

University Spin-offs' Market Orientation Development

Author: Ate Otten
University of Twente
P.O. Box 217, 7500AE Enschede
The Netherlands

ABSTRACT: The goal of this study was to see how the market orientation of university spin-offs developed after they were founded. The qualitative data used was obtained using two sources; semi-structured interviews and surveys. The interviews were designed to identify and measure the development of the market orientation, the survey was designed to only measure the current level of market orientation. A total of three interviews and surveys have been completed and are analysed in this paper. In the analysis the results were linked to the Development Process Framework. In two cases the results show a distinct increase of the market orientation during the re-orientation phase, each caused by a different trigger; finalizing product development and changing company course. In one case, the maturing of the spin-off also played a role. In the remaining case only limited market orientation development could be identified.

Supervisors:

Kasia Zalewska-Kurek
Rainer Harms

Keywords

university spin-off, market orientation, customer orientation, competitor orientation, MKTOR scale, orientation development, Development Process Framework, qualitative research

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. To copy otherwise, or republish, to post on servers or to redistribute to lists, requires prior specific permission and/or a fee.

7th IBA Bachelor Thesis Conference, July 1st, 2016, Enschede, The Netherlands.

Copyright 2016, University of Twente, The Faculty of Behavioural, Management and Social sciences.

1. INTRODUCTION

This research will be focused on the market orientation of university spin-offs. This specific type of start-up, university spin-offs, all began at a university where they first developed their ideas or technology and those doing the research thought it could be commercialized. University spin-offs are usually a result of long and complex development paths (Roberts, 1991). Similar to start-ups in general, university spin-offs have also been the subject of much research, such as the impact of network capability and entrepreneurial orientation on organizational performance of university spin-offs (Walter, Auer, & Ritter, 2006), as sources of employment (Pérez & Sánchez, 2003), or as contributors to higher innovation efficiency (Rothwell & Dodgson, 1993).

The concept of market orientation, sometimes referred to as marketing orientation, was first developed by Kohli and Jaworski (1990), which was an implementation of the marketing concept. Narver and Slater (1990) continued in the market orientation path and operationalized market orientation. Three equally important components were identified which determine the degree to which a company is market oriented: competitor orientation, customer orientation, and interfunctional coordination. Furthermore, two decision criteria were identified: a long-term focus and a profit objective. In Figure 1, these five elements of market orientation are shown.



Figure 1: a representation of Narver and Slater's (1990) market orientation. Reprinted from Narver and Slater (1990).

However, there has been little research on university spin-offs that engage customers in order to develop their strategies or business models. This study will try to fill that gap by exploring the development of the market orientation of university spin-offs. Research on market orientation is valuable, since it is considered an important strategic orientation in literature (Hunt & Lambe, 2000). Furthermore, studies have shown that market orientation has positive influence on business success (Greenly 1995; Kahn 2001) and it is an important factor for a firms' innovative abilities (Roersen, Kraaijenbrink & Groen, 2013). Therefore, it is important to keep studying market orientation from a researchers' perspective to further expand and improve the available knowledge concerning this concept. Furthermore, Hakala (2010) claims that orientations literature is mostly based on quantitative research and more qualitative research should be done, which is what this study will be doing.

The goal of this study is to examine university spin-offs and the development of their market orientation since they first started till today. It becomes clear, when

combining the importance of market orientation and university spin-offs, with the need for new models, that exploring the market orientation of university spin-offs can add to the existing knowledge of both the university spin-offs and the market orientation concepts.

Using this goal, a research question can be formulated: *"How does the market orientation of university spin-offs change over time?"*

Insights gained from this study could provide the research community and potential university spin-offs with relevant information on the development of market orientation of university spin-offs, and potentially increase the success rate of university spin-offs or similar start-ups.

In the following section, section 2, the used concepts of market orientation and university spin-offs and supporting theory will be explained. In section 3, the research methodology will be discussed. Section 4 will contain the results, and section 5 will continue with the discussion of the results. Finally, section 6 will reveal the conclusions this study has found.

2. THEORETICAL FRAMEWORK

2.1 Market Orientation

As mentioned before, Narver and Slater (1990) continued the work of Kohli and Jaworski (1990) on the concept of market orientation, which Narver and Slater (1990) defined as the degree to which a company engages in competitor orientation, customer orientation, and interfunctional coordination. In their study, Narver and Slater (1990) found a positive relationship between market orientation and business profitability. Roberts (1990) came to a similar conclusion in his study amongst 114 technology-based spin-offs from MIT. Roberts (1990) found that the character of these firms evolve over time towards a more market oriented way of doing business, and these changes were manifested in many ways, such as increased formal commitment by the entrepreneurial founders to marketing and sales activities, and an increase in the use of direct sales forces and sales representatives. Although Roberts' (1990) study appears very similar to this research, there is one major difference; this study has the market orientation concept of Narver and Slater (1990) at its foundation, whereas Roberts (1990) uses his own model based on his hypotheses, with more focus on the entrepreneur(s) who started the company. This study will research if there is a change in the orientation of university spin-offs and will try to understand the process.

Hakala (2010) did an extensive literature review on the subject of interaction between strategic orientations, and devised a framework with three approaches (sequential, alternatives, and complementary) to the relationship between multiple orientations. In the sequential and complementary approach Hakala (2010) suggests there is an evolution or development of the orientation(s) through the lifecycle of a firm. In the sequential orientation firms' orientation develops from an internal focus towards an external focus, from one orientation into another. In the complementary approach, a firm has a combination of several orientations that work together and evolve in a contingent manner (Hakala, 2010). The alternatives approach argues that certain orientations work better than others in certain situations (Hakala, 2010).

A study by Lewrick, Omar and Williams (2011) researched the relationship between market orientation and innovation, and business success and explored the differences between start-ups and mature companies. One

of their main findings was that strong competitor orientation, a big part of market orientation, has a positive relationship to incremental innovation for start-ups, but is contra productive for mature companies. This suggests a change of the market orientation from when the firm was just a start-up and then grew into a mature company, which was defined as a company that was successful on the market for more than two years.

However, there are studies that argue that market orientation has some negative effects too, such as reducing innovativeness (Berthon, Hulbert & Pitt, 1999), may lead to short-sighted research and development (Frosch, 1996), or may confuse business processes (Macdonald, 1995). According to Narver, Slater and MacLachlan (2004), the underlying reason for this confusion is that the perception and understanding of market orientation is too narrow. Narver et al. (2004) make the distinction between responsive market orientation, which is when a business tries to discover, to understand, and to satisfy the expressed needs of customers, and proactive market orientation, which is very similar to the responsive market orientation, but it has one big difference; it is focused on the latent needs of customers.

The following three subsections will provide some information about the three components of market orientation: competitor orientation, customer orientation, and interfunctional coordination. The final subsection will provide information about the MKTOR scale and its limitations.

2.1.1 Competitor Orientation

Competitor orientation means that a seller understands the short-term strengths and weaknesses and long-term capabilities and strategies of both the key current and the key potential competitors (Narver & Slater, 1990). Differently put, competitor orientation is the degree to which the company understands what other firms, are offering to customers (Blythe, 2009). One issue with identifying competitors depends on the perception of customers whether a completely different product from another firm is seen as a product that offers the same, or better, value. A restaurant, a theatre and a bowling alley all offer something completely different and they might not recognise each other as competition, while people who are looking for a fun night out might consider all three options (Blythe, 2009).

2.1.2 Customer Orientation

Narver and Slater (1990) define customer orientation as "the sufficient understanding of one's target buyers to be able to create superior value for them continuously". When using a customer orientation, a firm must understand the buyer's entire value chain. This value chain is not static as it evolves over time to internal and market dynamics and the firm therefore must evolve with it (Narver & Slater, 1990). According to Blythe (2009), customer orientation is the degree to which the firm understands its customers. The better the understanding, the better able the firms is to create value for the customers. Since value is determined by the customers and not by the firm, customer orientation means that the firm can make better offers to customers and therefore receive better payments and in return.

To achieve customer orientation, a firm must not only focus on external customers, but also on internal customers (Conduit & Mavondo, 1998), with internal customers being all employees of an organisation. Conduit and Mavondo's (1998) study also shows that cooperation

between departments, the sharing of market intelligence, and management support for a market orientation are important for its development. Employee training may not be effective. There are ways to measure the customer orientation of a firm, for example, Saxe and Weitz (1982) developed the SOCO scale to measure the customer orientation of salespeople.

2.1.3 Interfunctional Coordination

The third component of market orientation is defined by Narver and Slater (1990) as the coordinated utilization of company resources in creating superior value for target customers. Any point in the buyers' value chain affords an opportunity for a seller to create value for the buyer firm. Blythe (2009) views it as the degree to which the internal structure of the organisation and the attitudes of its members combine to deliver market orientation.

2.1.4 The MKTOR scale

As said before, the MKTOR scale has three elements, or dimensions: competitor orientation, customer orientation, and interfunctional coordination. It is a 15-item, seven-point Likert-type scale with Cronbach's Alpha higher than .7 for the three dimensions. The customer orientation dimension is split up into six items, competitor orientation into four items and interfunctional coordination has five items. The scale has to be graded according to the degree the firm engages in each of the 15 items, with 1 being that the firm does not engage in the practice at all and a 7 indicating that it engages in it to a very great extent. The two decision criteria's, a long-term focus and a profit objective, were considered too unreliable and therefore will be omitted.

However, Roersen et al. (2013) challenged the validity of Narver and Slater's (1990) MKTOR scale and, according to their study, were right to do so. While Roersen et al. (2013) found that the firms included in their study scored high on the MKTOR scale, they also found that the accompanying thoughts and behaviour did not match their high scores on the MKTOR scale. In fact, they argue that the found thoughts and behaviour represent a low or even lacking market orientation. Roersen et al. (2013) conclude that this mismatch is caused by the minimum level of marketing knowledge required by the respondents to give valid answers to the items on the MKTOR scale. Many of the respondents did not have much experience or education in marketing, and therefore, the scores did not represent the actual market orientation. The new constructs made in Narver et al. (2004) are based on the MKTOR scale, and are therefore also susceptible to this invalidity. Roersen et al. (2013) suggest to replace the Likert-scale in the MKTOR-scale with a semantic differential scale and to confront statements reflecting a market orientation with statements reflecting product, production, and sales orientations. Furthermore, since education and experience in marketing are also important factors, these should be included in the scale as well. The benefits of these adaptations will be that measuring market orientation will be more accurate, will be less dependent on knowledge of marketing terminology, and will decrease the bias caused by respondents' perceptions. (Roersen et al. 2013).

Furthermore, because of the small size of the university spin-offs in this study and therefore the lack of multiple departments, interfunctional coordination will be omitted, similar to Roersen et al (2013).

2.2 University Spin-off

According to Pirnay, Surlemont and Nlemvo (2003), there is no clear definition of a university spin-off in the social science literature, even though the number of empirical and theoretical studies increases across multiple domains. In certain studies different forms of start-ups and spin-offs processes have been researched under the same label. In most cases this is justifiable, because the firms share common characteristics and face similar difficulties in establishing market legitimacy and mobilizing their growth potential (Zahra, 2007). However, for the sake of clarity, this study will use the definition of Pinray et al. (2003): "new firms created to exploit commercially some knowledge, technology or research results developed within a university".

To show the importance of university spin-offs, an analysis by BankBoston (1997) covering 4000 spin-offs from MIT, found that these spin-offs were employing 1.1 million people and have annual worldwide sales of \$232 billion. This amount equals the 24th largest national economy in the world. These results are just the spin-offs of MIT, every other university's spin-offs are not included. Furthermore, a study by Carayannis, Rogers, Kurihara and Allbritton (1998) shows that the number of spin-offs in a given area is often underestimated, even while they play an important role in technology transfer. Lubik and Garnsey (2015) claim that university spin-offs are playing an increasing key role in the development, demonstration and early commercialization of revolutionary technologies, supplementing or even substituting corporate research labs. Lubik et al. (2015) also mention that the business models used to commercialize previous generations of technologies are unlikely to be suitable, because of unique external and internal challenges. Therefore, new business models must be created and adapted to suit these specific challenges (Mustar et al., 2006).

2.3 Development of the Spin-off

As previously mentioned, start-ups undergo a change over time as they interact with their market (Lewrick, 2011). Furthermore, Smith, Mitchell and Summer (1985) have argued that a firm has some specific phases it goes through for organizational development, and so do the organization's characteristics. Vohara, Wright and Lockett (2004) developed a framework for the development process of university spin-offs; the Development Process Framework (DPF) (Figure 2). The DPF also suggests that a spin-offs goes through five different phases, and each phase has to be completed before the next phase can be reached. When a new phase has been reached, previous decisions and activities might have to be reconsidered. Secondly, Vohara et al. (2004) found that between each phase, there is a "critical juncture" which has to be overcome. Four junctures have been identified: opportunity recognition, entrepreneurial commitment, credibility and sustainability.

In the first phase, the research phase, the spin-off is being born. An idea, technology or knowledge that is created is seen as potentially commercially viable. In the next phase the opportunity is identified and framed. This is a challenging phase, as understanding of how to maximize returns from commercial exploitation and experience in framing scientific discoveries in relation to creating commercial value is often lacking (Vohara et al., 2004). In order to proceed to the next phase, pre-organisation, entrepreneurial commitment has to be achieved. This involves learning from the problems that have risen and reframing the opportunity till the market accepts it. In the pre-organisation phase, the management of the spin-off can develop and start to implement strategic plans. This involves decision making about which resources and capabilities to develop and what resource and knowledge to acquire. Decisions taken in this early phase can have unpredictable results for the future and

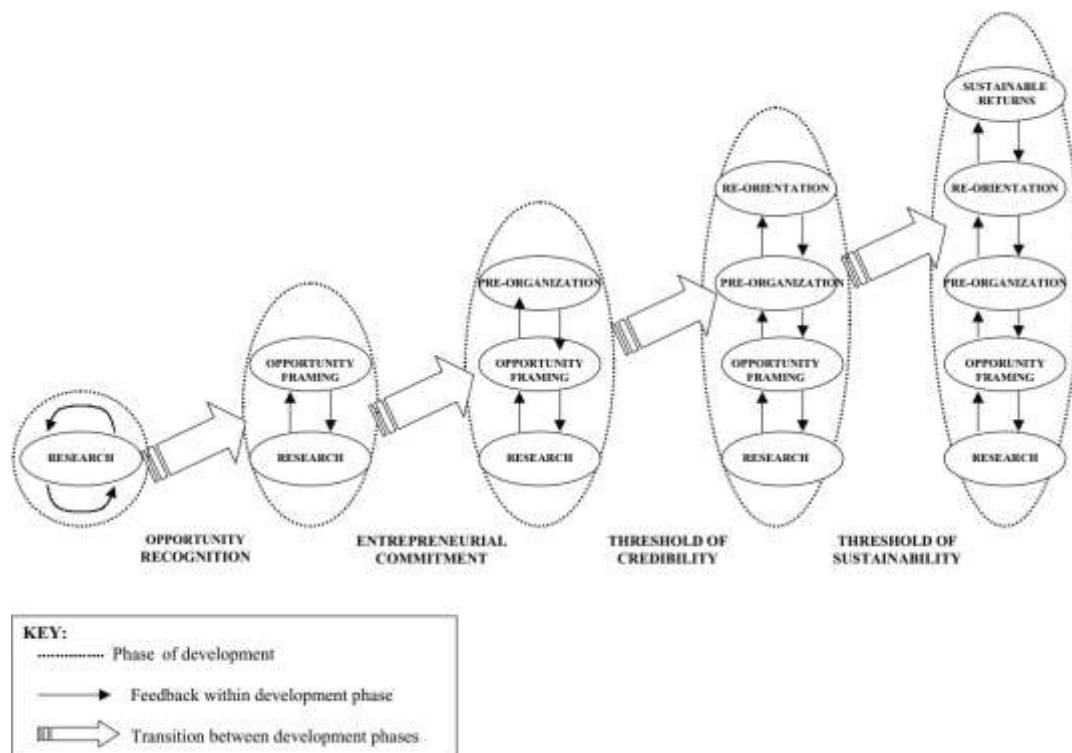


Figure 2: Vohara's Development Process Framework. Reprinted from Vohara (2004).

success of the spin-off (Vohara et al., 2004). Vohara et al. (2004) propose that the pre-organisation phase represents the steepest learning curve for the academic entrepreneur. Prior entrepreneurial experience, human capital and access to networks of expertise are very valuable at this phase, and lacking these conditions makes the learning curve even steeper. The next juncture is credibility as a spin-off, where spin-offs are required to access, acquire and assemble resources with which to commence business operations. Once this juncture is passed, the spin-off can proceed to the re-orientation phase, where actual returns can be generated by continuously identifying, acquiring and integrating resources and offer something of value to customers (Galunic & Eisenhardt, 2001). These resources must be used to alter previous decisions based on new information and knowledge (Vohara et al., 2004). Before the final phase is reached, the final junction, sustainability, must be overcome. Here it is required to continuously reconfigure existing resources, capabilities and social capital based with information, knowledge and resources. When this is achieved, the sustainable returns phase is entered, and the spin-off can start thinking about upscaling their business (Bigdeli, Li & Shi, 2015).

3. RESEARCH METHODOLOGY

3.1 Design

In this study the goal is to compare the market orientation of university spin-offs at the present time with their market orientation at the beginning of the spin-offs, in order to see how it developed. The data sources used are surveys, semi-structured interviews, and secondary data. The survey consisted of ten questions to measure market orientation according to the MKTOR scale (Narver & Slater, 1990). Each question is based on one of the points of competitor orientation and customer orientation. As mentioned before, interfunctional coordination is omitted due to the small size of the spin-offs. As suggested by Roersen et al. (2013), the scale was adapted from a seven-point Likert scale to a semantic differential scale. The interviewee had to choose between two statements, one of the statements containing a single point of customer or competitor orientation, and the other statement was a similar statement based on sales, production, or product orientation. The interviewee was asked to choose the statement that was most similar or most true to their situation. Scoring the survey was done by assigning a point for each question answered in favour of market orientation. This gives a maximum score of ten points if all questions are answered in favour of market orientation. Furthermore, there was a question to measure the perceived market orientation of their spin-off on a scale of 1 to 7.

The interview questions were also based on the ten points of competitor and customer orientation of the MKTOR scale and were designed to ultimately see the development of their market orientation and link it to Vohara's (2004) phases. Before this development could be determined, the interviewee was asked how the spin-off operated, how their relationship with customers and competitors was, and what kind of customer and competitor related activities they engaged in during their existence. When there was a change in any of the previous aspects, the interviewee was asked about the underlying cause of the change. In this manner, it was possible to determine the level of customer and competitor orientation during the spin-offs existence and to identify the phase when a change occurred.

Furthermore, there were several questions to measure the marketing background and knowledge of the interviewee. Since the interviewee might lack such a background, marketing terms were avoided as much as possible. Due to the semi-structured nature, only a small part of the interview was static and made beforehand. Therefore, not all asked questions are available in appendix A.

The analysis of the present state of the market orientation did not pose any problems, however, analysing the past had a potential response bias, or memory bias. The current state of their market orientation should be relatively clear in the mind of the interviewee, you cannot explicitly say the same for their memory of the state of their market orientation five or ten years ago. In order to reduce this bias, as much secondary data, such as websites and business documents as were available were used in order to complement and/or verify the data obtained from the interviews. For example, an old mission or company values statement compared to their current statement.

3.2 Sampling

The sample used in this study were three university spin-offs of the University of Twente, in accordance with the previously mentioned definition of university spin-offs by Pinray et al. (2003). Furthermore, in order for the university spin-off to have had enough time for a potential market orientation development, firms were chosen that were more than two years successfully on the market, similar to Lewrick (2011). The interviewees were relevant employees who were either working at the spin-off since the beginning or had sufficient knowledge of the way things were done during the start of the spin-off. A total of three interviews were successfully completed.

3.3 Procedure

Firstly, the interviewee was asked to fill in the survey to measure the current market orientation of the spin-off and their perceived market orientation. Following this survey was the semi-structured interview. During the interviews, questions based on the two relevant elements of the MKTOR scale, competitor orientation and customer orientation, were asked. Since it were semi-structured interviews, through questions the interviewee was invited to talk about the development of the spin-off, and when necessary, probing questions were asked to subtly steer the interview in the right direction. In order to focus on the interview, no notes were made during the interview, which was recorded and transcribed. The used interview guide can be found at Appendix A.

3.4 Data Analysis

The objective of this study was to measure the current and past level of market orientation, and to compare both levels to look for development. To do so, the data gathered from the surveys and interviews was codified in order to be analysed and compared. The found patterns were compared to any secondary data to validate the patterns.

4. RESULTS

A total of three surveys and interviews have been successfully conducted. Each spin-off will be discussed in a separate subsection. Each subsection will start with some background information about the spin-off and the interviewee, followed by the results from the survey and then the results of the interviews will be shown. The actual data of the surveys can be found in appendix B. In the final subsection the results will be analysed. Since anonymity is requested by the interviewed spin-offs, the spin-offs will

be referred to as spin-off A, spin-off B, and spin-off C and any background information will be limited.

4.1 Spin-off A

Spin-off A is a company that has its foundation in a unique technical product in the communication sector. When founded in 2009, the interviewee was brought on board quite fast as the CEO, because of his educational background in both technical and marketing studies, and extensive experience with new business development and product marketing. Spin-off A currently has five employees.

On the survey spin-off A scored a total of 7 out of 10 points. When asked how market oriented they think they are they only give themselves 2 out of 7 points. The three points on which they do not choose for the market orientation statement are "discussion of competitor's strengths and weaknesses", "measurement of customer satisfaction", and "monitoring of commitment and orientation to serving customers' needs".

Spin-off A's goal was to use technology not used by anyone else in the market to build a similar but technically more advanced product. To achieve their goal, they had to validate their technology and made demo versions to show its potential. Throughout the years, when the technology proved itself, they made their product smaller, more efficient, smarter and cheaper. Their strategy from the start was to aim high and have a long-term objective, but whilst getting there you have to get short-term jobs to fund the development of your technology and product. Spin-off A's customer for the long-term were subsidized projects. Within those long-term projects the customers also had short-term uses for the technology that was being developed, financing the long-term development. As spin-off A said: "You have to have something to go for on the long-term, whatever you can obtain on the short-term you have to do as well. It is a combination." Furthermore, those short-term jobs have to match the long-term direction, but could be for an entire different market. This will help pitching for jobs in that different market in the future. Spin-off A also mentioned that they increasingly looked at their product from the customers perspective to see the products' advantages and utilize that information.

Furthermore, according to spin-off A, networks are very important. Spin-off A's first customers were old colleagues from the same university who were aware of their technology, but left to work somewhere else. Eventually, they became the ambassadors of spin-off A's technology there and through those ambassadors they found more customers. Spin-off A also looked at the value chain of their product by visiting conferences and exhibitions to see with whom they could cooperate, customers and suppliers alike. When dealing with potential customers, spin-off A found that there are certain important things to look out for. First, the bigger the potential customer, the more important certifications and ISO standards are to the customer. Often spin-offs do not have these certifications and standards, just like spin-off A. Secondly, spin-off A claims that you must always make the translation of technical lingo to something the market and end-users understand, or as spin-off A puts it: "You need not commend the features so much, but the benefits for the customer." Thirdly, you have to understand the risks the potential customers are willing to take. Spin-off A thought it might be wiser to sometimes focus on subcontractors and to supply only a module instead of a

whole system. Furthermore, spin-off A mentioned that they are actively trying to match the (latent) problems of their customers with their solutions and to increasingly think from the perspective of the customer.

On the subject of competition, spin-off A mentioned that they are not at all interested in their competition's activities, but do occasionally see them appear in the news. "They are greedy for publicity. They claim this and that, started a new cooperation, joint venture with a big player. Whatever. There is not much we can do with that." Spin-off A does know that there is competition that makes similar products, but does not feel threatened by them, as they claim to have superior technology, although the competition might be in a more advanced stage of development. Spin-off A had some trouble convincing big producers to use their new technology, but step by step they demonstrated their technology and showed lab results and that is now starting to pay off. This way the producers could compare their technology with the technology of their competition and it showed the producers that spin-off A's technology is superior. The difference in technology is also the reason that spin-off A does not cooperate with their competition, since there is no overlap. However, they do approach customers of their competition in order to obtain contracts.

4.2 Spin-off B

Spin-off B is a company that currently produces high-tech deposition equipment and was founded in 2007. They have eighteen employees and the interviewee is the CEO of spin-off B. The amount of market knowledge and experience present at spin-off B was limited to the CEO's master in business administration with no previous experience in marketing in a firm elsewhere. However, they do hire external marketing expertise through consultancies and freelancers.

Concerning the survey, spin-off B scored 8 out of 10 points and they gave themselves 6 out of 7 points when asked how market oriented they think they are. The points on which they did not choose for the market orientation statement are "attention to after-sales service" and "measurement of customer satisfaction".

Spin-off B has its origins in a customer's need that the university where they were active could not fulfil. They jumped in and offered a consultancy and measurements service based on short ad-hoc projects. Years later customers asked for a specific kind of job that changed the direction of the spin-off, instead of providing advice and measurement for a customer, they now produce high-tech machines that require more commitment of both them and the customer. Spin-off B mentioned that this way both the transactional worth and the future worth for them is increased. When the customer increases their production, this also means that they require more machines. "When he buys a machine from us, he becomes depended on us. We have to help with support and maintenance." However, since their product requires more commitment compared to the service they used to provide, sales also require more effort and are less frequently done than in the past. When changing their direction, they saw that the market they started to operate in had sufficient potential customers making new products that could utilize their technology, but the market was still in its early phases and its development was slower than predicted. "There were a lot of different companies making new products, but they took much longer than expected. That has to do with product development. Our product also took longer,

and the market as well.” Because of the increased time it took for the market to develop, competitors had also developed similar machines and spin-off B asked itself if it still wanted to continue their current direction. The answer was to remain active in the current market with a focus on pilot production, and they are leading in that field.

Competition-wise, spin-off B mentions that they do not have direct competition. There are companies that use the same technology, but they cannot operate on the same scale. However, one of those companies could grow and become real competition. Furthermore, there are companies that can provide a similar solution to the customers' problem. The customers look at each solution and choose the one they think is best for them. This is similar to what spin-off B does, they also look at competing techniques and they talk with their competition. They swap limited amounts of information about their technology and give each other advice about which market to enter or not. When asked to describe the kind of relationship they have, “professional and friendly” was the answer. However, this was not always the case, especially in the beginning. During this phase, it was every company for itself and no information whatsoever was being shared. During the maturation of spin-off B they became less wary of each other and as they saw each more often, a more friendly relationship was built.

4.3 Spin-off C

Spin-off C is a spin-off that develops high-tech medical equipment and was founded in 2008. They currently have six employees and the interview was with the managing director, who was the only one with some marketing education. However, he has extensive experience with product development and innovation and was brought on a couple years after the founding of the spin-off.

On the survey spin-off C scored 7 out of 10 points and they scored themselves a 6 out of 7 on the question how market oriented they see themselves. The points on which spin-off C chose for the alternative statement and not the market orientation statement are “sharing information within their business concerning competitors' strategies”, “we rapidly respond to competitive actions that threaten us”, and “we pay close attention to after-sales service”.

Similar to spin-off B, spin-off C has its origin in a customer's need. This customer asked a different local spin-off for a product with certain requirements and one of the managers of the spin-off decided to found spin-off C with funding of an investment fund to fulfil the customer's request. “There was a demand for a certain product with spec's, a design input.” This initial customer had a long-term ambition and is currently still a customer. Throughout the years additional short- and long-term customers have been found by visiting relevant symposia, conferences and summits. “We have customers that are very curious with whom we have a short-term agreement. Concerning the R&D, we have customers that for very strategic reasons engage in a long-term relationship with us.” Occasionally spin-off C was contacted via the internet as a result of being visible online. However, spin-off C claims that it is mostly networking at previously mentioned meetups.

When talking about spin-off C's competitive advantage, they claim that there are not many products like theirs available on the market, especially not with the specifications of their product, which is more precise, efficient and comfortable for the patient. There are alternative products that achieve the same goal as spin-off

C's product, but instead of viewing those products as competitive products, spin-off C sees them as “disciples” for the relative new scope of methods to utilize their product and encourages the development of such alternatives. According to spin-off C, those disciples show the market all the possibilities what can be done with their products, including spin-off C's. “...we supply very good tools with which they can apply something underneath the skin. That applying underneath the skin, I like to see that getting propagated, if necessary by the competition with different products.” Furthermore, spin-off C does not feel threatened by the competition, as they claim to have a superior product. Spin-off C has contact with another company that produces a similar product for a different market and is therefore not considered competition. We share information about packaging, sterility, and communication with doctors.

However, spin-off C mentioned that for the last six years, they have been focused on R&D and making prototypes for customers. For all those years, spin-off C kept their marketing activities to a minimum, intentionally, and developed several products based on their patents and the requirements supplied by their initial customer. Due to financial reasons spin-off C is now focused on just one product, the others are currently not being further developed. After those six years, one year ago, a change occurred when spin-off C finished the development of their product and started production, expanding their network, and talking to competition. Spin-off C's choice for focussing on developing their product at the time was one of choosing what was important as they claim it was very important to develop a good and clinically proven product for it to be accepted by the market. “I've noticed that before you have clinically proven it, curious or innovative doctors are interested, but they still want to see data of your product. How does it perform?”

Now that spin-off C has a fully developed and clinically proven product, their goal is to focus on the manufacturing of their product and to make most of their profits from production and selling, and to make their R&D activities play a more supportive role.

4.4 Cross-case Analysis

In the following subsections the results of the survey and interview for each of the spin-offs will be analysed. At the end of each subsection a simplistic visual representation of the development of the market orientation for each spin-off can be found.

4.4.1 Spin-off A

Starting with spin-off A, there is a clear pattern on how they operate. From early on, they used short-term jobs to learn and finance the development of their technology, which is their long-term goal. Their focus in the early stages was to improve and show their technology in order to gain short-term customers, overcoming the threshold of credibility, while gaining new access to new markets. As their technology developed, they also had a chance to obtain larger contracts. Since the beginning they continuously paid attention to developing their technology whilst simultaneously obtaining the correct type of customers in order to gain funding for said development. Throughout this time, little attention was paid to the competition and their market orientation has not developed much since the start.

Comparing these results with the survey, there is a match with their choice for “we regularly discuss competitors' strengths and strategies”, the alternative

being “we regularly try to innovate our product/service”, and for “creating a product that fits well to the customer’s needs”, the alternative being “creating a product of higher quality”. However, it does not match with their choice for “we regularly share information within our business concerning competitors’ strategies” over “we focus on keeping prices low and quality high”, as in the interview spin-off A did mention that through the development of their technology they could reduce costs and they paid little attention to the competition. Spin-off A also chose “we rapidly respond to competitive actions that threaten us” over “we focus on developing the best product ourselves”. Again, spin-off C paid little attention to their competition and they did focus on improving their own technology, making this choice questionable. Their total score of 7 out of 10 of the survey therefore does not seem to be accurate and with the previous thoughts in mind, a reduction of 2 points to a total of 5 points seems more accurate. This is also more similar to the score of 2 out of 7 points they gave themselves on the question how market oriented they are. A simplistic visual representation of the market development of spin-off A can be found at Figure 3.

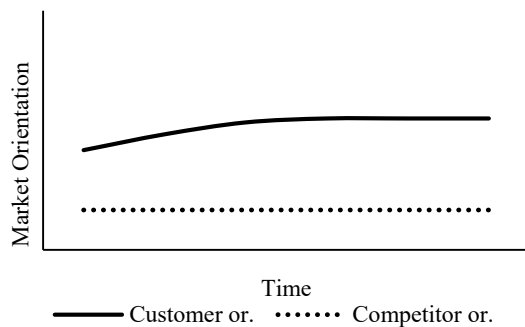


Figure 3: spin-off A's market orientation development.

4.4.2 Spin-off B

Since spin-off B has had their origin in a customer's need, that aspect remained important throughout their existence. They did, go through several changes over the years, switching from offering a service to offering a product and the relationship with their competition also changed. Starting with the product change, spin-off B saw a chance to provide a more substantial product to their customers and more importantly, the relationship with customers became more long-term. Changing from offering a service to offering a product was triggered by customers and spin-off B saw it as an opportunity to grow as a company. The second change, the change of the relationship with their competition, has its roots at the maturing of the company. The relationship with their competition grew into a more professional and friendly one, with each side somewhat helping the other.

Looking at the results of the survey of spin-off B, they scored a total of 8 out of 10 points and gave themselves 6 out of 7 points on the question how market oriented they see themselves. Considering their current state of market oriented based on the interview, their score is reasonable. Customers' needs are important and there is a healthy relationship with their competition. However, spin-off B chose “we constantly try to improve production” over “we pay close attention to after-sales service”, and “we regularly try to innovate our product/service” over “we regularly discuss competitors' strengths and strategies”. Spin-off B mentioned that the

scale of their production is one of their competitive advantages and the contact with their competitor is friendly and professional. Spin-off B's total score of 7 is perhaps a little high, likewise to their own grade of 6. A simplistic visual representation of the market development of spin-off B can be found at Figure 4.

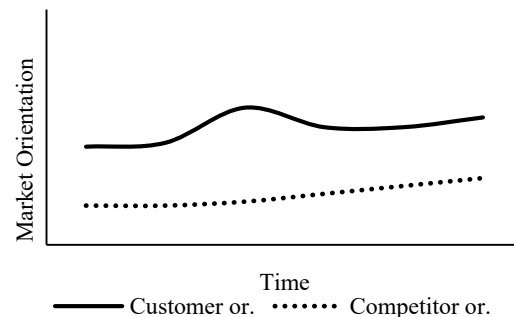


Figure 4: spin-off B's market orientation development.

4.4.3 Spin-off C

The path spin-off C took is very clear, a very narrow focus on developing and testing their product until the required data could be gathered and the customer was satisfied. Meanwhile, all market related activities were kept to a minimum. Developing several products simultaneously, spin-off C eventually had focus on one product, as financial resources were limited. When spin-off C's customer was satisfied, they could shift from an intensive product development orientation to a market and production orientation and make R&D play a supportive role in the firm.

On the survey spin-off C scored 7 out of 10 points and gave themselves 6 out of 7 points on the question how market oriented they see themselves, due to their recent switch from developing their product to being more market oriented. On the statements, the choices spin-off C made seem to fit their current orientation. Spin-off C chose for “focus on keeping prices low and quality high” and “focus on developing the best product ourselves”, as a matter of fact, which were both not chosen by the other spin-offs. The choice for “we regularly discuss competitors' strengths and strategies” over “we regularly try to innovate our product/service” seems to originate from spin-off C's recent switch to an increasing external focus. Spin-off C's own grading of 6 is ambitious, triggered by previously mentioned change. Their total score of 7 seems slightly high, considering they only recently started to increase their efforts on becoming more market oriented. A simplistic visual representation of the market development of spin-off C can be found at Figure 5.

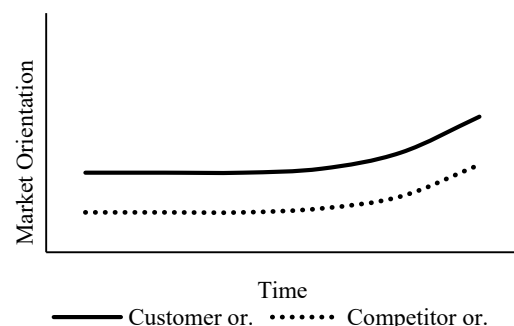


Figure 5: spin-off C's market orientation development.

5. DISCUSSION

In this section the results will be discussed and explained in relation to the theory that was introduced in the theoretical framework.

First off all, this study's results suggest that in each case competitor orientation is considered as insignificant in the early phases. When entering the re-orientation phase, either through finishing product development or by changing the firms' course, it seems that the spin-offs re-evaluate their orientation and competitor orientation does gradually becomes more important and competitor oriented activities are increased.

Secondly, throughout each spin-offs existence, there always seems to be a decent level of customer orientation. This can be explained by the roots of the spin-offs, as in two cases it was a customer's needs that led to the founding of the spin-off and that attention to customer need remained present. In the remaining case, it is caused by the short-term and long-term needs of the projects they were working on, demanding constant attention to customer needs, and the increasing awareness of the importance of customer perspective. Similar to competitor orientation, customer orientation and related activity increases during the re-orientation phase.

Thirdly, when looking at the most prominent orientation of the spin-offs, the results suggest that in each case product orientation is most dominant. Especially in the early phases of the spin-off, there is a distinct focus on product development and improvement, with a much lower level, if any, of market oriented activities. However, the level of market oriented activities does increase as the spin-off matures, whilst the focus on product orientation either remains or changes into production orientation.

In order to explain the above mentioned results, this study uses the DPF framework of Vohara (2004). In the re-orientation phase, Vohara (2004) claims that a spin-off should use their resources to evolve, based on the information and knowledge they gathered throughout their existence. When arriving in this phase, the spin-offs have to re-evaluate their current direction and make changes if they decide to follow a different path. The results suggest that in two cases the spin-offs do indeed enter the re-orientation phase and as a result evolve, as either the product orientation evolved into a combination of product and market orientation, or as the spin-off changes its course, resulting in more long-term customers. In both cases the decision was made to increase attention to customer orientation and thus increasing their market orientation. In one of these cases this evolution also resulted in an increase in competitor orientation, increasing their market orientation even further.

These changes can also be explained with the framework of Hakala (2010). In the sequential approach, Hakala (2010) suggests that firms' orientation evolves throughout their life cycle from an internal orientation towards an external orientation, meaning an increased level of customer and competitor orientation, which is similar to the results. However, it appears that throughout their existence, the researched spin-offs continued to have either a significant product or production orientation, even after the re-orientation phase. This suggests that the spin-offs have a combination of orientations, which would fit the complementary approach, in which the orientation configuration as a whole evolves based on the contingencies of the spin-off. However, unlike in the sequential approach, the level of each separate orientation could either diminish or grow, or a previous orientation

could disappear entirely and a new orientation could appear. This seems to be the case with both spin-offs which underwent a change. In one case the spin-off's product orientation made room for production orientation in combination with an increasing market orientation, and in the other case the competitor and customer orientation both grew. This can also be seen as the maturing of the spin-off.

In one case, there is no distinct development of the market orientation other than a slight improvement over time at the beginning, when the spin-off was starting and building up their activities. According to Hakala's (2010) alternatives approach and complementary approach, certain orientations fit certain contingencies, meaning there is no need to change orientation if the environment the spin-off operates in is stable or is perceived as stable. Also, it could be that this spin-off already went through the re-orientation phase but did not make any distinct changes and remained unnoticed by this study, or it does not follow the path described by Vohara (2004).

6. CONCLUSION

This study's goal was to research the development of the market orientation of university spin-offs. Qualitative data was gathered from three high-tech spin-offs using survey's and interviews. Based on the results, it was found in this study found in two cases there was a development in the market orientation during the existence of the university spin-offs so far. They changed from a focus on product orientation towards a complementary orientation of both market orientation and product or production orientation. This development started during the re-orientation phase where spin-offs are reconfiguring themselves based on gained knowledge and information during their existence to reach a state to commence business activities, and by the maturation of the spin-offs. The trigger for each spin-off's development was different, in one case it was finishing product development, in the other case it was part of the spin-off's change of course.

7. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Firstly, the used sample size is small and limited to high-tech spin-offs located in the Netherlands. In order to expand this study's finding to a more general outcome, a more diversified and larger sample must be researched.

Secondly, the added value of the conducted survey is limited, as it is not scientifically validated and therefore can only play a supportive role in measuring how market oriented a small company is. However, future research could further utilize this survey and improve its validity.

Thirdly, in this study the element of interfunctional coordination in the MKTOR scale was omitted due to the relatively small size of the spin-offs. Although this was justified, it reduces the validity of the scale.

Finally, there is a more general limitation of qualitative research and interviews being that the data provided from the sources is not necessarily the truth, knowingly or unknowingly, and is subject to interpretation on the researcher's side. There is not much to be done to about these problems other than to verify data through other sources, ask the right questions, and to try to be as objective and methodical as possible as a researcher.

Future research could focus on the triggers that initiate a university spin-offs to develop or change its market orientation, as this study suggests the triggers originate from different causes. Of course, the triggers of the development or change of any other orientation could also be the topic of future research.

8. ACKNOWLEDGEMENTS

The author would like to extend his gratitude towards dr. Kasia Zalewska-Kurek for her extensive feedback and help as a first supervisor, and to dr. Rainer Harms, who gave feedback as a second supervisor. The author is also grateful for the cooperation of the interviewed spin-offs. Furthermore, the support from the thesis circle and friends was also greatly appreciated.

9. REFERENCES

- BankBoston (1997). *MIT: The Impact of Innovation*. Boston: BankBoston.
- Berthon, P., Hulbert, J. & Pitt, L. (1999). To Serve or Create? Strategic Orientations toward Customers and Innovation. *California Management Review*, 42(1), 37-58.
- Bigdeli, A.Z., Li, F. & Shi, X. (2015). Sustainability and Scalability of University Spinouts: A Business Model Perspective. *R&D Management*
- Birley, S. & Westhead, P. (1994). A Taxonomy of Business Start-up Reasons and their Impact on Firm Growth and Size. *Journal of Business Venturing*, 9(1), 7-31.
- Bhave, M.P. (1994). A Process Model of Entrepreneurial Venture Creation. *Journal of Business Venturing*, 9(3), 223-242.
- Blythe, J. (2009). *Principles and Practice of Marketing*. Hampshire: Cengage Learning.
- Carayannis, E. G., Rogers, E. M., Kurihara, K. & Allbritton, M.M. (1998). High-technology Spin-offs from Government R&D Laboratories and Research Universities. *Technovation* 18(1), 1-11
- Conduit, J. & Mavondo, F.T. (1998). How critical is Internal Customer Orientation to Market Orientation? *Journal of Business Research* 51, 11-24
- Frosch, R. (1996). The Customer for R&D Is Always Wrong! *Research-Technology Management*, 39(6), 22-27.
- Galunic, D., Eisenhardt, K. (2001). Architectural Innovation and Modular Corporate Forms. *Academy of Management Journal* 44, 1229-1249.
- Greenly, G. E. (1995). *Forms of market orientation in UK Companies*. *Journal of Management Studies* 32(1), 47-66.
- Hakala, H. (2010). Strategic Orientations in Management Literature: Three Approaches to Understanding the Interaction between Market, Technology, Entrepreneurial and Learning Orientations. *International Journal of Management Reviews*, 13, 199-217.
- Hellmann, T. & Puri, M. (2002). Venture Capital and the Professionalization of Start-Up Firms: Empirical Evidence. *The Journal of Finance*, 57, 169-197.
- Hunt, S. & Lambe, J. (2000). Marketing's Contribution to Business Strategy: Market Orientation, Relationship Marketing and Resource advantage Theory. *International Journal of Management Reviews*, 2(1), 17-43.
- Kahn, K. B. (2001). Market Orientation, Interdepartmental Integration, and Product Development Performance. *Journal of Product Innovation Management*, 18(5), 314-23.
- Kohli, A., & Jaworski, B. (1990). Market Orientation: The Construct, Research Propositions, and Managerial Implications. *Journal of Marketing* 54(2), 1-18.
- Lewrick, M., Omar, M. & Williams, R.L. (2011). Market Orientation and Innovators' Success: an Exploration of the Influence of Customer and Competitor Orientation. *Journal of Technology Management & Innovation*, 6(3), 48-62.
- Lubik, S. & Garnsey, E. (2015). Early Business Model Evolution in Science-based Ventures: The Case of Advanced Materials. *Long Range Planning* 1-16.
- Macdonald, S. (1995). Too Close for Comfort: The Strategic Implications of Getting too Close to the Customer. *California Management Review*, 37(4), 8-27.
- Maurya, A. (2012). *Running lean: iterate from plan A to a plan that works. The lean series (2nd ed.)*. Sebastopol, CA: O'Reilly.
- Mustar, P., Renault, M., Colombo, M.G., Piva, E., Fontes, M., Lockett, A. . . & Moray, N. (2006). Conceptualizing the Heterogeneity of Research-based Spin-offs: A Multi-dimensional Taxonomy. *Research Policy*, 35(2), 289-308.
- Narver, J. & Slater, S. (1990). The Effect of a Market Orientation on Business Profitability. *Journal of Marketing*, 54(3), 20-35.
- Narver, J., Slater S. & MacLachlan, D. (2004). Responsive and Proactive Market Orientation and New-Product Success. *Journal of Product Innovation Management*, 21, 334-347.
- Osterwalder, A., Pigneur, Y. & Clark, T. (2010). *Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers*. Hoboken, NJ: John Wiley & Sons.
- Pérez, M.P. & Sánchez, A.M. (2003). The development of university spin-offs. Early dynamics of technology transfer and networking. *Technovation* 23(10), 823 - 831.
- Pirnay, F., Surlemont, B. & Nlemvo, F. (2003). Towards a Typology of University Spin-offs. *Small Business Economics*, 21, 355-369
- Ries, E. (2011). *The Lean Startup: How Today's Entrepreneurs use Continuous Innovation to Create Radically Successful Businesses*. Crown Publishing.
- Roberts, E.B. (1990). Evolving Toward Product and Market-Oriented: The Early Years of Technology-Based Firms. *Journal of Product Innovation Management*, 7, 274-287.
- Roberts, E.B. (1991). *Entrepreneurs in High Technology: Lessons from MIT and Beyond*. New York: Oxford University Press.
- Roersen, M.J., Kraaijenbrink, J. & Groen, A.J. (2013) Marketing Ignorance and the Validity of Narver and Slater's MKTOR Scale in High-Tech Russian Firms. *Journal of Product Innovation Management*, 30(3), 545-559.
- Romanelli, E. (1989). Environments and Strategies of Organization Start-Up: Effects on Early

- Survival. *Administrative Science Quarterly*, 34(3), 369-387.
- Rothwell, R. & Dodgson, M. (1993). Technology-based SMEs: their role in industrial and economic change. *International Journal of Technology Management* 8(1), 8 -22.
- Saxe, R., & Weitz, B. A. (1982). The SOCO scale: A Measure of the Customer Orientation of Salespeople. *Journal of marketing research*, 343-351.
- Smith, K.G., Mitchell, T.R. & Summer, C.E. (1985). Top Level Management Priorities in Different Stages of the Organizational Life Cycle. *Academy of management Journal* 28(4), 799–820.
- Tidd, J. & Bessant, T. (2009). *Managing Innovation: Integrating Technological, Market and Organizational Change*. West Sussex: John Wiley and Sons Ltd.
- Vohora, A., Wright, M., & Lockett, A. (2004). Critical Junctures in the Development of University High-tech Spinout Companies. *Research policy*, 33(1), 147-175.
- Womack, J. P., Jones, D.T. & Roos, D. (1990). *The Machine that Changed the World: Based on the Massachusetts Institute of Technology 5-million dollar 5-Year Study on the Future of the Automobile*. New York: Rawson Associate.
- Zahra, S.A., van de Velde, E. & Larrañeta, B. (2007). Knowledge Conversion Capability and the Performance of Corporate and University Spin offs. *Industrial and Corporate Change*, 16(4), 569-608.

10. APPENDIX A

Interview guide

Survey

MKTOR scale (competitor and customers orientation)

What is more important or most similar to the situation in your company?

We regularly share information within our business concerning competitors' strategies or we focus on keeping prices low and quality high.

Our business objectives are driven primarily by customer satisfaction or by production efficiency.

We rapidly respond to competitive actions that threaten us or we focus on developing the best product ourselves.

We constantly monitor our level of commitment and orientation to serving customers' needs or we constantly seek new customers in different areas to increase sales volume.

Our competitive advantage is based on: actual measurements of customers' needs or active deployment of sales techniques. Creating a product of higher quality or creating a product that fits well to the customer's needs.

We measure customer satisfaction systematically and frequently or we measure sales volume systematically and frequently.

We pay close attention to after-sales service or we constantly try to improve production.

We regularly discuss competitors' strengths and strategies or we regularly try to innovate our product/service.

We target our customers where we have an opportunity for competitive advantage or we target markets where we can increase our sales volume the most.

Our company is market oriented (1 strongly disagree...7 strongly agree)

Interview Questions

What was the initial idea for the company?

At the beginning, did you have some kind of mission statement, philosophy, or company goal you were hoping to achieve?

What was the main idea behind that statement, philosophy or goal?

What kind of strategy did you enforce hoping to achieve that statement, philosophy or goal?

How did you develop that strategy?

Has that statement, philosophy or goal and its strategy changed over the years? How come?

--

Who were your main customers?

What kind of relationship did you have with these customers? Long- or short-term?

Are your current main customers different from the previous main customers? What has changed?

--

What makes this company better than the other companies in the industry?

Has this changed in any way during the firms' existence?

Who are your main competitors?

Is it similar to the situation when you first started? What has changed?

Over the years, how has the contact been with those competitors? Have you collaborated with any? How did the contact develop?

In what way, if any, does the company like to distinguish itself more from its competitors and how was this way developed?

--

Has anybody in the company received marketing training or education, or not?

11. APPENDIX B

Question	Spin-off A	Spin-off B	Spin-off C
We regularly share information within our business concerning competitors' strategies or we focus on keeping prices low and quality high.	regularly share information within our business concerning competitors' strategies	regularly share information within our business concerning competitors' strategies	focus on keeping prices low and quality high
Our business objectives are driven primarily by customer satisfaction or by production efficiency.	customer satisfaction	customer satisfaction	customer satisfaction
We rapidly respond to competitive actions that threaten us or we focus on developing the best product ourselves.	rapidly respond to competitive actions that threaten us	rapidly respond to competitive actions that threaten us	focus on developing the best product ourselves
We constantly monitor our level of commitment and orientation to serving customers' needs or we constantly seek new customers in different areas to increase sales volume.	constantly seek new customers in different areas to increase sales volume.	constantly monitor our level of commitment and orientation to serving customers' needs	constantly monitor our level of commitment and orientation to serving customers' needs
Our competitive advantage is based on: actual measurements of customers' needs or active deployment of sales techniques.	actual measurements of customers' needs	actual measurements of customers' needs	actual measurements of customers' needs
Creating a product of higher quality or creating a product that fits well to the customer's needs.	creating a product that fits well to the customer's needs	creating a product that fits well to the customer's needs	creating a product that fits well to the customer's needs
We measure customer satisfaction systematically and frequently or we measure sales volume systematically and frequently.	measure sales volume systematically and frequently	measure sales volume systematically and frequently	measure customer satisfaction systematically and frequently
We pay close attention to after-sales service or we constantly try to improve production.	pay close attention to after-sales service	constantly try to improve production.	constantly try to improve production
We regularly discuss competitors' strengths and strategies or we regularly try to innovate our product/service.	regularly try to innovate our product/service.	regularly try to innovate our product/service.	regularly discuss competitors' strengths and strategies
We target our customers where we have an opportunity for competitive advantage or we target markets where we can increase our sales volume the most.	target our customers where we have an opportunity for competitive advantage	target our customers where we have an opportunity for competitive advantage	target our customers where we have an opportunity for competitive advantage
Our company is market oriented (1 strongly disagree...7 strongly agree)	2	6	6
Total score (0-10)	7	8	7