



storaenso

AI Platform for large scale manufacturing industry



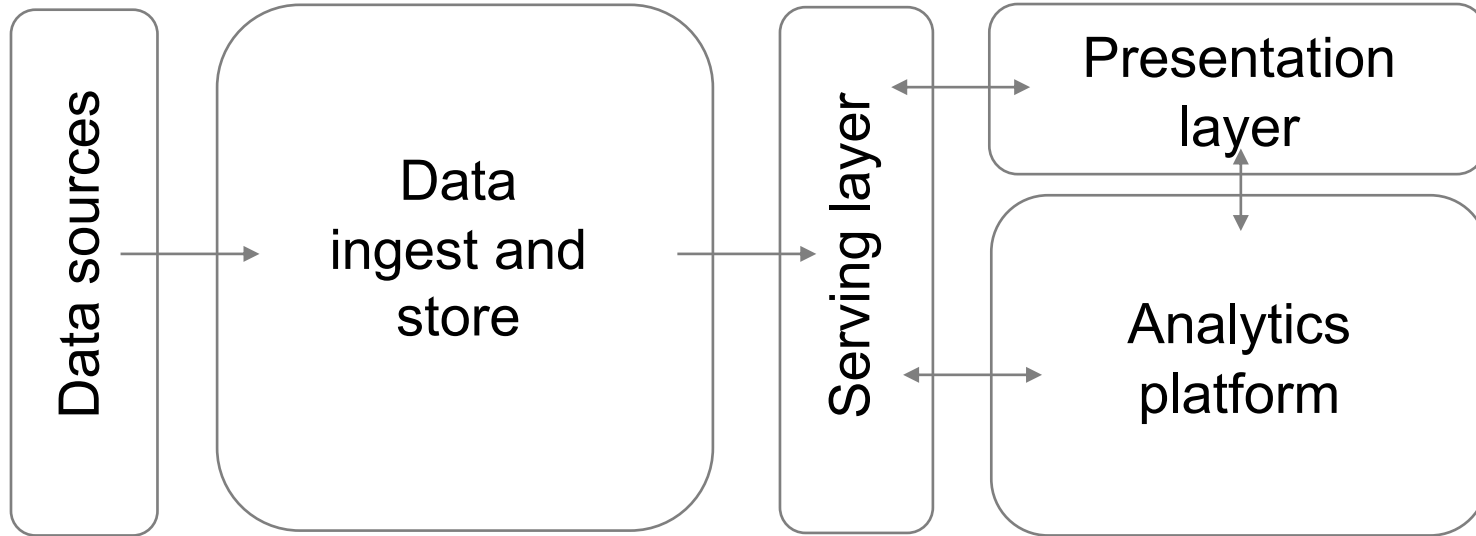
THE RENEWABLE MATERIALS COMPANY

Outline



- Conceptual view of AI Platform
- Conceptual view of AI based service
- Major data and AI related challenges at Stora Enso
- How to meet these challenges?
- Conclusions

Conceptual view of AI Platform

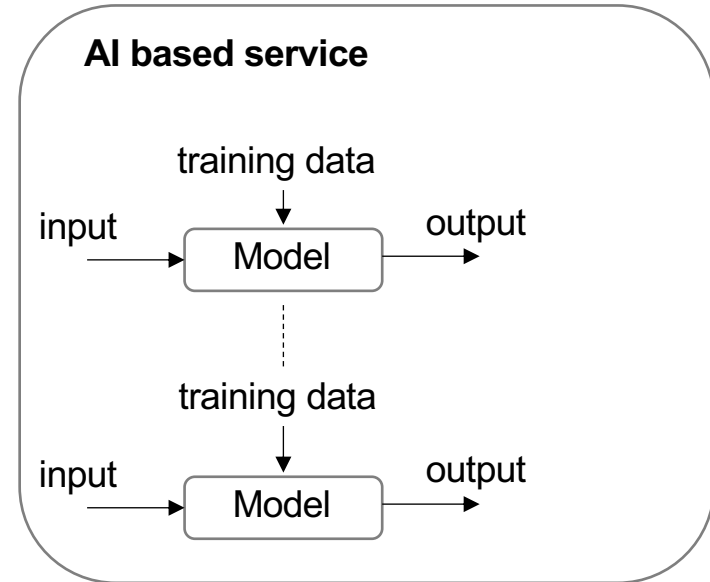


Not a single platform but a set of tools and architectural guidelines!

Conceptual view of AI based service



- The core component of an AI based service is a **model or several models**
- A model is a function that performs an **input-output mapping**
- Usually model is statistical and its parameters are calibrated by using **training data**
- A model should never be exposed in production to the data with significantly different statistical properties as the training data has



Major data and AI related challenges at Stora Enso



- **High data volumes and data variety**
 - Production line data, high timing requirements, large volumes (~200 TB/year)
 - Transactional business data, low timing requirements, moderate volumes (50 TB/year)
- **Quality and changing properties of the data**
 - Sensor data is not always available, infra problems
 - Statistical properties of the data can change: aging of a sensors, configuration changes, human errors, ...
- **Multivendor environment**
 - SE operates in 36 countries
 - Over 400 vendors: service providers, software vendors and integrators, ...

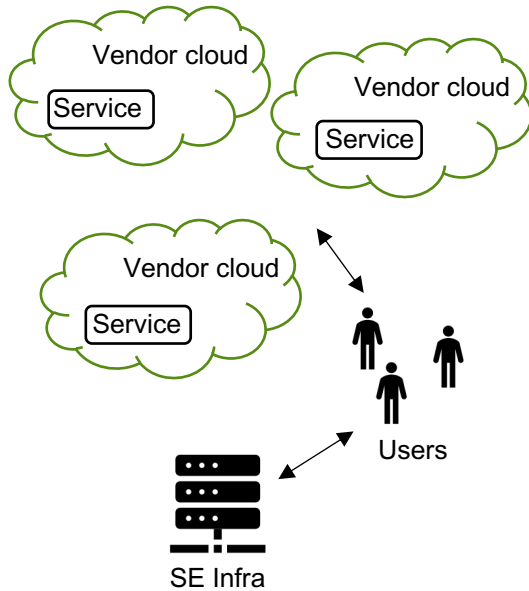
- **Visibility to AI based services**

- How to provide tools for the service owner to observe functionality of an AI based service, data and models?
- AI ethics in practice:
 - Are the decisions suggested or taken by AI sound, rational and follow ethical guidelines?
 - Discriminatory bias in the data used to train the model?
 - What actions to take to correct faulty system?

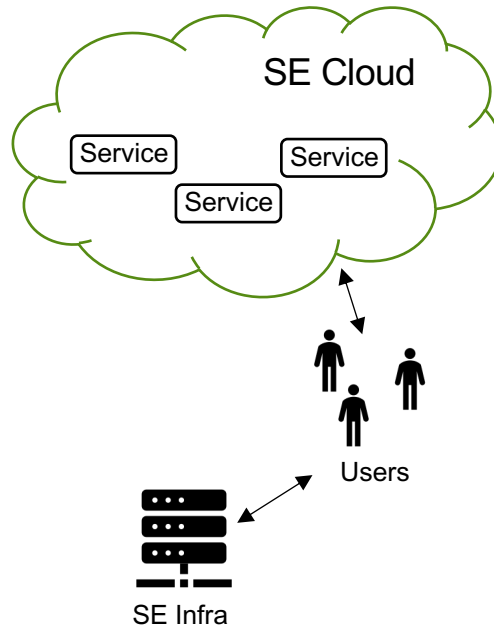
Evolution of digital services at Stora Enso



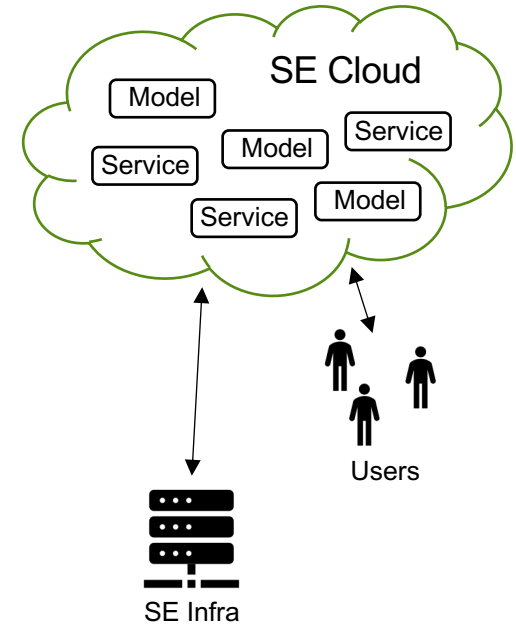
How it used to be



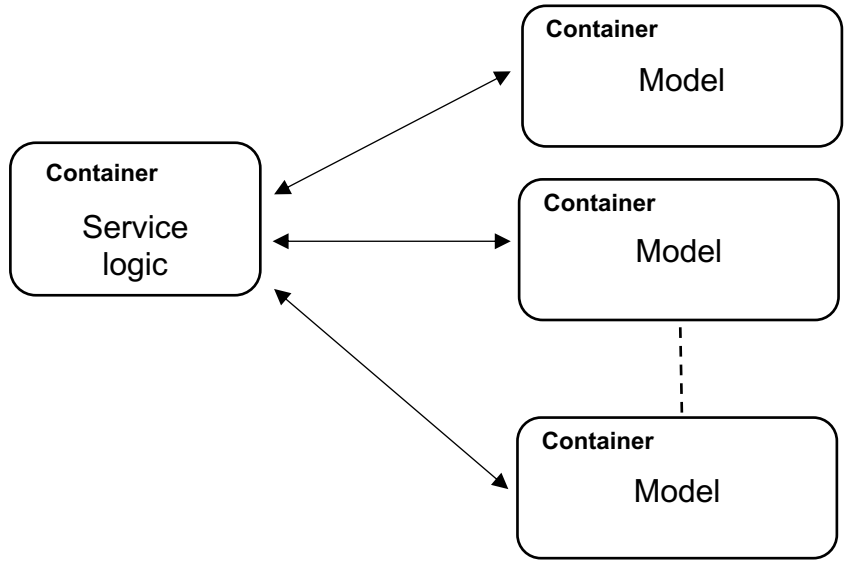
How it is



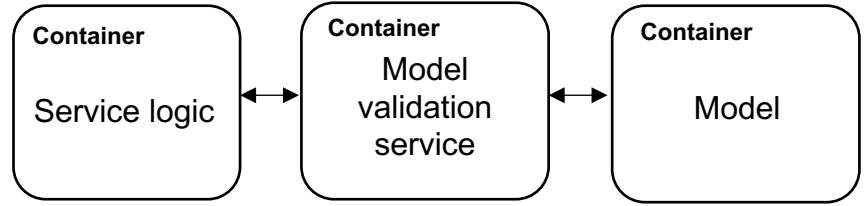
How we would like it to be



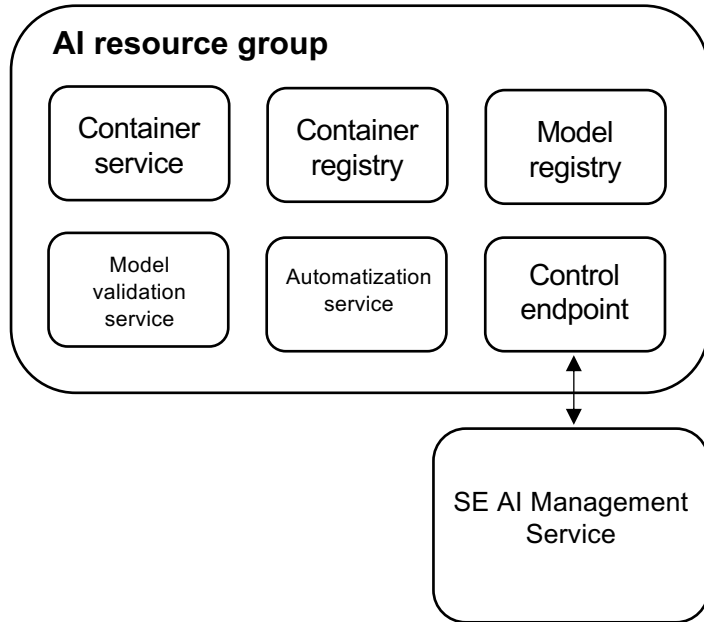
Why it is important to separate model from service logic?



- Visibility to the models
- Possibility to associate proper metadata to models
- Possibility to change (retrain) the models without touching the service logic



AI resource group concept



SE AI Management service

- Company level visibility to AI based services
- Listing and status of the active models
- Tool for responsible persons of AI based services to observe and control their services

Conclusions



- Provide company level visibility to AI based services, models, and data
- Enable easy access to the shared data resources with proper metadata
- Separate service logic and models
- Consider adding separate validation service between the service logic and the model