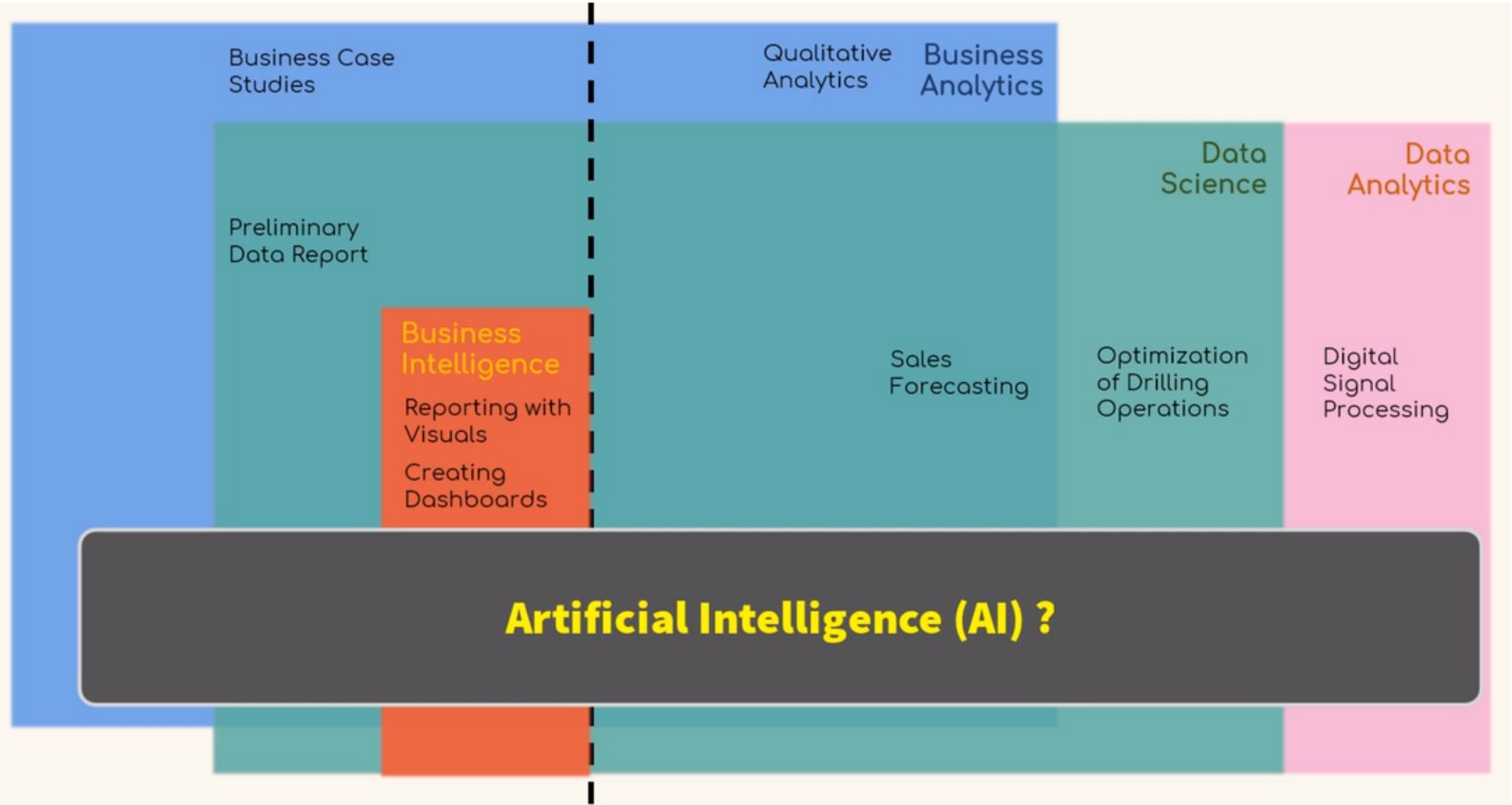
Data Analytics

Agenda

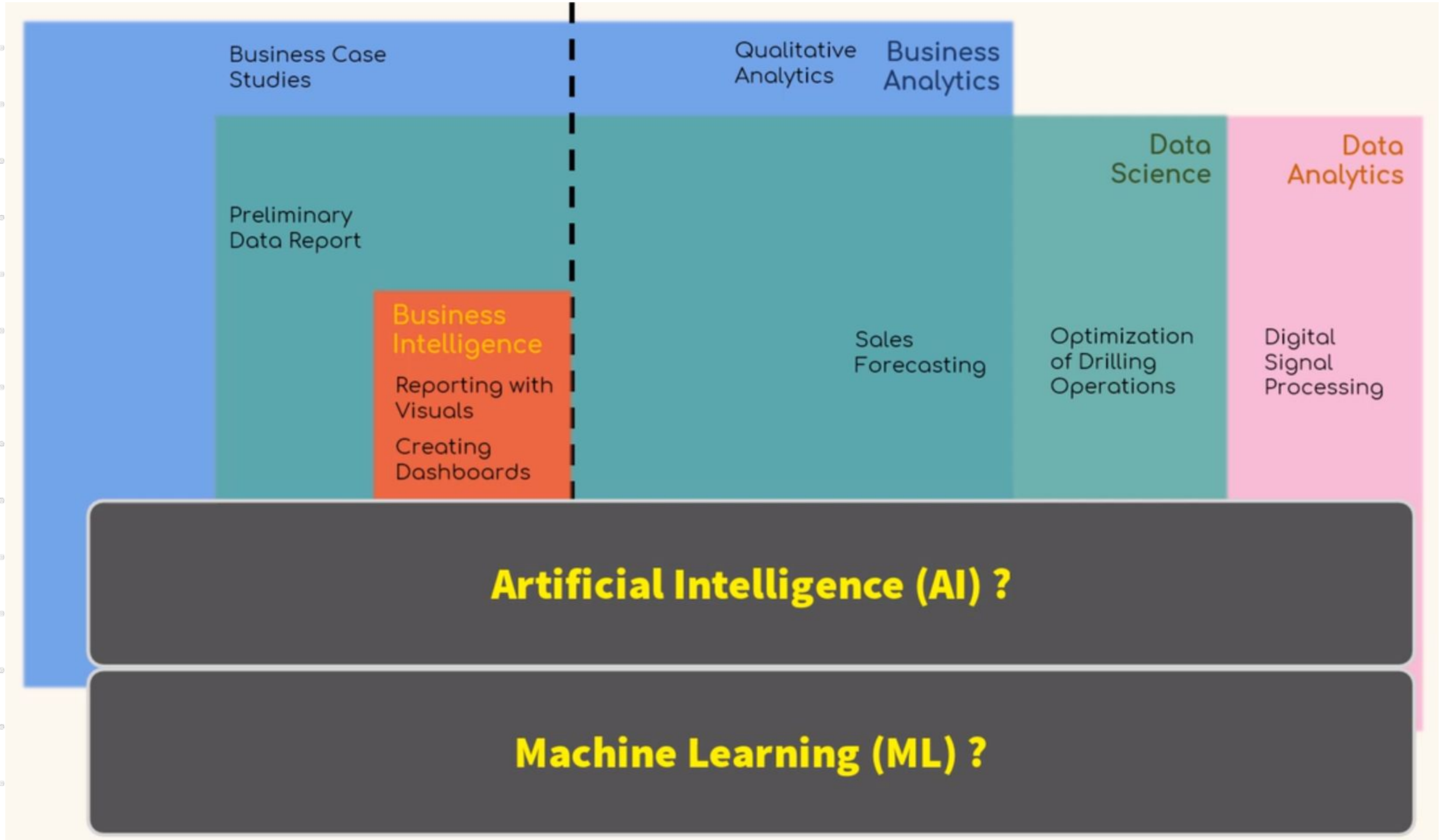
1. Artificial Intelligence
2. Where Image/Speech Recognition?
3. Where Symbolic Reasoning?
4. Advanced Analytics

AI

Artificial Intelligence (AI)?



Machine Learning (ML)?



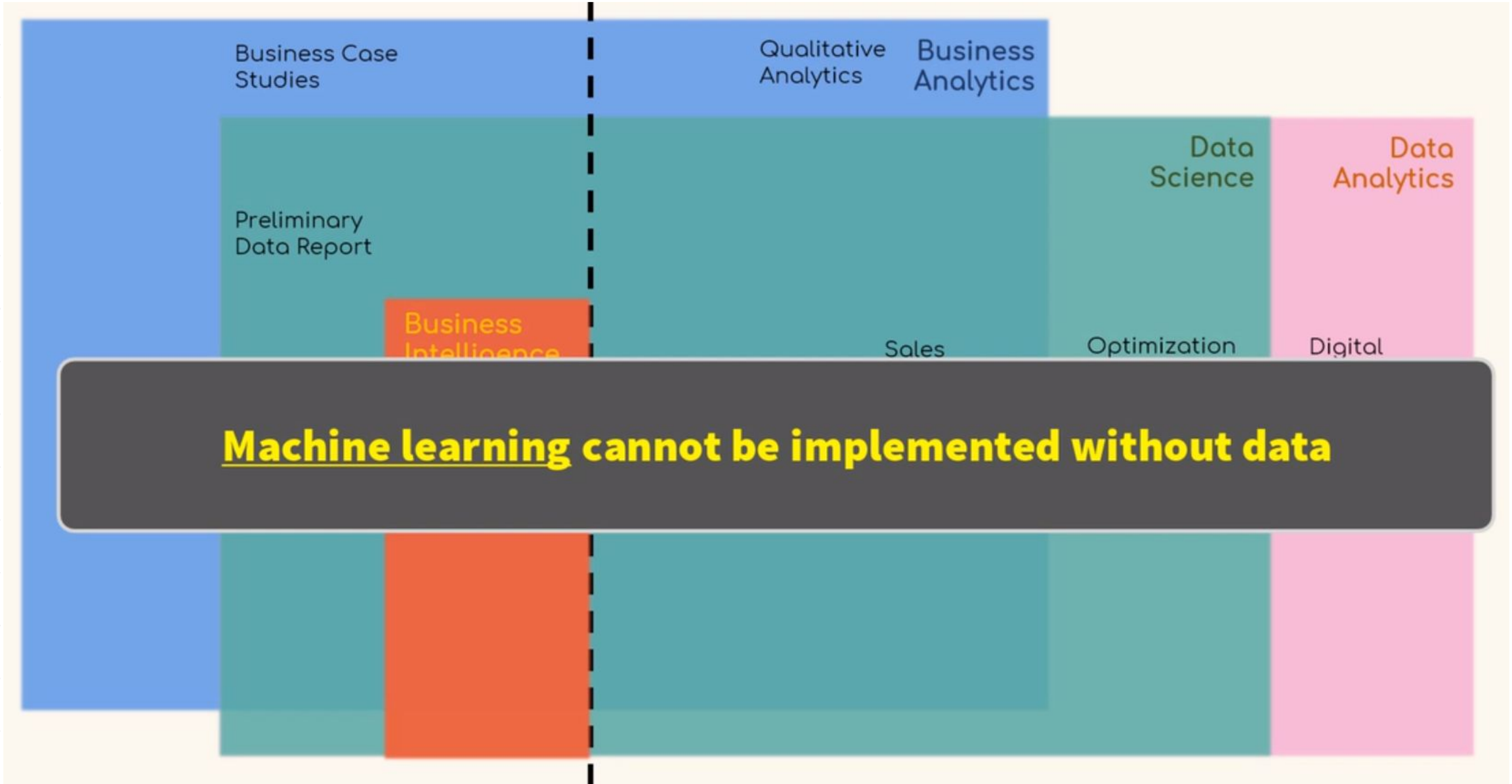
Machine Learning (ML) - 1

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

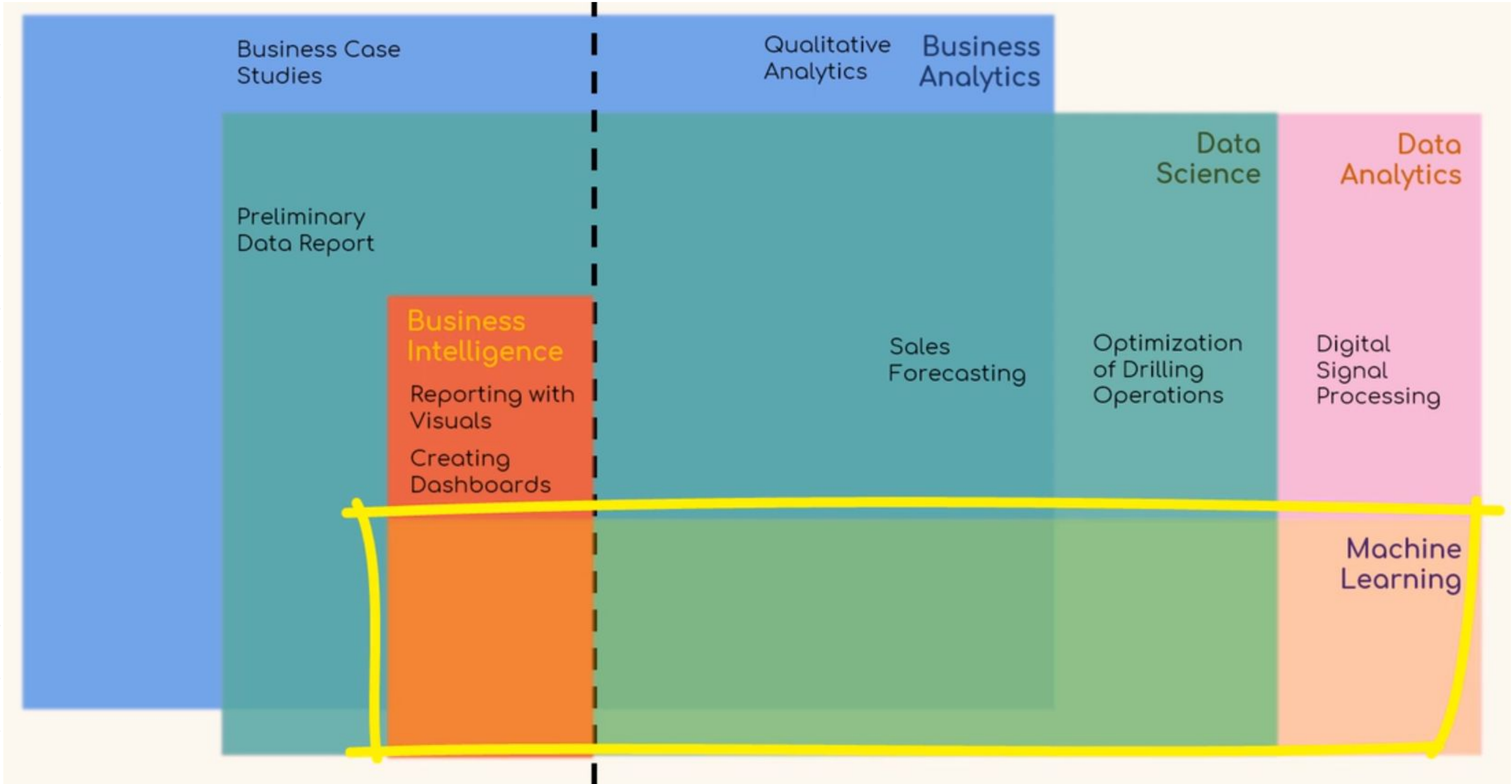
ML is about creating and implementing algorithms that let machines receive data and use this data to:

- make predictions
- analyse patterns
- give recommendations

Machine Learning (ML) - 2

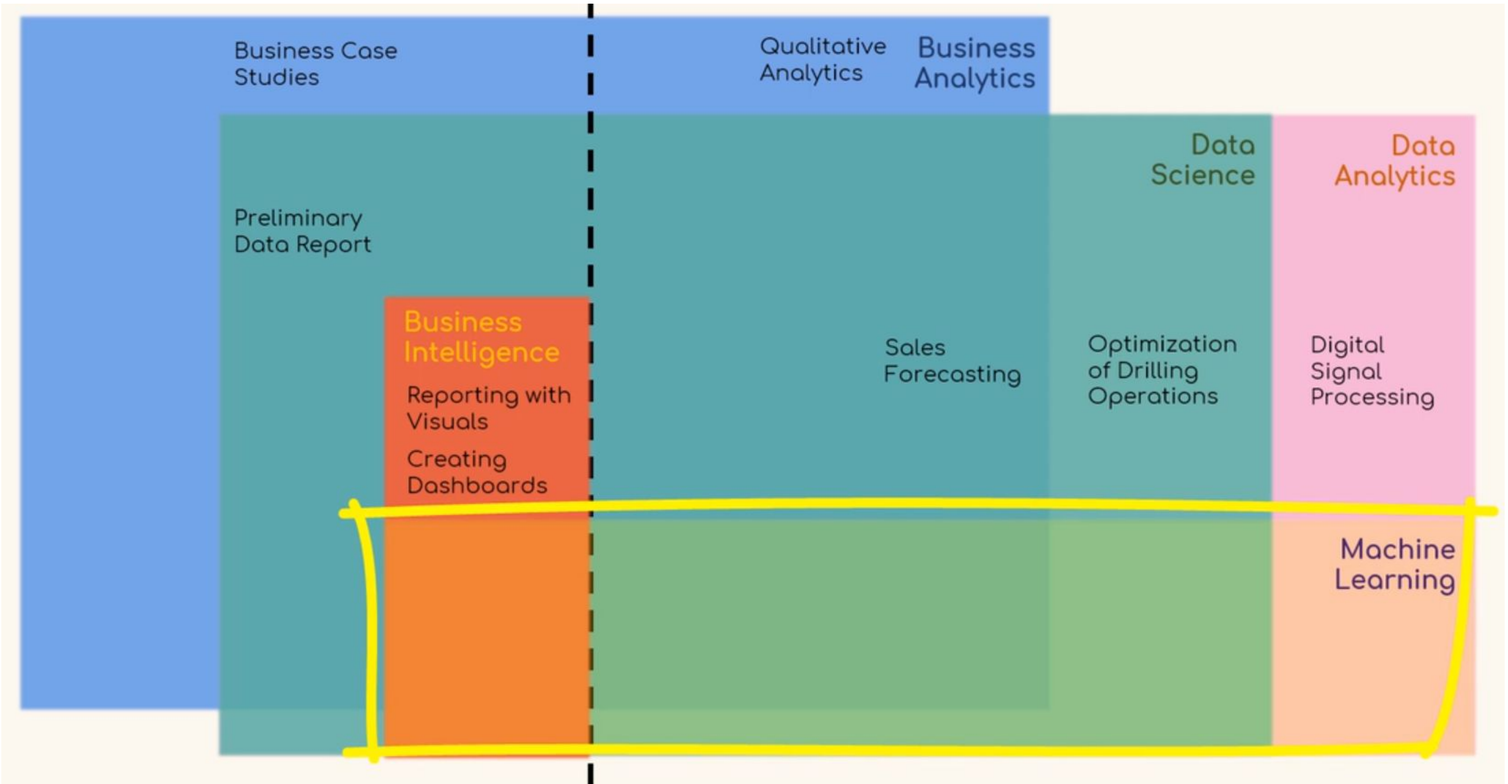


Machine Learning (ML) - 3

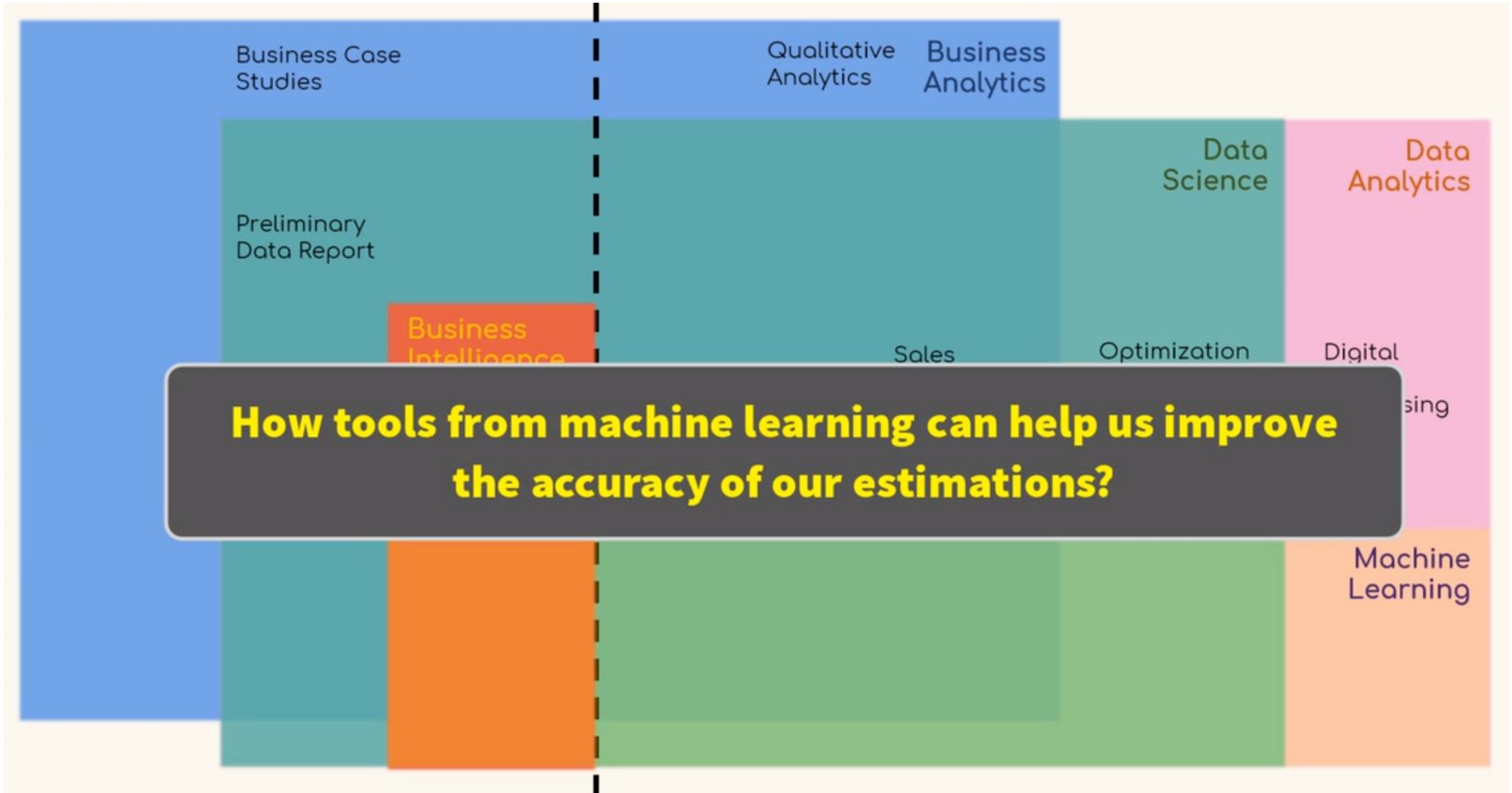


Machine Learning (ML) - 4

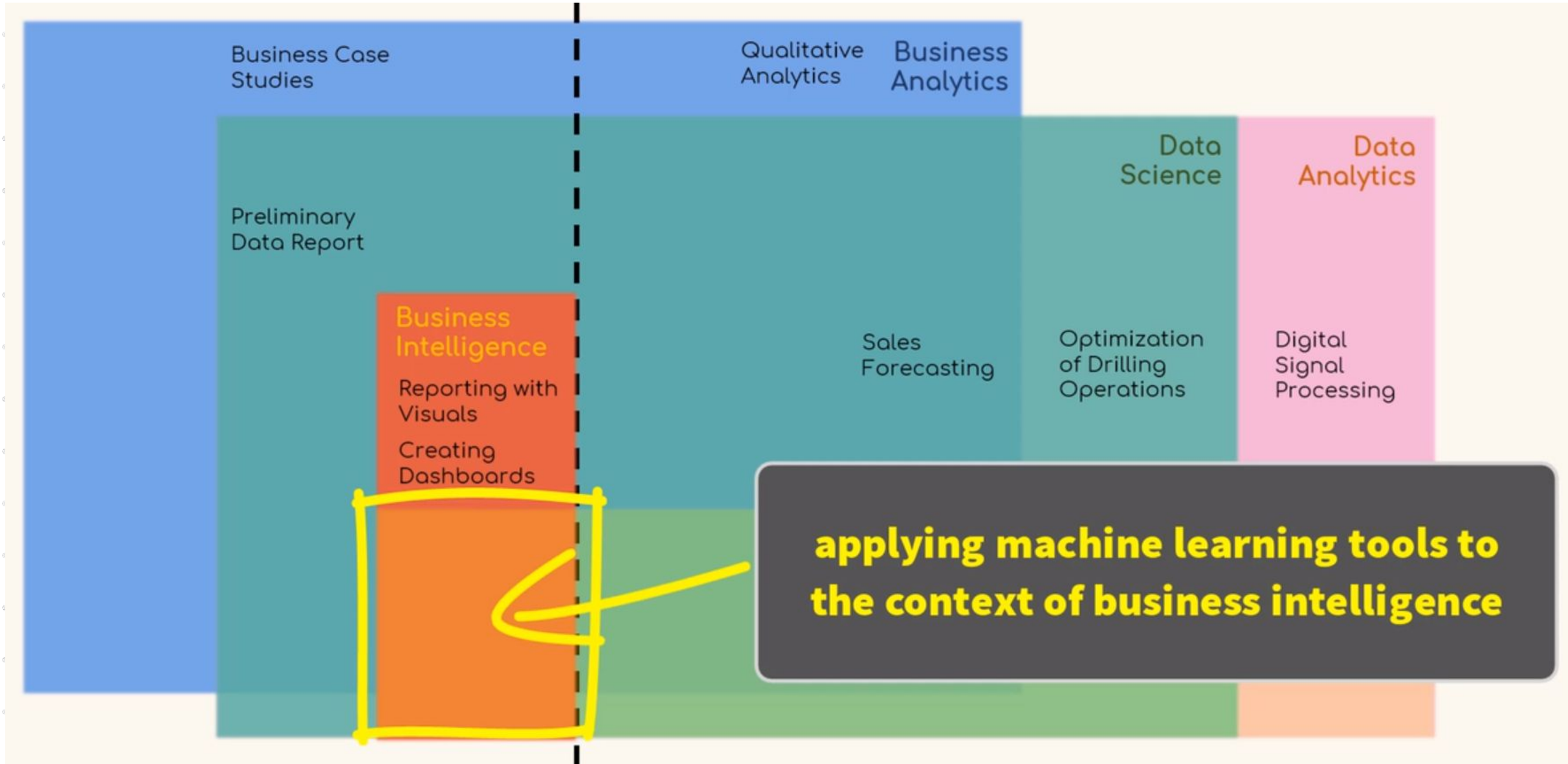
- **ML** stay within **Data Analytics** completely
- This could be considered a **bold statement** to make
  - As it **debatable** whether this is correct
  - Some argue that **Data Analytics** and **ML** are two unrelated scientific fields



Machine Learning (ML) - 5



ML with BI - 1


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
applying machine learning tools to the context of business intelligence

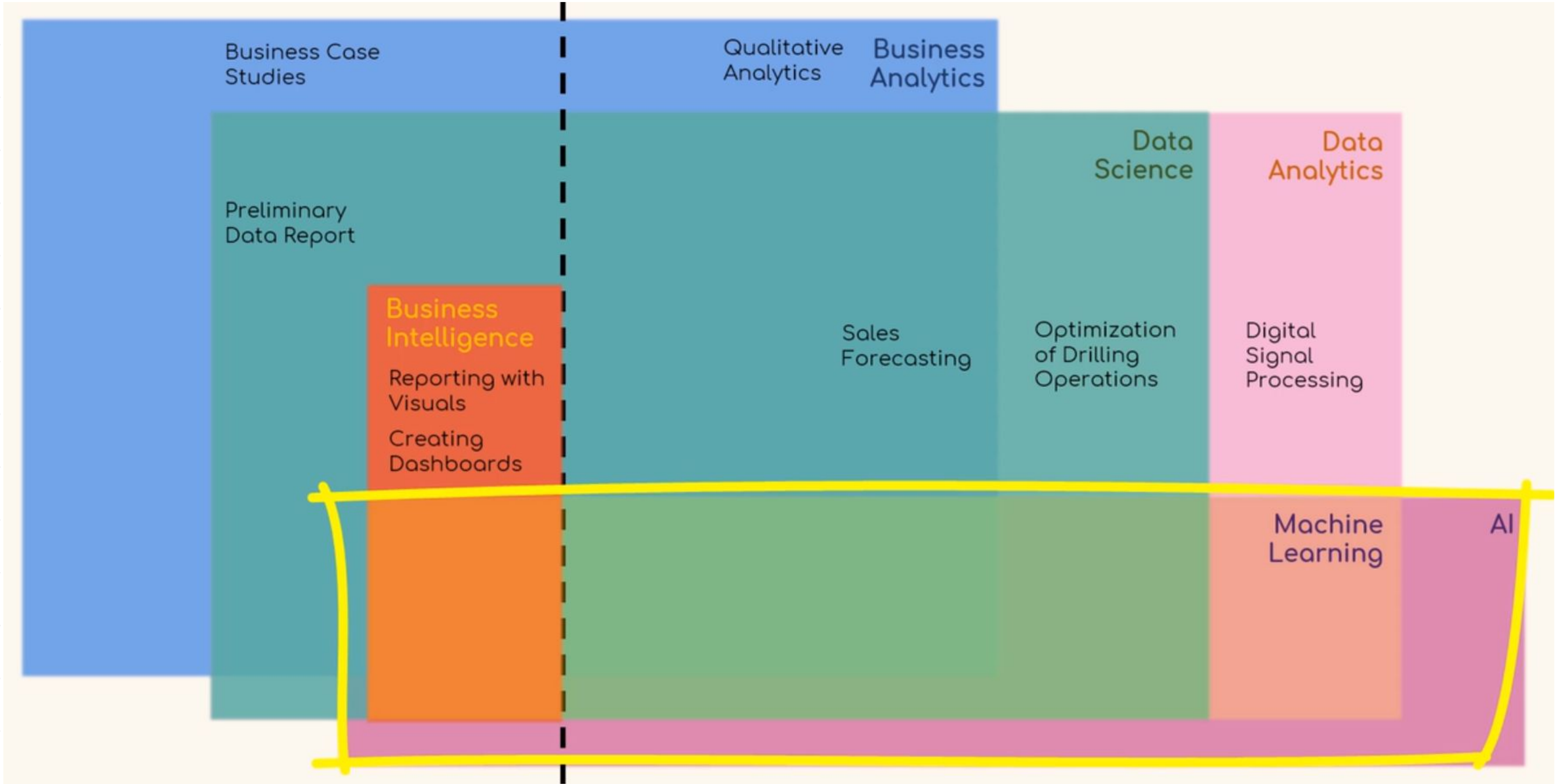
ML with BI - 2

- 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 their data
  - →suggest real-time recommendations and 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

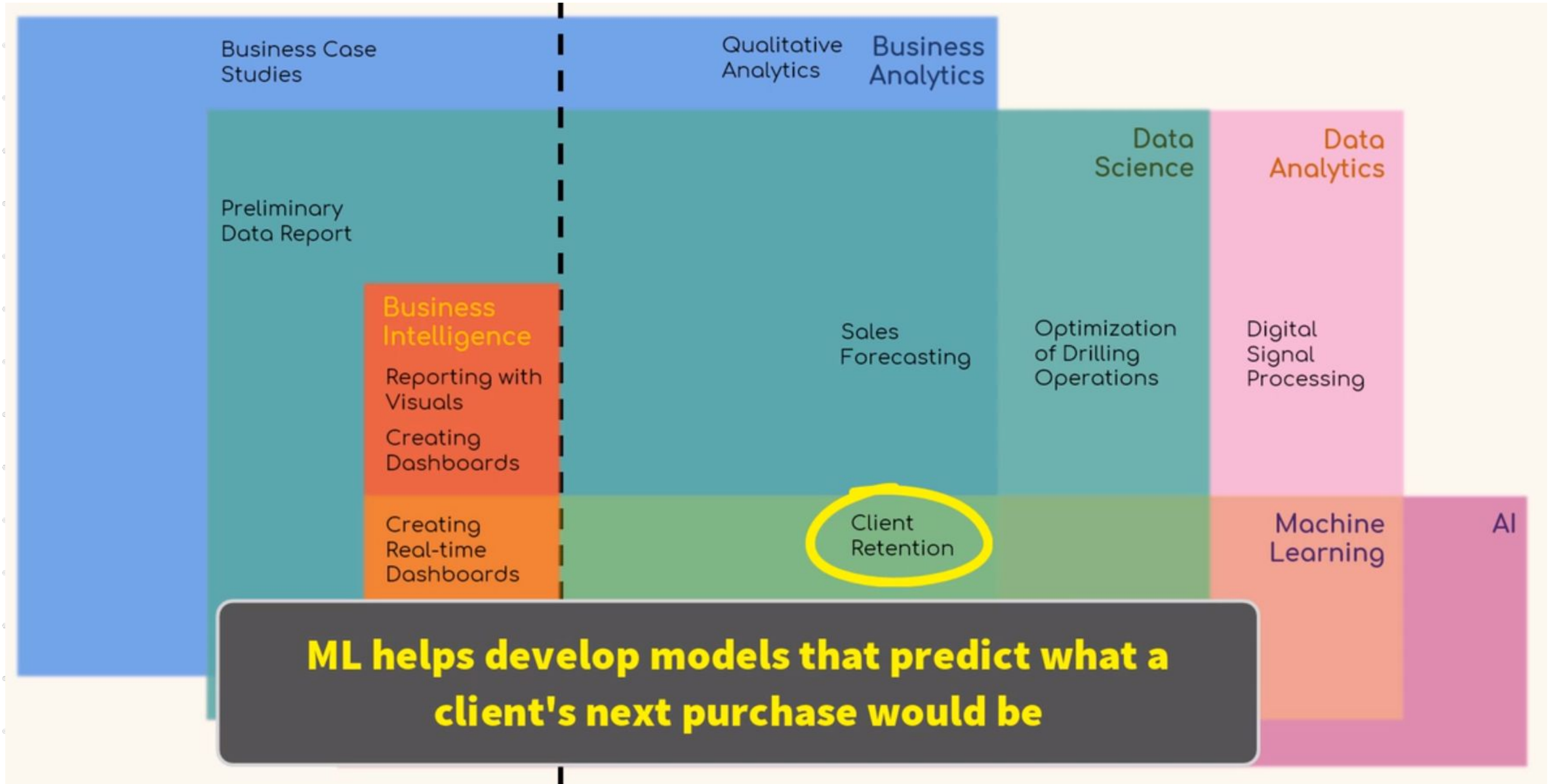
Artificial Intelligence (AI) - 1



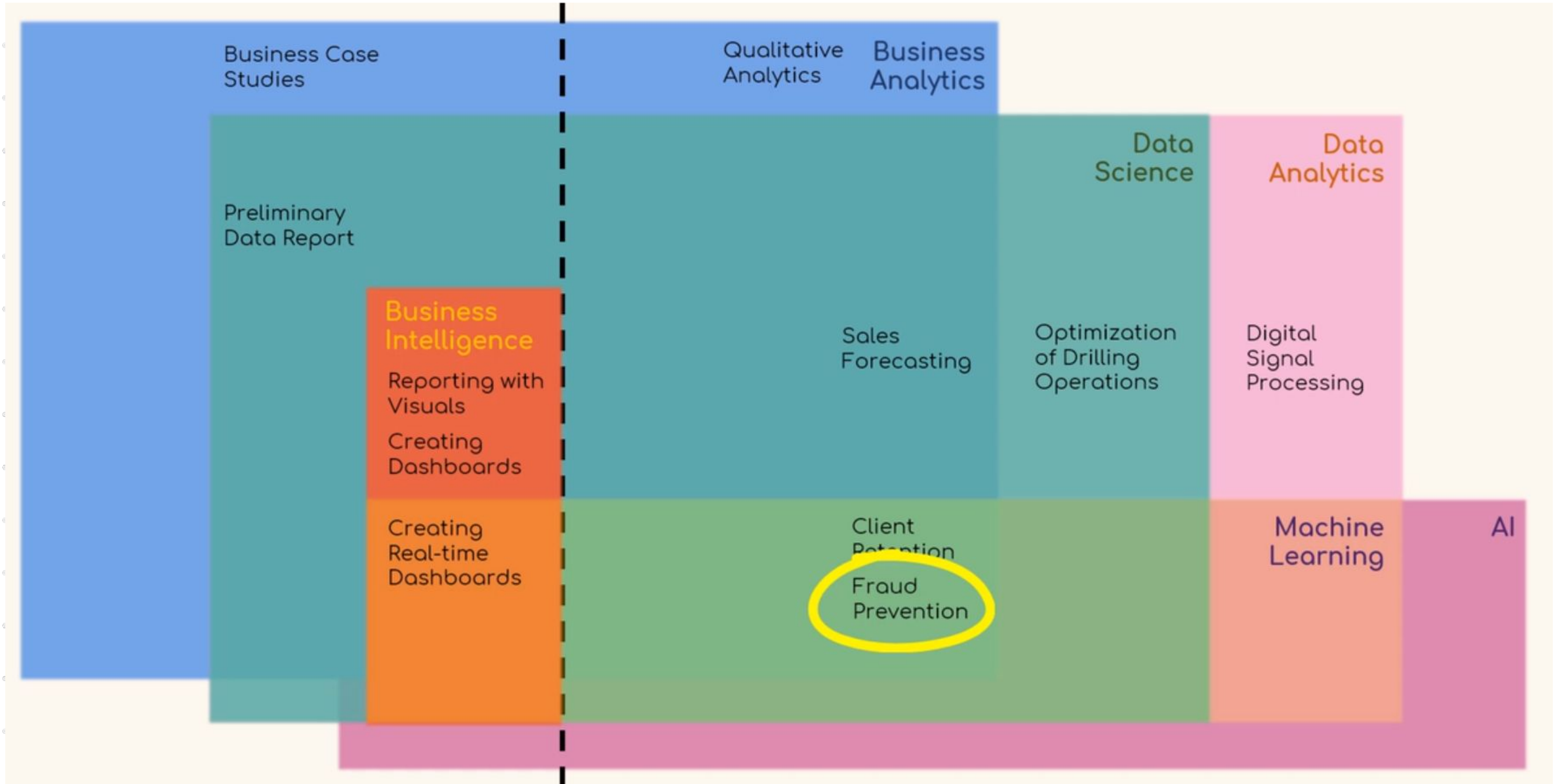
Artificial Intelligence (AI) - 2

- **AI** is a pretty general term that can have a somewhat philosophical interpretation
- We, as humans, have only managed to reach **AI** through **ML**
- **Data Scientists** are interested in how tools from **ML** can help improve the accuracy of estimations

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

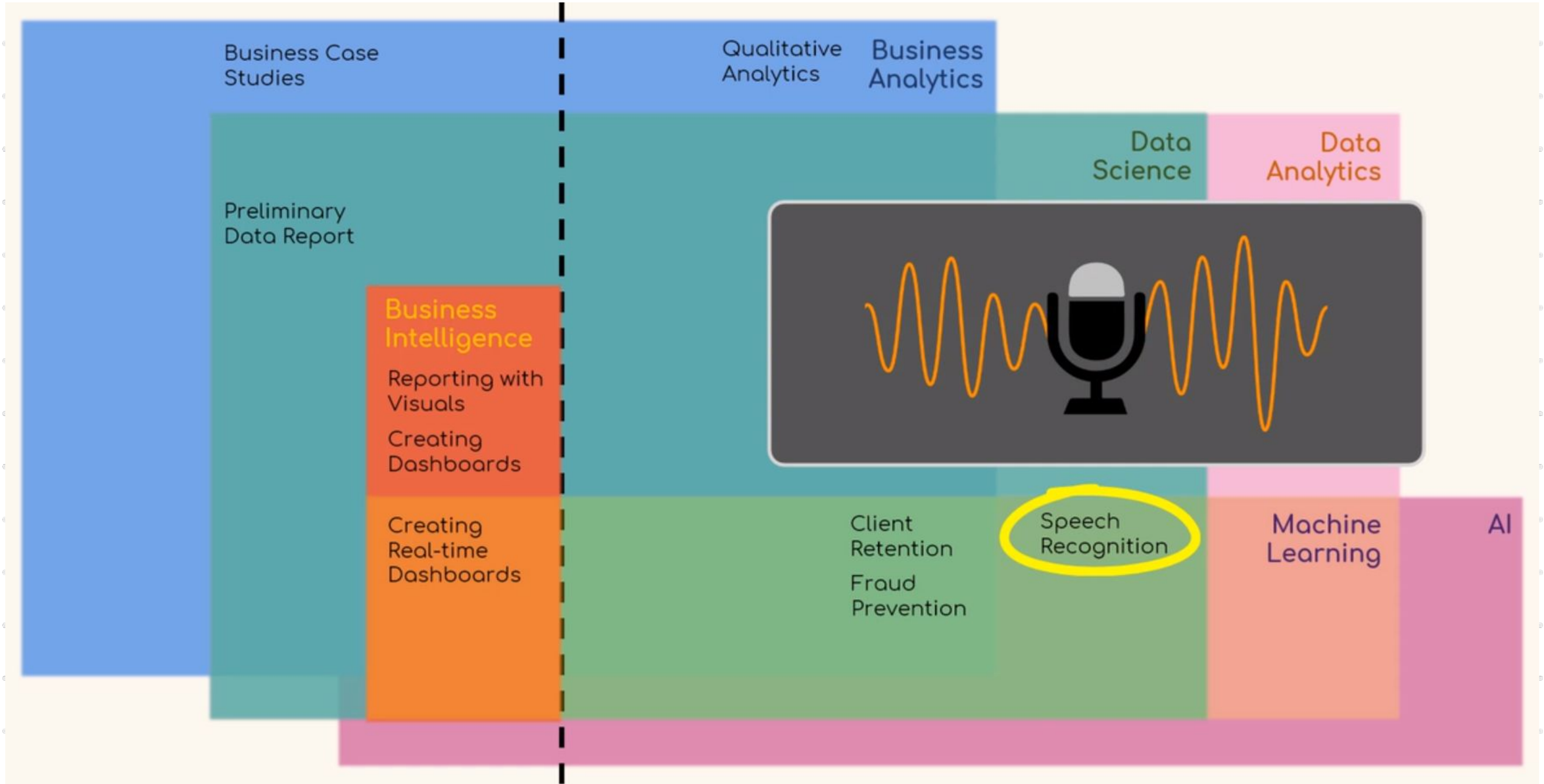
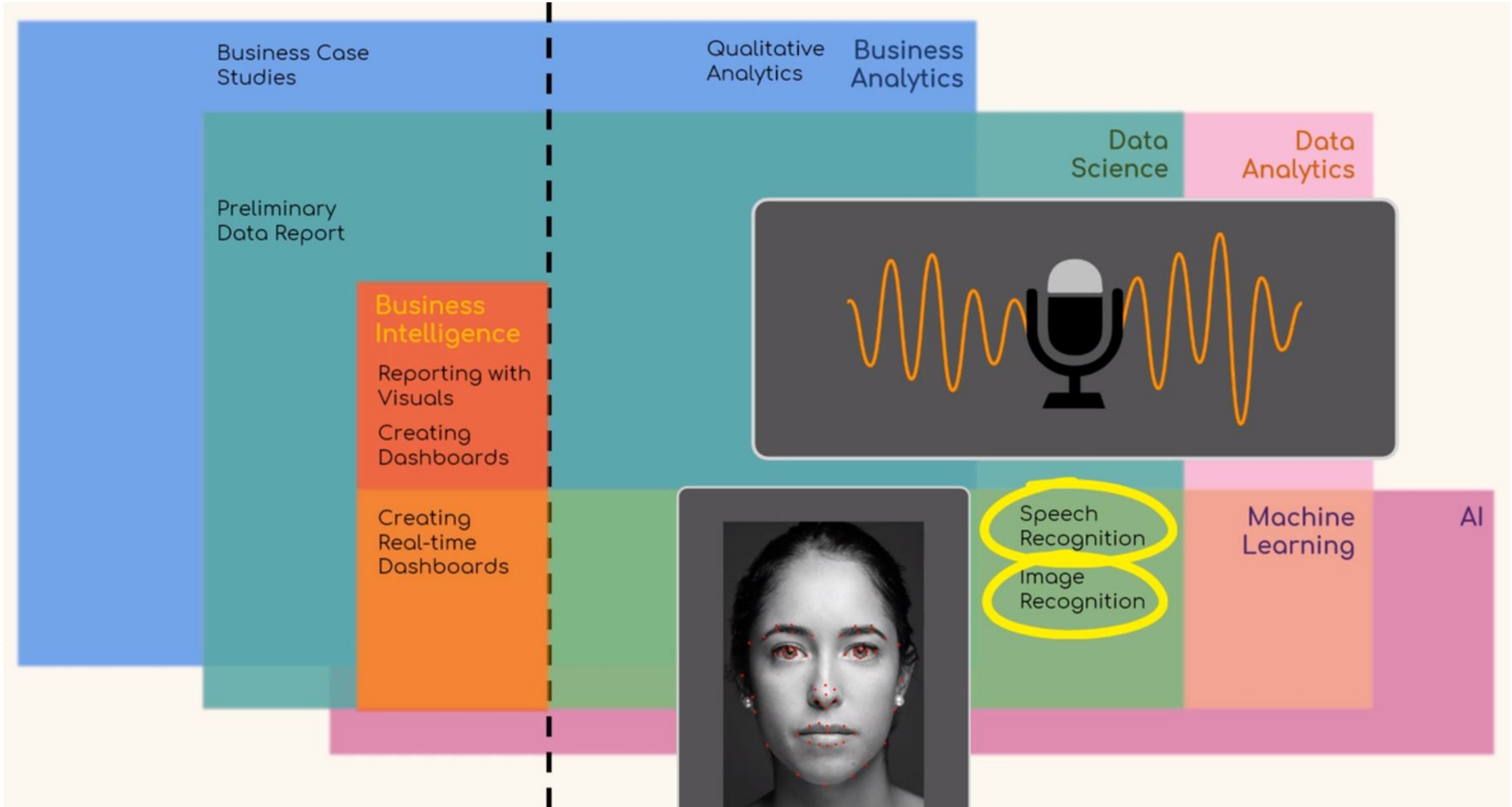
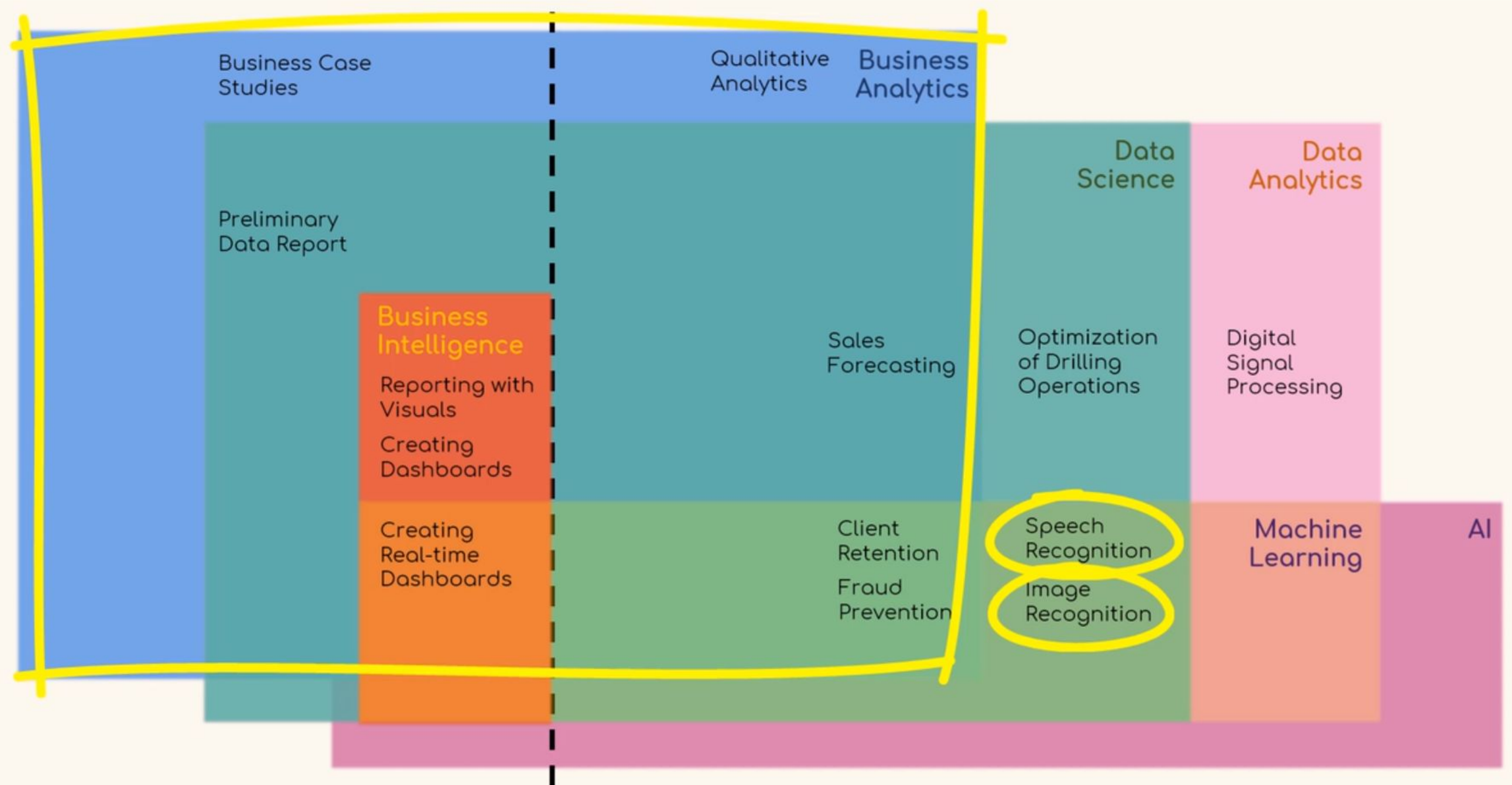


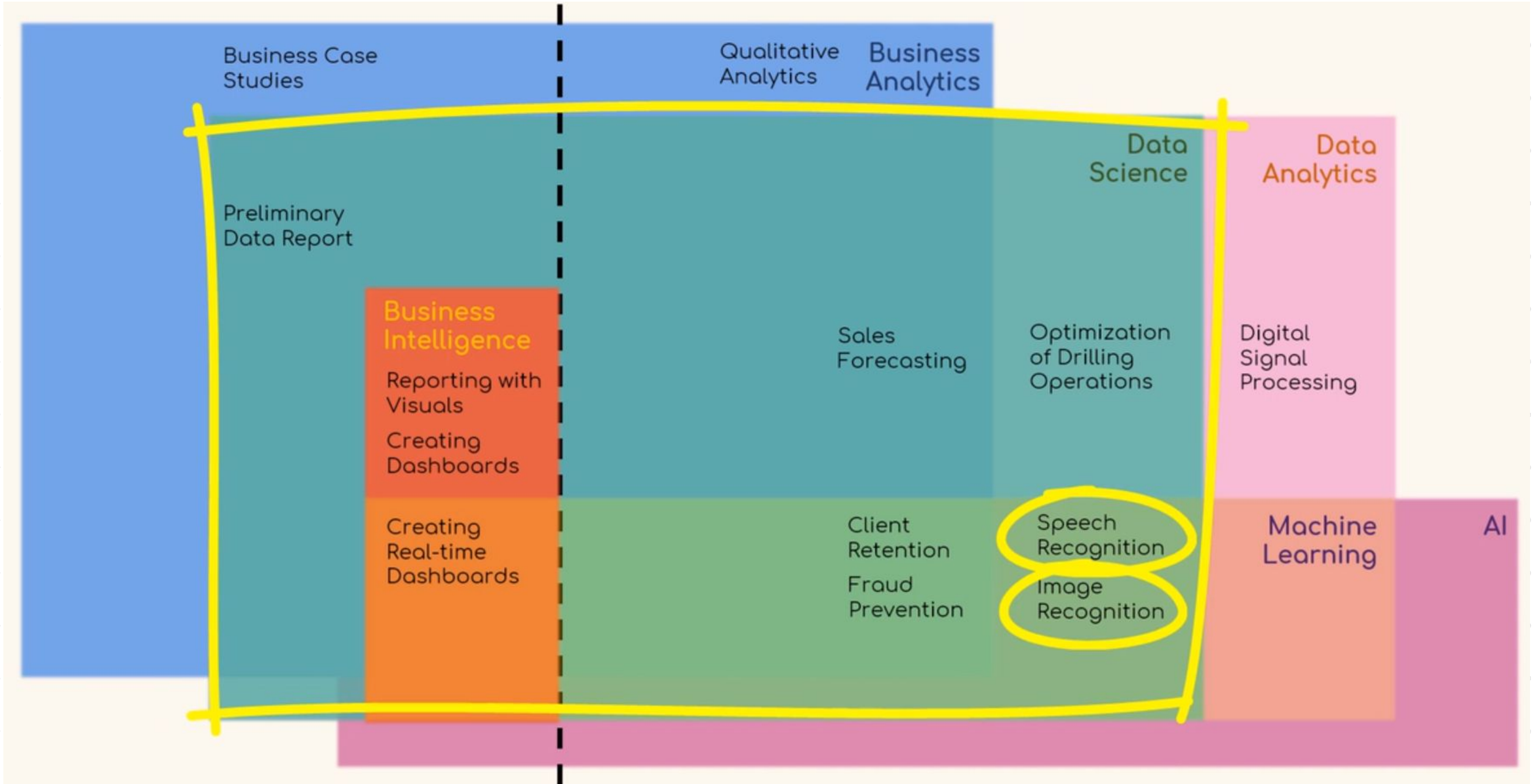
Image Recognition



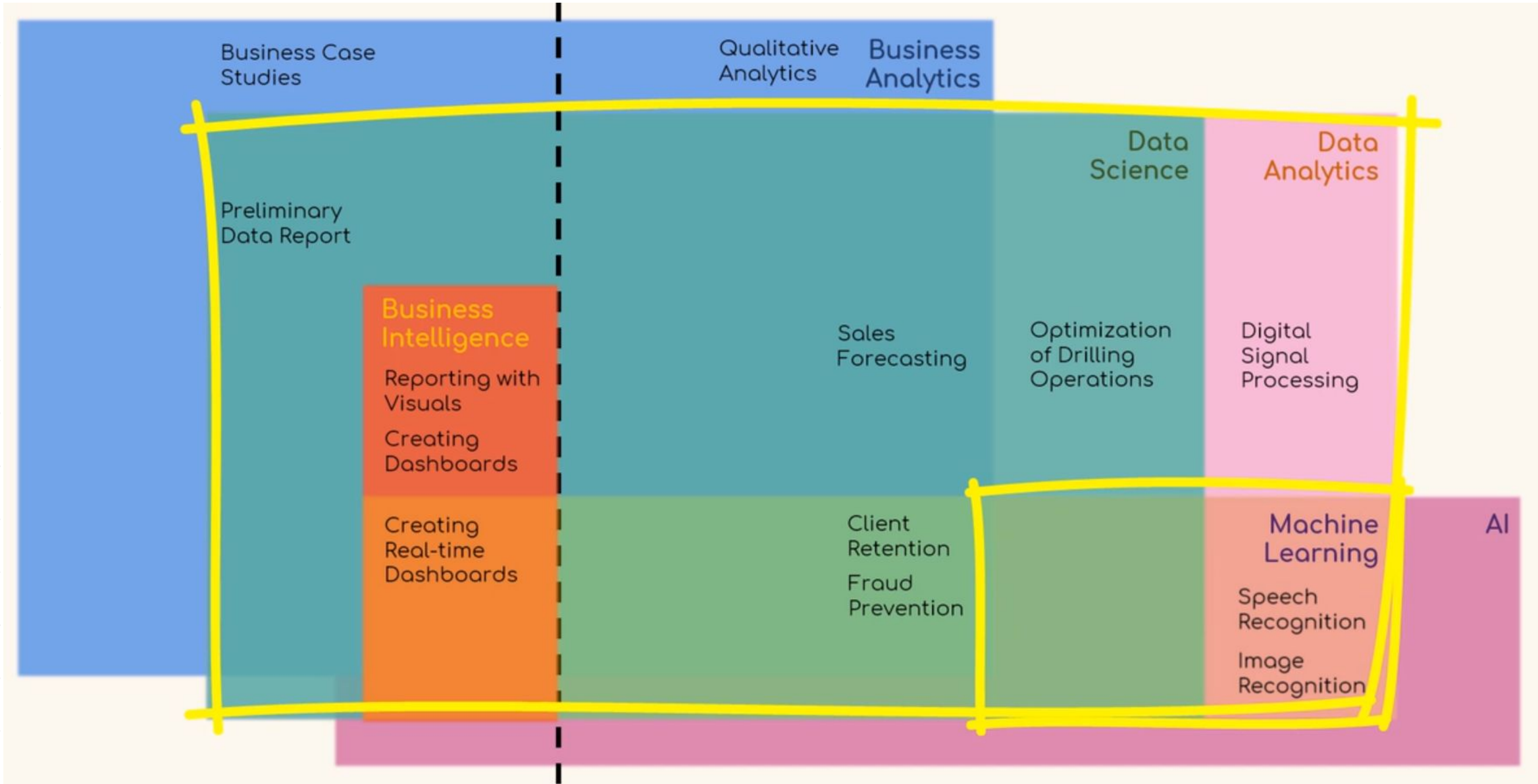
Where Image/Speech Recognition? - 1



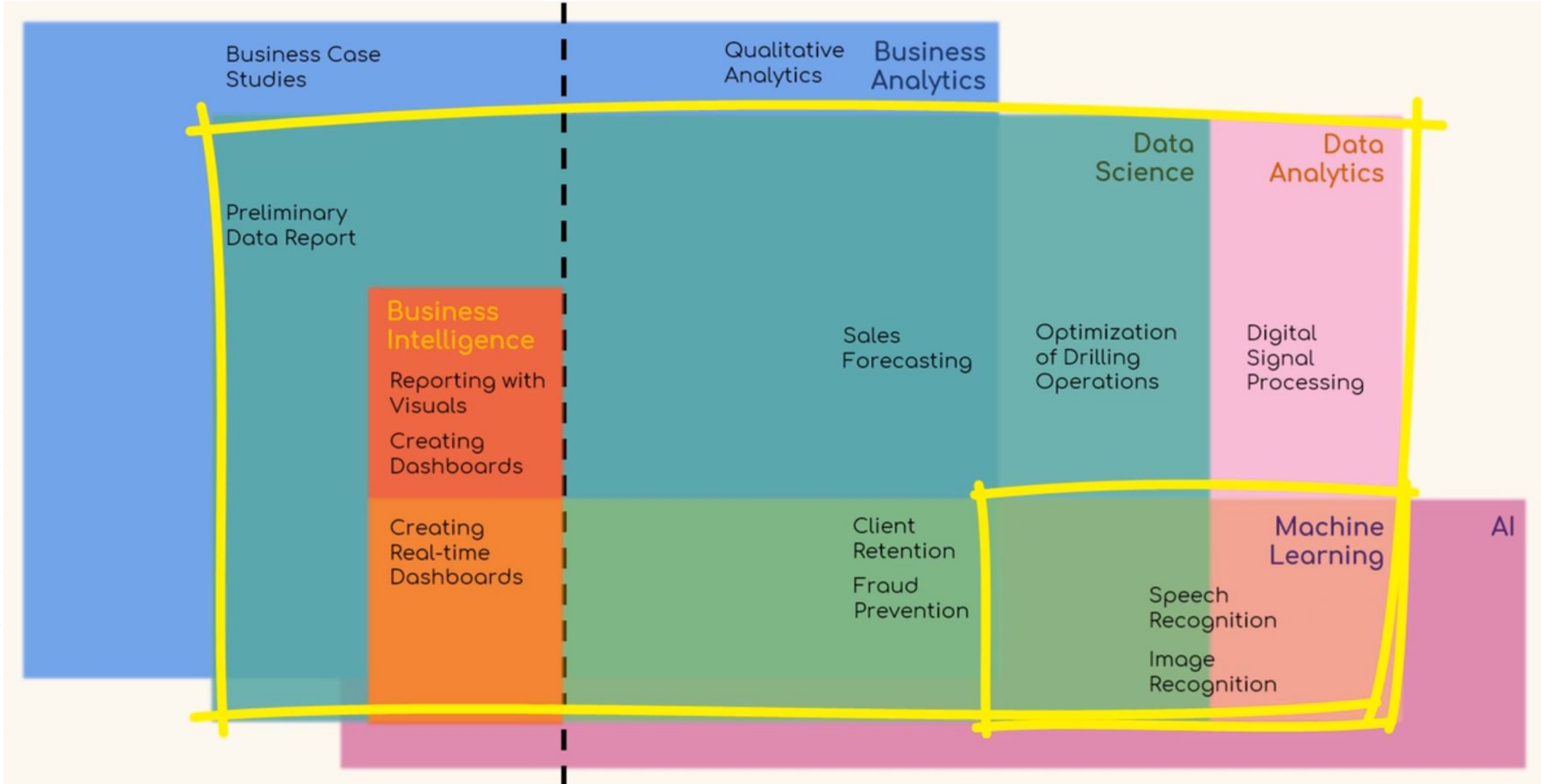
Where Image/Speech Recognition? - 2



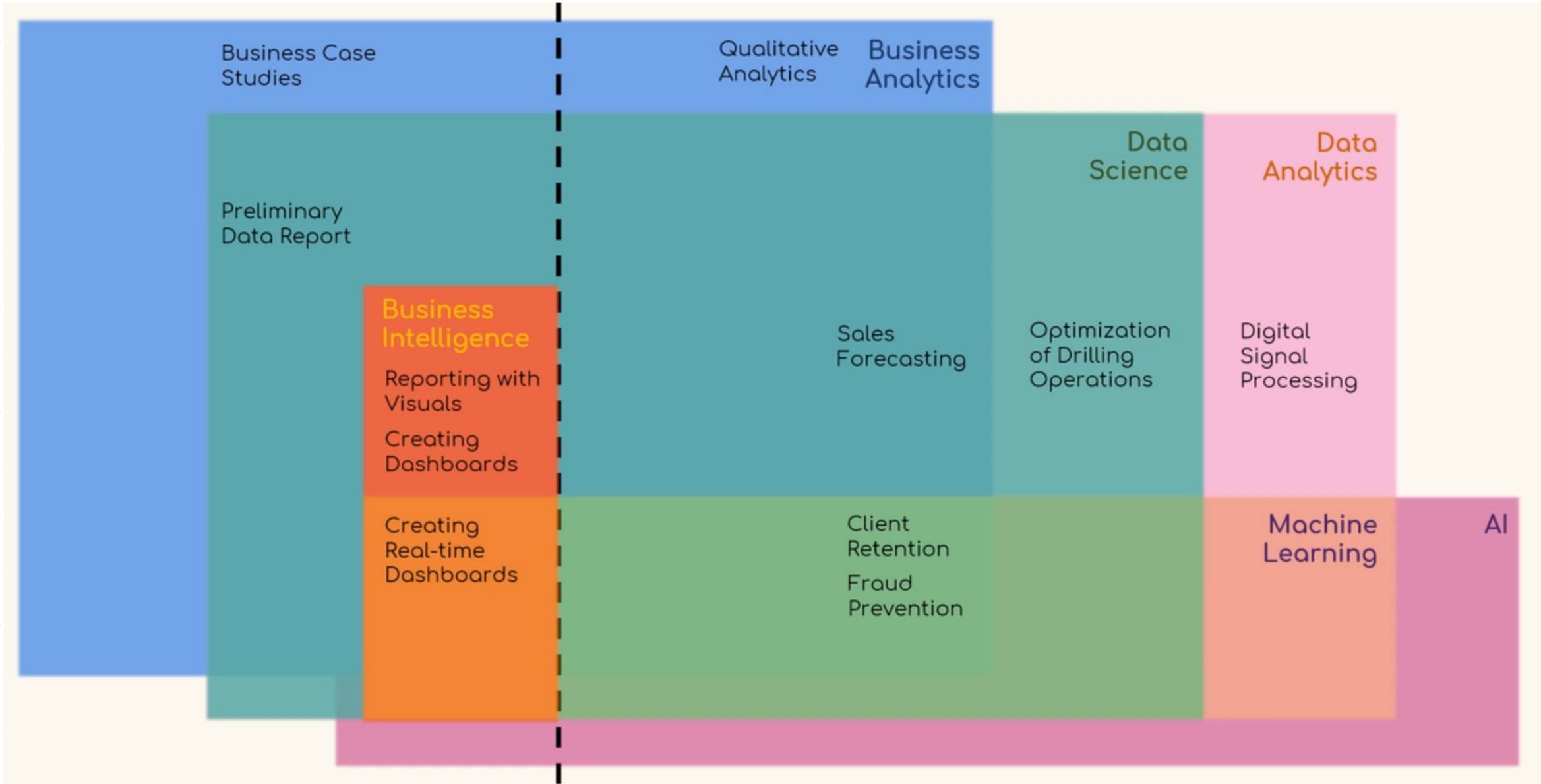
Where Image/Speech Recognition? - 3



Where Image/Speech Recognition? - 4

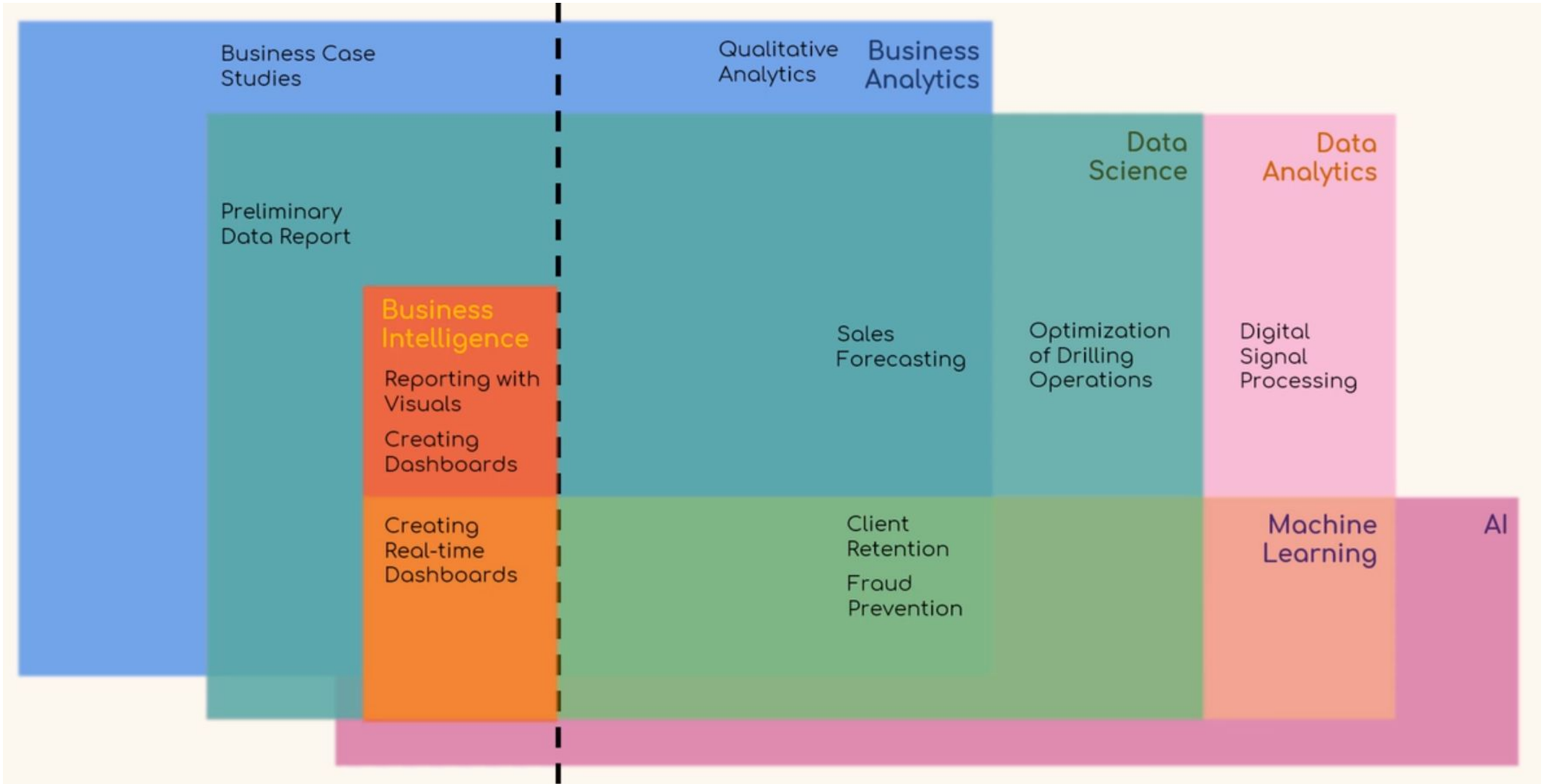


Where Image/Speech Recognition? - 5



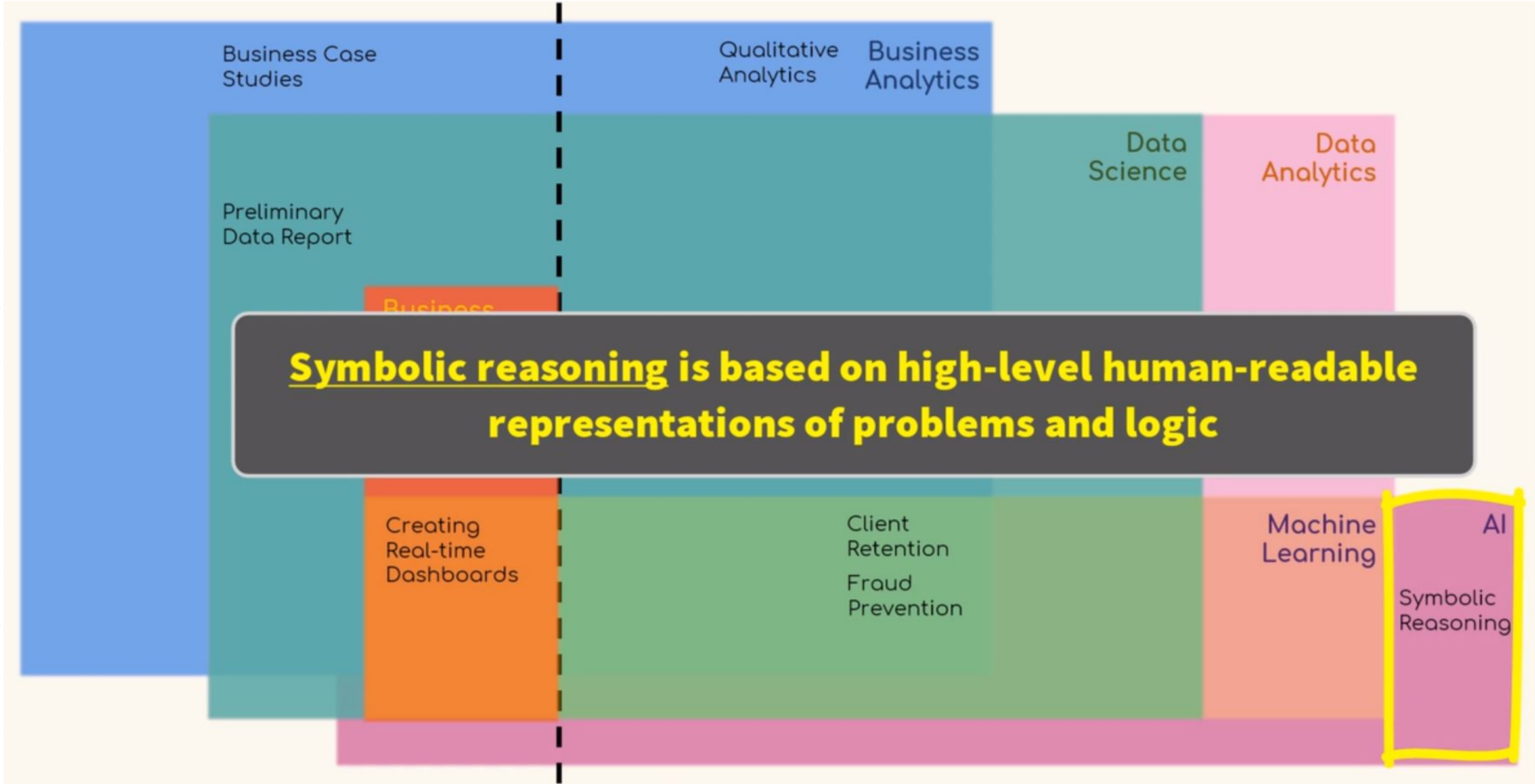
Removing Image/Speech Recognition

- **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:

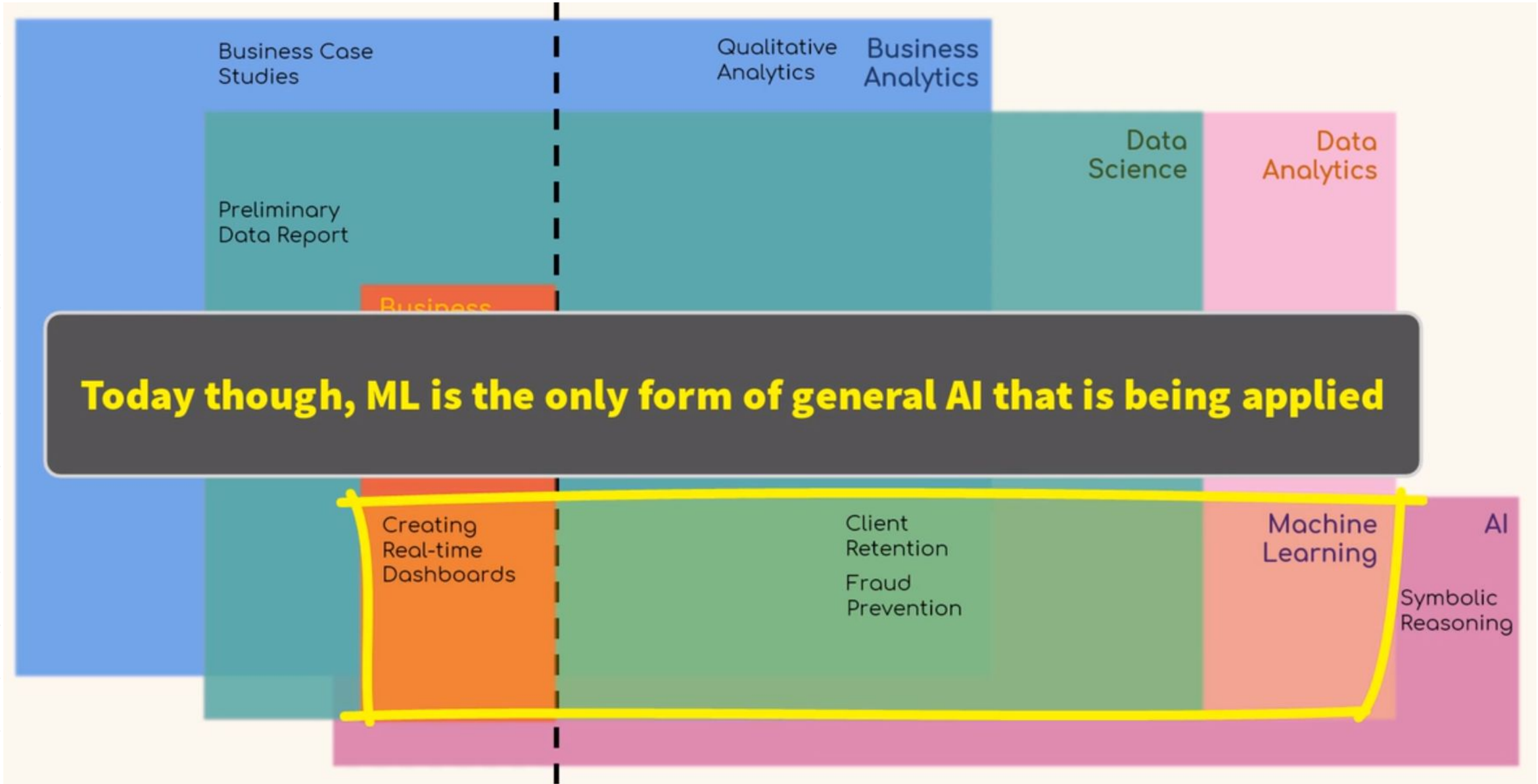
- If all mammals feed their babies milk from the mother (A)
- If all cats feed their babies mother's milk (B)
- ⇒ All cats are mammals(C)

Conclusion: A Λ B ⇒ C (Λ symbol means and & ⇒ symbol means implies)

Explanation:

- Proposition A and proposition B lead to the conclusion C

Now ML


Business Case Studies
Qualitative Analytics
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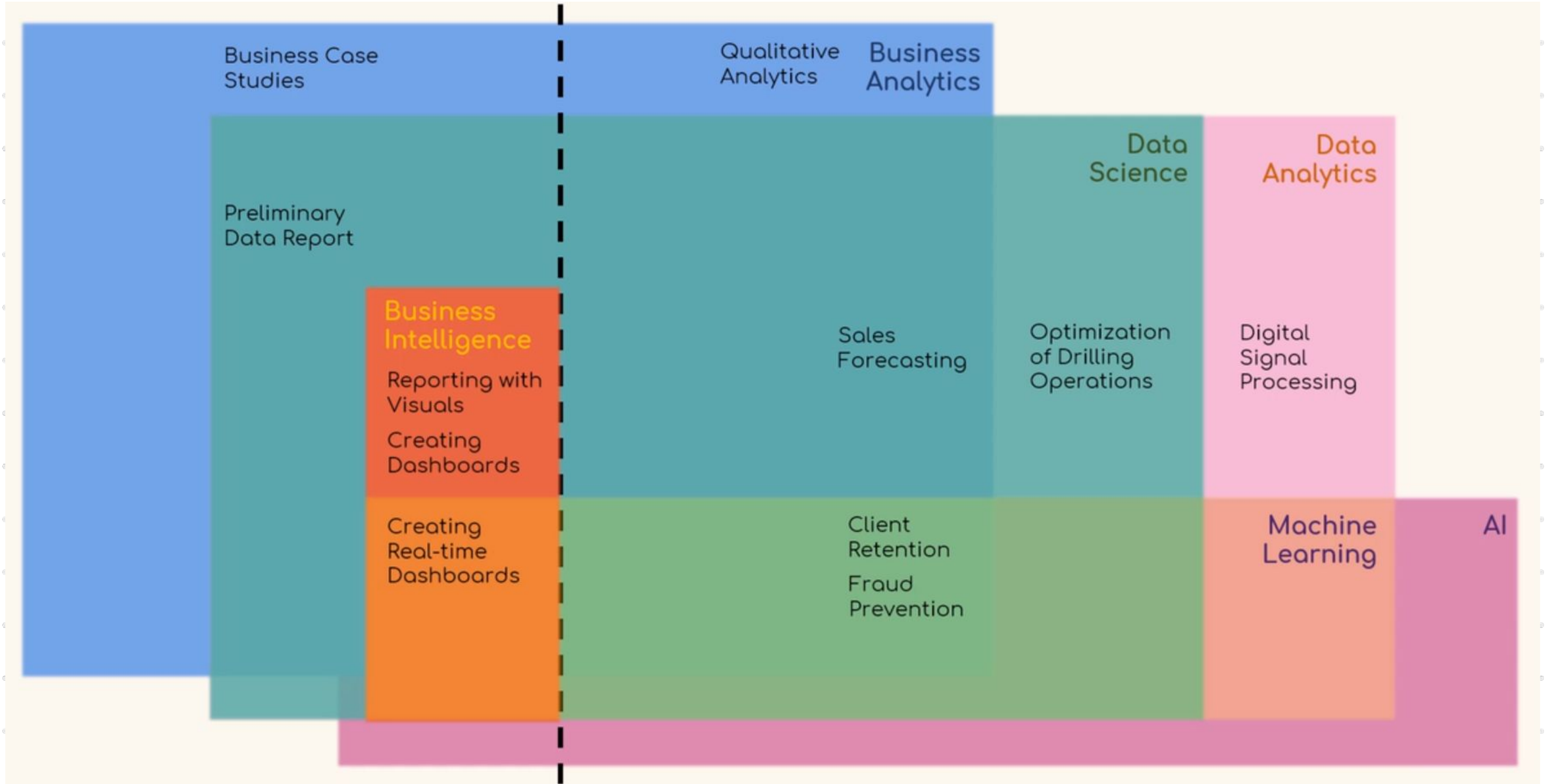
Preliminary Data Report
Today though, ML is the only form of general AI that is being applied
Creating Real-time Dashboards
Client Retention
Fraud Prevention
Machine Learning
AI
Symbolic Reasoning

Symbolic Reasoning was

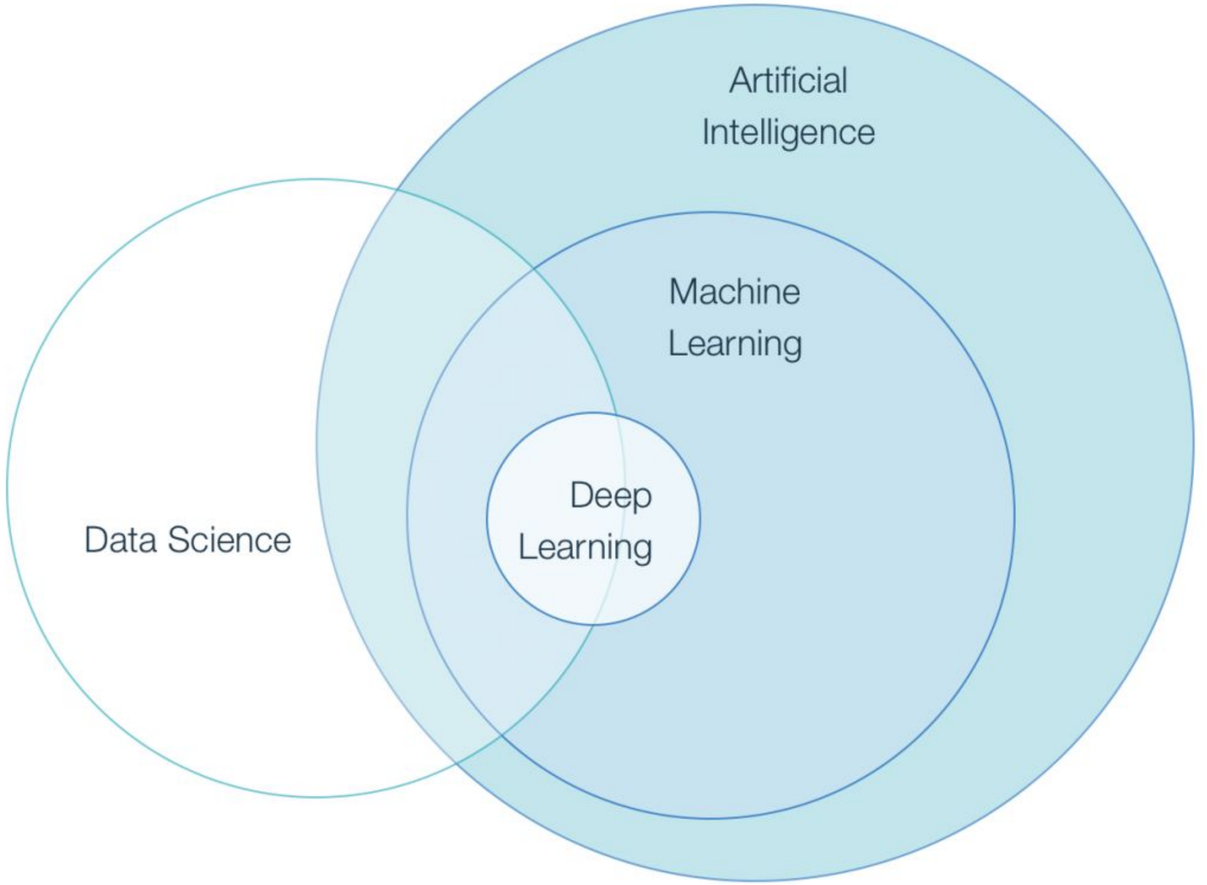
- **was** once a trend when people were trying to create human-like intelligence

- 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



AI

- According to the Turing test,
- is the machine's ability to exhibit intelligence behavior indistinguishable from that of a human

365 DataScience Vision for Advanced Analytics

Advanced Data Analytics?

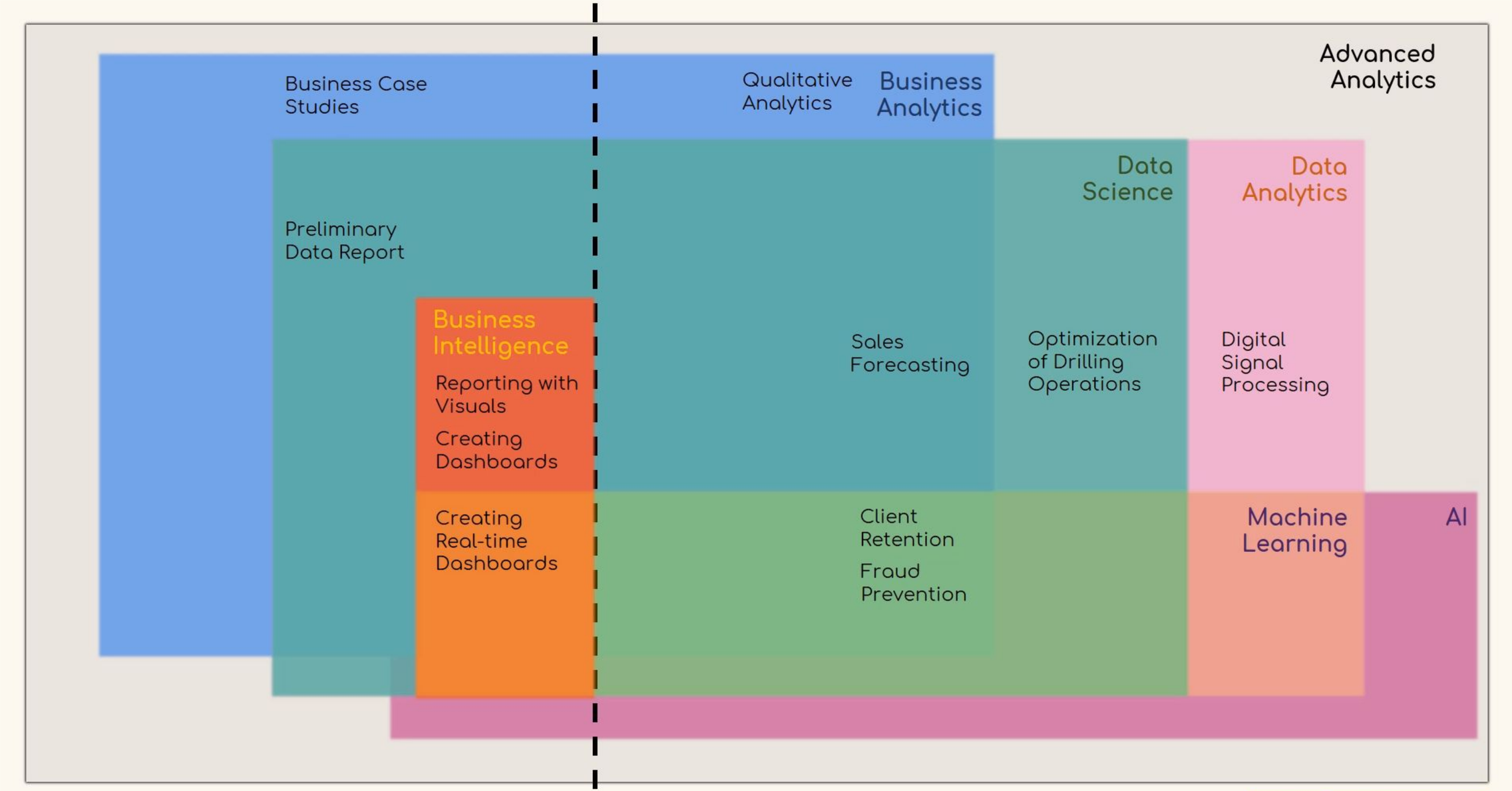
Advanced Data Analytics?

- 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

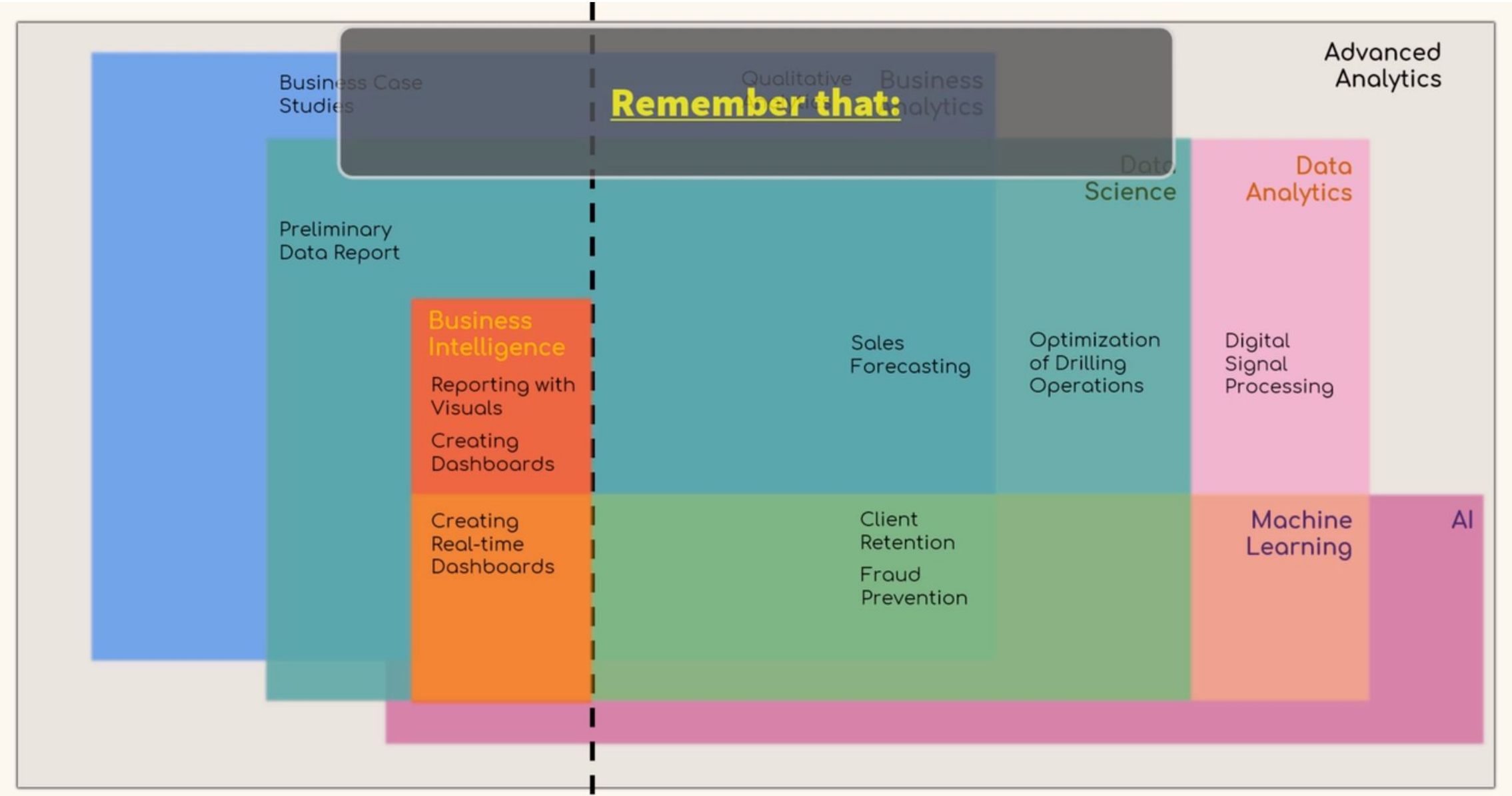
- Intimidating-sounding terms maybe used to discourage learning and create prestige

- 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

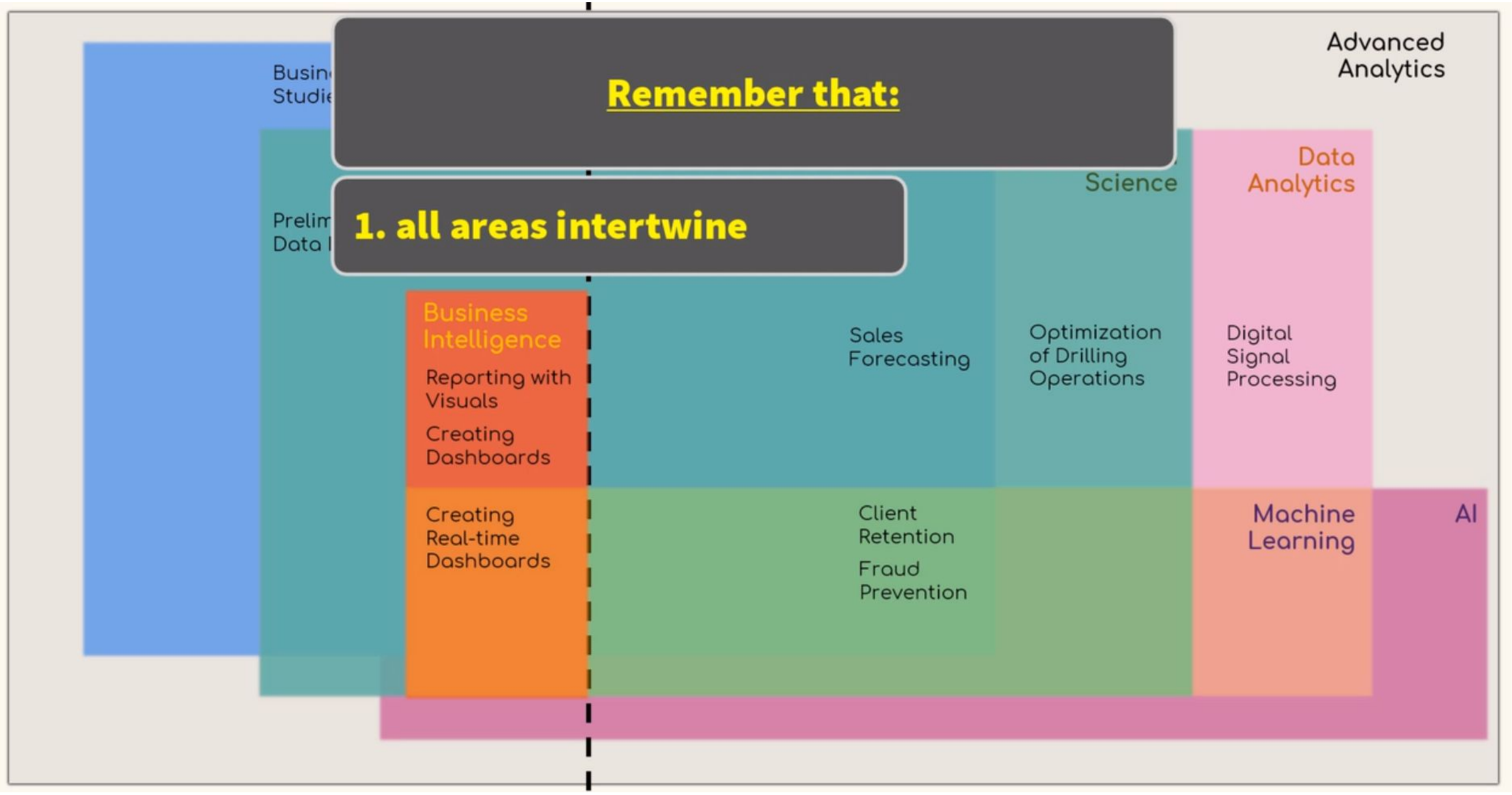
Advanced Data Analytics (Advanced Analytics)



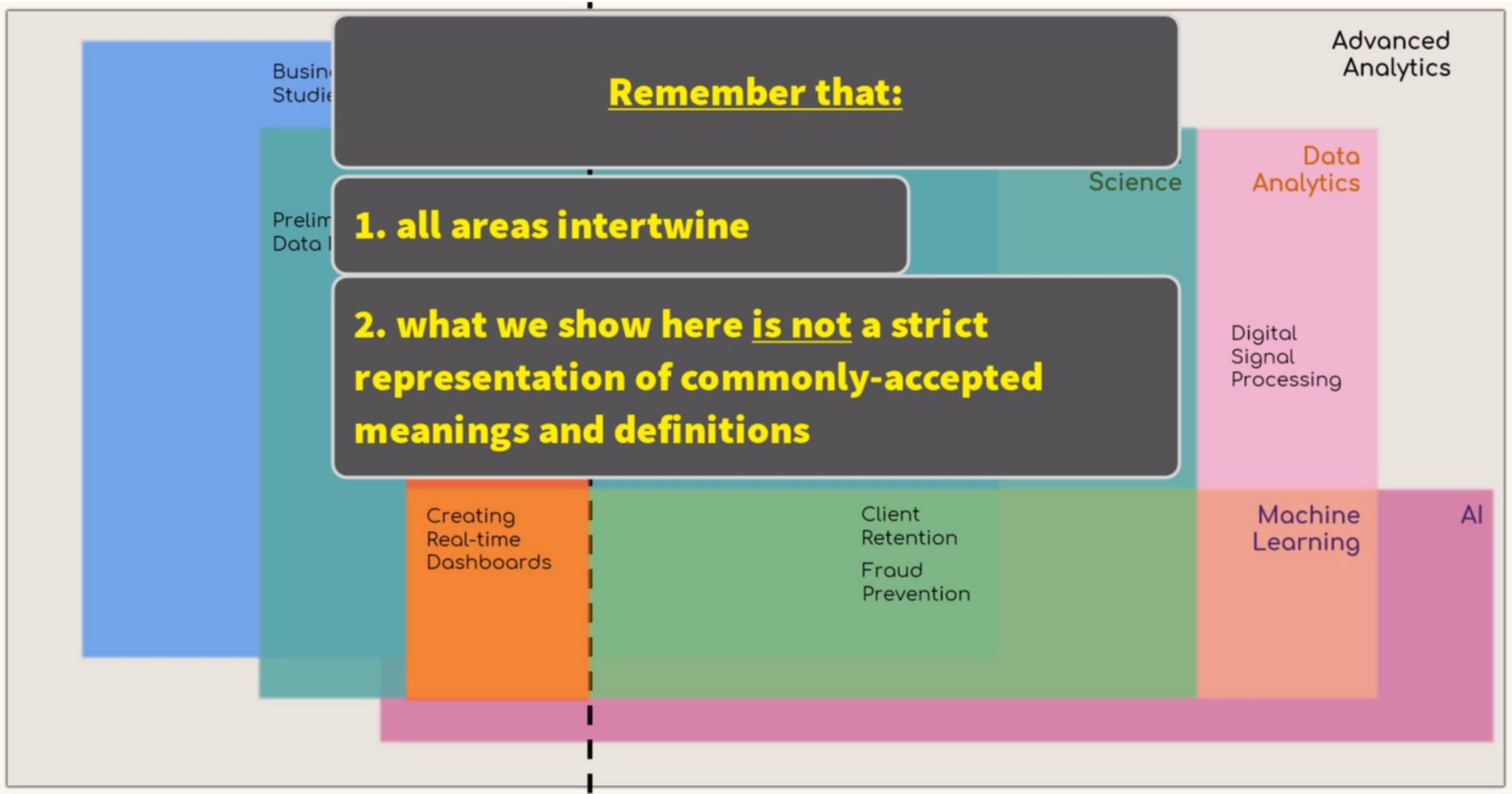
Advanced Data Analytics?



Advanced Data Analytics?



Advanced Data Analytics?



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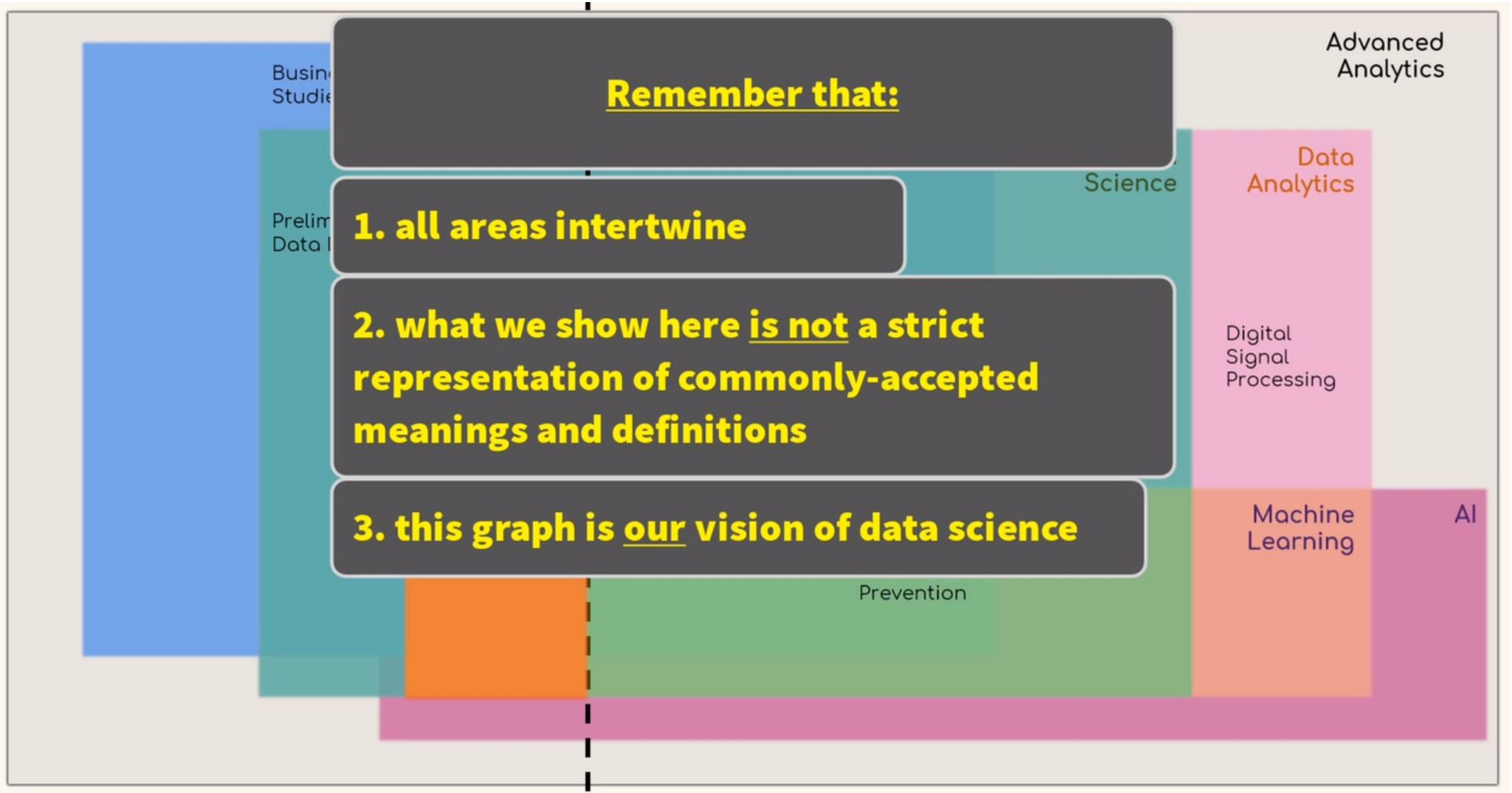
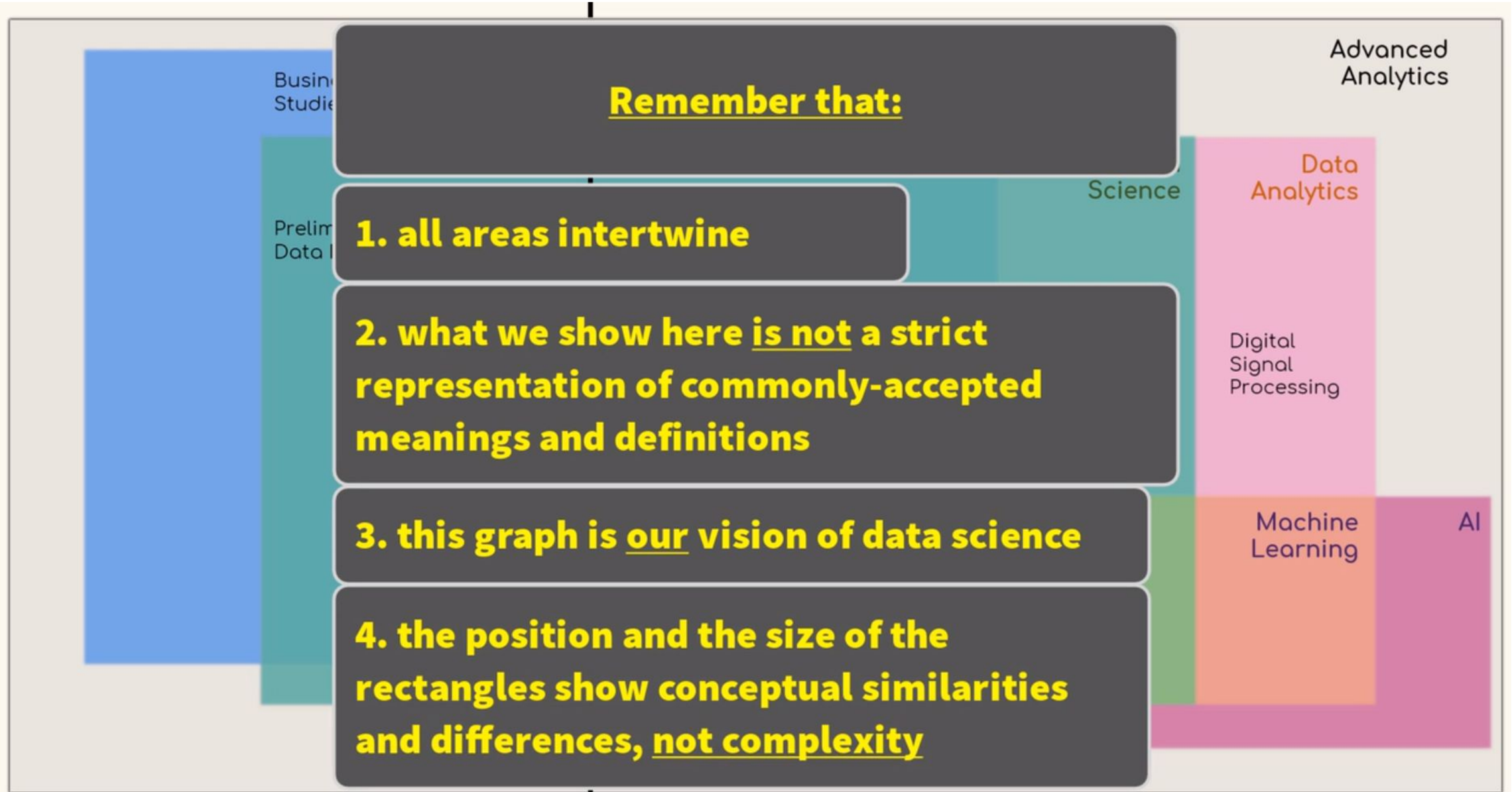


Advanced Data Analytics?



Remember that about the Diagram

- This diagram is **365 DataScience Vision**
  - 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.

Questions

Links

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

References

1. https://learn.365datascience.com/courses/intro-to-data-and-data-science
    - 365 Data Science - Introduction to Data and Data Science