



Collaborative lifecycle data management of production assets: a case study of an upgrade project from the forest industry

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Why collaborative asset management matters – *a starting point*

Increasing complexity & ecosystem reality - Lifecycle management is inherently cross-organisational and data-intensive

Organisations are not yet ready for full collaboration - Companies are often not prepared for cross-organisational data sharing: Challenges include both technical interoperability and collaboration mindset

Current reality is still “fragmentation and silos” - Data is often distributed across systems, organisations, and formats. Limited system integration reduces data usability and value realization.



Research setting



Empirical evidence is still limited on how production asset lifecycle data management unfolds in real-life multi-stakeholder environment (collaborative asset lifecycle management).

Examining the full lifecycle of production assets would be overly broad and complex:

=> Narrowing the scope: Use Case 1 - a brownfield upgrade project in forest industry. Enabling a more focused analysis of lifecycle data management in a defined context.

Research questions:

How is asset lifecycle data management realised in a multi-stakeholder brownfield upgrade project?

What practices and challenges support or hinder it?

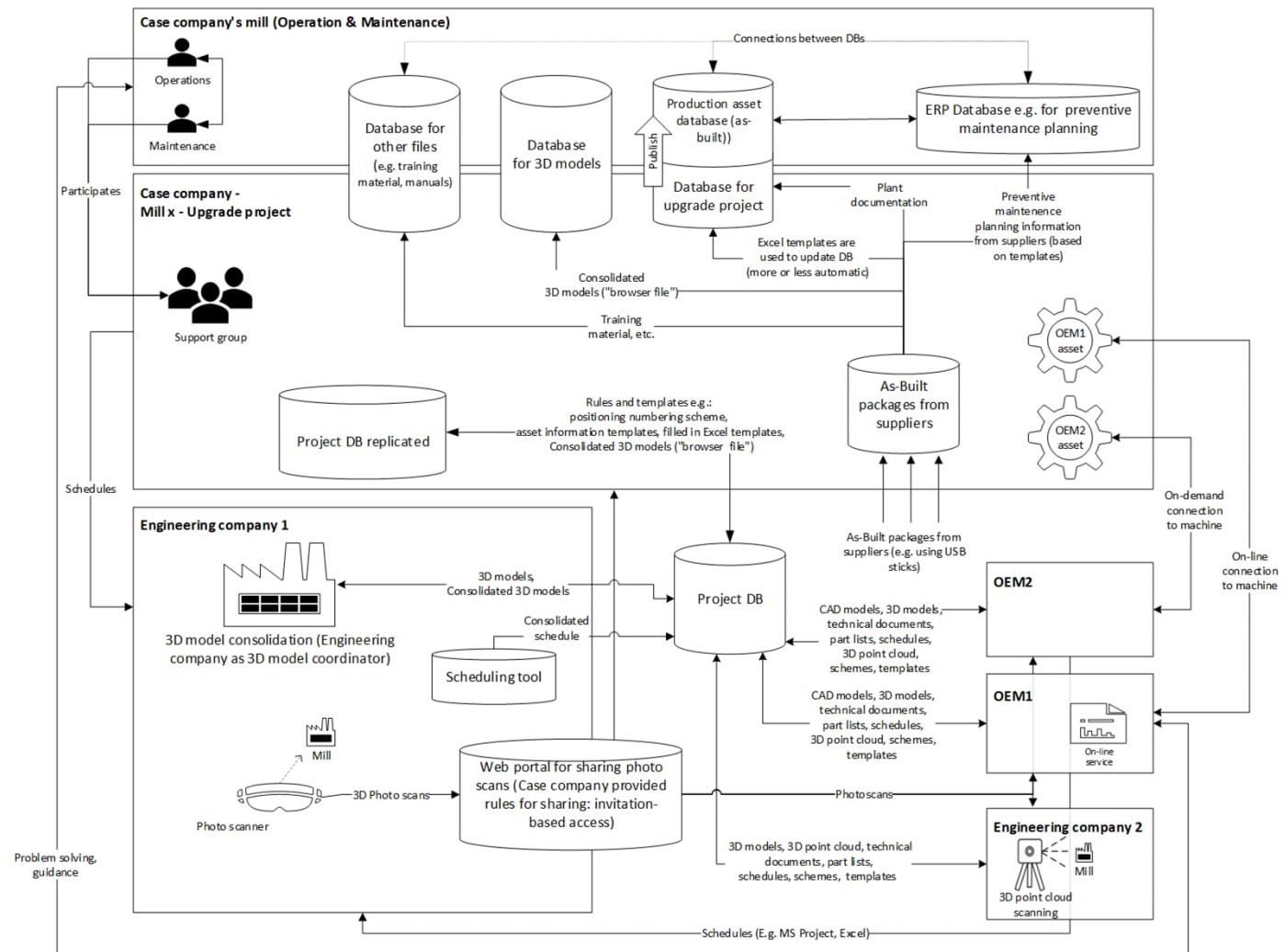
Case context & data collection



- Finnish forest industry company
- The upgrade project at one of the case company's mills
- COVID-19 pandemic complicated communication and awareness
- Multi-stakeholder project environment
- Project achieved:
 - The annual capacity of the production line was significantly increased.
 - Introduced also smart automation across the factory's production environment, while also enhancing occupational safety

Company	Industry/role	Number of interviewees
A	Forest industry company	4 (2 project mgmt., 1 operations, 1 maintenance)
B	OEM company 1	2 (1 project mgmt., 1 maintenance master data)
C	OEM company 2	1 (project mgmt.)
D	Engineering company 1	1 (project mgmt.)

Asset data sharing and management concept of case project



RQ1: How was asset lifecycle data management realised?

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Through a shared project data environment (Project DB) enabling document management, data sharing and traceability

Use of multiple data types and tools: 3D models, point clouds, photoscans supporting collaboration and remote work

Structured data collection practices (templates, position numbering) to ensure consistency

Final data distributed across multiple systems (asset DB, ERP, DB for 3D models, ...) → varying integration levels

RQ2: What enabled or hindered asset lifecycle data management?



Enabling practices:

Strong stakeholder involvement (incl. maintenance & operations early) and "mirrored organisations"

Shared platform and transparency → "one source of truth"

Standardised asset identification & templates (position numbering)

Trust, collaboration, and prior relationships

Digital tools (e.g. photoscanning) improving collaboration and shared view

Structural challenges:

Lack of up-to-date baseline data (e.g. outdated 3D models)

System integration gaps → data silos (especially 3D data)

Late and incomplete data delivery → high workload peaks

Inconsistent use of identifiers (position numbers)

Data quality and metadata issues → difficult to find and use data

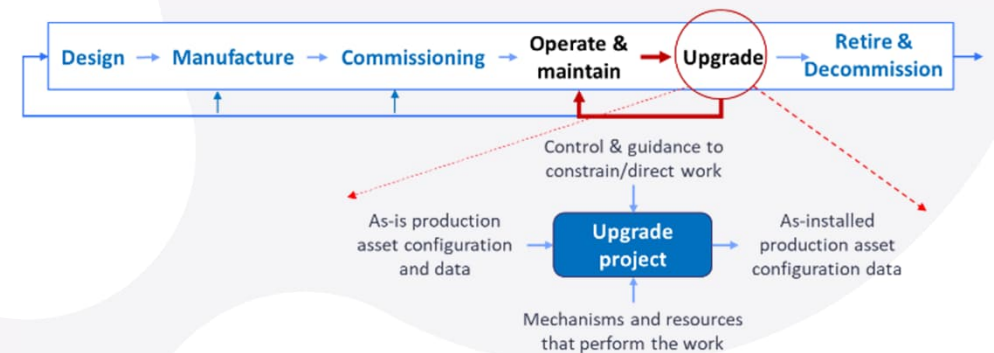
Lifecycle data management success is largely set early in the project through common definitions, clear responsibilities, integrated systems, and early stakeholder involvement

Upgrade projects act as "lifecycle data checkpoints" –where data quality and usability are either reinforced or compromised

Limitations

A single-case study approach with limited asset management lifecycle coverage restricts the generalizability of the findings.

The selection of stakeholders was not all-inclusive => restricts the range of perspectives captured.



What next? – *Towards a collaborative asset lifecycle management (Co-AM) playbook*

The case presented in this paper represents one example of collaborative asset lifecycle data management in practice – focusing to upgrade phase of the lifecycle.

We are currently developing the first version of playbook for collaborative asset lifecycle management (Co-AM). Follow site <https://seedforest.fi/> for 1st version of the playbook (Autumn 2026).

The playbook aims to:

- Provide a practical guide to understanding collaborative asset lifecycle management (Co-AM)

- Explain why traditional asset management is no longer enough in ecosystem-based environments when increasing amount of data provides new business possibilities

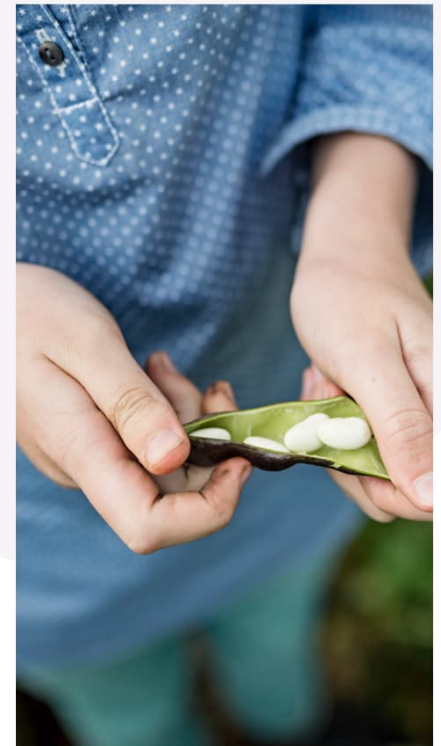
- Support companies in mobilising asset data for collaborative, win-win value creation

The playbook helps industrial companies to:

- Understand what collaborative asset management is and what it can offer to them

- Adopt a data-driven and collaborative mindset for asset lifecycle management

- Understand practical approaches for cross-organisational data sharing and utilization



From fragmented asset lifecycle data management → shared value creation across the ecosystem

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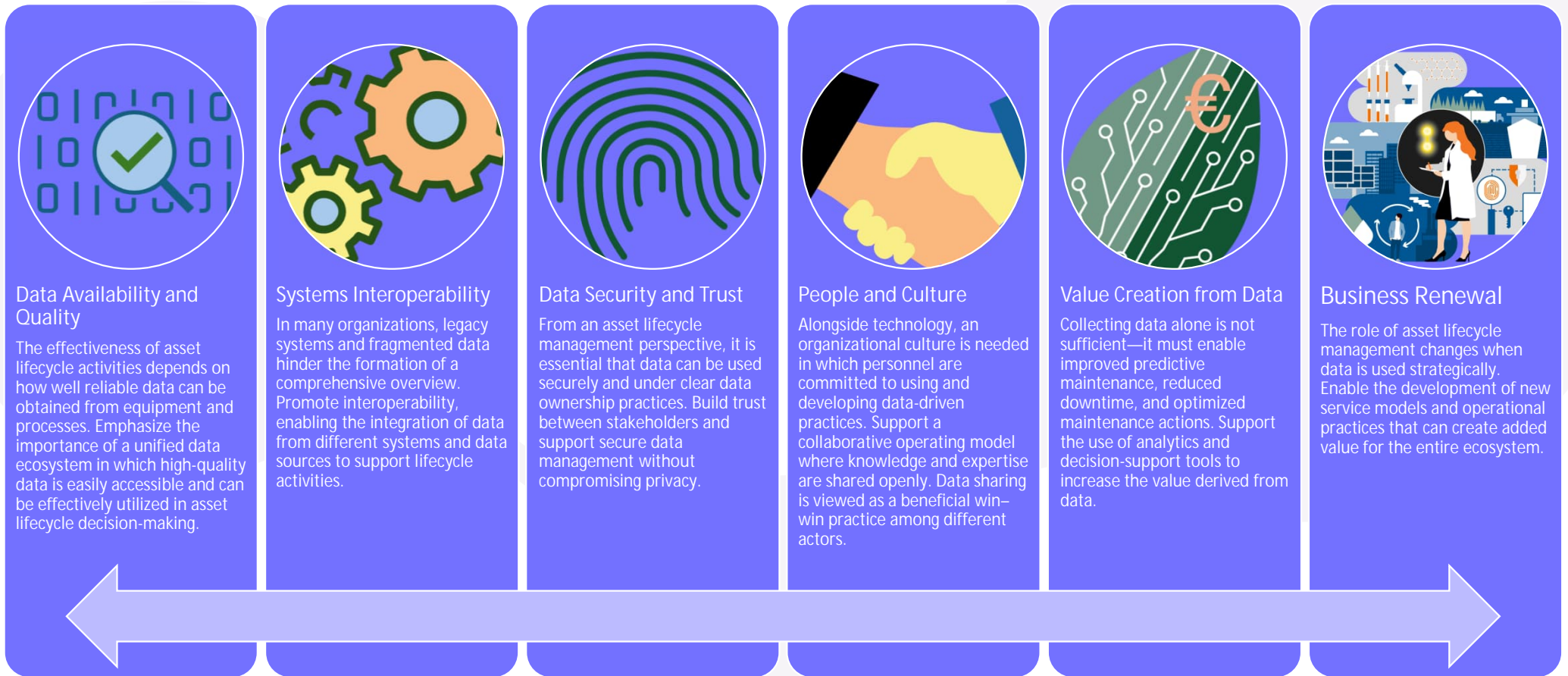
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Principal elements of Co-AM – Colife analytical lenses



- Valkokari, P., & Kääriäinen, J. (2025). Colife konseptin elementtien tunnistaminen teollisuuden omaisuudenhallinnassa (Identifying elements of the Colife concept in industrial asset management). *Promaint*, (4/2025), 44. <https://www.promaintlehti.fi/lehtiarkisto/?issue=339>
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