

Exploring Systems Thinking in Supply Chains

Why operations and supply-chain management
may need more than linear tools

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The modern supply-chain challenge

Supply chains must now balance three demands at once

Operational efficiency

Cost • Quality • Delivery •
Inventory • Productivity

Resilience

Anticipate • Absorb •
Recover • Adapt • Learn

ESG & sustainability

Carbon • Resources •
Ethics • Regulation • Long-
term impact

These have developed in silos.

But in today's supply chains they are very much interrelated and interdependent

The questions practitioners are facing

The language may be practical, but the problems are systemic

Operational efficiency

How do we achieve quality and reliable delivery at the lowest cost?
How do we track suppliers' performance?
Where can we reduce waste (Lean)?

Resilience

How do we ensure continuity of supply?
Where are we most vulnerable to disruption?
How quickly can we sense and respond to change?
Which dependencies could cascade into failure?

ESG & sustainability

How do we get to Net Zero?
Are people in our supply chain victims of modern day slavery?
How will Net Zero, regulation and scarcity reshape the system?
Could today's solution create tomorrow's unintended consequences?

All these issues involve relationships, trade-offs, feedback, boundaries and perspectives.

Why linear tools struggle

Many useful tools are necessary, but not always sufficient

Conventional assumption

- Supply chains operate as a linear sequence
- Stable Boundaries
- Clear cause and effect
- Parts can be improved separately
- Predictable behavior
- One agreed view of the problem
- Neutral decision making



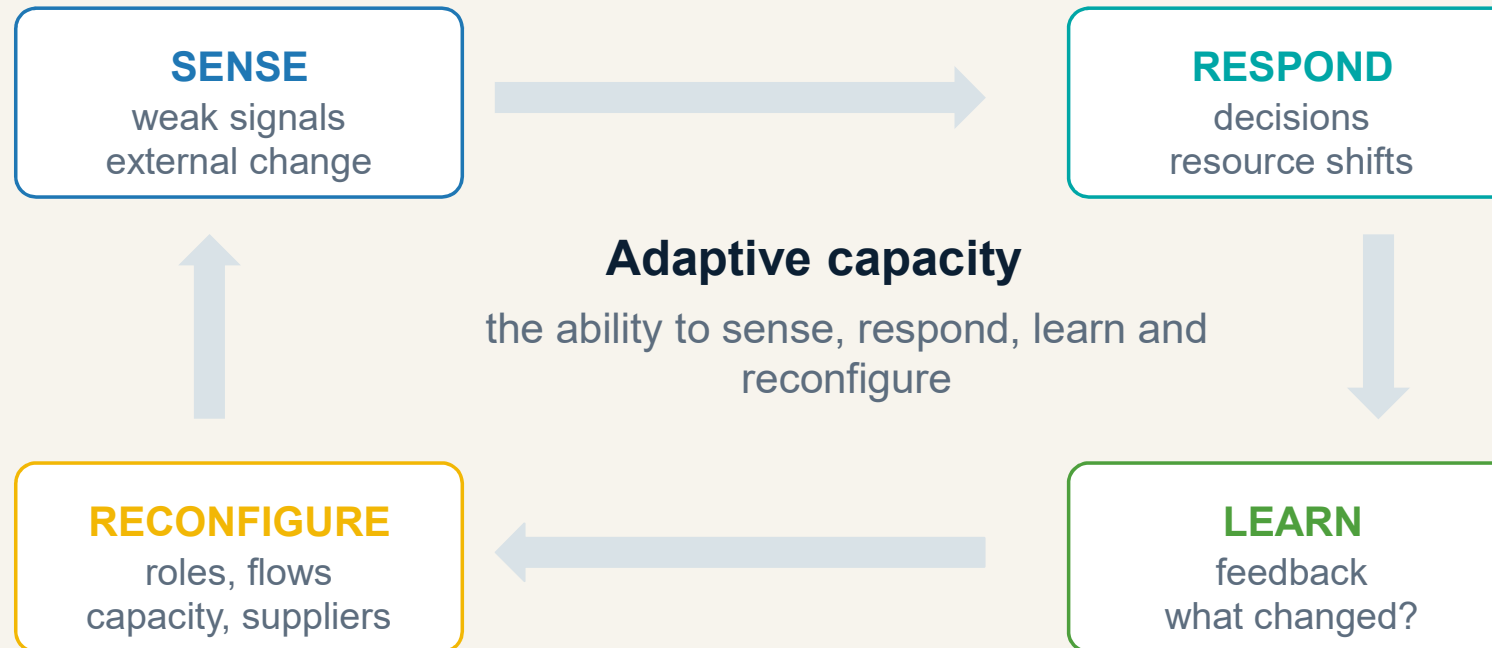
Supply Chain realities:

- An interconnected network or eco-system
- Changing boundaries and external influences
- Feedback loops, delays, oscillation and indirect effects
- Changes in one area affect the wider system
- Emergence and unintended consequences
- Multiple perspectives and competing purposes
- Power, conflicting interests and unequal influence

Supply chains behave more like complex adaptive systems.

Supply chains as adaptive systems

Resilience is not only “bouncing back”



Why systems thinking?

A richer problem situation may need more than one lens

“Only multi-methodology and multi-method practice can cope with the increasing complexity, change and diversity that managers encounter.”

Mike Jackson, Creative Holism (2006)

problem framing

boundary critique

multiple perspectives

feedback over time

organisational viability

intervention design

Systems thinking helps us ask better questions before choosing solutions.

Supply-chain questions → systems approaches

Start with the practical question, then choose the lens

O&SCM question	Particularly relevant approaches
Are we seeing the whole chain and all perspectives?	SSM • CSH • INFORM/INFORMED
Do we understand the problem and competing purposes?	SSM • rich pictures • CATWOE
Why does the system behave like this?	System Dynamics • CLDs • systems laws
Are we organised to cope with disruption and change?	VSM • recursion • OMM • requisite variety
Where should we intervene?	Meadows' leverage points
How do we make change achievable?	Mosaic Transformation • Design Thinking
What if we need several approaches at once?	Critical Systems Practice • multimethodology

The full systems knowledge base is broader — the issue for practitioners is navigation.

So why isn't it mainstream?

"If systems thinking is so good, why isn't it used more?"

Perception barriers

- low awareness and visibility
- academic or abstract
- unclear value proposition
- systems practice can look slow
- weak professional identity
- limited case studies

Use barriers

- high cognitive load
- unfamiliar language and jargon
- fragmented methods
- capability gap
- existing tools seem "good enough"

Organisational barriers

- operational pressure
- silos
- power and hierarchy
- benefits hard to measure

A mix of awareness, understanding and adoption.

The accessibility problem

Practitioners rarely start with the name of a methodology

They will never say...

“I need Critical Systems Practice.”



They may say...

“Our supply chains are struggling.”

“We need to cut cost without adding risk.”

“We cannot see what is happening upstream.”

“Our Net Zero plan shifts problems elsewhere.”

“We need to become more adaptive.”

The entry point should be the practitioner’s problem, not the methodology.

Making systems thinking easier to access

From my initial literature research, there are several strands of work already tackling parts of the problem

Challenge	Emerging response	Examples
Which approaches should we combine?	Methodological pluralism	Jackson — EPIC/CSP
Can we make the landscape comprehensible?	Fundamentals, methodologies and tools	Lloyd & Smith — FMT Circle
Can non-experts participate?	Visual, accessible systemic inquiry	Lloyd & Forbes — eCanvas
Can technology reduce cognitive load?	AI-assisted modelling and navigation	Hosseinchimeh; Schoenberg

Built on a substantial systems-thinking knowledge base:

SSM • VSM • System Dynamics • CSH • SODA • POS • OR • Meadows • Complexity

Hosseinchimeh et al. (2024); Schoenberg (2025/26); Lloyd & Smith (2025); Lloyd & Forbes (2026); Jackson (2020).

What may be needed for O&SCM

A better route in (rather than simplifying the tools). Make systems thinking approaches:

easier to enter

easier to explain

easier to navigate

connected to real problems

justified in business language

usable before becoming an expert

**We need an accessible front door into
systems practice for supply-chain problems.**

Emerging research question

A question for my dissertation and for this community

How can systems thinking be made more accessible, navigable and useful for operations and supply-chain practitioners?

Helping to answer:

What kind of problem is this?
Who needs to be involved?
What are we not seeing?
Which systemic approach might help?
Where should we intervene?
How can we act without oversimplifying?

Closing invitation

This research is still emerging

I would welcome:

examples from supply chain, logistics, infrastructure or sustainability
practitioner cases where systems thinking has helped
views on barriers to adoption
feedback on accessibility and language
collaborators interested in O&SCM systems practice



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Final thought

Supply chains need the right systemic questions.

Selected references

For notes and follow-up

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