

Intelligent Decision Support for Logistics and Supply Chain Management – Introductory Remarks

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Abstract

Digital transformation is among the most important buzzwords these years. A key driver initiating this stems from the rapid and ongoing innovations in the field of information and communication technology (IT). Implications of these innovations include the development of new information systems and related applications in almost any area one can think of. Information systems, theoretical developments and real-world applications related to intelligent problem solving in logistics and supply chain management are re-gaining importance because of this trend. That is, rejuvenating theoretical and practical developments, fostering related applications and information systems are allowing us to advance the state-of-the-art in solving decision problems in logistics and supply chain management.

Starting with *digitization*, this refers to the process of converting analog sources into a digital form, often already misinterpreted under the umbrella of digital transformation. As a next step, one may use the term *digitalization* as a reference to sociotechnical processes related to applying digitization techniques to a broader social and institutional context. Then, the broader process of transforming an organization or a network of organizations on different levels by making use of digitalization as well as digital technologies and concepts can be regarded as *digital transformation*. For a more detailed discussion of this ongoing debate see, e.g., [1].

Intelligent Decision Support for Logistics and Supply Chain Management has become a major driver within digital transformation and digital innovation projects in industry. This had been before the dawn of the current buzzwords and it seems to stay. For a brief history of the minitrack we refer to [2]. This year the

minitrack consists of four papers. They are covering a relatively broad range of topics within the above discussion as follows (they papers are listed in alphabetical order of the authors).

Heilig, Lalla-Ruiz, Bode and Voß consider the *assessment of quay and yard transshipment operations under proximity limitations in multi-terminal container ports*. Here we see a study of the impact of closeness limitations on specific areas of a container terminal when conducting transshipment operations at multi-terminal transshipment ports. Through a detailed mathematical model and computational study, the authors show that specific objective functions may be beneficial when operationalizing the major key performance indicators of vessels in ports. With this they succeed in having an impact on an important area of maritime shipping.

Neumann, Schosser, Vogt and Voigt focus on the use of information as a major enabler of successful supply chain management in discussing *credible information sharing in supply chains - a behavioral assessment of review strategies*. Even if their study is based on laboratory experiments, they provide most valuable food for thought regarding behavioral effects and their relation towards theoretically predicted benefits of review strategies. To achieve this, a long-lasting supplier-buyer relationship is modeled as an infinitely repeated game.

Siawsolit and Gaukler investigate, in a similar spirit, *the value of demand information in omni-channel grocery retailing*. As is common sense, advance demand information can support various measures in supply chain management, including inventory control. Now that e-commerce is starting to handle every-day provision of food, this becomes an important issue regarding the avoidance of waste due to deterioration. Their results indicate that when the demand lead time is longer than the replenishment lead time, a considerable reduction on safety stock can be

achieved, leading to a decrease in product deterioration and outdated.

Sonneberg, Leyerer, Kleinschmidt, Knigge and Breitner focus on logistics developments using *autonomous unmanned ground vehicles for urban logistics: optimization of last mile delivery operations*. They formulate an electric location routing problem with time-windows, aiming at simultaneous planning of locations, delivery robots, and tours to maximize the efficiency of these “future” vehicles. While it might still be on the road ahead, this new technology will come and it will support courier, express and packet services especially in urban areas.

To conclude, again using words from [2], among others, the technology is there and even the data is there (at least in many cases); we just need to learn using it. And we need to be able to put our algorithms and methodological developments into running systems. If we succeed in that, we may have an impact. The above mentioned contributions pave the road towards doing so. Coming back to the issue of digital transformation and digital innovation, we have seen the birth of different loosely coupled layers of devices, networks, services, and contents created by digital technology [3]. We are also seeing profound changes in the ways that firms organize for innovation in the future. A holistic view on digital innovation answers the question of “Who owns digital innovation?” (even if this might be wrong English) by “Information Systems.” Digital transformation needs to change and is currently changing almost any field, including supply chain management, marketing, corporate governance.

References

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