

Digital supply chains

Still more "wannabe" than practice

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THE DANISH SUPPLY CHAIN PANEL

DIGITAL SUPPLY CHAINS: STILL MORE “WANNABE” THAN PRACTICE

Digitalization is upon industries as an enabler for improving the competitiveness of the company where new emerging technologies disrupt current practices.



BY MORTEN BRINCH, INDUSTRIAL PHD STUDENT, SIEMENS WIND POWER A/S, AND JAN STENTOFT, PROFESSOR, DEPARTMENT OF ENTREPRENEURSHIP AND RELATIONSHIP MANAGEMENT, UNIVERSITY OF SOUTHERN DENMARK

From a strategic perspective, we experience that smart-connected-products are changing the current business models, for example, new offerings. Thus, a paradigmatic shift is happening to the popular five-forces provided by Michael E. Porter where technologies and the embedded data utilization change the competitive landscape (Porter & Heppelmann, 2014). In this regard, the traditional supply chains are to be shaped by the digital trends in the future, where supply chain managers are

to be aware of the technological development

for their specific industry and how these technologies can be utilized for supply chain purposes. The emerging technological capabilities seem immense ranging from the use of big data, advanced analytics, 3D printing to cloud computing, Internet of Things, robots, drones, RFID chips and industry 4.0, among several more. By the use of these technologies supply chains become more and more integrated, where digital capabilities enable processes to be connected in an automated manner and, thereby, make supply chains better

capable of managing the increasing complexity in markets, products and internal processes. In leveraging digital capabilities, the development of supply chains becomes a knowledge-based approach enabling higher growth and better profits (Stevens & Johnson, 2016). A significant portion of these digital technologies are empowered by data and its domain-specific usage in the processes of sourcing, manufacturing, services, planning, logistics and return, and it gives the impression that every supply chain application potentially can be affected by the increasing information flow (Brinch et al., 2017). Here, better decision-making practices can create new insights by integrating new data sources and thereby empower informed, faster, precise and even automated decisions that can mitigate risks and

DET KAN DU LÆSE OM

- ▮ Digitale supply chain-strategier
- ▮ Behov for og investering i big data
- ▮ Udfordringer ved implementeringen af digitale supply chain-løsninger
- ▮ Forventet påvirkning af digitaliseringen

uncertainties while still meeting customer requirements in relation to cost, quality and time. However, academic literature dealing with this topic is sparse why extant literature seems to be dominated by grey literature (e.g. AT Kearney/WHU Logistics Study (2015), Raab & Griffin-Cryan, 2011; Schrauf, S. & Bertram, P. (2016), Nowosel et al., (2015)).

In a supply chain context, the approach to digitalization can happen at three different

THREE LEVELS OF SUPPLY CHAIN DIGITALIZATION

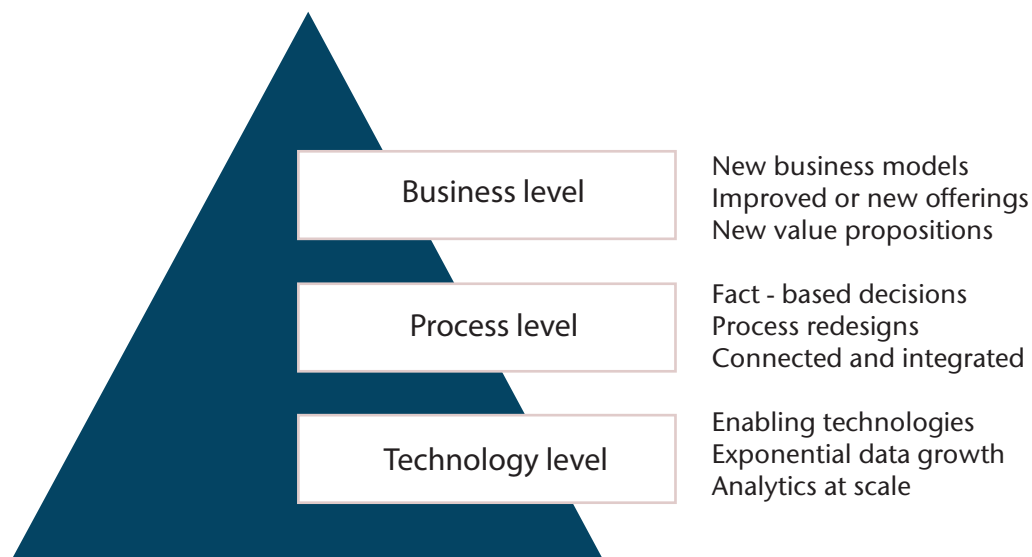


Figure 1. Source: The Danish Supply Chain Panel

levels (see figure 1). The first level is strategic focusing on having a strategic approach to digitalization as part of the supply chain strategy. The second level is on business processes to identify which processes are influenced the most by digitalization and what projects then are needed to be implemented. The third level is the enabling level focusing on the concrete technologies and systems to be implemented in supporting the requirements of business process outcomes.

As a consequence of the digital acceleration in supply chain management, strategies are to be determined in the offices of supply chain managers on how digitalization will impact their specific supply chain both from upstream, internal and downstream approach. The focus of this mini-survey is on digital strategies, digital improvements and the expected impact that digitalization will have, while also highlighting gaps towards the current state. The supply chain panel was asked about the relevance of this theme on a five point Likert scale from 1 (not relevant at all) to 5 (very high relevance) with the average score on relevancy being 3.4.

Digitalization strategies

The first question is concerned with whether the companies being part of The Danish Supply Chain Panel have an explicit digitalization strategy. As shown in figure 2, an average of 2.90 is obtained on this issue on a 5 point Likert Scale. It does not seem like there is a match of the proclaimed importance of digitalization and strategic work on this matter. Moreover, 71 % of the respondents have answered from “to a very low degree” to “to some degree”. The low average can also be caused by different industry practices (i.e. some industries are first movers while others not are feeling the same pressure to focus on digitaliza-

DIGITALIZATION STRATEGY

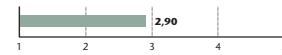


Figure 2. Source: The Danish Supply Chain Panel

tion). However, it might also be that some companies simply are more proactive in this area compared to other firms. Overall, the results indicate a so far slow diffusion of digitalization strategies for supply chain purposes.

The respondents were also asked to which degree their companies are pursuing digitalization strategies within different technical areas (see figure 3).

Figure 3 shows that planning is obtaining the highest average (3.02). Planning might be evaluated highest for better matching supply and demand, thus being able to mitigate risks and uncertainties in the internal and external environment. The second highest average is on digital services which indicate service processes becoming more critical to the future of SCM practices. Furthermore, digitalization has moved the digital priorities from earlier being focused on manufacturing automation to now being more focused on planning, service, logistics and sourcing which all require more cross-functional capabilities. Finally, the data reveals that return management is being weakly on the agenda.

DIGITALIZATION STRATEGIES PURSUED WITH DIFFERENT AREAS

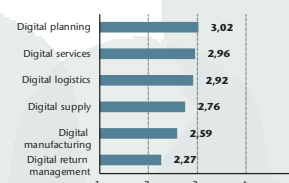


Figure 3. Source: The Danish Supply Chain Panel

Expectations of digital improvements in the coming years

The supply chain panel was further asked about their expectations on whether their companies will make digital improvements in various areas over the next three years. The list is borrowed from AT Kearney/WHU Logistics Study (2015). With an average of 3.59 “IT integration across all areas” is high on the agenda. Thus, establishing a single-source of truth for data utilization that enables easy information sharing and responsive data utilization across business functions seems to be the utmost priority (see figure 4). In addition, downstream IT integration is rated second and upstream IT integration is rated fifth. This shows that the focus also is to increase the transparency across company boundaries. More innovative technologies seem to have limited expectations (e.g. the use of robots and 3D printing), a result that is similar to the study presented by AT Kearney/WHU Logistics Study (2015). Software innovation is rated over hardware innovation which might indicate that supply chains should be better to utilize the available computer power.

Figure 5 shows by what means the respondents perceive classical IT systems will be changed to digitalization. Each system is evaluated both in terms of their expected degree of change (the upper bar) and their

EXPECTATIONS OF DIGITAL IMPROVEMENTS IN 2017-2019

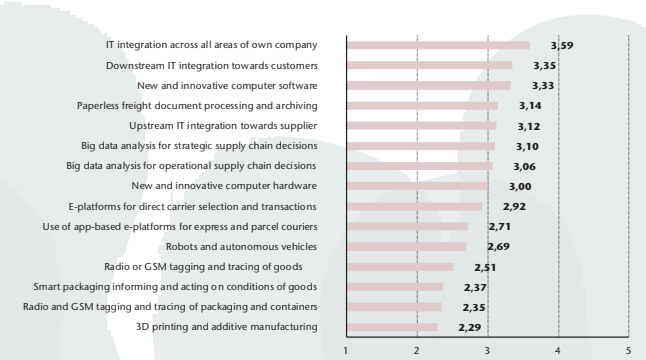


Figure 4. Source: The Danish Supply Chain Panel

CHANGE OF CLASSICAL IT SYSTEMS DUE TO DIGITALIZATION

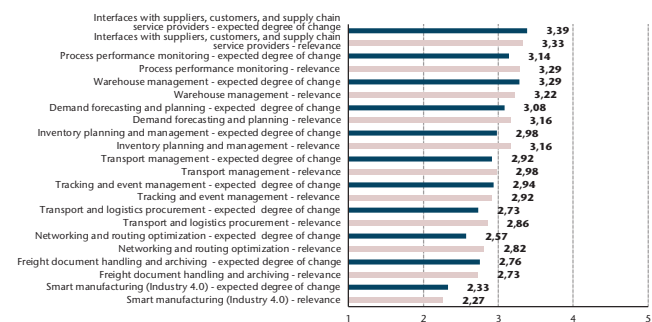


Figure 5. Source: The Danish Supply Chain Panel

relevance (the lower bar). Supply chain integration across company boundaries is rated the highest with an average of 3.39. It seems like companies are pursuing to obtain the full potential of true chains by making integration that moves beyond the single firm. Process performance monitoring is also evaluated high which stresses the importance of this capability to get faster access to process performances through, for example, live or almost live monitoring. Finally, it is interesting that given the high hype of industry 4.0, it is rated the lowest indicating that the realization of industry 4.0 is still in its infancy. A recent poll during a presentation of “Industry 4.0: Buzz word or reality” by Jan Stentoft at the annual meeting of M3 User Group revealed that only 9 % of the participants have a strategy for Industry 4.0.

Impact of digitalization

Digitalization efforts in the supply chain is also claimed to have several impacts on supply chain practices and performances (AT Kearney/WHU Logistics Study, 2015; Schrauf & Bertram, 2016), (see figure 6 and 7). However, it is not a severe impact as all scores are below 3 except for JIT sourcing. The adoption of digitalization might then be seen as being incremental rather than radical. JIT sourcing is rated highest which indicate a need for matching supply with demand.

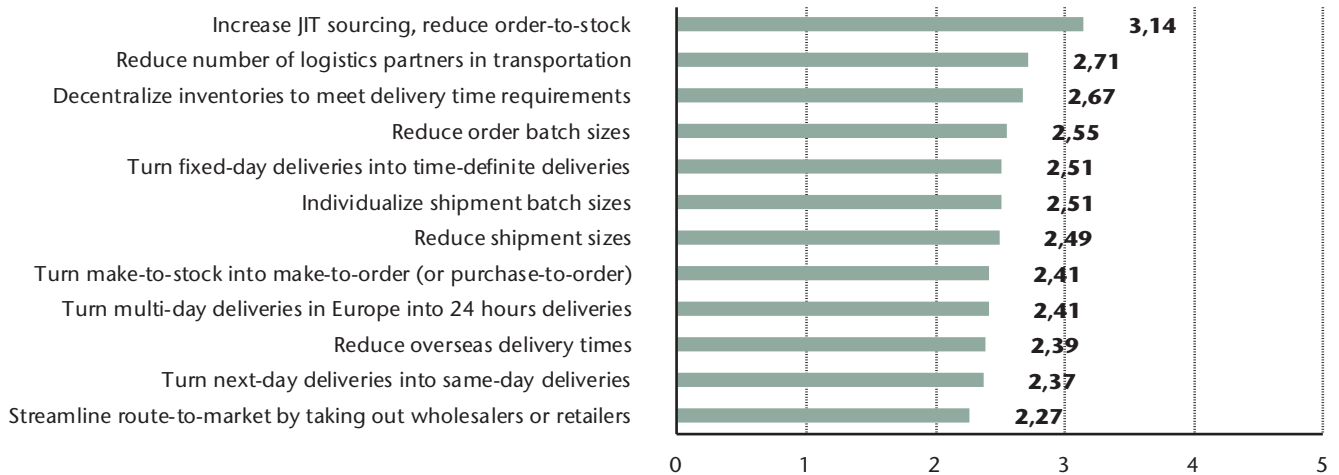


Figure 6. Source: The Danish Supply Chain Panel

The respondents were still asked to judge how various levers will impact their supply chain performance in the coming three years. As shown in figure 7, “better decision making” is a high lever which is reinforced by the focus of IT integration as pointed out in figure 4 and 5. Thus, the practice becomes more mature to take leverage of available data in the larger ecosystem network.

Improved supply chain responsiveness is also perceived to be an affected performance area due to digitalization. This can take place by implementing smart processes and agile analytics to meet individual customer needs. Lower supply chain complexity is less likely to be reduced owing to digitalization. Instead digitalization might

be used to manage supply chain complexity better.

Big data and data driven supply chain analytics

A special focus on big data has been included in this mini-survey on digitalization. Figure 8 shows the supply chain panel’s answers on the actual and needed investments in big data across six process areas in the supply chain.

As shown in figure 8, the current investments and perceptions of needed investments in big data analytics is not that high across the six supply chain process areas (ranging from averages from 2.80 to 1.61). However, the “need” scores are higher than

DIGITAL LEVERS IMPACTING SUPPLY CHAIN PERFORMANCE

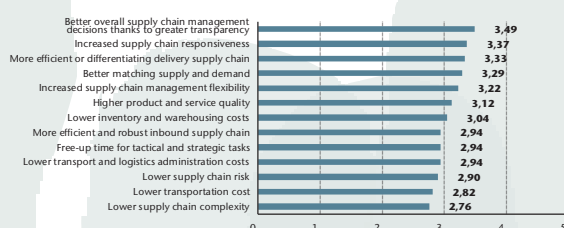


Figure 7. Source: The Danish Supply Chain Panel

ACTUAL AND NEEDED INVESTMENTS IN BIG DATA ANALYTICS

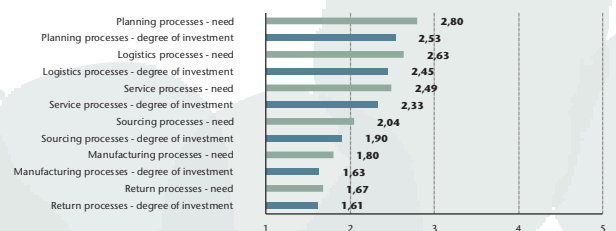


Figure 8. Source: The Danish Supply Chain Panel

DEGREE OF PURSUING A DATA-DRIVEN SUPPLY CHAIN AND ITS RELEVANCE

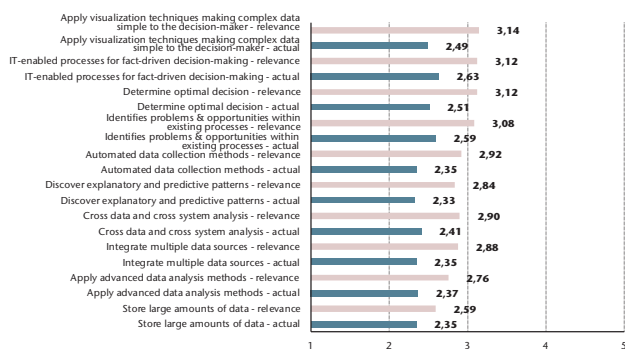


Figure 9. Source: The Danish Supply Chain Panel

“current investments” for all process areas. The data shows that the most needed areas are within planning and logistics whereas sourcing, manufacturing and returns are rated rather low which is in line with previous results (Brinch et al., 2017; Stentoft et al., 2016).

The Danish Supply Chain Panel was asked to evaluate their actual level of pursuing a data-driven supply chain (e.g. by applying business analytics and big data) and its relevance. Severe gaps were found as portrayed in figure 9.

Crunching large datasets for simplification and visualization purposes in order to improve decision making processes is perceived being the most relevant but also the area with the largest gap between the actual performance and its relevance. The data shows that fact-driven decision-making and the determination of optimal decisions are of importance. Storing data and applying advanced analytics have the least relevance, highlighting that advanced analytics (e.g. machine learning and neural networks) is not for every application and that more common analytic techniques also can fulfill the purpose of fact-driven decision-making.

Implementation issues

The last question is concerned with challenges for implementing digital supply chain solutions (see figure 10). The respondents were asked to mark what they see as the top three main challenges. Correspondingly, 47 % of the respondents did mark lack of time as a main challenge to implement digital solutions. This phenomenon is top score among challenges whatever topic we are dealing with in these mini-surveys. It calls for prioritization and focus. Figure 10 also shows that another challenge is lack of internal competences. Thus, digitalization requires new capabilities and competences, for example data scientists to crunch data for domain-specific purposes (Davenport & Patil, 2012) and R&D capabilities (e.g. implementing drones). In addition, lack of strategy is also a high scoring challenge. A digital strategy would be the foundation and starting point for digital process improvements that are aligned with business strategy. Finally, lack of business case is a reported challenge. It can be difficult to clarify the potential value that relies in digitalization, for example the effects of big data and better decision-making.

Conclusion

The results reveal that the level of digitalization in the supply chains is still low. Much hype is created about digitalization concerning its importance and necessity to stay in business, but that seems not to have affected the actual use. However, this is not the same as saying that digitalization is not being thought as important. The respondents do in general believe that they will invest more in digitalization in the coming three years with some supply chain processes being more relevant than others. However, such a development does not come of its own record. In order to jump start such a process, more time is needed to be allocated to such developing activities,

the right competences must be sourced and a strategy with a proper business case needs to be developed. We hope these results can stimulate discussions about what digitalization means in your organizations, what the current level is and what targets and strategies are needed. /

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CHALLENGES FOR IMPLEMENTING DIGITAL SUPPLY CHAIN SOLUTIONS

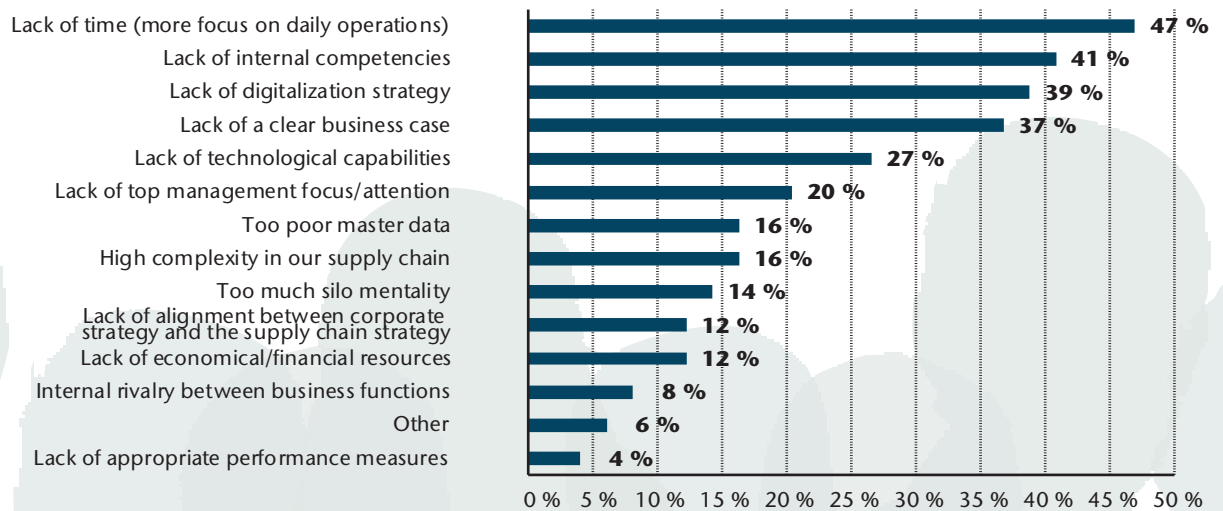


Figure 10. Source: The Danish Supply Chain Panel