

DATA-DRIVEN SUSTAINABILITY MANAGEMENT

FREDRIK HELLMAN

PhD Student | Information Technology | Åbo Akademi University



fredrik.hellman@abo.fi
+358 (0) 505-309 304
linkedin.com/in/fredrikhellman/

INTRODUCTION

The EU's Corporate Social Reporting Directive (CSRD) requires companies to provide detailed sustainability reports, creating significant challenges in data collection, integration, and analysis. Traditional data systems struggle to meet these demands, especially regarding scalability, data sharing, and security. The DDSM project aims to revolutionize sustainability management based on developing and implementing data-driven models of the company's impact on sustainability.

OBJECTIVE

To develop and implement data-driven models that assess companies' impacts on sustainability, and to collaborate with industry partners in building robust data pipelines using data lakehouse architecture. This will ensure efficient management of the data required for CSRD compliance.

KEY TECHNOLOGIES

Apache Kafka, NiFi
Delta Lake, Apache Iceberg, Apache Hudi
Unity Catalog OSS
OpenLCA
AWS, Microsoft Azure, Databricks

KEY COMPONENTS

Corporate Sustainability Reporting Directive (CSRD)

- Introduces stringent requirements for sustainability reporting across Europe
- Enable informed decision-making across the product lifecycle

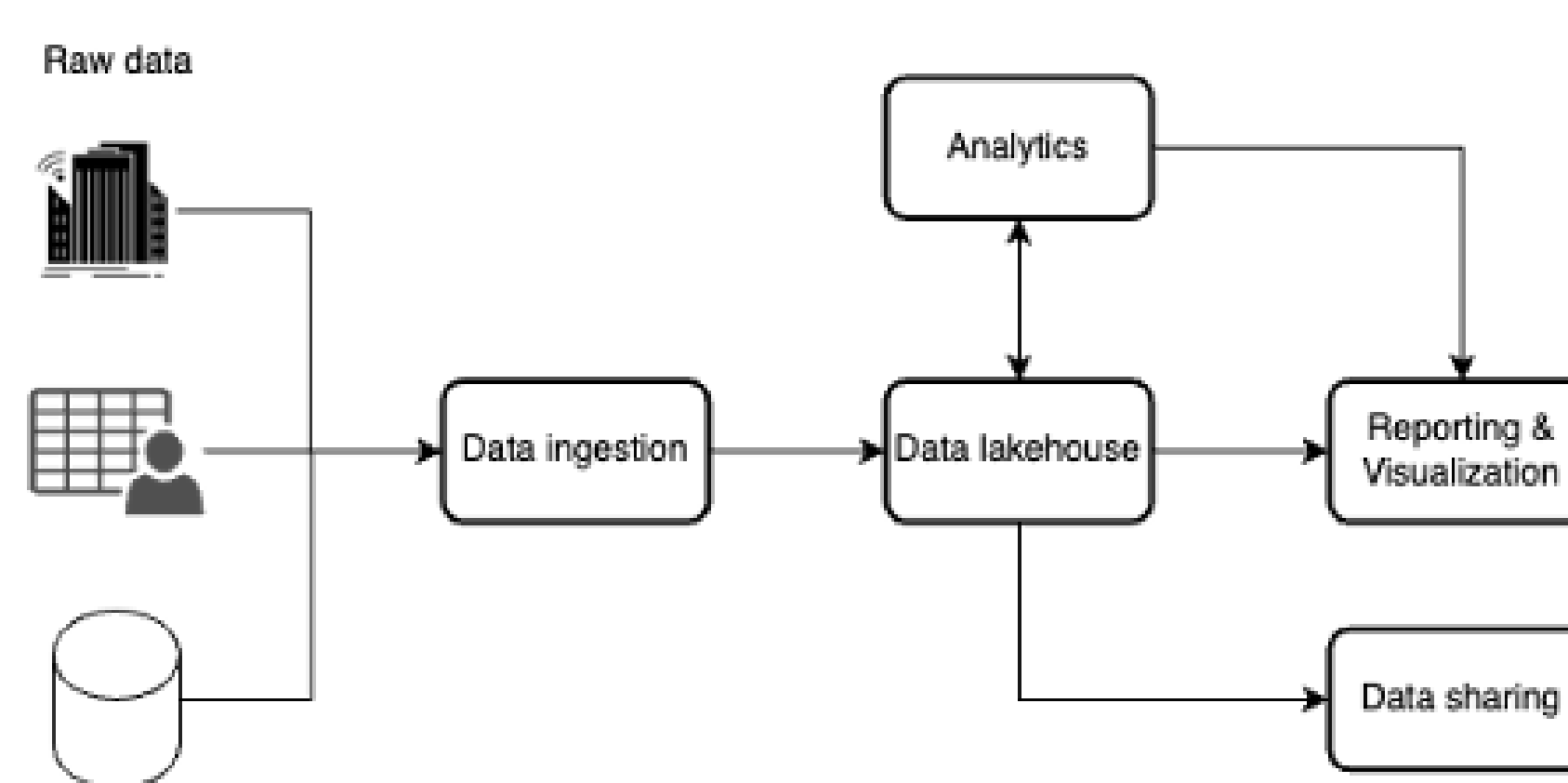
Digital Product Passport (DPP)

- Method to assess the environmental impact of products.

Dynamic Life Cycle Assessment (LCA)

- Combines the scalability of data lakes with the management capabilities of data warehouses
- Provides a unified platform for integrating, storing, and analyzing diverse data sources, critical for CSRD compliance

HIGH LEVEL PIPELINE



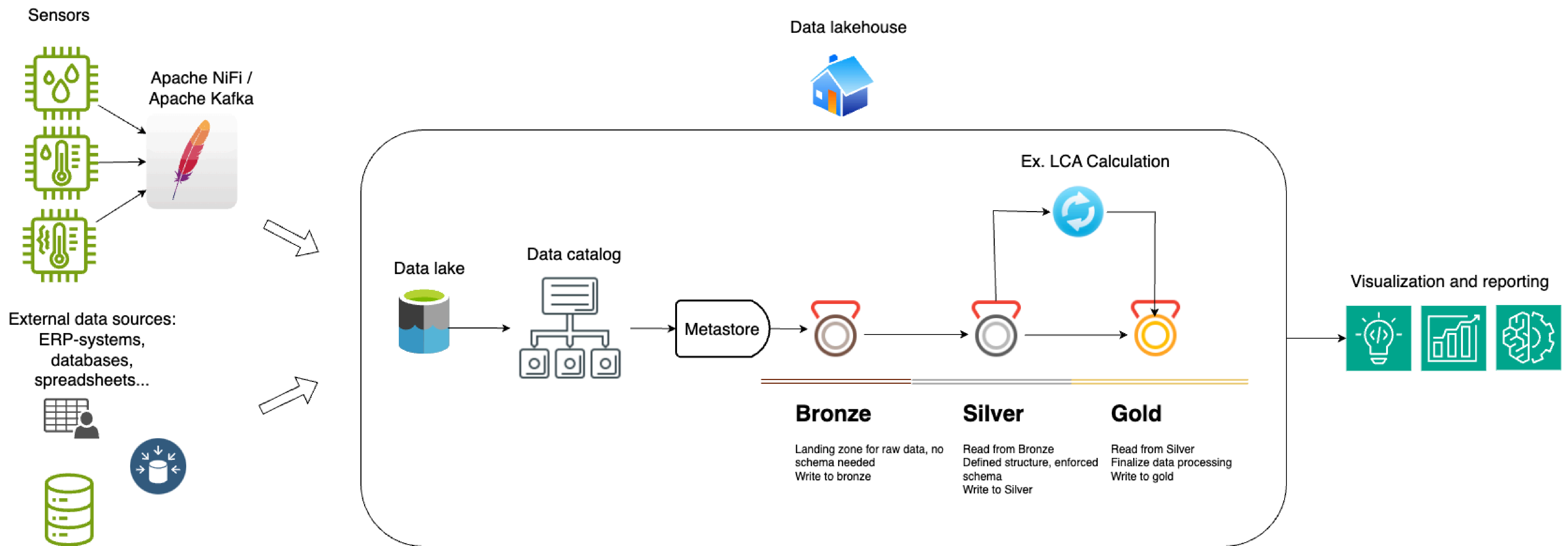
RESEARCH PLAN

Leveraging Data Lakehouse Architectures for Data-Driven Sustainability Reporting

Utilizing Data Lakehouse Architectures for Dynamic Life Cycle Assessment

How Dynamic LCA Results Differ from Conventional Static LCA Results

Building a Data Collection and Management System to Support Data-Driven Management



SHAPE ECOSYSTEM

SHAPE is an ecosystem launched by Mirka to accelerate the development of new solutions for the (re)manufacturing industry. SHAPE focuses on reshaping the life cycles of products and materials by boosting circularity, finding sustainable material solutions, piloting new business concepts and by optimizing sustainable processes.

The project Data-Driven Sustainability Management is an important basis to the SHAPE ecosystem, where a DDSM model will be used to create a tool for decision making for insight into structuring and prioritizing research projects.



PARTNERS

