Deloitte.

Data Platforms & Generative AI Solutions

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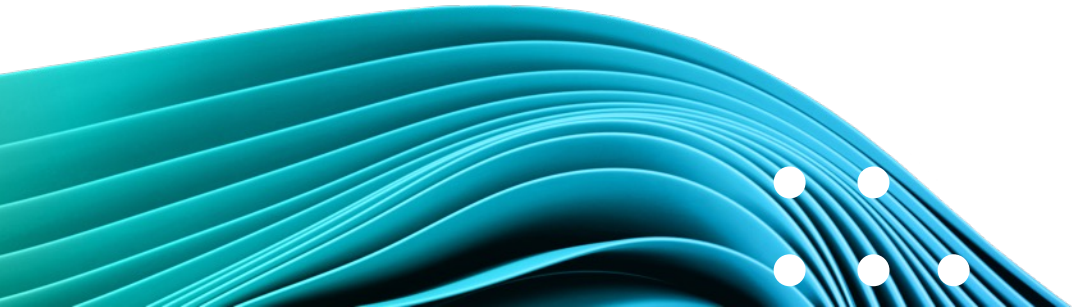
Agenda

01 Data & AI Technology

02 Data Platforms

03 Advanced Use Cases

04 Generative AI



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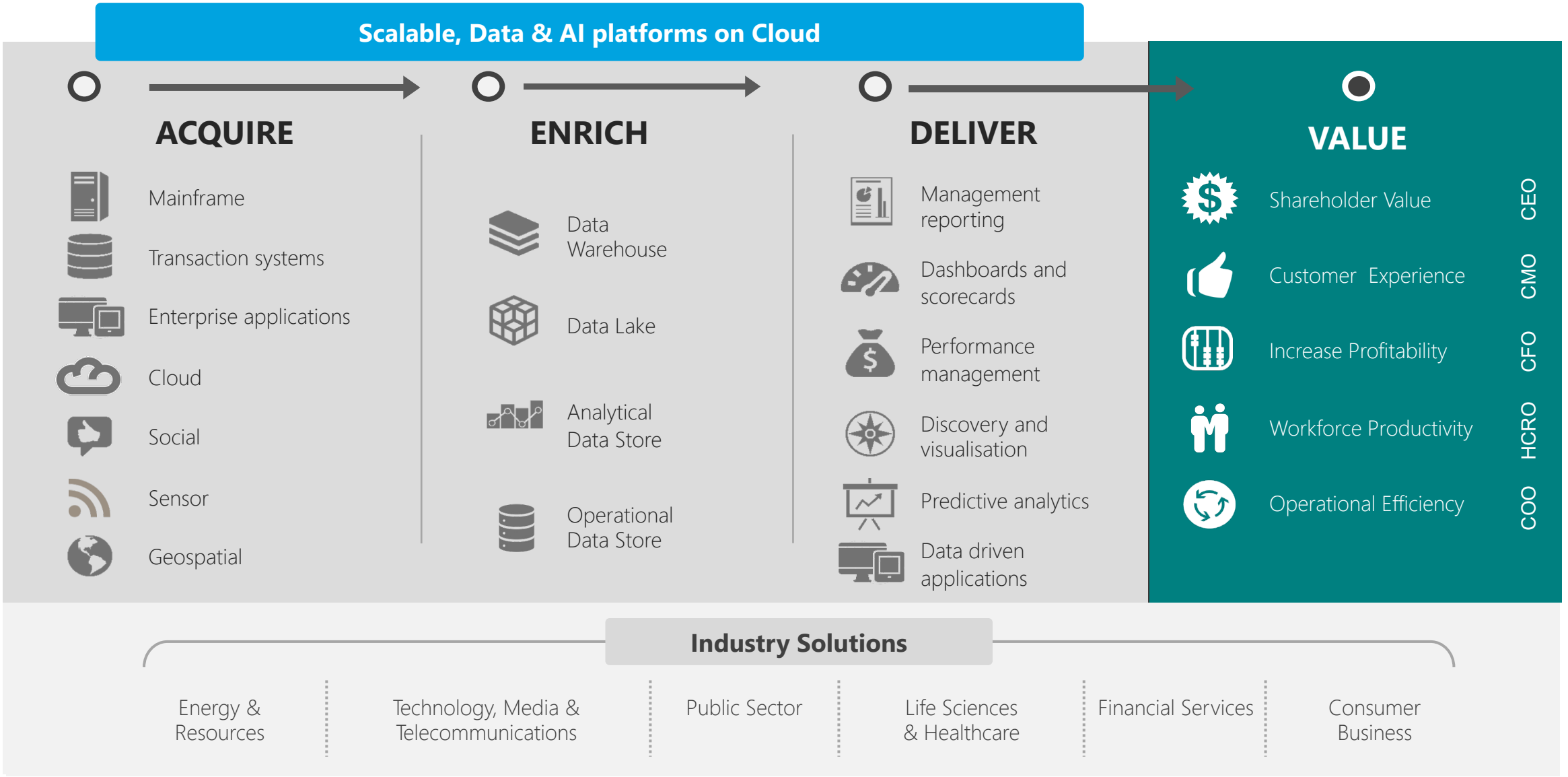
Shreya Sharma

EDGE ELECTRONS™ KPMG Deloitte.

DELOITTE DATA & AI

Data & AI Technology plays a critical role in creating customer value



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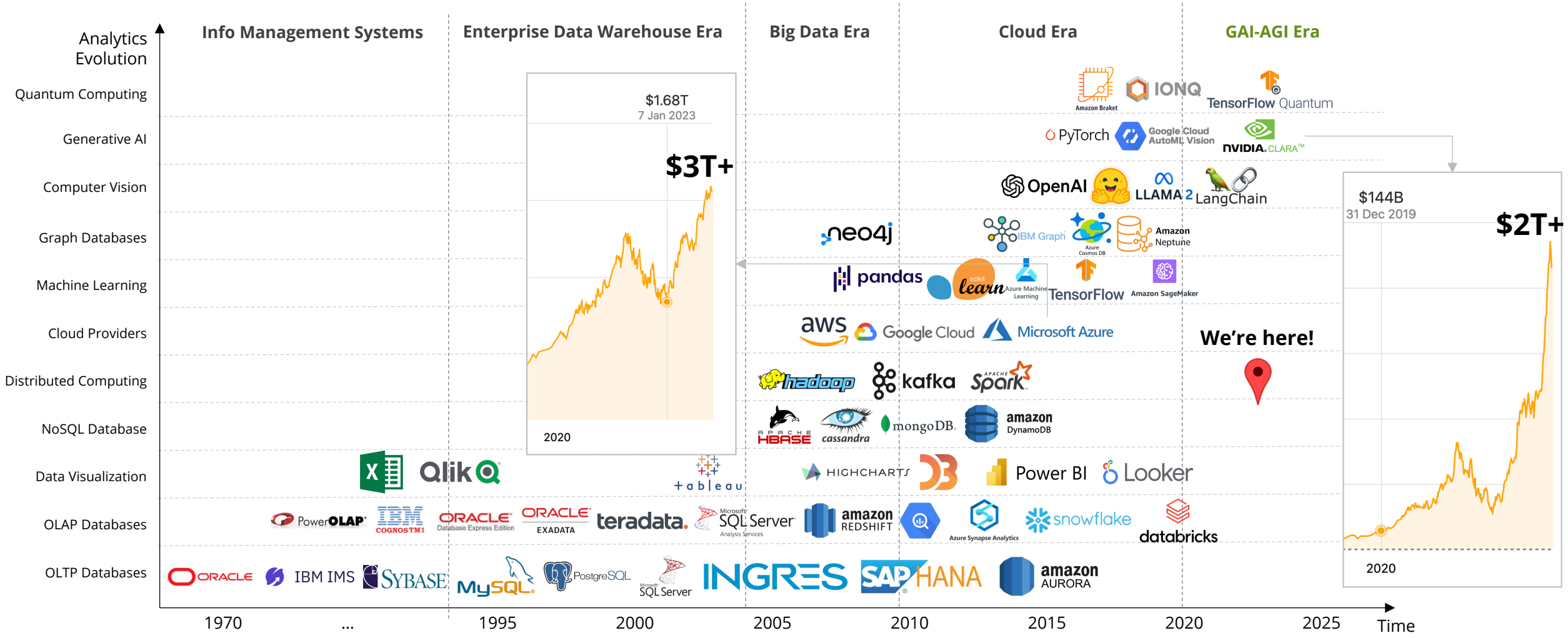
In recent times, Data & AI Technology has evolved exponentially…

Rapid technological advancements have fueled the enablement of more advanced analytics



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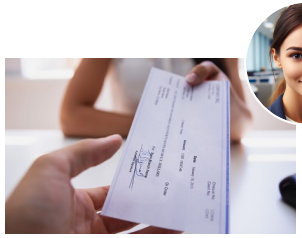
Resulting in highly connected and meaningful customer experiences

Simple customer experiences are powered by elaborate data architectures

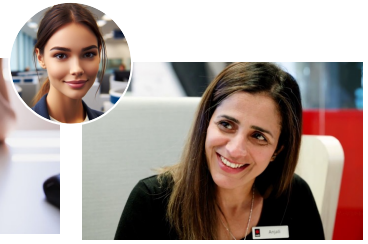
Shreya goes to deposit a cheque and withdraw some money from her local bank.

01



A **Banker** validates cheque and identifies the account and add transaction indicating money has been added.

02

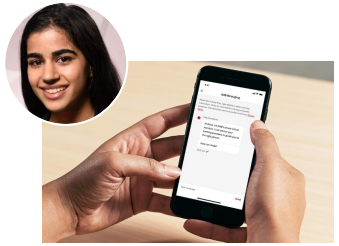


The **Banker** validates that Shreya has the money to withdraw and then adds transaction to remove money.

03

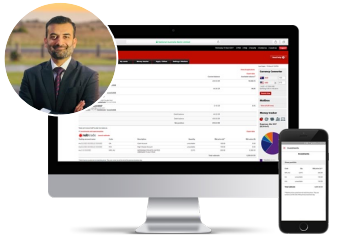
Shreya is identified as a potential customer for a new buy-now-pay-later credit card.

04



The bank sends a personalized email to **Shreya** with advice for how to get started.

05



A **banking analyst** wants to analyze the effectiveness of the marketing promotion.

06

By the end of the month, the **CFO** wants a summary of the marketing success of the promotion.

07

OLTP

- Efficiently record business transactions
- Handle high-concurrency transactions and ensure data integrity in real time
- Excel in quick inserts, data retrievals and updates

OLAP

- Execute complex analytical queries efficiently
- Excel in analyzing large historical data volumes for strategic decision making
- Business intelligence, data mining and decision support

2

3

CustomerValidationDB
Validate that Shreya is a customer of the bank using information such as her drivers license number.

Identify account number

AccountDB
Identify which account Shreya is depositing/withdrawing money to and lodge the appropriate transaction

CreditScore

CreditCards

Repayments

QantasPoints

Data Warehouse

CustomerInfo

6

4

7

8

GenerativeAI:
Leverage GenAI to create a personalized email, based on data from CustomerInfo, QantasPoints or CreditScore. For example, if Shreya has a low credit score, include tips about financially responsible, or if Shreya collects Qantas points, leverage that information to find deals to increase her points

Analytics:
Identify whether Shreya is an appropriate target customer by combining information such as her credit score and repayment history.
Identify whether she was successfully targeted through the marketing promotion by identifying whether she opened a credit card once the promotion was made available t o her.

Dashboarding:
Consolidate key information such as the amount of people targeted for this marketing promotion, the amount of people registered the new card, the total amount of money made for the bank using this card and the total debts accrued to show the CFO.

To deliver those experiences, we build large, scalable Data & AI platforms…

Purpose built to ingest data from a variety of sources and transform it into a format that provides business value

Data Warehouse

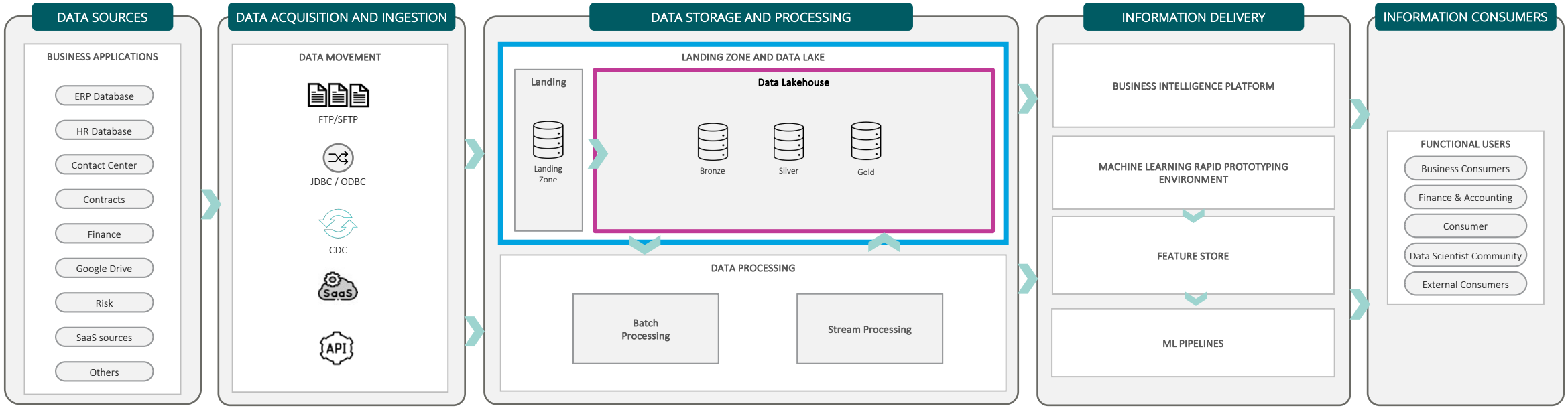
- Purpose built for Business Intelligence (BI) and Reporting
- ACID compliant with enforced data quality
- Limited support for diverse data types; lacks support for data science and machine learning

Data Lake

- Capable of handling machine learning and data science workloads
- Supports all data types, including high volume and high velocity data
- Limited BI support and complex setup may lead to data swamps

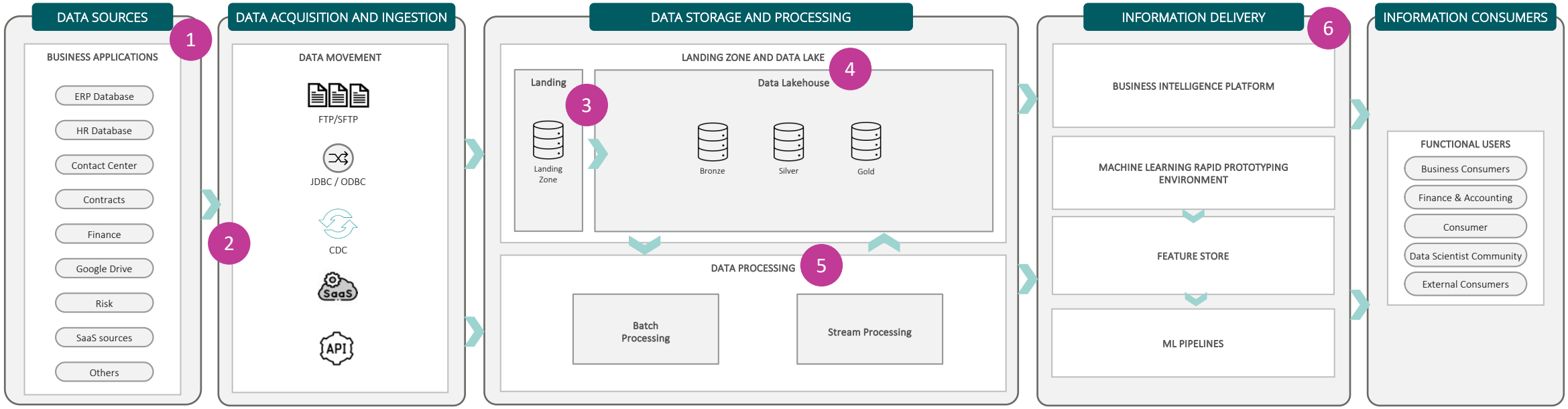
Data Lakehouse

- Implements a data warehouse structure on top of a low-cost, open-format data lake storage



These Data Platforms fuel a number of Analytical use cases and capabilities

Purpose built to ingest data from a variety of sources and transform it into a format that provides business value



1 Data sources can be anything where a business stores it's operational data – this could be OLTP databases capturing sales, or pdf documents in a google drive

2 Based on the data source, different ingestion patterns will be used to ingest the data into the platform

3 The data will be copied as-is into the Landing Zone – which is typically an object store

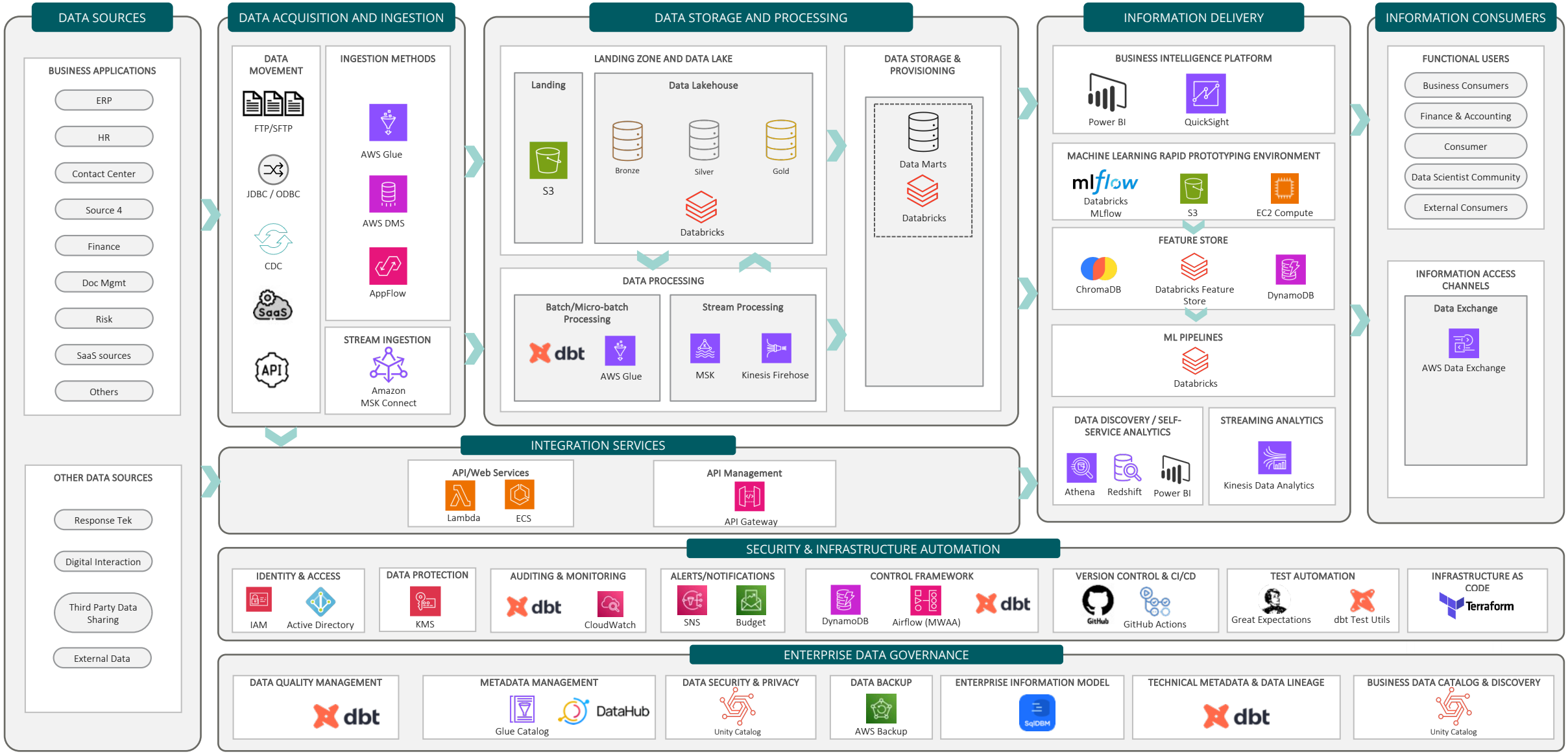
4 Medallion architecture is one way to store and process data inside your Lakehouse

1. Bronze: Data is copied as is, with minor changes to check data quality and add auditing columns (e.g. hash columns)
2. Silver: Data modelling is applied to this layer, joins are made across multiple tables based on the requirements of the business
3. Gold: This is the 'reporting layer' – data is modelled and structured so it is ready for reports to consume

5 Data can be processed as a batch (e.g. once a day) or as a stream depending on business requirements

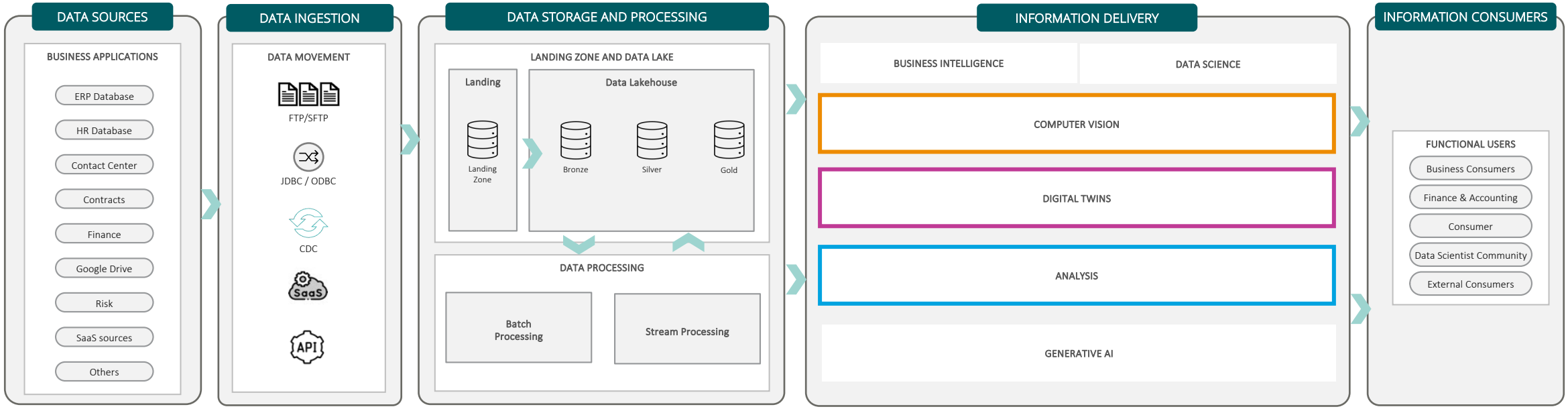
6 Data in the Gold (and sometimes Silver) layers is made available to be analyzed, added to dashboards or be used for machine learning

In Practice, Data Platforms are Sophisticated



Data Platforms need to be able to support complex use cases

Extending the data platform architecture to handle multiple advanced use cases



Meal Vision

Tackle the issue of malnutrition in aged care headfirst by:

- Providing insights of nutritional value of meals
- Early detection of malnutrition by identifying changed eating behaviors

Optimal Reality

Help organizations run millions of permutations on a digital replica of their network to drive optimal decisions in seconds:

- Stimulate traffic control under poor weather conditions and identify bottlenecks early
- Compare planned implementation to actual

Climate Emissions Analysis

Help banks identify the emissions of their customers and businesses to achieve a net-zero lending portfolio by 2050:

- Provide comprehensive predictions into future trends
- Enable informed customer discussion and enablement

Computer Vision Example: MealVision

World-first AI-enabled solution making a difference to people’s life in a major way

Digital Twin Example: Optimal Reality

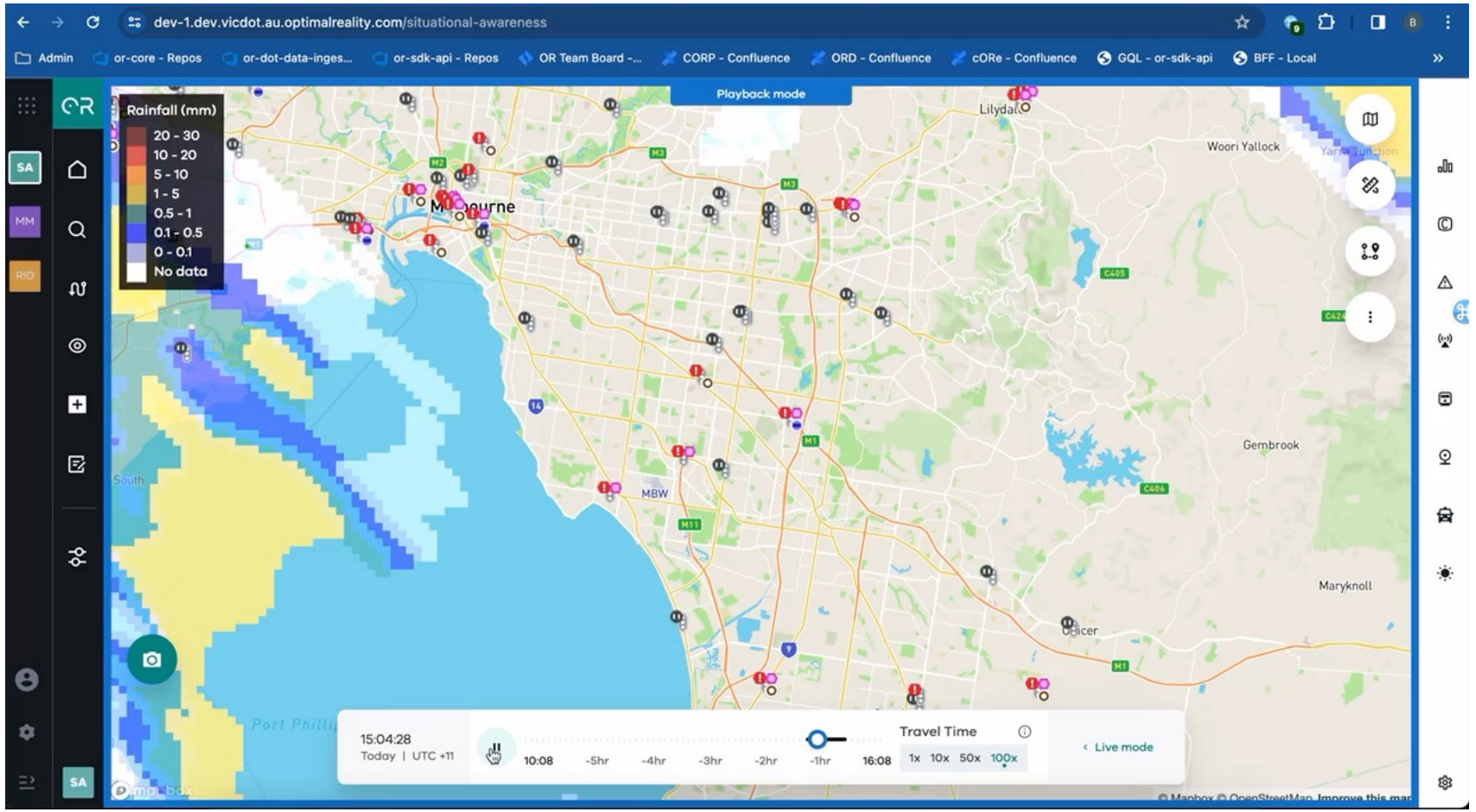
Create a smart city around connected industries – giving you mission control capabilities to solve strategic climate issues

A Government Agency leverages an Optimal Reality solution **for optimising traffic flow across the state transport network.**

Through OR, individual operators are provided with role-specific, contextually rich information to help them effectively participate in mission-based network management.

Feb 13th 2024 3PM: storms caused the collapse of 6 transmission towers and tripped an entire power station in Gippsland.

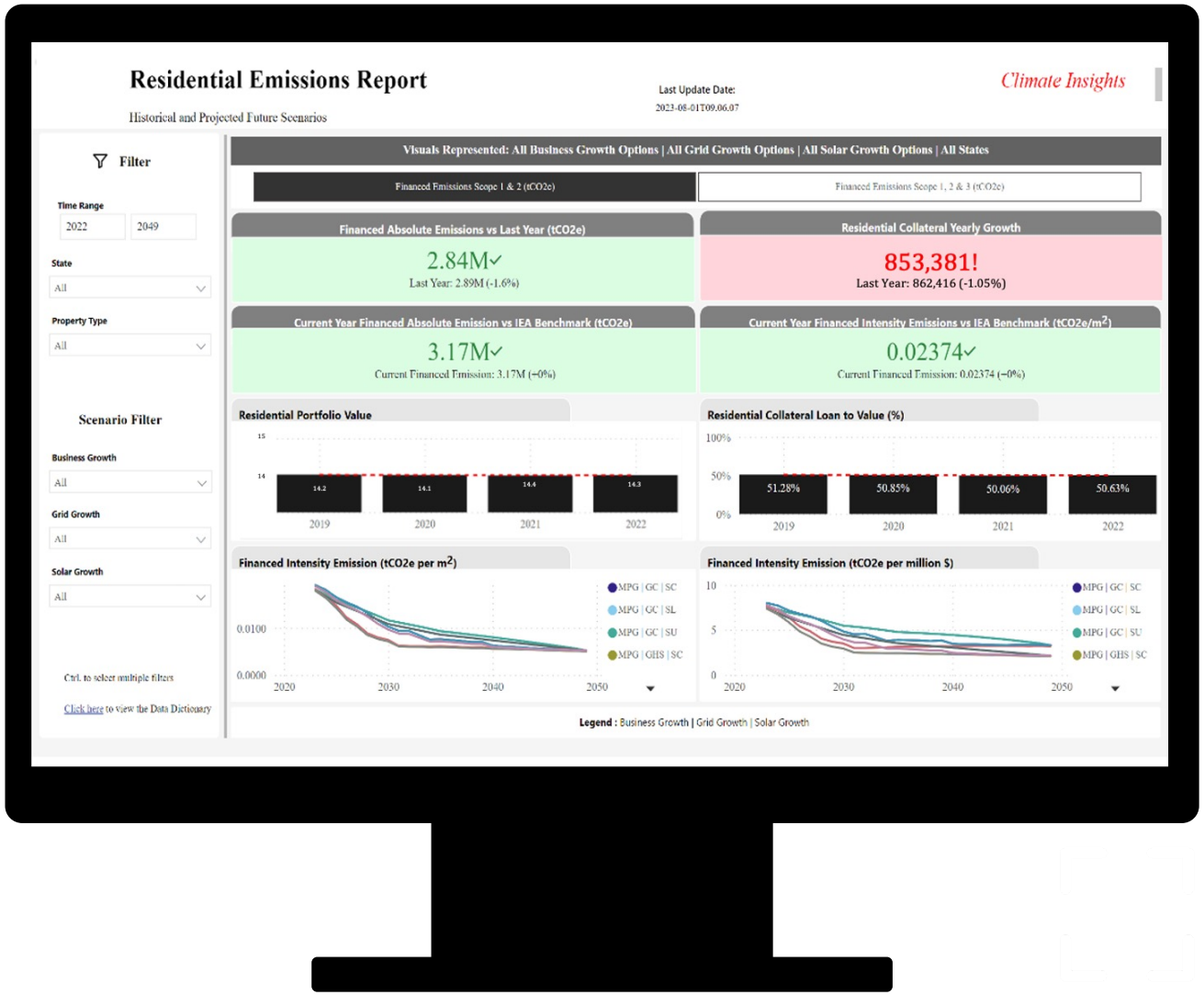
- 530,000 homes lost power
- Train lines went down
- Traffic lights went down



Business Analytics Example: Climate Emissions reporting and Scenario Planning

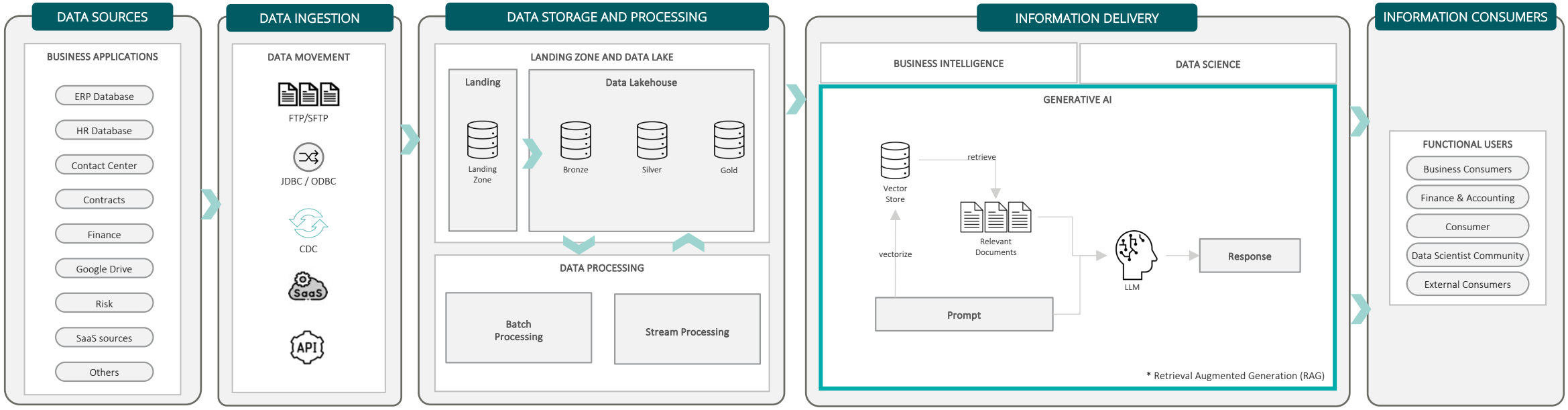
Banks need to be able to measure their Financed emissions, then provide customers with support to adapt greener alternatives

- Comprehensive Projections: The analysis dives deep into future trends, factoring in:
  - Portfolio growth dynamics
  - Evolving grid emissions
  - Inflation fluctuations
  - Technological advancements impacting emissions
- Filtering Options: Tailor the data view based on:
  - Specific states
  - Customer sectors
  - Desired timeframes (by year)
  - Emissions scope of interest
- Informed Customer Discussion: The report enables dialogue on:
  - Current market solutions for emissions reduction
  - Benchmarking: How the customer compares to peers in their locality or industry
  - Essential climate-related and financial risks for their assets



Complex Use Case Deep Dive: Generative AI

Extending the data platform architecture to handle Generative AI use cases



Level 1
Companies use ChatGPT to help them achieve their tasks.

LLM is not aware of the context of the business.

Level 2
Companies use ChatGPT, and in the prompt they provide extra context relevant to their company.

Private company information is shared with OpenAI.

Level 3
Companies host a generic LLM in their cloud platform and query that model and provide additional context as required.

Employees need to already know about the additional context to provide to the LLM.

Level 4
Companies set up a retrieval augmented generation (RAG) model to find relevant documents for them to provide context to the model.

The vector store needs to be configured to appropriately choose documents to understand context.

Level 5
Companies employ a combination of fine-tuning and RAG to provide context and rules to their model.

The LLM is baseline-context aware, but can also retrieve additional context from the vector store.

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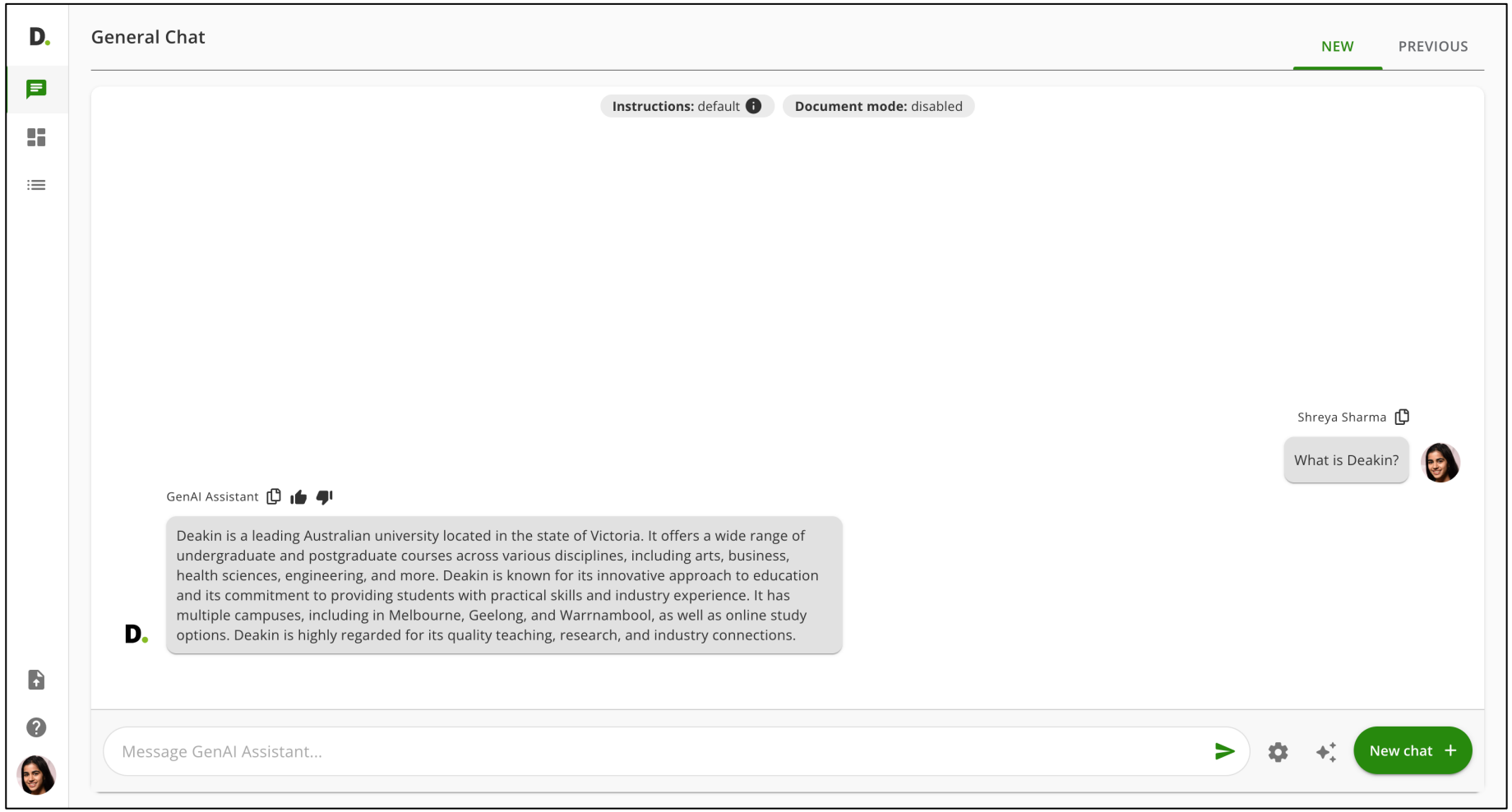
Exploring Generative AI

Deloitte's DGAP Accelerator allows clients to quickly create and interact with LLMs



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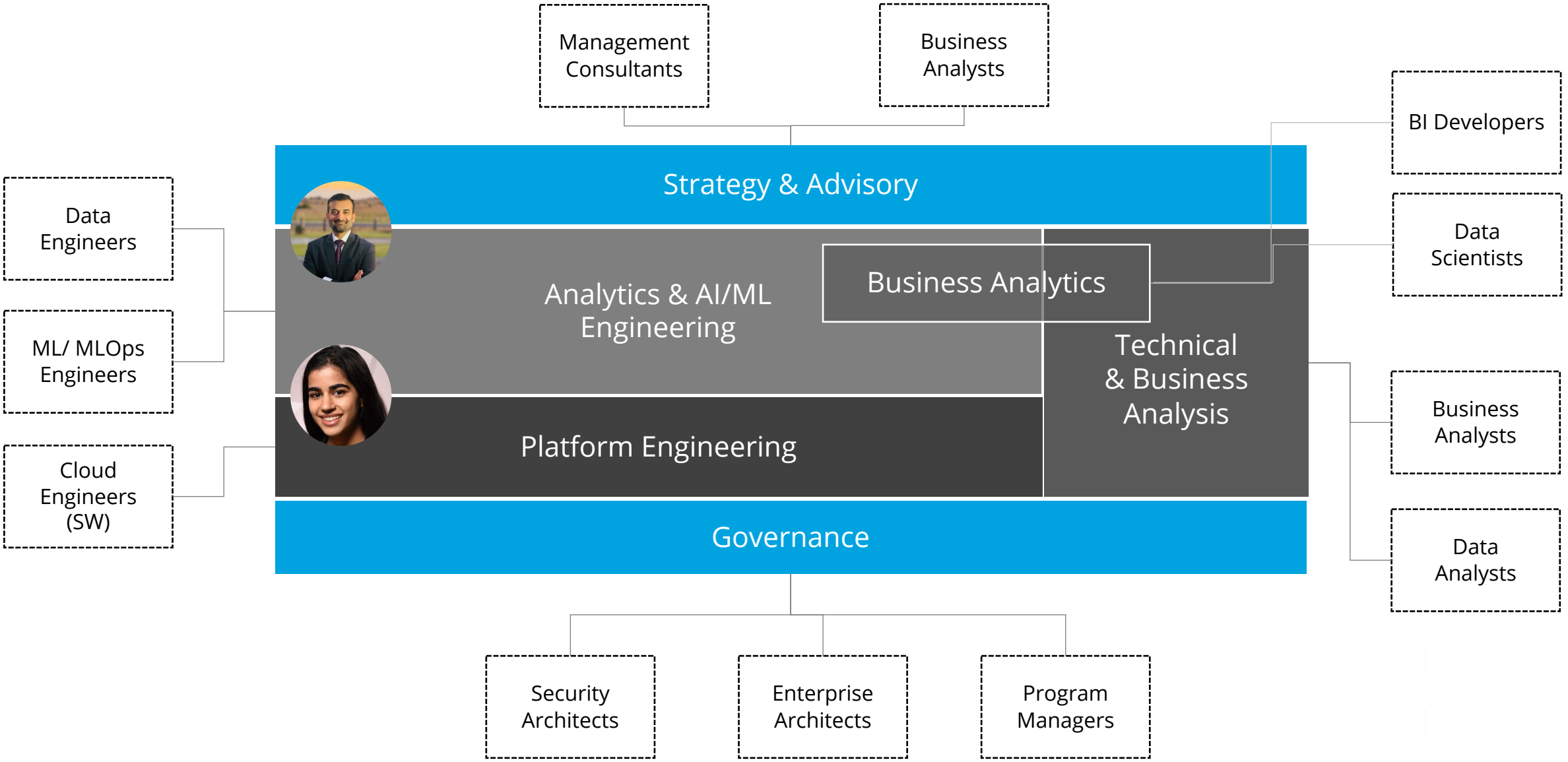
Career choices within a Data & AI Consulting Firm



Thank you!

Any questions?