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Decoding the DNA of Swiss Manufacturing – A taxonomy of competitive capabilities at the example of the Swiss watchmaking industry

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ABSTRACT

In today's changing and competitive business environment, companies must identify and adjust their manufacturing capabilities to remain successful. In the past, manufacturing companies relocated capacities from high- to low-cost environments. Recent events, however, resulted in a call for reshoring. To successfully reshore, companies must consider competitive capabilities. We follow the taxonomy development approach from Nickerson et al. (2013) to determine the key capabilities of successful companies in high-cost environments. Due to high labor costs in combination with global success, we investigate the Swiss watchmaking industry. Our findings are a first milestone to decode the structure of the Swiss manufacturing landscape.

KEYWORDS: Competitive Capabilities, Swiss Manufacturing, High-cost Environment; Watchmaking Industry, and Taxonomy Development

INTRODUCTION

Per capita, Switzerland is among the top performer of value added in manufacturing (Ferdows, 2021). In 2021, Switzerland had the third highest manufacturing value added per capita worldwide (UNECE, 2022). As a result, Switzerland outperforms even "Europe's manufacturing powerhouse" Germany in terms of per capita manufacturing value added (i.e., two times as much) (UNECE, 2022). Additionally, Switzerland is among the most competitive countries worldwide (IMD World Competitiveness Center, 2021; Schwab & Zahidi, 2021).

However, Switzerland has one of the highest average wages of the OECD countries (OECD Better Life Index, 2022). As a result, the high salaries, as well as the exchange rate, are seen by practitioners as the main barriers to the successful execution of manufacturing activities for four consecutive years (Friedli, et al., 2020). This phenomenon is not new: Globalization has resulted in a large number of relocations of manufacturing facilities from high-cost to low-cost environments (Wiesmann, et al., 2017; Sansone, et al., 2020). High-income country manufacturing firms were striving for a cost advantage (Sansone et al., 2020), as manufacturing is generally one of the most cost-intensive activities (Thakur-Weigold, 2021).

However, due to recent change events (e.g., Covid-19 pandemic, trade war between China and the USA) and to shorten supply chains the relocation (i.e., reshoring) of manufacturing activities grew (Edh Mirzaei, et al., 2021). To successfully reshore and sustain a long-term competitive

advantage, such decisions need careful consideration incorporating competitive capabilities (e.g., quality) (Wiesmann et al., 2017).

The Swiss watchmaking industry is particularly successful in the global competition. 50% of the total market value is generated by the Swiss watch industry (Jaberg & Turuban, 2020). As such, Switzerland is the leading exporter of watches in terms of value with a total amount of 20.5 billion Swiss francs in 2019 (FHS - Federation of the Swiss Watch Industry, 2020). Almost 70% of the total value exported from Switzerland is from the high-end segment (i.e., watches for more than CHF 3,000) (FHS - Federation of the Swiss Watch Industry, 2020). However, due to “Swissness”-regulations in order to use the label “Swiss made”, the majority (i.e., 60%) of the manufacturing costs must be accrued in Switzerland (Der Bundesrat, 2022). Additionally, technical development must take place in Switzerland (Der Bundesrat, 2022).

The objective of this paper, hence, is to develop a comprehensive understanding of the key competitive capabilities of Swiss watchmaking companies to guide managers in their decisions and actions as well as to contribute to the understanding of the advantages that might arise from high-cost environments. Due to its global success and the simultaneous obligation to produce in Switzerland, the Swiss watchmaking industry is especially suited for this research. Moreover, the high export share “signals the presence of competitive advantage” (Porter, 1998). The research question for this study is therefore as follows:

RQ: *What are the competitive capabilities that allow Swiss watchmaking companies to create and sustain a competitive advantage in the watch industry?*

In order to answer the research question, we develop a taxonomy. The approach is suited for our study since taxonomies provide a structure and organization of a knowledge base, hence, supporting scholars and practitioners in understanding complex issues (Nickerson et al., 2013; Lösner, et al., 2019). For a structured method, we follow the well-used approach from Nickerson et al. (2013).

The remainder of the paper is organized as follows: After the introduction, we discuss the relevant literature on competitive capabilities in high-cost environments. Subsequently, we introduce the applied research methodology. Later, the final taxonomy is presented, and lastly theoretical and practical implications, limitations, and possible future research avenues are discussed.

RESEARCH BACKGROUND

Competitive capabilities in manufacturing

Globalization has resulted in a large number of manufacturing facilities moving from high-cost to low-cost environments in the last three decades (Sansone et al., 2020; Ancarani, et al., 2021). Due to recent change events (such as the global crisis of 2008 or the Covid-19 pandemic), this trend was reversed, leading to reshoring initiatives of developed economies' manufacturers (Ancarani et al., 2021). As a result, recent research has aimed to gain insights into the factors that determine the attractiveness of high-cost environments (Ancarani et al., 2021). According to Ancarani et al. (2021) “[...] a crucial research theme lies in the identification of the competitive priorities underscoring firms' location initiatives in [developed economies].”

Competitive capabilities result in developing or maintaining individual sources of competitive advantage (Leong, et al., 1990; P. T. Ward, et al., 1998; P. T. Ward & Duray, 2000; Ancarani et al., 2021). They guide the location decisions of manufacturing facilities to reap the benefits of different countries (Buckley & Casson, 1976; Dunning, 1980; Ferdows, 1997; Da Silveira, 2014; Ancarani et al., 2021). The development of competitive capabilities follows a hierarchical sequence that begins with the development of a business strategy (Koufteros, et al., 2002). Driven by business strategy, a firm sets competitive priorities which could include for example enhancing innovation or reducing costs. These priorities are the basis from which a company can develop

the appropriate manufacturing competencies to reach its objectives and subsequently create the appropriate competitive capabilities (Koufteros et al., 2002). “Competitive capabilities compare a firm’s ability to meet customer expectations to its competitor’s ability to do the same” (Koufteros et al., 2002). In the manufacturing literature they are broadly expressed as low cost, flexibility, quality, delivery, and innovation (Leong et al., 1990; Miller & Roth, 1994; P. T. Ward et al., 1998; P. T. Ward, & Duray, 2000; Ancarani et al., 2021).

Related taxonomies

The academic literature provides some studies addressing the development of taxonomies of key capabilities in the manufacturing sector. Miller and Roth (1994) identified capabilities based on previous studies and included additional ones intuitively. They identified 11 capabilities for large manufacturers in North America. The findings of Kathuria (2000) include four competitive priorities for small manufacturers in America. Frohlich and Dixon (2001) replicated the study from Miller and Roth (1994) and highlighted 9 competitive capabilities for the general manufacturing industry in America, Western Europe, and Asia Pacific. Another application of the study from Miller and Roth (1994) was carried out by Zhao et al. (2006) with a focus on companies from the Tianjin region in China. Sum et al. (2004) identified 5 operations priorities with a focus on small and medium manufacturing companies from Singapore. Christiansen et al. (2003) focused their work on Denmark. They conducted an ad-hoc literature review and identified 9 competitive priorities. Luz Martín-Peña and Díaz-Garrido (2008) operationalized priorities detected in several studies with a focus on the general manufacturing industry in Spain. Lastly, Grant et al. (2013) replicated the study from Miller and Roth (1994) in Ireland for the general manufacturing industry. Despite the variety of studies investigating competitive capabilities, not all of them investigate high-cost environments. Additionally, Switzerland as one of the most suited countries (see INTRODUCTION) was not the subject of investigation of either one. Finally, manufacturing capabilities can evolve over time and differ depending on the focus area (Frohlich, & Dixon, 2001; Zhao et al., 2006; Grant et al., 2013). As a result, different criteria in the manufacturing industry need to be examined periodically due to a rapidly changing world (Grant et al., 2013). However, all studies have conducted their evaluation based on nearly identical generic capabilities that were rarely challenged. Moreover, the studies were conducted at least 9 years ago, potentially being outdated.

METHODOLOGY

To address our research question, we adopted the taxonomy development approach from Nickerson et al. (2013). The approach is widely applied and accepted in information systems research (Lösser et al., 2019; Deitermann & Friedli, 2021; Gelhaar, et al., 2021; Kundisch, et al., 2021). The approach provides a rigorous method (Kundisch et al., 2021) and is divided into three stages and seven steps (see Figure 1) (Nickerson et al., 2013; Kundisch et al., 2021). During the first stage, a meta-characteristic and ending conditions are defined in accordance with the purpose of the taxonomy. The meta-characteristic is “the most comprehensive characteristic” (Nickerson et al., 2013). Ending conditions, defined in the first stage, guide the termination of the iterative method. Nickerson et al. (2013) provide a comprehensive list of objective and subjective ending conditions. The second stage consists of the development of dimensions and characteristics. Depending on the availability of information on the objects of study and the researcher’s knowledge, two approaches exist: empirical-to-conceptual (E2C) or conceptual-to-empirical (C2E). With a lack of available data and information, Nickerson et al. (2013) recommend starting with the C2E approach. Subsequently, the characteristics, descriptions of the dimensions and logical consequences of the meta-characteristic, are defined. The C2E approach consists of

the identification of dimensions without the examination of the actual object. The E2C approach guides the researcher in order to identify subsets of objects and common characteristics. The last stage of each iteration is the alignment of the taxonomy with the ending conditions.

Meta-characteristics:

Our contribution aims to a) guide business leaders in the Swiss watchmaking industry to be and stay competitive and b) enhance the scientific knowledge on competitive capabilities in the manufacturing industry in high-cost environments with a special focus on Switzerland and the watchmaking industry. Therefore, we defined “competitive capabilities in high-cost environments” as the meta-characteristic for our taxonomy.

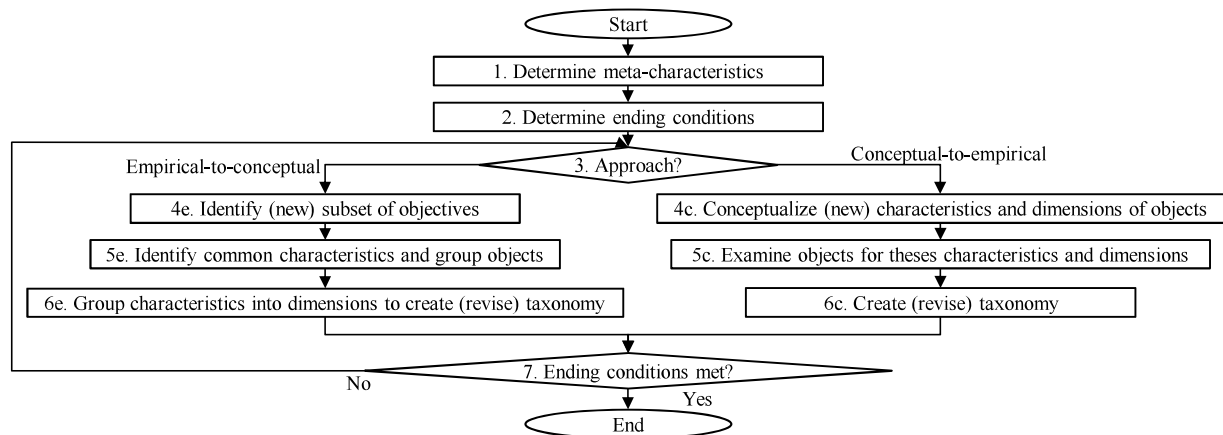


Figure 1: The taxonomy development method (Nickerson et al., 2013)

Ending conditions:

We applied the subjective and objective ending conditions provided by Nickerson et al. (2013) since they provide a rigorous approach to evaluating the taxonomy. In order to differentiate the degree of importance between different capabilities, we added one objective ending condition: “The taxonomy structure must be a hierarchical criteria model”.

First iteration (C2E):

To generate a comprehensive overview and understanding of the domain of interest, we conducted a systematic literature review (SLR). SLRs provide a vital and qualified mean to consolidate and progress the current knowledge base in an individual area (Cooper, 1988; Baker, 2000; Rowley & Slack, 2004; Ritchey, 2006), hence, it is suited for our procedure. To ensure “more transparency, reliability, and reproducibility of the findings” (Thomé, et al., 2016) we followed the approach from vom Brocke et al. (2009).

Due to the limited literature describing the Swiss industry sector, we broadened the scope of the SLR to global manufacturing in high-cost environments. Based on an initial understanding of the literature, we defined the search strings “capabil*” AND “competitive” AND “manufacturing” AND “high-cost”. The choice of the last keyword follows the reasoning of Ketokivi et al. (2017). They consider “high-cost” to be equivalent to a high GDP per capita, which in turn has a direct and positive link to wage levels. The search was conducted using the databases Web of Science, Scopus, and Google Scholar. We applied the keywords to all fields in the first two databases. Since the search via Google Scholar led to a great number of results, we limited the scope to the ones that contain the keyword “manufacturing” in their title. This narrowed the results down to the most important. To ensure a high-quality level, we included only journal publications from the 15 top-ranked peer-reviewed journals in the field of “Management Science and Operations Research” (Scimago, 2022). Additionally, we limited the scope of relevant articles to publications between

2010 and 2021. This is due to the fact that markets change over time and frameworks and factors need to be evaluated and updated frequently to reflect the current competitive environment (Sansone et al., 2020). The search yielded a total of 78 articles. After the inclusion of articles found via backward and forward search, the sample included 87 articles. The removal of duplicates and irrelevant articles led to a final list of 17 articles.

Based on the identified literature we derived the following dimensions: quality, cost, flexibility, innovation, sustainability, time, and relationship. Noteworthy is the work from Sansone et al. (2020), which provides a comprehensive basis for this study. Additionally, we identified 26 competitive capabilities. However, we eliminated 8 capabilities, as they are only mentioned in a single article or miss a customer focus. This resulted in 18 hierarchical ranked manufacturing-related capabilities, according to the average position in which they have been ranked by different authors. If a capability was not mentioned by an individual author, we assigned the lowest score. In a subsequent step, we merged the capabilities product- and process quality, as well as product- and process sustainability since they are almost equally relevant to customers. Additionally, we allocated the capabilities to dimensions based on the literature findings.

Second Iteration (E2C):

During the second iteration, we conducted semi-structured interviews with 6 different company representatives (see Table 1). All participants have diverse working experiences in the Swiss watchmaking industry and worked on average 22 years in the operation and production management of their company. We chose the companies and interview partners based on two criteria: (1) their location – the headquarter must be based in Switzerland and the majority of the product value is manufactured in Switzerland; and (2) their price segmentation – the products are either mid-price or high-end. Since the Swiss watchmaking industry is known for being highly confidential, we did not include any more criteria.

The price-range categorization is based on the general understanding of the industry. End products with an average price above 3,000 CHF are considered “high-end” and average prices between 500 CHF and below 3,000 CHF are considered “mid-range”. To classify the size of the company, we followed the European Union standard (<250 employees $\triangleq$ small; $\geq$ 250 employees $\triangleq$ large).

Table 1: Descriptive details of the company sample

Company	Role of the interviewee	Experience in the watchmaking industry (years)	Headquarter	% Value produced in Switzerland	Price range	Structure	Size
A	Head of Production	15	Switzerland	100%	High-end	Horizontal	Large
B	COO & Director of Product	15 & 15	Switzerland	>60; <100%	High-end	Horizontal	Large
C	COO	23	Switzerland	100%	High-end	Vertical	Large
D	COO	33	Switzerland	>60; <100%	Mid-price	Horizontal	SME
E	COO	37	Switzerland	>60; <100%	Mid-price	Horizontal	SME
F	Operations and Planning Manager	8	Switzerland	100%	High-end	Vertical	SME

The interviews were conducted in 2021 and 2022 via Zoom or face-to-face, lasted between 45 to 90 minutes, were recorded and transcribed, and finally analyzed following the approach from Thomas (2006). The participants were asked to evaluate the relative importance of the list of capabilities for their customers now and in the future. We used a Likert scale (“1 = not important” to “7 = very important”) and let the participants explain their ranking. Furthermore, the participants were asked to state additional capabilities or remove irrelevant capabilities.

Based on the interviews we derived an average importance score of individual manufacturing capabilities for both today and the future. Subsequently, the individual capability scores were

merged in order to determine the importance of the dimensions. We added the dimension “image”, since “brand image” incorporating “create emotion”, “history”, and “exclusivity” were repeatedly mentioned.

Third iteration (E2C):

Since the second iteration led to a new dimension and new capabilities, we conducted a third iteration. To reduce errors due to possible contrasting perspectives as a result of different structures and firm sizes, we interviewed experts, who are not directly involved in the watchmaking manufacturing process. Nevertheless, the interviewees are highly experienced and have huge expertise in the watchmaking industry. Two experts have over 40 years of experience in white labeling (i.e., companies that produce finished watches for other brands). A third one is the president of an association representing the Swiss watchmaking industry. He not only shared his view but also those of his three division chiefs (legal, economic, and administrative). The experts evaluated our results, commented on the ranking of the different capabilities, and were asked to add elements if necessary. We interviewed the industry experts for 30 minutes and the president of the association shared his and his colleague’s findings via an extensive e-mail.

The experts approved the taxonomy’s dimensions and capabilities. Despite not being mentioned in the literature, the experts highlighted the importance of the dimensions “image”, “quality”, and “innovation” for the Swiss watchmaking industry. Moreover, they highlighted the dimension “sustainability”, which they expect to become even more important in the future. One expert additionally added a capability “corporate social responsibility”, referring to environmental, social, economic, and ethical issues.

Ending conditions:

After the third iteration, the ending conditions were fulfilled as follows: 1) All papers from the sample of the literature review and all empirical data have been examined. 2) No object was merged with a similar object or split into multiple objects in the last iteration. 3) Each capability of each dimension could be classified with at least one object. 4) No new dimension was added in the last iteration. However, we added one capability. 5) Neither were dimensions or capabilities merged or split in the last iteration. 6) Every dimension is unique and not repeated. 7) Every capability is unique within its dimension. 8) Each combination of capabilities is unique and not repeated. 9) The taxonomy is concise because no unnecessary capabilities or dimensions were included. 10) The taxonomy allows differentiating of every object from each other (robustness). 11) It allows classifying all objects (comprehensive). 12) The taxonomy is extendible as new dimensions and capabilities can easily be added. 13) The taxonomy is explanatory, as it provides valuable and non-redundant information for the characterization of the manufacturing capabilities of Swiss watchmakers. 14) The taxonomy is a hierarchical criteria model.

All ending conditions are fulfilled, with the exception of condition four, which is partially fulfilled. Due to a) the effort to conduct a fourth iteration, b) the discretion and hesitation of interview partners in the Swiss watchmaking industry, c) the successful validation of the taxonomy, and d) the fact that only a single capability was added, we did not conduct an additional iteration.

TAXONOMY TO DESCRIBE STRATEGIC CAPABILITIES

The developed taxonomy serves as an answer to the research question of this study, as it develops a comprehensive understanding of key competitive capabilities and can guide executives. It consists of eight dimensions and 19 capabilities (i.e., characteristics) (see Figure 2).

The dimension *image* was ranked as the most important with a mean value of 6.5 for today. Moreover, all experts agreed that this dimension will also be crucial for the future and ranked it first with a mean value of 7.0. The dimension encompasses four capabilities: brand image, high pricing, traceability and product origin, and corporate social responsibility. Although creating a

strong brand image is also mentioned in the general manufacturing literature for high-cost countries, its importance appears to be far less decisive than in the Swiss watchmaking sector. One expert stated: “Swiss watchmaking companies do not merely sell objects that indicate time, but rather objects that create emotions. [...] They primarily sell dreams, something inaccessible, a notion of perfection that you cannot find in a machine tool”. In the process of image creation the “Swiss Made” label, which refers to Swiss expertise and exceptional quality (Goodman, et al., 2010), also plays a crucial role. The capability of offering high-priced products supports the brand image and is a key success factor for Swiss watchmakers. One expert mentioned: “Just like if you find a Ferrari at CHF 50'000, it will seem a little strange”. The third capability is called traceability and product origin. It refers to the “ability to prove the authenticity of one's product as well as the origin of the different materials [, which] is crucial, and this capability will become even more important in the years to come”, as one expert explained it. Lastly, corporate social responsibility concerns the environmental, social, economic, and ethical issues in the company's activities. It plays a key role in the image dimension and according to one expert becomes even more relevant due to current events (e.g., Ukraine war).

Ranking today	Ranking future	Trend	Dimension	Characteristics						
1	1	➡	Image	Brand image		High pricing		Traceability and product origin		Corporate social responsibility
2	3	⬇	Quality	Product/process quality	Delivery reliability		Customer service		Customer experience	
3	2	⬆	Innovation	Product innovation	Technology innovation		Process innovation		Market innovation	
4	6	⬇	Relationship	Partner relationship						
5	5	➡	Sustainability	Product/process sustainability						
6	7	⬇	Time	Delivery time			Time to market			
7	4	⬆	Flexibility	Volume flexibility			Product flexibility			
8	8	➡	Costs	Cost efficiency						

Figure 2: Key dimensions of the mid- to high-end segment of the Swiss watchmaking industry

The second most critical dimension today with a mean value of 5.1 is *quality*. It is predicted to gain more relevance in the future (mean value of 6.1). The dimension includes four capabilities: product/process quality, delivery reliability, customer service, and customer experience. Companies offering high-priced products generally are forced to offer a particularly high product quality to compete effectively (Pal, et al., 2018). While image prevails largely over other factors, it remains of high importance for the companies surveyed to offer a product that is qualitatively in line with its brand image as well as its selling price. One expert stated: “The product quality must be irreproachable, otherwise the brand's reputation would collapse”. Switzerland's unique expertise, supported by excellent educational institutions as well as by other industries, such as microtechnology (Goodman et al., 2010) allows the sector to benefit from a *savoir-faire* that ensures superior quality of products. Additionally, the quality of service provided to customers such as reliable delivery, customer service, and customer experience are important capabilities for Swiss watchmakers. One company representative explained: “It is not a warranty; it is a service [...] [that] high-end Swiss watchmaking companies ensure that parts sold 30 years ago are still available today”.

The third most critical dimension with a mean value of 4.6 is *innovation*. The innovation related capabilities are expected to become more essential in the future (main value of 6.3) Although innovation is not part of the list of factors developed by Miller and Roth (1994), it has been widely accepted in the recent manufacturing literature (Da Silveira, 2014; Pal et al., 2018; Friedli et al.,

2020; Sansone et al., 2020). The dimension is of particular importance for small countries, which do not possess significant natural resources (Roper & Arvanitis, 2012). Four capabilities are included in this dimension: technology innovation, process innovation, market innovation, and product innovation. The importance of individual capabilities of this dimension appeared to be different for the experts. The capability product innovation was ranked highest (i.e., 7.0) by two experts, while others had a different opinion. One expert stated: "Most of the existing models have not significantly changed throughout the years (...). Although there are plenty of different time displays that have been developed over time, 90% of them contain hands and are round". In general, the Swiss watch industry cannot be compared to companies like Apple, which revolutionized the watch market by seizing more than half of the world market share in only 5 years with the invention of smartwatches (Morgan Stanley, 2018; Deloitte, 2020). We identified varying opinions on the importance of innovation-related capabilities based on the interviews. Small and mid-range companies ranked the capabilities lower than large companies. Nevertheless, the dimension is also important to keep the "Swiss made" label.

Relationship was ranked as the fourth most important dimension with a mean value of 5.3. The third iteration resulted in the dimension to be less important in the future. One expert mentioned: "While supplier partners are key to the industry, seller partners will gradually lose relevance for the industry since an increasing number of brands are selling their products through a direct sales channel". This is supported by a Deloitte study, where 33% of the executives interviewed expect single-brand stores to be the most important sales channel in the years to come in the watchmaking industry (Deloitte, 2020). The dimension encompasses only one capability: partner relationship. Despite this dimension not being widely considered in the manufacturing literature, it is important to gain a competitive advantage (Pal et al., 2018). The Swiss watchmaking industry is particularly dependent on external relationships due to the complex and highly segmented structure of its supply chain (Deloitte, 2020). One expert admitted: "Without a personal friendship with our movement provider, we could not be where we are". As a result, the proximity of different stakeholders - also called "clusters" - plays a crucial role in these partnerships.

The fifth most critical dimension with a mean value of 3.5 for today is *sustainability*. The dimension only recently gained considerable attention in recent studies (c.f. Sansone et al. (2020)). For the future, different perceptions exist: While some experts believe that the dimension will become crucial in the coming years as customers increasingly seek sustainability, others remain skeptical. An expert states that "[t]he sustainable aspect is mainly of interest to the Western market (...). While European customers are willing to have the smallest package possible, customers from the Middle East are still willing to buy the biggest one, otherwise, they think the watch is worthless." While companies need to meet their customer's expectations, the sustainable trend does not yet seem to have reached the primary Swiss watch importing markets (FHS - Federation of the Swiss Watch Industry, 2020). The dimension includes the capability product/process sustainability. It focuses primarily on the environmental impacts of companies (e.g., materials used, emissions generated, etc.). In terms of maintenance, Swiss mid-range and high-end watches can be considered sustainable since mechanical watches can be repaired indefinitely. However, the materials used for the products combined with the production process are still not environmentally friendly. "The sector uses a significant amount of hydrocarbon for the production (...) and also a lot of energy" as one expert explains.

Time was ranked as the sixth most critical dimension with a mean value of 4.5. For the future, time was ranked as the seventh most critical dimension, as the various participants do not perceive it to become a major factor in the success of Swiss watchmaking. The dimension includes the capabilities "delivery time" and "time to market". In contrast to, for example, the apparel industry, the Swiss watchmaking industry aims to produce exclusive and long-lasting products, which are only slightly influenced by trends. An expert stated that "it takes between 3 to 4 months to produce an existing model and about a year for a new product - from conception to

market introduction.” Moreover, customers are willing to wait for the product: “A customer who really wants to have the exclusive product of his dreams is inclined to wait.” Additionally, Swiss watchmakers are more concerned about the quality of the product and will not sacrifice the quality in order to be faster. “We should not rush before releasing a product, we should study it and test it” revealed one expert.

The seventh most critical dimension having a mean value of 4.4 for today is *flexibility*. For the future, the interviewees perceive the dimension to become more important (i.e., rank four). As one expert explains it: “In the automotive sector, people can already customize their cars for a while. (...) As long as the customer pays, we should do whatever he wants.” The dimension encompasses two capabilities: volume flexibility and product flexibility. In terms of volume, Swiss watchmaking companies cannot be described as flexible in comparison to large Asian competitors that produce in greater quantities and have a broad pool of low-cost labor (FHS - Federation of the Swiss Watch Industry, 2020). Since the Swiss watchmaking industry produces in a “make-to-stock” approach, the product flexibility is limited. However, locating the production closer to customers and producing in a “make-to-order” approach would result in the loss of the “Swiss made” label, which is one of their key capabilities (i.e., brand image).

The least critical dimension is *costs* with a mean value of 4.2. It remains relatively unimportant for the future. Nevertheless, the dimension still contributes to the success of Swiss watchmaking companies. One expert explains: “In any industry, the objective is to ensure quality (...) but also to be profitable.” The dimension incorporates the capability cost efficiency, which is relevant for the Swiss watchmaking industry. One expert stated: “We try to have a competitive price positioning compared to our competitors and to be as affordable as possible for what we manufacture.” However, the “make-to-stock” strategy that characterizes the Swiss watchmaking industry generally results in a high level of inventory. One expert revealed that “some companies even have a stock level of 140%, which means they can cover 1.4 years of turnover with their stock.”

CONCLUSION

To answer the research question we followed the taxonomy development of Nickerson et al. (2013). We used the existing knowledge base and interviews to enhance the existing knowledge. In order to generate highly relevant results, we conducted our research in the mid- to high-end Swiss watchmaking industry. The industry is especially suited as it produces in a high-cost environment and is highly successful on the global market. The results reveal the key factors for the success of Swiss watchmaking companies today and perceptions for the future. The taxonomy incorporates eight dimensions and 19 capabilities and allows to draw several conclusions.

In terms of **scientific contributions**, our work contributes to a better understanding of the research area of key manufacturing capabilities. First, it supports existing research by identifying quality as one of the key capabilities for manufacturers in high-cost environments, while costs are less relevant. Second, the study gives valuable insights into the key capabilities in the highly discreet Swiss watchmaking industry. Third, this study is a first contribution to the understanding of the competitive capabilities globally successful Swiss manufacturers aim to achieve. As a result, the study contributes to the understanding of the success of Swiss manufacturers, who are successful in the global marketplace despite having one of the highest labor costs worldwide.

As for **managerial contributions**, the developed taxonomy provides a better understanding of the key capabilities, which globally successful Swiss watchmakers pursue today and perceive in the future. As a result, the structured view of different manufacturing capabilities can guide practitioners to implement successful operating strategies. Additionally, our findings provide insights for policymakers in high-cost environments about the strategic orientation of successful

manufacturers. Hence, the insights and the taxonomy can provide a reference point for politicians to adjust legislation.

As for all studies, our contribution is subject to **limitations**. Due to the discretion of the Swiss watchmaking industry, our sample was limited to 12 experts contributing. This resulted in a limited number of iterations, leading to the last iteration not meeting all ending conditions fully. Nevertheless, we were able to validate the taxonomy. Additionally, our taxonomy is a time-bound snapshot that needs to be updated regularly. due to the evolving nature of manufacturing capabilities over time (Frohlich, & Dixon, 2001; Zhao et al., 2006; Grant et al., 2013). Finally, despite being based on scientific literature and interviews, the data itself is open to interpretation. This can result in other researchers deriving other characteristics depending on their personal influences and preferences.

Based on the limitations possible **future research avenues** can be derived. Additional research could consider further luxury sectors with similarities to the Swiss watchmaking industry to overcome the confidentiality issue and augment the study. Moreover, despite our research giving valuable insights into the Swiss watchmaking industry, broadening the scope to Swiss manufacturers in general can lead to further insights into the competitiveness of successful companies in high-cost environments.

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