



Risk management in logistics: the path of SCRM enriched by procedural rationality

PRESENTATION OUTLINE

1- Supply chain risk management (SCRM): a risk management optimisation procedure

2- Non-optimising agents, in four logistic families, whose choices are based on a deliberative process

3- Our proposal : SCRM based on the deliberative process to respond to the specificities of each logistic family



1- SCRM: a risk management optimisation procedure (1/2)

SCRM =
SCM +
Risk management

Professionals must
coordinate to reduce
the vulnerability of the
supply chain

The 4 steps of SCRM	Identification	Evaluation	Risk treatment	Monitoring
Objectives of the step	<ul style="list-style-type: none">-Establish the exact structure of the logistics network-Identify the points of vulnerability of each link in the network	<ul style="list-style-type: none">-measuring risks to assess their criticality-Prioritise risks to prioritise their treatment	<ul style="list-style-type: none">-reduce the probability of occurrence of the risk by preventive measures-reduce the consequences of the risk through protective measures-manage the crisis	<ul style="list-style-type: none">-monitor the evolution of risks-checking the application and relevance of treatment measures
Methods to achieve the objectives (examples)	<ul style="list-style-type: none">-exchange of information within the company and with external partners-Feedback-Brainstorming-Methods from quality management: fault trees, event trees, Six Sigma, SCOR, etc...	<ul style="list-style-type: none">-brainstorming, mapping, feedback-expert judgements, qualitative and quantitative-FMEA...	<ul style="list-style-type: none">-auditing suppliers, simplifying the architecture of the logistics network-risk transfer, risk sharing- contingency plan, business continuity plan...	<ul style="list-style-type: none">-monitoring market developments-exchange of information with other members of the logistics network-Feedback...



1- SCRM: a risk management optimisation procedure (2/2)

Endowed with unlimited cognitive capacities, the economic actor can "anticipate all the possible consequences of his actions and rank them in order of preference" (Béjean et al., 1999)

- SCRM assumes perfect rationality of the logistics actors
 - Search for an optimum result at each stage of the procedure
 - Access to perfect information (strategic information from other members of the supply chain)
- => The SCRM is therefore a matter of substantive rationality (optimising and omniscient agent)**

"Agents have neither the cognitive capacity, nor the information, nor even sufficient time to make the optimal decision" (Ferrière, 2011, page 37)

- However, optimisation is not the only coordination modality (Simon) for managing crises



2- Non-optimising agents whose choices are based on a deliberative process (1/3)

- Agents operate in a context of radical uncertainty
 - To decide in this uncertain context, agents rely on a deliberative process
 - The agent does not know all the alternatives and chooses "the first satisfactory alternative" (Simon, 1955). He is no longer omniscient and optimising

- Conventions can help agents to carry out their deliberative process and to coordinate
 - Conventions are "values, rules, representations" (Eymard-Duvernay, 2006), shared references
 - Boltanski and Thévenot (1991) point to the emergence of 'cities' and 'worlds': typology of coordination modalities, diversity of coordination modalities

"How to explain that a society populated by autonomous individuals is not characterised by permanent chaos and instability" (Eymard-Duvernay, 2006)

2- Non-optimising agents whose choices are based on a deliberative process (2/3)



Salais and Storper (1993) propose four worlds of production: choices and coordination are structured by a convention specific to each world. Burmeister (2000) draws on this to propose four logistical families.

	Specific production resources	Standard production resources
Dedicated market (differentiated products for different customers)	INTERPERSONAL FAMILY Convention (value around which coordination is mainly structured): co-decision Example: tailor	MARKET FAMILY Convention: flexibility Example: car manufacturer offering different finishes for the same model
	IMMATERIAL FAMILY Convention: innovation Example: new technologies potentially addressing a large market	INDUSTRIAL FAMILY Convention: optimisation (strict compliance with the contract's objectives) Example: hard discount shops with little variety in products
Generic market (undifferentiated products : same product for all)		



2- Non-optimising agents whose choices are based on a deliberative process (3/3)

- Survey (2020-2022): 22 producers and transporters who have suffered a major crisis (COVID, major transport strikes, financial crisis of 2008...)
 - Result : logistic families resist the crisis : professionals from a given logistic family do not turn to another convention to cope with the crisis
 - In particular, non-optimising actors (interpersonal, market and immaterial families) do not become optimising in times of crisis.

- Thus, the SCRM, built for optimising agents, is relevant for only one family, the industrial family
 - We propose to evolve the SCRM based on the principles of the deliberative process used by agents in the three non-optimizing families

Interviews with cement manufacturers, a toilet paper producer, a steel manufacturer, a sugar producer for sodas, a polypropylene producer, river transporters...



3- SCRM based on the deliberative process to match each logistic family (1/3)

The deliberative process thus seems particularly suited to the context of crisis, which is uncertain by definition and requires a fine and continuous analysis rather than a single and constant response

The BCP is one of the methods foreseen by the SCRM

- The deliberative process is based :
 - on the acceptance of a "merely satisfactory" outcome
 - on a step-by-step analysis and exchange as the crisis progresses
 - this 'step-by-step' procedure may lead agents to reconsider their initial objective

- Let's take the example of a business continuity plan (BCP) following the principles of the deliberative process
 - The BCP incorporates the notion of degraded functioning during the crisis period, which may be consistent with the search for a "merely satisfactory outcome"
 - We draw on the principles of the deliberative process to adapt the BCP to the coordination modalities of non-optimising families



3- SCRM based on the deliberative process to match each logistic family (2/3)

Coordination structured around co-decision, i.e. taking into account the constraints and needs of the partner

The agents exchange frequently to find compromises, build solutions together or even help each other

Coordination structured around innovation. Frequent exchanges but very vertical client-provider relationship

— Interpersonal family

- In this family, a BCP must therefore be drawn up jointly with the main partners
 - Implies the setting up of an inter-company governance in order to structure the collection of the needs and constraints of the different actors, to structure the analysis of these data, leading (in fine) to a compromise

— Immaterial family

- In this family, a BCP could continue to satisfy this "innovation value", by defining the conditions for continuing to innovate during a major crisis
 - For example : focus on maintaining research and development staff during major crises and on protecting the tools for innovation



3- SCRM based on the deliberative process to match each logistic family (3/3)

Coordination structured around flexibility.

For example:

-flexibility of the transport function (recourse in certain cases to multi- or intermodal solutions),

-or flexibility of the production function (recourse to delayed differentiation to offer varied ranges on the basis of the same product).

— Market family

- In this family, a BCP should ensure that the flexibility on which the relationship is based is maintained
 - Flexibility of the transport function : forge links with other carriers, including greater use of spot contracts during crises, or with alternative carriers (networking strategy)
 - Flexibility of the production function : guaranteeing a minimum number of ranges (the main ranges with reduced workforce for example). Implies training all the personnel in the use of the production lines on which these ranges are produced



Conclusion

- Finally, the SCRM is a very good basis. Simply needs :
 - To be adapted to the values of each family
 - To accept a simply satisfactory result, adaptable to the progress of the crisis

- Beyond the SCRM, the deliberative process helps to meet resilience objectives
 - Step-by-step process with adaptation of objectives as the crisis progresses: meets the flexibility and 'agility' advocated by resilience

For many authors, the COVID crisis was a wake-up call: a change towards more resilience in supply chains is now inevitable (Javorcik, 2020 ; Fulconis et Paché, 2020 ; Fabbe-Costes et Seqari, 2020...).



Thanks for your attention

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