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## Value Chain Engineering

Wæhrens, Brian Vejrum; Slepnirov, Dmitrij

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*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link to publication from Aalborg University](#)

*Citation for published version (APA):*  
Wæhrens, B. V., & Slepnirov, D. (2015). *Value Chain Engineering*.

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# AAU WHITE PAPER

## VALUE CHAIN ENGINEERING



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## TABLE OF CONTENTS:

|   |    |
|---|----|
| INTRODUCTION .....  | 04 |
| VALUE CHAIN ENGINEERING .....                             | 05 |
| VALUE CHAINS IN DIFFERENT INDUSTRIAL CONTEXTS.....        | 08 |
| POSITIONING IN DIFFERENT VALUE CHAIN CONFIGURATIONS ..... | 09 |
| KEY DRIVER OF VALUE CHAIN CHANGES: OFFSHORING .....       | 14 |
| SME'S ROLES AND POSITIONS IN GLOBAL VALUE CHAIN .....     | 17 |
| SME ROLES & VALUE CONFIGURATIONS.....                     | 20 |
| DELIVERING IMPROVEMENTS IN THE VALUE CHAIN.....           | 36 |
| OVERALL RECOMMENDATIONS.....                              | 37 |
| ACKNOWLEDGEMENTS: .....                                   | 38 |

INTRODUCTION

VALUE CHAIN ENGINEERING  
— THE SME PERSPECTIVE

This workbook is recommended for the attention of students of and managers in Danish small and medium sized enterprises (SMEs). Danish SMEs are currently facing a number of key challenges related to their position in global value chains. This book provides an insight into value chain management that may help these SMEs to occupy and sustain a competitive position in the value chain. It addresses this objective by introducing and discussing:

- The concept of global value chains and its founding principles
- The buyer-supplier relationships
- Various SMEs operations configurations
- Ideas for positional change in the value chain
- Practical case examples
- Key take-aways and recommendations

VALUE CHAIN ENGINEERING

Value Chain Thinking and SMEs

SMEs have advantages in terms of flexibility, reaction time, and innovation capability that make them formidable competitors in various sectors. Therefore, it is not surprising that, SMEs have the potential to steal the centre stage from large companies. However, at the same time, SMEs are less endowed in human, financial, and technological resources than large firms. SMEs in general, and Danish SMEs among them, are currently facing a number of key challenges, and their response to these challenges will define their future competitiveness. The SMEs are challenged by growing customer demands and constant risk of losing business to larger companies. The SMEs are also under constant pressure from suppliers who may prefer collaboration with larger customers. The SMEs are also pressed by the industry that expects them to conform to industrial standards or certain ways of doing business, which are often set by large corporations. Furthermore, the SMEs need to keep up with the increasing technological developments and new trends. Additionally, Danish SMEs are facing an ever increasing risk of larger organizations either integrating backwards or simply excluding them as a part of their value chain to keep costs down, unless the specific SMEs add a unique value to the given product or service. As such, SMEs are being forced into undesirable positions in the value chain that are

either squeezed on profit margins or do not fit with the self-perception of the company.

Among some of the typical responses to these pressures are: offshoring to low-cost regions or to locations in proximity to their strategic customers outsourcing non-core competences and, generally, attempt to run faster in day-to-day business in order to survive. Numerous studies and industry reports on global value chains indicate that often, configuration choices are made based primarily on their expected capacity and narrow cost implications, without adequately taking into account the equally important aspects of risk, flexibility, innovation, and competitive positioning or the dynamic effects related to this dispersion of activities. As a result, companies not only leave value on the table from failing to make the right cost-risk-flexibility-innovation tradeoffs, but also put themselves in a difficult operational and strategic position. Trying to deal with these challenges the SMEs enter into areas unknown for them, and figuratively speaking, build the bridge as they walk on it – and there is thus a need for building a basis for increased consciousness and reflection to guide their actions.

Value chain engineering offers an important input into this discussion as it focuses on the very essence of organizations, i.e. the capacity to

manage activities and partners that are part of the greater value chain system that ultimately delivers value to end-customers. As such, it is believed that a solid understanding of the premise on which one competes is necessary before one can make fully informed decisions about value chain positions, out-sourcing and offshoring. This workbook is an attempt to put focus on this area and present the basic foundations of the concept as well as the tools that could enable SMEs to work proactively with value chains.

There are many perspectives on what constitutes a value chain. In this workbook, we adopt the following definition of the value chain: a chain of interdependent companies covering the full range of activities that are required to take a product or service from conception to market, going through the various stages of development, production and sales. The value chain analysis originates in the internal working of a focal company in the chain. It maps interrelated activities and functions that

POSITIONING IN VALUE CHAINS

A key concern for SME managers is the matter of being able to position their company in a position in their value chain to ensure survival, growth, and success. The first step for understanding value chains and positioning in them, is to understand the fundamental dimensions that describe specific value chain design traits. These traits are determined by both internal and external factors. External factors include industrial context, relationships with customers, suppliers and competitors. Internal influences can essentially be narrowed down to issues related to resources, power, interdependencies, physical and information flow.

define a firm's unique capabilities supporting competitive advantage. This view recognizes that a firm's strategic position is determined by a set of tailored activities designed to deliver value. It may extend beyond the boundaries of a single company and comprise what Michael Porter referred to as the “value system”. As acknowledged by many authors (e.g. Lambert, 2007; Gann and Dahlander 2010; Chesbrough, 2003), all organizations are part of such a supply and value system spanning from suppliers to retailers, customers, designers, consultants, etc. and their competitive performance depend on it. As such, organizations compete as part of a entire value chain rather than as single entities (Lambert, 2006). As a natural consequence companies increasingly seek improvements in the inter-organizational domain, which is, however, still ill understood as a means of performance.

To initiate this discussion a number of foundational considerations must be taken into account when starting the work with value chains:

- Firstly, value chains can be differentiated based on the types of relations in the chain, the nature of make-or-buy decisions that dominate the chain, the role of offshoring in the value chain, specialization and roles of different actors in the value chain.
- Secondly, there is no one ideal comprehensive framework that covers all aspects of value chain engineering and management. Instead different tools for analyzing, upgrading, and reengineering one's position in the value chain exist and should be proactively applied.

It is widely recognised that value chains are governed by demand logic. Therefore, the value chain analysis could be initiated from an assessment of the changing customer-supplier relationships. An overview of changing demand trends and how they affect uncertainty are provided in the table below. This could be a point of departure in discussions of the changing interfaces between customers and suppliers.

| Trends in demand  | ... and are likely to increase uncertainty  |
|---|---|
| Customers are consolidating their supply base                       | ... this is both a challenge and a opportunity, but it requires centrality and broad scoped contribution (eg. as systems supplier)<br>... requires broader sets of capabilities and knowledge               |
| Span of order quantity increases and so does frequency of orders    | ... a wider range of quantity implies greater variance in demand  |
| Lead time decreases   | ... there is less time to react to orders   |
| Increased standardisation of components and process demands         | ... demands to reach compliance increase  |
| Variety of required products increases                              | ... demand per product becomes more disaggregated   |
| Required service level increases                                    | ... supplier need to carry service and logistics<br>... firm now has to handle unusual surges in demand   |
| Number of channels through which products may be acquired increases | ... total customer demand is now disaggregated over more channels   |
| Rate of innovation increases  | ...demand for supplier driven innovation and engagement in customer R&D<br>... changing responsibilities for supply maintenance and product warranty<br>... new products tend to have more uncertain demand |

# VALUE CHAINS IN DIFFERENT INDUSTRIAL CONTEXTS

Value chain configurations are highly influenced by industrial context. According to one of the founding fathers of the value chain concept, Michael Porter, industrial factors and dynamics are likely to shape value chains and the attractiveness of different industrial positions. Experience from working with different industries shows how differences in industrial integration level are strongly related to the degree of

variability of inputs and outputs, the degree of industrial standards, the degree of technological change and finally the degree of rivalry in the industry. Now the question remains how the change in individual or several of these factors will contribute to a greater fragmentation of value chain activities. See the table below for inspiration to guide the discussion of the role of industrial contingencies.

| Value chain characteristics                   | Textile  | Marine industry   | Furniture                              | Telecom  |
|---|--|---|--|--|
| Integration/density<br>density of connections | Dramatic fine<br>slicing/low   | Quite integrated/<br>high                                   | Increasing fine<br>slicing/ medium     | Dramatic fine<br>slicing/ medium                                   |
| Governance type                               | Market/ modular  | Captive<br>(offshoring)                                     | Relational<br>(market server)          | Modular  |
| Lead  | OEM, but increasing-<br>ly the supply base<br>and its standards                      | OEMs and<br>shipowners                                      | Designers,<br>Brand owners,<br>outlets | OEM, but key compo-<br>nents become increas-<br>ingly concentrated |
| Key drivers                                   | Standards  | Certification,<br>tradition                                 | Automation                             | Platforms  |
| Challenges/<br>constraints                    | Breaking the code;<br>flexibility; optimizing<br>the system rather<br>than its parts | New entry; transport<br>cost; maintaining<br>knowledge base | Transportation cost;                   | Market standards   |
| Rivalry                                       | Intense  | Moderate, Moderate<br>strong positions                      | Intense                                |  |

# POSITIONING IN DIFFERENT VALUE CHAIN CONFIGURATIONS

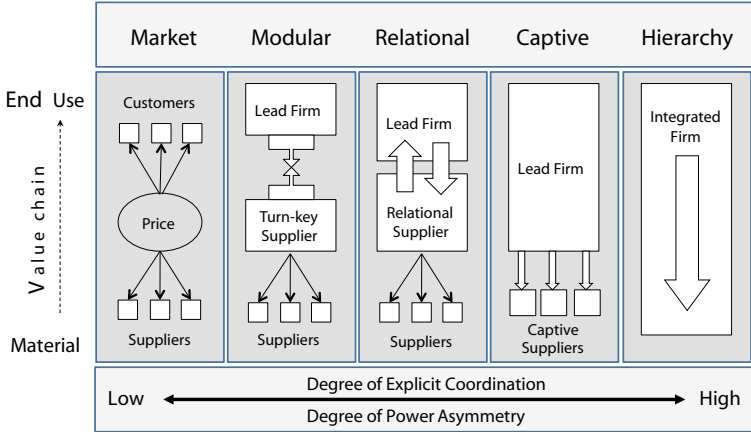
After specifying the industrial context in which the firm operates, the next step for understanding value chains and positioning in them is to describe the fundamental dimensions that determine specific value chain design traits.

Different value chain configurations

The types of value chain relations can be differentiated based on: 1) relations, 2) the make or buy and offshoring decisions that are made in value chains and 3) the different roles SMEs can take in value chains. The five generic value chain types presented in the figure illustrate examples of value chains that Danish SMEs could be part of. Each of them is further illustrated and described in more detail later in

this section. Overall, the full value chain of a given product may be composed by any number of different relations.

The value chain types illustrate the way in which companies are related within a value system and predicate key determinants that will tend to dictate how the relationships between companies are formed. The combination of product and process complexity and supplier capabilities can arguably determine whether one operates under market conditions or whether one engages in a strategic partnership with a supplier/buyer. This is important to acknowledge as these relationships are not static, but may be altered over time – also proactively.



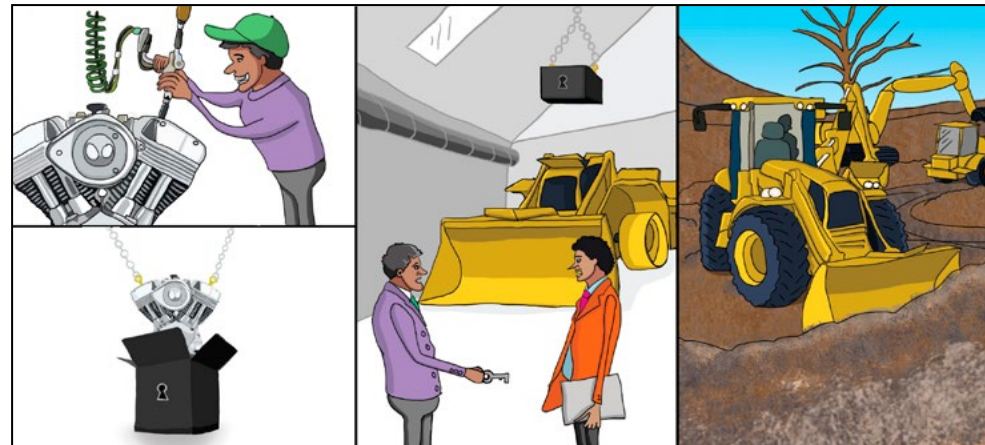
Based on: Gereffi, G., J. Humphrey, and T. Sturgeon (2005) 'The governance of global value chains'. Review of International Political Economy, 12 (1), pp. 78–104.



**The market type** of relationship is arm's length and is considered the most basic of relationships. The standard transactions are governed by the market price mechanism. The number of players on the market is high and the degree of power asymmetry between them is low. This also means that sources of sustainable competitive advantages are few.



**The modular type** of relationship is concerned with a closer link between the parties. Due to the nature of turn-key supply, the lead firm will need to provide the specifications to the suppliers who will deliver modules or complete systems complying with these specifications.



**The relational type** is, as the word indicates, far more interactive than the market and modular types. It typically involves several interfaces (R&D, production, finance, etc.), high intensity of the tacit knowledge transfers, meaning that the depth of interaction between the parties is continuously fostered. A typical example of this type of relationship would be a strategically important element of a product, for which competences do not exist in-house or where in-house production is considered unnecessary.



**The captive type** of relationship indicates that a supplier is highly dependent on (or held 'captive' by) its buyer. These types of relationships can be present in cases where a very large MNC fills the majority of the supplier's order book, and thus holds high leverage towards the supplier. This is combined with the fact that resources in the SMEs will be specified towards the MNC, making switching costs very high. It is often the case that the OEM will contribute with specific competences in e.g. purchasing, product development, or another area where the SME is less competent.



The **hierarchical type** of relationship is a further integration of the supplier through ownership. Explicit coordination and control as well as high degree of power asymmetry characterize this type of relationship.



It is important to note that these relationship types are not mutually exclusive, meaning that more than one type may exist within a given company or business unit, and it may even play different roles within these (lead, supplier, support etc.). As with all things this provides strengths and weaknesses. The strength of adapting resources to fit different relations is that different tasks require different relationships and as such it is a necessary evil to function optimally. The backside of it is that each type of relationship requires different structures, processes and competences, which can be tricky for a smaller organization. The biggest issue, however, is the appropriate allocation of costs to the

different types of products that caused the variety of relationships in the first place. This involves allocating development costs, fixed costs, and variable costs over product groups in order to ensure competitiveness throughout, and ensure that certain product groups are not too heavily loaded.

An important emerging discussion as we engage both with new organizational forms and increased geographical dispersion is the discussion of choosing between footloose and rooted networks (illustrated in the figure below). While these are related to offshoring and outsourcing, they also add new dimensions (product and process) to the discussion.

**Footloose networks** are comprised of arms lengths external operations partners and offer standard production processes and commodity products. As such, the footloose form is the most appropriate for the situations where it is relatively easy to move production processes (i.e. the textile example given above). Rooted networks, on the other hand, are concerned with building operations networks that offer proprietary production processes and unique products. Here operations are treated as a key source of competitive advantage, but they also hinder the movement of production across organizational borders. The discussion of footloose and rooted networks is important, especially when the dominating reason for outsourcing is the focus of costs, rather than the complexity and uniqueness of a given product or service. Thus, the best solution for outsourcing should be determined by more strategic concerns rather than on costs. The figure illustrates the different positions organizations can be placed in accordance to product characteristics and the processes needed to manufacture them.

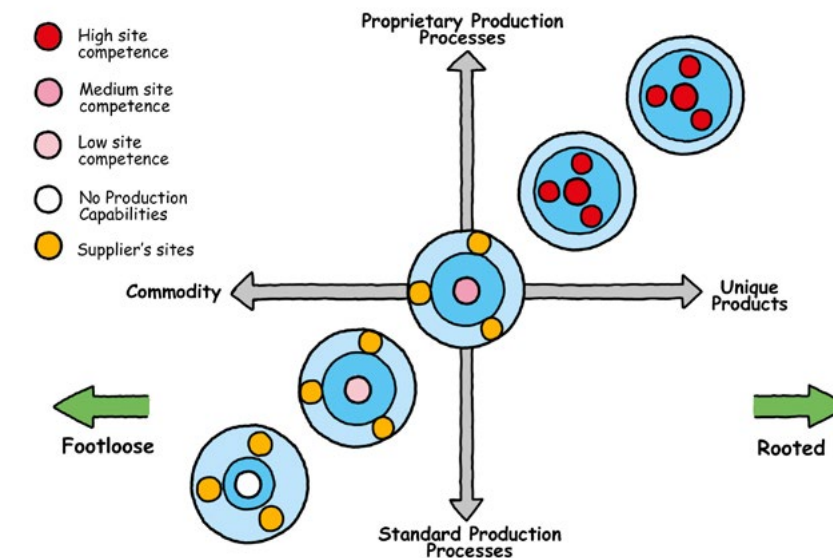


Figure: Footloose & Rooted Operations Networks, based on Ferdows (2008)

We often experience that companies shift their priorities over time and, therefore, shift position in the product-process matrix. They do so either by conscious strategic choice, strategic drift, or respond to shifts in the industrial context. The effects are seen in the need for new structures, processes and

capabilities for organizations in order to gain the benefits of the overall value chain. These together build operations configurations, which ideally should create the basis for competitive advantages as they embody key sources of productivity, flexibility, quality, profitability, costs, and market position of the organization.



# KEY DRIVER OF VALUE CHAIN CHANGES: OFFSHORING

Offshoring is a key driver of value chain reconfigurations in modern companies. In this book offshoring is defined as the act of moving processes of the organization to a foreign location – either in-house or via outsourcing. The distinction between different types of offshoring and outsourcing is illustrated in the figure below. The figure distinguishes between offshore insourcing, offshore outsourcing, domestic in-sourcing, and domestic outsourcing.

|          |                     |                      |
|----------|---------------------|----------------------|
| Abroad   | Offshore insourcing | Offshore outsourcing |
| Domestic | Domestic insourcing | Domestic outsourcing |
|          | Insourcing          | Outsourcing          |

Obviously, the four scenarios mentioned in the figure above do not represent the full spectrum of possibilities. They rather cover extreme scenarios that can be further detailed. In terms of contractual arrangements, strategic partnerships can be added to insourcing and outsourcing. From the point of view of location and distance from headquarters, companies can locate their activities: 1) in close proximity (domestically) or 2) offshore at a geographical distance.

The typical drivers for offshoring include access to new markets, knowledge and competences, and lower costs. Close proximity to market will allow for easier adaption of products/services to local needs – additionally, many MNCs choose to source locally, meaning that failure to remain close in proximity can lead to loss of a customer for SMEs. The experience shows that original home base suppliers often enjoy a strategic window of two-five years before their offshoring customers start to scan the local sourcing market. This window remains open for at least short-to-mid term because offshoring customers initially aim to stabilize their own operations before new uncertainties are introduced in the form of engaging with the local supply base. Offshoring activities also present the opportunity to exploit local talent. However, as mentioned before, the most common reason for offshoring activities in Danish SMEs remains labour costs and general cost savings related to e.g. lower establishing costs, lower costs of investment, and low cost components sourcing.

Studying industrial development trajectories over time will enable a further qualification of the future value chain configuration. As can be seen from the table below, the value chain configuration in the textile business has

changed from fully rooted and integrated to geographically dispersed and organizationally fragmented. The textile industry illustrates how new value chain configurations are constantly in the making and sources of competitive advantage are temporary and, therefore, value chain strategies rarely remain competitive for long. The history of the Danish textile and clothing industry demonstrates how manufacturing has shifted between a centralized production structure and a

decentralized production network, which opens discussions about changing sources of competitive advantage as well as of the overall business profile and its consequences. An additional step is today emerging for parts of the industry, where even the design responsibility has been outsourced to external partners, leaving a hollow company from a operations capability perspective, which further intensified the discussion of the origin of sustainable competitive advantages.

Value Chain Configuration and Internationalisation

| Activity:       | OPT<br>Outward Processing Traffic<br>(-1990) | CMT*<br>Cut, Make and Trim<br>(1990-1995) | SOD<br>Sourcing from own Design<br>(1995-) |
|-----------------|--|---|--|
| Design          | Denmark                                      | Denmark                                   | Denmark                                    |
| Logistics       | Denmark                                      | Outsourcing DK                            | Outsourcing DK                             |
| Procurement     | Denmark                                      | Outsourcing DK                            | Eastern Europe                             |
| Processing      | Outsourcing DK                               | Southern Europe                           | Eastern Europe                             |
| Cutting         | Outsourcing DK                               | Eastern Europe                            | Asia                                       |
| Sewing          | Southern Europe                              | Eastern Europe                            | Asia                                       |
| Packaging       | Southern Europe                              | Eastern Europe                            | Asia                                       |
| Quality control | Denmark                                      | Southern Europe                           | Asia                                       |
| Branding        | Denmark                                      | Denmark                                   | Denmark                                    |

\*) Based on Nielsen and Pedersen (1998). Dansk tekstil & tøj. p. 4

SME POSITIONS AND  
REPOSITIONING INITIATIVES

“*Danish companies have come quite far in reorganising most parts of their value chain, but they do it at great cost and with the potential loss of means for competitive leverage.*”

SME’S ROLES AND POSITIONS  
IN GLOBAL VALUE CHAIN

From the previous discussion it is clear that any business process or task that can be (i) depersonalised (ii) decomposed, (iii) codified, and (iv) digitalized, is transferable to a different location or a different provider and is, therefore, open for value engineering. This is a crucial task that most SMEs are struggling with today in one way or another. An outline of key value chain challenges is provided in the following table.

Danish companies in general have been quite apt in responding to these challenges, but although they have come quite far in reorganising their value chains, they do so at great initial cost, followed by intense coordination efforts and the potential loss of competitive leverage. This leaves the question: how may Danish SMEs support their successful engagement with global value chains? In the following pages we seek to provide insight and inspiration in support of individual companies seeking to answer this question. Firstly by introducing a methodology and secondly by discussing different roles of SMEs in the value system.

Key value chain challenges for SMEs

SMEs may be too small to have any leverage against or even to buy from raw-material suppliers.

Specialized sub-suppliers may over time outperform or make the function played by the focal company obsolete as they push for increased downstream engagement .

The typical contribution of Danish SMEs – flexibility, ingenuity – is increasingly devalued by larger and more professional purchasing departments in lead-firms.

Failure to be local will result in declining sales, due to e.g. logistics reasons.

The typical knowledge contribution of Danish SMEs is difficult to work with across great distances. They are dependent on proximity.

The challenge, on the other hand, is very limited resources in SMEs.

If a Danish SME miss the window-of-opportunity as the lead-firm misses its activities, it will be difficult to retain the position.

The limited scope of SME activities may mean that resources for R&D are limited, and the technological capabilities do not keep up the pace.

Increased cross-border, cross-firm collaboration as a result of multi-technology usage and increased fragmentation and dispersion.

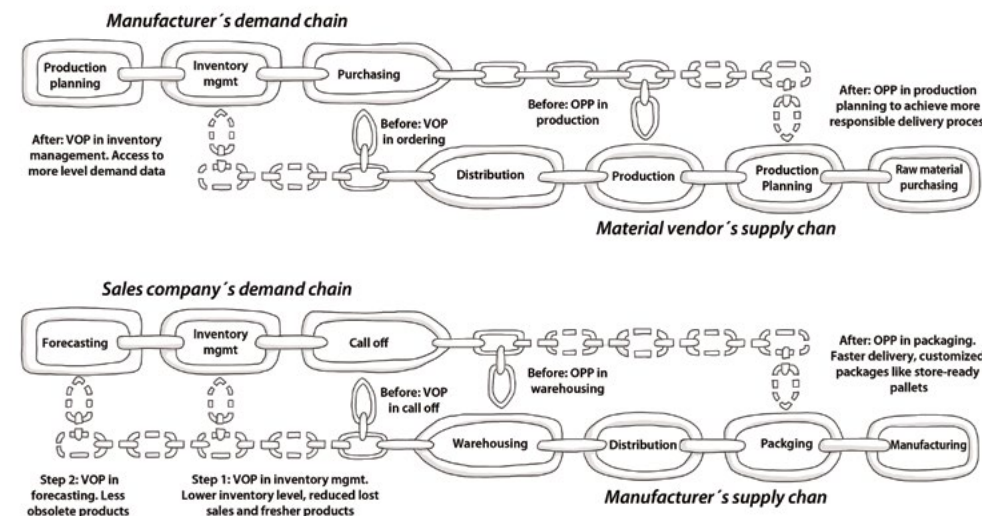
### Methodology—Value Chain Engineering

The starting point for value chain engineering is that supply chain reconfiguration is a major challenge that cannot be answered by any single company or any individual functional area of the company, but requires broad involvement. There are no simple solutions and no one sits with the solution alone, but we generally find that there is much insight to draw from, if all come into play. The objective is to change the supplier-customer relationship in such a way that value is increased, new sources of value are identified and/or waste is reduced. To accomplish this there is a need to move beyond the status quo and to work with a holistic clean-slate concept to support

a future value chain design, which may then as a second stage be translated into detailed sub-concepts. The methodology works with two primary concepts as its outset, which constitute key value drivers these are:

- Value Offering Point: The VOP is the point in the demand chain at which the customer allocates demand to a specific supplier.
- Order Penetration Point: The OPP is the point where the product is allocated to a specific customer.

On the following page we will introduce a procedure for working with these dimensions in practice.



Holmström, J. et al. (1999) Using Value Reengineering to Implement Breakthrough Solutions for Customers, Internatiwnal Journal of Logistics Management, Vol. 10 No. 2, pp. 1-12.

Following the conceptual introduction to value chain engineering we will now outline a procedure for working with the existing value chain position based on the VOP/OPP figures. The procedure has been divided into 5 sequential steps:

#### A: Choose a market segment, for which you want to address the discussion of value.

- By market (customer)/By product?

#### B: Map your supply chain. Ask yourself:

- What are the processes leading up to the delivery of value/product/service?
- At what point in the process do you allocate your product to a specific customer? This is the Order Penetration Point, and it is important to understand as a means to assess the cost and development opportunities related to serving specific customer needs.

#### C: Map your customer's demand chain. Ask yourself:

- What are the processes leading up to the consumption of your value/product/service?
- At what point in the process does your customer choose whom to source from? This is the Value Offering Point, and it is important to understand the impact of customer behavior. What are the underlying principles behind the decision-making in the demand chain? Why do they choose to source from particular suppliers and why does the decision happen where it does?

#### D: What is the value we offer? And what is our solution for providing that value?

#### E: Solution—How can we design the VOP/OPP relationship and provide a solution for mutual gain?

Things to consider for your VOP/OPP solution:

- Cost structure and cost drivers related to the solution,
- How can we engage customers in a dialogue?
- Who needs to buy into the idea and how are they equipped to do so? Can we source additional resources (partner) to help provide the solution? Who will take to lead/system integrator role?
- What needs to be in place in order for the solution to be a success (e.g. complementary technologies/solutions)?
- If the necessary role lies outside of your "comfort zone", consider how you can manage different roles simultaneously.

Probe the new VOP/OPP with a select customer.

- It allows trial and error runs in a closed circuit.
- It allows for further development (maturation) of the solution.
- If successful it provides solid argumentation for other customers in the same segment.

# SME ROLES & VALUE CONFIGURATIONS

The following will introduce different types of SME roles that Danish suppliers are likely to take. These roles are not mutually exclusive, meaning that companies are able to, and likely will, assume more than one role. The roles are designed to give you an opportunity to identify yourself, and thus the challenges and opportunities that exists with each role.

The **systems integrator** is a relatively new type of organization. Typically a single technology is mastered, but the key to the profitability here is the ability to coordinate the cooperation of multiple suppliers and sub-suppliers, and deliver turn-key solutions. There are examples of these companies that have changed from a specialist towards a systems integrator. This seems to happen when sourcing achieves a higher strategic importance within the customer organization as a result of increased specialization and outsourcing, leaving much of the coordinating role to an external party who is willing and capable of doing so.

| Characteristics                       |   |
|---------------------------------------|---|
| Competitive advantage                 | Strong coordination mechanisms and processes.<br>Skilled workers who are capable of understanding the entire system.  |
| Customer relations                    | Relatively close customer relations. In order to facilitate the transactions that are necessary for systems integrators, the relations mostly go beyond arms-length.<br>1st tier supplier for the customer.   |
| Product process<br>(Unique/commodity) | The turn-key solutions may be either/or. The uniqueness of the systems integrator is the coordinating capability. As such, the processes for coordination will be unique and situationally dependent. The turn-key solution of the system may be somewhat standard. |
| Manufacturing Network                 | The systems integrator is likely not to have a manufacturing network of its own, but instead rely on those of others.   |
| Product development                   | If involved in product development, it will be in a coordinating manor, in which the systems integrator supports the system innovation.   |
| Challenges                            | Gaining economies of scope/scale in order to appear attractive to the MNC.<br>Establishing and maintaining excellent supplier portfolio management.   |

**Case in point:**  
**The sub-supplier and its journey towards the systems-supplier position**

The SME in this case was established in the early 90s and started as a subcontracting company with competence within metal work The company delivered simple products based on customers specifications. In the 90s the company was able to create its own product programme based on customer solution to a niche market. In the 00s some customers started to push the company to develop solutions and to take over responsibilities for meeting the full range of customers demands. Over the years the integration with the customers transformed the company into a system integrator. The company is now able to develop and produce client specific solutions including full assembly and engineering work.

Today the solutions business represents 50% of revenue, its own product programme 35% and subcontracting only represent 15% of the overall business. The subcontracting position, however, remains an important business, as it holds the key to recruiting new customers, who over time can become systems customers, but also because it demands that the company remains sharp on its competitive capabilities within this market, which remains a key qualifier for retaining the systems business. This also remains one of the key problems for many systems integrators (as they shift their positions

towards servicing the systems business), that the virtues that brought them into this position in the first place sometimes slip out of focus. The lack of performance on cost, flexibility, speed etc. cannot in the long term be compensated for by increased engagement with the customer, service, logistics services, which comes with the systems integrator position.

The industry was generally undergoing change from a focus on subcontracting towards a more integrated customer relationship. Looking into potentials for growth, its own product program was expected to shrink by 30% within 5 years, and the subcontracting was expected to shrink over time as well. Meanwhile the solutions business was steady, but not increasing – something had to happen to meet ambitious growth plans. The challenge was addressed by actively seeking economies of scope by looking for other use of knowledge to integrate the solution in other markets. By harvesting its capabilities built from delivering solutions to existing customers the company was, among other initiatives, able to create a new product to the declining marked within its own product programme in order to increase market share. The SME was able to pursue new opportunities and offer new solutions by applying the leverage of existing technologies and competences, which provided it with a high initial legitimacy in the market and strong operational capabilities.

**The commodity supplier** is a supplier or sub-supplier of commodity products or services. They are concerned with commodity processes in which they have achieved a high degree of efficiency due to a high degree of automation. Considering the fact that they deal with commodity products, they are typically in markets of high cost pressure and as such possess advanced processing skills in order to be competitive. Foreign firms com-pete with the commodity supplier on cost via e.g. access to low-cost production or differences in factor conditions.

| Characteristics                       |  |
|---------------------------------------|--|
| Competitive advantage                 | High efficiency as a result of a high degree of automation.<br>Access to key scarce materials or other factor conditions.  |
| Customer relations                    | Often unknown via an intermediate, akin to the market relationship.<br>If known, then shallow and arms-length.<br>Highly opportunistic behavior.   |
| Product process<br>(Unique/commodity) | Commodity suppliers deliver commodity products.  |
| Manufacturing Network                 | The process technology applied by the commodity supplier relies on high technical capabilities, and as such a rooted manufacturing network is desirable.   |
| Product development                   | The commodity supplier is rarely involved in product development. The commodity supplier is an extreme case of laggard, who only adapts its products.  |
| Challenges                            | Maintaining business excellence.<br>Continuously exploiting process technology.<br>Utilizing their superior process technology to create higher value added products.<br>Gaining access to commodity markets and trading platforms and qualifying for bidding on orders.<br>Commodity suppliers are highly dependent |

**Case in point:**  
**Dealing with the commodity business**  
**in the food industry**

The case company has its primary activities in the food industry; they include both production and sales. The company is primarily known locally under its own label, but it operates globally and serves a wide range of customers. In the recent years the company, who sells processed food products to large supermarket chains, have been experiencing downstream pressure from the market. Customers are consolidating their supplier base, and in doing so forcing producers to offer a wider product portfolio. In order to stay competitive downstream, the company had to address numerous issues upstream.

An increasing share of the business in the industry comes from private label products, where the supermarkets offer best price products under their own name. This business is usually conducted through a tender process, where the customer specify the content of the demand as well as its expectations for overall volume. Competition in this market segment is increasing – many players on the market are able to deliver standardized commodities Therefore, the tender process must be fast, flexible and accurate in order to secure and sustain a stable position on the market.

**Taking charge of the tender process**

The old tender process was slow and created a lot of flux in the organization. The company had a history of putting bids on all tenders in the business, although it was well-known that only a small percentage of tenders would be won. However, it was important to show presence in order to build customer awareness. Every tender went through the same internal process, stretching internal resources to the limit and building fatigue into the process. So changes had to be made. The company decided to work towards: selecting best fit tenders, matching tender conditions with stock and operations resources.

The development of a new tender process was divided into three steps: Before, during and after. This more structured and systemic approach allowed the company to gain knowledge of the different strategic importance of various tenders in the market and to act in accordance with these. The tender process, included the entire organization, allowing for better transparency and internal knowledge flows. Lastly the company developed the process and performance monitoring procedures: their own and competitors for different categories of quality of the products in the portfolio.



**Case in point:**

**Changing the position of the commodity supplier**

As the food producing companies have been focused on reducing inventory of packaging materials quick response capabilities are key to competing in the industry. This also means that the case company only serves 20% of demand from finished good stock; the rest is produced during the week it is shipped. Furthermore, the customer loyalty to the supplier is low and shifting cost are generally believed to be low, which means that cost is still the main performance criteria.

The case company is taking a lead in the industry to take charge of these business conditions, partly through new product development offering new opportunities and solutions to their customers and through intensifying its partnering set-up with its customers through new logistical services and order flow and replenishment optimization. However, few customers consider their packaging supplier as a strategic supplier and there is a strong tradition for shifting between suppliers in this industry to drive cost down. In spite of this the company increasingly identifies itself as a full service provider, which alongside its efforts to optimize its cost profile has built an integrated approach to customer service. Key selling points are customization, solutions design, logistics, reliability, quality and environmental footprint and are based on the economic

rationale that these priorities will also bring down cost. Individual customers often purchase a narrow range of products. Hence although the company has a very broad product range, consisting of 4 product families and an almost indefinite number of variants within each of these, the typical customer interface is limited to a few variants. Therefore, from a product/logistical perspective, the complexity of servicing new markets is rather low, which provides an opportunity for optimization and has become a key outset for planning.

The customer interface takes its outset in co-design, where the technical team and experienced sales force follow every job to its completion. The company promises its customers a competent and experienced partner that is willing to ask questions in order to optimize production in every phase. This is built on the principle that well-thought-through solutions start as early as the design phase. Here, the company's industrial designers and tooling team from the outset advise customers on how material types, design and functionality can be composed to meet specific product requirements without losing stability or entailing production stoppages in customers' packaging lines. The team of technical experts visits customers to ensure a smooth and problem-free production flow. The company is not satisfied until the packaging fully fits the operational priorities of the customers. And when it does, it has a technical sales department that assists the customer in making further optimizations.

*“Designs help managers: to identify opportunities and potential capabilities from existing positions; embed these in a configuration that grows and exploits them; leverage those capabilities across complementary sets of market opportunities. In other words effective designs enable synergies between resources and emerging opportunities.”*

**The problem solver** is a supplier that possesses strong engineering skills, within a given technology domain, but often lacks the ability to formulate the product specifications themselves, and is thus highly dependent on their professional buyers. The problem solver provides engineered solutions to the customer’s product specifications and as such works as an OEM/ODM supplier. Project management is vital in the eyes of the problem solver, as everything they do revolves around projects with their buyer.

| Characteristics                    |  |
|------------------------------------|--|
| Competitive advantage              | Highly skilled engineers, who can solve any problem within their given domain, based on customer specifications.<br>Skilled project management organization.   |
| Customer relations                 | Relations with customers may be relatively weak, as product specifications are typically designed for an arms-length approach.   |
| Product process (Unique/commodity) | Products are unique by nature, as standard solutions would be cheaper at generic companies.  |
| Manufacturing Network              | Given the uniqueness of the products and resources, manufacturing networks will be rooted rather than footloose. This, however, will depend on the manufacturing technology, which may or may not be outsourced.   |
| Product development                | The problem solver does not develop products per SE. The role of product development lies with the OEM, who uses the problem solver to engineer solutions pertinent to those specific requirements.  |
| Challenges                         | Commoditization of technology. Increased competition influences the price of the product, which comes to a disadvantage for expensive Danish workers.<br><br>Avoiding tunnel vision. We see examples of companies that, due to increased competition, become so focused on keeping the wheels running on the bus that they forget to earmark resources for organizational development. |

**Case in point:**  
**The specialist taking charge of solving customer problems**

The company works with industrial customers and provides solutions based on high quality woven fabrics. Until the mid 1980s, the company’s focus centered on the domestic market. But since then exports have been gradually increasing, and in 2013 it reached 95%. These changes affect not only sales, since the late 1990s, the company had seen a growing low-cost competition from Asia, which revealed the need to transform the company’s operations and subsequently also the business model. The company was known as a specialist in wool-based fabrics, but more recently the company has supplemented them with other types of fabrics and moreover with a range of related services from logistics to innovation services. This has changed the profile of the company quite radically and has allowed the company to change its position in the value chain.

Historically the company mastered each stage from the processing of raw materials for the textile finishing and had invested a great deal of management attention and financial resources in these processes and achieved a market leading position in its niche. This niche, however, experienced increased pressure partly from other product technologies and partly from new competitors with a lower cost base. This pressure drove a radical shift in the business model

and the company’s supply chain. The business model involved more focus and broader engagement with the market’s top 50 customers. In relation to the supply chain, outsourcing of manufacturing became a key means for restructuring. Concurrently, the company had established a sourcing office in China with the original purpose to address standardized supplies as well as to offer customers a low cost option, but later this unit has managed to take on development tasks, as well as key account responsibility for strategic customers.

This new reality required numerous organizational changes. The shift from being a traditional textile manufacturer to solutions provider had to be supported by organizational development building on the ability to integrate multiple deliverable elements, and a strengthening of business and product development. The organization was split into independent profit centers, all of which were fully competitive externally with the aim of creating an efficient and competitive delivery system. However, with a long history as a manufacturing company, the company had a lot to learn in terms of establishing and managing the virtual operations network and external supply chain. These factors were directed towards the employee’s understanding of their work, support systems, supply chain management and customer and supplier development. The company has successfully met the challenges and today it orchestrates a highly effective global network.

**The specialist** is, as the name would indicate, a supplier that has chosen to specialize in a given domain, i.e. process technology, product/component, etc. The specialist employs highly knowledgeable experts, who can aid the buyer in the development of process and/or product innovations, and they work closely together with e.g. the systems integrator. The specialist is deeply involved in the product development process where they, in interaction with their buyers, are close to the technological lead.

| Characteristics                    |  |
|------------------------------------|--|
| Competitive advantage              | Highly specialized knowledge within a narrow domain - be it process, technology or a product.  |
| Customer relations                 | The specialist has relatively deep relations with customers and would likely be labeled <i>Relational Supplier</i> .   |
| Product process (Unique/commodity) | Products are likely unique, on the basis of a unique process technology. Value proposition is based on specialized knowledge & capabilities in a narrow domain not deeply supported by the customer own capabilities.                    |
| Manufacturing Network              | Due to the proprietary nature of its processing technology and products, it is likely a rooted manufacturing network.  |
| Product development                | Two forms of product development may exist here: <ul style="list-style-type: none"><li>• Co-development with customer on behalf of customer requirements.</li><li>• Own development on the basis of research within the field.</li></ul> |
| Challenges                         | Safeguarding towards IPR infractions. Continuously expanding their technology depth to avoid commoditization and thus competition from lower cost countries.   |

**Case in point:**  
**The Problem Solver in a Squeeze**  
**– leeway for the specialist**

The company is a SME specialized in developing wireless communications solutions and equipment, which were either sold as private label or as part of OEM products. The company started as an entrepreneurial initiative, and it has build a strong position in the industry as a technology leader, and has historically invested heavily in technology development in its domain. From the start, the business model relied on producing physical products in foreign low-cost destinations, while all knowledge-intensive engineering and development tasks were carried out in Denmark.

The company strategically placed its headquarters within a telecommunication cluster, close to a leading university in its field, which provided a good recruitment base for qualified staff. The company's core business currently and throughout its history has been heavily reliant on the company's proprietary engineering capabilities. Therefore, it approached offshoring and outsourcing of engineering the tasks with great care because of the strategic risk involved.

The company belongs to a value chain dominated by large multinational companies, which during the lifetime of the company has become increasingly mature. As a consequence most components and solutions are now widely

available in the global sourcing market and customers are increasingly looking to consolidate their supply base. This meant that the company found itself in a fragile position, surrounded by large and powerful players, who were increasingly pushing their total operations footprint towards low cost destinations while insourcing main parts of the knowledge work.

While the company is well-recognized in the market for its problem-solving capabilities for complex tasks, Its partners catch up fast and are slowly starting to develop their own systems solutions putting the role of the development houses in a squeeze, and meant that it was increasingly difficult to win high volume orders. The company has recently refocused its business towards groups of customers in search of full service outsourcing partners (R&D, design, assembly and test). This has also enabled the company to strike a better balance between research related work, building future capabilities and application work initiated by the customer. The company has more recently established offshore engineering close to the production base of the company in South-East Asia in order to respond to local demands from the production base and from local customers. Technology development, which is regarded as the traditional core business of the company is, however, still firmly rooted at its home-base, but by supplementing it with offshore resources its activities are now more focused around high value adding activities.

**The flexibility supplier** concerns itself with building capabilities that allow it to become flexible in all aspects. This type of supplier employs a highly flexible workforce, utilizes flexible machinery and prefers variation to scale, i.e. they produce in smaller quantities but with large variation. Typically, the flexibility supplier will manage multiple technologies, which again puts high requirements towards their resources being flexible.

| Characteristics                       |  |
|---------------------------------------|--|
| Competitive advantage                 | Flexible resources.<br>Highly adaptive.<br>Commanding multiple technologies.<br>Order processes are highly efficient.  |
| Customer relations                    | Functioning in somewhat market conditions, relations with customers are quite shallow.   |
| Product process<br>(Unique/commodity) | Manufacturing processes are standard, as are products.   |
| Manufacturing Network                 | Commodity products, flexible resources and standard manufacturing processes means footloose manufacturing network.   |
| Product development                   | Not involved in product development, as they do not possess sufficiently deep knowledge in a domain.   |
| Challenges                            | Maintaining sufficient customer base to avoid excess capacity.<br>Avoiding legislations and other issues that may reduce resource flexibility.<br>Keeping up-to-date on order qualifiers (e.g. certifications and cost). |

**Case in point:**  
**The flexible supplier searching  
for tighter customer relationships**

The company is a medium sized company in the electronics industry. In a very volatile marked with fierce competition a great deal of the production in the industry has moved to low cost countries. The company has followed this industrial trend and established production in Asia in order to offer its customers low-cost manufacturing and serve existing customers at their offshore facilities. Based on this the company creates flexible supply chain solution according to customer demand.

In the midst of these changes the remaining Danish manufacturing facility needed to redefine its role. It was recognized that a home base would remain an important gateway for the business and that the specialized capabilities, which had been built-up over many years and had resulted in a highly capable and broad phased manufacturing set-up, was key to maintaining the ability to solve customers problems during product development, ramp-up and operations upgrades. However, the reality was that price was often the key order winner. Many customers have been outsourcing electro-

ronics for years now, but more recently this also pertains to tasks related to product maintenance and development, as it for many customers is too expensive to maintain or build-up these capabilities in-house. This also means that offerings are not only limited to the product, but that the company is now offering a complete solution to the customer including service and development. The company wants to be at the center of developing a good and sustainable solution to the customer needs, but it also needs to do so while keeping cost in control. The business case for the customer builds on a total cost perspective, where the value of employing tight and geographically proximate relationships, but also builds on the fact that its customers demands are diverse and its volumes too small to make sense in a international sourcing market. In order to stay competitive this type must build its capabilities to cater for flexibility and cost efficiency, thus recognizing that cost represents an important threshold capability.

**The market developer** is a type of SME that has specialized in targeting new markets with new or new combinations of known products/services. This type of company often has a entrepreneurial approach to the market and draw on strong entrepreneurial R&D capabilities. This is, like the market server, a B2C configuration as opposed to the other five SME roles mentioned. The market developer makes a living by interpreting future user needs and establishing the necessary structure and processes to feed that market early. They experience limited competition due to their ability of reaching the market fast, before it is commoditized by competitors, who in return are often much better at exploiting the markets afterwards.

| Characteristics                       |   |
|---------------------------------------|---|
| Competitive advantage                 | Strong entrepreneurial spirit.<br>Skilled marketing department, including price setting capability.<br>Capability of continuously adapting the organization.<br>Strong brand.   |
| Customer relations                    | Strong relations to groups of customers who are capable of relaying needs.  |
| Product process<br>(Unique/commodity) | Unique offerings, which are new to the market, but not necessarily new to other markets or with can be found in other combinations.<br>It represents a break with existing norms, standards and ways of doing business in the industry. |
| Manufacturing Network                 | Footloose manufacturing network that is applicable for the flexibility that is so essential for the market developer.   |
| Product development                   | Skilled product development function. Core technologies are sought applied in new markets and new product applications.<br>Mature project portfolio management function.  |
| Challenges                            | Continuously developing new offerings.<br>Assessing/realizing market acceptance and need<br>Maintaining the entrepreneurial spirit.<br>Maintaining a dynamic organization.<br>Keeping pace with user trends.                            |

**Case in point:**  
**The knowledge intensive market developer**

The case company was established in the late 90s by two entrepreneurs as a spin-off from a number of research projects at Aalborg University in water treatment. Today they employ 20 highly skilled employees and the company serves customers' worldwide and has secured a strong position in its market. The customer is working within a wide range of industries. The main focus area has been to develop and mature sterilisation systems with the aim of substituting traditional filtration systems.

The company works as an innovative business developing new solutions for a range of different market segments. This sets the conditions for the overall strategy and the daily decisions. Since the beginning it has been the intention to become a market leader within green-tech water cleaning systems. The company is challenged by the demand for continuous new product offerings, which put pressure on the overall organisational structure. Selling products and components to international distributors provides access to multiple markets, however the penetration to markets is highly dependent on the reliance on the distributors, further it prevents the company from developing an understanding of the markets in which the

products are used and decouples the company from the profitable spare parts market. Recently the company has established sales activities in Sweden, the close geographical proximity makes it possible for the local activities to rely heavily on the managerial, engineering and product delivery competences build in the home market. Further, the expansion in the market has only slowly developed resulting in an well-established market position in southern part of Sweden after five years, meanwhile the remaining Swedish market is untouched. Indicating the slow rate in which the market expansion has taken place.

Despite massive efforts neither the entry into the British nor the American market has yet taken place. The founders recognizes the challenge of market expansion because of the difficulty of replicating the Danish operational setup and knowledge base.

As the Swedish activities are supported by the knowledge base in Denmark, the close proximity allows for an easy knowledge exchange during business hours and the possibility to quickly dispatch technical assistance if required. To establish a foothold in new markets, a similar knowledge base would have to be built locally, which would require significant resources and managerial attention.



**The market server** is an example of a company that is capable of exploiting already existing markets. Where the market developer looks externally first, and then adapts its resources to fit external demands, the market server looks internally first, aiming to see how they can exploit their resources most effectively. The market server does not enter the market until the product has reached a level of maturity where the design is well-established.

| Characteristics                    |  |
|------------------------------------|--|
| Competitive advantage              | Narrow focus.<br>Capable of exploiting resources to target new [to them] markets.  |
| Customer relations                 | Little or no actual relations to customers. Likely to operate through an intermediary.   |
| Product process (Unique/commodity) | Commodity products based on well-known production processes  |
| Manufacturing Network              | Footloose manufacturing network, due to it being commodity products and likely standard processes.<br>Most likely situated very close to the markets it serves, to ensure market responsiveness and quick response capabilities. |
| Product development                | The market server is only concerned with minor developments to products.   |
| Challenges                         | Retaining some resource flexibility to ensure the adoption of new products and markets.  |

**Case in point:**  
**Changing the position**  
**for the commodity supplier**

The case company has its competence within sheet metal for industrial use. The company was founded in 50s and has developed into a highly specialized company within the industry.

The company has changed from simple technologies to including a wide set of specialised process technologies and increasing its level of automation, enabling a dynamic and flexible value proposition for its customers. The company applies a unique technique in production. The focus is on few product segments that consist of a wide product range customized to customer requirements and special needs. The company serves an “engineer to order” approach for all customer orders, as a part of their service. This leads to a focus on securing an innovative and close collaboration to both customers and suppliers.

The SME faces a challenge in achieving high production flexibility to meet new product requirements from different markets. The challenge was met by looking at the company's position in the value chain, which has challenged the approach towards serving customer demands. By clustering and addressing different types of customer requirements the company was able to change internal processes to establish both a higher responsiveness towards selected customers and improving its cost efficiency.

As the concept developed the company aimed to move closer to selected customers by developing the means to embed the company's services into the operations processes of the customer. Solving problems for the customer, which were not core business to the customer, and which the customer could not solve without heavy investments and which could not be easily solved by non-relational partners managerial attention.

# DELIVERING IMPROVEMENTS IN THE VALUE CHAIN

## Important process elements

- 1. Create common ground and understanding of the VC position in the management team.
- 2. Identify your most prominent VC (assuming there are more than one).
- 3. Reconsider your value offering for customers, the potential and constraints within the existing supply base.
- 4. Probe the market with your new idea!
- 5. Consider internationalization in your new business model / value offering.
- 6. Change and monitor

Value chain redesign helps help managers: to identify opportunities and potential capabilities from existing positions; Embed these in a configuration that grows and exploits them; Leverage those capabilities across complementary sets of market opportunities; Effective design enables synergies between resources and emerging opportunities. Several types of design improvements may guide this journey according to outset for the redesign effort (see table):

| Type of improvement                       | Example  | Output/performances   |
|---|--|---|
| Improving process efficiency in terms of: | R&D; production; changes in logistics; changes in sales/marketing.<br>Supply chain management procedures; strategic sourcing; information sharing.   | Cost cuts; shorter time-to-market; first-to-market due to higher degree of customer needs. Lower costs of final products; enhanced patent activity.   |
| Introducing/improving existing products   | Expanding marketing and development department; establishing cross-functional project teams.<br>Cooperation for new product development; concurrent engineering.   | Percentage of profit coming from newly introduced/improved products; sales from products that have PR; number of copyrighted brands; increase in profit due to increase in relative unit price without losing market share. |
| Changing the mix of activities            | New higher value-added chain specific functions that have evolved from other links in the value chain (e.g. vertical integration); outsourcing low value-adding activities.<br>Moving into new links in the value chain. | Improved division of labour in the value chain; focus on core competencies; increase the focus on establishing right fit between given task and the task supporting skill/salary profiles.                                  |
| Placing the company in a new value chain  | Adding and focusing activities in a new value chain  | Higher profitability; looking into the proportion of income coming from different and new product/service/concept areas   |

# OVERALL RECOMMENDATIONS

In summary, the challenges and their recommended solutions are presented in the table below. The challenges presented confront most of the company types discussed and are related to the company position in the value chain. For each challenge a recommendation is presented in order for the company to know how to meet the given challenge and to engineer a more sustainable position

| Point of interest   | Recommendation   |
|---|--|
| Positioning and the related challenges?   | Get to know your position as an outset for value generation in order to make informed strategic decisions.   |
| Companies often gets locked into a particular value chain position. This is due to customer expectations, past investments in resources and capabilities. | Perform a value chain analysis and develop strategies for acting according to your position in the VC and explore opportunities for positional change, by accessing elasticity of demands, expectations and resources. |
| Who takes responsibility for the overall VC performance – and how can it be mitigated?  | Perform a stakeholder analysis and get to know the different sources of power and leverage.  |
| Companies specialize within the chosen position and towards its competitive prerequisites in order to become competitive on the market.                   | Look for key sources of resource asymmetries, which may become sources of competitive advantages.  |
| How to connect with customers and suppliers (external input) for business development.  | Be aware of the customers use of product in order to secure quality in your products.  |
| Value chain Interdependencies.  | Consider who does your company rely on and what needs to happen to make your repositioning a success?  |
| Increased fine slicing of the value chain   | Be aware of who have responsibility and who have the knowledge. Establish effective means to share knowledge between companies.  |
| How to facilitate effective boundary management and resilient VC relationships.   | Commit boundary resources and look for ways to create robustness of supply conditions.   |

#### ACKNOWLEDGEMENTS:

This book is produced by Dmitrij Slepnirov and Brian Vejrum Wæhrens with support from the Global Project and the European Social Fund. We are grateful for a number of contributions made to the work and to supporting cases by various participants from industry as well as Aalborg University in the Global project and in particular Alexia Jacobson, Alan S. Jensen, Jens W. Madsen and Thomas Sloth, who have all contributed to previous versions of the book and to Søren L. Therkildsen for his illustrations.

#### BIOGRAPHY OF MAIN AUTHORS:

**Brian Vejrum Wæhrens** is a Professor of Operations Strategy & Development at the Department of Business and Management, Center for Industrial Production at Aalborg University, Denmark. His current research interests are focused within management and innovation of globally dispersed value chains. He has (co-)authored numerous articles and chapters in books in the field of strategy, supply chain management, knowledge management, innovation and organizational development theories. He has extensive experiences of international scientific collaboration. He has managed and participated in international projects in Scandinavia, Asia and Eastern Europe.

**Dmitrij Slepnirov** is an Associate Professor at the Department of Business and Management, Center for Industrial Production at Aalborg University, Denmark. He holds an M.Sc. from the London School of Economics and a Ph.D. from Aalborg University, Denmark. Prior to starting his academic career, he held a position at the Confederation of Lithuanian Industries, fulfilling an analytical role in close collaboration with member companies. His current research work and publications focus on internationalisation and the implications of globalization for business. His international experience includes teaching and research programs in the UK, Lithuania, Denmark, China, South Korea and Japan.

# GLOBAL

GLOBALISERINGSPROGRAMMET I NORDJYLLAND



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GLOBAL er et EU-rammeprogram, hvor små og mellemstore nordjyske virksomheder kan få hjælp til at arbejde med hele virksomhedens internationale berøringsflade og som resultat opnå øget vækst.

Formålet med GLOBAL-programmet er at opsamle eksisterende og ny viden om globalisering, så der via internationale aktiviteter og en planlagt og koordineret indsats skabes vækst i de nordjyske virksomheder. I begyndelsen af 2015 havde GLOBAL-programmet været katalysator for flere end 1.150 virksomhedsforløb under en bred vifte af de 10 indsatsområder, som de tre parter – NordDanmarks EU-kontor, Aalborg Universitet og Væksthus Nordjylland – har stillet til rådighed via EU-medfinansiering fra Vækstforum Nordjylland. Indsatsområderne giver samlet set et stærkt set-up til gavn for de nordjyske virksomheder, som ønsker optimale betingelser på det internationale marked.

Dette whitepaper præsenterer en række overvejelser og eksempler på, hvordan arbejdet med værdikædebegrebet kan skabe forandring i den enkelte virksomheds forretningsgrundlag. Desuden adresserer whitepaperet forskellige tiltag, der kan være afgørende for, om den enkelte virksomhed formår at udnytte de nye muligheder bedst muligt. Forhåbentlig kan whitepaperet være en inspiration til, hvordan du kan strukturere den fremtidige internationale indsats i din virksomhed – de tre parter i GLOBAL står klar til at hjælpe dig yderligere på vej.

God læselyst!

Henrik Thingholm Kristoffersen

Global Projektleder, Væksthus Nordjylland

NB: I denne serie er tidligere udkommet: Digitalisering – Vejen til Vækst! samt Digitalisering: Når teknologisk forandring får eksponentielle kræfter! Disse to publikationer er en samling af erfaringer fra Indsats F i Global og læsning af dem giver erfaringsmæssigt anledning til at overveje virksomhedens fremtidige internationale indsats. Ovennævnte og nærværende publikation fra Indsats D kan downloades fra [globaliseringsprogrammet.dk](http://globaliseringsprogrammet.dk)



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