

Transferability of Green Innovation Practices to the Customer

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ABSTRACT

Over the last decades, environmental protection has become a crucial part of peoples' understanding of a sustainable society. Growing demand for eco-friendly products and services along with rising political intent are more and more affecting the way different industries and organizations are handling environmental issues. In recent years, the topic of green innovation has drawn a lot of attention in the literature as new emerging field of interest in response to growing environmental concerns. However, while potential deriving benefits (from green innovation), challenges and the influence on organizational performance have been extensively investigated, the literature does not provide any guidance for firms on how to transfer those benefits to their customers. This study aims to investigate this transfer process under consideration of a firm's effort towards green innovation practices and the customer's perceptions of potentially deriving benefits expressed by the concept of customer value. The analysis reveals that the positive externalities on the environment resulting from the use of GI practices do not necessarily reflect the dimension that will have the highest positive effect on customer value and therefore, successful transformation. In fact, it turns out that customers place much higher value on other elements like accessibility and increased product portfolios. Besides, laws and regulations along with associated green innovation practices can result in major performance improvements and other unforeseen positive effects for the company that could be transferred to the customer. The study shows that firms can exercise a certain influence on the transferability of green innovation practices to the customer by transforming deriving benefits into elements that will be perceived and valued by the customers.

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1. Introduction

In recent years the topic of Green Innovation has drawn a lot of attention in the Literature as a new emerging field of interest. While the focus on regular- and other forms of innovation has been extensively investigated in the last decades, the link between Corporate Social- and/or Environmental Responsibility, Innovation and the Customer is still widely unexplored, although environmental protection becomes more and more important. However, some authors tried to bring some light into the darkness. So far, the main field of attention was to give a clear definition of Green Innovation as a distinctive form in relation to other types of Innovation (Chang, 2011; Chen et al., 2006; Rennings, 2000; Ghisetti & Rennings, 2014).

Other authors already went one step further by identifying potential barriers and challenges of Green Innovation (Cuerva, Triguero-Cano & Corcoles, 2014; Orsato, 2006; Skjøndal Bar, 2015; Triguero et al., 2013;), thus touching upon the concatenation between Green Innovation and the organization among different aspects (Resistance to change, Regulation standards, Value of Environmental protection, etc.). The latter one (i.e. value of environmental protection) reflects a growing concern for many firms that are considering the adoption Green Innovation practices. Generally, consumers experience some direct benefits from products and services when a company manages to achieve quality improvements in their organizational processes. Environmental issues however, are seen as a public good and can therefore not be (directly) transferred to products & services (Orsato, 2006). As Orsato concludes: "While the value of quality is more immediately measured through the intrinsic characteristics or performance of products and services, the value of environmental and social responsibility is less objective and depends on a broader set of consumer perceptions" (Orsato, 2006; p.80).

Does it mean that potential positive externalities deriving from green innovation practices cannot be passed over (products & services) to the customer? Considering the fact that the potential positive impact - stem from the adoption of Green Innovation practices - on the customer is identified as a core driver for Green Innovation (Chen et al., 2006; Berry and Rondinelli, 1998; Lozano, 2014; Skjøndal Bar, 2014; Lai et al., 2003;) it seems questionable to what extent those innovation practices can be really beneficial for companies since any value added (by the use of green innovation practices) could not be passed over to the customer. So, are Green Innovation practices really worth the effort when the customer does not even recognize them (at least not via products & services)? Are there any other opportunities for the customer to recognize a firm's effort towards green innovation? While the potential contribution of green innovation towards firm performance is already more or less examined in the literature (Chang, 2011; Hana, 2013; Chen, 2010; Salvado et al., 2014; Lin et al., 2013; Pujari, 2006), clearly, the transferability of green innovation to the customer raises a lot of questions and represents a lack in the literature. Therefore I would like to investigate the linkage between green innovation and the customer more in-depth in terms of transferability. Therefore, the Research Questions of this paper is:

Main research question:

How can a firm's effort towards Green Innovation practices be transferred to the customer?

Sub-questions:

How can firms affect the transfer process and thereby increase customer value?

2. Literature Review and Relevant Concepts

In the following I would like to examine some relevant key concepts of this study – *Green Innovation Practices, Customer Value, Value Transfer and Transferability*.

2.1. Green Innovation Practices

One of the main variables is "Effort towards Green Innovation practices". As already mentioned, the literature provides many definitions of Green Innovation. A study on the influence of Green Innovation performance on Corporate Advantage defined green innovation as "hardware or software innovation that is related to green products or processes, including the innovation in technologies that are involved in energy saving, pollution prevention, waste recycling, green product designs, or corporate environmental management" (Chen et al., 2006). Those authors consider green innovation as a potential approach in order to boost the performance of environmental management related to environmental protection (Lai et al., 2003). Other authors like Chang (2011) distinguish between Green Products and Green Processes, thereby focusing on technological innovations related to energy saving, pollution prevention, waste recycling, green product design or corporate environmental management. And again the main focus lies on the improvement of products and processes linked to the mentioned fields. Many other studies in the literature share this understanding of Green Innovation: "Green Innovation would imply that innovations in products, processes or business models lead the company to higher levels of environmental sustainability (Cuerva et al., 2014).

Obviously, a lot of definitions are focused on the potential (or maybe desired) outcome of Green Innovation practices (i.e. higher levels of environmental sustainability or more specifically, improved performance in environmental protection related management). But what exactly are the practices that firms can use in order to do so? Are those efforts expressed in organizational, operational or strategic changes? Which aspects might promote the mentioned performance improvements related to environmental sustainability? The research of Cuerva et al. provides some insights into those questions, by investigating several hypotheses. Their findings present some of the potential aspects that might be beneficial for environmental related performance improvements, however they also reveal the uniqueness of Green Innovation as a distinctive form of innovation.

Some of their (statistically supported) findings are listed below:

- H1: R&D promotes Green Innovation to a lower extent than other innovations.

- H2: Human Capital promotes Green Innovation to a lower extent than other innovations.
- H3: Financial constraints limit Green Innovation to a greater extent than other innovations.
- H4: The existence of Quality Management Systems promotes Green Innovations to a greater extent than other innovations.

Other authors have examined the potential organizational changes more in depth, focusing on a variety of aspects. Tseng et al. (2012) for instance, highlight the importance of leadership, arguing that: "firms are more likely to adapt an environmental innovation strategy if their managers place a high value and are concerned for the environment and its protection".

Others are concerned with the organizational structure itself, highlighting the importance of organizational learning and internal- and external collaboration (Lozano 2014, Greeno & Robinson 1992).

The above-discussed issues concerning Green Innovation reveal only a small share of practices that are available in the literature, and which reflect the potential efforts a firm could expend towards green innovation.

To illustrate the large variety of further methods, approaches and strategies provided by the literature, some examples (in addition to the above discussed issues) are listed in Table 1. For the purpose of this study, those examples illustrate some of the initiatives, which reflect the underlying concept behind the (independent) variable "Efforts towards Green Innovation practices".

2.2. Customer Value

Delivering value to customers is essentially important for every business. In order to be willing to pay, a potential customer must obtain value from a market offer. But how do customers derive value from a product or service? The underlying theoretical concept behind this issue is Customer Value.

There is a large variety of different explanations and definitions by many authors involved in defining customer value. The research of R. Sanchez-Fernandez and M.A. Iniesta-Bonillo (2007) provides a consolidated overview of the various approaches to the operationalization of "value" in the literature (Figure 1).

Practice	Aim	Source
Cleaner Production through Pollution Prevention	"Source reduction or practices that reduce or eliminate the creation of pollutants by increased efficiency in the use of raw materials, energy, water or other resources, or protection of natural resources by conservation"	De Giacomo et al. (2014)
Source Reduction	"Any practice reducing any hazardous substance or pollutant prior to recycling, treatment, or disposal"	De Giacomo et al. (2014)
Industrial Ecology Methods	Use of local by-products and energy flows to reduce inefficient materials and energy use	Lehtoranta et al. (2011)
Life Cycle Analysis	A tool for evaluating and quantifying the environmental impacts of a product during the whole Life Cycle	Lemming et al. (2010)
Integrated Product Policy	Aims to minimize life cycle environmental impacts of products from the acquisition of raw materials to manufacturing, distribution use and waste management	Grncarovska et al. (2014)
Extended Producer Responsibility	Actions concerning manufacturers' responsibility for the impact of their products after consumption	Fishbein B. (1996)
Selection of low carbon products	Actions & Strategies to reduce operations' emissions and foster low carbon purchases	Bocken & Allwood (2012)

Table 1: Green innovation practices from the literature

As the model reveals, most studies can be classified as *one-dimensional* or *multi-dimensional* approaches to perceived value. The first one conceives perceived value as "a single overall concept that can be measured by a self-reported item (or set of items) that evaluates the consumer's perception of value".

The *multi-dimensional* approach "consists of several interrelated attributes or dimensions that form a holistic representation of a complex phenomenon". One of the most commonly referred studies on multi-dimensional approaches is the *Customer value hierarchy* by Woodruff and Gardial (1996). This framework takes a broader perspective, implying that customers perceived value does not simply depend on the attributes of a product but also on the consequences of using a product and the goals achieved by it. Consequently, the three hierarchical levels of value are: 1.Attributes, 2.Consequences and 3.Desired end-state. According to the authors, customers' (value) judgements are shaped within the boundaries of particular situation-related usage. Thereby, the circumstances of usage situation, the timeframe and specific "triggers" are influencing and determining those judgements. Therefore, Woodruff defined perceived value as: "*Customer's perceived preference for an evaluation of those product attributes, attribute performances, and consequences arising from use that facilitate (or block) achieving customer's goals and purposes in use situations.*"

Thereby, the Total cost of ownership is used as the denominator since most transactions involve more than just "price" (e.g. Inventory carrying costs, maintenance costs, running costs, disposal costs etc.)

The literature review on customer value illustrates the broad diversity of understandings about this concept. However, this study will use the definition of Martin Christopher (1996) to conceptualize Customer value since the elements involved in multi-dimensional approaches (i.e. Customer value hierarchy by Woodruff and Gardial (1996)) are too complex to be investigated considering the circumstances of this research (See limitations for details).

2.3. Value Transfer

As already mentioned in the introduction, the nature of environmental issues (being a public good) does not allow a (direct) value transfer to products & services (Orsato, 2006). But how can value generally be transferred to products and services? And how can customers be made aware of this additional value?

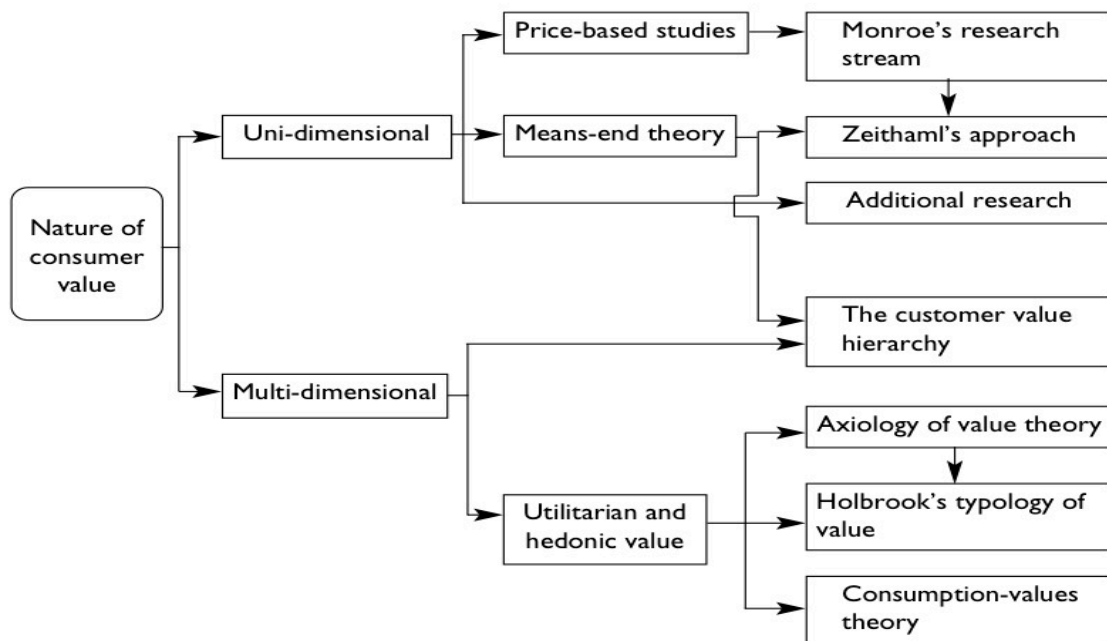


Figure 1: "Research streams on perceived value" (R. Sanchez-Fernandez and M.A. Iniesta-Bonillo, 2007)

Other authors like Martin Christopher (1996) conceptualized Customer Value into a formula, stating that: "*Customer value is created when the perceptions of benefits received from a transaction exceed the costs of ownership*". Or expressed as a ratio:

$$\text{Customer Value} = \text{Perception of benefits} / \text{Total cost of ownership}$$

One possible approach is known as the "value proposition" which can be defined as "a written statement focusing all the organization's market activities into customer critical elements that create a significant differential within the customer's decision process, to prefer and/or purchase the organization's offering over a competitor's" (Fifield, 2007; p.443). Rather than taking the traditional view of business as a set of functional activities, this approach emphasizes the need for an externally

oriented view (i.e. customers perspective) of business as a form a value delivery (Bower and Garda, 1985).

However, many other authors have developed a variety of perspectives on the creation and transfer of value using different terms: (i.) *creating and delivering superior customer value*, (ii.) *value of the customer*; and (iii.) *perceived customer value*.

The first one emphasizes that the success of a company depends on their ability to provide customers with what is valued. This approach involves the establishment of a market-oriented-culture in order to build and maintain the core capabilities of the firm that are creating superior customer value. (Slater and Narver, 1994).

The second category implies an understanding of customer value from the perspective of “the value of the customer on the organisation” (Payne & Holt, 1999; p.13) by focusing on the “value outcome that can be derived from providing and delivering superior customer value” (Payne & Holt, 1999; p.13). Therefore, this approach suggests tools like the *customer lifetime value* (CLV), which is defined as the net present value of the future profit flow over a customer’s lifetime.

The latter one (i.e. perceived customer value) refers to the notion of perceived benefits against perceived sacrifice as presented by the customer value definition of Martin Christopher (see section above).

2.4. Transferability

So what is the link between a firm’s effort towards green innovation practices, customer value and value transfer?

From a theoretical perspective, customer value reflects a trade-off between customers’ perceived benefits against perceived sacrifice (i.e. TCO). Therefore, there are two aspects to customer value: (i.) Perception of benefits; and (ii.) Total cost of ownership. The first one refers to a combination of physical- and service attributes, available support and indicators of perceived quality (e.g. purchase price), while TCO implies all costs the buyer has to sacrifice (acquisition costs, maintenance costs, running costs, disposal costs etc.) Thus, increasing customers’ perceived benefits or reducing perceived sacrifice could lead to increased customer value.

Therefore, the transferability of value requires that any additional value added to a product or service has to be transformed (by the company) into particular features that can be perceived by the customers, enabling them the evaluation of (i.) potentially deriving benefits (from the additional value) against (ii.) all potential costs (i.e. TCO) which both, will finally add up to Customer Value.

From the organizational perspective, customers’ perceptions of benefits can be shaped and influenced by a value proposition, which has to be proposed, communicated and delivered to the target market (i.e. Targeted customer segment). Thereby, both dimensions of customer value - "what you give" and "what you get" - have to be addressed and seen to be superior to competitive offers (Christopher, 1996).

Thus, it can be concluded that the transferability of GI practices (to the customer) is determined by customers’ evaluation of perceived perceptions of potentially deriving benefits against all costs (i.e. TCO), which adds up to Customer Value and is

influenced by the transformation process, which in turn is partly depending upon the actions of the organization (e.g. value proposition).

Therefore, *transformation* refers to the attempt of the firm to convert the additional value deriving from the use of green innovation practices into features that can be perceived by the customers. *Transferability* on the other side, incorporates not only the *transformation* process of value, but also the following evaluation process of the customer (i.e. formation of customer value).

This process represents the understanding of *transferability to the customer* as the dependent variable of this study. Therefore this paper will focus on the identification of potential favourable actions and strategies available to firms in order to affect the transformation process and thereby increase customers’ perceived value of the efforts the firm has taken towards green innovation practices.

3. Methodology

In order to investigate the transfer process of green innovation practices to the customer, the data collection method implies the conduction of depth interviews with two different companies.

“The depth interview seeks to gather an in-depth understanding of a topic that the research informant is able to speak about” (Belk & Russell, 2013; p. 31). This type of interview is especially well suited for investigating processes and outcomes, as well as exploring the corresponding notions and feelings of the target audience (i.e. respondent). The open-ended questions and semi-structured format of the interview enable a naturally flowing conversation and encourage the respondent to expound his point of view.

The choice of the units of analysis is subject so several criteria to ensure an appropriate sample for the analysis. It might be for instance more challenging for a small-sized firm to establish particular green innovation practices as compared to a bigger enterprise, since they might be unable to provide the necessary resources and capabilities. Besides, particular industry sectors might be subject to regulation and judicial procedures, which could be conducive as well as impeding for firms’ involvement in green practices. Affinity to the business-to-business (B2B) or the business-to-customer (B2C) sector on the other side, could reveal potential differences related to customer value since customers might have different perceptions of benefits in each segment respectively.

Therefore, the nature of an enterprise in terms of: 1). *Size* (i.e. number of employees); 2). *Industry sector*- as well as 3). *Customer segment affiliation* might be some influencing-, and determinative factors for the scale of green innovation practices on the one side, and for the formation of customer value on the other. In this study, all three aspects will be considered for the choice of the units of analysis.

The interview itself implies several indicators in order to measure the relevant concepts as referred to in the conceptual framework (See table 2).

Variable / Concept		Indicator
Firms effort towards GI		Active GI practice
		Resulting drawbacks and benefits from GI practice
		Reason for establishment
		Requirements and obstacles of the GI practice
Transferability	Customer Value	Customer's perceived benefits
		Total Cost of Ownership
	Transfer process	Firm's attempt to transfer
		Consequences of the transfer attempt

Table 2: Indicators for the analysis

The indicators in the first section will be used to analyse a *firm's effort towards green innovation practices* (independent variable). Thereby, the scale and intensity of a *firm's effort* is expressed by the formation of the corresponding indicators given in table 1.

Questions related to the first indicator (i.e. Active GI practice) aim to identify the green innovation practices that are currently in use, or have been used in the past. The time dimension might reveal whether particular practices have been cancelled in the past, which in turn might reflect unforeseen obstacles.

The second section is addressed to the dependent variable of the analysis – *transferability to the customer*. As already examined in the conceptual framework, the transferability of GI practices (to the customer) is determined by customers' evaluation of perceived perceptions of potentially deriving benefits against all costs (i.e. TCO), which adds up to Customer Value and is influenced by the transformation process, which in turn is partly depending upon the actions of the organization. The aim of this study is to investigate those actions and to identify the one that lead to a successful transformation process (of firms effort towards GI practices).

Therefore, both aspects (i.e. Customer value and the Transfer process) and the corresponding indicators will be used to investigate the second variable of the analysis (i.e. transferability to the customer).

3.1. Firm A: Graf Holland B.V.

In compliance with the mentioned selection criteria, the first unit of analysis is the Graf Holland B.V., located in Enschede, Netherlands. As a member of the Swiss Graf Group of Companies with headquarter in Zürich, Graf Holland has over sixty years of experience and is serving international markets. The production facility in Enschede with 130 employees manufactures metal precision parts for the textile industry using technologies like wire drawing, rolling, cutting and sophisticated heat treatment.

The product portfolio includes: clothings for short staple spinning, circular combs, card clothings for roller cards and service machines for cards and roller cards. In addition, the company provides various services like assistance with professional product processing, dismantling/fitting of the clothings on card, or grinding/smoothing of the clothings. The company's clients are located worldwide, including China, India, Pakistan, Bangladesh, and Turkey.

Considering the product-, and service portfolio, Graf Holland is clearly operating in the *B2B sector* related to the *textile industry*. The number of employees on the other side, indicates a *medium-sized enterprise* (European Commission, 2003).

The firm represents an interesting sample for the analysis since the formation of customer value and the transfer process might be different as compared to another industry and/or the B2C segment. Customer in the B2B segment (textile industry) might for instance place higher value on low inventory costs of particular textile fabrics, while a client in the B2C segment might only derive value from a low purchase price. On the other side, the textile industry might be subject to regulation (e.g. concerning the use of chemicals in the production), thereby, forcing the company to transfer their eco-friendly practices to the customer (e.g. labelling).

The interview will be conducted with the production manager of the facility. Due to his experience in the company (over 15 years) and his involvement in environment related issues that will be presented during the analysis, it can be assumed that he holds valuable knowledge and insights about the industry, corresponding customers and of course the activities of Graf Holland B.V. Therefore, the production manager represents an appropriate respondent for the analysis.

3.2. Firm B: Vostok-Europe

The second company to be interviewed is Vostok-Europe located in Vilnius, Lithuania. The watch brand was formed in 2003, resulting from the joint venture Koliz Vostok, established by the Vilnius Koliz, Lithuania Company and the Chystopol Watch Factory Vostok, Russia. Just four years later, Vostok-Europe was distributing their products to 30 countries around the world like Germany, USA, Greece or Japan, just to name a few. With just 25 employees, the company managed to establish a global network of suppliers, distributors and other stakeholders. The latter one especially refers to national as well as global sport officials and related institutions like the Greek Football Federation or the Amaury Sport Organisation. The resulting network facilitates Vostok-Europe's presence at major sport events like car racings (e.g. Enduro Rally, Lithuania; Dakar Rally, South America), martial-arts championships (e.g. MMA One Fighting Championship awards, Singapore) or the Free-Diving World Championship. However, their involvement goes beyond sport events including for instance cooperation with the Greek Institute of Marine archaeology.

The wide range of activities reflects the company's affinity to design products suitable for such extraordinary circumstances and customer segments, which is also represented by their slogan - "For Going to Extremes". The product range mainly implies automatic-, quartz, and chronograph watches.

The company can be assigned to the *B2C sector*, although the firm is also operating in the B2B segment since distributors are part of the distribution channels. The product portfolio reflects the firm's affinity to the *jewellery industry*. However, considering the small number of employees, Vostok-Europe can be classified as a *small medium enterprise* (SME) according to the recommendations of the European Commission concerning the definition of micro-, small- and medium-sized enterprises (European Commission, 2003).

The company represents an interesting sample since it can be compared to firm A due to the differences related to 1). *Size*; 2). *Operating Industry sector*; and 3). *Customer segment affiliation*.

The interview will be performed with the managing director of the company. As the co-founder of Vostok-Europe, he has been involved into the jewellery business for almost 20 years. His experience in the industry and corresponding customers around the world will provide important insights in order to answer the research question of this study.

4. Analysis

4.1. Firm A: Graf Holland B.V.

Firm's effort towards GI:

The company has a variety of practices that can be classified as green innovation practices. The probably most essential one are those that can be associated with the firm's ISO 14001 certification.

The International Organization for Standardization (ISO) provides standards and practical tools for economic, environmental and societal development. The ISO 14001 framework represents an environmental management system (EMS) – "That helps organizations both to manage better the impact of their activities on the environment and to demonstrate sound environmental management" (ISO, 2010; p.6). With more than 300,000 certifications in 171 countries, ISO 14001 is the most recognized environmental management system around the world. (ISO, 2010; p.6)

In addition, Graf Holland B.V. complies with the Dutch "Activiteitenbesluit". Based on the type of commercial activity, companies in the Netherlands have to comply with environmental regulations related to issues like air quality, noise, energy consumption, waste or soil quality.

Concomitant with the ISO 14011 certification as well as the Dutch Activiteitenbesluit, the company is using an internal monitoring and reporting system, which is regularly maintained by a production manager. The report includes several indicators measuring the energy consumption and other performance aspects related to the environmental impact of the production facility. A detailed illustration of all indicators is given in Table 3.

- | |
|---|
| <ul style="list-style-type: none"> • Electricity consumption • Water consumption • Gas consumption • Risk related to hazardous substances • Condition of machines and other equipment • Air quality • Noise • Pollution/Emission • Garbage |
|---|

Table 3: Indicators from the monitoring report of Graf Holland B.V.

In addition to those indicators (i.e. Table 3), the report incorporates other aspects related to the environmental performance of the company. Laws and regulations on the national- and international level are checked on a regular basis to ensure that the firm complies with all of them, or might be even able to perform better. Besides, the report monitors the condition of the machines and equipment in the facility. Maintenance of those is considered to be essentially important "to ensure that everything is in top condition and internal systems are up-to-date, controlled and certificated" (Respondent).

The respondent reported several benefits resulting from the use of the above-mentioned practices.

The indicators related to the consumption of electricity-, water-, and gas, comprise measures that provide a detailed overview of consumption for each department and machine respectively. Thus, enabling the firm to monitor their consumption, which has a variety of positive effects. On the one side, overconsumption in particular stages of production can be identified and eliminated, thus making the production process more efficient. This in turn, can derive potential financial benefits as the improved production process leads to less energy and resource consumption resulting in costs savings for the company. On the other side, the impact on the environment decreases along with the cutbacks in energy consumption.

Improved production efficiency due to reduced energy consumption as described above, and the corresponding cost savings are clearly beneficial for the company. However, it seemed to be more important for the respondent to expound the advantages resulting from the ISO certification and the Dutch Activiteitenbesluit. Compliance with those regulations simplifies the collaboration with local authorities due to better communication and trust, resulting in less controls and time savings. As the respondent states: "Life gets easier". Therefore, compliance with laws and regulations is probably the most important advantage for the firm resulting from the corresponding practices. Though, it should be noted that the ISO certification is not required by law.

However, the above-mentioned practices and regulatory procedures are very time consuming. Although, once established, they provide guidance and assistance to comply with new regulations and can be time saving in the long-term. Therefore, the main reason for the establishment of the green practices the firm currently has obviously roots in strategic interests (i.e. compliance with laws and regulations).

Transferability:

Nevertheless, Graf Holland B.V. does not conduct huge efforts to transfer their practices to the customer. Their web site incorporates a small section stating that the firm is in possession of the ISO 14001 Certificate. In addition, the company published an environmental statement that implies the firms' actions and goals towards environmental sustainability.

However, customers are very unlikely to show interest in issues related to the protection of the environment. Like the respondent states: "We supply to the textile business, and I don't expect that we will get prettier. Our main customers are located in China, India, Bangladesh, Turkey. Those countries do not really care about the environment". Clearly, environmental protection seems not to be an essential part of value for the company's clients, which might explain the relatively small effort expended by the firm to affect the transformation process. The interview also reveals that the involvement in environmental friendly practices is partially depending upon the operational activities of a business. Companies that are consuming high amounts of energy and chemicals are more likely to be subject to regulations and controls by local authorities as compared to a manual labour manufacturer. Thus, driving them to establish GI practices which in turn can lead to positive externalities related to costs (i.e. Costs savings through more efficient production).

4.2. Firm B: Vostok-Europe

The following section will analyse the interview with Vostok-Europe.

Firms effort towards GI:

The company has established several environmental friendly practices in the past few years, mainly due to regulatory issues. One of those regulations is the *Restriction of the use of certain hazardous substances* (RoHS) based on the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical electronic equipment (EEE¹) (EU, 2011). The purpose of the Directive aims to: "lay down rules on the restriction of the use of hazardous substances in electrical and electronic equipment (EEE) with a view to contributing to the protection of human health and the environment, including the environmentally sound recovery and disposal of waste EEE" (EU, 2011: Article 1, p.91). In order to achieve the level of environmental protection desired by the European Union, the substitution of hazardous substances used in EEE by more eco-friendly materials is the most effective initiative for the reduction of health related risks and environmental harm resulting from the use of particular substances (EU, 2011; p.89).

Companies involved in EEE might experience some positive effects from the Directive, due to improved profitability related to the recycling process of waste EEE and decreased negative

health impact on the employees in the recycling plants (EU, 2011; p.89)

The new regulations had several resulting implications for the business of Vostok-Europe. First, suppliers of the particular components had to restructure the whole production process in order to comply with the new regulations. Before the commencement of the law, suppliers' operational procedures of manufacturing included the method of Electroplating. Also known as Galvanic coating, the process is basically used to cover a base material (i.e. steel) with a metal coating (i.e. zinc) to protect the surface against corrosion.

However, suppliers have been pushed by Vostok-Europe and other buyers to adjust their production methods to the new regulations imposed by the EU. Therefore the process of galvanic coating was replaced by the more environmental friendly method of Physical Vapor Deposition (PVD) coating.

Although, the establishment of the method was quite challenging, expensive, and lasted over many years. In fact, as the respondent recalls: "Actually all production facilities that have been using the galvanic coating method, have been shut down. It was simply cheaper to build a new facility equipped and designed to operate with the PVD coating method".

Nevertheless, the long-term change process has not negatively affected Vostok-Europe in terms of additional costs or supply shortcuts. Au contraire, the new regulation and resulting operational adaption have revealed some unexpected positive implications. The new method of PVD coating enables a broad variety of opportunities to cover the watchcase with a surface layer using materials that could not be affixed before. Thus, suppliers could realize and manufacture new types of components like blue, brown or silver watchcases, thereby, facilitating Vostok's ability to come up with new innovative product features resulting in a rapidly growing product portfolio.

The second practice related to green innovation concerns a particular product range of Vostok-Europe that includes watch dials with integrated tubes filled with tritium gas in order to be visible in the dark. Generally speaking, this kind of light emission - also called luminescence - is either based on Photoluminescence or Radioluminescence in form of tritium paint or gaseous encapsulated tubes. The latter one classifies as a radioactive gas and is therefore subject to labelling requirements regulated by ISO 3157. The International Standard aims to "Specify requirements for the optical, mechanical and radioactive characteristics of the radioluminescent deposits fixed on time measurement instruments, together with the test methods relating to them" (ISO, 1991; p.1). Thus, the Standard allows only two types of radionuclides: Tritium (3H) and Promethium (147 Pm). There are two designations being used - the "T25" and "T100" labelling. The number behind the letter refers to the amount of radioactive substance measured in millicuries (mCi) to be contained. Therefore, T25 for instance, comprises between 1 and 25 mCi of radioactivity, which is the highest value allowed in the European union.

(1) ¹ 'electrical and electronic equipment' or 'EEE' means equipment which is dependent on electric currents or electromagnetic fields in order to work properly and equipment for the generation, transfer and measurement of such currents and fields and designed for use with a voltage rating not exceeding 1 000 volts for alternating current and 1 500 volts for direct current; (EU, 2011; Article 3.1, p. 91)

Transferability

In case of Vostok-Europe’s products - for instance the model “Anchar” – the European law requires the company to designate the use of tritium tubes on the watch with the label T25 indicating that all tubes in sum do not contain more than 25 mCi. Besides, in order to be able to export their products to the United States, Vostok has to present a certificate to the local customs authorities attesting compliance with all U.S. federal laws and regulations related to products including radioactive substances. Therefore, the firm has contracted their supplier of tritium tubes to conduct regular crash test with the corresponding products to ensure that the tubes can withstand the strain in compliance with official regulations. In addition, a label on the backside of the watch – “mb-microtec H3” – states that containing tubes have been supplied by a licenced company whose products are conform with the European and U.S. law – in this case, the *mb-microtec ag* located in Switzerland.

However, the amount of radioactive substances in the watches is very low. As the respondent states: “If 50 watches that contain 600 tubes, would burst at the same time, the resulting level of radioactivity would equal to that of a banana.” Besides, there is no emission that could lead to ecological- or health related hazards. Therefore, it could be argued that the potential impact from the use of those materials in such small quantities does not have any negative effect on the environment. Although as the respondent confirms, without regulatory restrictions, watch manufacturers would use tubes with higher concentrations of mCi (e.g. T100 in the European market) and therefore, the overall consumption of radioactive materials like tritium would increase.

Due to the regulatory obligations, the firm is forced to transfer the environmental standards related to processed materials to the customer, using the above-mentioned labels (i.e. T25 and *mb-microtec H3*).

However, as the respondent states, there is no additional value for the clients deriving from labelling or the actions of the company behind it, at least not directly from the eco-friendly regulations. In this case, customer value grounds in the ability of the company to meet new demands (e.g. blue watchcases) and to make their products easily available (i.e. also in the USA). Both aspects have been facilitated by the emerging legislation. First, the environmental Standards of the EU (indirectly) forced the suppliers to change their production, thereby establishing the foundation for new product features to meet growing demand. Second, the certificates required by U.S’ customs authorities and the necessary crash tests provide valuable insights for company’s quality assurance and enable access to the U.S. market.

The respondent also believes that more legislative acts will push the industry towards more environmental friendly practices (i.e. green innovation) in the future, which will not only be beneficial for the environment but also for the companies involved, as has been illustrated by the analysis

The results of the analysis (for both firms) in relation to the indicators described in the Methodology section are illustrated in table 4.

5. Conclusion

First, it can be concluded that Graf Holland’s affinity to the textile industry enhanced by the involvement in the B2B segment is obviously limiting the firm’s ability to affect the transformation process of GI practices to the customer.

Variable / Concept		Indicator	Firm A	Firm B
Firms effort towards GI		Active GI practice	ISO 14001; Monitoring & Reporting System, Dutch Activiteitenbesluit	Compliance with RoHs and T25; ISO 3157
		Resulting drawbacks and benefits from GI practice	Simplified collaboration with local authorities; Improved production efficiency; But, Costly and Time consuming	Enabled production of new product features (i.e. increased portfolio); Access to markets; Quality assurance; But, Costly and Time consuming (long-term process)
		Reason for establishment	Due to regulations and resulting benefits	Only regulations since benefits were unknown
		Requirements and obstacles of the GI practice	Time to establish, maintenance	Time to establish, Costs
Transferability	Customer Value	Customer’s perceived benefits (from GI)	No additional value	Meet growing demand, product availability, quality
		Total Cost of Ownership	Known	Known
	Transfer process	Firm’s attempt to transfer	Environmental Statement (web) and ISO 14001 Certification	Labelling (<i>T25, mb-microtec H3</i>)
		Consequences of the transfer attempt	No effect on the customer	No (direct) effect on the customer

Table 3: Results of the analysis

In order to achieve a successful transformation, the customer has to experience increased value derived from the additional feature after evaluating all perceived benefits against all costs (i.e. TCO). Otherwise they might not recognize or even consciously ignore the company's attempt of transfer (e.g. Simply not look at the environmental statement on the web site). Since in this case, there are no additional costs for the customer resulting from the GI practices of the firm, it has to be assumed that the clients do not perceive any benefits resulting from the environmental friendly practices (i.e. GI) of Graf Holland. According to the respondent, such preference can be observed among major parts of the textile industry, especially in countries like China, India, Bangladesh or Pakistan. Due to the lack of ecological awareness among the industry sector, any attempts to affect the transformation process are more or less useless, as long as the recipient (i.e. the customer) does not deploy any additional value to the transformed feature – in this case, the GI practice of the company and the resulting effect on the environment.

Although Vostok-Europe is operating in another industry, the problem of ecological awareness could also be observed, since the transfer attempts of the company (i.e. labelling) had no (direct) effect on customer value, highlighting the limited ability of a firm to affect the transferability of GI practices to a customer who does not care about environmental protection.

Therefore, the positive externalities on the environment resulting from the use of GI practices do not necessarily reflect the dimension that will have the highest positive effect on customer value and therefore, successful transformation.

However, the analysis reveals that GI practices can also result in other externalities that might be beneficial for the company as well as for the customer (i.e. reflecting the core elements that will lead to increased customer value).

In fact, the laws and regulations in this case, forced the companies to establish particular practices and corresponding tools of transfer (i.e. labelling). Thereby, the firms have experienced a variety of positive effects like improved production efficiency and increased opportunities to expand their product portfolio reflecting the core elements of value that are perceived by the customers (i.e. meeting growing demand). Therefore, it can be concluded that regulation does not only drive firms to introduce particular GI practices, but is also likely to reveal some unforeseen benefits and opportunities for the organization which could be transferred to the customer.

6. Discussion and Research Limitations

As already mentioned in the conceptual framework, the choice of theory (i.e. conceptualization) behind the concept of customer value is limited to the boundaries of this research project. The multi-dimensional approaches like the *Customer value hierarchy* by Woodruff and Gardial (1996) implies a broader perspective on customer value, considering the consequences and desired end-state of using a product or service. This requires a deep understanding of customers' (value) judgements under particular circumstances of situation-related usage.

Due to the requirements of this project to gather data from companies, it was not possible to investigate the formation of customer value (directly) from the perspective of the clients. Thus, the results of the analysis and corresponding conclusion related to the formation of customer value (i.e. Perception of benefits / TCO) are limited to the statements of the respondents gathered from the interviews.

However, it might be contributive to investigate the perspective of the customer directly since it might reveal particular aspects that are determinative for the formation of customer value (i.e. time frame-, & triggers of usage). Therefore, further research could focus on gathering data directly from the customer (e.g. by conducting depth-interviews) using one of the multi-dimensional approaches to conceptualize customer value.

However, as the analysis has shown, firms might underestimate the effect of particular activities on customer value and thereby limiting their ability to transfer the deriving positive externalities to the customer. Therefore, it might be interesting to investigate the difference between the formation of customer value as assumed by a company in relation to customer's perceptions of value, in order to identify the elements of a firm's value chain that have the potential to become a core component of customer value.

The study reveals that firms can exercise a certain influence on the transferability of green innovation practices to the customer by transforming deriving benefits into elements that will not only be perceived, but also valued by the customers. However, it should be noted that successful transformation (i.e. the customer perceives the alleged benefits) does not automatically lead to increased customer value since the customer might not perceive the transformed elements as a positive benefit. Therefore, firms should try to identify those core elements of their business activities that are valued by their customers.

Besides, the study has shown that laws and regulations along with associated green innovation practices can result in major performance improvements and other unforeseen positive effects for the company that could be transferred to the customer. Thus, green innovation practices are not only beneficial for the environment, but also for organizations and their customers.

Therefore, it can be concluded that firms might be able to increase ecological awareness among society by transferring the variety of deriving opportunities and advantages.

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APPENDIX

Interview Questions

- 1). Are you familiar with the concept of “Green Innovation” (GI)?
 - If NO: Give definition from literature + example
 - If YES: Corresponds with literature?

- 2). Does your Company have any GI practices?
 - IF NO: Why? Any Obstacles?
 - IF YES: Which one? How does it work?

- 3). What are the Benefits of the GI practice?
 - A: For Firm: - Financially (cost savings)
 - Strategic (access new markets)
 - Operational (improved efficiency)

 - B: Same aspects for customer perspective
 - C: For Environment: More eco-friendly? Other Externalities?

Same for: 4). What are the drawbacks of the GI practice?

- 5). Why was the GI practice established?
 - Financial reasons
 - Strategic
 - Operational

- 6). What are the requirements to establish the GI practice?
 - Resources: Which needed? Acquisition process?
 - Org. Structure: Organizational changes? New Skills needed?
 - Change Process: Resistance to change?

- 7). Which value does your Company deliver to the Customer?
 - Product/Service features
 - Environmental aspect

- 8). How do you know? (Market Research VS Planned Strategy)

- 9). Does the Company have a Value Proposition?
 - How is this Communicated and Delivered to the target market?

- 9). Do you know all TCO of your Customers?
 - Inventory carrying costs
 - Maintenance costs
 - Running costs
 - Disposal costs

- 10). Do you offer any support related to those issues? (Disposal/Waste Mgt.)

11). Are your Customers aware of the GI practices in your company?

- How do you know?

NO: Why not? Do you think they would even care?

YES: How do they know?

12). How do you manage to Transfer your practice to the Customer?

- Any attempts? → Requirements? Obstacles?

13). What are the resulting/potential Consequences of successful Transferability for the Company and the Customer respectively?

- Benefits

- Risks

- Opportunities

14). Time Dimension

- GI Now

- In Past: Cancelled? Finished? Effect/Contribution?

- In Future: Why not now? Any Obstacles?