Abstract of the research proposal of Y. Lont, for the PhD congress of 20-9-2022

Decision-making for reliable internal supply chains in military organisations
Understanding the effects and adaptation of coordination mechanisms on supply chain reliability in military organisations

Effective military deployability and deployment depends on the timely availability of dedicated military units, equipment and essential supplies anywhere in the world. Due to the dynamic context of a military organisation, processes and procedures must be in place that ensure the timeliness. However, military organisations face deeply uncertain environmental changes, for example in funding due to shifting political priorities, changing public expectations regarding military capabilities, and changing coalitions. All these changes may cause unpredictability and many uncertainties. The changing, threatening, strategic landscape creates additional dynamics at the operational level, and causes for example outliers in demands or disruptive requirements for new supplies. These dynamics require military organisations to be prepared, in order to deliver their supplies timely. To be prepared and act in time, multiple actors in these organisations make decisions at various times, on strategic, tactical and operational levels. The decisions on operational level are often made in real time and are the result of needing to make adjustments or changes. The interdependencies in supplies, activities and multiple actors require planning and coordination in timing, quantity, or quality. However, military organisations tend to be massive institutions organised in a vertical hierarchy with limited horizontal coordination. Coordination of activities and decisions in such organisations can be bureaucratic and rigid, which inherently involves information delays (Willem and Buelens, 2007), causing supply chain unreliability. Rigidity causes challenges in adapting the ways to coordinate to new future contexts. According to Rohrbeck (2010), one of the reasons why it is difficult for organisations to respond and adapt to external changes is because of inertia, which can result from the complexity of internal and external structures.

Therefore, this PhD research project will study the effects and adaptation of coordination structures on supply chain reliability in military organisations. To this end, agent-based modelling will be combined with exploratory modelling and analysis. As a first step towards understanding this question, I theoretically investigate the emergence of a vertical coordination structures and assess how deeply uncertain changing contexts affect the effectiveness of coordinating decisions. Specifically, I extend Epstein's model (Epstein, 2006) of growing adaptive organisations with fragmentation of information. In this model, individual agents endogenously generate internal coordination structures (e.g., local hierarchies and trading regimes) and share information to make decisions. Next, I experiment with dynamically changing contexts and analyse how this affects the performance of the organisation, as well as when and how this leads to organisational change.

References

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