Towards an Evolving Software Ecosystem in the Mining Industry

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Understanding machinery.

Presenter

TU Clausthal

ISSE | Institute for Software and Systems Engineering

Dipl.-Inf. Mirco Schindler

- Study of computer science at the Technische Universität Clausthal
- Doctoral Researcher at the Institute for Software and Systems Engineering

Research Interest:

- Software Engineering with a focus on **Software Architecture** especially **Architectural Concept** Extraction, Comprehension and Evolution
- Engineering of **Software** and **Data intensive** Ecosystems
- …

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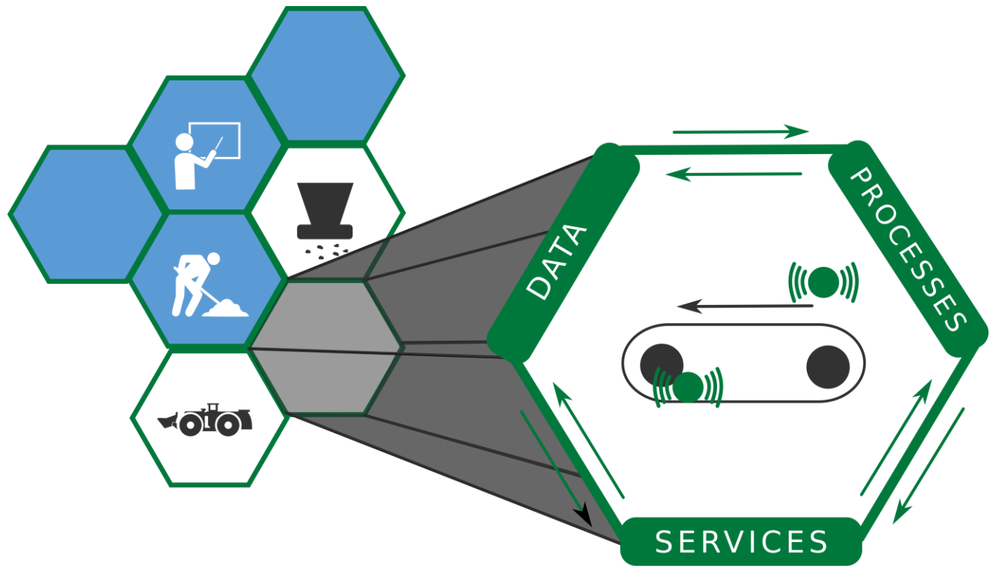
WHAT IS IT ABOUT? | THE MINE AS IT ECOSYSTEM

In analogy to biological ecosystems, IT Ecosystems are based on the balance between individuals (**AUTONOMY**) and rules (**CONTROL**) that define **EQUILIBRIA** within an IT ecosystem.

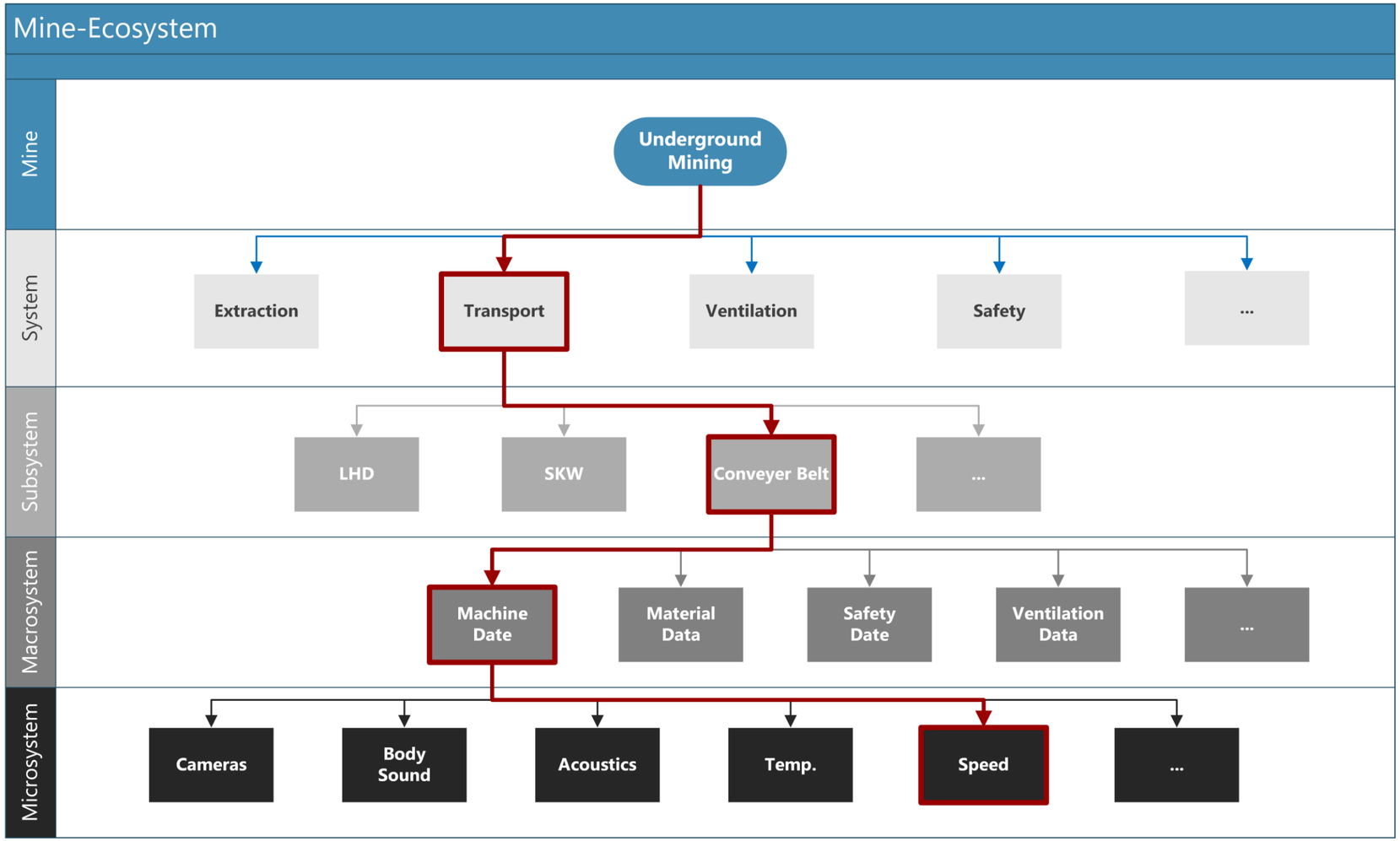
The maintenance and continuous development of IT ecosystems requires a deep **understanding of this balance**.

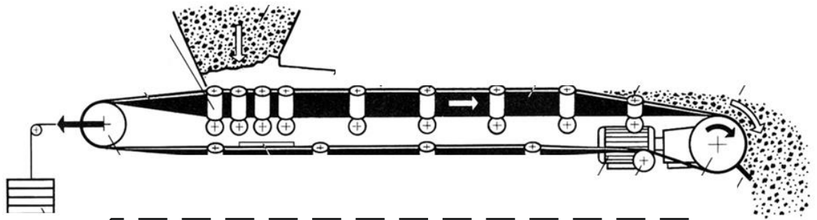
The **aim of the project** is to establish an IT ecosystem and to ensure the balance between autonomous sub-processes and systems and the controllability of the overall system through a better understanding of the influencing components and actors.

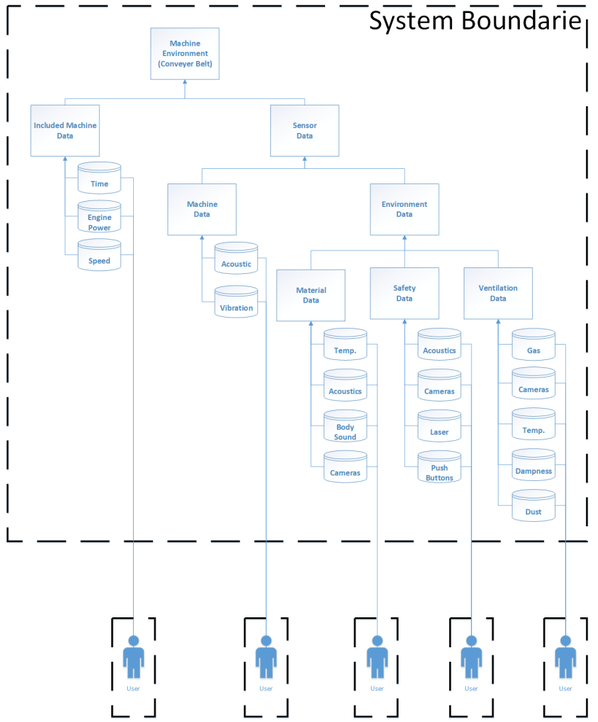
SUBSYSTEM BELT CONVEYER



Motivation

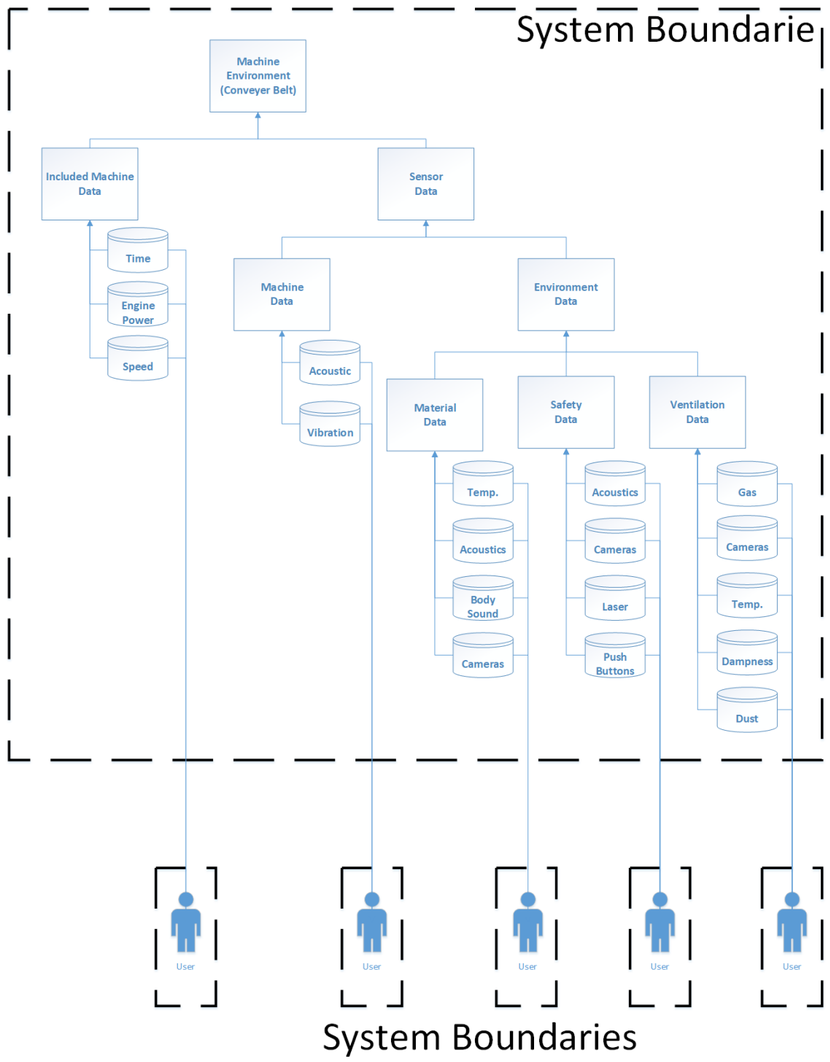


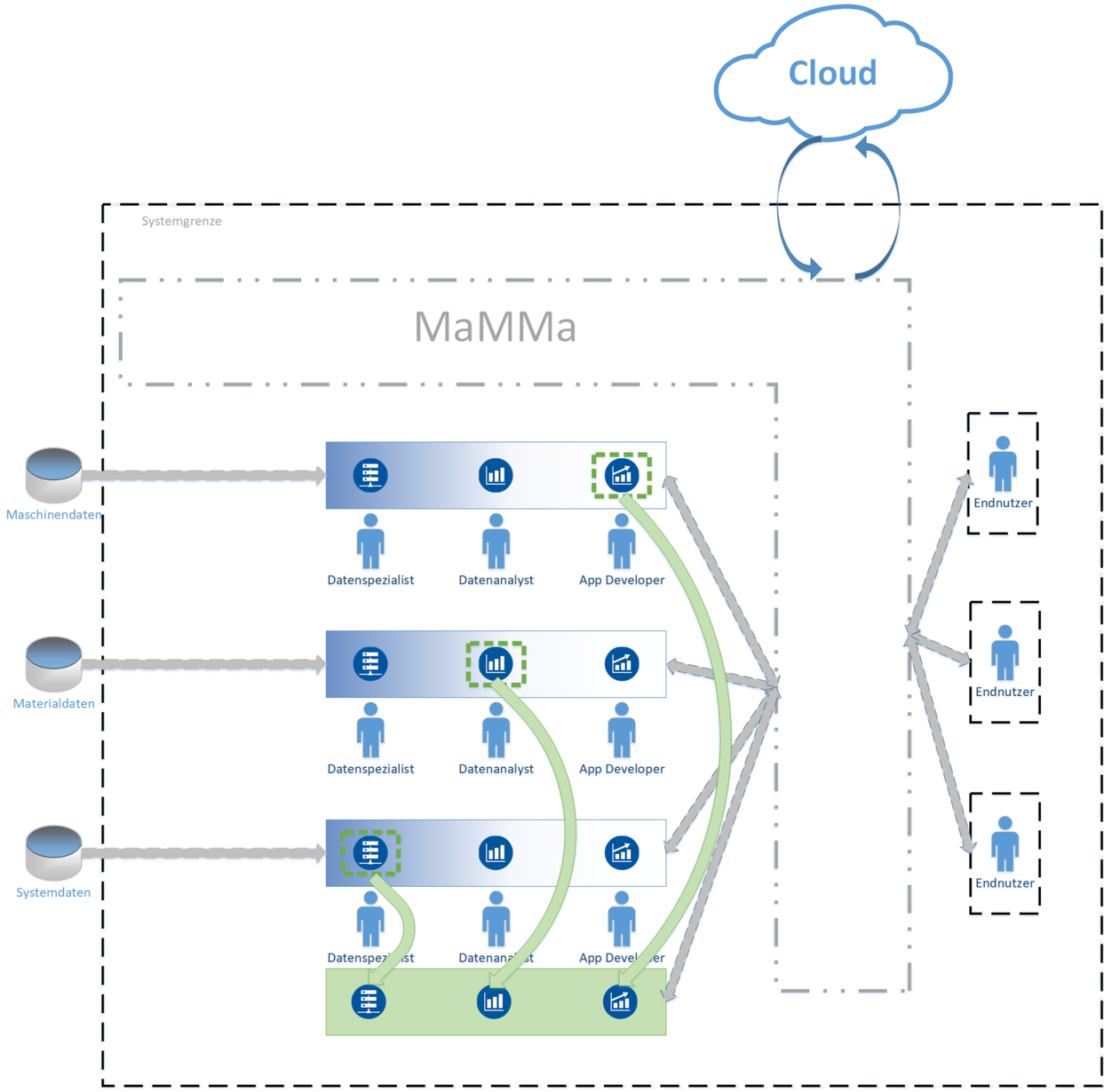




System Boundaries

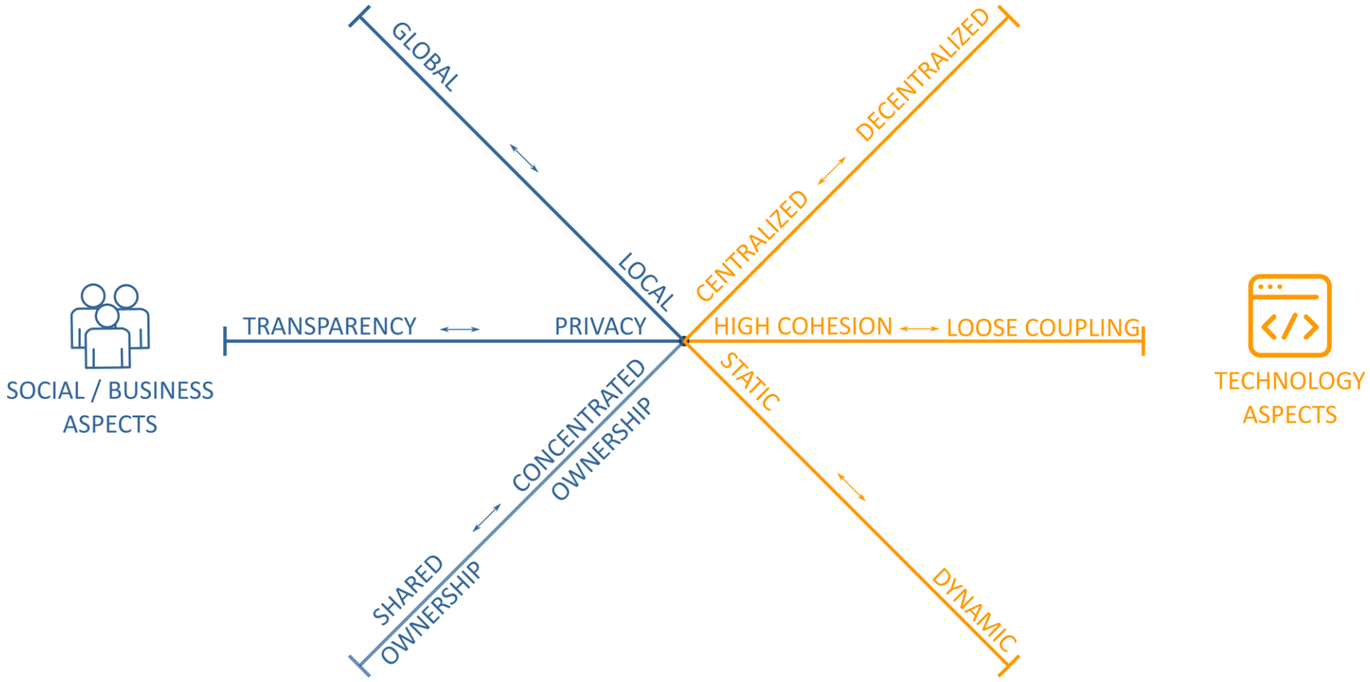
Digital Transformation



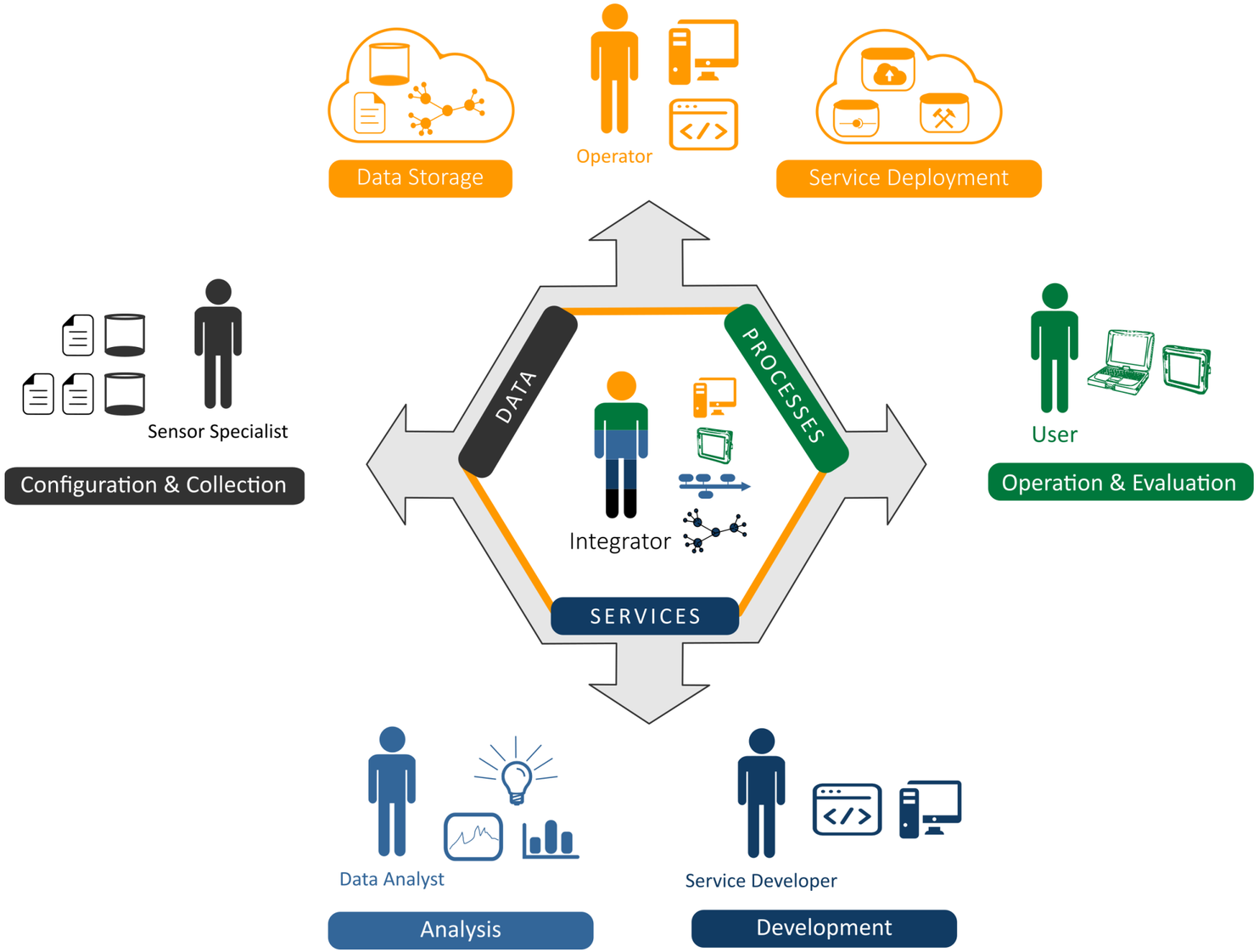


New Challenges…

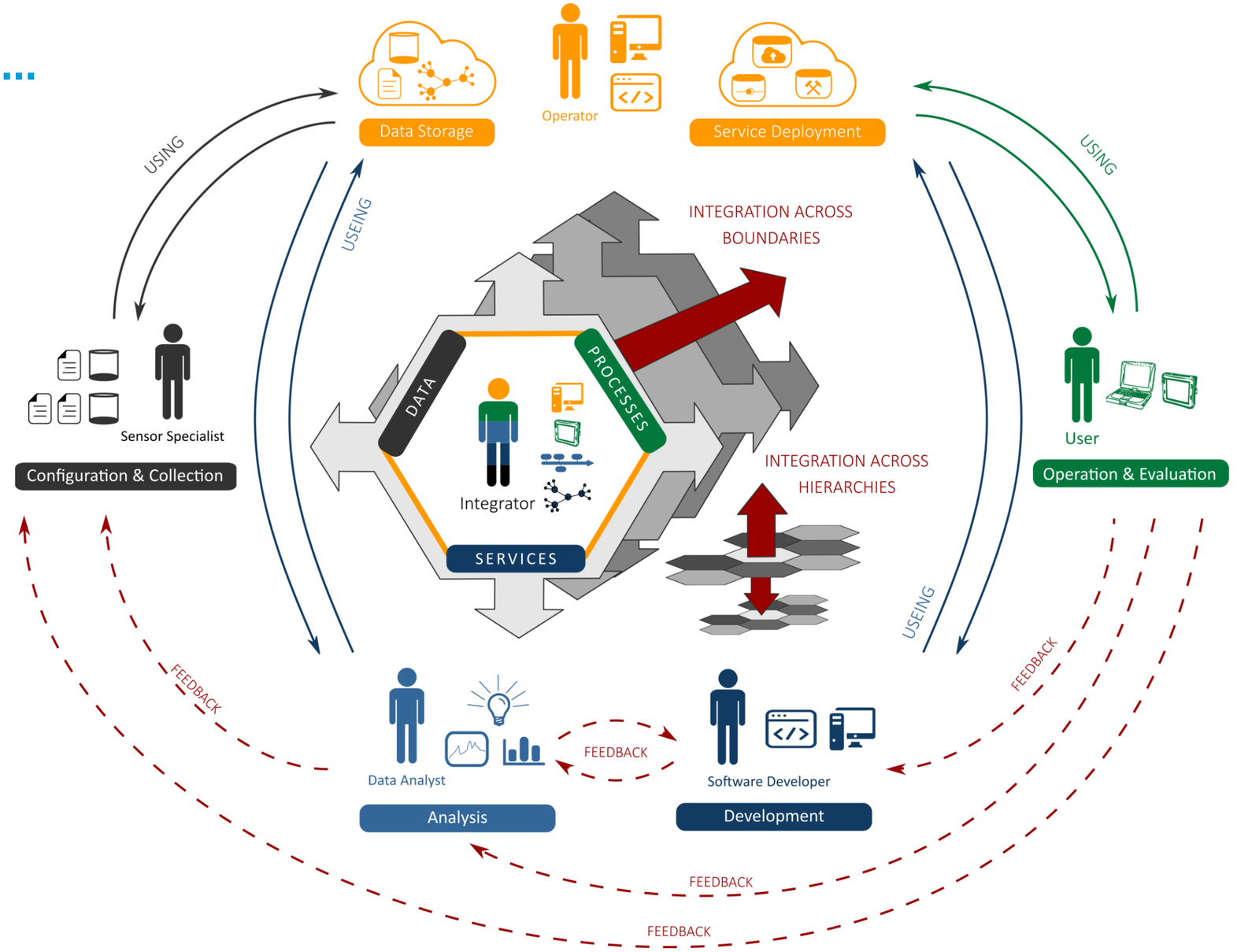
- Overcoming the **technical barriers** is not enough.
- It is not possible to **transform an entire mine** into a single data warehouse.
- Current structures do not allow the use of methods **of agile development**, especially for **small projects**.
- It is necessary to have an **innovative** and **flexible platform** for this purpose.



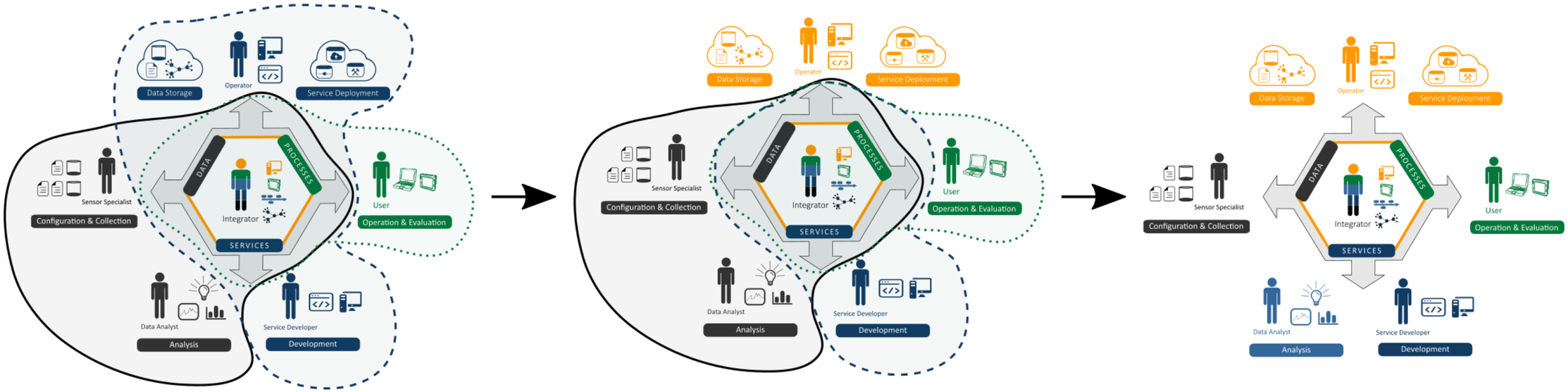
Role Model


Data Storage
Operator
Service Deployment
Sensor Specialist
Configuration & Collection
DATA
PROCESSES
SERVICES
Integrator
User
Operation & Evaluation
Data Analyst
Analysis
Service Developer
Development

Interaction...



Project Evolution and Scalability



Conclusion

- We believe that it is necessary to **establish agile project structures** in classical structures to enable **short innovative and experimental projects**.
- With regard to the “project” **lifecycle** of the **initiation** and also the **transfer to regular operation** is of major concern.
- Furthermore, the framework presented here addresses the topics:
  - Technology and Tool kit
  - Methodology and Procedure-Model kit
  - Integration of Standards and User Experience