

Samhandling, Preparedness and Supply Chains

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Abstract: Supply-chain preparedness means to design inter-organisational structures, to organise supply-chain resources, and to plan and train to ensure efficient response if this is called for. Acknowledging that supply chains are made up of two or more organisations, and that interaction describes relations between two or more actors, the purpose of this research is to explore whether the introduction of the concept of interaction (*samhandling*) to supply-chain thinking adds to our understanding of efficiency and the effectiveness of logistics preparedness.

We position our work along three dimensions: a profit – non-profit classification, a descriptive – normative dichotomy, and a micro – macro continuum. Information was retrieved both through semi-structured interviews and by studying secondary sources. Interaction and preparedness is assessed through an empirical case: the operation Atalanta. By applying interactional indicators, enablers and barriers to relationship success can be studied at both micro, meso, and macro levels. Without understanding the mechanisms leading to interactional competence, success (or the lack thereof) in supply-chain preparedness is difficult to address properly. Thus, managers need to assess the interactional constructs at all levels when planning and training for preparedness.

Keywords: *Samhandling*, interaction, preparedness, supply chain management, defence logistics, collaboration

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Introduction

Why are inter-organisational relations important for preparedness? The Cold War ended, as the Soviet Union and the Warsaw Pact collapsed after the fall of the Berlin Wall in 1989. During the Cold War, the defence strategies of smaller NATO members aimed at establishing and supporting strongholds along national borders, to prevent or delay invasion from an identified adversary. From a logistics point of view, this meant employing pre-determined nodes and links for feeding troops and transporting equipment from other parts of the country and from allied partners, to these strongholds. The conclusion of the Cold War, together with the Balkan crises and the War on Terror, caused a redirection of the NATO alliance. Peace and security would be ensured through engagements outside the NATO home territories. After almost two decades, in which NATO and its member states directed their attention towards expeditionary operations, the pendulum swung the other way again, as a consequence of Russian involvement in Georgia in 2008, and indeed, the Russian – Ukrainian conflict since 2014. Preparedness and homeland defence is again at the centre of defence planning.

Running parallel to this, and rooted in the Neoliberal ideas of the 1970s and 80s, the New Public Management (NPM) paradigm was adopted in several nations, including Norway (Måseidvåg, 2011). NPM is built on the premise that the public sector should put more emphasis on results, management, competition, markets and consumers (see e.g. Hood, 1995). Such ideas, commonly applied in the commercial sector, manifested themselves as competitive bidding, outsourcing, Public Private Partnerships (PPP) and Private Finance Initiatives (PFI) in public organisations. The belief in a 'peace dividend' (see e.g. Garfinkel, 1990; Mintz & Huang, 1990) after the Cold War made the Defence sector particularly prone to such ideas. Organisational downsizing and outsourcing alter the relations and dependencies between the Defence forces and external agents. Unless managed wisely, this will probably have consequences for the Defence forces responsiveness. The ability to quickly respond, i.e. to be prepared to act, assumes logistics systems designed for responsiveness. As (Mentzer et al., 2001) point out, optimising the supply-chain output presupposes a supply chain orientation; a recognition that processes need

to be aligned throughout the whole supply chain. Understanding how supply chains for high-readiness defence units are designed and managed is important for dealing with the seeming divergence between being efficient during the dormant period and effective in action (Kovács & Tatham, 2009). Acknowledging that supply chains are made up of two or more organisations, and that interaction describes relations between two or more parties, the research question reads:

Would the introduction of interaction to supply chain thinking add to our understanding of efficiency and effectiveness of logistics preparedness?

An open systems perspective

To answer this question, this research builds on the most common epistemological stance within Scandinavian logistics research: the open systems perspective. Performance of a supply chain depends not only on activities and processes within a focal company, but also on the ties, bonds, and links to other parties. From a supply chain perspective, which will be defined shortly, this encompasses all parties that directly or indirectly control resources of value for the focal party, and that perform activities linked to activities within the focal party.

This work is positioned along three dimensions: a profit – non-profit classification, a descriptive – normative dichotomy and a micro – macro continuum. The investigated context is interaction in defence supply chains. The conception of interaction follows the operationalisation of the Norwegian term *samhandling*, as described by (Torgersen & Steiro, 2009). The main rationale for defence organisations is to offer welfare, in the form of safety and security, to a population and not to maximise for example, return on investments. This research will therefore contribute to enhancing our understanding of interaction in a *non-profit context* (although the commercial parties which make up the civilian part of the defence supply chains have other goals). The aim is to explore how interaction is perceived in logistics and supply chain management literature; hence a *descriptive approach* to research. The micro – macro continuum in a supply chain perspective means that the individual constitutes the micro perspective, whereas the supply chain, with its many participants

and activities directly and indirectly influencing processes and outcomes, represents a macro perspective.

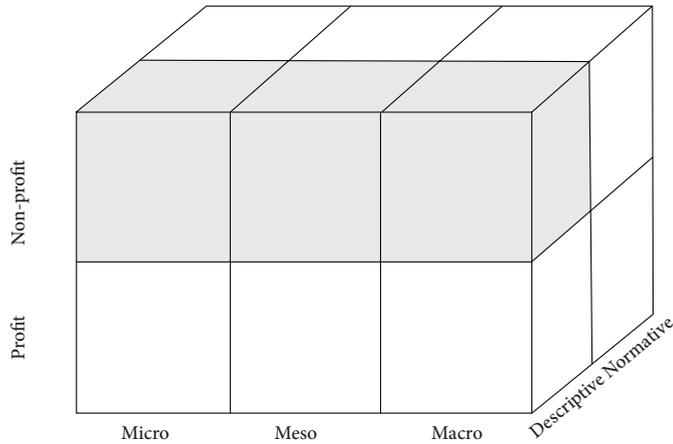


Figure 27.1 Positioning of research.

Between these there are processes linking the individual to its organisation (be it a project, a parent organisation or the whole supply chain); processes and dependencies which can be defined as a meso perspective. (Torgersen & Steiro, 2009) describe constructs related both to interpersonal relations, relations between individuals and organisations, and inter-organisational relations. Hence, these findings relate to both the *micro*, *meso* and *macro* perspectives.

Reviewing articles published in peer-reviewed logistics and Supply Chain Management (SCM) journals between 2007 and 2017 revealed theoretical knowledge about supply chain interaction. In *Science Direct*, the search term 'supply chain interaction' was applied to titles and key works. This resulted in 83 hits. Similarly, a search for 'Supply chain collaboration' and 'Supply chain interaction' under titles, 'Supply chain interaction' under keywords and abstracts, and 'Supply chain preparedness' under abstracts in *Academic Search Premier*, resulted in 65 articles. And an additional 83 hits were found by searching for 'supply chain interaction' under titles and keywords in Google Scholar.

Semi-structured interviews, with personnel from both the Defence forces and a logistics provider involved in the planning and execution of

Operation Atalanta, provided valuable insight into the status of interaction in defence supply chains. This was part of the EU operation against piracy in the Gulf of Aden in 2009. Norway contributed with one frigate, and a commercial logistics provider worked closely together with the National Support Element (NSE) in serving the frigate.

Preparedness and supply chains

A supply chain is *'an integrated process wherein raw materials are manufactured into final products, then delivered to customers.'* (Beamon, 1999). The supply chain includes various flows, where the flows of products, services, finances and information are assumed to be the most central. Applying a supply chain perspective indicates a strategic view of materials and distribution management, emphasising joint benefits across functional and corporate borders (LaLonde & Pohlen, 1996; Mentzer et al., 2001; Kempainen & Vepsäläinen, 2003).

Managing a supply chain (termed Supply Chain Management, or SCM) as an integrated system encompasses both coordination and structuring decisions (Truong & Azadivar, 2003). This requires a supply chain orientation (SCO), defined as *'the recognition by an organization of the systemic, strategic implications of the tactical activities involved in managing the various flows in a supply chain.'* (Mentzer et al., 2001). An SCO assumes a willingness to: assess inter-organisational trust and commitment; recognise interdependencies between participants in the supply chain; focus on organisational compatibility regarding goals and objectives, operating philosophies and corporate cultures; emphasise key supply chain processes; and, apply top management support and visions (ibid). Supply chain management thus presumes not only a recognition that supply chains exist, but also that supply chain participants acknowledge the interconnectedness and interdependencies between them.

In their work, (Chopra & Meindl, 2013) argue for the need of a strategic fit between company strategy and supply chain designs. They claim that, *'a company may fail either because of a lack of strategic fit, or because the overall supply chain design, processes, and resources do not provide the capabilities to support the desired strategic fit.'* (p. 33) To ensure strategic

fit, one must assess the supply chain's capabilities – whether the supply chain needs the ability to be responsive or efficient. (Fischer, 1997) argues that efficiency is a preferred strategy when demand is predictable, whereas strategies ensuring responsiveness are best suited when needs are unknown or uncertain. In such situations, the supply chain needs the ability to respond quickly to: fluctuations in required quantities and products; handle short lead times; and, provide a high service level (Chopra & Meindl, 2013; Demeter, Gelei, & Jenei, 2006; Fischer, 1997; Gunasekaran, Laib, & Cheng, 2008; Parmigiani, Klassen, & Russo, 2011). Since demand in a preparedness context is uncertain or even unknown, one would expect supply chains for preparedness to have the properties of responsiveness rather than of efficiency.

(Zacharia, Nix, & Lusch, 2009) find a strong relationship between supply chain collaboration and business performance. Finding interdependent supply chain partners, investing the time and resources to understand them and to collaborate intensely, are critical to achieving successful operational and relational outcomes (p. 116). Thus, one needs to understand the partners' processes, objectives, and values, openly share information, and ensure that supply chain goals are understood and shared. As proposed by (Simatupang & Sridharan, 2005), *'in order to ensure effective collaboration, the chain members are encouraged to clearly define mutual objectives and associated performance measures and link their performance systems with decision synchronisation, information sharing, and incentive alignment.'* (p. 271). This is supported by (Parmigiani et al., 2011), who find that relational capabilities in responsive supply chains reflect the ability to collaborate and exchange knowledge that promotes flexibility and innovation in the supply chain (p. 218).

Hence, choosing supply chain partners and deciding how to interact with these, are important aspects of supply chain management. In fact, (Truong & Azadivar, 2003) show that supplier selection, partnership, inventory ownership, information sharing, and trust and commitment are central elements of a supply chain strategy. Such cooperation is often thought of as being close and long-term (Marasco, 2008; Skjøtt-Larsen, 2000), since inter-organisational factors take time to develop, and managing close supply chain relationships is resource demanding.

On preparedness

To be trustworthy, defence organisations should demonstrate a real, or perceived, ability to respond when certain adverse events or disasters occur. Carter (1999), cited in (Pettit & Beresford, 2005), defines ‘disaster management’ as *‘an applied science which seeks, by the systematic observation and analysis of disasters, to improve measures relating to prevention, mitigation, preparedness, emergency response and recovery.’*

(Kruchten, Woo, Monu, & Sotoodeh, 2008), in their study of the impact of disasters on critical infrastructure, claim that research on emergency preparedness can be identified in the intersection between hazard and disaster research. Building on Tierney et al. (2001), they identify three phases related to disasters: pre-impact, trans-impact, and post-impact. (Kovács & Tatham, 2009), comparing defence organisations with humanitarian organisations and their ability to respond to large-scale disruptions, pointed out that *‘[m]ilitary organisations need to prepare for (and engage in) warfare or peacekeeping missions [...] [this] require[s] the speedy mobilisation of resources and capabilities, from a “dormant” to an “active” state.’*

When relating this to a supply chain perspective, disaster preparedness should encompass measures such as: ensuring compatible communication and ICT systems; pre-stocking of emergency supplies; pre-designed purchasing agreements; preparation for cooperation with other organisations; establishment of planning teams; analysis of capabilities and hazards; development and implementation of plans; creation and validation of scenarios; development of detection plans; and, development of mitigation plans (Hale & Moberg, 2005; Kovács & Spens, 2007; Pettit & Beresford, 2005).

In this research, I define preparedness in a supply chain perspective thus: *as a means to design inter-organisational structures, to organise supply chain resources, and to (jointly) plan and train to ensure efficient response if response is called for* (Listou, 2015).

When discussing relations between public and private parties, (Smyth & Edkins, 2007) find that such relations are often reactively managed, due to a lack of trust and confidence, and weak interfaces between the private supplier and the public client. Often, relationship development and management depends on the initiatives of individuals, without systematic leadership, organisational management support, systems or procedures.

This might influence the effectiveness of public participants' preparedness measures.

Supply chain literature and interaction

The SCM literature search identified works that seek to explore or explain how partners in a supply chain work together, and how this influences supply chain success. Different authors apply different constructs for describing and analysing relations between business partners, such as coordination, cooperation, collaboration and integration.

(Zacharia et al., 2009), when analysing supply chain collaboration and effects on performance, refer to (Malone & Crowston, 1994), who define supply chain coordination as managing interdependencies between firms. They posit that there are three distinct approaches to managing such interdependencies: competition, cooperation, and collaboration. These approaches represent a continuum from competition, which represents the least direct contact between participants, to collaboration.

(Xu & Beamon, 2006), although not defining coordination, claim that coordination is a strategic response to problems arising from inter-organisational dependencies within supply chains. They describe a framework for selecting the appropriate coordination mechanism, consisting of a resource-sharing structure, decision style, level of control, and risk/reward sharing between firms.

(Singh & Power, 2009), cited in (Soosay & Hyland, 2015), define supply chain cooperation as firms exchanging basic information and having some long-term relations with multiple suppliers or customers. At the same time, they state that coordination, where a continuous flow of critical and essential information takes place using information technology, is at a higher level than cooperation. In this respect, their view differs from Zacharia et al. (2009), who view cooperation as a subset of coordination. Furthermore, they claim that collaboration, including high commitment, trust and information sharing, is again a more advanced level than coordination. Zacharia et al. (2009), share this opinion, defining high level of *collaboration* as high levels of commitment, numerous joint activities, overlapping operations and relationships that cause changes in each other's organisations. This requires a commitment of time and resources on the part of each firm.

(La Forme, Genoulaz, & Campagne, 2007), in their framework for analysing collaborative performance, define collaboration as *'a way by which all companies in a supply chain are actively working together toward common objectives...characterised by sharing information, knowledge, risks and profits. At this level, the company announces information related to its sourcing strategy, goals or stakes, in order to improve the supply performance.'* In their meta-analysis of literature on supply chain collaboration, (Soosay & Hyland, 2015) distinguish between horizontal collaboration and vertical collaboration. Whereas the former describes collaboration between firms/organisations at the same level in the supply chain, the latter relates to supply chain issues, which is the one of interest in this work. Identifying 12 different theoretical bases (including resource-based theory, social-exchange theory, stakeholder theory and transaction cost theory, to mention a few), they conclude that most studies takes a dyadic perspective, for the most part between buyers and suppliers. Adding to this, (Simatupang & Sridharan, 2008) show that (vertical) supply chain collaboration should include collaborative performance systems, decision synchronisation, information sharing, incentive alignment, and innovative supply chain processes.

(Chen & Daugherty, 2009), when describing supply chain integration, claim that this term is often used interchangeably with the related but distinct concepts of cooperation and collaboration. Referring to (Harrison, Van Hoek, & Skipworth, 2014), (Soosay & Hyland, 2015) show that some authors conclude that cooperation is 'the indispensable step to supply chain integration', and that collaboration goes beyond (supply chain) integration, by including long-term commitments to technology sharing and closely-integrated planning and control systems. (Fabbes-Costes & Jahre, 2007), in their systematic literature study, set out to test the established conception that (more) supply chain integration has a positive effect on supply chain performance. They identify four layers of integration between supply chain participants: 1) integration of flows; 2) integration of processes and activities; 3) integration of technologies and systems; and, 4) integration of participants. They analyse dyadic relations, both upstream and downstream (between a focal company and either a supplier or customer), triadic relations (supplier – focal company – customer), and extended relations (i.e. more than three parties). Contrary to

conventional wisdom, they do not conclude that more integration leads to better performance of the supply chain.

The literature review was designed to find articles about relationships within supply chains. Based on the above, one might conceive that SCM literature describes a hierarchy of relations, from competition – cooperation – coordination – collaboration, as depicted in Figure 27.2.

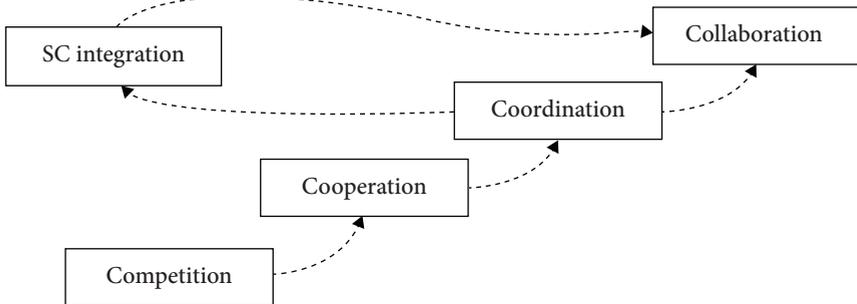


Figure 27.2 Hierarchy of relations.

Supply chains and interaction (*samhandling*)

Although identified works recognise interactional mechanisms, such as power, trust, and social contracts, most of them seem to focus on the macro level; the units of analysis are the organisation, relationships between organisations, or the supply chain as a whole. Thus, when (Fabbes-Costes & Jahre, 2007) could not find proven effects of supply chain integration on performance, they analysed articles focussing on inter-organisational relations, and not explicitly inter-organisational or inter-personal relations.

Whereas supply chain literature seems to focus predominantly on relations between organisations, Torgersen & Steiro (2009) build on an array of literatures when defining interaction (*samhandling*). Their indicators cover both micro, meso, and macro relations. Does this matter when trying to improve supply chain effectiveness in preparedness situations?

A case presented in Listou (2013) helps to shed light on this question. The case study investigated supply chain relations before and during Operation Atalanta 2009. In this operation, in which a Norwegian frigate participated in the UN-initiated anti-piracy operation, the Norwegian

Defence Forces relied on a civilian logistics provider to supply and sustain the frigate in the Gulf of Aden. The supplier was co-located with the National Support Element (NSE), which is the mediating point between the deployed frigate and operational headquarters in Norway. Based on interviews with involved personnel from both organisations, studies of secondary sources such as evaluation reports, e-mail correspondence and meeting minutes, cooperation both before the operation started (the preparedness phase) and during the operation was assessed (Listou, 2013). The findings are summarised in Table 27.1 (Interactional Factors, from Torgersen & Steiro, 2009):

Table 27.1 Interactional aspects and Operation Atalanta (Listou, 2013).

<p>The ethical dimension Before: Not discussed at individual level During: Consensus about work ethics and moral standards</p>	<p>Sense of involvement Before: Not established since personnel not assigned During: Involved personnel contributed actively</p>	<p>Coordination of tasks Before: Not detailed in advance During: Worked very well</p>
<p>Complementary expertise Identified at institutional level, not individual level</p>	<p>Shared situational awareness Before: At institutional level, not individual level During: Evolved between NSE personnel and logistics provider</p>	<p>Role awareness Before: At institutional level During: Evolved at individual level</p>
<p>Precise communication Personnel acquainted with maritime vocabulary</p>	<p>Institutional logic Personnel familiar with maritime operations and ships services</p>	<p>Balance of power: Institutional level: Defence needed external competence, logistics provider wanted cooperation. Not discussed at individual level</p>
<p>Transparency, confidence, trust Before: Not at individual level; personnel didn't meet before operation started During: Evolved at individual level during operation</p>	<p>Understanding of the organisation and culture Before: At institutional level: supplier knew the Defence Forces. Informal talks prior to engagement During: Differences between military and commercial culture</p>	<p>Mastery of tools Before: No compatible information systems During: Relied on Gmail</p>
<p>Joint learning Before: Not at individual level During: High degree of joint (informal) learning, both at individual and institutional level</p>	<p>Instinct Before: Not assessed During: Logistics provider developed good sense of Defence needs</p>	<p>Training in interaction No; new supplier, no history together, no joint training</p>

As pointed out by Listou (2015), the Defence Forces and the logistics provider did not work closely together before Operation Atalanta. Defence personnel and supplier personnel did not know each other and hence did not develop social contracts before the operation and cooperation started. Although the logistics provider organised a joint assessment trip to the Gulf of Aden during operation planning, the officers who were to man the NSE were not appointed at the time. The logistics provider was not included in the planning and training of the force. As the supplier maintained, joint training would be most welcome, since they have employees that aren't familiar with the military system and cooperation during an operation runs smoother if personnel have developed social contracts beforehand.

If we relate this to the supply chain literature hierarchy presented in Figure 27.2, one could claim that the relations at an organisational level were at a Cooperation level during the preparedness phase, and at a Coordination, or possibly Collaboration, level during the operation. In the after-action evaluation report, both parties claim that the operation was a success, since the frigate was operational at all times. However, quantitative key performance indicators (KPIs) were not defined beforehand. As such, this confirms the impression of (Fabbes-Costes & Jahre, 2007), that effects of supply chain integration are difficult to measure quantitatively. If so, then 'success' must be assessed otherwise. In this case, the parties point to the fact that inter-personal cooperation (i.e. interaction) between Defence and logistics provider personnel worked smoothly. Although, as the assessment of the interactional indicators show, this was not planned or catered for beforehand and as such, interaction was not emphasised during the preparedness phase. Hence, the level of interaction was not a result of deliberate organisational actions. This supports the findings of (Smyth & Edkins, 2007), that success in public-private cooperation is often a result of individual initiatives, not rooted in a deliberate strategy.

Conclusions

A supply chain is a business process that crosses organisational borders. In an open systems perspective, one acknowledges that supply chain

output depends on all participants directly or indirectly controlling activities and resources necessary for the supply chain. Preparedness poses some other challenges to supply chains than ongoing business does. Preparedness is a form of insurance that one acknowledges the need for but hopes will not be called for. If resources on stand-by for preparedness are not called for, then supply chain effectiveness is difficult to assess. Hence, preparedness organisations need to demonstrate a presumed ability to act. This includes establishing routines for efficient interaction at all levels – both micro, meso, and macro, and between personnel, both within the focal organisation and in inter-organisational projects.

SCM literature seems to focus predominantly on inter-organisational relations and to a lesser degree, on inter-personal relations. Relations can be organised along a continuum ranging from competition to collaboration, although it is not clear how to distinguish between these levels. Furthermore, there are different opinions about the connection between this continuum and the concept of supply chain integration; does integration require relations at a coordination level, and is supply chain integration a prerequisite for supply chain collaboration?

By applying the interactional indicators when analysing inter-organisational relations, enablers and barriers for relationship success can be studied at both micro, meso, and macro levels simultaneously. As illustrated in the Atalanta example, interaction was not emphasised during the operation planning, at least not at the micro (individual) level. The operation and cooperation was evaluated as a success, which could be the effect of a lucky combination of personnel being available when the posts were manned. If so, this would indicate that interaction took place at a macro level, whereas the micro and meso levels were not addressed.

Without understanding the mechanisms leading to interactional competence and without defining indicators to assess interactional processes, success (or lack of success) in supply chain preparedness is difficult to address properly.

Hence, managers need to assess the interactional constructs when planning and training for preparedness. Moreover, these constructs must be assessed at all three levels. If not, success of inter-organisational

cooperation during operations (i.e. after the preparedness phase) would most likely depend on individual initiatives and competence, not on deliberate strategy.

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