S4M – Advancing Sustainability and Competitiveness in the Shipbuilding Supplier Network Through a Maturity Model

Network paradoxes

Lead Investigator Dr Heli Aramo-Immonen

Pictures by Janne-Petteri Kumpulainen

S4M SUSTAINABLE MATERIAL MANAGEMENT MATURITY MODEL

Boosted by BUSINESS FINLAND

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1. The Paradox of Opportunities and Limitations in Network

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A firm's **resources and network position** create opportunities for value creation, innovation, and influence—but **the same embeddedness simultaneously limits what the firm can do**.

Why it is paradoxical?

The stronger and more successful a firm's network position becomes, the **harder it is to change direction**.

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- Existing networks are optimized for **current technologies, cost structures, and performance metrics**

- Sustainability innovations (e.g. circular models, low-carbon technologies) often **do not fit existing resource combinations**

- Strong embeddedness can lock actors into **incremental improvements rather than systemic change**

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Managerial implication
Managers cannot simply “use” networks as tools. Acting in networks requires **working with expectations, commitments, and resistance**, often beyond the firm’s direct control.

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2. The Paradox of Influencing and Being Influenced in Network

Companies attempt to **influence other actors** through strategy, investments, and relationship management—but **their own strategies are continuously modified** by the reactions and adaptations of others.

Why it is paradoxical?

Managers must strategize and make commitments **without knowing how the network will respond**, while knowing that every action reshapes the network context in which they themselves operate.

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Managerial implication
Strategy becomes less about control and more about **learning, sensemaking, and adaptation through interaction**.

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3. The Paradox of Control and Non-Control in Network

Firms need some degree of **control and power** to secure resources and coordinate activities, yet **attempts at excessive control undermine relationships and network functioning**.

- Networks lack a central authority
- Over-controlling behavior can damage trust and reduce collaboration

- Under-controlling behavior can expose firms to dependency and opportunism

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Why it is paradoxical?

Effective network management requires **accepting partial loss of control** while still acting purposefully.

Companies must manage *in* networks rather than manage *the* network.

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Sustainability in Networks includes paradoxes

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Sustainability development—environmental, social, and long-term economic—**cannot be achieved by single firms acting alone**.

It requires coordinated change across supply chains, innovation systems, and multi-actor networks.

At the same time, sustainability introduces **additional tensions.**

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Empirical sustainability research confirms that historical investments and dominant logics can create **path dependency**, making sustainability transitions slow and contested in inter-organizational settings.

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How the paradoxes enable sustainability?

At the same time, network embeddedness provides:

- access to shared knowledge and learning
- trust and coordination mechanisms
- the ability to scale sustainability solutions once alignment is achieved
- mutual adaptation
- co-creation of new norms
- collective learning over time

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Network paradox	Effect on sustainability development
Opportunities vs. limitations	Creates path dependency but also provides resources for scaling sustainability
Influencing vs. being influenced	Limits unilateral action but enables collective learning and co-creation
Control vs. non-control	Weakens command-and-control approaches but strengthens collaborative governance

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How S4M maturity model helps network sustainability development ?

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- S4M reframes sustainability **from a goal state to a developmental capability**.
- Instead of asking *“Are we sustainable?”*, S4M asks *“How capable are we—and our network—of handling sustainability paradoxes?”*

- Early maturity stages typically **deny or simplify paradoxes** (e.g. prioritising efficiency over transformation).

- Higher maturity stages **explicitly recognise and work with tensions**, such as short-term vs. long-term or local vs. system-level change.

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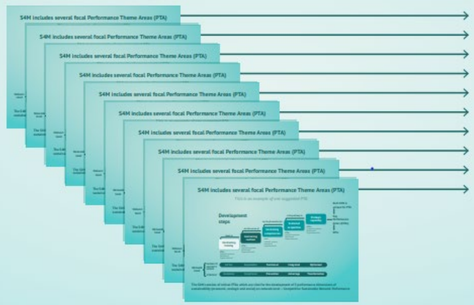
Several PTAs



Company specific maturity KPAs and KPIs

- **Network level S4M maturity of network**
- **Scalable to wider SBE**

PTA *Performance Theme Area*
KPA *Key Performance Area*
KPI *Key Performance Indicator*
SBE *Ship Building Ecosystem*
S4M *Sustainable Material Management Maturity Model*

How S4M enables development:
At higher maturity, influence is reconceptualised as:

- sensemaking,
- norm co-creation,
- relational learning.

S4M supports **orchestration roles** rather than leadership-through-control.

It helps actors understand that being influenced is **not weakness**, but a condition for collective sustainability development.

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By integrating network paradoxes with an S4M maturity perspective, sustainability development is conceptualised not as a transition from "unsustainable" to "sustainable", but as a gradual increase in network capability to live with and mobilise paradoxes.

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Merima Oy (BF-project)
Lautex Oy Ab (BF-project)
E.U.-Adhoc Project Oy (BF-project)
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Carina Solutions Oy (in-kind)

Research organisations
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Thank You!

Lead Investigator Dr Heli Aramo-Immonen

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