A centralized tag mapping library in MS Fabric

Subsurface Production Data (SPD):
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Agenda

- Background and Scope
- Fabric Architecture
- Fabric Implementation
- Collaboration with Microsoft
- Summary
- Q&A

EPI SUB EXD DI SDD

Subsurface Data Delivery (SDD)

VISION

All subsurface data available anytime & anywhere with known quality

The same data shared seamlessly between all applications and subsurface users

Microsoft Azure

OSDU

Subsurface Production Data (SPD)

Problem Description

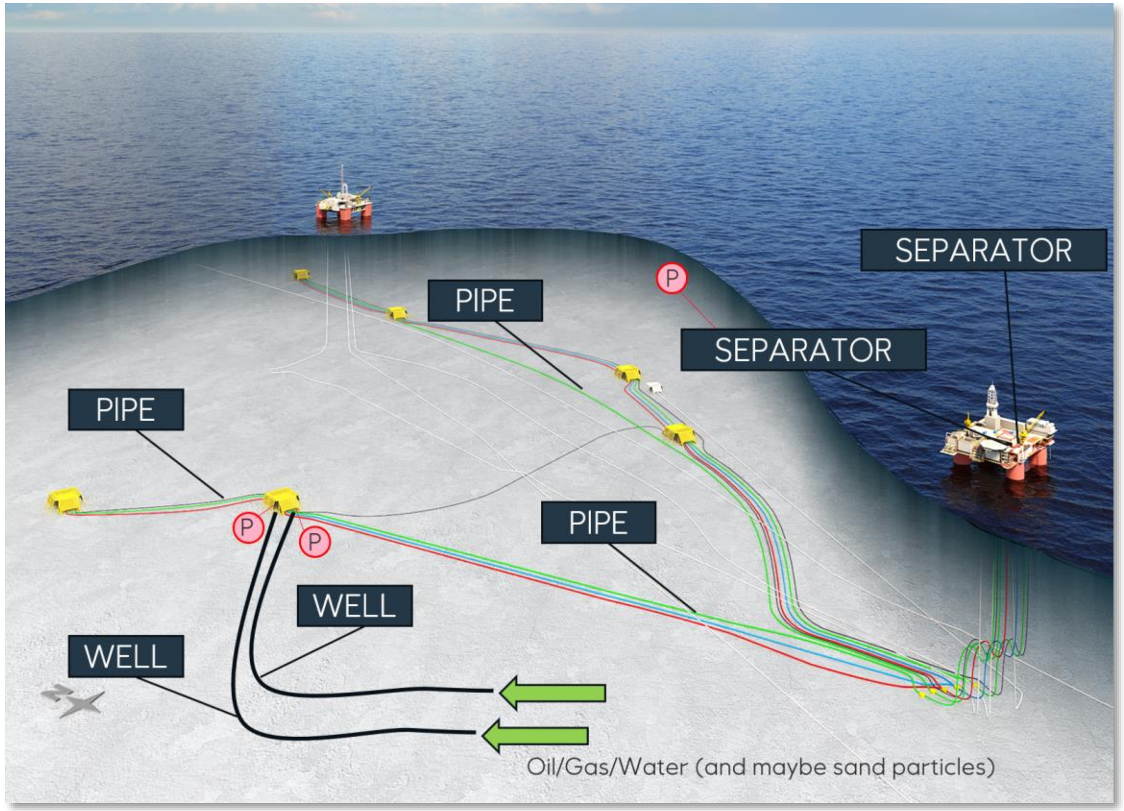
We have limited data models standardized and structured available for describing production and injection networks in Equinor

Proposed Solution/Outcome

"Centralized tag mapping library for relevant objects in production- and injection networks"

Combine data from multiple sources to a common cloud database with an aligned naming standard.

Production Network – simplified example



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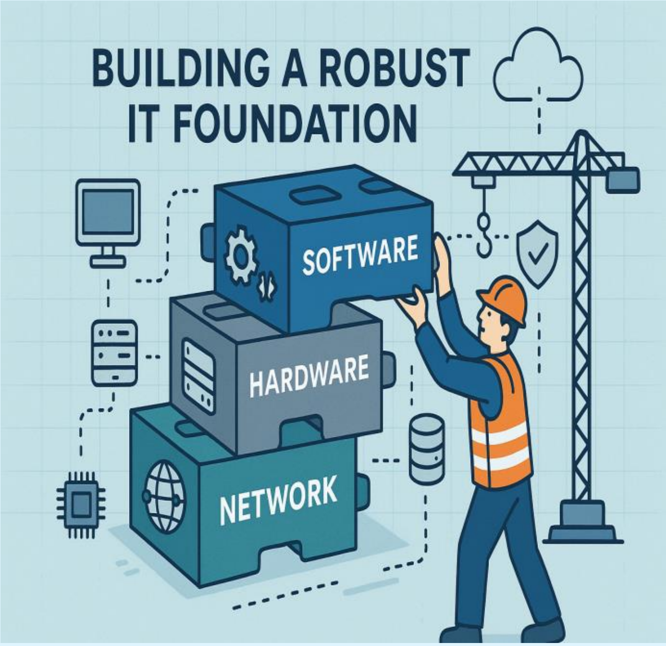
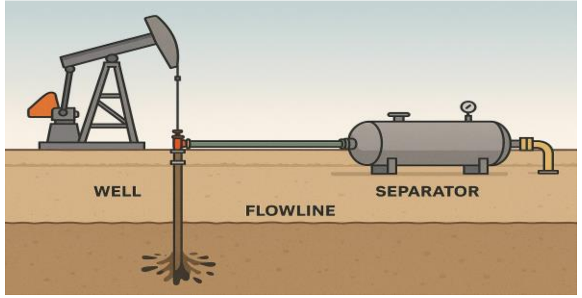
Building a robust foundation for future digitalisation



Standardized **objects from the sources** **(providing uuid, unique naming structure)**



SAP STID

energy components

Standardized naming of **properties** of the object

Tubinghead pressure

WHP

WH Press

BHT

Brønnhodetrykk

THP

Mapping of standardized **properties** of sensor data to an object

Challenge: WH Press WELL.NO 34/7-P-30. -> IMS Tag number: 16A-PI___305 **?????**

Solution :

- Standardized equipment Type: **WELL**
- Standardized equipment Name: NO 34/7-P-30
- Standardized equipment Type Property Name: **WH Press** (with mapped tag no:16A-PI___305)

What we deliver and the SPD tables structure

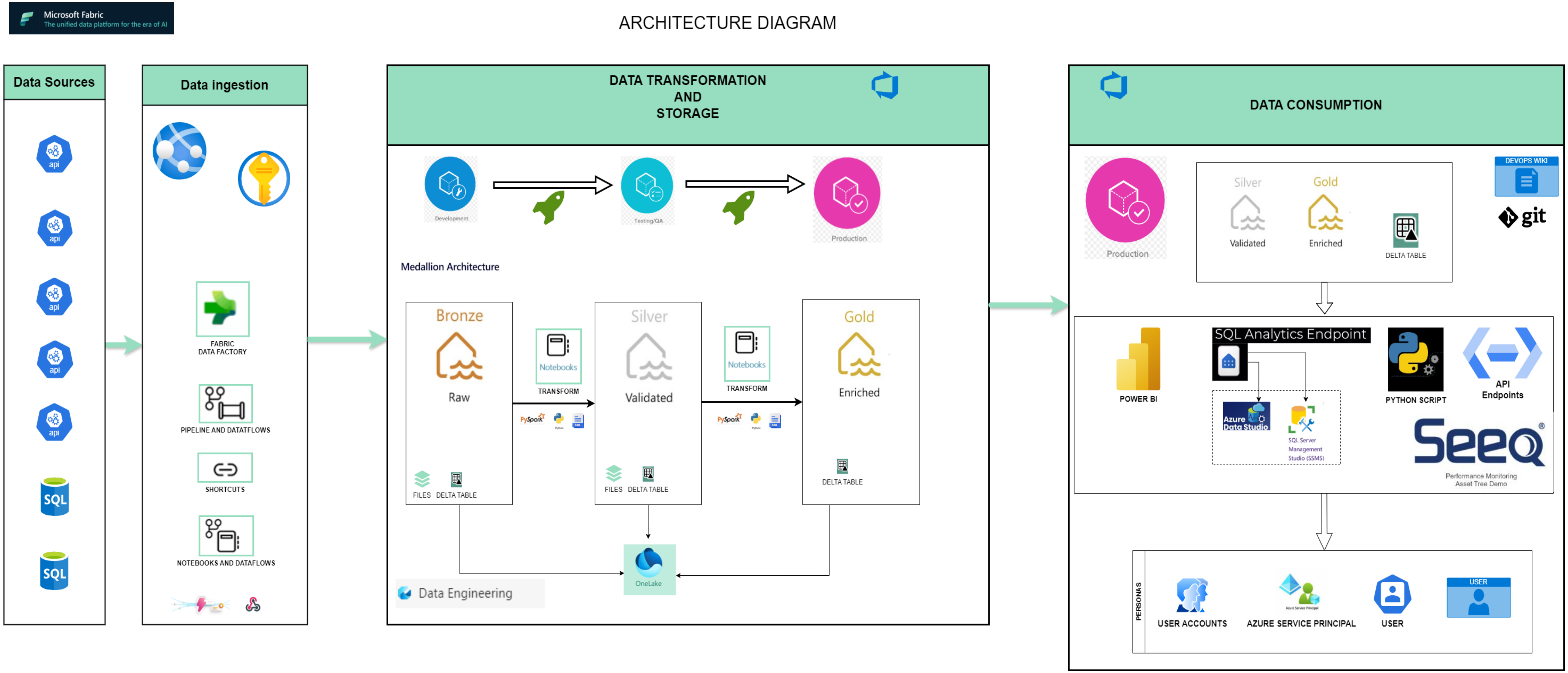
4 types of tables for each object Well, Separator and Flowline

- Header (standardized information about the object, uuid, name, location etc....)
- Alias (alias names as key information for further connections to relevant databases, removing silos)
- Attributes (standardized definitions of the attributes belonging to each object)
- Attributes mapping (local IMS tag number in for each attribute, cross assets)

In addition, we deliver:

- Generic model with a high flexibility
- Constants table enabling easy availability

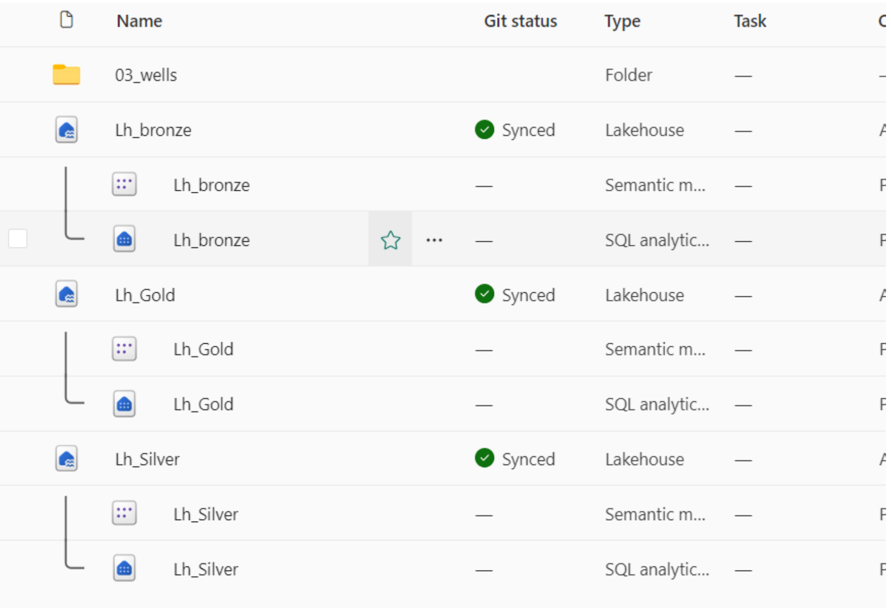
Fabric Architecture Overview



Open

Microsoft Fabric Architecture

- **Data Ingestion:**
  - APIs
  - Databases
- **Data transformation and sharing:**
  - Lakehouse Architecture (Medallion)
  - Notebooks for data transformation
  - Fabric data pipelines for orchestration
  - SQL-endpoint for direct queries and our API
  - Microsoft Entra for authentication
- **All-in-one data platform:**
  - Alignment and easier to set up
  - Support and ownership within Equinor



Name	Git status	Type	Task
03_wells		Folder	—
Lh_bronze	Synced	Lakehouse	—
Lh_bronze	—	Semantic m...	—
Lh_bronze	—	SQL analytic...	—
Lh_Gold	Synced	Lakehouse	—
Lh_Gold	—	Semantic m...	—
Lh_Gold	—	SQL analytic...	—
Lh_Silver	Synced	Lakehouse	—
Lh_Silver	—	Semantic m...	—
Lh_Silver	—	SQL analytic...	—

Implementation on Microsoft Fabric

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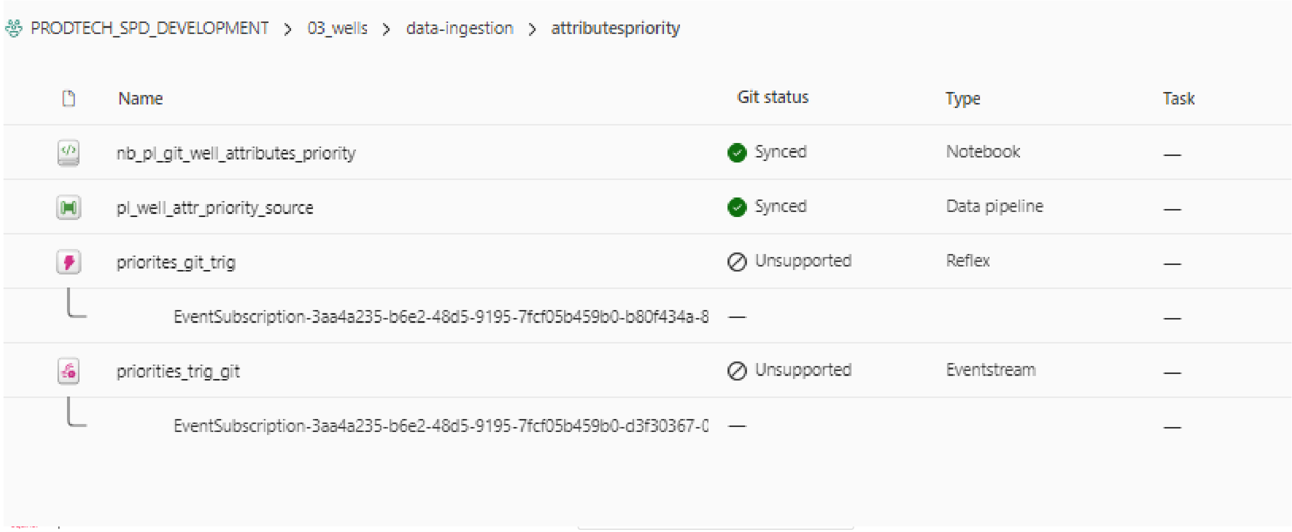
- **On the ingestion side**

- **Example**: triggering a pipeline when a git pull request is merged

  - Webhooks

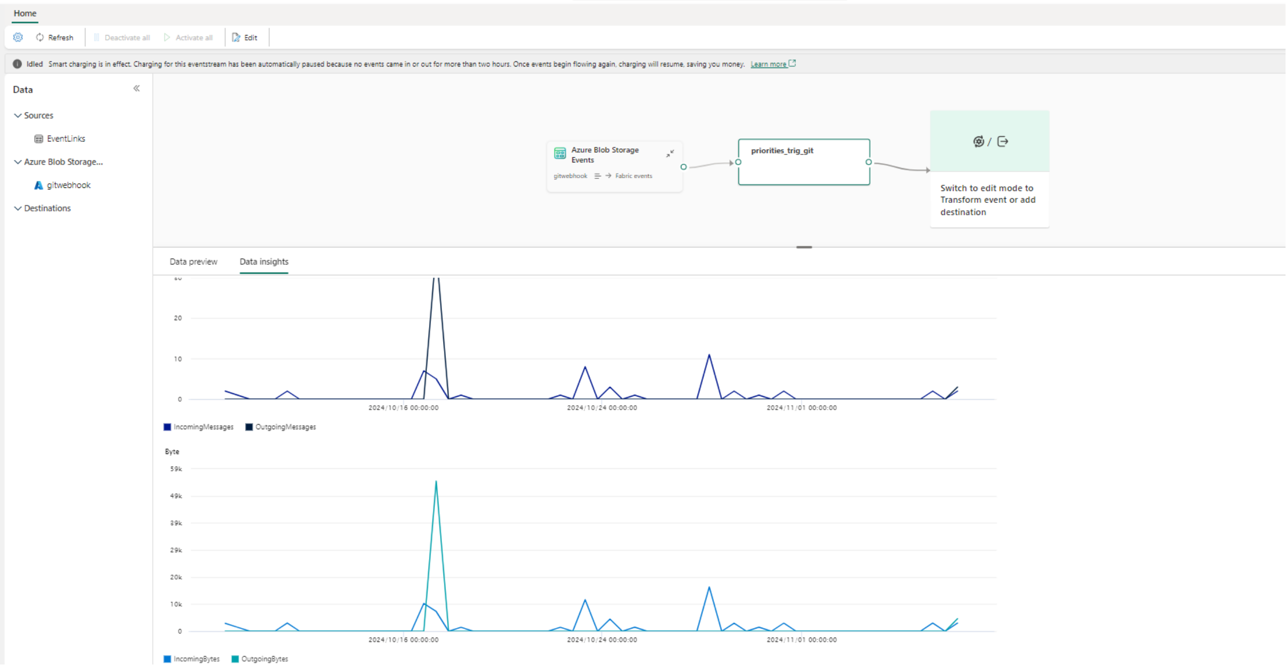
  - Data Activator:
    - Function app creates blobs
    - Listening to blob storage
    - When a new file arrives, the pipeline is triggered

  - Fabric API
    - Now allows service principals
    - Migrating to a function app to trigger pipelines



PRODTECH_SPD_DEVELOPMENT > 03_wells > data-ingestion > attributespriority

Name	Git status	Type	Task
nb_pl_git_well_attributes_priority	Synced	Notebook	—
pl_well_attr_priority_source	Synced	Data pipeline	—
priorites_git_trig	Unsupported	Reflex	—
EventSubscription-3aa4a235-b6e2-48d5-9195-7fcf05b459b0-b80f434a-8	—		—
priorities_trig_git	Unsupported	Eventstream	—
EventSubscription-3aa4a235-b6e2-48d5-9195-7fcf05b459b0-d3f30367-0	—		—



Implementation on Microsoft Fabric cont.

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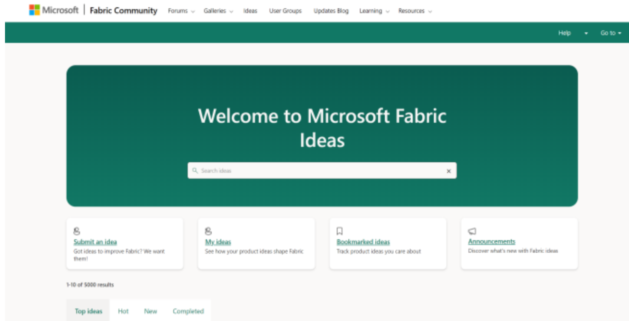
- **On the consumption side:**
  - PowerBI report
  - RestAPI using the Fabric SQL-endpoint
    - SQL pool warm
  - Python SDK
  - SeeQ
  - Mismatch legacy applications which might only allow SQL-authentication
  - Streamlit frontend for data visualization

Collaboration with Microsoft

Early adopter of Microsoft Fabric:

- Collaborating with Microsoft on development
- Reporting critical issues
- Forums for discussions within Equinor and Capgemini



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Summary

- What worked well
  - Fabric is an all-in-one data platform
    - As such, easier to set up
  - Ownership and push from Equinor
    - Fabric core team
  - An SME team and open forums where we can ask questions and learn from each other
  - Support from Microsoft

- What could have been better
  - Core features were missing in the start
    - Steady improvements have followed
  - Often the errors are not very well explained
  - SQL request time outs
  - Can be a challenge to combine with other applications