How to improve the relationship between buyer-supplier: A qualitative research with exploration of new methods

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ABSTRACT,

This paper aims to find activities/steps that are important for improving the relationship between buyer and supplier. Research about the benefits of having a good relationship is conducted frequently literature shows, however, current research lacks findings on how to improve this relationship. This paper uses a qualitative research design and it explores new methods to use for analysing interviews. The results are manually analysed and compared to the IBM Watson and Weka software that is being used to draw conclusions on its potential. Furthermore, AmberScript software is used for transcribing the interviews. From literature and the first interviews ten topics are created to which the interviews will be assigned. This will create a list with the most important topics based on the number of times that they are mentioned. It was found that communication, having high potential and building up a personal relationship were the three most mentioned topics by the interviewees to improve the relationship with the supplier. The software's that were used showed deviating or wrong results compared to the manual analysis. There is some potential for using software, however, it either needs to be improved or requires a lot of data. The transcribing software however proved to be successful.

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1. BACKGROUND INFORMATION ABOUT INCREASING IMPORTANCE ON BUSINESS RELATIONSHIPS

In the Business-to-Business (B2B) context, almost all firms have some suppliers. Whereas in the past it was the objective of the supplier to actively sell the product to the customer, nowadays this has switched. Buying firms need to put in more effort to make sure that they will get the product from the supplier. This because the market is switched to an oligopolistic market structure which implies that suppliers are more selective with who they collaborate (Schiele, Calvi, & Gibbert, 2012, p. 1178). A logical result of a decrease in the number of firms active in certain markets. Han et al. (1993, p. 332) also found that there was a strong industry shift towards reducing the number of suppliers. This leads to customers selling themselves to the suppliers rather than the other (and usual) way around. A phenomenon described as reverse marketing by Leenders & Blenkhorn (1988, p. 129). This has led to an increasing importance of being a preferred customer to increase collaboration and ensure supply. Only one customer can be the preferred customer which makes it difficult for companies to achieve this status with the supplier.

The stress on improving the relationship was already mentioned by researchers in 1988 when the term strategic alliances was used to describe this importance on relationships which can make a difference between extinction of a company or survival (Spekman, 1988, p. 81). Johnston & Lawrence (1988, p. 16) use the term 'value-adding partnership' to stress the focus on collaboration and relationships rather than a more isolated way of doing business.

Another change is seen in innovation since the 1990's. Before those years, innovation was mostly done by firms themselves without much collaboration (Schiele, Calvi, & Gibbert, 2012, p. 1178). This switched to an open innovation approach in which firms work together. This increased the importance of having a good relationship with the supplier to get access and influence on these innovations to get the most benefit out of them for the buying firm. For example, a study concluded that a good relationship between buyers and suppliers can create a competitive advantage (Dyer & Hatch, 2006, p. 702). However, when having a good relationship it is important that the buying firms keep investing in the relationship and keep working on it to maintain the relationship and its benefits (Storey, Emberson, & Reade, 2005, p. 256). Multiple factors are included in becoming a preferred customer. The three main terms are customer attractiveness, supplier satisfaction and preferred customer status (Schiele, Veldman, Hüttinger, & Pulles, 2012, p. 142). Customer attractiveness is about how attractive the customer is to a supplier before they do business with the customer. Supplier satisfaction mostly is a general thing that counts for all suppliers, once the business relationship has started, how does the customer make sure that they are satisfied. The preferred customer status is more focused on strategically important suppliers and embraces actions that are specifically aimed at a certain supplier to become a preferred customer to them and outperform other customers.

Research is already conducted on the benefits that a preferred customer status has for a buying firm. However, there is still a lack of research on what buying firms can do to achieve this status or what buying firms do to become a preferred customer. The problem here is that there is just a small amount of research that advices buying firms on how to improve the relationship. This research will give more insights into how to improve the relationship and become a preferred customer by looking at what customers perceive the most important and this story will also be analysed from the supplier's perspective to create a realistic picture. Therefore, it will supplement existing academic research. Besides, more research nowadays stresses the increasing importance on the relationship between the buyer and the supplier. Therefore, it is relevant to know how to improve this relationship.

For buying firms it is beneficial to know how to become a preferred customer since it brings many benefits as is known from previous academic research. When suppliers have problems with their production the preferred customer will get the delivery first and often the supplier will collaborate closely with the customer to design their products specifically to the customer's needs. It is also stated that the customer sometimes even pays a lower price just because they are the preferred customer and more advantages are found in previous research of which a few are mentioned in the previous section. This research will provide the readers with the most important steps that should be taken in the eyes of the buying firm as well as in the eyes of a supplier to create a realistic picture. Therefore, this research is practically relevant for businesses.

The objective of this research is to find out what customers did to improve their relationship with their suppliers. With this data a more general list will be made which clearly shows what factors contribute to a good relationship. Via this more insight is created in how to become a preferred customer. In particular, the focus of this thesis will be on what buying firms perceive to be the most important steps to undertake in improving the relationship with their supplier and how difficult they think these different steps are.

This thesis specifically focusses on what buyers recommend and what suppliers perceive to be important for improving their relationship. Besides that, the buyers and suppliers are asked to rank the activities according to how hard it is to implement or cooperate in the sense of time, money and resources.
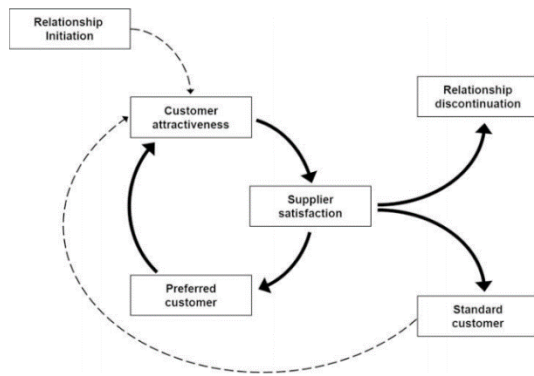
The specific research question for this thesis is: What do buyers/suppliers perceive to be the most important steps/activities to improve their relationship with their suppliers/customers.

2. THEORY

For this part literature will be reviewed about the preferred customer status and activities that are already known to improve the buyer-supplier relationship. This can supplement the results of the research and confirm that these factors indeed are being used by customers or appreciated by suppliers.

2.1 Understanding the Process of Becoming a Preferred Customer

Becoming a preferred customer does not happen in an isolated way. Some steps need to be satisfied before this status can be achieved. To begin, the steps towards becoming a preferred customer are explained to give some insights in how this status can be achieved looking at the beginning of the relationship between buyer and supplier. As mentioned before, the three steps are customer attractiveness, supplier satisfaction and finally firms get a preferred customers status, or they are a standard customer, or the relationships ends.

Figure 1: The virtuous circle of Preferred Customer Status (Schiele, Veldman, Hüttinger, & Pulles, Towards a social exchange theory perspective on preferred customership, 2012, p. 142)

The three steps will be further discussed. The process starts with attractiveness. The buyer needs to be an attractive customer for the supplier to make sure he wants to do business with them. The importance of attractiveness for a good relationship is stressed by Ellegaard et al. (2003, p. 352). Attractiveness can be achieved via financial means but often is achieved via a reputation that a buying firm holds. This reputation is a result of a corporate image that suppliers hold based on ethical standards that the buying firm holds (Bendixen & Abratt, 2007, p. 79). Unethical behaviour e.g. bribery has a negative impact on company reputation and therefore attractiveness. When the first step of attractiveness is satisfied and the business relationship is started, buying firms need to put in efforts to keep suppliers satisfied. Supplier satisfaction often is something that is done in a general way for multiple suppliers of which not all need to be of the same high level of strategic importance. Supplier satisfaction is defined as 'the feeling of equity with the relationship no matter what power imbalance exists' (Benton & Maloni, 2005, p. 5). Supplier satisfaction is not only important for becoming a preferred customer, but it is also important since satisfied suppliers are more willing to help buying firms to meet the needs of their customers (Wong, 2000, p. 427). Introducing a new pay system that smoothens payments to suppliers is an example of something that increases supplier satisfaction. Finally, when both previous conditions are met, there needs to be extra action from the buying firm to become a preferred customer. To become this, a buying firm must outperform other customers on important areas as so to get the preferred customer status. Research has shown that the preferred customer status has a positive influence on supplier innovativeness. (Schiele, Veldman, & Hüttinger, 2011, p. 16). What is also interesting is that they found that innovative suppliers do no charge higher prices than suppliers that were less innovative. An advantage of having the preferred customer status is that supplier will offer its innovations to the preferred customer first (Bemelmans, Voordijk, Dewulf, & Vos, 2015, p. 193).

2.2 Buyer-supplier Activities for Improving the Relationship

This section will focus on what activities previous literature suggests for improving the relationships with suppliers or what activities are commonly used by buying firms. Some elements of supplier development are mentioned by Krause & Ellram (1997, p. 233) which are mentioned below. These elements mentioned are: Supplier evaluation, evaluate suppliers on several criteria and give scores to them. Via a final score suppliers can be evaluated and/or compared; Feedback of supplier performance, when measuring supplier performance on multiple dimension, give the supplier feedback about how they are doing or on what

dimensions they can possibly improve; Raising performance expectations, trying to get even better performance from suppliers via joint efforts can decrease costs and improve the relationship between buyer and supplier; Education and training for supplier personnel, knowledge of the buying company can be transferred to the supplier to increase productivity and decrease defects. It can also decrease costs and it improves the relationship; Supplier recognition, showing the supplier that it has good evaluations and performance scores gives it recognition. This can be done via supplier awards for example; Placement of engineering and other buyer personnel at the supplier's premises, e.g. when designing new products, include the supplier from the start and send engineers to the supplier to create a product that is modified to the buying firms needs; Direct capital investment by the buying firm in the supplier, e.g. paying the supplier beforehand. This allows the supplier to pay their supplier in order to reduce financial complications which allows them to continue to produce the goods. This also improves the relationship between buyer and supplier. The latter two activities can be defined under the term supplier development. Supplier development is any effort by a buying firm with a supplier to improve the supplier's performance and/or capabilities and to meet the buying firm's short and/or long term supply needs (Krause D. , 1999, p. 205). Supplier development can mean investing resources, time or personnel at the supplier. Placement of engineering personal is an example of providing resources to the supplier whereas with direct capital investment the buying firm provides money to the supplier. Supplier development does not happen suddenly. The perception of each other, communication level and reputation are factors influencing whether buying firms will invest in their supplier (Anderson & Weitz, 1992, p. 18).

Some other activities mentioned in previous literature are mentioned below (Terpend, Tyler, Krause, & Handfield, 2008, p. 35): Communication, which can be face-to-face communication or via e-mail or telephone; Information sharing, meaning to exchange information that is perceived to be useful for the supplier to improve their products, production or flow; Specific investments, meaning that the buyer invests in the supplier which can be for a new product or a new production technology which can be beneficial for the buyer at a later stage; EDI adoption, which stands for Electronic Data Interchange and which is mostly implemented for routine activities. E.g. billing, placing new orders, transport documents. This is then done electronically. When successfully implemented, EDI has the potential to improve responsiveness to consumer needs, lowers costs and speed up stock replenishment (Bouchard, 1993, p. 367).; Trust, meaning that the buyer shows the supplier that they have trust in them via e.g. paying upfront or financing new products/machines. Something which proved to have a positive effect on the performance of the relationship (Johnston, McCutcheon, Stuart, & Kerwood, 2004, p. 36); Knowledge sharing, transferring knowledge from the buying company to the supplier to improve the suppliers capabilities and processes. Often to reduce costs or create better products (higher quality, lower defects); Integrated New Product Development, when creating a new product, involve the supplier from the beginning to create a product that is better adjusted for the customer and which the supplier has the ability for to produce it. Needs of both the buyer and the supplier are synchronized.

When looking at Zirpoli & Caputo (2002, pp. 1399-1402), some elements mentioned before can be seen e.g. information sharing and dedicated investments. However, they also come up with some new elements. The first they name is supplier segmentation which can seem a little odd, however, firms have to segment suppliers based on importance of the supplied product and the

supplier's involvement in creating new products. This allows buyers to focus on the right suppliers and better focus their attention on important relationships. Price setting is another important aspect especially when involving suppliers in new product development. The costs can be unclear since the product still needs to be realized. There need to be clear agreements on what will determine the price so both parties know why a particular product is priced at a certain price. This to reduce conflicts which can hinder the relationship between the buyer and the supplier. This leads to the next element of profit sharing. Be clear about how cost reductions or larger profits are split, dependent on who introduces the innovation or who takes the investments. But besides profits this also includes risk sharing. Acknowledging a supplier's efforts and awarding them for it improves the relationship.

The activities mentioned above are done because the buyer has competitive priorities that can only be met through dramatic improvements in the suppliers' capabilities. Advantages are created for both sides. Some advantages are superior access to resources, decreased supply and inventory costs and development of unique process technologies (Jap, 1999, p. 466).

Some of the elements above are expected to be an outcome of the interviews and possibly this list will be extended. Another aspect this research wants to achieve is to see which of the activities that are done are the most important and which are easy or difficult to implement.

2.3 Social Capital Theory

For this part this paper will use the social capital theory as adapted by Carey et al. (2011, p. 277). Social Capital can be broadly defined which makes a single definition difficult due to its complexity. Although hard to define, it always refers to factors of effectively functioning social groups (Social capital, 2019). Interpersonal relationship is an important term in this theory and it mostly focusses on resources that are available to people and which can be used to reach a certain goal. A resource is 'a source or supply from which benefit is produced, typically of limited availability.' (Resource (disambiguation), 2019).

Carey et al. (2011, p. 279) stated that cognitive capital positively influences the level of relational capital between buyer and supplier, meaning that shared ambitions, goals, vision and values help foster trust, identification and obligation within the relationship.

Besides that, they state that structural capital, structurally embeds buying firms and their key suppliers, encouraging reciprocated communication and information sharing. Meaning that purchasing managers who spend the time and resources to foster structured social interactions with their key suppliers, may see improvements in these relationships in terms of increased mutual trust and higher levels of reciprocity.

Furthermore, they state that relational capital acts to mediate the relationship between cognitive capital and buying firm performance. Meaning that relational capital, and the trust, obligation and identification it embodies, is the means by which the intrinsic value of shared norms and values are translated into performance, measured in terms of product and process design, product quality, and new product development cycle times.

Lastly, they state that complementarity of contractual and relational methods of governance in driving improvements in performance. These results suggest that when buyers and suppliers have a relationship characterized by mutual trust and reciprocity, the formalization of expectations relating to operational requirements and protection of shared knowledge, will further help lower product cost and total cost, and drive improvements in products and processes.

More simplified this means the following: The more buyer and suppliers think, reason and relate to things in the same manner, the more trust there is between the buyer and supplier; The better the processes and tools are organized for social interaction with the supplier, the better the relationship will be in terms of trust and reciprocity; The image of the company based on reputation and relationships with stakeholders allows the values and norms of both companies to translate into better performance of the relationship between buyer and supplier; When high levels of trust are achieved, contracts can even improve the relationship between buyer and supplier.

3. METHODOLOGY

3.1 Qualitative Research - Interviews

The research design follows a qualitative approach using face-to-face interview with purchasers and salespersons. Approximately 40 interviews are conducted, and this data is used to come up to a list of the most important steps, activities or aspects that purchasers and salespersons perceive to be the most important for improving the relationship between buyer and supplier. The interview consists of seven subjects with one, two or three corresponding questions. The subjects are: positive episodes; attractiveness; satisfaction; preferred customer; regular activities; negative episodes and ease of implementation. The interviews are all held in English or German and with one or two interviewees present. Purchasers and salespersons from any industry and any company size are included. The two questions specifically for this paper that are asked to the purchasers and salespersons are listed below.

Q1: Which would be the five most important steps you recommend someone who wants to start a program to improve the relationship with suppliers?

Q2: What supplier-customer programs/activities to improve the relationship do you perceive to be easy and which are difficult to prepare, implement and/or perform?

The other interview questions for the purchaser and the salesperson set can be found in the appendix. Furthermore, the interviewees are asked to fill in a short survey about their customer/supplier management and general information to gain more insights. This information is used to see whether there is a difference between answers given by successful firms and the somewhat less successful firms in terms of supplier satisfaction. This survey can also be found in the appendix.

From literature and the first 10-20 interviews codes emerged that represent a certain topic. The rest of the interviews will then be split into paragraphs were interviewees talk about a certain step or activity and then it will be assigned to a topic to see what purchasers and salespersons in general find the most important steps to improve the relationship between buyer and supplier. In total there are ten codes which are: Communication; Inter-company teams/ (investment) support; Keep promises; Consistent/accurate demand; Potential; Reputation; Personal relationship; Timely payment; Long-term contracts; Connected IT-systems. All interview answers will be analysed manually and assigned to the topic which fits best to what the interviewee responded. The number of times a certain topic is mentioned to create an overall list containing the most important topics. For the ease of implementation there will also be a list which states the hardest and easiest activities to prepare/cooperate in according to the interviewees.

3.2 Technology Help

This paper also aims to explore and use new methods in qualitative research. Previously this was done manually by reading interview transcripts and coding them manually.

For this research, AmberScript, IBM Watson and Weka software will be used to test its potential. The results from these software's will be compared to the manual coding to see whether it corresponds, supplement or even gives different results. Via this the potential can be discussed for further research. The interviews are recorded and transcribed via AmberScript to create a text document. This text document is analysed via IBM Watson which will pick out important keywords. Watson's natural language tool detects words accommodated with a weight between 0 and 1 based on importance. Generally, numbers with a number below 0,5 can be perceived as not important. For all the data it creates a list of keywords ranking from most important to less important. The higher the weight is to 1, the higher the importance. It also gives a count which says how many times the word is being mentioned. The more it is mentioned by interviewees, the more important it is. This software is used since it should be able to give a more representative overview of keywords without bias. It may mark words as important that the researcher would deem is not important. For Weka the system needs to be trained. A sample of interview paragraphs will be assigned to a certain topic by the researcher and this file will be uploaded in Weka which will look for patterns that explain why a paragraph belongs to that topic. Weka can learn from this and when additional paragraphs are inserted without corresponding topics it should be able to appoint the right topic to it from which a list can be deducted with most mentioned topics. This software is used since it should save the researcher time. It does need to be coded and trained by the researcher, but when functioning as expected, it should analyse large amounts of data by itself within a very short time.

4. ANALYSIS OF OUTCOMES

4.1 Results of Manual Coding

In the table below the results are summarised. The results are based on 36 interviews in which all interviewees are asked the five most important steps for improving the relationship. The table contains all answers that were given by the interviewees.

Interview	Paragraph	Topic
1	1	Keep promises
	2	Personal relationship
	3	Potential
	4	Inter-company teams/(investment) support
	5	Inter-company teams/(investment) support
2	1	Personal relationship
	2	Keep promises
	3	Communication
	4	Inter-company teams/(investment) support
	5	Personal relationship
	6	Reputation
3	1	Inter-company teams/(investment) support
	2	Keep promises
	3	Communication
	4	Potential
4	1	Reputation
	2	Keep promises
	3	Potential
	4	Connected IT-systems
5	1	Keep promises
	2	Personal relationship
	3	Communication
	4	Inter-company teams/(investment) support
6	1	Potential
	2	Communication
	3	Personal relationship
7	1	Keep promises
8	1	Communication
	2	Reputation
	3	Timely payment
9	1	Consistent/accurate demand
	2	Communication
	3	Timely payment
10	1	Long term contracts
	2	Consistent/accurate demand
	3	Communication
	4	Inter-company teams/(investment) support
	5	Inter-company teams/(investment) support
11	1	Potential
	2	Personal relationship
	3	Timely payment
12	1	Communication
	2	Potential
13	1	Timely payment
	2	Potential
	3	Reputation
	4	Keep promises
14	1	Timely payment
	2	Potential
	3	Reputation
15	1	Timely payment
	2	Potential
	3	Reputation
	4	Personal relationship
16	1	Communication
	2	Inter-company teams/(investment) support
	3	Connected IT-systems
	4	Personal relationship
17	1	Communication
	2	Timely payment
18	1	Communication
	2	Keep promises
	3	Inter-company teams/(investment) support
	4	Personal relationship
19	1	Timely payment
	2	Communication
	3	Potential
20	1	Communication
21	1	Communication
22	1	Communication
	2	Timely payment
23	1	Personal relationship
	2	Reputation
24	1	Communication
25	1	Potential
26	1	Potential
	2	Reputation
	3	Inter-company teams/(investment) support

	4	Communication
27	1	Communication
28	1	Potential
	2	Communication
29	1	Communication
30	1	Keep promises
31	1	Personal relationship
32	1	Communication
	2	Potential
33	1	Consistent/accurate demand
34	1	Communication
35	1	Communication
	2	Personal relationship
36	1	Communication

Table 1: All interview results

The higher the count, the more important a topic is perceived by purchasers and salespersons. In the table below, the results can be seen of which topic was perceived as most important. The topics are ranked from high to low, meaning that the most important one is at the top.

Topic	Number of times mentioned
Communication	24
Potential	14
Personal relationship	12
Inter-company teams/ (investment) support	10
Keep promises	9
Timely payment	9
Reputation	8
Consistent/accurate demand	3
Connected IT-systems	2
Long-term contracts	1

Table 2: Results of manual analysis important topics

The top three topics will be discussed in more detail. As can be seen the most important one is having good communication which is mentioned 24 times. By good communication it is meant that there are clear contact persons who need to be addressed when certain issues may arise. It also means that customers provide feedback to their supplier(s) about the products which may be improved to be better adapted to the consumers' needs. Another important part is to make clear to the supplier what is exactly expected. This will lower the chance of getting the wrong products. Having good communication frequently makes sure that buyer and supplier stay on the same page which can prevent a lot of mistakes and burdens.

The second most mentioned topic is potential. This basically means that a customer can mean something for the supplier. Firms have to show the supplier that they have potential and that they can grow in the coming years so that this potential can be maintained. Potential can mean different things. For example, provide a lot of turnover but it can also be helping them with the

marketing by giving them credit or having a good research and development department which they could benefit from and which shows that the customer wants to innovate and grow. It can also mean that customers can open their products to new markets because of their location. This topic of potential is mentioned by the salesperson a lot.

The third most mentioned topic is personal relationship. This goes somewhat further than communication. Communication can be via e-mail or phone calls as well, but the personal relationship goes deeper. It is necessary to have face-to-face meetings and besides pure business; customers try to create a relationship with the supplier. When having a good relationship, customers (and suppliers) will more easily ask if everything is going well and if the supplier maybe needs help with anything. Suppliers appreciate that the customer takes the time for them and that they do not just try to squeeze them for the lowest price. In the end, business is a thing between (two) persons.

Below the results can be found from the ease of implementation. Unfortunately, less useful data was found for this from the interviews. For six of the topics data was found about ease of implementation. As done previously, the top three topics will be discussed in more detail.

Category	Times mentioned as easy or hard	
Communication	Hard	0
	Easy	4
Personal relationship	Hard	4
	Easy	1
Inter-company teams/ (investment) support	Hard	4
	Easy	0
Keeping promises	Hard	0
	Easy	1
Connected IT-systems	Hard	2
	Easy	0
Consistent/accurate demand	Hard	1
	Easy	0

Table 3: Results of manual analysis ease of implementation

The most important one, communication, was perceived to be easy because it can be just one e-mail of phone call away. It is not necessary to visit the supplier or vice versa which saves a lot of time. Given the fact that most interviewees deemed communication as important and easy it should be a good thing to have good and frequent communication.

It gets harder at the personal relationship. Of course, the supplier and the customer need to be physically together for face-to-face contact. This means that the buying firm has to invest time in it. Building up a personal relationship takes time is what is mentioned most by the interviewees. And since it sometimes is hard to get a good relationship when being a small customer, a lot of effort has to be devoted into this.

What is also perceived to be hard is the inter-company teams/(investment) support. This because it takes a lot of time and resources. Often, employees from the research and development department are needed rather than only purchasers. Since the research and development employees have other priorities than visiting suppliers it takes planning and effort to realize such a team whereas it is the purchasers' job to maintain

contact with suppliers. Besides time it also requires money and it needs to be negotiated how much money each party will devote to the development. These are all aspects that makes the joint development hard to realize, but wat is mentioned often is that, in the end, it pays off.

4.2 IBM Watson Natural Language Software Results

In the table below the results can be seen from Watsons' natural language software. On the left, keywords can be seen that Watson picked out of the interviews. The relevance shows how important it is, the closer to one, the more important. Values lower than 0.5 can be perceived as not important. The count stands for the number of times the specific keyword is mentioned, and the topic is added manually which will later be used to compare the results from Watson to the results of manual coding.

Keywords	Relevance	Count	Topic
personal relationship	0.6171	3	Personal relationship
good relationship	0.5959	3	Personal relationship
direct communication	0.5957	2	Communication
supplier make agreements	0.5830	1	Communication
be transparent	0.5757	1	Communication
clear agreements	0.5659	1	Communication
long term contracts	0.5626	1	Long term contracts
Information Technology	0.5514	2	Connected IT-systems
time pay	0.5503	1	Timely payment
technical support	0.5487	1	Inter-company teams/(investment) support
long term needs	0.5431	2	Potential
new product developments	0.5399	1	Inter-company teams/(investment) support
personal thing	0.5386	1	Personal relationship
transparent	0.5368	1	Communication
long term	0.5311	1	Potential
information exchange	0.5308	1	Communication
good reputation	0.5284	3	Reputation
clear communication	0.5274	1	Communication
face contact	0.5217	1	Personal relationship
development department	0.5204	1	Inter-company teams/(investment) support
good relationships	0.5174	2	Personal relationship

reliable economic situation	0.5172	1	Potential
personal relationships	0.5165	1	Personal relationship
investment support	0.5155	1	Inter-company teams/(investment) support
reliable operational systems	0.5152	1	Potential
good quality	0.5146	1	Potential
consistent demand	0.5144	2	Consistent/accurate demand
new products	0.5142	1	Inter-company teams/(investment) support

Table 4: Result of Watsons' keyword analysis

For this analysis the five most important topics according to Watson will be discussed in more detail. The most important keyword according to Watson is personal relationship. The second keyword is good relationship which comes down to the same thing. If the plural personal relationships and good relationship is also included together with the other keywords fitting to the topic of personal relationship it has the highest relevance and the highest count which is 11. The second group of important keywords all belong to the topic of communication which means that they have the second highest relevance and a combined total count of 8. Watson states that the third most important topic is long term contracts which is solely based on its importance since it is just counted once. The fourth topic is connected IT-systems. It has a somewhat average importance and the word is counted twice in the interviews. The fifth and last topic is about timely payment which is similar to the IT-systems in the sense of relevance, but it is only counted once by Watson.

Since there is an expected difference between the more successful companies and unsuccessful companies in the sense of supplier satisfaction the interviews will be divided in two parts to create two distinct lists of keywords to see if there are differences. These results can be found in the two tables below.

Keywords successful	Relevance	Count
personal relationship	0.6852	4
development department	0.6205	1
good relationship	0.6174	3
Information Technology	0.6163	4
supplier make agreements	0.6148	1
exchange of market information	0.5752	1
long term contracts	0.5560	1
information exchange	0.5538	2
technical support	0.5500	1
direct communication	0.5409	3
improvement processes	0.5345	1
personal relationships	0.5341	3
joint developments	0.5320	2
joint development	0.5309	1
reliable economic situation	0.5214	1

	0.5199	1
constant process improvement department	0.5199	1
good reputation	0.5170	3
growth potential	0.5155	1
investment support	0.5140	1
new market development	0.5128	1
clear agreements	0.5127	1

Table 5: Results Watson successful companies

Keywords unsuccessful	Relevance	Count
good relationships	0.6094	1
new product developments	0.5841	1
important clear agreements	0.5710	1
consistent demand	0.5488	2
good communication	0.5486	1
open communication	0.5398	1
good quality	0.5353	1
communication	0.5325	4
Constant communication	0.5312	1
good supply relationship management	0.5304	1
factory visits	0.5277	1
respectful communication thing	0.5219	1
lot of communications	0.5195	1
face contact	0.5191	1
good information flow	0.5187	1
operational excellence	0.5187	1
joint teams	0.5186	1
good relationship	0.5181	2
fair way	0.5173	1
personal meetings	0.5161	1
sustainable growth	0.5158	1
regular information exchange	0.5156	1
good price	0.5152	1
long term relationship	0.5130	1

Table 6: Results Watson unsuccessful companies

Both tables show that the relationship is an important thing since it is placed at the top for both type of companies, although Watson gives a higher importance to the keyword for the successful companies. However, the term is mentioned more often for the unsuccessful companies. Also, in terms of reputation and potential both tables show similar results. However, there are some differences. The most striking one is about the inter-company teams / (investment) support. This topic is mentioned 6 times in the table for the successful companies but only 1 time in the unsuccessful table which may imply that companies who do this have a higher chance of being successful in their relationship with the supplier. What can also be seen is that communication is mentioned a lot by both company types, but the successful companies mention this 8 times whereas the unsuccessful companies mention this 12 times. This can mean that they focus more on communication than they might should

do. From this comparison it can be concluded that there is a small difference between successful and unsuccessful companies, but it does seem that unsuccessful companies spend too less time on setting up inter-company teams and providing support to their supplier, either financially or technological. Also, the importance for the successful companies table is in general higher which implies that their claims are more representative.

4.3 Results from Weka Software

Weka is a supervised machine learning software. It can be used to replace manual analysis. Own codes/topics have to be created beforehand but after training Weka, it could save time by assigning topics to certain texts itself. To train Weka, the first 50 interview paragraphs with the topic will be uploaded in the program so it can learn why a certain paragraph belongs to a topic. For this training set of 50 paragraphs, Weka runs an analysis and looks for patterns and it tries to learn assigning the right topics to the interviews based on the 50 cases that are given as input. After that, the test set is uploaded which includes paragraph 51 to 70 without an assigned topic to test the accuracy of Weka. It should assign the right topic to the paragraph. The results are listed in the table below.

Paragraph	Actual	Predicted	Error prediction
51	F	E	1
52	G	H	1
53	A	H	0.874
54	B	H	0.744
55	J	C	0.884
56	G	E	0.972
57	A	C	0.97
58	A	H	0.991
59	C	H	0.984
60	B	C	0.92
61	G	A	1
62	H	F	1
63	A	C	1
64	E	H	0.98
65	A	H	0.935
66	A	A	0.994
67	A	A	1
68	H	A	0.869
69	G	H	0.985
70	F	H	1

Table 7: Results from Weka analysis

The predicted column shows what topic Weka had assigned to an interview paragraph. The error prediction shows how certain Weka is that it assigned the right topic to the paragraph. As can be seen in the table, only 2 out of 20 times the prediction was right at case 66 and 67. This comes down to a success rate of 10% which is very low. For this research Weka proves to be not applicable since it has very low reliability. This is because the interview paragraphs combined with the large number of categories are too complex for Weka with this number of pre-defined samples. It needs much more samples to learn correctly and to be able to predict correctly.

4.4 Comparison of Results Between Manual and Software Analysis

First, the manual coding will be compared to Watson's analysis using table 3. The manual analysis stated that the most important topic was communication which was mentioned 24 times although Watson ranked this as second with only 8 counts.

After that, potential was seen as the second important topic in the manual analysis. Watson places its importance a bit lower and counted it 6 times which is only half of what the manual analysis found. As third, there is personal relationship with a count of 12. Although Watson claims that this is the most important topic it does count the word 11 times which comes very close to the manual analysis. Inter-company teams are fourth and the manual analysis shows it is mentioned 10 times. Here again, Watson was only able to define half of them in the text. This almost goes the same for the other keywords excluding connected IT-systems, long-term contracts and consistent/accurate demand. For the first two the count is the same as for the manual analysis, but the importance given by Watson is too high. Only for consistent/accurate demand the findings from Watson correspond with the manual findings.

In conclusion, Watson missed a lot of keywords that were found in the manual analysis. It did however find that communication and personal relationship are two important topics which is also found in the manual analysis. Apart from that, only the consistent/accurate demand corresponds with the manual results leaving the rest of the keywords and topics wrongly predicted.

The comparison to Weka can be identified with more simplicity. It simply assigned only 2 out of 20 topics to the same category as was done with the manual analysis. So, Weka mostly fails to identify the right topics for the given paragraph. Table 6 contains the full information about actual topics as identified by the manual analysis and the predicted topics by Weka.

5. CONCLUSIONS

5.1 Conclusion About the Content

The top 5 steps for improving the relationship are visualized in the table below.

Top 5 steps for improving the relationship
Communication
Potential
Personal relationship
Inter-company teams/ (investment) support
Keep promises

Table 8: Top 5 steps to do for improving the relationship

As became clear from the manual data, the most important steps to improve the relationship with the supplier is to first have a good communication. The customer should provide information to the supplier about the industry, consumer needs and new development. Keeping them up-to-date constantly can prevent mistakes and allow for opportunities to arise. This topic is supported by Watson's analysis which also places a high importance on communication.

The second step is that customers need to show the suppliers what potential they have or, with other words, showing what they can mean f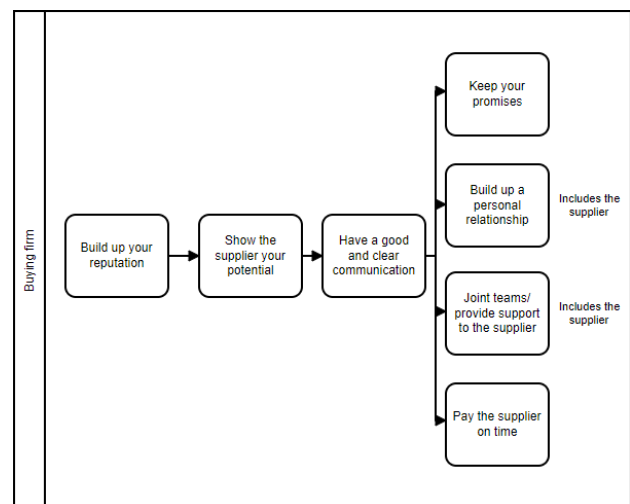or them. Suppliers want to see that customers are growing every year since that also brings benefits to them. Keep innovating and improving products to cut costs or gain more simplicity. The simpler the product, the easier the supplier can produce it. So, make sure that the supplier is aware of the customers potential and that this is being showed to them.

The third step is building up a personal relationship. This goes further than communicating. Face-to-face contact has to be maintained and the supplier has to be visited multiple times a year to build up and maintain a personal relationship. A good personal relationship also allows for smoother communication and more willingness on both sides to help the other with developing new products or improving the current products. It also increases the chance that the supplier will share more private information with the buyer that can help both sides.

The fourth step is inter-company teams/ (investment) support. Nowadays more companies collaborate with their supplier in new product development. This can create advantages for both sides since they all have their own expertise. Suppliers show their costs to the buying company and together they look on how to cut costs rather than just ask for a 2% price reduction every year. Joint development can result in better and simpler products and it can cut costs which both sides benefit from.

The fifth step is about keeping promises. This seems quite straightforward, but it can deteriorate the relationship significantly when failing to keep promises. Always inform suppliers in time if something could possibly go wrong which will affect the agreements that are made like a wrong forecast. Always be realistic when making agreements and do no try to collaborate in unrealistic agreements to satisfy the supplier because in the end this will not help but deteriorate the relationship.

To increase understanding of what actions to take and which actions precede the other, the top seven results from the manual analysis are visualized in a process model (steps 8 to 10 are left out because of low count).

Figure 2: Process model of results from manual analysis

The seven steps can be seen in the model. The steps are placed in time-logical order meaning that the first step has to be satisfied in order to proceed with the next step. After implementing good and clear communication, all other steps can be taken simultaneously. The two steps in the middle state that they include the supplier. This means that this step cannot be taken only by the buying firm, but they will also need the supplier to be cooperative in order to successfully implement the step. This makes it harder and it will cost more time. Nevertheless, they are important steps for improving the relationship with the supplier.

As mentioned in the beginning of this paper, the process of becoming a preferred customer of the supplier can be divided in three elements. These are attractiveness, satisfaction and the preferred customer status. This can also be seen in the figure above. The first steps are about attractiveness, namely, reputation and potential. Then supplier satisfaction, good communication often is done with multiple suppliers. Then the steps are more focused on one specific supplier such as joint teams which are very specific.

5.2 Conclusions About the Method

The first software that is used is AmberScript. A voice file is uploaded into the software and it translates this file into a text file including which person said what, so it also needs to know how many persons are speaking. The text output result was very good. The text was adjusted with the original voice file for comparison to see how correct it was and most of the times it picked the correct word. When it didn't pick the correct word, it was often that the word that was said was pronounced unclear or sounded a lot like another word. In general, AmberScript is very useful for transcribing interviews since it is correct most of the time and it saves the researcher a lot of time.

Using new methods in qualitative research seems to be unsuccessful for now. Watsons' natural language software can be useful but only when interviewees describe certain topics with exactly the same keywords. Watson is then better able to provide representative counts and importance. Then, a useful list can be created for the results. However, interviewees often do not provide the exact same keywords. When still preferring to use Watson for analysing interviews, the transcripts should be adapted manually by the researcher to use the exact same keywords instead of the original text when the interviewees talk about the same thing. This will cost a lot of time and that would make Watson less useful since manual analysis of the data has to be performed anyway. So, the problem with Watson is that it cannot handle variability or synonyms very well which leads to an unrepresentative outcome.

Weka also proved to be not useful for this qualitative research. The problem is that Weka needs a lot of data to be able to learn in a correct way. This means that a lot of interviews have to be conducted. Weka probably needs a few hundred cases of each topic to be representative. The more topics, the more training data is needed. Weka is more useful when only 2 categories are used since it can learn more easily, and it has less chance of predicting a wrong topic. Weka can be useful for interviews but only when there is a large amount of training data per topic. It already proved to be good software for more simpler cases with only two topics and more training data.

In conclusion, the new methods for analysing the results have some potential, but they either need to be improved to become "smarter" or they need more pre-defined data. But, the AmberScript software proved to be very useful.

6. ACKNOWLEDGMENTS

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8. APPENDIX

8.1 Purchaser Interview

Q1	Positive episodes	Are there specific events/ episodes that contributed positively to the relationship with your customer(s)?		
Q2	Attractiveness	Let's systematically look at buyer-supplier relationships. The start: What factors had influence on you building up a relationship with a particular customer in the first place (attractiveness = before the start)?	How do you identify (new) customer(s) / How do you come to know about them?	Do you classify customers? If so, how?
Q3	Satisfaction	What did your customer do in his firm to increase your satisfaction (i.e. during the ongoing relationship once it is established)? What did your customers do internally (e.g. in their processes) or externally (involving you)?	How do your customers identify what you as supplier expect most from the relationship with them?	Does any of them measure supplier satisfaction (i.e. how satisfied you are with the relationship to your customer(s))? How do they do?
Q4	Preferred customer	Imagine your having several customers to serve with the same good/capacity, who gets the delivery first? It is the preferred customer. What did your customers do in to become your "preferred customer" and outperform other customers?	What do they do to stay preferred customers?	What are suppliers that are far away doing differently than the ones closeby?
Q5	Regular activities	What specific periodic/ regular activities do your customers organize to improve their standing with you?	E.g. Supplier day, supplier club, any upstream marketing applications, awards/ certificates, supplier development, yearly communication, innovation sharing	
Q6	Negative episodes	What should buying firms generally avoid in order not to annoy their supplier? Have there been actions from your customers which have negatively impacted your relationship with them?	In case in your firm different people have contact relationships with the same customer, how does one negative relationship of someone from your company affected the overall relationships with the same customer?	How did you fix negative impacts on the relationship?
Q7	Ease of implementation	To conclude: Which would be the five most important steps you recommend customers who want to start a programme to improve their standing with you as a supplier?	What supplier-customer activities/programs that your customers organize are easy to cooperate in and which are difficult to cooperate in? Think in the sense of time, resources and/or preparation it requires.	

8.2 Sales Interview

Q1	Positive episodes	Are there specific events/ episodes that contributed positively to the relationship with your supplier(s)?		
Q2	Attractiveness	Let's systematically look at buyer-supplier relationships. The start: What factors had influence on the supplier building up a relationship with your company at first hand (attractiveness = before the start)?	How do you identify (new) suppliers / how they came to know about you?	
Q3	Satisfaction	What did you do in your firm to increase supplier satisfaction (i.e. during the ongoing relationship once it is established)? Inernally and externally?	How do you identify what your suppliers expect most from the relationship with your firm?	Do you measure supplier satisfaction? How?
Q4	Preferred customer	Imagine your supplier having several customers to serve, who gets the delivery first? It is the preferred customer. What did you do in your firm to become a preferred customer and outperform other customers?	What do you do to stay preferred customer?	What are you doing differently to address far away suppliers, i.e. to be a preferred customer with those suppliers located in distante countries?
Q5	Regular activities	What specific periodic/ regular activities is your company engaged in to improve your standing with your suppliers?	E.g. Supplier day, supplier club, any upstream marketing applications, awards/ certificates, supplier development, yearly communication, innovation sharing	
Q6	Negative episodes	What should generally be avoided in order not to anoy the supplier? Have there been actions from your firm which have negatively impacted your relationship with (specific) suppliers?	In case in your firm different people have contact relationships with the same supplier, how does one negative relationship of someone from your company affected the overall relationships with the same supplier?	How did you fix negative impacts on the relationship?
Q7	Ease of implementation	To conlcude: Which would be the five most important steps you recommend someone who want to start a programme to improve standing with suppliers?	What supplier-customer programmes/activities to improve the relationship do you perceive to be easy and which are difficult to prepare, implement and/or perform?	

8.3 Purchaser Survey

Supplier Satisfaction

Most of our suppliers...	1	2	3	4	5 (very much agree)
...are very satisfied with the overall relationship to us					
...are very pleased to have us as their business partner					
...if they had to do it all over again, would still choose to serve us as customer					
...do not regret the decision to do business with us					

Preferred Customer Status

Compared to other customers in our suppliers's customer base, on average...	1	2	3	4	5 (very much agree)
... we are their preferred customer					
... they care more for us					
... we receive preferential treatment					
... our suppliers go out on a limb for us					
... our suppliers' employees prefer collaborating with us to collaborating with other customers					

Status

In the view of our suppliers, our firm...	1	2	3	4	5 (very much agree)
...has a high status					
...is admired by others					
...has a high prestige					
...is highly regarded by others					

Success of supplier management

	1	2	3	4	5 (very much agree)
Our supplier management is better than that of our competitors.					
Overall, we are satisfied with our supplier management					
In recent years, we were able to minimize supplier dissatisfaction					
In recent years, we improved our supplier management more than our competitors did					

General information

Annual Turnover (in €). (When you belong to a firm-group, please provide the details of your firm branch!)	
Number of employees	
Ownership (private, public)	
What is your position in the company?	
Since how many years you are in purchasing with your company?	

Please chose your firm's ecl@ss classification from the following list:
(For more information to determine your ecl@ss please visit http://www.eclasscontent.com)

13 Development (Service)	30 Auxiliary supply, additive, cleaning agent
14 Logistics (Service)	31 Polymer
15 Maintenance (Service)	32 Laboratory material, Laboratory technology
16 Food, beverage, tobacco	33 Installation (complete)
17 Machine. device (for special application)	34 Medical Device
18 Equipment f.mining, metallurgical plant, rolling mill a.foundry	35 Semifinished product, material
19 Information, communication and media technology	36 Machine, apparatus
20 Packing material	37 Industrial piping
21 Manufacturing facility, workshop equipment,	38 Inorganic Chemical
22 Construction technology	39 Organic Chemical
23 Machine element, fixing mounting	40 Occupational safety, accident prevention
24 Office product, facility and technic, papeterie	41 Marketing
25 General Service	42 In-vitro diagnostic
26 Energy, extraction product, secondary raw material and residue	43 Optics
27 Electric engineering, automation, process control engineering	44 Motorvehlice
28 Automotive technology	45 Human and veterinary drug, pesticide as well as active ingredient
29 Home economics, Home technology	46 Clothing and textile
	47 Body care and personal hygiene
	48 Sport, playing, leisure
	49 Public safety and military technology
	90 Interim class (mix)

Many thanks for collaborating!

8.4 Sales Survey

Satisfaction with customers

With most of our customers...	1	2	3	4	5 (very much agree)
...we are very satisfied with the overall relationship to us					
...we are very pleased to have them as our business partners					
...if we had to do it all over again, would still choose to serve them as supplier					
...we do not regret the decision to do business with them					

Preferred Customer Status

Compared to other customers in our suppliers's customer base, some...	1	2	3	4	5 (very much agree)
... are our preferred customer					
... we care more for them					
... receive preferential treatment from us					
... we go out on a limb for them					
... our employees prefer collaborating with them to collaborating with other customers					

Status

In the view of our customers, our firm...	1	2	3	4	5 (very much agree)
...has a high status					
...is admired by others					
...has a high prestige					
...is highly regarded by others					

Success of customer relationship management

	1	2	3	4	5 (very much agree)
Our customer management is better than that of our competitors.					
Overall, we are satisfied with our customer management					
In recent years, we were able to minimize customer dissatisfaction					
In recent years, we improved our customer management more than our competitors did					

General information

Annual Turnover (in €). (When you belong to a firm-group, please provide the details of your firm branch!)	
Number of employees	
Ownership (private, public)	
What is your position in the company?	
Since how many years you are in sales with your company?	

Please chose your firm's ecl@ss classification from the following list:
(For more information to determine your ecl@ss please visit http://www.eclasscontent.com)

13 Development (Service)	30 Auxiliary supply, additive, cleaning agent
14 Logistics (Service)	31 Polymer
15 Maintenance (Service)	32 Laboratory material, Laboratory technology
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19 Information, communication and media technology	36 Machine, apparatus
20 Packing material	37 Industrial piping
21 Manufacturing facility, workshop equipment,	38 Inorganic Chemical
22 Construction technology	39 Organic Chemical
23 Machine element, fixing mounting	40 Occupational safety, accident prevention
24 Office product, facility and technic, papeterie	41 Marketing
25 General Service	42 In-vitro diagnostic
26 Energy, extraction product, secondary raw material and residue	43 Optics
	44 Motorvehlice
27 Electric engineering, automation, process control engineering	45 Human and veterinary drug, pesticide as well as active ingredient
28 Automotive technology	46 Clothing and textile
29 Home economics, Home technology	47 Body care and personal hygiene
	48 Sport, playing, leisure
	49 Public safety and military technology
	90 Interim class (mix)

Many thanks for collaborating!