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Agile Value Chain as Competitive Advantage

A case study on digital transformation and non-linear manufacturing in the fashion industry

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ABSTRACT

This paper investigates possible shifts in the portfolio of key competitive strategies as well as the implication for manufacturing operations. 'Industry 4.0' and its digital transformation indicate new structures and management strategies in the organization for the entire value chain over the lifecycle. The fashion industry as well as in other industry, agile management of manufacturing and value-chain organization is practiced for which the fashion industry is examined in detail. 'Agility' is not only project management strategy but a value chain strategy allowing to realize a competitive advantage. The fast-moving fashion industry has shown that even a low-tech industry can be disrupted by an agile approach, which may be a paradigm for the future industrial organization.

KEYWORDS

Agile Manufacturing; Industry 4.0; Competitive Strategy

INTRODUCTION

The future viability of companies depends to a large extent on how work and organization adapt to the firm's specific market requirements (Hughes, 2016, p. 120). However, although agile management can be a promising approach for a number of applications, strict 'agilization' does not necessarily lead to the desired goal. In the future, there will still be markets and fields of application in which scale effects and efficiency-oriented work offer advantages. But precisely in the identification of these business cases is the challenge: When does a traditionally shaped, efficiency-oriented approach to a task make more sense than a more agile approach focusing on responsiveness and customers?

Classical ('stable') organizational structures are either process-oriented (e.g., automotive industry or machine

tool industry) and sometimes more project-oriented (e.g., construction industry, shipping industry) (Kerzner, 2017, p. 43). Against the backdrop of a turbulent, unstable environment, these organizational structures may not be able to keep pace with change because of their hierarchy: For a company, agility means being able to operate profitably in a competitive environment that is characterized by consistently unpredictable changing customer requirements. Agile customer-oriented organizations plan their processes, products, and services iteratively instead of waterfall models (Stober & Hansmann, 2010, p. 168; Brechner, 2015, p. IX), reducing the time required for planning and design of products and their manufacturing. The customers receive the products and services in rapid succession in smaller parts instead of after a longer period in one piece (Gunasekaran, 2001, p. 393). Agile processes are iterative and incremental and focus on short-term results while enabling quick adaptation to changing conditions (Joslin, 2017, p. 169). On the contrary, traditional organizations are often self-centred. They think in 'pyramids', 'silos' and linear process patterns (Jestin & Nelis, pp. 3-5; Aartsengel & Kurtoglu, 2013, p. 153). Agile companies, on the other hand, align their strategy with the customer and strive to maximize customer service. Agile, customer-oriented organizations are characterized by network structures instead of hierarchies (Hugos, 2009, p. 53). The focus is on the team-based process organization instead of on non-value-creating organizational structure.

Many companies are starting agile change processes in their IT areas. After a while, the question arises as to whether agility is to be understood only on the project or product development level or on other levels of the organization. Sticking with proven but rigid organization structures is one of the biggest obstacles to organizational development and change management in the digital transformation of business processes or business models. The reorientation to agile thinking

and behaviour as well as the shaping of agility-promoting structures may bring decisive strategic competitive advantages for companies. Better operational communication, higher learning speed, as well as faster decisions and adjustments are seen as important levers for agility. But several questions remain open such as: How do organizations have to be designed to ensure changeability and customer orientation in a dynamic environment? How much agility is needed in a particular area of all business operations and activities? Which approaches fit the company and its industry? How does a company implement iterative short-cycle coordination to meet individual, diverse, and often unstable customer requirements?

THE FASHION INDUSTRY EXAMPLE

The term Industry 4.0 stands for the fourth industrial revolution, a new stage in the organization and management of the entire value chain over the lifecycle of products (Kagermann et al., 2016, p. 5). This cycle is geared to the increasingly individualized customer requirements and extends from the design idea, development and production, the delivery to the customer, up to recycling, including associated business services (Kagermann et al., 2016, p. 5). The basis is the availability of all relevant information in real time through the networking of all entities included in the value creation as well as the ability to derive from the data the best value-added flow at any time. By connecting objects, people, and systems, dynamic, real-time, and self-organizing cross-company value-added networks are created, which can be optimized according to different criteria such as availability, cost, and resource consumption (Koch et al., 2014, p. 10). Smart and agile manufacturing is seen as the key concept of companies in the context of the coming fourth wave of industrialization (Moller, 2016, pp. 312-313).

However, in the 1990s already first approaches of agile management could be identified known as Efficient Consumer Response (ECR), Collaborative Planning, Forecasting & Replenishment (CPFR) and Quick Response (QR). One of the first companies to implement ECR was Wal-Mart, which focused on closer cooperation with suppliers to improve the quality of the process and customer service, the efficiency of production, inventory turnover, revenue per sale, and operating profit (Pfeifer et al., 2008, p. 2). The goal of

ECR was

“a responsive, consumer-driven system in which distributors and suppliers work together as business allies to maximize consumer satisfaction and minimize cost” based on “information and [...] products flow [...] between manufacturing lines with minimum [...] interruption both between and within trading partners.”

(Senauer & Kinsey, 1999, p. 443)

The implementation of ECR was highly successful and contributed much to Wal-Mart's success. It resulted in IT companies, such as SAP, initiating collaborative projects that led to the development of the first version of CPFR (Pfeifer et al., 2008, p. 3). CPFR, which represents an enhanced ECR model, is based on the iterative and joint planning and forecasting of sales and order volumes, as well as collaborative inventory management (Hollmann et al., 2015, p. 975). Companies from diverse industries, such as Kraft, Proctor & Gamble, Coca-Cola, Unilever, etc., have implemented CPFR (Rushton & Walker, 2007, p. 34; Pfeifer et al., 2008).

Fast fashion (FF) is the analogous adaptation of ECR and CPFR in the fashion industry. As a mature industry with a globally advanced value chain organisation, the fashion industry was one of the first sectors initiating the 'agilization' not only of its manufacturing but of the total value chain (Choi & Chow, 2008). As a response to increasing competition from foreign suppliers and manufacturers, the U.S. fashion industry introduced several initiatives known as QR in the 1990s (Sheffi, 2002, p. 4). A QR leadership committee was established in 1994, aiming at defining a process to meet the continually changing requirements of a competitive market and promoting responsiveness to customer demand to encourage the cooperation between suppliers and manufacturers for the effective use of resources and shorting manufacturing cycles (Sheffi, 2002, p. 4).

The QR concept is based on the ECR concept but with the goal of broadening coordination in the value chain beyond the limits of the ECR concept, focusing mainly on category management (Sheffi, 2002, p. 4). The ECR has focused on the enhancement of effectiveness in the demand creation and satisfaction process through faster new product introduction and store assortment (Sheffi, 2002, p. 4). QR has upgraded this concept by integrating a new information flow management

approach to optimize the collaboration between all value-chain members (MacCarthy & Jayarathne, 2010, p. 42). QR is defined as a concept for organising a diverse range of products and services in the fashion industry, according to real-time consumer demand by modifying the current organisational system of physical and information flows in both directions of the value chain (MacCarthy & Jayarathne, 2010, p. 42).

QR is the source of development of FF business models, which changed fashion industry norms by enabling the emergence of allowed dynamic assortment (Caro & Martinez- de-Albeniz, 2014, p. 11, 14). Fast fashion is, first, a term used to describe clothing collections based on the most recent fashion trends and is an important industrial practice in fashion apparel (Li et al., 2014, p. 422). Second, fast fashion is also a business strategy which aims to reduce lead times for new fashion products to arrive in stores and to satisfy consumer demand at its peak (Barnes & Lea-Greenwood, 2006, p. 259). Its objective is to quickly produce fashion products in the most cost-efficient manner, so that demand for the latest fashion trend can be exploited (Li et al., 2014, p. 422). Therefore, fast fashion incorporates two core features, quick response and short lead time, regarding inventory management and enhanced fashion design (Li et al., 2014, p. 422). The traditional fashion product cycle is 9 to 12 months, whereas fast fashion companies work with 6 to 15 week product cycles and therefore increase the number of fashion seasons, representing constant change in store merchandise; 12 seasons of styles are produced and sold instead of the traditional three to four seasons (Peterson et al., 2010, p. 391). The overall result of this new concept of organising design, production, and demand-driven supply, realised by ZARA, Benetton, Mango, H&M, and others (Divita & Yoo, 2014, p. 23), is disproportionately higher revenue growth and the seizure of market share from traditional rivals (Sull & Turconi, 2008).

ZARA is possibly a best practice case for the fast fashion concept, as the brand realises the whole cycle from conceptual design to a ready for sale, well-produced, and packaged product in the retail store within approximately 15 days (Li et al., 2014, p. 422), allowing to offer almost the same or comparable designs as high-fashion brands but at much lower prices.

ZARA's designers work on at least two seasonal collections simultaneously and create approximately 40,000 new designs per year, from which no more than

10,000 are selected for manufacturing (Ferdows et al., 2005). The process of adapting the design to trends continues throughout most of the selling season and is initiated by high-frequency information system providing real-time data from the POS on demand changes delivering shifts in customer preferences (Divita & Yoo, 2014, p. 25). The point of sales (POS) data are analysed and compiled into customer demand trend reports. Both information sources are supplemented by reports from continuous trend research. Consequently, ZARA's stores are at the beginning of the value chain, not the end as was traditional. Furthermore, store managers are instructed to remove unsold stock from the sales floor after two to three weeks, which is possible due to the small size of each shipment, with the consequence that unsold merchandise accounts for less than 10% stock in contrast to the industry average of 17% to 20% (Divita & Yoo, 2014, p. 25).

The result of this high-frequency rotation of goods in the shop leads to a significantly higher customer-visit rate, an average of seventeen times annually compared to four visits to traditional retail stores (Divita & Yoo, 2014, p. 25). The high frequency rotation of goods generates sales because zero stock levels, or the consumer perception that goods will quickly be out of stock, can stimulate a more frenetic demand for the fast fashion product. Hence, impulse buying is the norm to avoid the risk of no opportunity to purchase (Li et al., 2014, p. 422).

This type of customer demand and high frequency in store stock rotation is only possible because ZARA manufactures 60% of its assortment in-house (Ravasi & Canato, 2010, p. 62), whereas many competitors have outsourced their production (Hayes & Jones, 2006, p. 283). The consequence is that ZARA has the flexibility to react quickly due to changes in consumer purchase behaviour and preferences (Leeman, 2010, p. 17).

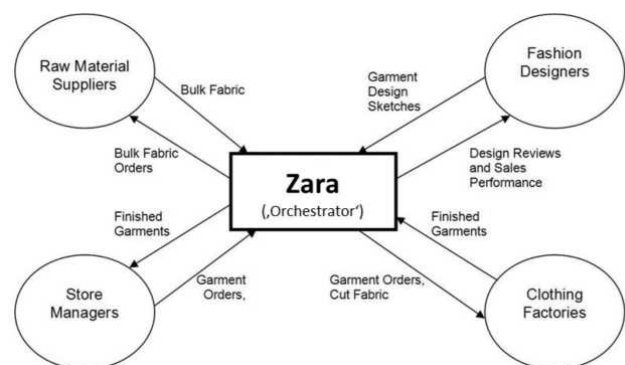


Figure 1: Zara's Orchestrator Value Chain Management Approach
Source: Author's presentation based on Chettupalli, 2017

Sabri and Shaikh (2010, pp. 133, 202) have described the ZARA approach as lean and agile value chain (LAVC), which allows the company to fast-process re-sequencing, resulting in faster design and manufacturing cycles and leading to a higher responsiveness to demand shifts and, thus, to a higher revenue growth and margins, while ZARA is one of the fastest-growing fashion company worldwide (Mangan & Lalwani, 2016, p. 70). However, the company itself should be considered as a distribution hub in a network which reacts to demand signals (see Figure 1).

CONCLUSION AND OUTLOOK

Agility is a conglomerate of a multitude of individual concepts. Conboy (2009) states that this concept includes many different and disparate methods and variants which are used interchangeably throughout the literature (Conboy, 2009, pp. 330, 336). However, the examples of ECR, CPFR, QR, and FF have shown that at least major elements of the agile concept have existed before the introduction of the agile project management in the IT industry. The same applies to the agile paradigm as a whole. Several concepts of the organizational theory that originated in the industrial era have included the concept of agility long before flexible process management was labelled as agile (Yusuf et al., 1999; Vazquez- Bustello et al., 2007; Sherehiy et al., 2007).

Agility is often equated with the Scrum concept deriving from the example of the IT industry (Maximini, 2015, p. 3). Scrum is an approach for project and product management. It was originally developed in software technology but is independent of it. The approach is based on the experience that many development projects are too complex to be included in a full-scale plan. In addition to the product development, the planning of the development and production process too is developed iteratively and incrementally in Scrum. The long-term plan (the product backlog) is continually refined and improved. The goal is the fast and cost-effective development of high-quality products according to a formulated vision of the product from the user's perspective in the form of properties. The list of these requirements is the product backlog. These requirements are implemented one by one at intervals of one to four weeks, so-called sprints. At the end of a sprint, Scrum delivers a finished sub-product (the product increment). The product increment should be in a state that it can be delivered to

the customer (potentially shippable product). After the cycle, the product, requirements, and procedure are checked and further developed in the next sprint. ZARA's "competitive advantage centre around one thing: speed" (Hill et al., 2013, p. 92). ZARA's priority is very often on execution speed to minimize the time-to-market factor (Lago et al., 2016, p. 63).

It was assumed in the introduction that there will still be markets and fields of application in the future in which scale effects and efficiency-oriented work offer advantages. The degree of reasonable 'agilization' depends on the business case. ZARA was presented in this case study as an example for a company being able to operate in a competitive environment which is probably the industry with the highest unpredictability of changes in customer requirements. However, ZARA's manufacturing system is very similar to other firms based on economies of scale operations such as in-house dyeing, cutting, labelling, and packaging but while coordinating 300 small subcontractors who are specialized in one specific type of garment or process at the more labour-intensive finishing stage. This network allows a permanent workflow re-sequencing according to demand shifts (Johnsen et al., 2014, p. 211). This allows the flexibility to produce small batches at short notice (Christopher, 2016, p. 39). Instead, the traditional approach is to manufacture large batches (mass production), shipping in large quantities, and buffering the factory, both downstream and upstream, with inventory (Wallace & Xia, 2015, p. 43). Consequently, ZARA is not a case of strict 'agilization', but a mix of traditional economies-of-scale processes combined with a multitude of modularized productions stages which allow a high responsiveness to fast-changing customer preferences by orchestrating a large network of small subcontractors allowing higher lead times of smaller batches and a fast re-sequencing of existing routines.

Furthermore, this study has revealed that agility is a concept which has been existing for a longer time as a quasi-latent paradigm and has been realized in industries such as fashion and the retail long before the label of agile management was coined. Both industries have shown that agility is not only project management strategy but a value chain strategy allowing to realize a competitive advantage. ZARA has been one of the fastest growing fashion companies over the past ten years and a classical example of how competitive advantage can be accomplished by streamlining the

whole value chain (Hill et al., 2013, p. 92). The company can be considered as the contrary example of a self-centred traditional organization but as a leader in value chain re-organization beyond 'pyramids', 'silos', and linear process patterns, showing typical characteristics of agile companies, such as network structures, instead of hierarchies, customer orientation, and modularized process organization instead of non-value-creating linear processes.

Viswanadham and Kameshwaran (2013, p. 105) have described such an agile value chain approach as a new kind of business model, which they called 'orchestrator business model'. It replaces the classic industrial linear value chain organization by a network-centric value chain management approach that extensively uses real-time data and information flows, allowing the modularization of work sequences and the re-sequencing of the manufacturing process with in-house units or external partners. It was further stated in this case study that the agile customer-oriented organization is not based on long-term planning, linear processes, and waterfall models of logistics but on organizing the flow of goods and information which allows the adaptation of processes, products, and services to fast changes in consumer trends by producing smaller editions instead of larger quantities of the same over a longer period. ZARA has shown that in the near future planning may be replaced by market-driven reverse value chains beginning with the customer who initializes the design, manufacturing, and supply (IRMA, 2017, p. 203) based on an extended information flow and infrastructure as well as an advanced data analysis approach. The management task in the context of agilization is then to structure the organization and its operations into smaller units and modules, allowing the organization to regroup in shorter cycles, whereby the organization (decentralisation) of the information flow allows a higher degree of self-organization of smaller units.

Finally, to answer the questions developed in the introduction, it can be noted that the core of an agile business model, respectively agile value chain model, is the information infrastructure and the organization of the information flow as the core of a non-linear organization. This also means that 'agilization' is informatization (digitization) of all processes within the firm and of all interaction processes network partners - of which the main partner is the customer. However, the degree of agility may differ between industries. The

fast-moving fashion industry has shown that even a low-tech industry can be disrupted by an agile approach, which may be a paradigm for the future industrial organization. This example existed just before recent literature has detected agile project management in the IT industry as a brand-new paradigm.

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