S4M SUSTAINABLE MATERIAL MANAGEMENT MATURITY MODEL

# Transparency of supply networks

## - real time material visibility

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TURKU AMK

# Material tracking working group

**Industrial Engineering Research Group:**

Janne Siivonen, Senior Lecturer, PhD student

**Resilient Supply Chains Research Group:**

Jari Hietaranta, Research Group Leader

Harri Heikkinen Senior Lecturer

Sakari Kajander, Researcher

Nelli Puhakka, Project assistant

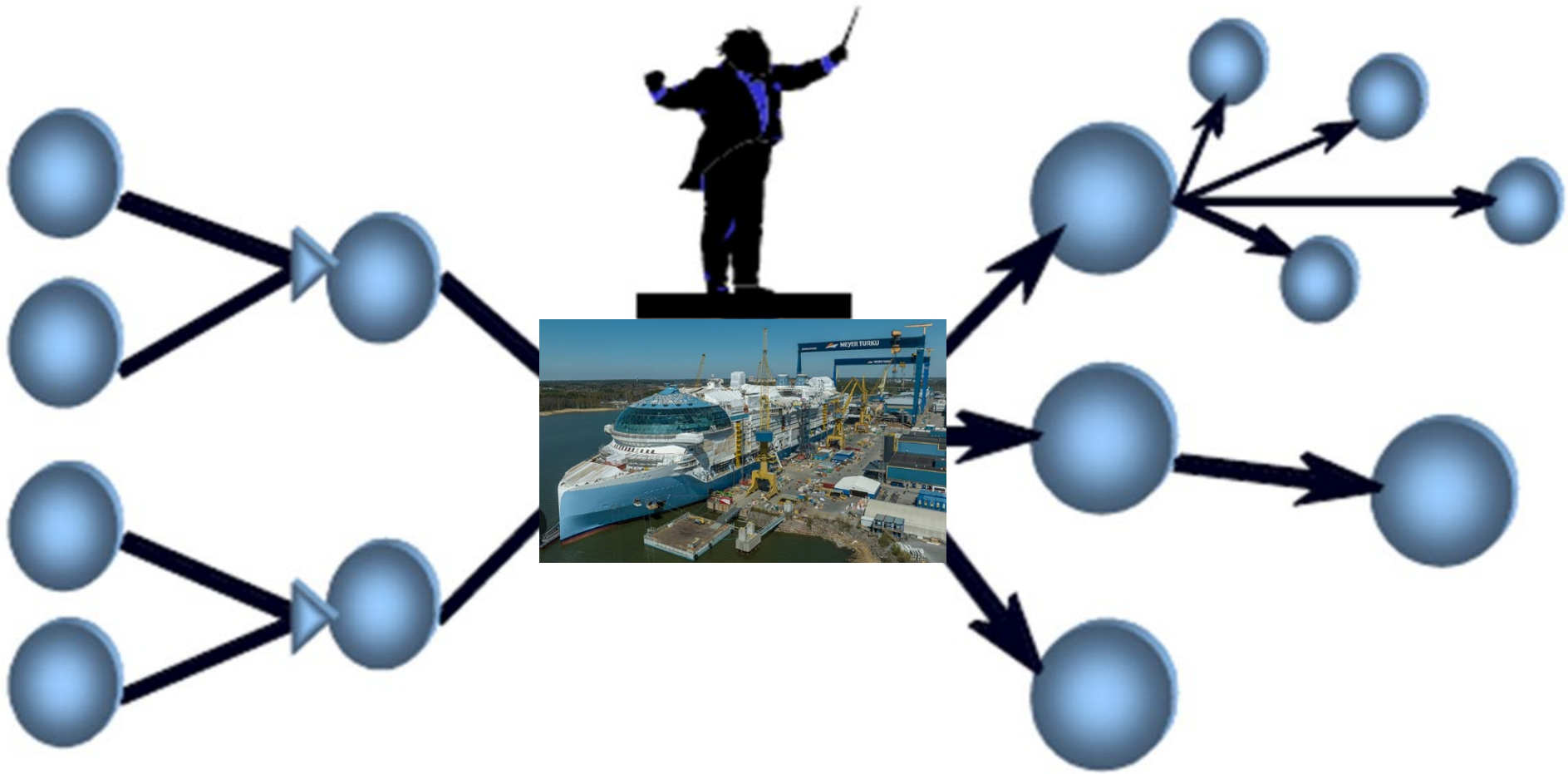
**ICT-Software development & AI Research Group:**

KimmoTarkkanen, Degree Program Leader

Pertti Ranttila, Senior Lecturer

Antti Laatikainen, Software Specialist

# Orchestration of supply chains



# Supply Chain Control Tower (iSCCT) is

# “a central hub with the technology, processes, and organization to capture and use supply chain data in real time, providing enhanced visibility for improved decision-making”.

https://www.gartner.com/en/articles/what-is-a-supply-chain-control-tower-and-what-s-needed-to-deploy-one

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# Supply performance of shipbuilding network.

**Challenges identified:**

- Materials for production arrive too late or early.

- Work will be delayed due materials shortages. Reschedule
- Execess inventory. Loss of material, working capital

- Delivered quantities greater than required (loss/yield).

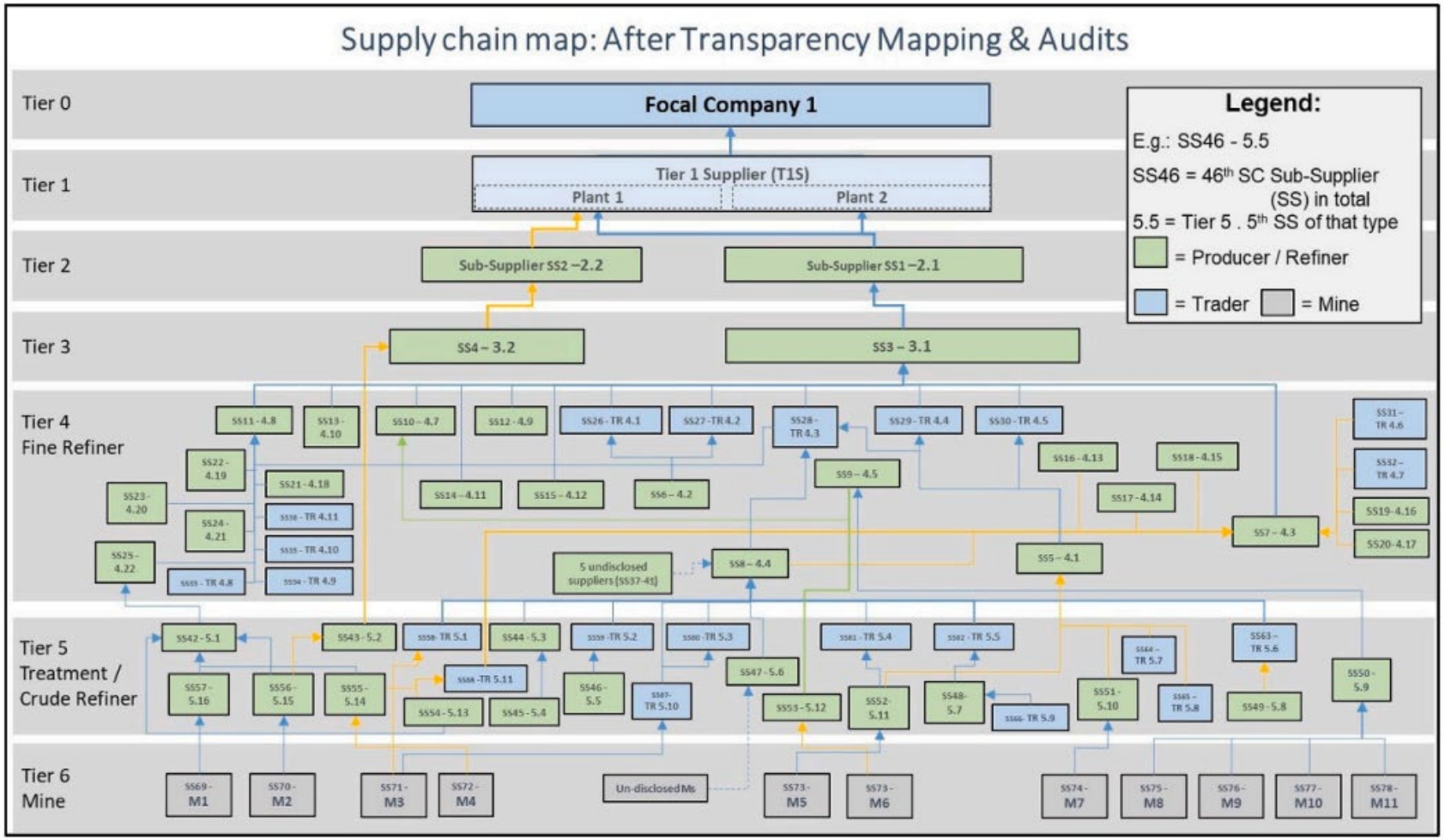
# Supply Chain Mapping and Digitalization

## Rationale for research:

- Supply chain mapping is a first step towards transparent supply chains.
- Emerging digital technologies such as Digital Twins, Internet of Things (IoT) and Blockchain will provide new opportunities to develop more advanced mapping solutions that have the potential to develop more transparent supply chains in the future.
- So, level of mapping can be developed from understanding supply chain operational key performance indicators to provide knowledge about the supply chain other capabilities such as compliance against Maturity models.
- Future direction of DT supply chain research is to test the framework with a real case study. Assessing how various technologies can converge to build a digital environment for a physical SC system is important.


MacCarthy B, Ahmed W, Demirel G. Mapping the supply chain: Why, what and how? 2022
Zaidi S.,Khan S., Chaabane A., Unlocking the potential of digital twins in supply chains: A systematic review, 2024

# Supply Chain Mapping and Digitalization



# S4M Sustainable Material Management Maturity Model

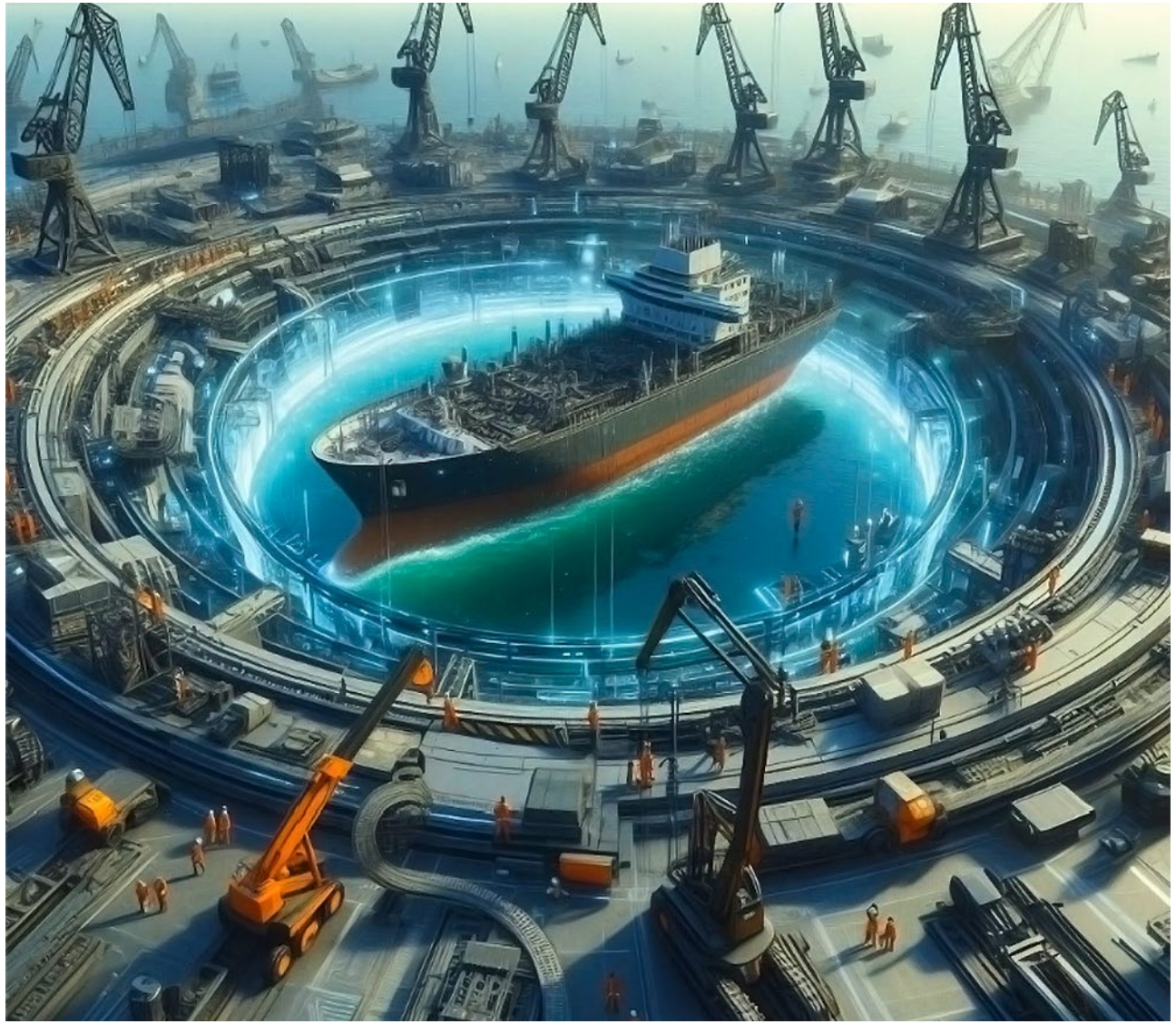
S4M project introduces a novel approach:

- The development of a Situational Awareness through the Network Mapping ( S4M-model).

- This model serves as a framework for assessing the maturity of sustainable actions across key performance areas (KPA) of business and material management within the supply network.

# RQ:s

**RQ1: How integration of SC mapping and real-time location data supports decision making in transparent supply chain.**



## Industrial partners

## Research organisations

# Thank you!
# &
# Questions?

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