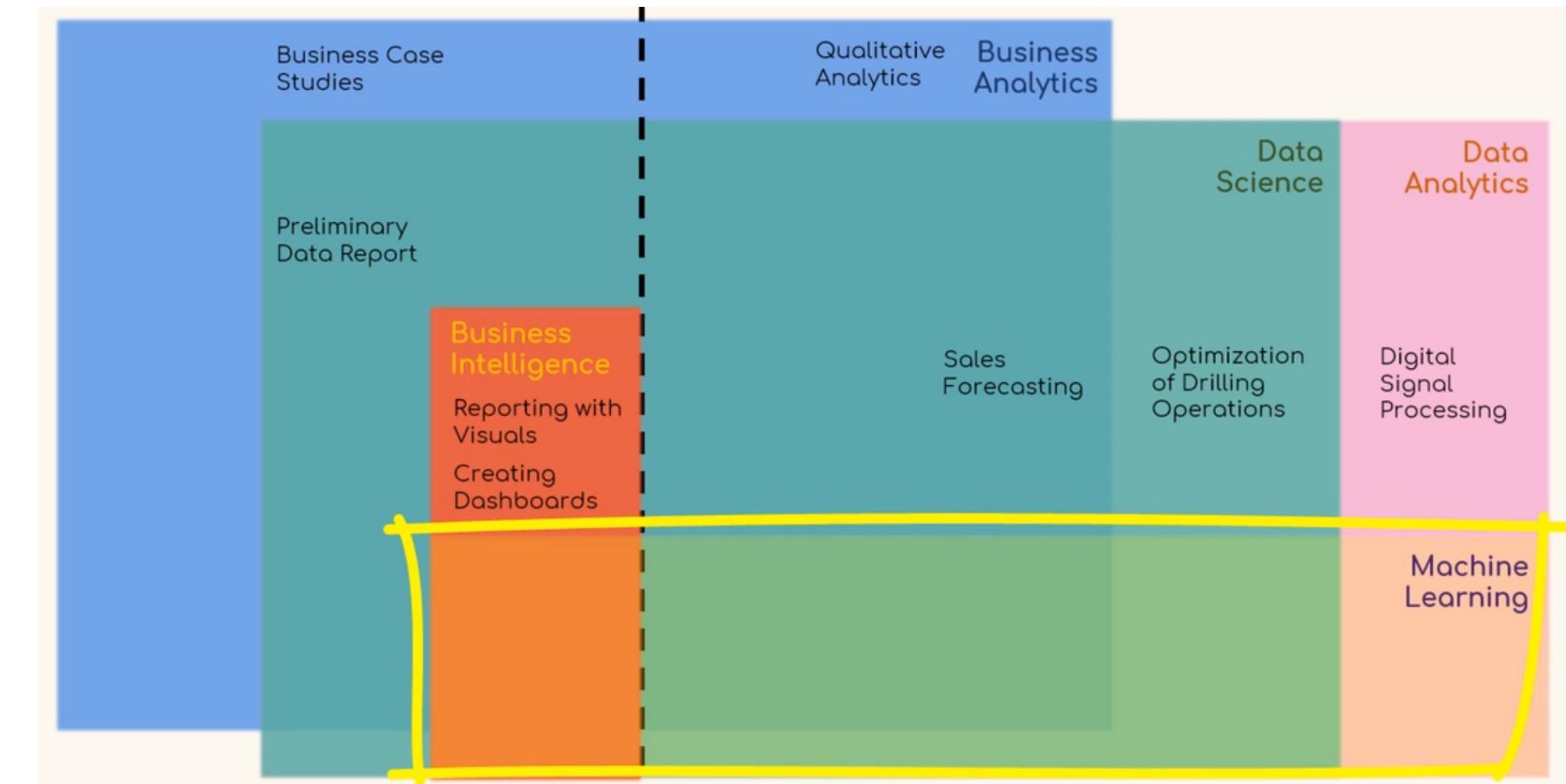


# Machine Learning (ML) - 3

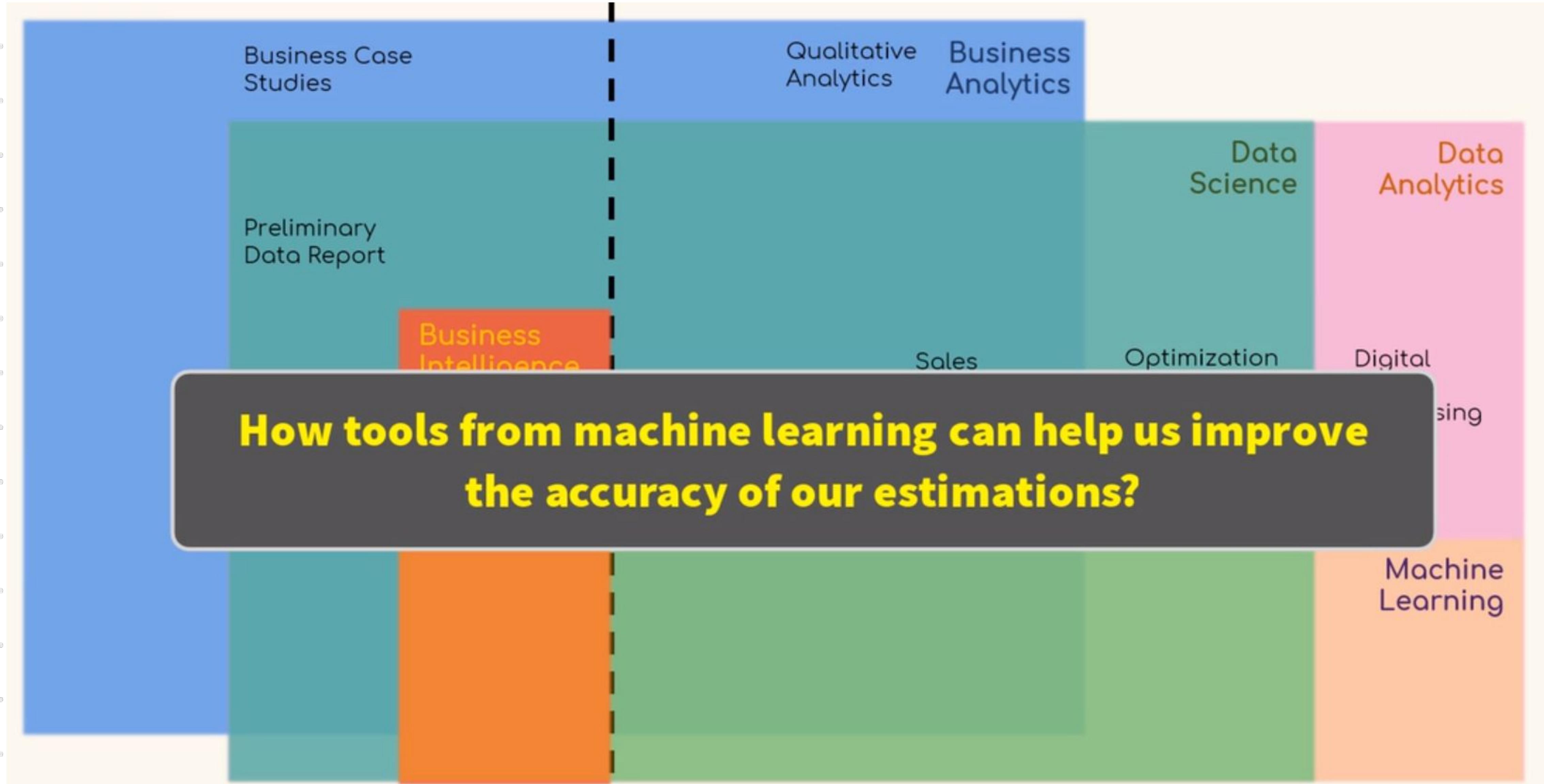


# Machine Learning (ML) - 4

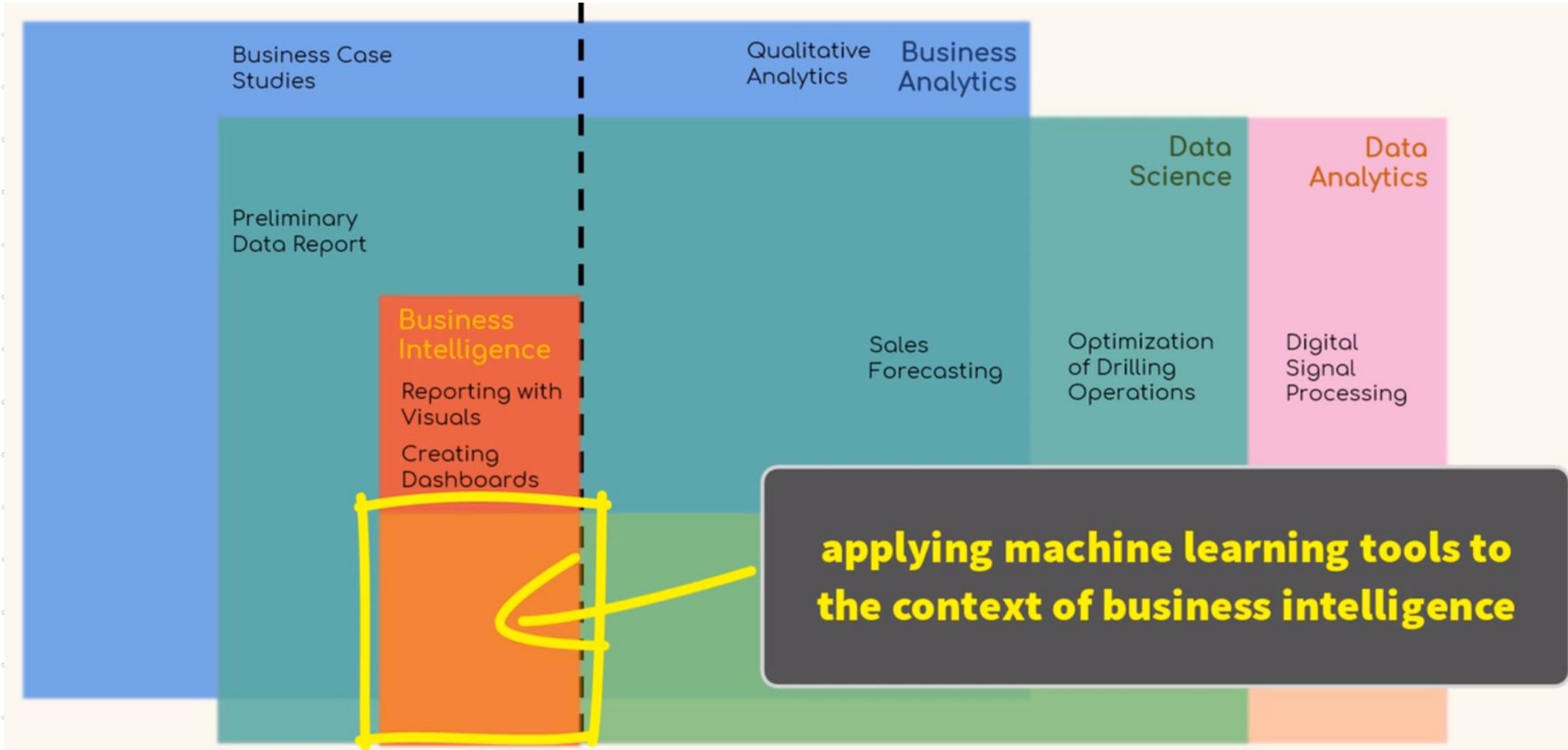
- ML stay within Data Analytics completely
- This could be considered a **bold statement** to make
  - As it **debatable** whether this is correct
  - Some argue that **Data Analytics** and **ML** are two unrelated scientific fields



# Machine Learning (ML) - 5



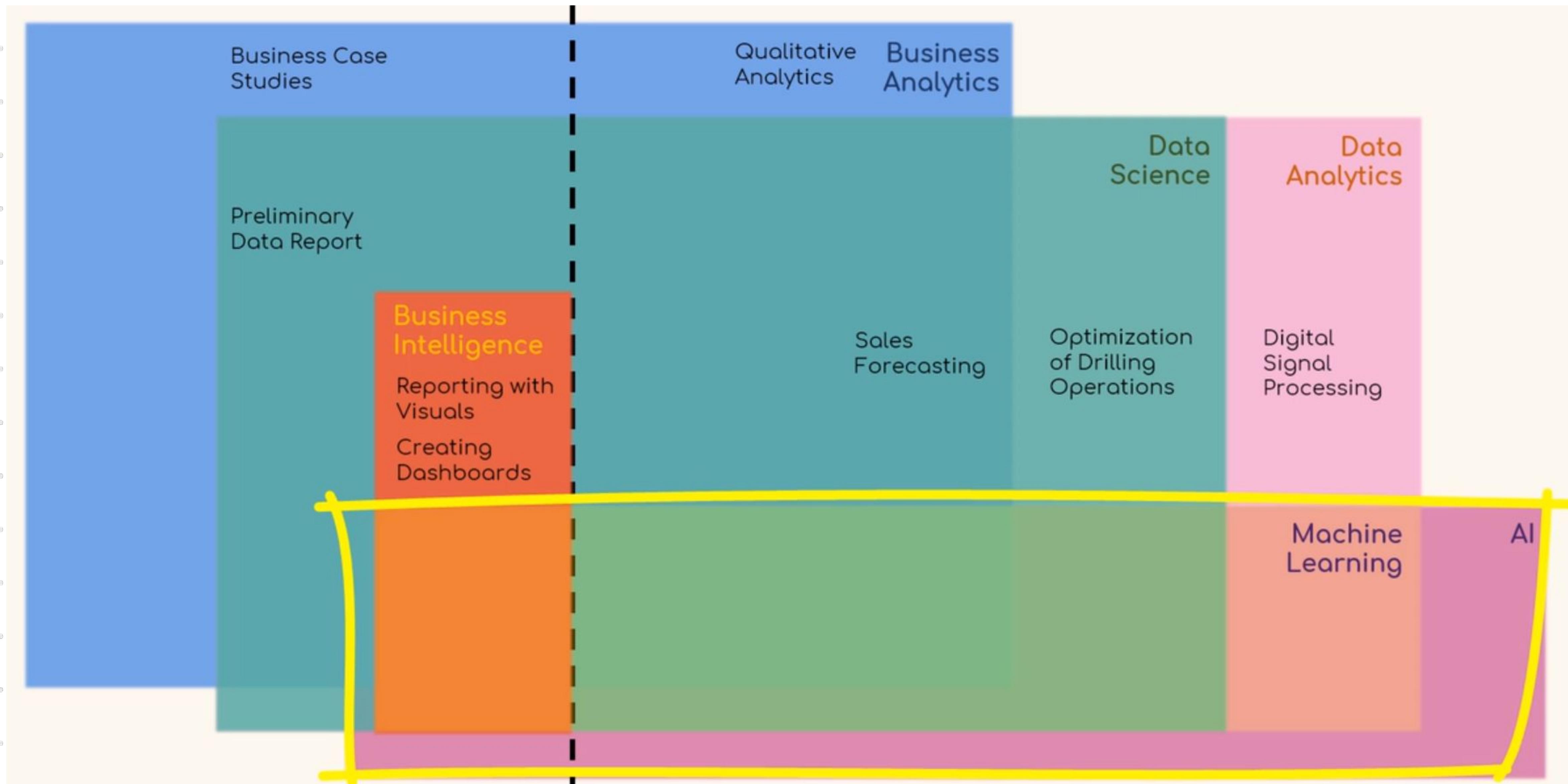
# ML with BI - 1



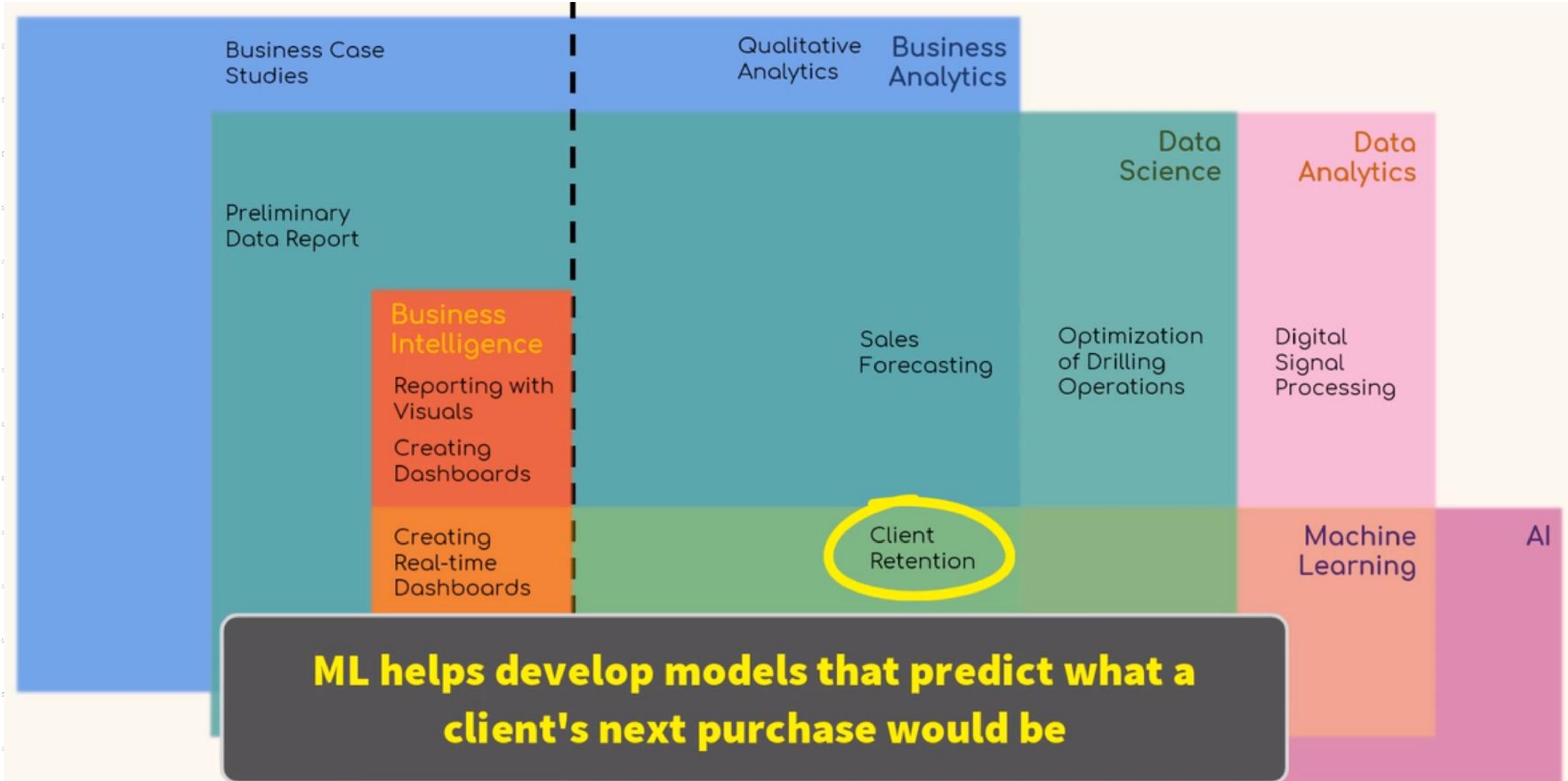
# ML with BI - 2

- The demand for accurate **Real-time Dashboards** opens space for more **ML** apps
- **ML** software can
  - pull data from third-party companies (as Facebook or Shopify)
  - detect new patterns from data
  - →**suggest real-time recommendations/insights to managers/decision-makers**
- A great way to improve the performance of business
- In general, this field has a lot of potential for development

# Artificial Intelligence (AI) - 1



# Client Retention



# Fraud Prevention - 1



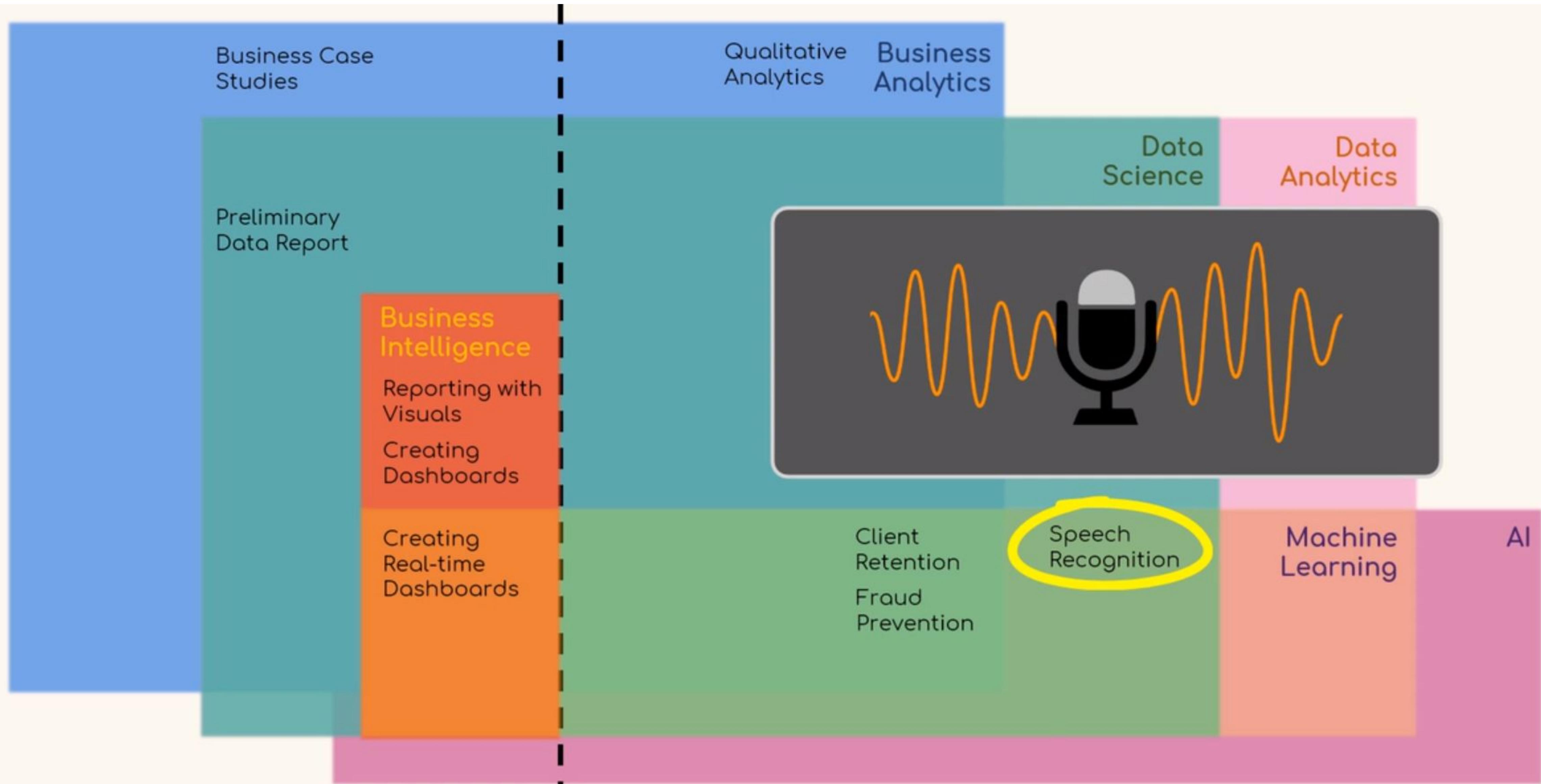
# Fraud Prevention - 2

- We can feed an **ML algorithm** with prior fraudulent activity data
- **ML** will find patterns that the human brain is incapable of seeing
- Having a model which can detect such transactions or operations in real time has helped the financial system prevent a massive amount of fraudulent activity

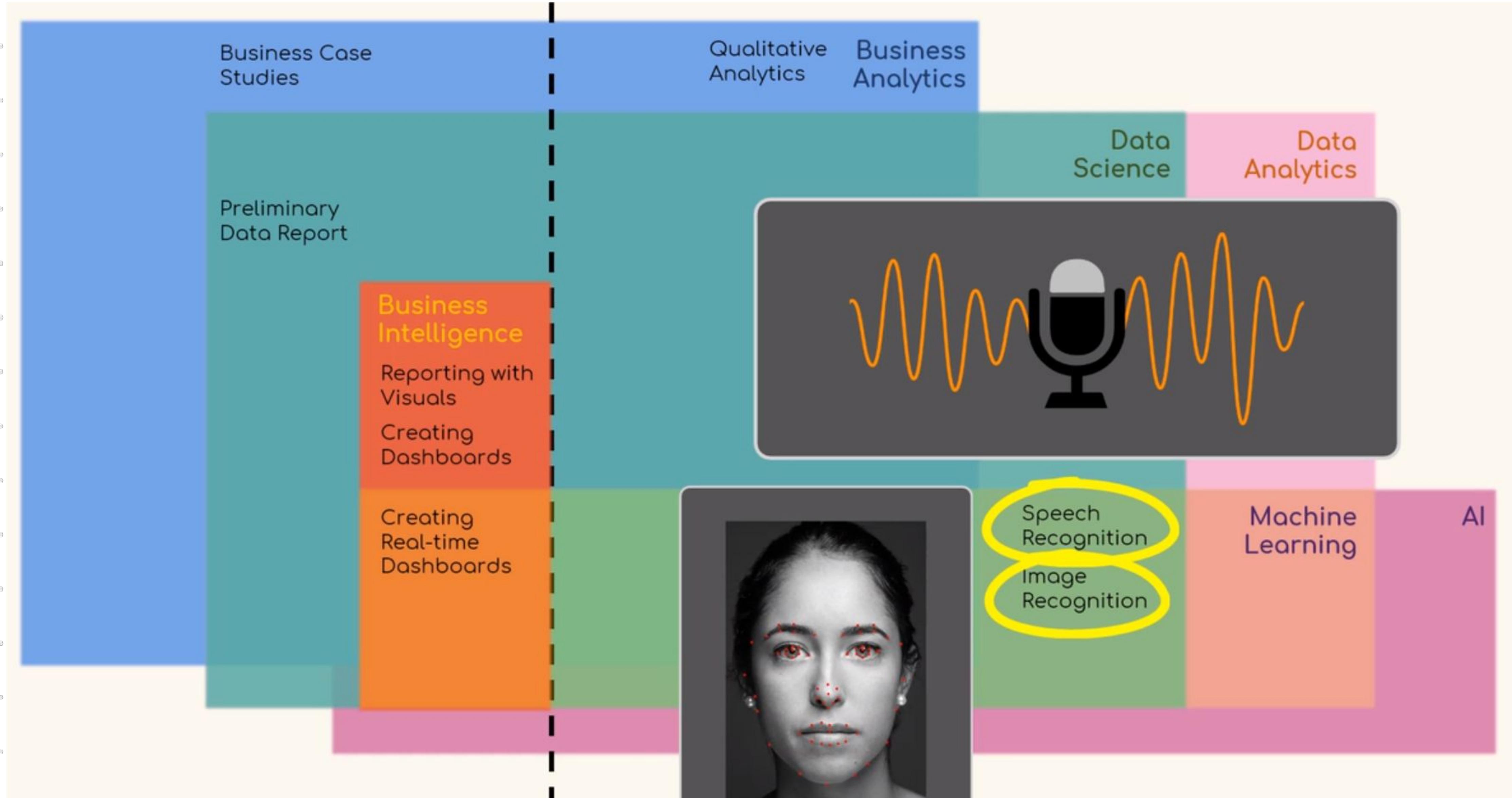


Where  
Image/Speech  
Recognition?

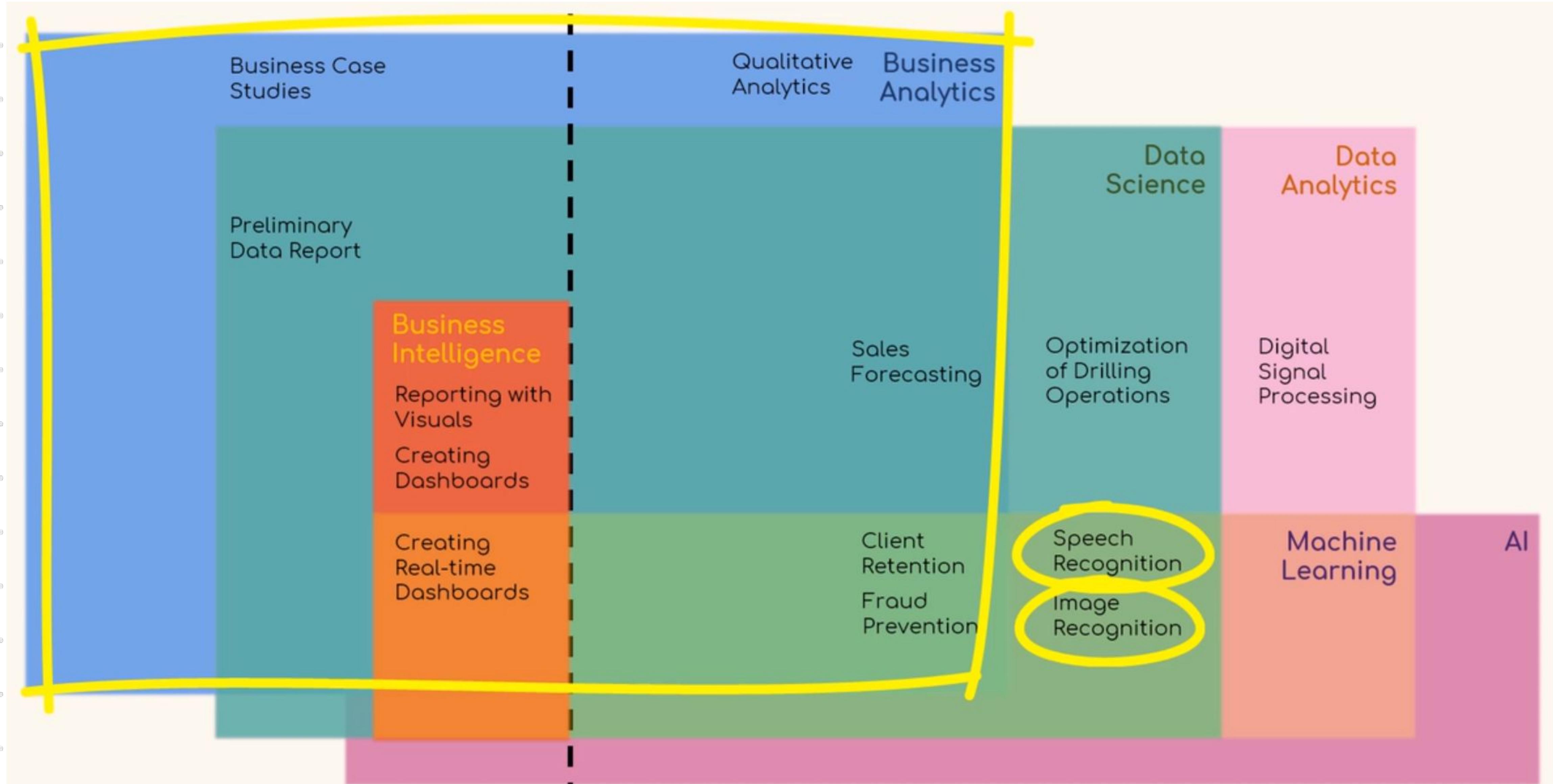
# Speech Recognition



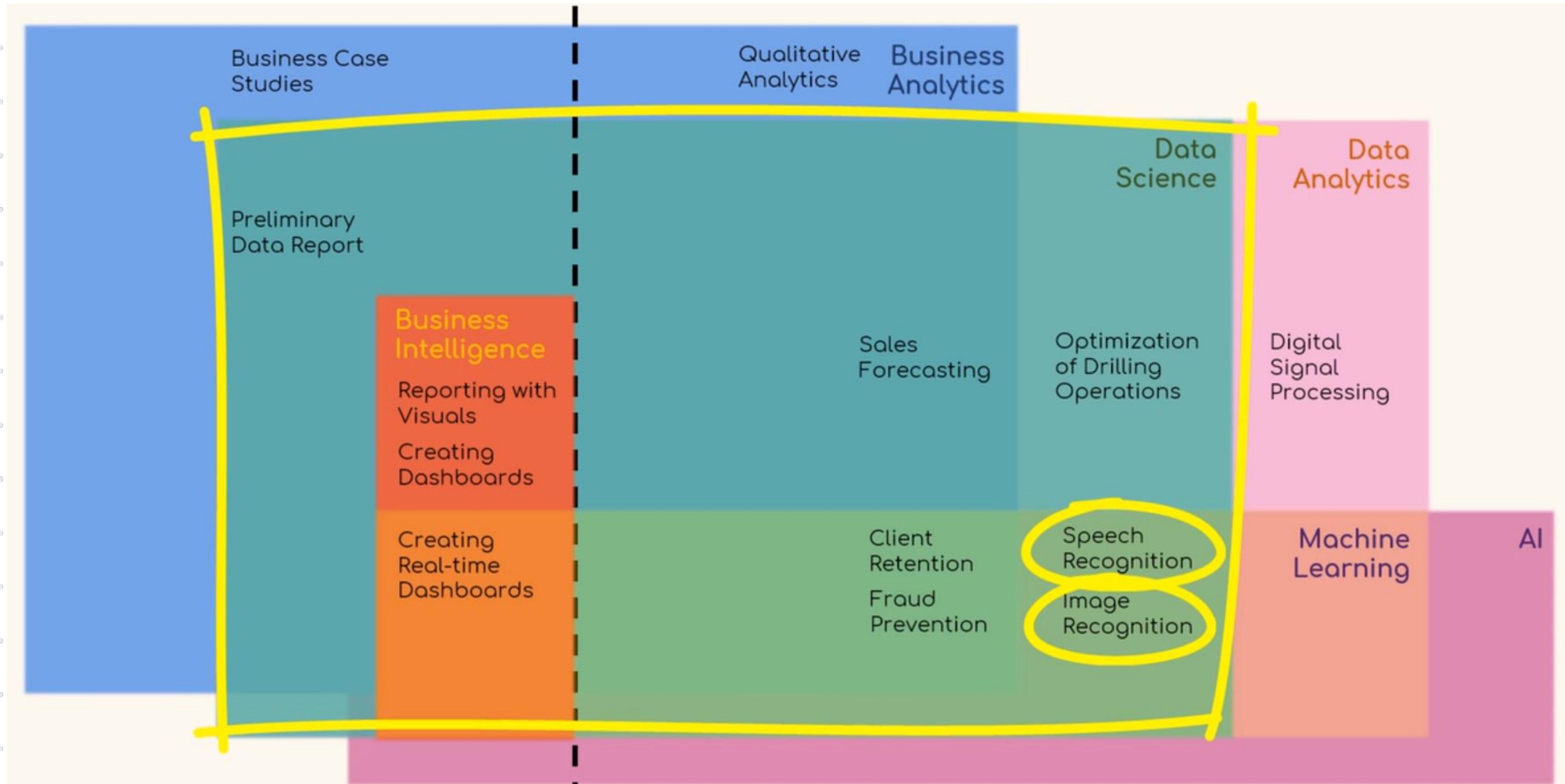
# Image Recognition



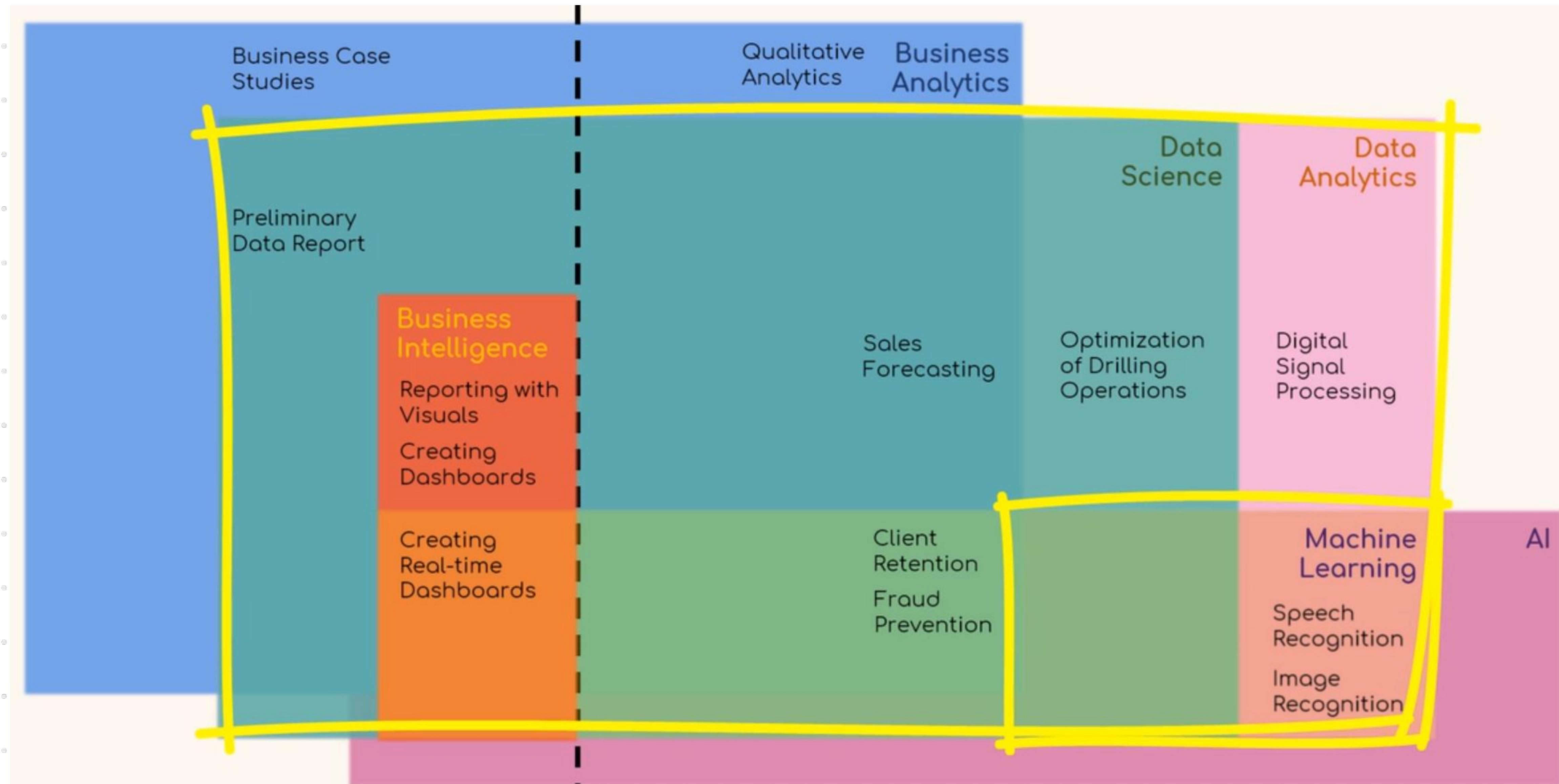
# Where Image/Speech Recognition? - 1



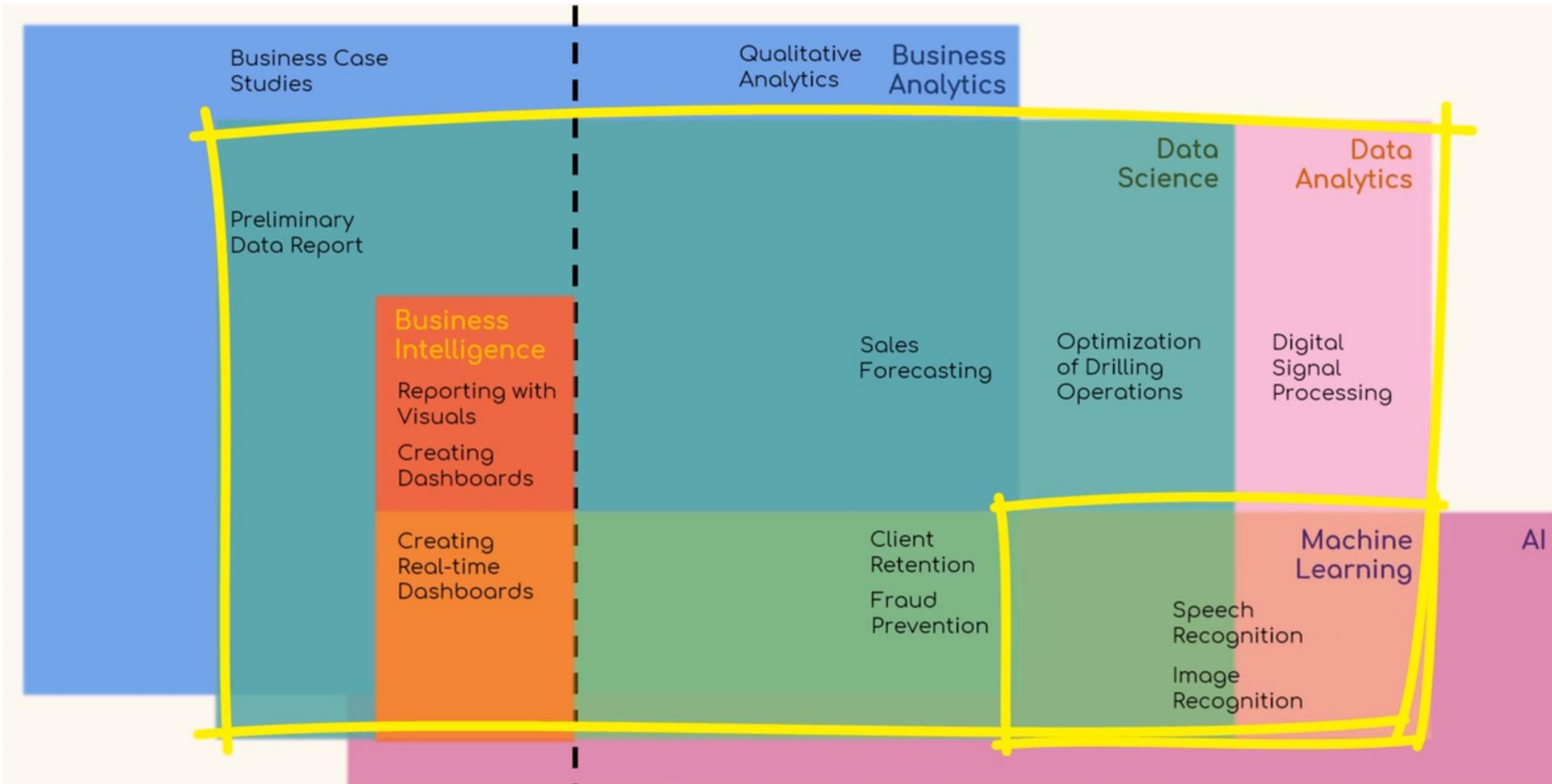
# Where Image/Speech Recognition? - 2



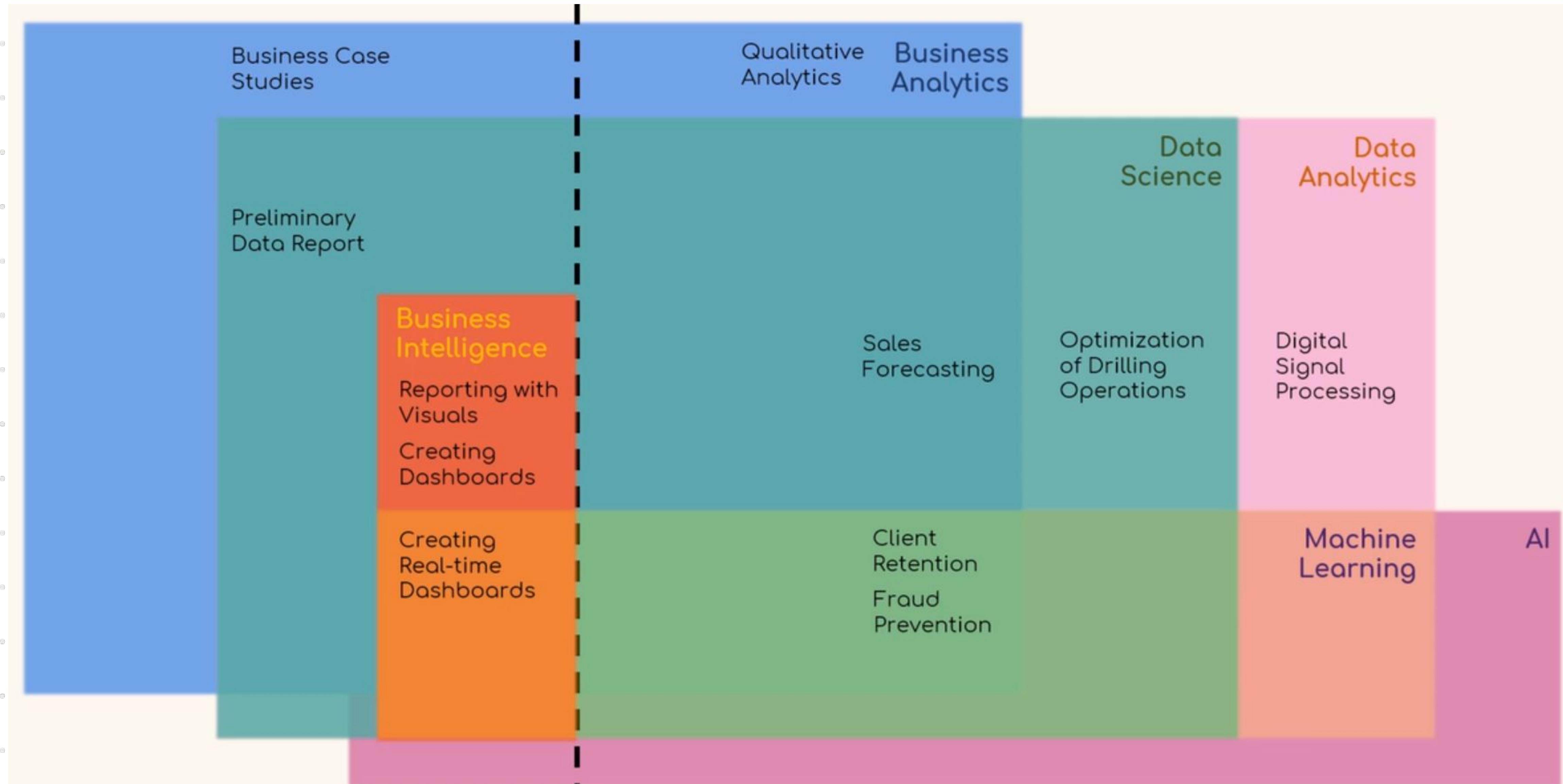
# Where Image/Speech Recognition? - 3



# Where Image/Speech Recognition? - 4

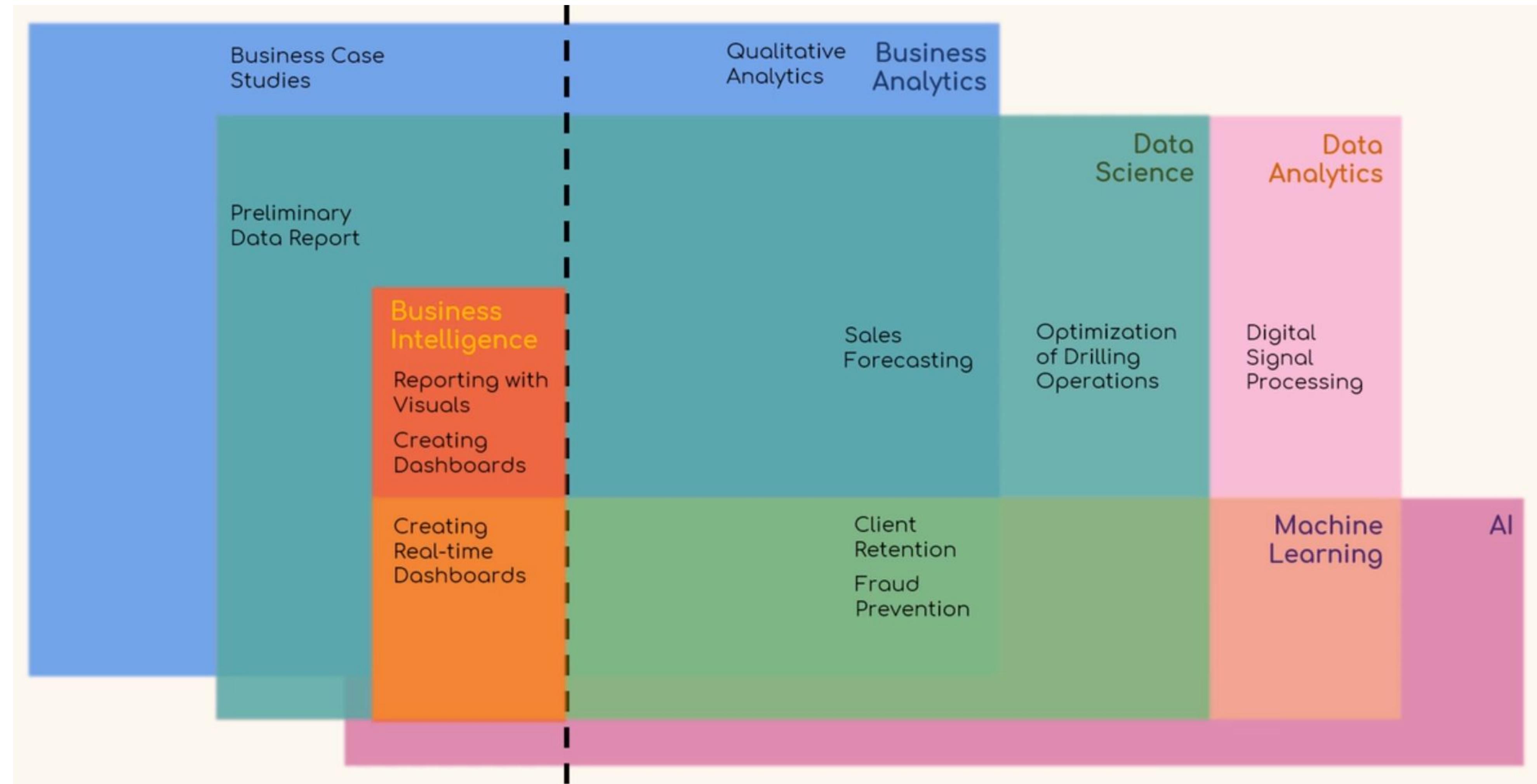


# Where Image/Speech Recognition? - 5



# Removing Image/Speech Recognition

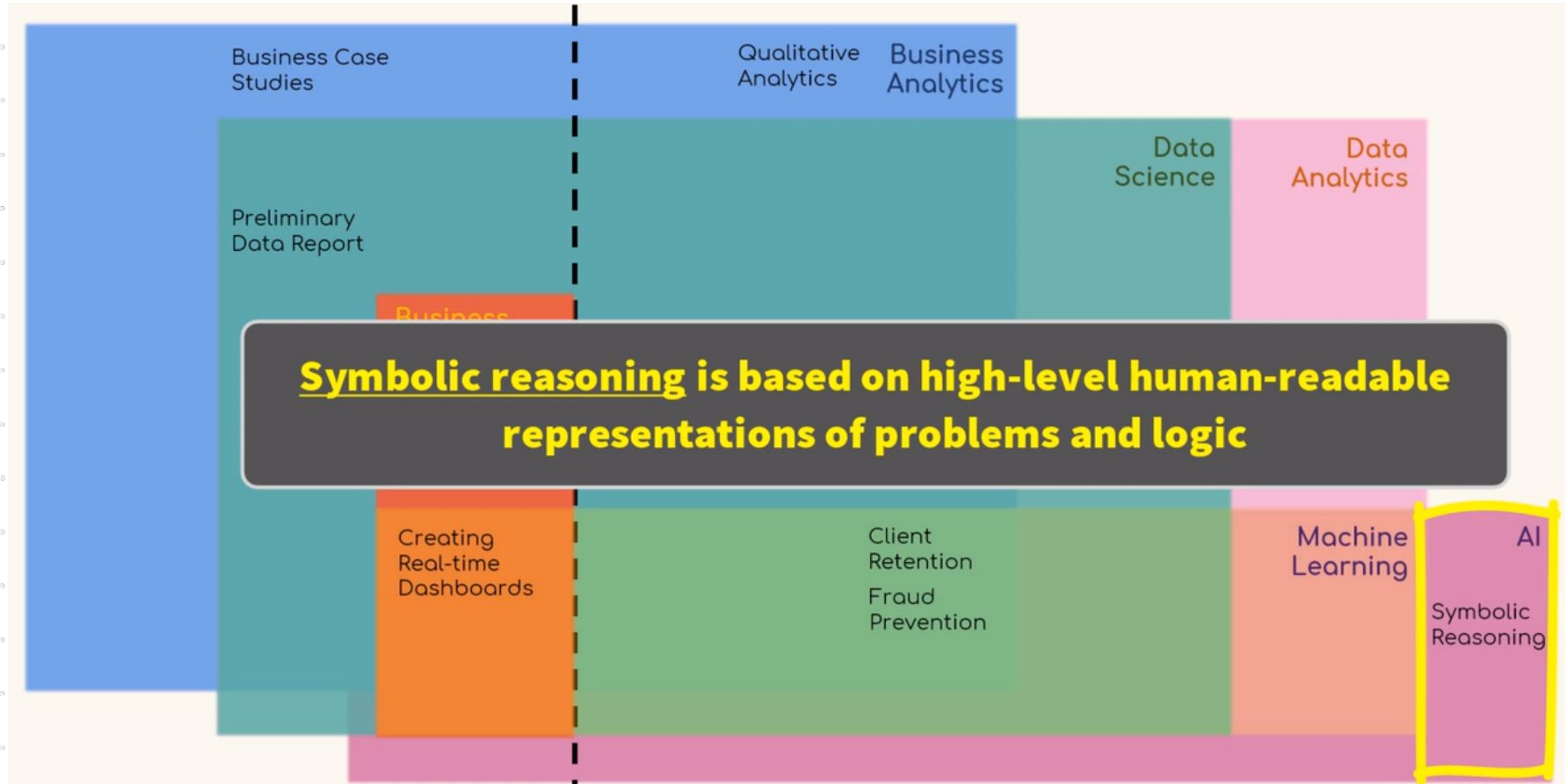
- **Image/Speech Recognition** are outside the business context
  - To avoid further disputes, let's take **Image/Speech Recognition** out of the picture





Where  
Symbolic  
Reasoning?

# Symbolic Reasoning



# Symbolic Logic Example

## Propositions:

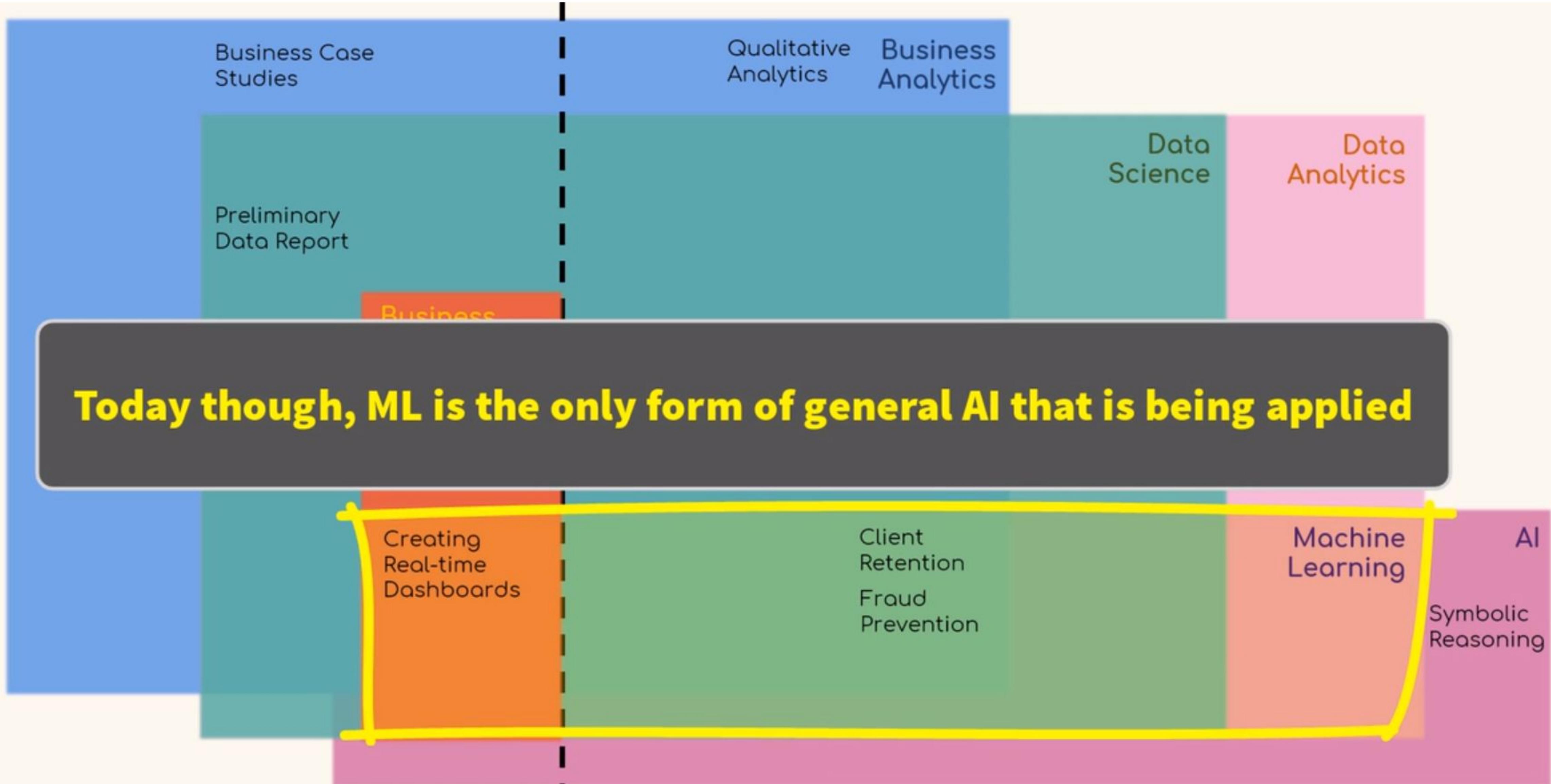
- If all mammals feed their babies milk from the mother (A)
- If all cats feed their babies mother's milk (B)
- $\Rightarrow$  All cats are mammals(C)

**Conclusion:**  $A \wedge B \Rightarrow C$  ( $\wedge$  symbol means and &  $\Rightarrow$  symbol means implies)

## Explanation:

- Proposition A and proposition B lead to the conclusion C

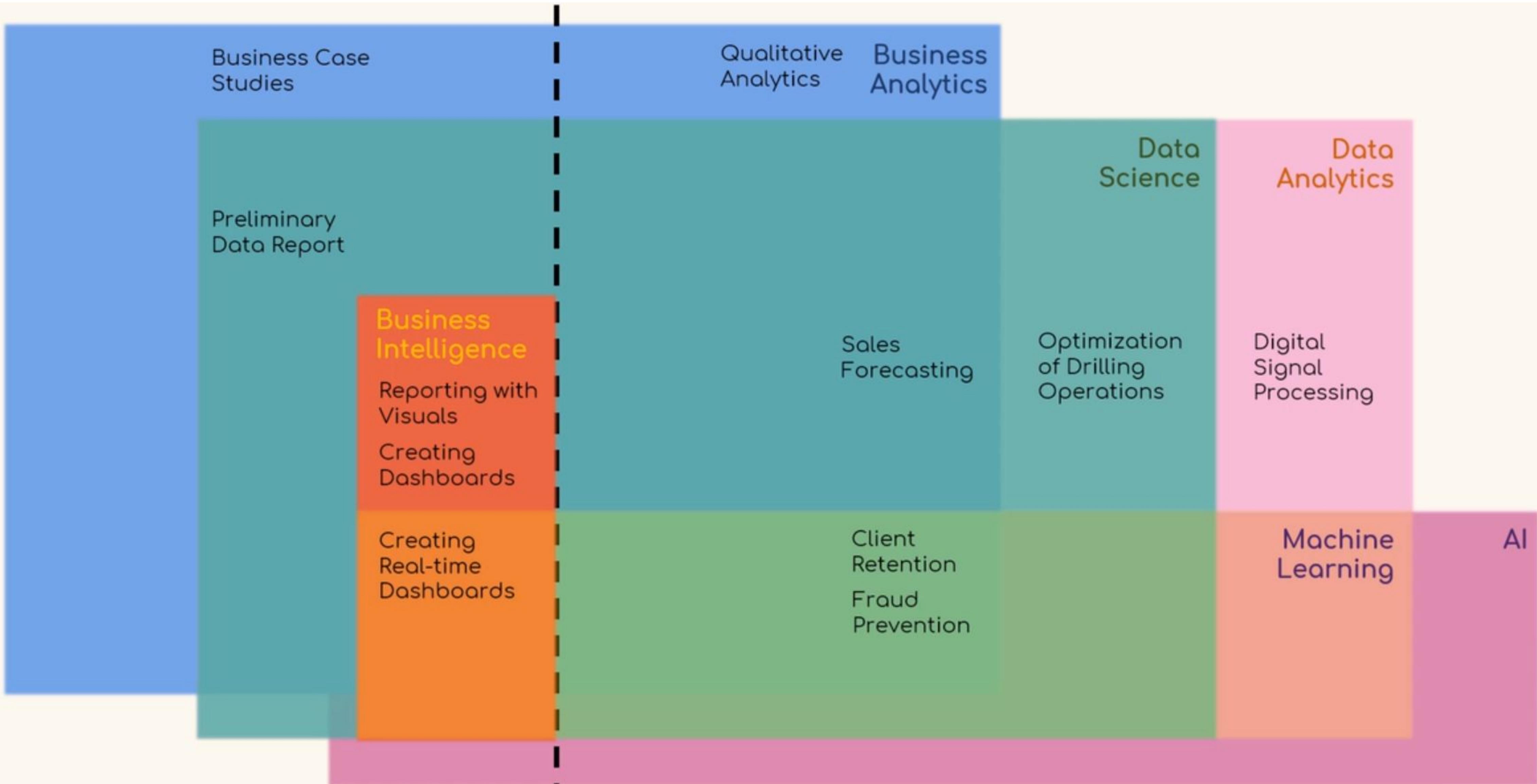
# Now ML



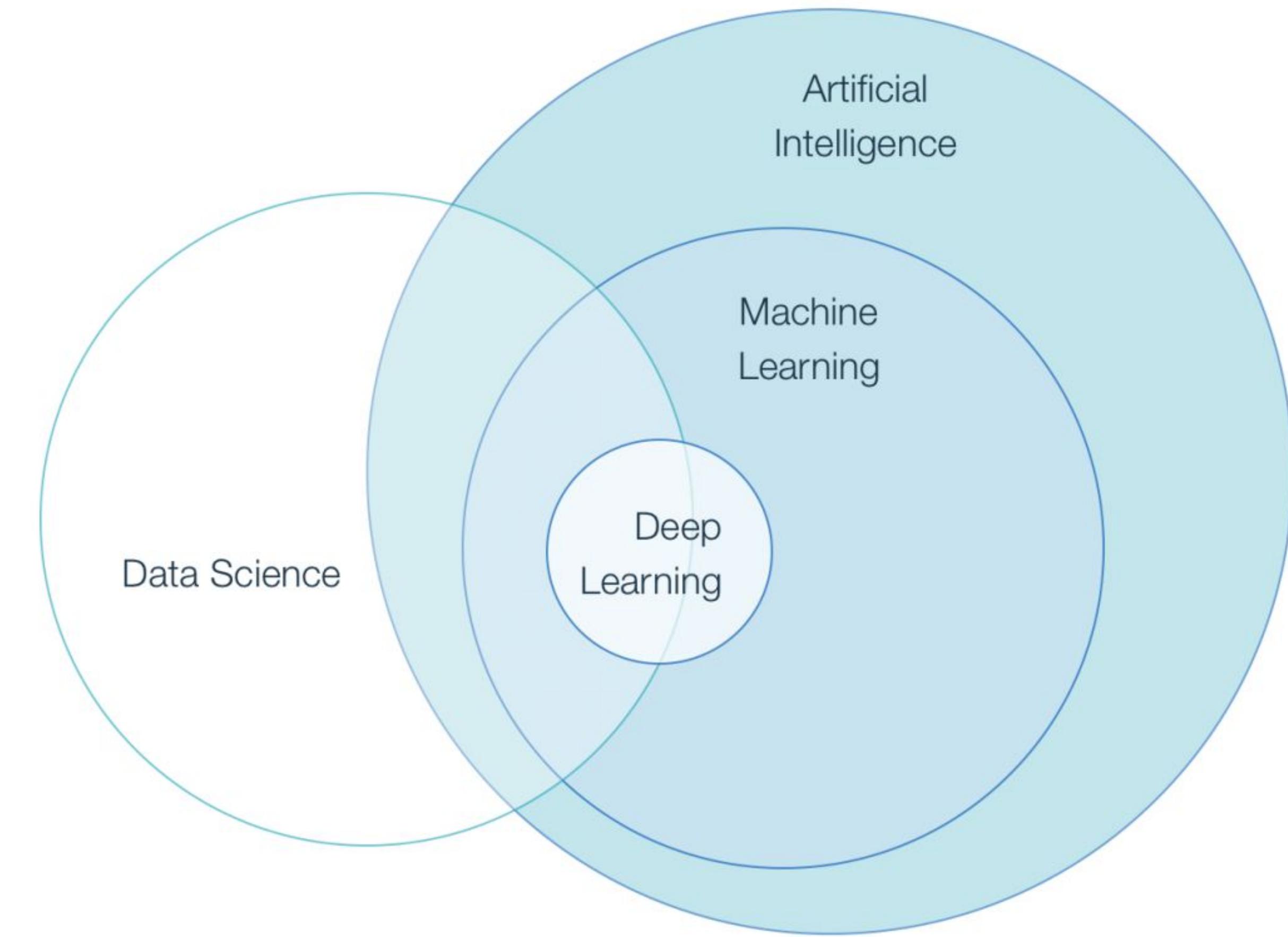
# Symbolic Reasoning was

- **was** once a trend when people were trying to create human-like intelligence
- Today though, **ML** is the only form of **general AI**
- And **Symbolic AI** is rarely encountered, let alone practiced

# Removing Symbolic Reasoning

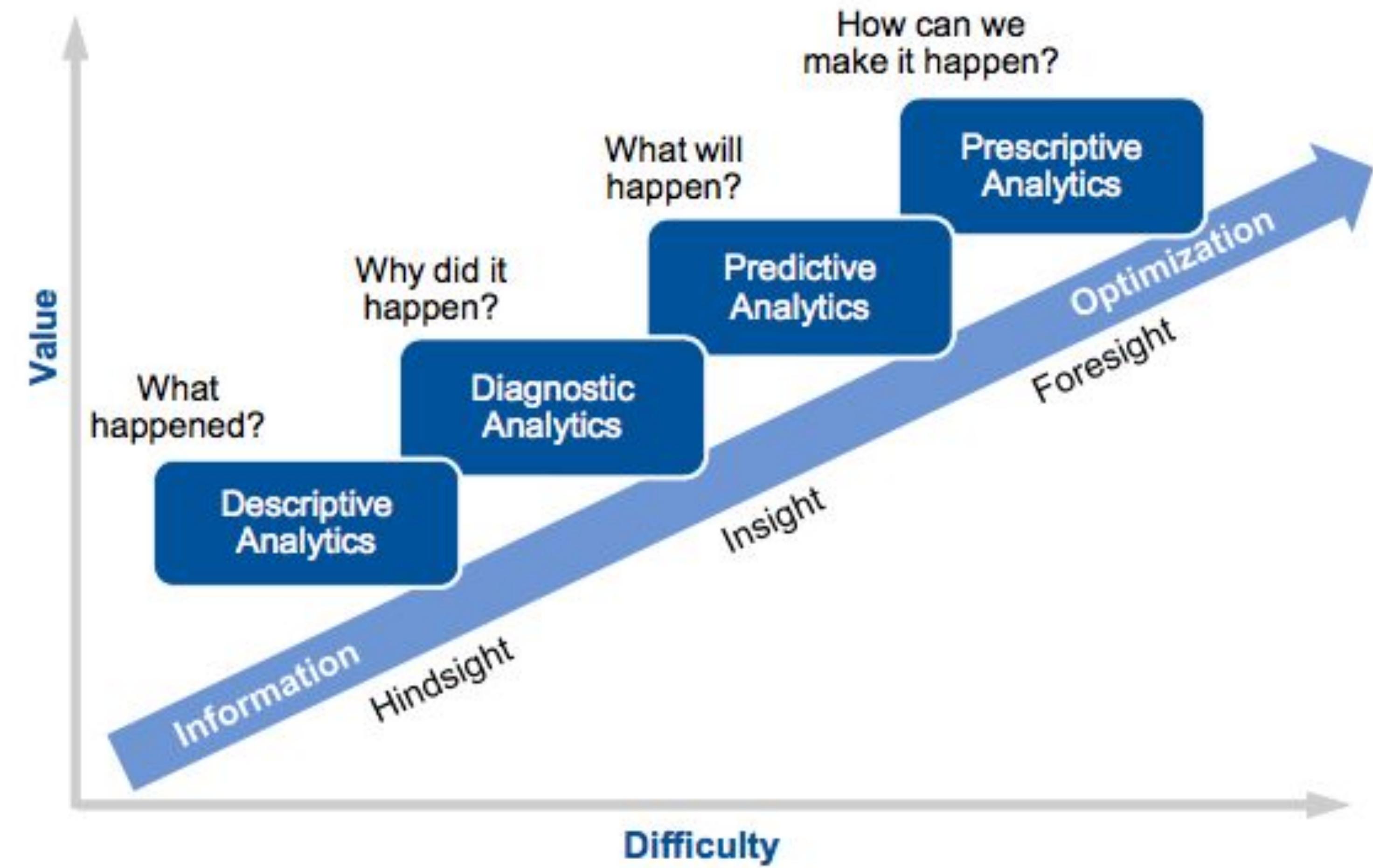


# Data Science & AI from another Viewpoint



# A Vision for Advanced Analytics

# Data Analytics Types

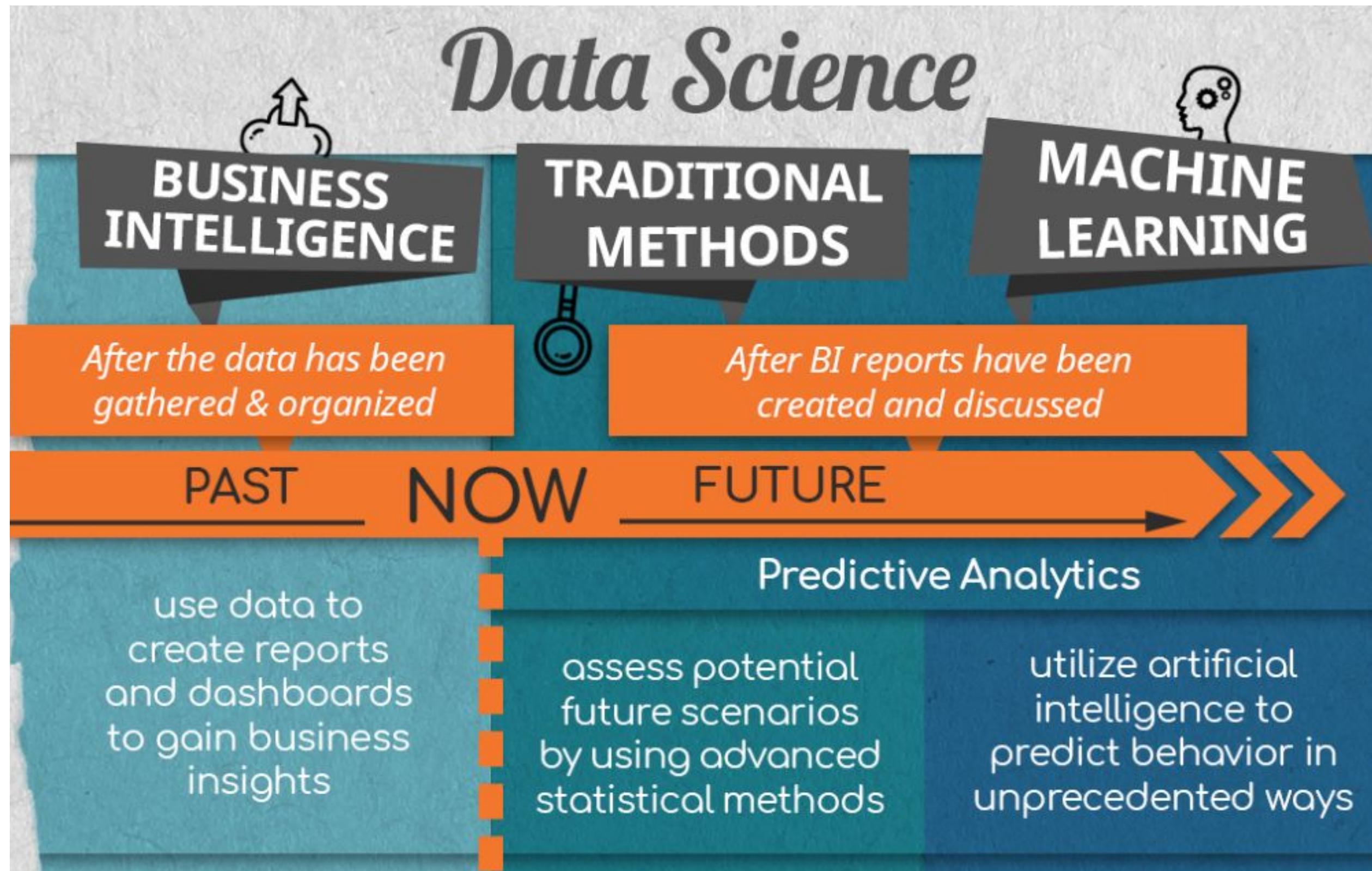


Source: Gartner (March 2012)

# Advanced Data Analytics?

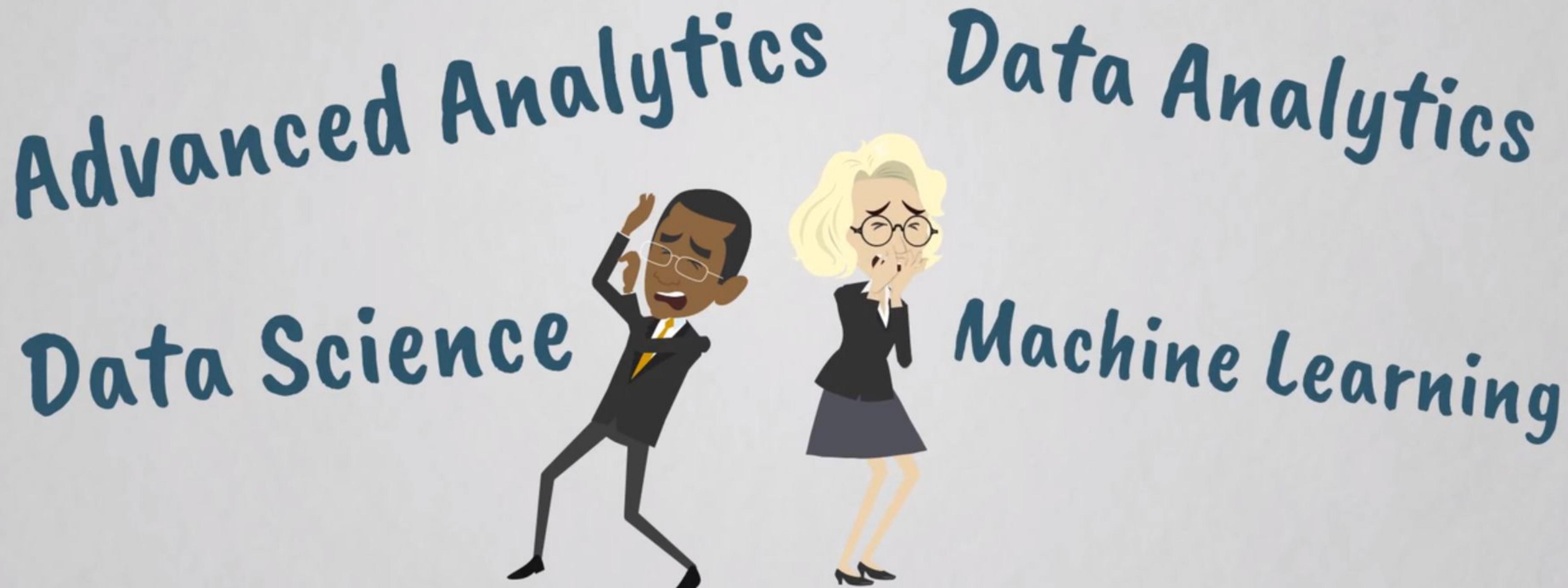
Some opinions about what is Advanced Data Analytics

- Data Analytics where we use the ML
- Data Analytics where we work on the future
- Data Analytics where we
  - work on the future or
  - use ML to understand the past
- Other opinions



# Advanced Data Analytics?

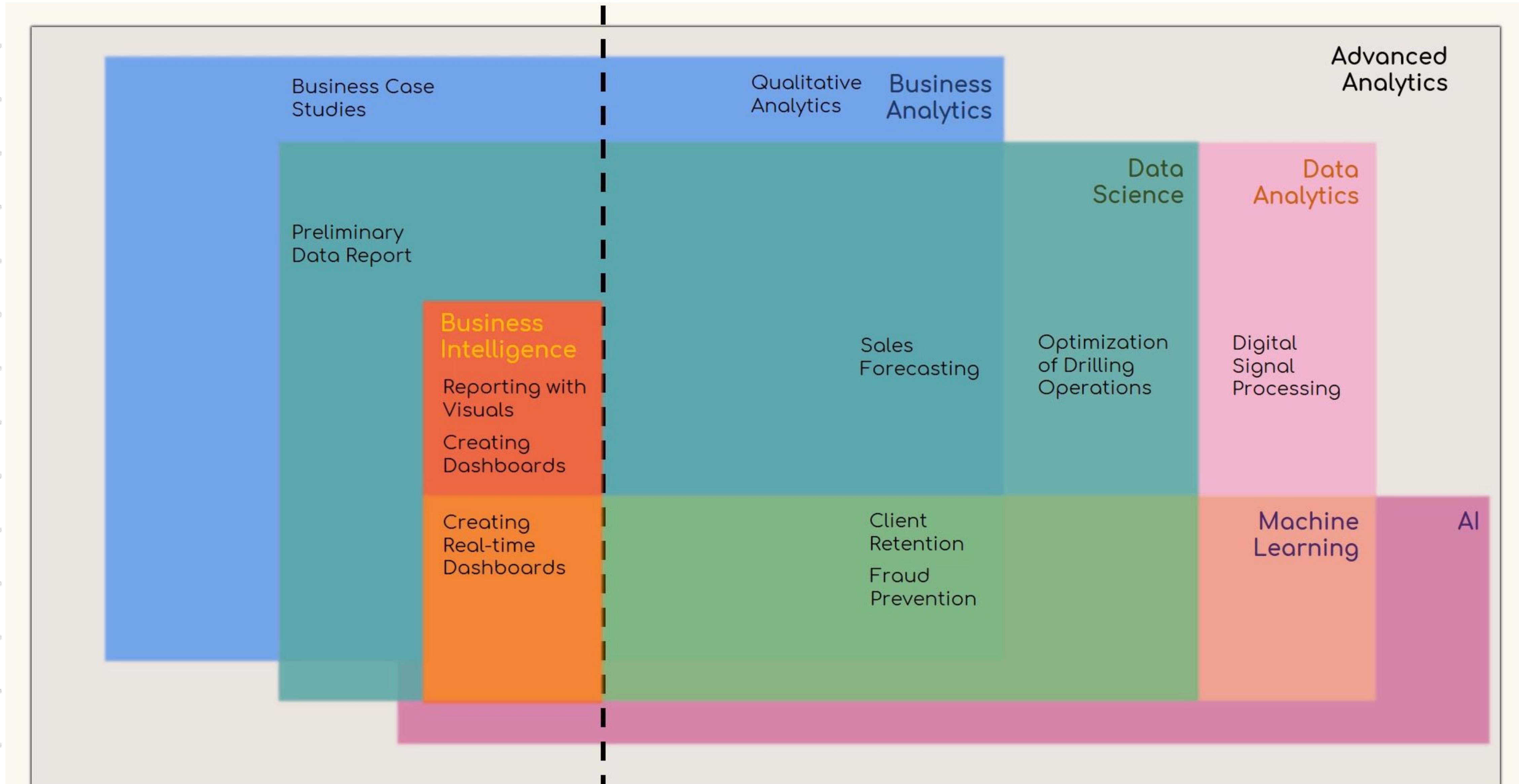
**advanced analytics: a marketing term...**



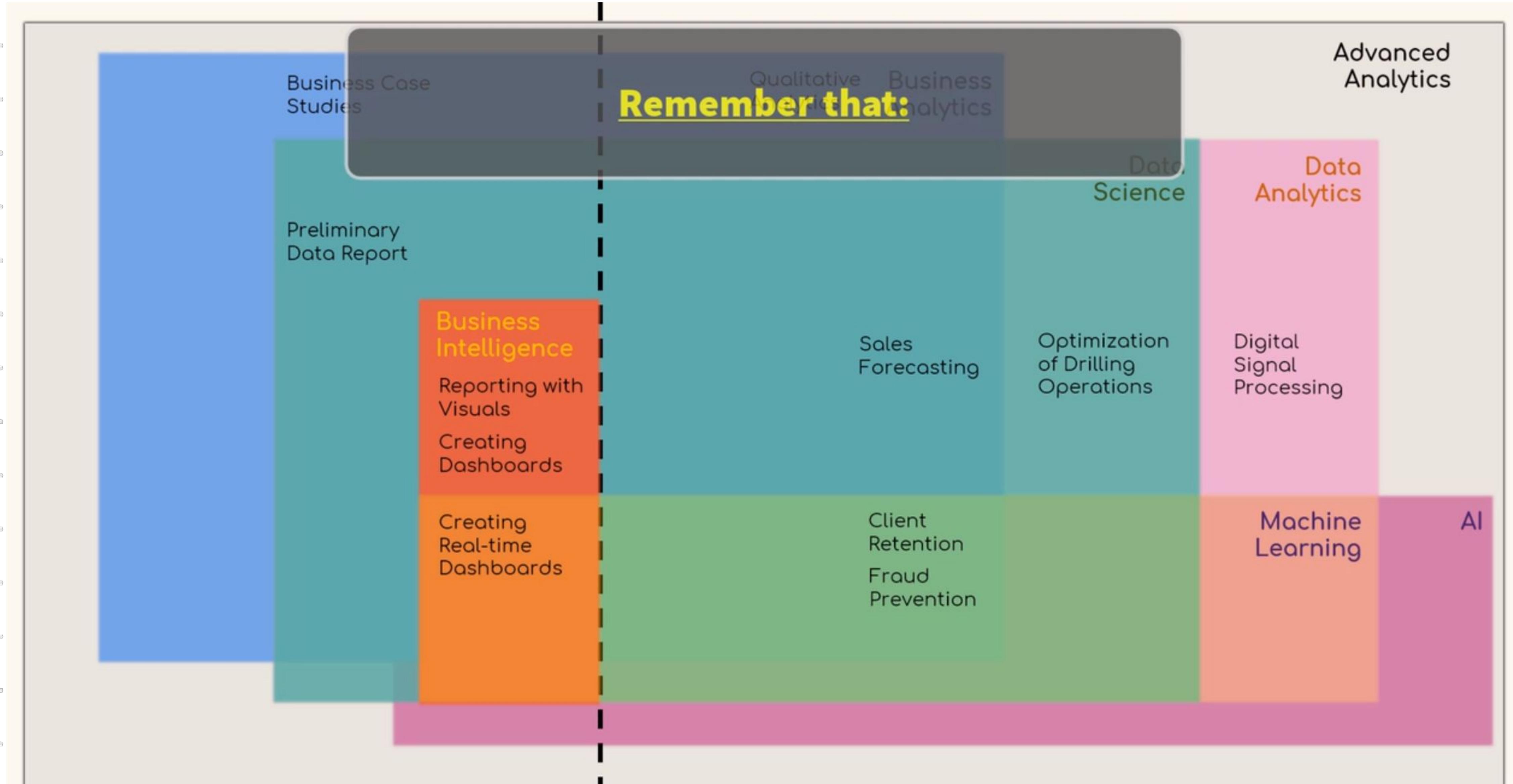
# Advanced Data Analytics?

- It is a marketing term coming from people who want to say that the types of analytics they are dealing with are not easy-to-handle
- Intimidating-sounding terms maybe used to discourage learning and create prestige
- So, we will collectively group all areas of analytics under **Advanced Analytics**
  - With the idea that any part of analytics can seem advanced at first
  - But no part is exclusively or permanently within this category

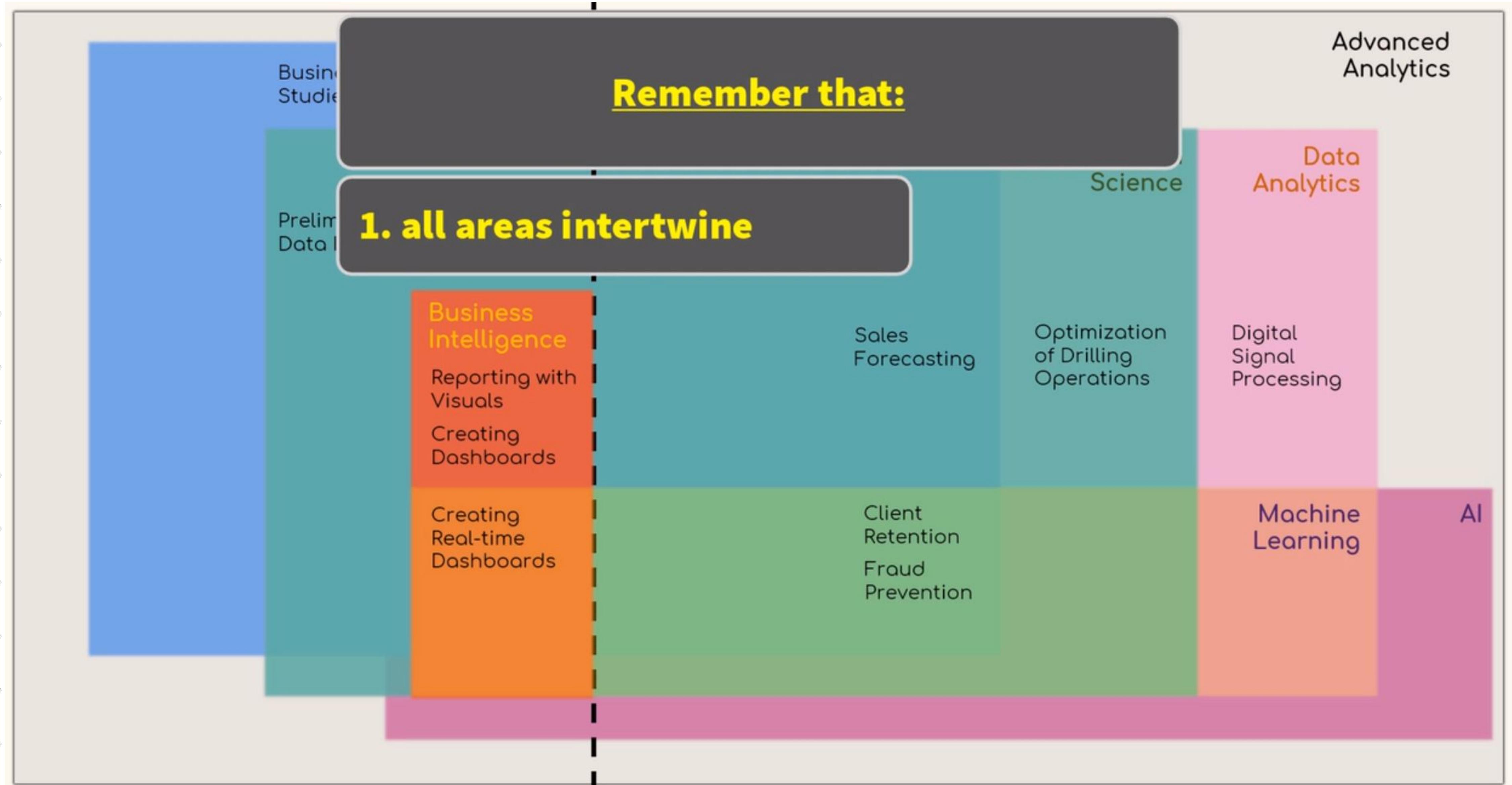
# Advanced Data Analytics (Advanced Analytics)



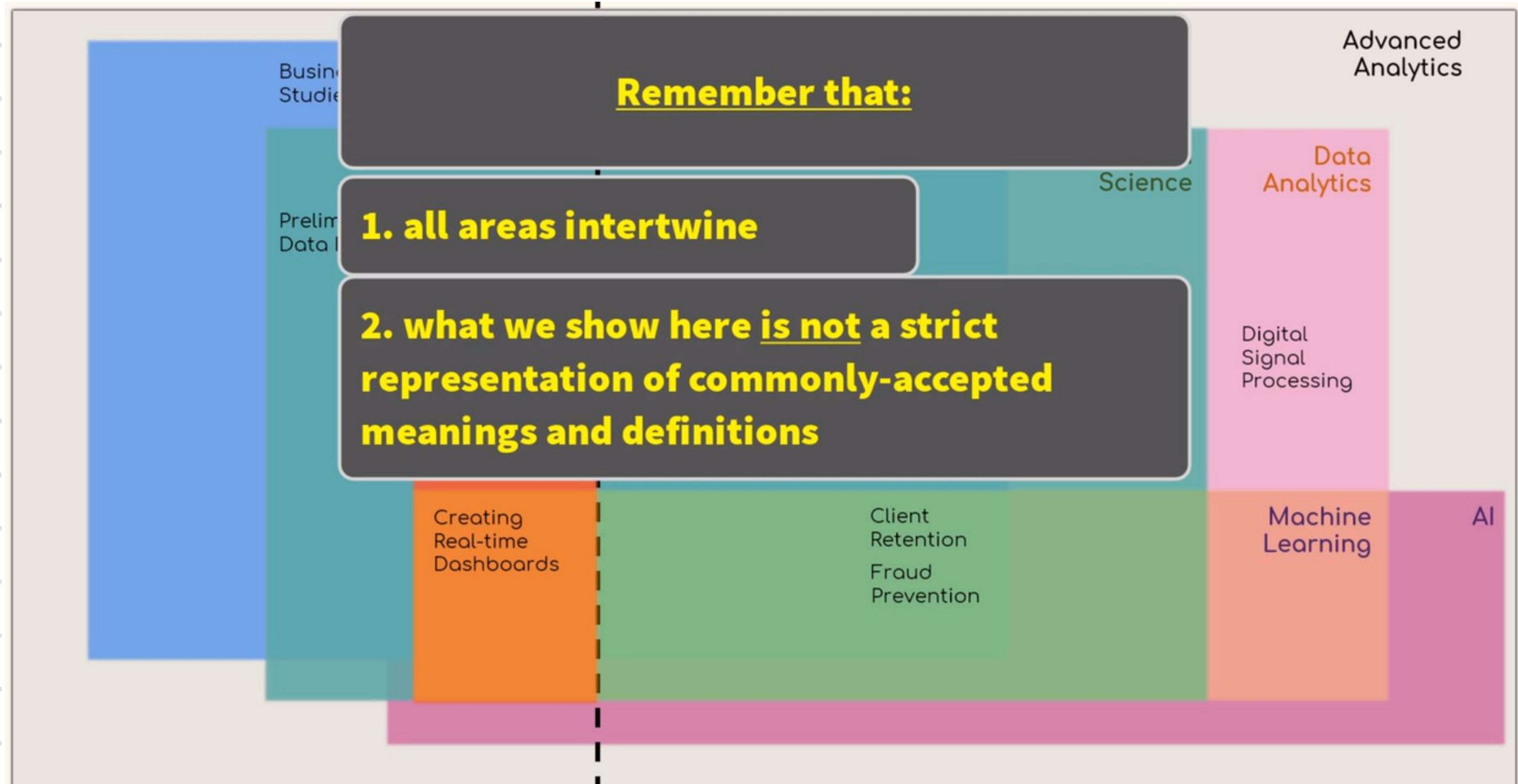
# Advanced Data Analytics



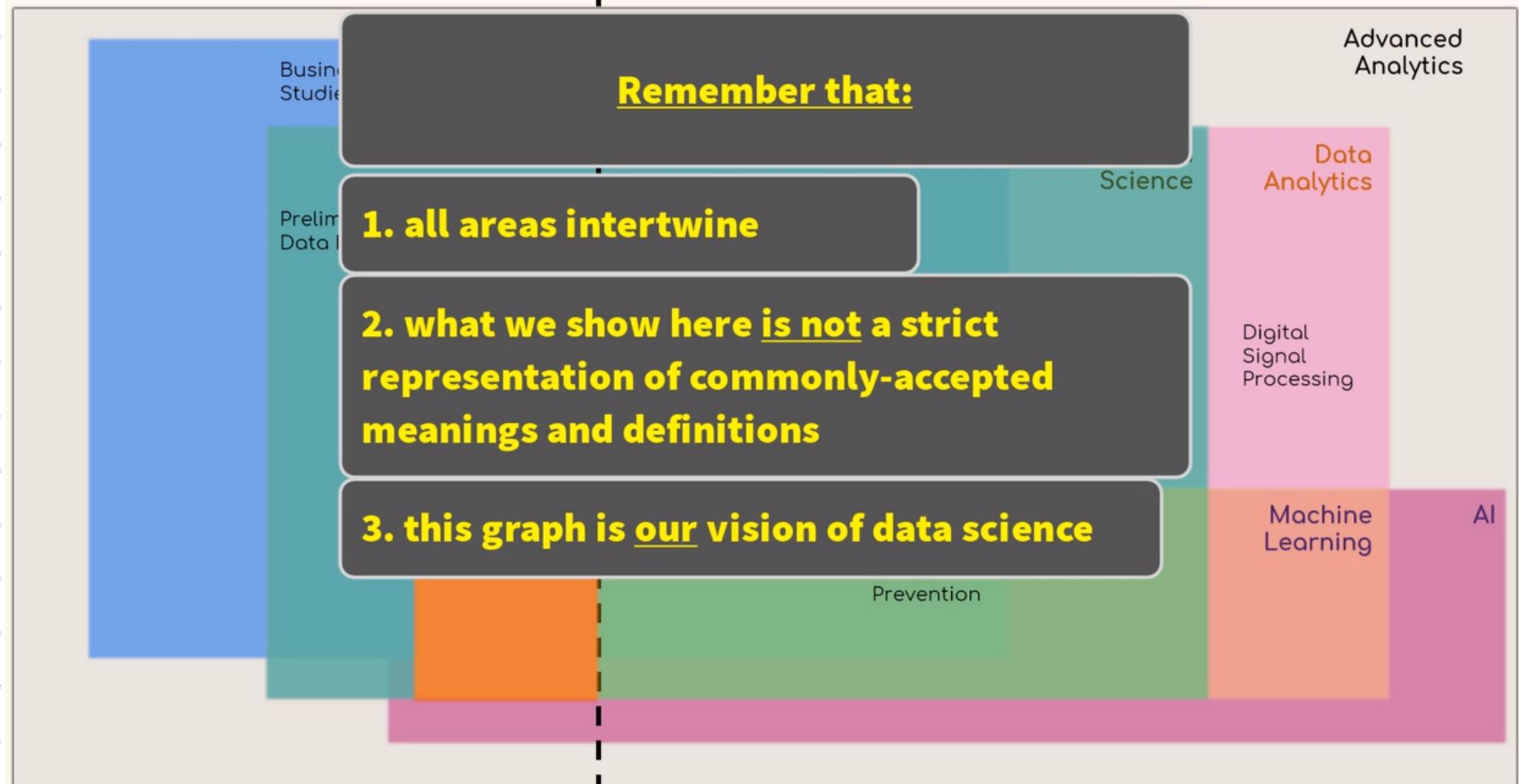
# Advanced Data Analytics



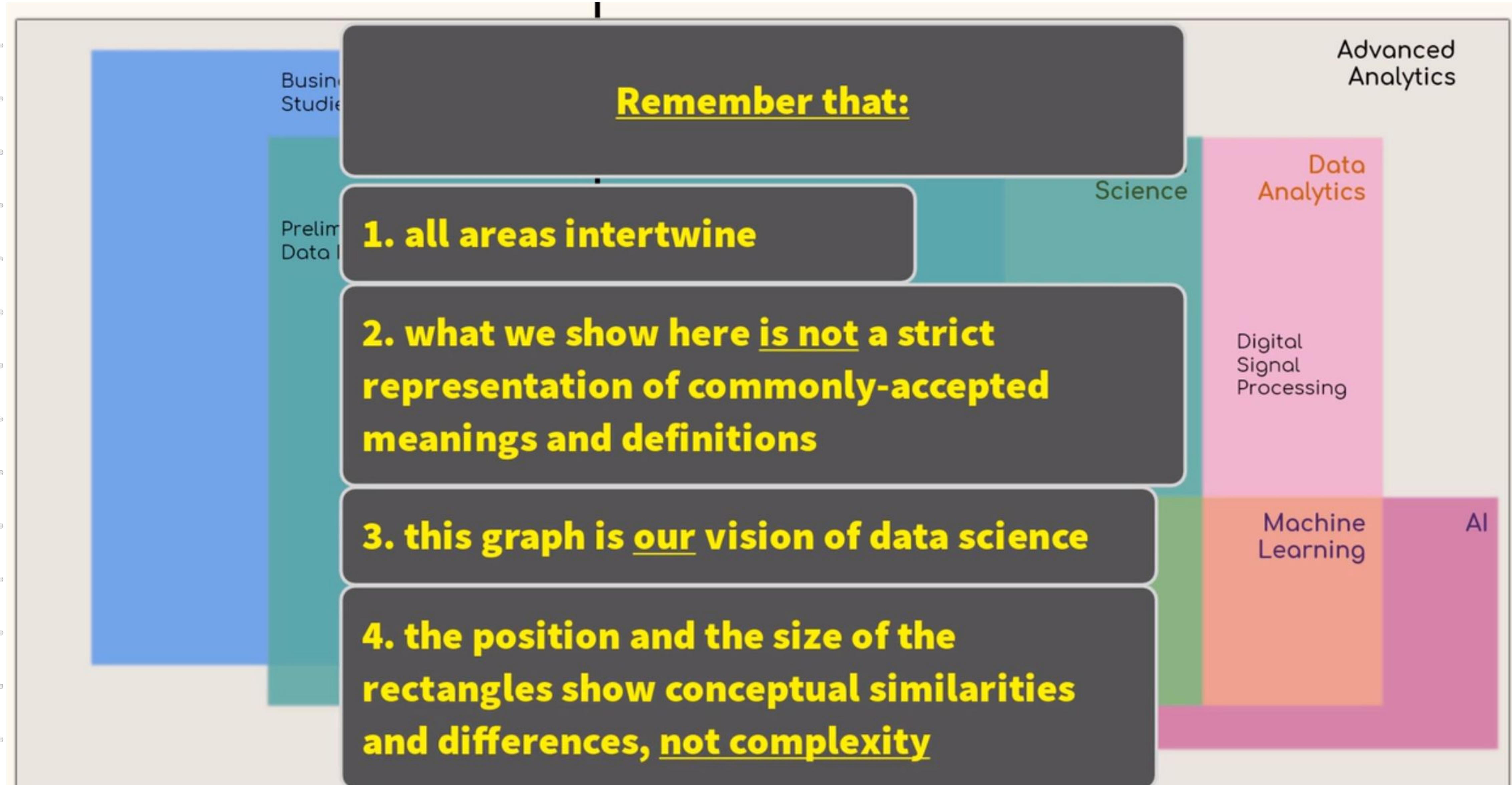
# Advanced Data Analytics?



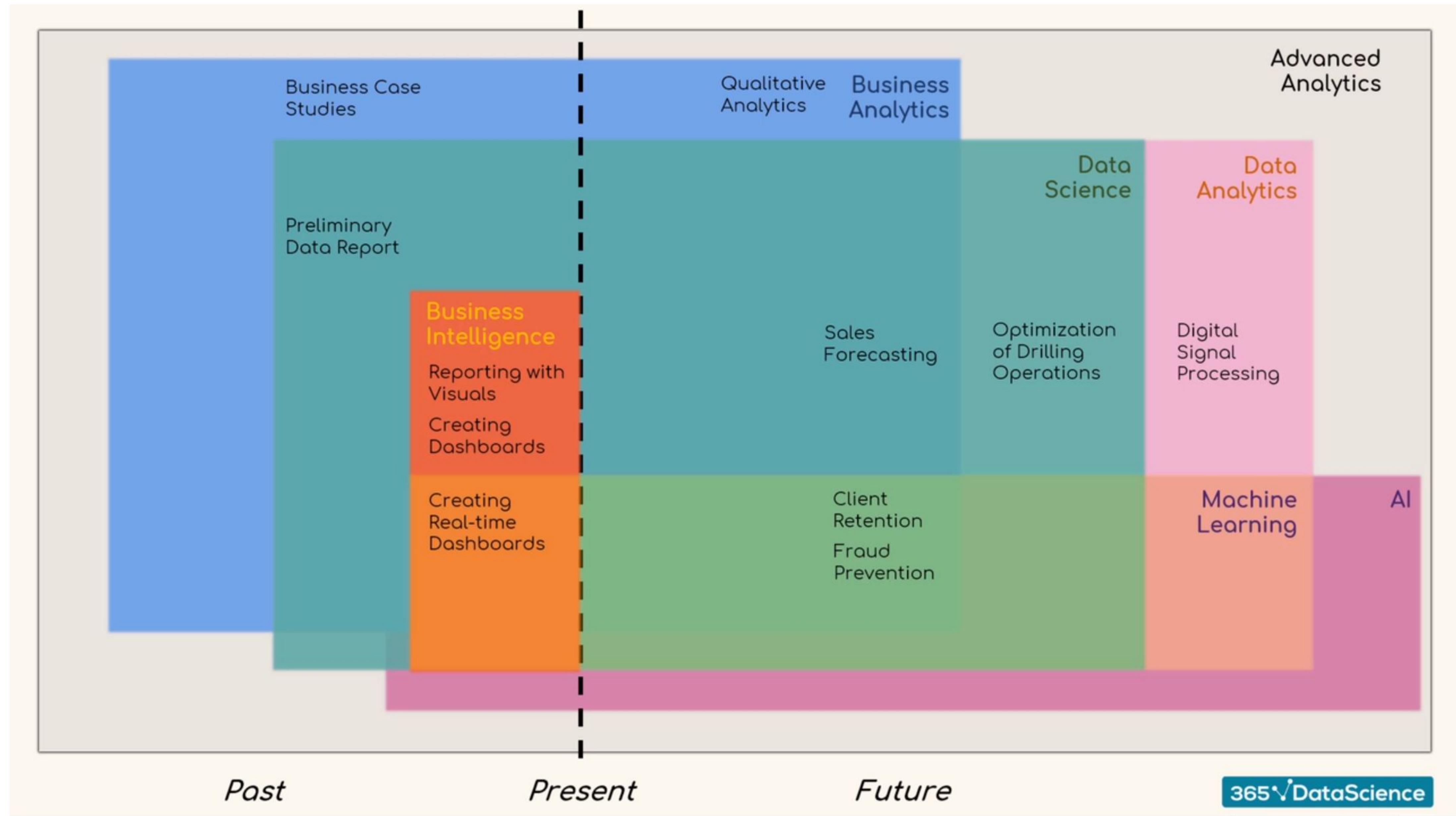
# Advanced Data Analytics?



# Advanced Data Analytics?



# 365 DataScience Advanced Data Analytics Diagram



# Remember that about the Diagram

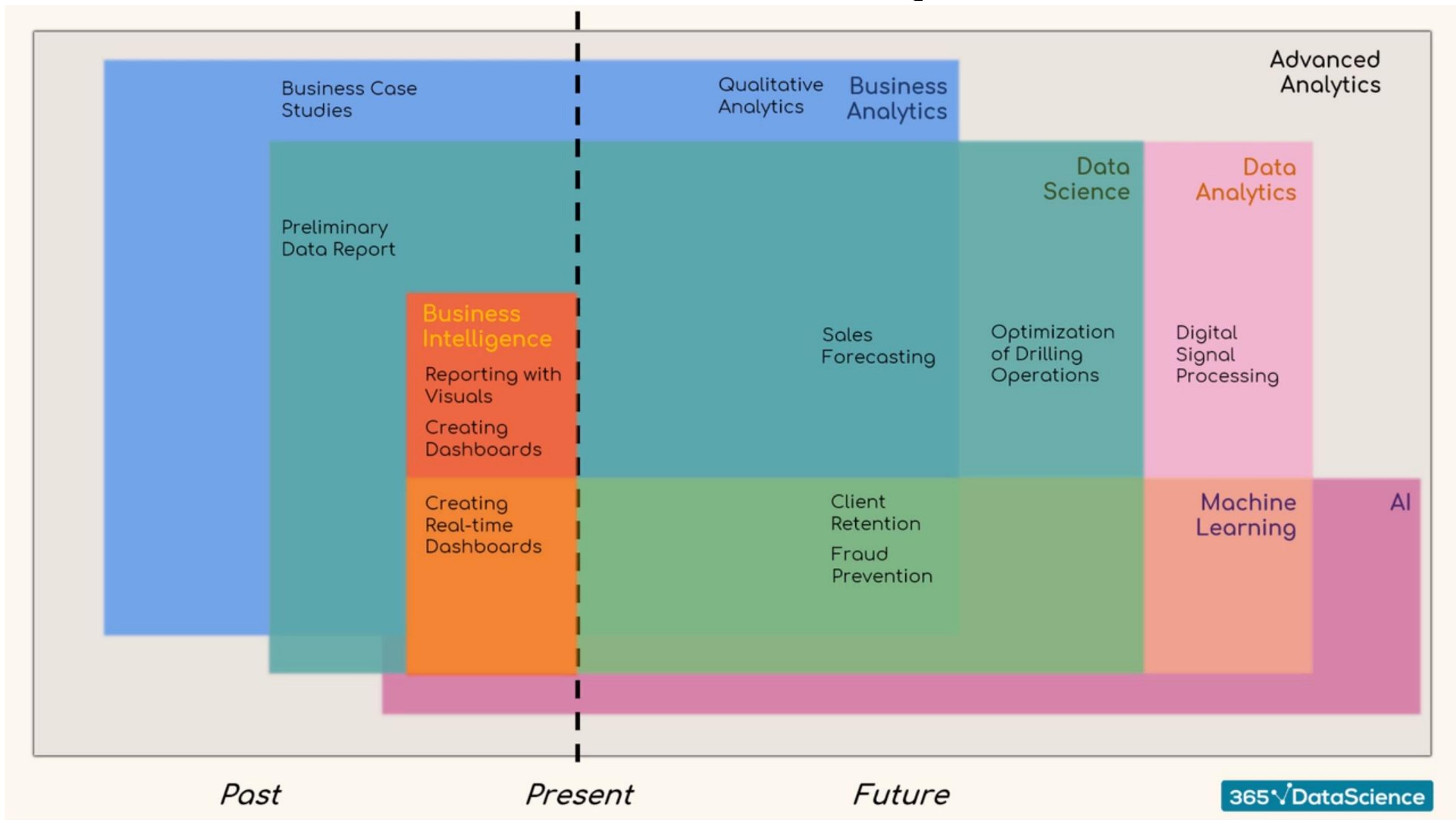
- This diagram is **365 DataScience Vision** of data science (a matter of interpretation)
  - concentrate on Data science and its applications in business
- The locations of some of the components are somewhat controversial
- The diagram can be seen as a very comprehensive depiction of what these disciplines are about and how they overlap.

**365**

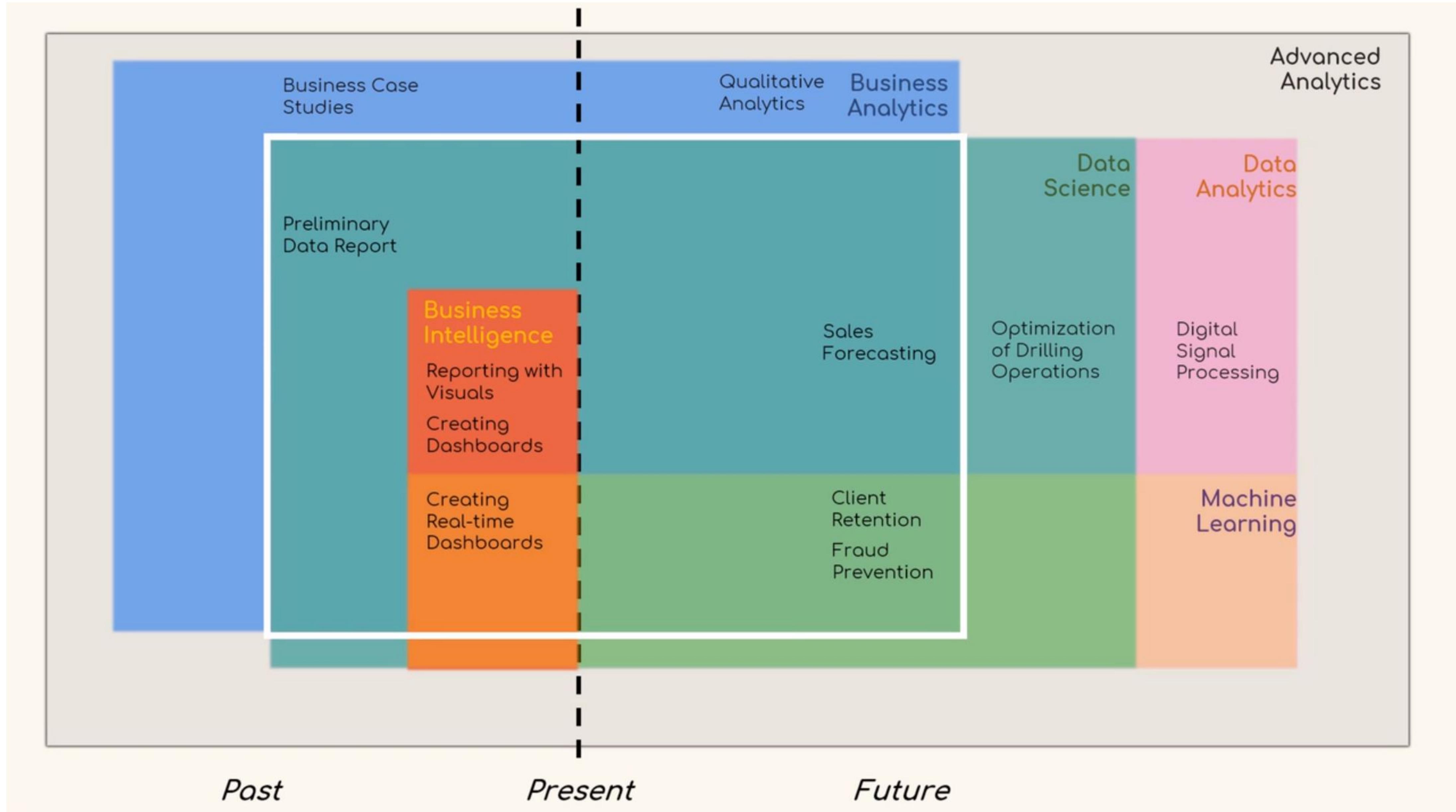
**Data Science**

**Infographic**

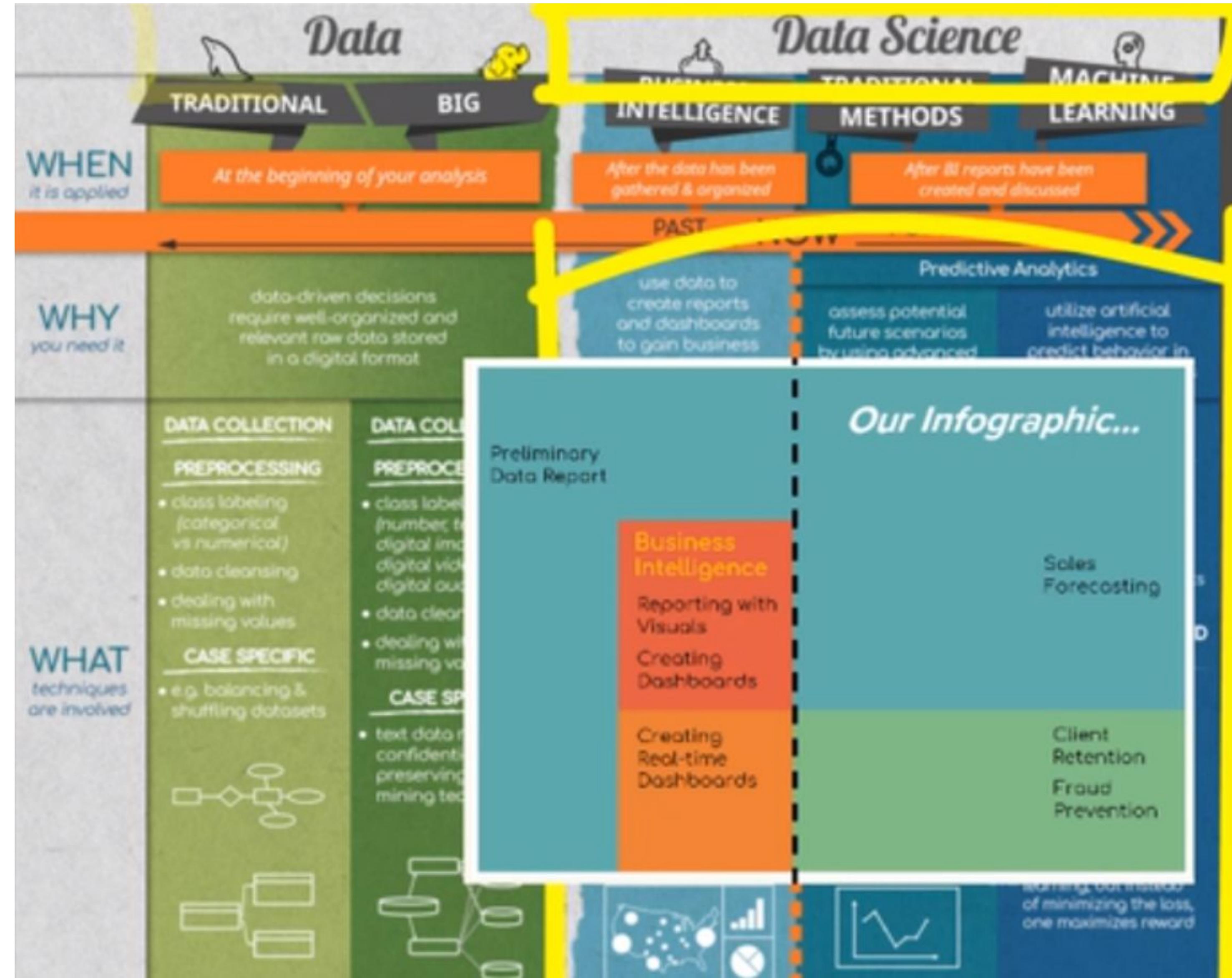
# Advanced Data Analytics Diagram



# Advanced Analytics & concentrate on Business



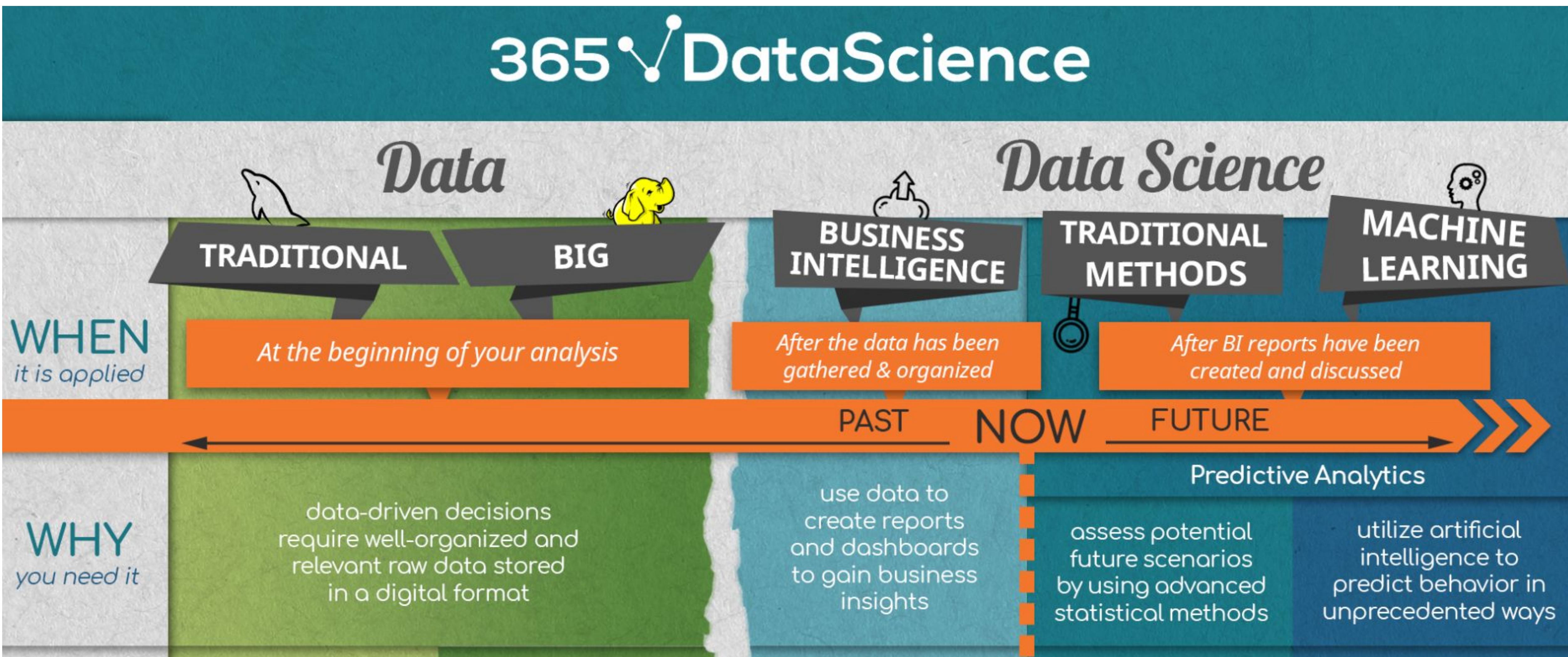
# Advanced Analytics & its companion Infographic



# 365 DataScience Infographic - Question 1,2



# 365 DataScience Infographic - Question 1,2



# Questions

# Links

<https://github.com/FCAI-B/da>