

# SUPPLY CHAIN DESIGN IS PERCEIVED IMPORTANT BUT MORE CAN BE DONE IN PRACTICE

DILF AND RESEARCHERS FROM THE DEPARTMENT OF ENTREPRENEURSHIP AND RELATIONSHIP MANAGEMENT AT SDU IN KOLDING EACH YEAR CONDUCT A NUMBER OF MINI SURVEYS 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 THE MINI SURVEY WHICH FOCUSES ON SUPPLY CHAIN DESIGN.



ADAPT  
TO  
CHANGES

BY THORSTEN KRÆGHPØTH, PHD STUDENT AT DEPARTMENT OF ENTREPRENEURSHIP AND RELATIONSHIP MANAGEMENT, UNIVERSITY OF SOUTHERN DENMARK, JAN STENTOFT, PROFESSOR AT DEPARTMENT OF ENTREPRENEURSHIP AND RELATIONSHIP MANAGEMENT, UNIVERSITY OF SOUTHERN DENMARK AND ASSOCIATE PARTNER AT 4IMPROVE AND ANTONY PAULRAJ, PROFESSOR AT DEPARTMENT OF ENTREPRENEURSHIP, MARKETING AND MANAGEMENT SYSTEMS, NOTTINGHAM UNIVERSITY BUSINESS SCHOOL CHINA

The supply chain design is concerned with all the elements within the supply chain that can be (re)configured both internally and externally (e.g. production and logistics facilities, supplier network, IT, and automation manufacturing). As the world becomes more volatile and connected, the demand for adaptability has never been greater. In order to survive, and, more importantly, become competitive in a globalized world, understanding and adjusting accordingly to both internal and external factors is the key to a company's success.

Looking at the Fortune 1000 List (an annual list of companies with the biggest earnings made by the American magazine Fortune) from the last decade, 70 % of the companies have disappeared from the list; this has been ascribed to the companies' inability to adapt to change (Le Clair, 2013).

This means that companies who are accustomed to reap the benefits of economies of scale are challenged to embrace new strategic requirements based on competitive advantages related with a variety of factors.

## DET KAN DU LÆSE OM:

- Hvorfor evnen til at tilpasse sig på alle parametre er afgørende for virksomheders konkurrenceevne
- Hvorfor det er vigtigt, at supply chain-design er en integreret del af organisationens kerne
- Hvordan virksomheder betragter supply chain-design som et vigtigt strategisk redskab, men ikke altid for omsat tanken til handling

This has been backed up by a survey from 2017 (Krægpøth et al., 2017), in which the scholars asked Danish manufacturing companies what drives a change to their supply chain design. In this survey cost came out as the number one factor. For this reason, when companies' competitiveness depends on their alertness towards events that affect its performance, and how well it can react to these events, building an active dynamic supply chain design that is linked into the corporate organization is crucial.

### Various capacities of the supply chain design are needed

Consequently, when market or products change, the supply chain design accordingly must change in order to avoid a degradation in performance.

If, for example, customers demand faster or more environmentally friendly products, and the supply chain design is built for lean operations (cost), both the supplier network, production facilities or workforce might be out of sync, which ultimately can lead to losing orders.

Thus, to improve performance, companies ought to build and maintain various capabilities, especially when supply chains are organized geographically dispersed around the globe. However, developing the right supply chain capabilities is of high importance as resources are scarce. Hence, developing supply chain design, should be seen from a strategic perspective and linked to the organisation's core.

### The three areas of supply chain design

When connecting supply chain design to the corporate organisation, we suggest dividing supply chain design into three main areas – structural, coordination and strategy/organization. This can make it easier to position the decisions towards the right shareholders when choosing which capabilities to develop or redesign to secure continued competitiveness.

Structural design refers to the physical plants, inventories and distribution network; it mostly covers decisions that have an influence over a longer period of time. Coordination design pertains to the decisions about integration, information sharing and relationship governance, namely decisions that coordinate the supply chain design internally and externally. Lastly the strategy/organization design cares about what type of strategy the design should follow, which type of IT and technology platforms should be pursued, etc.

By linking these decisions to the demand of dynamic supply chains, it has been stated that it is no longer adequate for a company to review its supply chain design once every five to ten years (Melnyk et al., 2014).

Supply chain executives need to be at the front edge on how to compete, and when changes are likely to emerge, they need the capabilities to respond fast with the right supply chain design. In the present mini-survey, the respondents an-

swer that they need a supply chain redesign with an average of 3,22 on a five-point Likert scale where 3 is "sometimes" and 4 is "often". This indicates a certain awareness of the importance of supply chain design. Furthermore, supply chain design is on the corporate strategic agenda with an average of 3,59 on five-point Likert scale ranging from 1 "very low degree" to 5 "very high degree". It is quite surprising to see that only 57 % of the respondents answered to a high or a very high degree.

This paper sets out to examine how well supply chain design is connected to the rest of the organization; which factors influence the supply chain design and which elements are likely to be (re)designed within the supply chain in the years to come. The panel members evaluate this theme as being much relevant with a score on 4,1 on a five-point Likert scale. This might inspire and help supply chain managers to bring supply chain design into the company's strategic agenda.

### Competitive parameters

Figure 1 shows how the respondents have ranked five competitive parameters based on average scores. 55 % have ranked cost as the most important competitive parameter followed by responsiveness and risk/quality. Supply chain design based on new parameters of innovation and sustainability obtains the lowest ranking. This result indicates that the classical parameters of cost, responsiveness and risk/quality still dominate corporate strategies.

The respondents have also been asked to rank competitive parameters for their supply chain design. Figure 2 shows that it is the classical parameters of cost, responsiveness and risk/quality that dominate the design. Sustainability and innovation has obtained middle values; while these might be emergent parameters, they still are not considered as critical design parameters yet.

RANK OF COMPETITIVE PARAMETERS

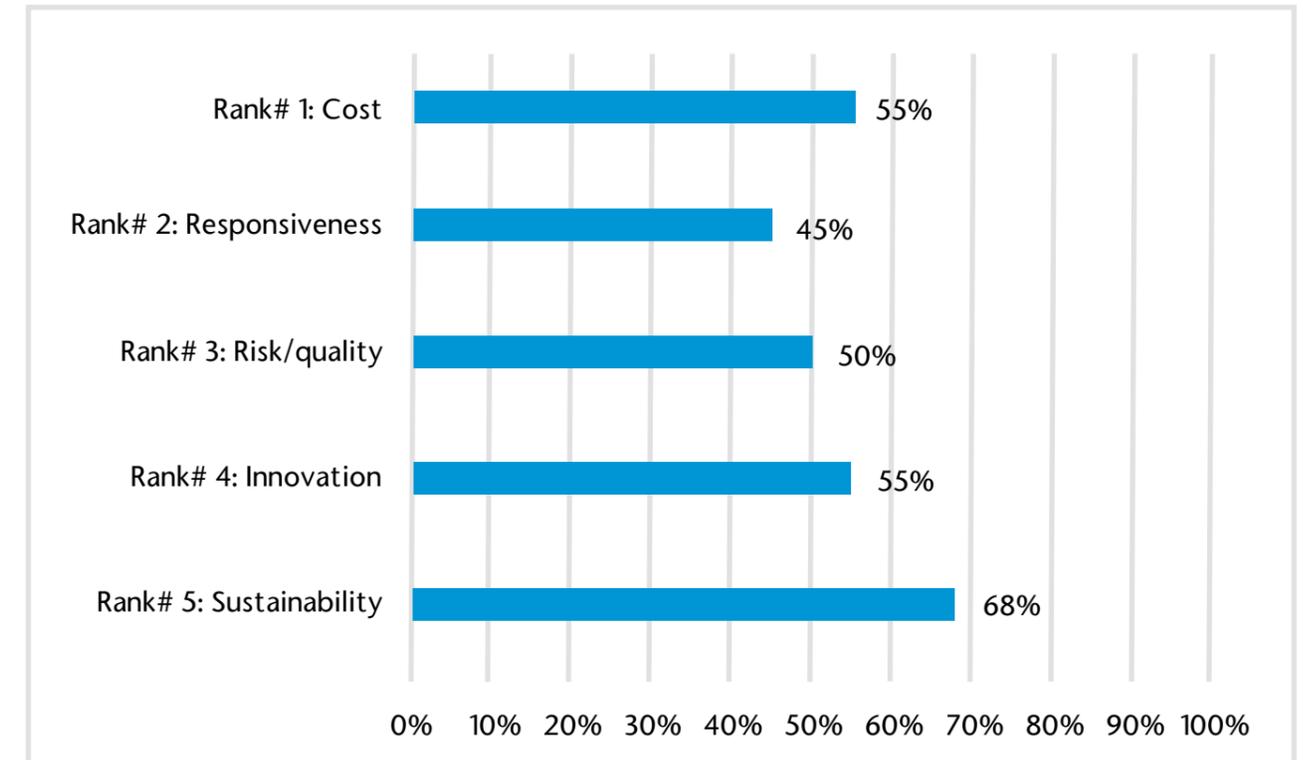


Figure 1. Source: The Danish Supply Chain Panel

RANK OF COMPETITIVE PARAMETERS FOR SUPPLY CHAIN DESIGN

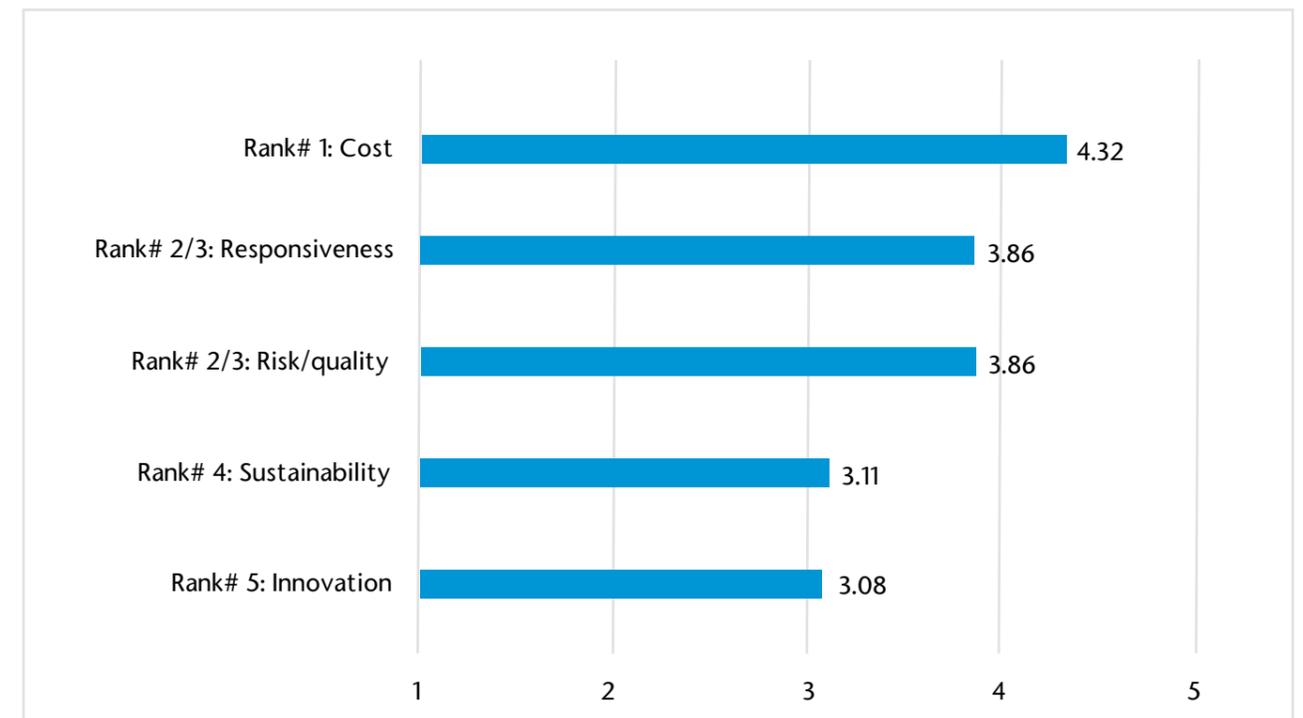


Figure 2. Source: The Danish Supply Chain Panel

### External and internal influencers

The respondents have been asked to evaluate the factors that impact the design of their supply chains. Such factors are divided into external as well as internal factors.

The external factors comprise customers, competitors, suppliers and environmental factors as legislation and globalization. Internal factors are related to strategy, organizational structures, product mix and product life-cycle issues.

As figure 3 shows, both external factors and internal factors obtained relatively higher mean values indicating that both groups of factors are important in supply chain designs. It is surprising that internal factors receive such high an average, indicating that several supply chains still struggle with internal alignment and design issues.

In contrast, it is encouraging to see that external factors are evaluated with such importance,

thereby signalling a clear recognition of the importance to design towards external performance requirements.

### Design decisions

The respondents have been asked to evaluate three categories of design decisions: 1) structural design decisions, 2) coordination decisions, and 3) strategy/organization decisions. The results of these data are being analysed in the following figure. Structural design elements are concerned with location of distribution and production, capacity, inventory and supplier management.

Figure 5 shows that the location of distribution seems to be the most used design elements among the respondents with an average on 3,94. The upstream part seems not to be that important; this seems to be in line with a recent literature study on supply chain design that reveals a dominated focus on internal and downstream related design decisions.

### INTERNAL AND EXTERNAL FACTORS IMPACTING THE SUPPLY CHAIN DESIGN

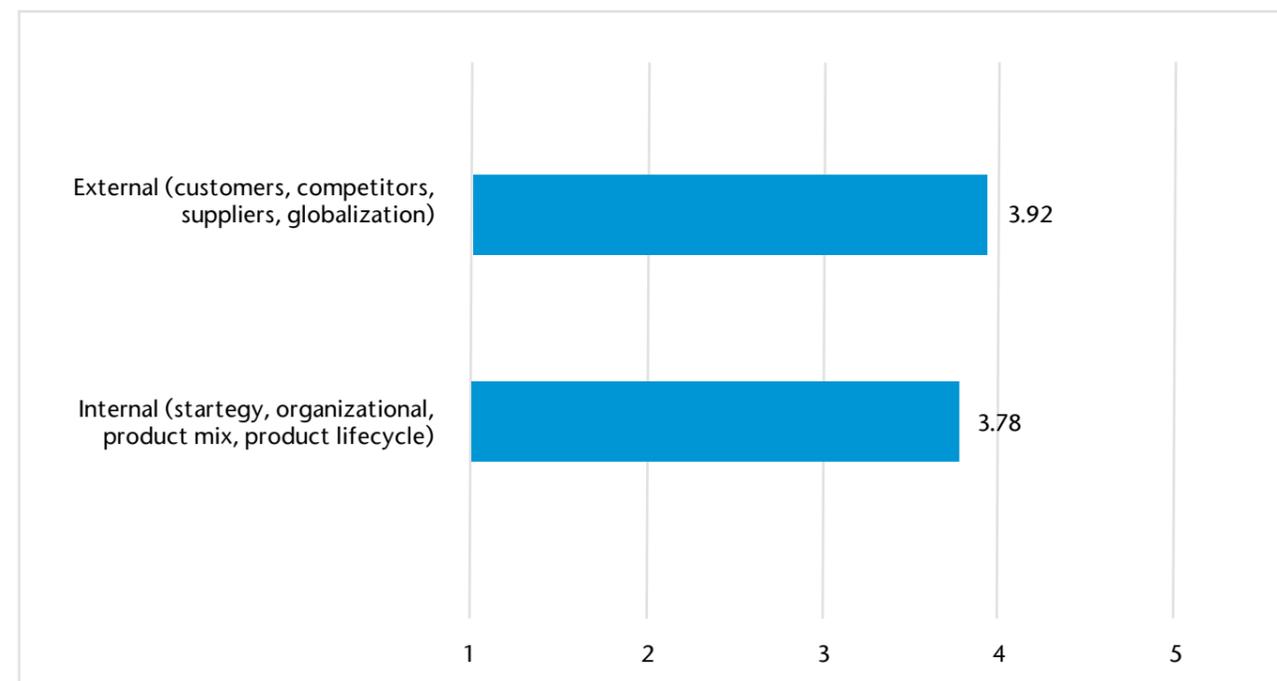


Figure 3. Source: The Danish Supply Chain Panel

### LIKELIHOOD OF CHANGES IN SUPPLY CHAIN DESIGN OVER THE NEXT FIVE YEARS



Figure 4. Source: The Danish Supply Chain Panel

### MOST USED STRUCTURAL SUPPLY CHAIN DESIGN ELEMENTS

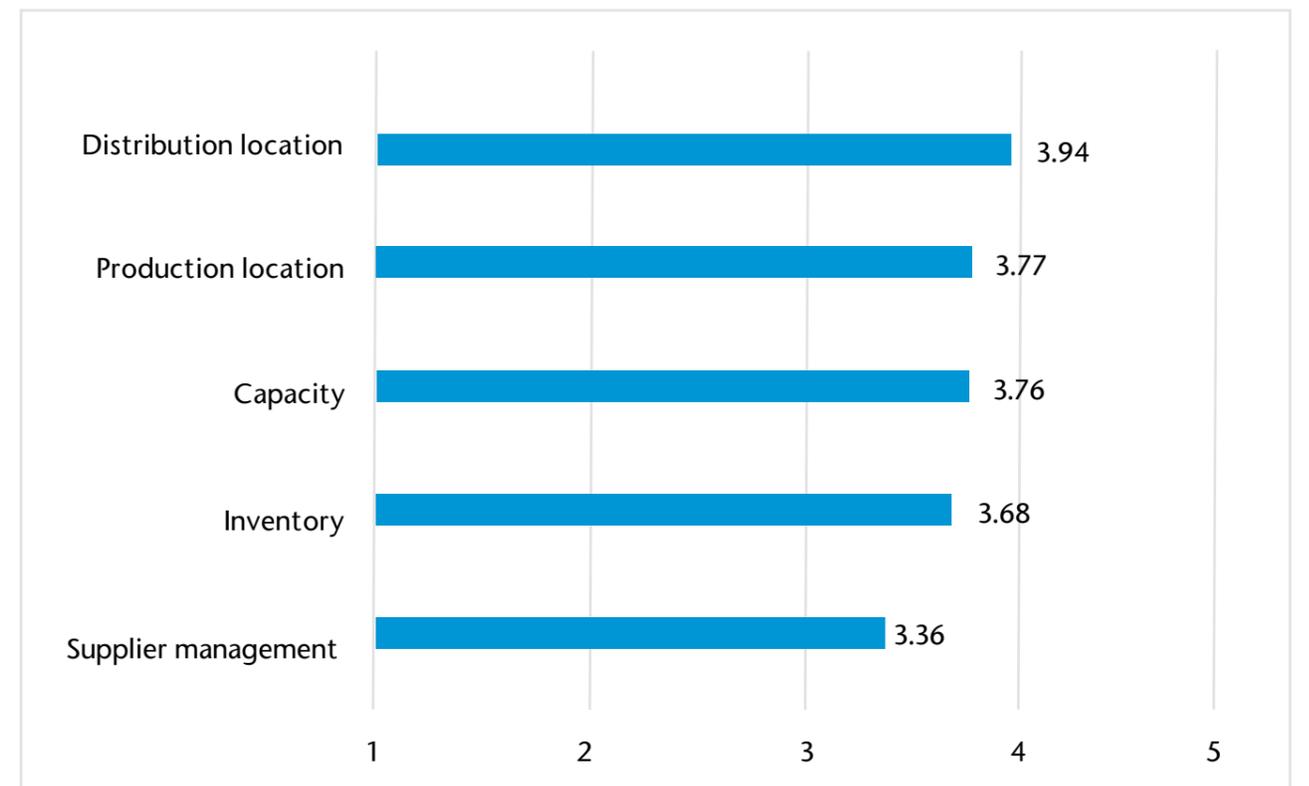


Figure 5. Source: The Danish Supply Chain Panel

Figure 6 includes the answers to the question about the type of coordination element that is being used in designing supply chains. As for the coordination element, we focus on how the international functions as well as external customers and suppliers interact. Data reveals that integration is the highest scoring coordination element with an average on 3,24.

Overall, the mean values do not differ much between integration, routing, relationship governance and information sharing and is centred around mean values of 3, indicating either a lack of consciousness of coordination elements or simply that they are not perceived as being important.

The panel members were asked to evaluate which type of strategy and organization design they see as the most used. Figure 7 indicates that IT systems is the most used with an average on 3,78, followed by technology in general with 3,59.

It is surprising that management capabilities obtained the lowest average (3,24) indicating that the companies seem to be more willing to invest in IT systems and technology than in people.

Finally, the respondents were asked about the extent to which other functions in their organizations are part of the supply chain design discussions. The panel members answer with an average on 3,16 that marketing/sales are included in such discussions and that product development is included with an average on 3,43.

In other words, product development seems to be included more than marketing/sales. Also, it is evident that both groups are only included to a high or a very high degree in about half of the companies. There seems to be a potential improvement area here in that the companies need to integrate important strategic elements for marketing/sales as well as product development in the supply chain design.

#### MOST USED COORDINATION ELEMENTS IN SUPPLY CHAIN DESIGN

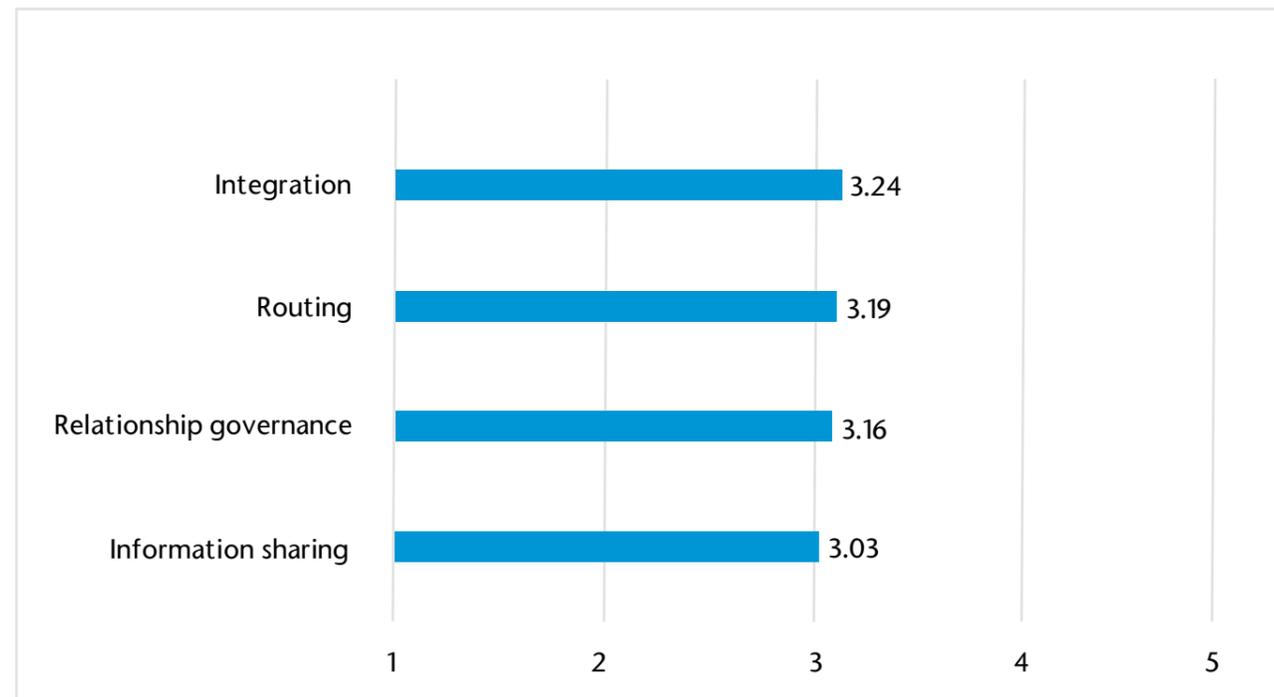


Figure 6. Source: The Danish Supply Chain Panel

#### MOST USED STRATEGY/ORGANIZATION DESIGN ELEMENT

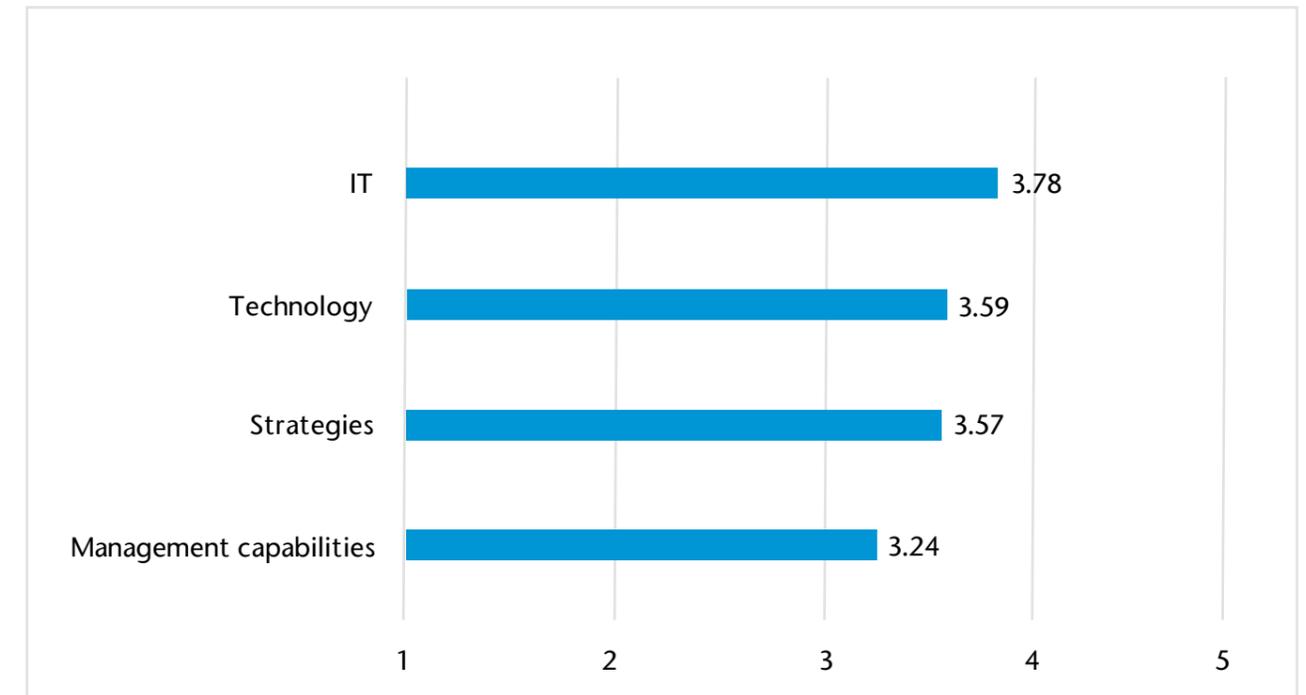


Figure 7. Source: The Danish Supply Chain Panel

#### Conclusion

This paper has focused on the importance of supply chain design as a critical element for maintaining and further developing competitiveness

Overall, the data reveals that the panel members find this theme very important and that it is still the classical parameters of cost, responsiveness and risk/quality that drive supply chain designs. In spite of a perceived relevance of supply chain design, it seems that companies still struggle to get supply chain design on the strategic agenda.

One way to achieve this is to involve marketing/sale and product development more in such issues. However, data from this mini-survey find that there are still room for improvement for such involvement and internal integration.

This is also evident by looking at the decision category "coordination" that obtains the lowest mean values compared with the two other decision categories of "structure" and "strategy/organization". In other words, there seems to be a potential of improvements in supply chain design by focusing more on the coordination category.

We hope this article can stimulate further conversations and analyses about the current supply chain designs in order to evaluate whether they are in sync with customer and market requirements.

## VIL DU VÆRE MED I DET DANSKE SUPPLY CHAIN PANEL?

Det Danske Supply Chain Panel startede i 2012 i et samarbejde mellem DILF og Syddansk Universitet. Panelet undersøger en række SCM-udfordringer i danske virksomheder, og består af ledende SCM-folk, og så er det gratis at sidde med. Panelet har siden 2012 undersøgt emner som supply chain performance, supply chain set-up, planlægning og S&OP sustainable sourcing, risk management og mange flere.

### Lyder det som noget for dig?

Så kan du se mere [her](#) eller kontakte DILF på [mail@dilf.dk](mailto:mail@dilf.dk) eller 3326 9791.

### References

Le Clair, C. (2013). Make business agility a key corporate attribute – It could be what saves you. *Forbes* (<https://www.forbes.com/sites/forrester/2013/09/09/make-business-agility-a-key-corporate-attribute-it-could-be-what-saves-you/#5e5e3bf35a4e>)

Krægpøth, T., Stentoft, J., & Jensen, J.K. (2017). Dynamic supply chain design: a Delphi study of drivers and barriers. *International Journal of Production Research*, 55(22), 6846-6856.

Melnyk, S. a., Narasimhan, R., & DeCampos, H. a. (2014). Supply chain design: issues, challenges, frameworks and solutions. *International Journal of Production Research*, 52(7), 1887–1896.