Developing sustainable value propositions in industrial markets – a case study.

Proposal for a work-in-progress paper in IMP 2012 conference, Rome, Italy

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ABSTRACT

This study examines the role of sustainability in customer value propositions in industrial markets. Building on the existing knowledge of customer value propositions, we will examine the role of sustainability in the value propositions and examine two life cycle tools that can be used to verify sustainability arguments. We explore this further with a case study of an industrial technology supplier, giving an example of a sustainable value proposition and descriptions of its value creation mechanisms. We also use a systematic combining approach to link existing knowledge on customer value propositions with the insights gained from the case study to describe the process of developing a sustainable value proposition.

Keywords: Customer value proposition, sustainability, life cycle assessment, life cycle profit assessment

PAPER TYPE

Work-in-progress

INTRODUCTION

Sustainability has become increasingly important in marketing, as evidenced by the growing popularity of "green marketing", i.e. companies using a marketing messages that emphasizes the environmentally-safe aspects of their offerings. Sustainability is widely seen as a new strategic imperative (Porter & Reinhardt, 2007; Kotler, 2011) and source of competitive advantage (Berns et al., 2009), but to successfully leverage sustainability in their marketing messages, companies need to verify their arguments and provide proof of their environmental claims (Parguel, Benoit-Moreau, & Larceneux, 2011). One way to do this is by developing sustainable customer value propositions that quantify the benefits of the supplier's offering (Anderson et al. 2006; Ballantyne et al., 2011). Typically, customer value propositions express the functional benefits of the supplier´s offering in economic terms (Anderson et al., 2006; Rintamäki et al., 2007), but while environmental and social impacts have an increasing effect on customer value propositions (Kowalkowski, 2011), their economic impact is often difficult to quantify.

Sustainable life cycle tools have been utilized to quantify environmental impacts in consumer markets (Harris 2007), but research on their role in industrial markets is more limited. Although sustainability plays an increasingly important role for firms operating in industrial markets (c.f. Porter & van der Linde, 1995; Porter, 2007; Nidumolu, Prahalad & Rangaswami 2011), prior research has not addressed the use of environmental and social benefits in developing customer value propositions. The present study examines the role of sustainability in customer value propositions industrial markets and in particular, what kind of tools could be utilized to develop sustainable value propositions. Specifically, we address the following research questions: First, what elements can a sustainable value proposition in industrial markets include? Second, how are sustainable value propositions developed in practice?

We answer these questions by integrating literature on sustainability and customer value propositions in industrial markets, and by illustrating the benefits of using sustainable life cycle tools through a single case study involving an industrial technology supplier. This research contributes to the literature on customer value propositions in industrial markets by examining the tools that industrial suppliers can use to verify and communicate their sustainable value. While the importance of sustainability is increasingly recognized, there exists a relatively small amount of research on tools that industrials supplier can use to verify their sustainability arguments. This research also contributes to the literature on life cycle assessment and life cycle profit assessment by providing a case example of how the tools can be utilized for marketing.

LITERATURE REVIEW

CUSTOMER VALUE PROPOSITIONS IN INDUSTRIAL MARKETING

The understanding of customer value is considered a key competitive advantage for industrial firms (Woodruff, 1997; Ulaga & Eggert, 2006), and it can be leveraged by developing distinctive customer value propositions that communicate the value that a firm provides to its customers (Anderson et al., 2006). Conventionally, customer value propositions have been defined as statements of benefits offered to a customer (Lanning & Michaels, 1988). Rintamäki et al. (2007) suggest that customer value propositions can be build around

economic, functional, emotional or symbolic benefits, and Anderson et al. (2006) identify three kinds of customer value propositions: all benefits, favorable points of difference, and resonating focus. In order to develop convincing customer value propositions, suppliers should quantify the benefits their offering will deliver (Töytäri et al., 2011). Recently, the discussion has shifted from emphasizing unidirectional value communication towards reciprocal value propositions (Ballantyne et al., 2011; Truong et al., 2012), where the supplier and the customer actively engage in developing customer value propositions together (e.g. Prahalad & Ramaswamy, 2004; Payne et al., 2008; Ballantyne et al., 2011). This line of thinking emphasizes the importance of a broader set of stakeholders, including non-customer stakeholders, (Frow & Payne, 2011), and is particularly relevant in the context of complex and service-intensive offerings, which usually involve multiple stakeholders (Cova & Salle, 2008; Ballantyne et al., 2011).

However, despite the recent developments in customer value proposition research (e.g. Ballantyne et al., 2011; Frow and Payne, 2011; Truong et al., 2012), scholars have pointed out that major gaps still exist in the literature. First, more research is needed to explore how companies develop customer value propositions in practice (Ballantyne et al., 2011; Frow and Payne, 2011). Second, although environmental factors have direct and indirect effects on customer value propositions (Kowalkowski, 2011), and there is a need to study how firms can communicate knowledge about evolving business conditions, opportunities and constraints to a wider stakeholder network (Ballantyne et al. 2011); prior research has not addressed the use of environmental benefits in developing customer value propositions. Environmental arguments play an increasingly important role in developing distinctive and sustainable customer value propositions due to various drivers from the buyer's side, such as personal values, internal and external communications value and stakeholder pressures (Drumwright 1994; Kotler 2011). In the following, we review the literature on sustainable life-cycle tools and consider how they could be utilized to develop convincing customer value propositions.

SUSTAINABLE LIFE CYCLE TOOLS

Sustainability is increasingly becoming a driver of competitiveness for the firm. Porter & van der Linde hypothesized in their 1995 study that tight environmental regulation can foster innovations and more efficient resource usage, leading to a win-win situation for both the firm and the environment (Porter & van der Linde, 1995). The effects of environmental megatrends such as climate change are also increasingly viewed through a strategic lens rather than the more traditional corporate social responsibility view, as the effects of such trends get increasingly tangible and present real threats to firm's operations (Porter, 2007). The road to moving towards more sustainable business practices calls for new competencies from firms, with systematic tools needed for inventorying the impacts of the firm's operations and offerings have on the environment and removing inefficiencies in the processes. (Nidumolu et al., 2011; Porter & van der Linde, 1995).

The studies on sustainability in marketing have conventionally focused on consumer marketing, studying how firm's can increase their market share by capturing the attention of environmentally and socially conscious consumers. (e.g. Peattie & Crane, 2005; Polonsky, 2011) The key factor determining the success of a firm's sustainability marketing activities has been found to be the adoption of a holistic view on sustainability (Polonsky & Rosenberger, 2001); since more opportunistic approaches or purely environmental approaches have often resulted in a backlash (Peattie & Crane, 2005). Thus from a marketer's point of view a vital point is verifying both the value provided for the environment and society as well

as the value for the customer, to avoid these pitfalls. A concept that has gained popularity in measuring sustainable value is the triple-bottom line approach, where the total value created is divided into economic, environmental and social dimensions. (Elkington 1999) The triple-bottom line approach is recognized in the guidelines for the global reporting initiative (GRI), a framework for promoting sustainable development that has gained widespread usage around the world (GRI 2011). While the triple-bottom line approach has gained recognition by businesses and media, academic interest in it has been small and its guidelines have been lacking in substance (Tullberg 2012). We will next examine two sustainable life cycle tools that can be to identify and verify the sustainable value provided to the customer: life cycle assessment (LCA) and life cycle profit assessment (LCP).

LCA is a systematic method that examines the material flows related to a product system, and it considers a wide scope of effects related to the natural environment, human health and resource usage, and aims to determine environmental impacts and the life cycle phases most relevant to them (Soukka 2007; Rebitzer, et al. 2004). The comprehensive scope of the LCA is useful in order to avoid shifting problems from one phase of the system´s life-cycle to another. (Finnveden, et al, 2009) The basic LCA process framework is provided by the international standards ISO 14040 and ISO 14044. The LCA process always starts with defining the goal and scope of the study, depending on the intended use of the study results. LCA studies can differ considerably depending on the goal. (SFS, 2006) The goal of the study determines the unit processes that will be included in the study and the system limits, and this can have significant impacts on the cost of the study project. (Soukka R. , 2007)

The main uses of LCA studies are identifying opportunities to improve environmental performance at various points of the life-cycle of a product, informing decision-makers and other relevant organizations (for purposes such as strategic planning, setting priorities or product design) and the selection of relevant indicators of environmental performance and marketing activities such as backing up an environmental claim. (SFS, 2006)

The basic philosophy of life cycle profit analysis (LCP) is presented in Figure 1. The topmost horizontal line in the figure represents the theoretical maximum value of production for a production line. But since there is always some amount of production lost due to unplanned downtime, decreased process performance or quality losses, the value of production is always less than 100% of the theoretical maximum. The eye-shaped part in the middle of the figure represents the differences between the revenues and costs incurred during the life cycle, or life cycle profits. (SCEMM, 1996)

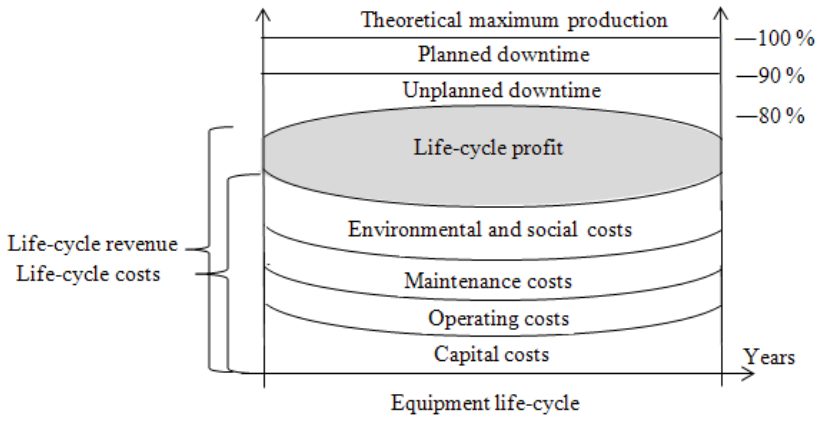

Figure 1: The philosophy of Life cycle profit, adapted from (SCEMM, 1996)

The profit analysis in LCP is based on overall equipment effectiveness (OEE) –analysis, which calculates the overall performance of a process based on three factors: availability, performance and quality. *Availability* refers to the amount of time that a production line is in use, compared to the amount of time that was planned. Various factors can affect downtime such as scheduled preventive maintenance or breakdown maintenance caused by a malfunction. *Performance rate* is related to the production speed of the line, compared to the maximum speed attainable. Process disturbances can also cause slowed speed of production in the case that they don't cause actual downtime. Process disturbances can also cause losses in the desired quality of the end product. The *quality rate* is the ratio quantity of production that fulfills the quality criteria to the total quantity of production. The *cost factors* in the LCP model include operational costs such as labor, energy and raw materials; maintenance costs related to spare parts and labor, capital costs, as well as environmental and social costs.

A LCP assessment gives the supplier and customer companies a better view of the process as a whole, so opportunities for improvement are recognized more easily. It also improves the users' readiness to identify and react to problems in the process. Users can also utilize the LCP information in designing and sizing their operational and maintenance organizations. (SCEMM, 1996)

Figure 2 summarizes the concepts examined in the literature review. The existing theoretical knowledge on value propositions has not addressed environmental and social impacts which are increasingly affecting the operations of industrial companies. To improve their sustainability, new value drivers need to be considered by industrial suppliers that want to remain competitive in the future. Their customers can receive pressures from end-consumers as well as their stakeholder network to improve the legitimacy of their operations. Verifying and documenting environmental and social impacts play can play a large role in this, but to do that suppliers need a different kind of expertise than traditional value assessment practices require. We suggest the life cycle tools examined here can provide the necessary information to address environmental and social impacts in developing value propositions. We examine this further through a case study of an industrial supplier of technological solutions to the mining and metallurgical industries.

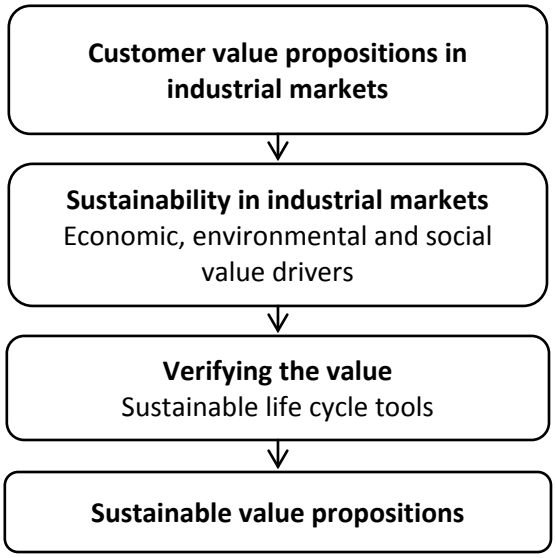

Figure 2: Conceptual framework

RESEARCH DESIGN

Given the explorative nature of our study, we adopted a single case study research method (Eisenhardt & Graebner, 2007; Yin, 2009), which is suitable for building new theory, and examining a novel or complex phenomenon (Eisenhardt, 1989; Johnston, Leach, & Liu, 1999). In addition, a single case study allows us to gain a deep understanding of the multiple aspects involved in using the identified life cycle tools in industrial markets (Eisenhardt & Graebner, 2007). Similar to Matthyssens & Vandenbempt (2009) and Aarikka-Stenroos & Jaakkola (2011), instead of a strictly inductive logic, we used a systematic combining approach to search emerging themes from the empirical data. In practice, we build on the existing literature on customer value propositions and sustainability to generate an understanding on how sustainable value propositions can be developed. At the same time, our empirical data provided the in-depth information on sustainability arguments in industrial markets and how they can be incorcorated in the value proposition in practice. The result was an iterative process where the theoretical framework and the case value proposition were developed concurrently, as pictured in Figure 3.

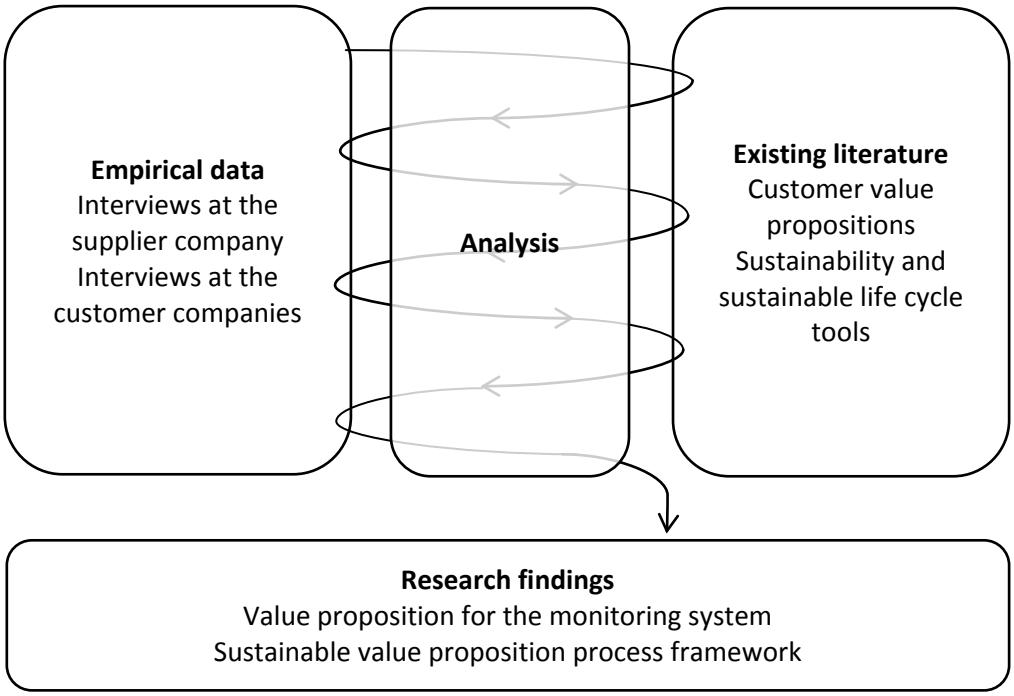

Figure 3: Research process

The selected case company is a global supplier of technology solutions for minerals and metals processing, with a key emphasis on the sustainable use of resources in these sectors. The company also provides solutions for the chemical industry, industrial water treatment and utilization of alternative energy resources. The present study is focused on a monitoring system designed to enhance process efficiency in an electrolytic copper refining process, with application also for nickel and zinc refining. This particular offering was selected because it involves new technology and provides various benefits related to process efficiency.

The empirical data was obtained through 12 expert interviews conducted at the supplier company, and seven expert interviews conducted at two different customer companies. All the respondents had experience with the monitoring system in their respective roles. The respondents were chosen on the basis of their experience with the case product, and chosen from various different backgrounds to give a comprehensive view of the benefits of the system and how they are valued. The interviews were semi-structured and included a number of themes relevant to the research areas. The main themes of the interviews were the economic, environmental and social benefits of the monitoring system and how those benefits can be verified. The interviews at the supplier company were conducted first, and the knowledge gained from these interviews was combined with previous theoretical knowledge to design the interview form for the customers. This dyadic information allows us gain rich insights relating to process of developing the value proposition. The details of the empirical data set are provided in Table 1.

Firm	Description	Respondents	Duration of the interviews
Supplier	Manufacturer of the monitoring system	12 respondents- divisional directors, product managers, sales managers and technical experts	50 minutes - 2 hours and minutes
Customer A	The first full customer of the system. Partly involved in co-development	6 respondents- research director, 2 operative managers and 3 operative personnel	15 minutes - 40 minutes
Customer B	First instance of applying the system to nickel refining. Currently has a test installation and considering a full installation	1 respondent- research engineer in charge of the installation project	40 minutes

Table 1: Empirical data of the study

All the interviews were recorded and transcribed. The analysis of the interviews was done using NVivo 9 -software package for qualitative analysis. The transcribed interview data was initially coded deductively according to the understanding on sustainable value propositions gained from the literature review. Secondly, to gain more detailed information, such as specific elements of the value proposition, inductive in-vivo coding was used. As the first interviews conducted at the supplier company were analyzed, a first iteration of the sustainable value proposition was developed. This was then further refined through the interviews conducted at the customer companies. The entire abductive process allowed to gain an understanding of what steps are needed in a process to develop a sustainable value proposition.

RESEARCH FINDINGS

The findings from the interaction between previous theoretical knowledge and the analysis empirical data gathered for this research are twofold. First, we will analyze the specific elements of the sustainable value proposition, i.e the benefits provided by the system and their

value creating mechanisms. Secondly, we will describe the process of creating the sustainable value proposition that emerged from the systematic combining research process.

DESCRIPTION OF THE VALUE CREATION MECHANISMS

The monitoring system affects the customer's electrolysis process in two main ways. Firstly, it speeds up the removal of efficiency-decreasing short circuits from the process. The removal of short circuits is done manually by the plant operators who have to continuously monitor the different sections of the plant for short circuits. The monitoring system makes the short circuits easier to detect and faster to remove. Secondly, the system provides continuous real-time process data which can be utilized to further develop the efficiency of the process. These two features provide value through mechanisms listed in Table 2: .

Value dimension	**Value creation mechanism**	**Case example**			
		Benefits	**Illustrative quote**	**Value indicator**	**Value estimate**
Economic	Improving the efficiency of the process	Faster process start-up after downtime improves the time efficiency of production	”We can also speed up the start-up of the process after downtime, increasing the time efficiency.” -Manager, Service product engineering, supplier	LCP, availability	57 000 € / year
		Increased current efficiency improves the performance of production	”I see the main benefit of the system to be the improved current efficiency that is obtained through faster removal of process disturbances.” -Project manager, supplier	LCP, performance	760 000 € / year
		Decreased short circuiting improves the average quality of production	”Improving the current efficiency also improves the average quality of production.” -Operational manager, customer A	LCP, quality	204 000 € / year
Environmental	Public image value of decreased environmental impacts	Decreased overall carbon footprint through improved efficiency	”We want to keep environmentalism in our company image, to show that we are doing all we can to reduce environmental impacts. Efficiency-improving products like this are part of that image.” -Sales manager, supplier	LCA, difficult to monetize	-
	Risk management		”Emissions trading costs could be one example of verifying the value of environmental benefits.” -Divisional director, supplier	LCA, emission costs	55 000 €/year
Social	Improved motivation of employees	Less wasted working time, improved feedback	” One of the most important benefits of the product is getting immediate feedback for the work, I believe that to be highly useful.” -Operational manager, customer	Cost of lost work hours, employee replacement costs	7 000 €/year

			A		
	Improving the health of employees	Less time on average spent in the hazardous air conditions of the plant	”Electrolysis plants in general are not very healthy environments to work in, if we can reduce the amount of required plant work, it’s positive for everyone.” -Manager, Service product engineering, supplier	LCA, cost of lost work hours and adverse health effects	-
Life cycle profits	**1 021 000 € / year**				

Table 2: Value creation mechanisms

Direct economic value is provided by the improvement of process efficiency. The overall efficiency of the process is affected by the time efficiency, performance of production and the quality of production according to the overall equipment efficiency analysis. In this case, the monitoring system was found to affect all 3 elements of OEE. This provides economic value for the customer in the form of increased annual revenue. The largest share of this is due to an increase in the current efficiency of the process, as shown in the last column of the table.

The environmental value in this case is provided by an increase in the energy efficiency and the material efficiency of the process, which are both related to the carbon footprint of the production. This carbon footprint can be calculated using life cycle assessment standards. The respondents described two mechanisms of value creation for the decreased carbon footprint. The first is related to using the footprint as a tool for strengthening the public image of the company. The mining industry in particular is known for having high environmental impacts and is often under public scrutiny for environmental hazards. Both the supplier and the customers mentioned that environmental impacts are highly important issues in affecting the public image of the company. The supplier described using certifications such as best available technique (BAT) to boost their environmental image, and thus increase the sales of certified products. However, while LCA provides the means to calculate the carbon footprint in physical units, this value creating mechanism is generally difficult to monetize.

The second value creation mechanism mentioned by the respondents for the decreased carbon footprint is risk management. Industrial firms are already partly responsible for their emissions through mechanisms such as the carbon emissions trading system, and such liabilities are likely to increase in the future. Thus, proactive cutting of the emissions means decreasing the risks of operation. If a manufacturer’s environmental management is ahead of its competitors in its respective industry, tightening environmental regulations pose a considerably smaller threat. This value creation mechanism also provides a means of monetizing the decrease in carbon footprint, through the value of carbon emissions in the carbon trading system. This was used as the basis for estimating the value of the reduced carbon footprint.

Social value is provided by the system in two ways. The monitoring system improves the efficiency of the short circuit removal work, leading to less wasted time for the operators and decreased exposure time to the hazardous air inside the plants. The two mentioned value creation mechanisms as a result of this are the improvement of operator motivation and decreased health impacts. Firstly, the traditional method of removing the short circuits involves a lot of wasted effort by the operators in examining sections of the plant that are

working normally. The monitoring system eliminates a lot of this wasted effort, allowing the operators to concentrate effort on the sections that are problematic. In addition, the monitoring system also provides direct feedback for removing the short circuit, something which was previously unavailable. These two effects together were recognized to have a positive impact on the motivation of operators. On the other hand, if the decrease in workload is enough to lead to decreases in the workforce, this can cause negative social value among the operators even though it decreases the costs of the company. Perceived job security was in fact mentioned as a factor that can adversely affect the adoption of the monitoring system into the daily working habits of the operators. Two possible quantification tools were recognized for measuring employee motivation: the cost of lost man-hours due to absences and the cost of replacing and training new operators due to turnover. Costs of lost man-hours were used as the basis for estimating the value in this example.

The second element of social value was operator health effects. For example, customer B mentioned that their refining process has substantially hazardous emissions inside the plant to the point where breathing masks are necessary. A decrease in the exposure time to the hazardous air decreases the impacts to the operators' health. Various LCA-related databases include the necessary information to calculate the lifetime impact on a human from emissions entering the body. This information can in turn be used to calculate the costs to the company caused be health hazards.

SUSTAINABLE VALUE PROPOSITION FRAMEWORK

The research process also allowed to gain in-depth understanding on the practical steps needed develop a sustainable customer value proposition. The framework in Figure 4 illustrates a proposed process of developing a sustainable value proposition, which emerged through a combination of the previous studies on value proposition and the analysis of the empirical data gathered for this research.

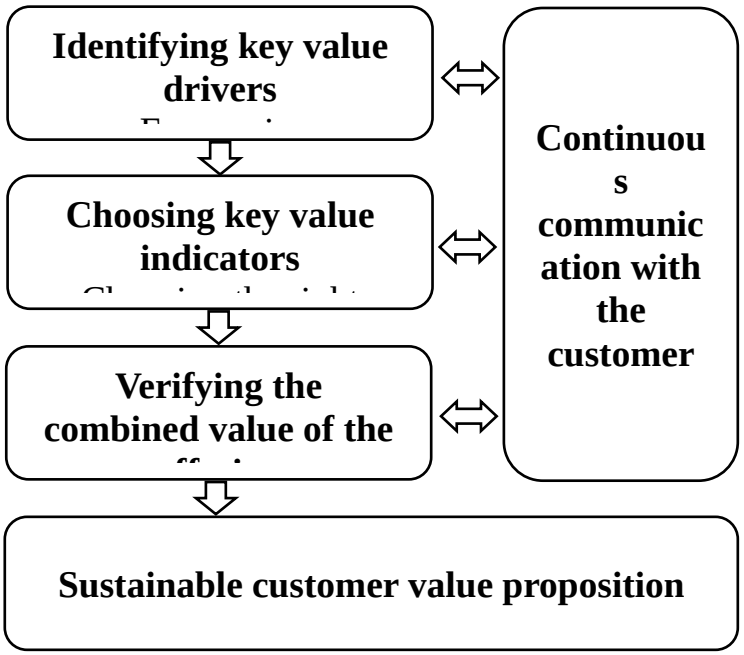

Figure 4: Sustainable value proposition framework

Identifying the key value drivers and their balance

The first phase of the process requires finding out the key value drivers for a specific customer. This requires knowledge on the specific environmental and social strategies of the customer company. Some industrial firms have a high focus on environmentalism in their image, and can thus effectively communicate decreases in environmental impacts. The supplier's respondents stressed that it's important to tread lightly with communicating environmental value, as too much emphasis on environmental value in the value proposition can decrease credibility for some conservative customers. Social value was recognized as a more consistent element of the value proposition, with more firms recognizing the benefits of improving the well-being of employees.

Location of the customer was found to be a key factor in determining the relative importance of environmental and social elements of the value proposition. The respondents mentioned that environmental and social values are both considerably more important in developed markets such as Western Europe, compared to developing markets. This is changing though, as developed countries such as China are seeing the environmental and social costs of high economic growth.

Choosing the key value indicators

The second phase involves choosing the indicators for measuring the value, based on the key value drivers identified in the first step. As highlighted in the customer value literature (Anderson et al. 2006; Terho et al. 2011), a credible value propositions needs verified improvements in the relevant value drivers. A generic value proposition process would aim to monetize as much of the value as possible, as economic criteria have traditionally been the only relevant criteria of value for industrial companies. For environmental and social elements of the value proposition, it's not necessarily as straightforward.

An example of this is the case of carbon footprint evidenced in the case described here. Most respondents agreed that the economic effects of climate change on firms are at the moment ambiguous to the point that communicating including them in value propositions is not effective. It was suggested that in this case communicating the value in physical terms (CO_2 equivalent emissions / amount of production) would be more credible and better understood. This suggests that the degree of ambiguity between the environmental/social value driver and its economic effects determines the most credible value indicator for a specific value proposition.

Verifying the value

The third step of the process is the verification of the value in the chosen indicators. A key activity in this step is measuring the baseline values of the indicators. The supplier's respondents stated that they often had difficulty of attributing improvements in the chosen indicators to their product, as the performance of the customer's process is also affected by many others factors, such as the quality of the input materials. The baseline values for the indicators should thus be measured in conditions that are as close to average as possible to get accurate results from the value assessment.

We propose the use of life cycle assessment for the verification the environmental impacts. Its main benefit is that it's a standardized tool, which has a large impact on the credibility of the results that can be achieved from using it. The LCA process can require a lot effort, depending on its scope, but there are various software packages available to streamline the process and provide the large amount of information needed.

After sufficient information is available on changes in the chosen value indicators, the last step of the value verification phase is calculating the life cycle profit impacts of the offering. LCP presents the combined value of the production increases through improved overall process efficiency, decrease in the operating costs of the customer as well as the indirect profit impacts through the environmental and social value provided. The final value proposition can include arguments that are not monetized as mentioned previously.

An important part of this phase is identifying value conflicts. We can consider the example of social value described in the previous section concerning the workload decrease of the plant operators. It can increase the motivation of the operators if they can concentrate their work on the sections of the plant that have issues, instead of going through the whole plant searching for disturbances. On the other hand, if the decrease in the workload is too much, this can cause the operators to fear for the security of their job.

Continuous communication with the customer

The whole process of developing the value proposition is highly dependent on the level of interaction between the supplier and the customer, as recent research on reciprocal value propositions has stressed (e.g. Ballatyne et al. 2011; Payne et al. 2008; Truong et al. 2012). The supplier's respondents also in this case mentioned that a large issue affecting their value assessment process was the information received from the customer. With many existing customers, value verification was a challenge due to the people who had been involved during the sales phase moving on to other projects. This made it challenging to construct credible reference cases to demonstrate value to potential new customers.

Regular interaction with existing customers was seen as a vital point to improve the development of value propositions. This could be carried out by regular campaigns to verify value, which could be included with existing service elements of the offering, such as updates and maintenance. These types of value verification services have the dual benefit of maintaining and building the relationships with current customers as well as providing references for use in future sales situations. Customer involvement is vital in all phases of the described process. Customer input is needed in choosing the correct customer specific value drivers and their indicators, as well as the value verification phase.

CONCLUSIONS

This research focused on the development of a sustainable value proposition for an industrial offering. As concern for environmental and social issues is increasing in our society, industrial firms need to be able address these issues to receive legitimization for their business. Our single case study of the mining industry provided a case example of what a sustainable value proposition for an industrial offering can look like, describing the possible value creation mechanisms of economic, environmental and social value. In addition, the

systematic combining of previous research with the empirical data allowed gave us the insights to describe the process of developing a sustainable value proposition.

THEORETICAL AND MANAGERIAL IMPLICATIONS

This research adds to the existing theoretical knowledge on customer value propositions by two ways. First, it gives an example of how industrial value propositions are developed in practice, which has received relatively little attention (Ballatyne et al. 2011). Secondly, this research examines the concept of sustainability in value propositions, which hasn't been addressed in current literature, even though industrial firms are increasingly affected by environmental and social issues. Thirdly, we described the value creating mechanisms of *economic, environmental* and *social* benefits in our case example.

This research has several practical implications for industrial managers and marketers who are involved with communicating environmental and social issues in value propositions. We provided an example of what the specific value elements can be in a sustainable value proposition. In addition our research described two life cycle tools, and how they can be incorporated into the process of developing a value proposition. Industrial firms can increase the legitimacy of their business and improve the management of stakeholder expectations by addressing environmental and social issues in their value propositions. Environmental and social value can also have links to economic value which can be demonstrated to customers, as shown by the examples in the research. In a wider context, the systematic nature of the life cycle tools presented here allows a supplier to gain a comprehensive view of the customer's processes and recognize opportunities for improving the process. As manufacturers are increasingly shifting their focus on their core production processes, it often falls to the technology suppliers to assess the performance of the processes. This increasing responsibility can improve the competitive position of the supplier, as the value of the relationship increases for both parties.

DELIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This research was a based on a single case from an industrial technology supplier. The efficiency-improving nature of the case product made it a relevant case for studying sustainable value, and the dyadic interview data allowed us to gain in-depth information on the development of a sustainable value proposition. While in-depth single case studies are ideal for studying novel phenomena such as sustainable value, future studies with a multiple-case approach from multiple industries could give us further insights into what are the commonly used elements of sustainable value. In addition, further research utilizing a longitudinal approach examining the sales effects of sustainable value propositions would enhance our understanding on the impacts of communicating sustainable value.

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