Supply chain planning is considered important, but classical factors constrain further development

Stentoft, Jan; Mikkelsen, Ole Stegmann

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SUPPLY CHAIN PLANNING IS CONSIDERED IMPORTANT, BUT CLASSICAL FACTORS CONSTRAIN FURTHER DEVELOPMENT

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DILF and researchers from the Department of Entrepreneurship and Relationship Management at SDU in Kolding conduct several mini surveys each year, focusing on different supply chain management issues. Respondents to these mini surveys are voluntary senior managers from various Danish companies represented as the Danish Supply Chain Panel. This article presents the results of a mini survey dealing with supply chain planning.

By Jan Stentoft, Professor at Department of Entrepreneurship and Relationship Management, University of Southern Denmark, and Ole Stegmann Mikkelsen, Associate Professor at Department of Entrepreneurship and Relationship Management, University of Southern Denmark

DANSK RESUMÉ

DILF og forskere fra SDU gennemfører hvert år adskillige surveys, der bliver besvaret af Det Danske Supply Chain Panel, og som har fokus på forskellige problemstillinger indenfor supply chain management. Denne artikel præsenterer resultaterne fra et survey, der har taget udgangspunkt i supply chain planning (SCP).

Resultaterne indikerer, at respondenterne allerede på nuværende tidspunkt har implementeret SCP i deres virksomheder, men viser samtidig, at der er plads til at forbedre løsningerne. Respondenterne ønsker især at forbedre sig ved at bruge alle de tilgængelige funktioner i applikationerne. Derudover viser undersøgelsen, at over halvdelen af respondenterne forventer at opgradere deres teknologier indenfor de næste to til tre år, men den videre SCP-udvikling i virksomhederne kan hæmmes af klassiske faktorer som mangel på menneskelige ressourcer og interne kompetencer.

/Redaktionen

1. Introduction

In the current volatile business environment, it is important that companies do not apply overly narrow perspectives on their supply chain planning (SCP) tasks. The old paradigm has been centered around a logic that it was enough for a company to focus on its capacity and capabilities, and only involve very few critical suppliers in SCP. The new paradigm emphasizes that every company - from the manufacturer to the logistics provider to the retailer - is operating in a much more complex, multifaceted supply chain.

Thus, companies are influenced by many new and external factors from the supply chain that has an impact on the overall planning. Drivers such as globalization, regionalization, in- and outsourcing, and the rapid development of new technologies for communication and visibility in the supply chain are facilitating such changes and thus the competitive landscape in the supply chains. The changes do not come without challenges, which both can be viewed internally (what we are in control of) and externally (what we are not in control of).

The internal perspective includes physical aspects of the business, which to a high degree are under own control of the business. This includes manufacturing, distribution or retail capacity, and the time and costs that go into sourcing, manufacturing and distributing the products. Supply Chain Management initiatives, in these areas, have focused on increasing performance and reducing costs. In the manufacturing arena, this has led to investments in automation and planning, as well as investments in sales and

operations planning technologies and advanced planning systems. In distribution and retail, the focus has been on warehouse management and transportation, as well as supplier relationship management/customer relationship management, and technology to support the operation and integration of the partners. The internal focus also includes the design of products and the corresponding supply chain necessary to secure delivery to the customer.

The external perspective contains business factors over which companies have little or no control. Traditionally, these factors have had less priority in many supply chain initiatives, or have been seen as static, given conditions. While some of the external factors are predictable, some are not - and this makes it an important factor in the scope of SCP. External factors drive complexity into the supply chain and dictate where and how a product is produced, how it is stored, how and where sourcing takes place, to which regions and trading partners it is shipped and how information about it is communicated.

The challenge in SCP is to incorporate the predictable factors, building sourcing intelligence into the SCP process. External factors that are difficult or impossible to predict may jeopardize a business without warning. This could be supply chain disruptions such as pandemics, natural disasters, intense increases in raw material prices and transport, cybercrime, wars and manmade mistakes as blocking the Suez-canal with a container vessel. Thus, supply chain disruptions make SCP a challenge (Stentoft et al., 2018a; Stentoft & Mikkelsen, 2021).

In such a VUCA business environment, SCP becomes even more vital. This is also indicated by the members of the Danish Supply Chain Panel. Figure 1 shows that, with an average value of close to 4 on a five-point Likert-scale (1 = to a very low degree and 5 = to a very high degree), the respondents find that SCP, to a high degree, is implemented in their companies, but that their palling applications only receive an average of 3.41. The positive thing is that SCP seems to be on the agenda and is practiced. However, more efforts are needed to improve the practice. This article will further unfold the panel members' perceptions of their practices and how they anticipate the future with what are needed.

2. Supply Chain Planning: Its content and degree of implementation

Figure 2 shows what content the companies perceive as part of supply chain planning (SCP) and the perceived state of implementation. All the listed content elements have averages above 3.50 on a 5-point Likert scale (1 = very little perceived importance, 5 = very high perceived importance). When above 3.50 in this type of survey, it is normally perceived as significant. As seen in the figure, the respondents start with the customers pointing toward demand requirements/fulfillment/-forecasting as the most important element in SCP with 4.34 on the 5-point Likert scale.

FIGURE 1. Practice of supply chain planning

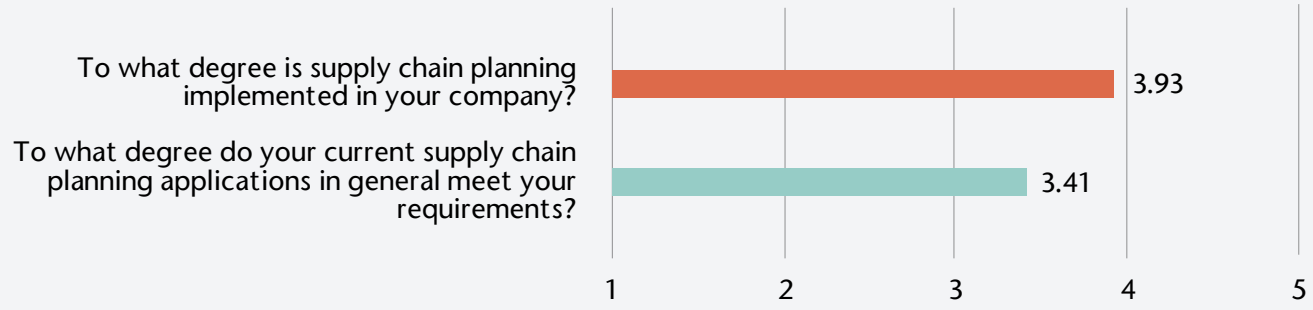
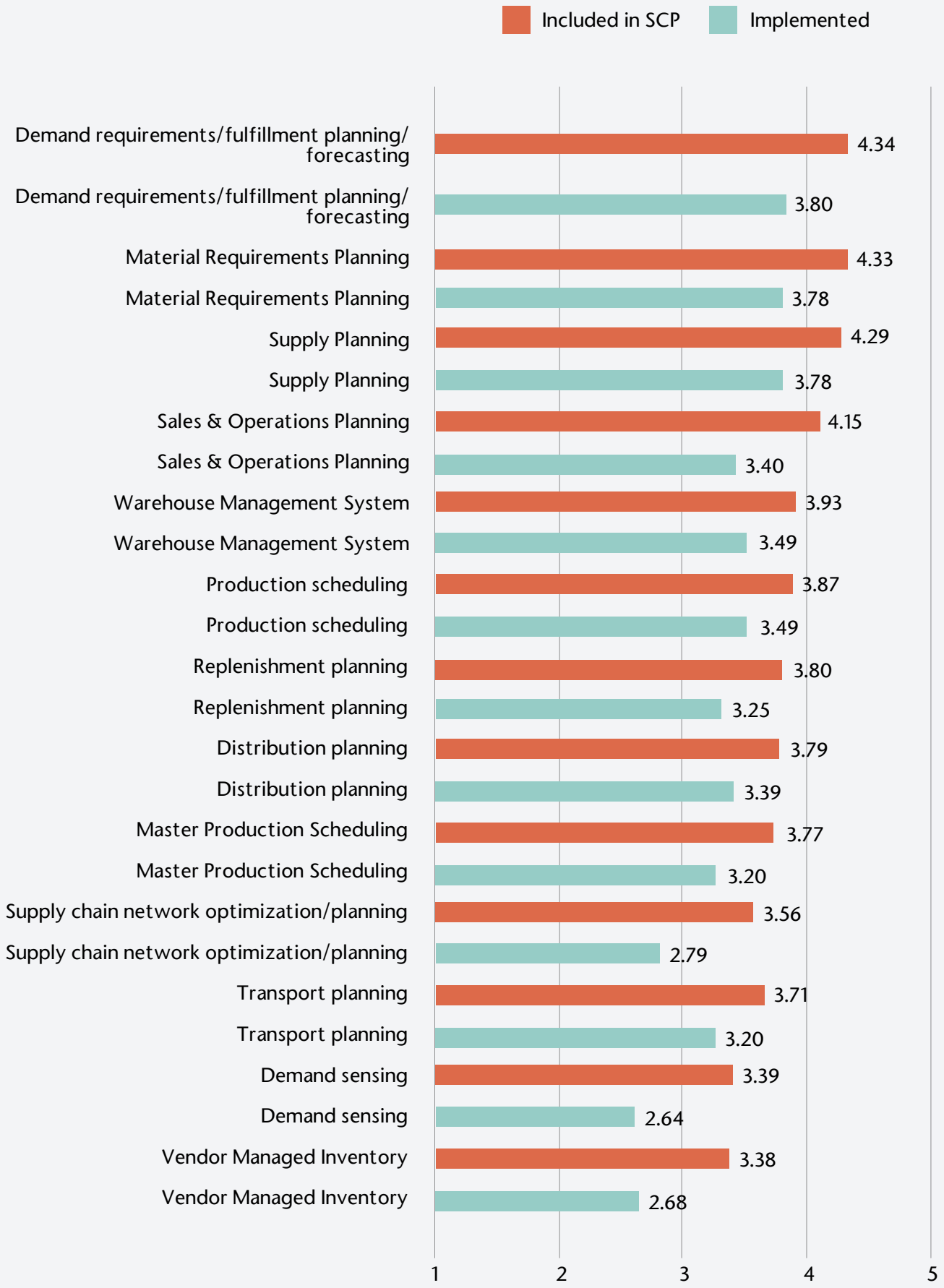


FIGURE 2. Perceptions of supply chain planning content and their degree of implementation



Closely following, with 4.33, the respondents point internally toward MRP as a content element of SCP. In third place, with 4.29, the respondents point upstream toward supply planning as an important part of SCP. Hence, it seems that the respondents think supply chain in pointing toward their top three content elements in SCP. Even if the three content elements pointed at are likewise the top three implemented, all three lacking more than 0.5 point behind in actual implementation, indicating a need for further focus and attention.

Sales and Operations Planning (S&OP), a cross functional planning process designed to balance downstream external demand with internal and upstream supply (Stentoft et al., 2018b), comes in fourth with 4.15, and is likewise perceived a highly important content element. However, actual implementation lacks behind here as well, but with 0.75 point, indicating a significant gap to be addressed.

Hereafter follows a row of content elements close to, but below 4.0. These include Warehouse Management Systems (WMS) with 3.93, production scheduling (3.87), replenishment planning (3.80), distribution planning (3.79), Master Production Scheduling (MPS) with 3.77 and transport planning (3.71) of which all lacks behind in actual implementation, leaving room for improvement. However, especially MPS implementation with 0.57 point, as well as replenishment planning with 0.55 and transport planning with 0.51, lacks behind perceived importance. Demand sensing and vendor managed inventory (VMI) are at the bottom of importance, with 3.39 and 3.38 respectively, but at the same time shows some of the largest gaps when comparing to actual implementation with 0.79 and 0.70. One explanation for this may be that since it is viewed as 'only' of some importance, it is not the main focus. Other elements of SCP are highlighted for optimization.

FIGURE 3. Systems facilitating supply chain planning

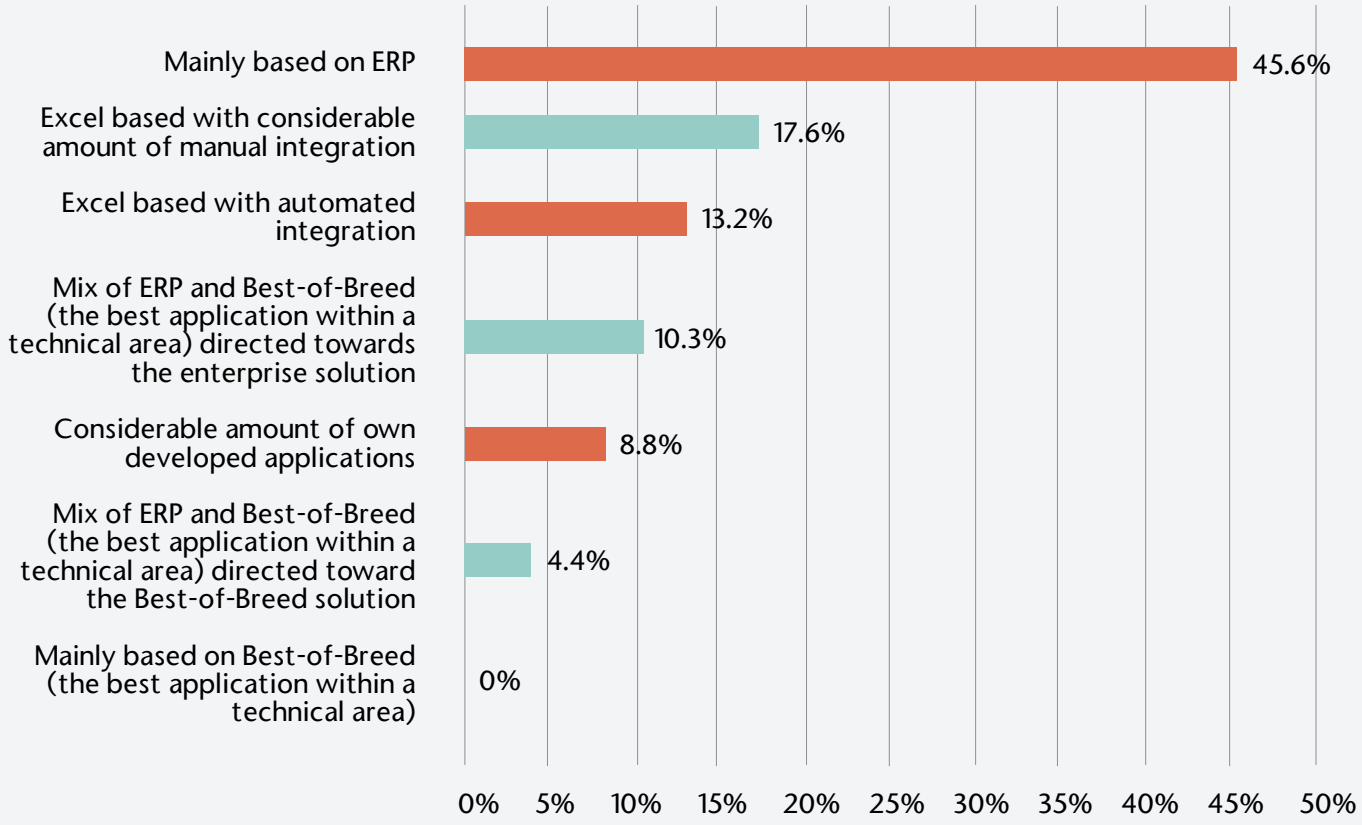
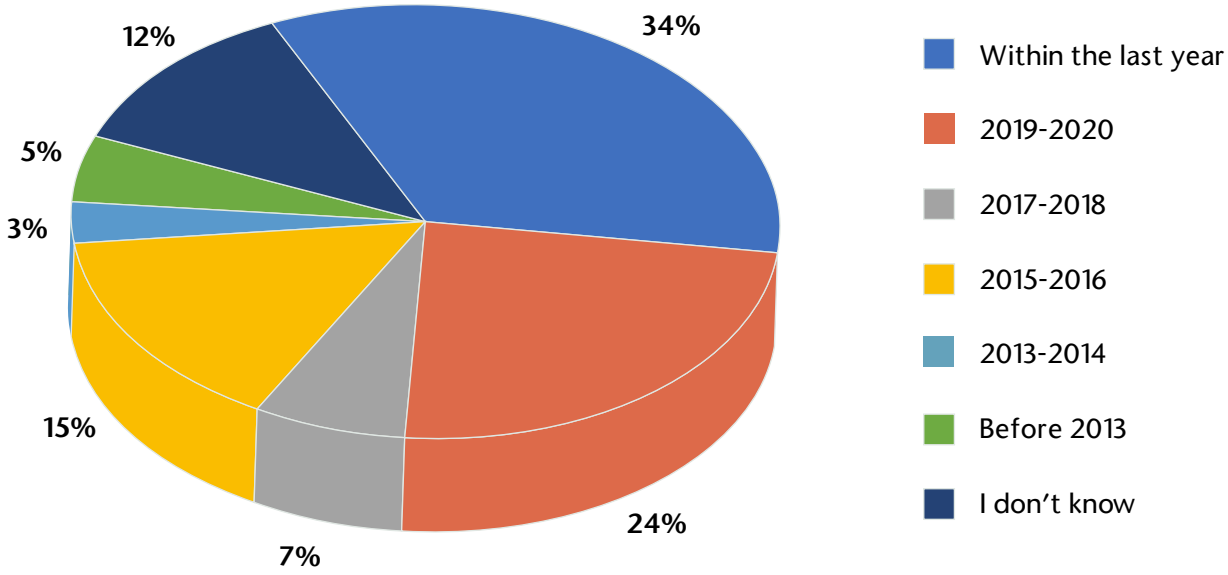


FIGURE 4. Age of current planning setup



3. Systems used for supply chain planning
It is interesting to dig into what solutions are used among members of the Danish Supply Chain Panel when conducting SCP. Figure 3 indicates, that for 45.6 percent of the companies, SCP is mainly based on ERP. The second most prominent solution is Excel-based solutions with 30.8 percent of the companies, of which 17.6 percent operate with solutions with considerable amounts of manual integration, while 13.2 percent of the companies rely on Excel-solutions with automated integration.

Best-of-breed applications are used by 14.7 percent of the companies, either directed toward the enterprise solution (10.3 percent of the companies) or directed toward the best-of-breed itself (4.4 percent of the companies). A best-of-breed application is the best application within a specific area e.g., forecasting or demand planning. 8.8 percent of the companies rely on some sort of homebrewed systems and applications.

After having identified the various applications and systems used by the companies in SCP, it is furthermore of interest to know how old the active applications are. Therefore, the respondents have been asked when their current technological SCP platform was last updated. As seen in Figure 4, 24 percent of the companies have updated their technological SCP platform within the last year, while an additional 24 percent answer that they have updated their platform in the years 2019 – 2020. Hence, 68 percent have updated their technological SCP platform within the last 2½ year. However, this leaves 32 percent that updated in 2018 or earlier, indicating a potential lack of investments in the area.

Though 32 percent is a large portion of companies that may lack investments in SCP platforms, it is an improvement from 2014, where the Danish Supply Chain Panel was asked a similar question (Stentoft, 2014). In the 2014 survey, 41 percent had not updated their SCP technology platform within the last 2½ years. Thus, it seems to move, slowly, in the right direction.

5. Improvement areas

The companies were also asked what challenges they face in working with their current planning setup, and what improvement areas they see in terms of SCP in their respective companies.

As seen in Figure 5, all the challenges listed are 3.0 or below (3 = to some degree on the 5-point Likert scale) in average, indicating that the challenges are not significant issues. Compared to the results of the mini survey in Stentoft (2014), it is interesting that the bottom three challenges have not changed in being at the bottom of the order. However, the top three challenges have met a change in order. In the 2014 mini survey, the top three was that "the companies were not able to model processes and data at the right level" with 46 percent of the respondents, "companies did not have the needed applications" came in as second (37 percent), and "we do not use all the features in the applications" came in third with 35 percent of the companies pointing it out as a challenge.

We are fully aware that we cannot compare percentages with the level on a Likert scale one to one. However, it can be argued that either the companies have improved their modelling and data capabilities, which is positive, or they currently have more preceding issues to address. Modelling, including supply chain modelling, as well as data quality and maintenance, has been on the SCM agenda for decades. A positive interpretation of this result indicates that the companies are making improvements on this. However, in our continuous contact with companies, we often hear that data quality and management are still pain points and leaves room for improvement.

Hence, a negative interpretation of the data, the above change in order may just reveal that companies have more pressing issues with lack of features or the lack of using the features available in the applications. We hope for the first and fear for the latter. We have included some quotes from the respondents supporting both stories:

"The importance of master data accuracy is very high and a focus area" (A respondent from the Danish Supply Chain Panel).

"The greatest challenge of ours. We do not have Item Master data but run all sales/purchases as projects. This does not allow us to capture a fixed setup on item level - we currently have

FIGURE 5. Challenges with the current planning setup

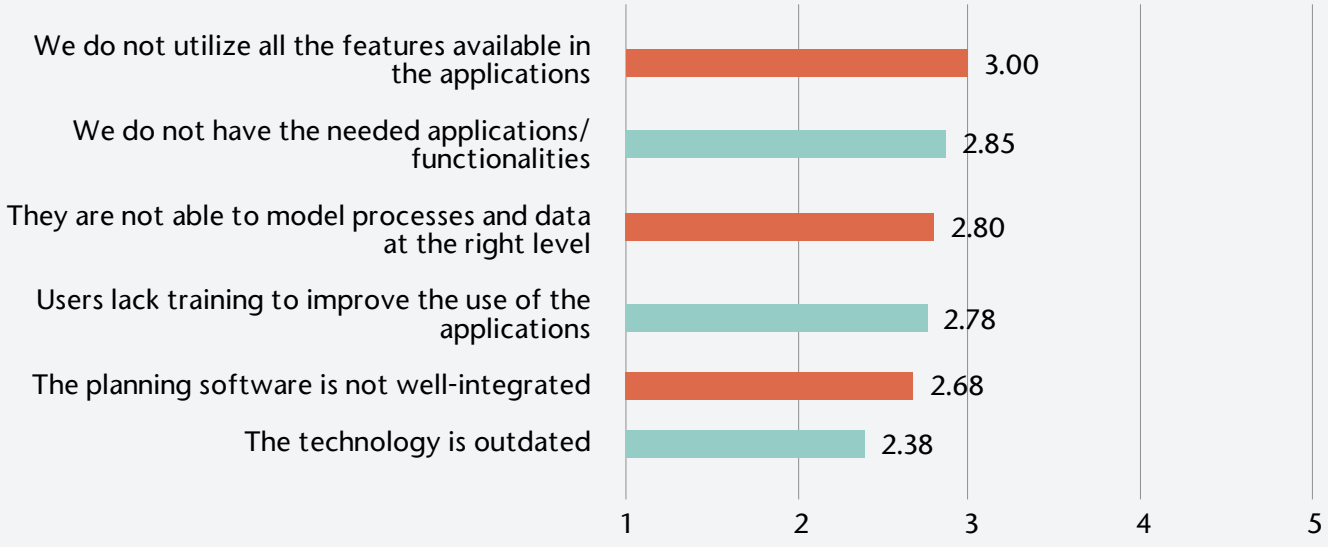
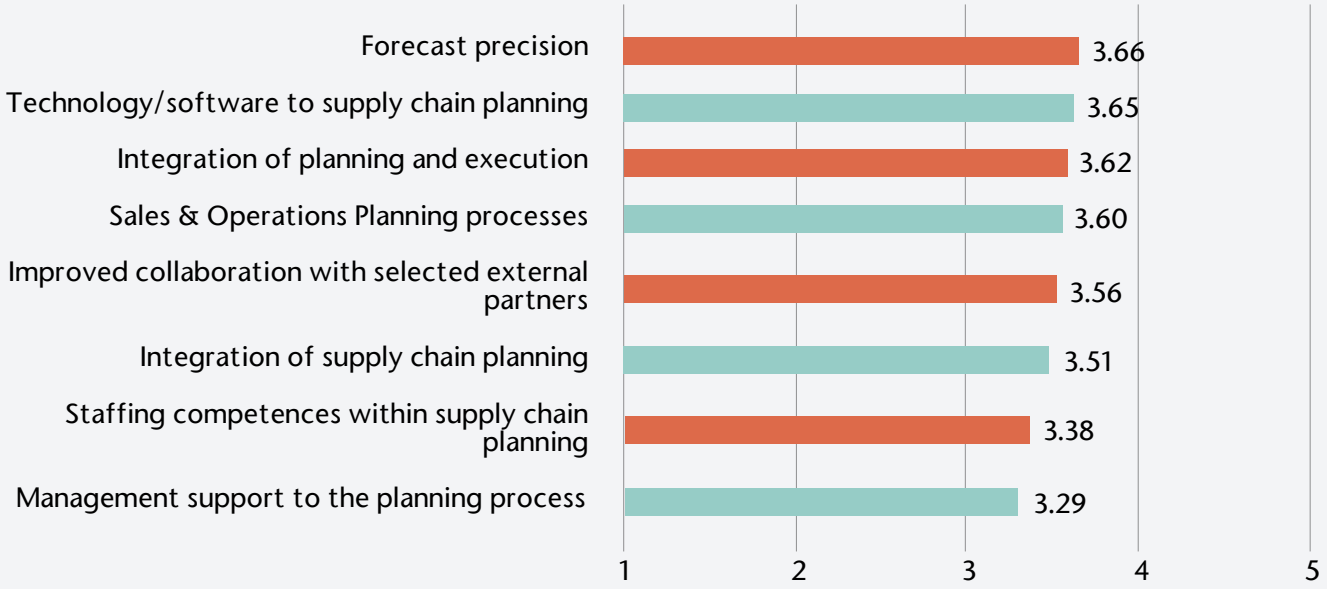


FIGURE 6. Perceived improvement areas of supply chain planning



limited methods of standardizing our work" (A respondent from the Danish Supply Chain Panel).

Outdated technology is last among the perceived challenges and only perceived a little more than a minor challenge (2.38). So, returning to Figure 5, on average, the respondents do not see a challenge in their companies' current SCP technology setup despite the time passed since last update.

The respondents have also been asked to reflect on improvement areas in their companies' SCP systems. Looking at Figure 6, it appears that the respondents do indeed think they, on average, can benefit "to some degree" or more from improving the listed improvement areas. The respondents point mainly to the potential of improving forecast precision (3.66), technology or software to SCP (3.65), integrating planning and execution (3.62) and improving Sales & Operations Processes (S&OP) (3.60). In surveys like this, results at 3.50 or above indicate significance.

Given that companies perceive that they can benefit from improving the various areas in SCP, the respondents have also been asked for their SCP investment plans for the coming 2 – 3 years. As it appears from Figure 7, 56.1 percent of the respondents answer that they plan to make considerable upgrading of their current technology. As previously seen, outdated technology does not seem to be a current challenge, though 32 percent of the companies report that it is more than 2½ years since they have updated their SCP platform. However, it seems that some of the 68 percent, who have updated their SCP platform within the last 2½ years, foresee a future challenge if they do not invest in new SCP solutions now.

19.5 percent of the companies will upgrade more modestly by adding a few applications/functionalities, and 17.1 percent perceive that they will maintain status quo.

"Other" includes a focus on the data part instead of the system which the following quote illustrates: "Master data will be a new area of focus to ensure SC efficiency" (A respondent from the Danish Supply Chain Panel).

FIGURE 7. Expectations for development of supply chain planning in the coming 2-3 years

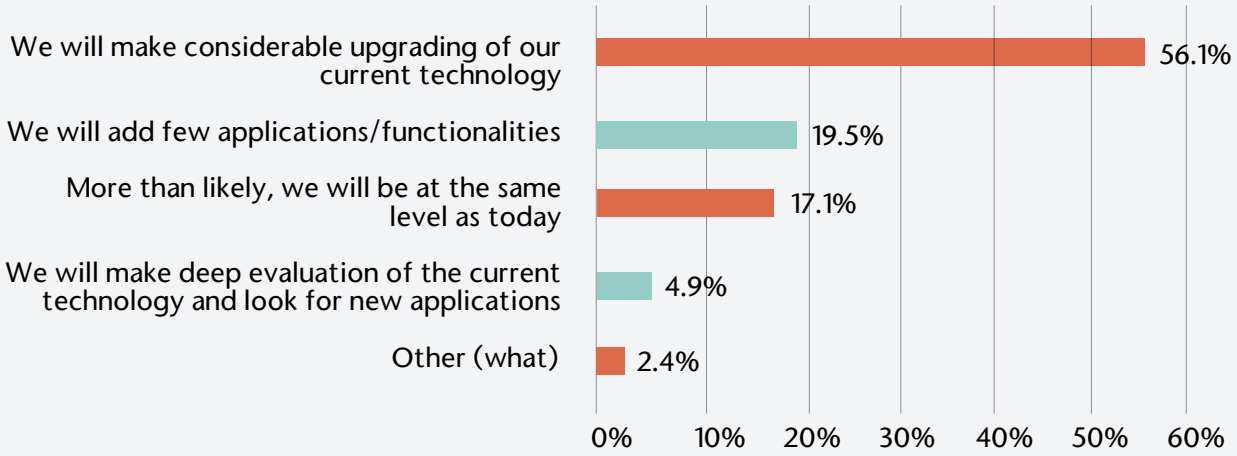
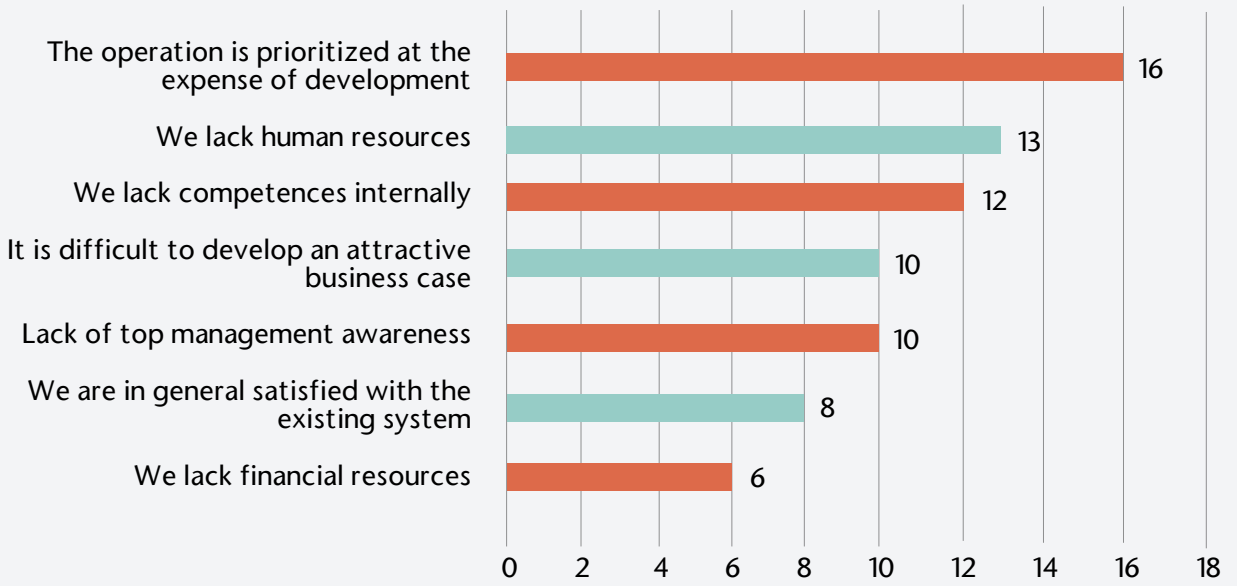


FIGURE 8. Perceived barriers for developing supply chain planning



Note: More marks have been allowed.

Two respondents have utilized the possibility to comment the questions about barriers which we have included here:

- "Again, the largest barrier is the lack of item master data" (A respondent from the Danish Supply Chain Panel).
- "Lack of organizational understanding of a common ERP/data platform is to some degree a hindering" (A respondent from the Danish Supply Chain Panel).

6. Barriers

Developing and improving SCP is not without challenges, and the panel members have been asked about what barriers their companies face in securing the development of SCP. It appears from Figure 8, that the most frequent barrier is that daily operations are prioritized over the development of SCP. Second and third, the panel members report the lack of human resources and internal competences to focus on developing SCP in the companies. However, the lack of an attractive business case and top management attention are also among what the respondents perceived as barriers in working with improvement and development of SCP.

7. Conclusions

This article, based on data from the Danish Supply Chain Panel, has set out to present the results of a mini survey on SCP. The respondents report "to a high degree" that SCP is implemented in their companies, but also that there is potential for improving their solutions. When asked about content elements under the SCP umbrella, the top ten list includes demand requirements/ fulfillment planning/forecasting, MRP, supply planning, S&OP, WMS, production scheduling, replenishment planning, distribution planning, MPS and transport planning, with averages ranging from 4.34 to 3.71.

The degree of implementation obtains in general averages 0.5 points below the perceived inclusion in SCP. The majority of the respondents indicate that their SCP is facilitated through the ERP system followed by Excel solutions coupled with either manual integration or automated integration. 68 percent of the respondents indicate that their companies have upgraded the SCP technology platform within the last two and a half years, and thus indicate an improvement in close to one-third of the companies.

In general, the respondents do not find that their SCP solutions have challenges of particular importance. Not using all the features available in the applications is the highest scoring improvement area with an average of 3.00. However, within their running SCP solution, the respondents do find areas for improvements such as better forecast precision, investing in technology/software to supply chain planning, better integration of planning and execution, implementing S&OP and improving collaboration with selected external partners.

More than half of the respondents indicate that they expect to make considerable upgrading of the technologies within the coming 2-3 years. But, operating such a development is not without barriers, and the top three perceived barriers are a strong focus on operation at the expense of development, lack of human resources and lack of internal competences. Thus, we can conclude that SCP is considered important, but that classical factors seem to constrain further development of SCP in the companies./

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