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THE BENEFITS OF EFFICIENT WASTE MANAGEMENT FOR ORGANIZATIONS

Annastina Saari

International Business
Bachelor's Thesis
Supervisor: Susan Grinsted
Date of approval: 13 April 2017

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ABSTRACT OF
BACHELOR'S THESIS

Author: Annastina Saari
Title of thesis: The Benefits of Efficient Waste Management for Organizations

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Supervisor: Susan Grinsted

Objectives

The objectives of this thesis are to discover the different types of organizational waste, the ways it can be processed and the possible benefits that can be gained from these different waste management procedures. In addition, the effect of ecolabels and Environmental Management Systems (EMS), specifically ISO 14001, will be assessed.

Summary

Waste management is an integral part of nearly every business, especially those operating on manufacturing fields, that should be taken into serious account in organizations. At its best, waste management can be an efficient way to diminish costs. In order to find more information on the specific waste management methods resulting in cost savings, existing literature was researched and three companies from different fields were interviewed regarding the subject.

Conclusions

The main findings of this research concentrate on the gained benefits of efficient waste management techniques. It looks both at what the techniques and benefits are and how they are related to each other. In addition, the effects of ecolabels on consumers are assessed. The results seem to indicate that there is a link between efficient waste management and cost savings at the least for the interviewed companies. What comes to ecolabels, they were perceived more as a supposition for the organizations rather than a huge differentiating factor.

Key words: *organizations, waste management, recycling, sustainability, ecolabel*
Language: English

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1. INTRODUCTION

Managing organizational waste efficiently and in an environmentally friendly manner is becoming more and more timely. There are several ways that waste in general burdens our planet as a whole, including us humans, the nature and different species. In this section, the background, research problem, research questions and objectives will be identified.

1.1. Background

In addition to wastelands and their visual and environmental burdens, seas and oceans of our planet are suffering from waste created by humans. Fish and other species are exposed to trash, such as plastic, on a daily basis and end up for example eating it. This, in turn, affects also us humans, as we are the ones both killing and eating the fish in question. In the worst case, these species become extinct due to our behaviour. (www.theguardian.com and www.bbc.com)

Therefore, in addition to municipal waste management and change in consumer behaviour and consumption habits, efficient waste management in organizations is becoming more and more important and timely. Nowadays, environmental issues are highlighted more than ever in our society and it is becoming a general perception, that we cannot continue to produce the same amount of waste as before. Hence, efficiency regarding both waste generation and management is highly encouraged.

To find a solution, both new governmental regulations and support for new innovations, combined with institutional research regarding waste diminution could allow organizations to find new ways of re-using and disposing the waste they create. There is high potential for efficient waste management and re-usage of materials to result in higher economic value and cost savings for organizations.

This would not only benefit the organizations themselves but also governments, as the diminishing amount of waste created could result in having less need for example for landfills.

Therefore, waste management and the environmental aspect of organizational behaviour should not be treated as problems. On the contrary, they should be seen as new possibilities and opportunities for both organizations and other stakeholders.

1.2. Research Problem

In addition to municipal waste, organizations create a varying amount of waste dependent on the field. As they are being perceived more and more as responsible institutes and are expected to function ethically and in an environmentally friendly manner in addition to being economically beneficial, they need to start paying more attention to environmental issues, specifically waste management.

Moreover, environmental issues, such as global warming, are becoming more and more important and are very timely for our society. Besides new stricter governmental regulations, a growing number of organizations are implementing extensive sustainable development and waste management programs and targets into their agenda of their own free will.

As the impact of Corporate Social Responsibility (CSR) activities have been studied, it is not always that these practices bring more profitability or revenues to the organization. Instead, such actions might result in decreased amount of risk, meaning that the organization is less prone to risks e.g. law suits, as it is pursuing socially responsible actions. (Cronin et al., 2011)

Therefore, as CSR and waste management are somewhat overlapping topics, this thesis will concentrate on discovering the potential benefits that different types of waste management procedures have to offer for organizations, or whether they bring no additional value or even create more costs in the first place. In addition, the main concentration is on the benefits gained from efficient waste management in organizations mainly located in Finland.

1.3. Research Questions

The research questions this thesis will seek to answer are the following:

1. What type of waste do organizations create?
2. What are the organization's policies/attitudes towards waste? /How do different organizations perceive waste management (a constraint/compulsory measure or an opportunity)?
3. What different type of methods are there for organizations to deal with waste?
4. What are the outcomes of different types of waste management?

1.4. Research Objectives

The objectives of this thesis concentrate on the following activities:

1. To discover the economic benefits a company can gain from efficient waste management.
2. To discover the procedures for managing and minimizing waste.
3. To explore the impact of environmental awareness of the companies to customers and target groups.

2. LITERATURE REVIEW

2.1. Introduction

This part of the thesis will discover the different ways of managing waste in organizations and explore the possible benefits related to each method based on existing literature and research.

2.2. Background

Increased consumption, resulting from rapidly increasing number of people on our planet, follows the fact that our natural resources are becoming more and more limited (Madu, 2007). Therefore, prices for raw materials are going up, which in turn causes problems for organizations in manufacturing fields (Jonsson et al., 2011). Hence, the increasing cost of raw materials and energy is forcing organizations to rethink their product manufacturing processes.

This raises the question whether the design and/or distribution of the product could be modified in order to minimize costs and maximize value to the organization. In the best-case scenario, this could open new opportunities for organizations to sell their used equipment, by-products from manufacturing processes and used resources that have previously been incinerated in order to produce energy. (Cronin et.al., 2011)

Although huge steps have been taken towards a greener future in the organizational world, still today, sustainability, and as a big part of it production of waste and its management, is a struggle. Schrettle et al. (2013) cited in Penttilä (2016; 76) identifies that it needs constant attention in order for organizations to minimize their environmental impacts.

Especially organizations operating in the manufacturing field are becoming more and more of an eyesore for both consumers and governments, and are forced to constantly focus on developing their green habits (Sarkis, 2001). Therefore, the current situation

calls for serious action on using our resources efficiently, if we were to sustain the prevailing quality of life. In addition, we should focus on preserving the current natural diversity. (Madu, 2007)

2.3. Definitions

2.3.1. Waste Management

In the Finnish Waste Act 2011, waste management is defined as 'the collection, transport, recovery and disposal of waste, including monitoring and supervision of such operations and the aftercare of disposal sites--'. In addition, in this thesis, efficient waste management is referred to a method that efficiently reduces the amount of produced waste and is at the same time to some extent considered environmentally friendly.

2.3.2. Waste

In the context of waste management, where waste is a solid, physical product, Christensen (2011) defines it as 'left-over, a redundant product or material of no or marginal value for the owner and which the owner wants to discard' (p.3). What is note-worthy is that the definition of what concretely is defined as waste depends on the specific situation and owner's perception in addition to time, location, state and personal preferences (Christensen, 2010).

According to European Council Waste Framework Directive (2008a) cited in Lilja (2016: 11) and the Finnish Waste Act (2011) 'Waste' shall mean any substance or object which the holder discards or intends or is required to discard'. However, it should be noted that this does not include possible by-products (the Finnish Waste Act, 2011).

2.3.3. By-product

A by-product is not defined as waste when '--It results from a production process whose primary aim is not the production of that substance or object--' (the Finnish Waste Act, 2011). In addition, it is required that it is certain for the 'product' to have further use, it can be used just as it is 'without any further processing (other than normal industrial practice), the [product] is produced as an integral part of a production process and the substance or object fulfils all relevant product requirements and requirements for the protection of the environment and human health for the specific use thereof and, when assessed overall, its use would pose no hazard or harm to human health or the environment' (the Finnish Waste Act, 2011).

2.3.4. Industrial Waste

In his book, Christensen (2010) defines 'industrial waste' as 'waste from industrial production and manufacturing' (p. 100). The term 'industry' includes various industrial sectors and subsectors which highly differ in what type of raw materials and manufacturing technology they use and what they manufacture from these particular raw materials (Christensen, 2010).

2.4. The Finnish Waste Act

Due to both Finnish and EU legislation, there are some legal restrictions regarding waste production and waste management procedures.

According to the Waste Act 2011, product manufacturers should strive to ensure that

- raw materials are used sparingly in production, and that waste, raw materials produced from waste, or recycled products or components thereof, are used in production;
- in manufacturing, the production method which is chosen generates as little waste as possible, and the waste which is generated is as harmless as possible to human health and the environment;

- the product is durable, reparable and re-usable and recoverable as waste, and that the product and the use thereof generates as little waste as possible. (the Finnish Waste Act, 2011)

Therefore, the Waste Act in itself forces organizations to pay attention to their manufacturing processes in order to minimize created waste. Although, as there are no quantities or percentages mentioned and the laws are relatively vague and ad hoc, there are possibilities for organizations to get around the laws.

When applying section 8 (general obligation to comply with order of priority) in the Finnish Waste Act 2011 to organizations, all performed activities should primarily be considered to produce the minimum amount and harmfulness of waste. However, in a situation where waste is being generated (which is the case for majority of organizations), they should concentrate on producing first of all re-usable waste and secondly recyclable waste. If neither of these is possible, the next best alternative is to use the waste to produce energy. Finally, if none of these can be applied and the created waste isn't recoverable, it will be disposed of. (The Finnish Waste Act 2011)

Some of the benefits that organizations can gain through efficient and environmental waste management is a head start regarding future laws and legislations. It is likely that laws and legislations regarding sustainability as a whole will become stricter, forcing organizations to innovate new ways of becoming greener and reducing waste. An organization that is already a forerunner regarding the subject and has already implemented greener strategies in the organization, will better avoid the effects of such new restrictions. In extreme cases, these organizations may gain a competitive advantage against other organizations in the same field.

2.5. Waste Management Methods

Although waste isn't desirable in the first place due to its feature of not bringing any additional value to its owner (in this case an organization), it also has other features that make it unwanted. First of all, storing waste is impractical, as it takes space from other potentially storable products/items. Secondly, depending on the type of the

waste, it may cause problems, such as undesired odours and insects. (Christensen, 2010) Therefore, some of the most common waste management methods will be explored.

2.5.1. Inverse Manufacturing

Some universal strategies have been distinguished in order to make product manufacturing more efficient and greener. One of these is inverse manufacturing, where the life of a product is being extended as far as possible by dismantling it into several re-usable, recyclable, maintainable or up-gradable items. This reduces the amount of waste produced, as existing parts from products can be re-used and exploited for new products. (Madu, 2007)

A good example is separating different metals from old computers which are no longer updatable, and making use of them on new computers. The idea behind inverse manufacturing is to extend the life of a product, minimize the amount of waste created by not fully exploiting the original materials of a product and minimizing the amount of waste delivered to landfills. (Madu, 2007)

In order to make inverse manufacturing profitable, to avoid time consuming processes and make it as easy as possible, the manufactured product (and the whole process) needs to be designed well (Matsuda et al. 2002).

Also, the quality of the parts of the manufactured products might vary (Matsuda et al. 2002). Some parts have likely been used more than others and may require different type of processing to be able to reuse/recycle them. Therefore, the used parts also require a special quality checking process (Matsuda et al. 2002).

Some potential problems related with inverse manufacturing include the collection of specific raw materials vital for an organization in order to manufacture their products. Without resources from e.g. a local waste management facility, which has already implemented a well working procedure of separating different materials from each

other, it will require a lot of resources from the organization itself to carry out such technology.

2.5.2. Product Stewardship

The idea in product stewardship, which works as reverse logistics, is that instead of the consumer, the manufacturer is the one responsible for the product from the very beginning of its manufacturing to the point where it needs to be responsibly disposed of (Madu, 2007).

Some of the focuses of product stewardship are in recycling, safe disposal of hazardous wastes and unusable components, and environmental impact assessment of all manufacturing processes. The gained benefits of the reverse logistics business strategy can be substantial; the amount of industrial waste from beginning to end of the manufacturing process could be reduced by even 30%. In order to succeed in attaining the benefits, the products should be designed so that they are easily renewable, that the proper functioning of the product can be trusted and that they have a high residual value. (Madu, 2007)

2.5.3. Remanufacturing

Madu (2007) also talks about re-manufacturing as a way to minimize environmental damage and save both in costs of labour and materials. It differs from inverse manufacturing only in that remanufacturing uses the original product to manufacture a new one, whereas inverse manufacturing uses parts of random used products to manufacture a new, different one.

The process involves collecting used items via a recycling program in which the first step is to collect the original products back to the manufacturer. The second step is to evaluate their condition and decide whether they are worth recycling. Finally, the original, used product is dismantled either fully or partly, depending on its condition after which it is repaired to be able to recover it as a new usable product. (Madu, 2007)

One of the defects concerning remanufacturing is the possible consumer's supposition that products which are remanufactured have a poorer quality in comparison to the original product (Jonsson et al., 2011). This also applies to inverse manufacturing.

In addition, charges related to transportation of the returned product has an effect on the viability of the whole remanufacturing process (de Brito et al., 2005). Hence, an organization should carefully examine the costs related to used product collection. Just as for inverse manufacturing, remanufacturing may require extensive collection networks, which might become very time, money and resource consuming if implemented by the organization itself. In such case, the technology required for the process, potential need of new workforce to carry it out and some warehouse space are potential costs (Jonsson et al., 2011). Also, the whole activity of implementing a remanufacturing process into the organization requires some investments.

Furthermore, the clients, whether individual consumers or companies, need to be engaged in the network in order to make it function. This might be difficult, especially when it comes to individual consumers as they might be more difficult to reach with the subject than organizations.

What is also noteworthy is that the remanufacturing process faces difficulties when the products are sold abroad. First of all, the whole process gets a lot more complicated when trying to get the products back to the manufacturer from a foreign country. Secondly, there might be laws and legislations which might hamper or even forbid this type of action. (Jonsson et al., 2011)

2.5.4. Recycling

Maybe the most recognized environmentally friendly way of dealing with organizational waste is recycling. Madu (2007) defines it as 'a process of converting materials that could have been treated as wastes into valuable resources' (p. 49). Recycling is based on separating recyclable material from other produced waste and then getting rid of the non-recyclable material and finding new purposes for the recyclable material.

Not only does it decrease the amount of waste brought to landfills and incineration, it is also profitable for organizations. By recycling already existing, used material, organizations can save on costs of new material. In addition, it enables them to reduce the cycle time of introducing new products and processing time and they are more aware and in control of their supply chain. (Madu, 2007)

It should be noted that the amount of materials used on a product and the way the product has been built from these materials affects its recyclability and the technology needed for it, separation of parts and the quality of the recycled materials (Sas et al., 2015). It must also be taken into consideration that some materials are very difficult to separate from each other, making the recycling process a lot more difficult, if not even impossible. Such materials include different kinds of plastics. In such cases, the benefits of recycling and/or separating the product materials from each other might result in low quality products, which in turn diminish the economic benefits in such measures that the product might not be worth recycling anymore. The only option to get any benefits of the product is to use it as a resource of energy by burning it (Jonsson et al., 2011). Therefore, it is wise for an organization to design their products so that they are easily recyclable in the first place, as it will decrease the cost of the overall process (Sas et al., 2015).

What is contradictory, and highly dependent on the manufacturing field and the advancement of the used technology, in recycling is whether the process enables cost savings, or whether it increases the price of the product. What should also be considered is that the customers willingness to pay more for a recycled product than for a normal product is limited. (Jonsson et al., 2011)

2.6. Ecolabels

Madu (2007), claims that the primary purpose of ecolabels is to help consumers identify health and environmental impacts on their product buying habits. Therefore, it is expected that consumers would base their purchasing decisions to such values that make them choose the less environmental and health-risk including options. On the other hand, for manufacturers, eco-labels work as an encouragement to develop more environmentally conscious production systems. In order to make the idea of

ecolabeling function, consumers should be aware of their meaning and the labels should be trustworthy. (Madu, 2007)

Below, two common ecolabels used in Finland. According to research, 94% of consumers in the Nordic markets are able to recognize The Nordic Ecolabel (www.nordic-ecolabel.org).

Figure 1: EU Ecolabel (eu-ymparistomerkki.fi)

Figure 2: The Nordic Ecolabel (www.joutsenmerkki.fi)

2.7. ISO 14001

The ISO 14000 is an Environmental Management System (EMS) standard developed by International Organization for Standardization (ISO) Technical Committee ISO/TC 207 and its various subcommittees (www.iso.org). In this thesis and literature review, the concentration will be specifically on the ISO 14001 part of the ISO 14000 family. As two of the three companies interviewed for this thesis have implemented the ISO 14001 system to their organization, the concentration will mainly be on its benefits instead of other environmental management systems.

The idea behind the ISO 14001 standard is to improve an organization's environmental performance as a whole (Romvall et al., 2011). According to iso.org 'it helps organizations improve their environmental performance through more efficient use of

resources and reduction of waste, gaining a competitive advantage and the trust of stakeholders' (www.iso.org).

Previous research seems to suggest that organizations that have implemented certified systems, such as ISO 14000, tend to perform better than those with only formalized systems. In addition, organizations that have certified systems give an impression of acting socially responsibly. This, in the consumers' eyes, tends to give a better impression of the company's image. (Cronin et al., 2011)

According to some findings, presumably, organizations which had implemented the ISO 14001 had succeeded in decreasing the amount of produced waste (Sroufe, 2003). When it comes to environmental programs in general, they usually affect resource, energy and water usage by decreasing their consumption and also by reducing the amount of produced waste. These, on the other hand, tend to diminish costs compared to their previous consumption or production. (Penttilä, 2016)

The results regarding stock value and shareholder value are rather contradictory. Some studies argue that Corporate Environmental Initiatives (CEIs) mostly decrease shareholder value (Walley and Whitehead, 1994), whereas some other studies indicate that there are at least some positive market reactions with certain CEIs (Jacobs et al., 2010). Jacobs et al. (2010) also find that most of the CEIs are value-neutral. The same study discovers that Environmental Awards and Certificates (EACs), especially ISO 14001, are related to positive market reaction (Jacobs et al., 2010).

All in all, ISO 14001 has received some criticism based on its lack of performance-based standardizing (Corbett and Klassen 2006). Hence, organizations can still have poor waste management processes which lead to inefficient waste streams (de Jong, 2014). In addition, as an organization's primary task is to be economically beneficial, according to numerous studies, such as Albuquerque et al. (2007); Bansal and Hunter (2003); Florida (1996); Krut and Gleckman (1998); Rothenberg et al. (2001) cited in de Jong et al., (2014: 133), the ISO 14001 may be misused in order to create a better image instead of genuinely trying to make the organization as a whole more environmental friendly and financially beneficial.

2.8. Conclusions

Cronin et al., (2011) claims that the idea behind getting economic benefits through waste management procedures is by decreasing the amount of inputs, in this case different types of materials needed for product manufacturing, organizations should gain cost savings. In addition to saving manufacturing costs, organizations may be able to price their products more competitively and gain competitive advantage (Cronin et al., 2011).

As can be seen from this literature review, there are multiple ways of executing an efficient waste management program into an organization. However, what is problematic in the subject of waste management is the fact that technology regarding it develops quickly and makes it difficult to compare efficiency between studies from different years (Christensen, 2010).

Also, the academic literature available regarding waste management and its efficiency gains is quite contradictory. Depending on from which perspective the results from waste management are looked at, there are very different findings.

First of all, due to the high variety in types of waste created by organizations, it is very difficult to straightforwardly claim a certain way of how to efficiently deal with waste or predict the outcome of different types of waste management techniques. For some organizations, it might be more beneficial to burn their waste to get energy out of it whereas for another organization recycling brings the biggest cost savings. Moreover, depending on the waste produced, recycling technology can be very expensive and it can take several years for it to actually start generating any kinds of profits for the organization.

In addition, some organizations are incapable of recycling or burning their waste. In such cases, the only way to get rid of the waste might be to take it to a landfill etc. which does not benefit the organization at all. Therefore, organizations profit in different ways depending on what they manufacture and which type of raw materials they use.

2.9. Conceptual Framework

In the conceptual framework, waste management techniques, laws and legislations and the ISO 14001 and their effects on both each other and an organizations performance are identified.

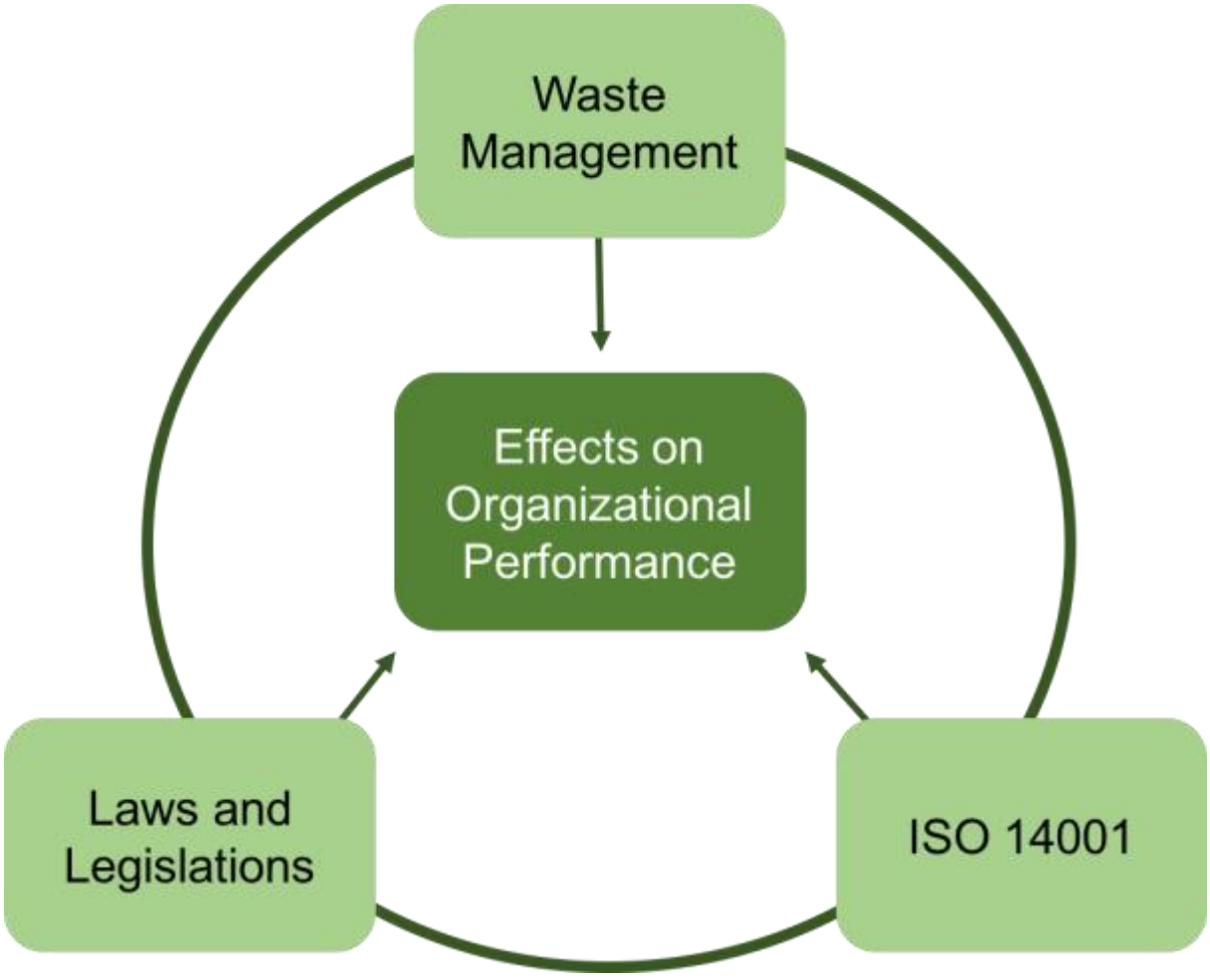

Figure 3: Conceptual Framework

3. METHODOLOGY

This section will look at the data collection methods used in this thesis. In addition to used methodology, this section will discuss other alternatives for data collection that could've been used.

3.1. Data Collection for Research

Some possible interview methods that could have been used to conduct data for this thesis are structured and unstructured interviews. The reason behind discarding these methods was that structured interviews would have not enabled enough in-depth information regarding the subject, whereas unstructured interviews might have led to too broad and irrelevant information. In addition, some relevant themes regarding the thesis subject might have been missed entirely due to the lack of a clear structure. (Wilson, 2010)

Besides differently structured interviews, questionnaires could have been one way to reach out for organizations and collect data. By using this method, a bigger number of companies could have been reached, but on one hand, the gathered data might have been too superficial or on the other hand, there could have been too much information depending on the way the questionnaire would have been conducted and distributed.

In addition, the concentration could have been on one specific field and the questionnaire could have been sent to several organizations on a specific field in order to compare their answers among themselves. The disadvantage in this method would have been the difficulty to reach and get the organizations interested and answering the questionnaire, and hence getting enough replies.

3.2. Semi-structured Interviews

The primary research methodology used to collect information for this thesis is semi-structured interviews. Three organizations from different fields were chosen for the

interview based on what they manufacture and how well they suit for the subject of waste management.

This specific methodology was used for several reasons. First of all, according to Wilson (2010) it gives the interviewer the possibility to think about the questions beforehand and assure that all relevant information and questions regarding the subject will be covered. In addition, it gives the interviewer the opportunity to refine their questions so that they are easily understandable and that the interviewer can in-depth explain the questions if left unclear for the interviewee (Wilson, 2010).
The reason why semi-structured face-to-face interviews and telephone interviews were chosen for this thesis is that they gave the possibility to ask additional questions from the interviewees during the interview sessions, in case something was left unclear or if the interviewer wanted to know more regarding a certain subject. The face-to-face interview method also gave the possibility to record the interviews and therefore it was easy to return to the collected material and avoid misunderstandings etc.

Moreover, a semi-structured interview enabled to assuredly get an answer to those subjects that information was needed on, while simultaneously allowing to diverge from the structure and ask additional questions regarding unclear subjects and topics arising during the interview. It also helped to keep the focus of the interview on the relevant subjects, and not let it drift away from the main subject.

3.3. Implementation of the Interviews

For this thesis, two face-to-face interviews and one telephone interview were conducted for the chosen companies. The questions were sent beforehand to all interviewees in order to give them the opportunity to prepare and make themselves familiar with the questions. The basic structure of the interview was the same for everyone, but the questions were to some extent customized for each interview to be able to get the most relevant information.

The first interview with Helprint Oy was conducted on January 19, 2017 in Mikkeli, in the company’s own premises. The duration of this interview was approximately 44

minutes. The second interview, with Company X, took place on January 23. 2017 and was originally supposed to be conducted via Skype and be recorded, but due to technical problems, ended up being a telephone interview. The answers to the interview questions were typed on computer and later on sent to the interviewee to check accuracy. The duration of the telephone interview was approximately 45 minutes. The third interview was conducted on January 27. 2017 in Kotka, at Ahlstrom Glassfibre Oy's own premises and took approximately 23 minutes.

Both of the face-to-face interviews were recorded and then later transcript. All of the interviews were conducted in Finnish and afterwards translated into English. Some of the interviewees were contacted after the interviews via email for additional questions or to clarify some of the questions asked during the interviews.

Originally, the telephone interview was supposed to be a Skype interview, but due to technical issues, the decision to conduct the interview via telephone without recording was made. Later on, the interview notes regarding the interview were sent to the interviewee, who in turn checked the accuracy of the answers (due to the fast pace and time limit of the telephone interview) and added some additional information to the questions.

4. FINDINGS

In this part, material from three conducted interviews will be analysed. The first section will introduce the companies and look into their waste management procedures. Next, the exploitation of by-products will be discovered, followed by assessing the effect of ecolabels for their business. Lastly, the overall efficiency and benefits of different types of waste management will be analysed.

4.1. Introduction

The interviews were conducted for three companies, which all operate on different fields;

1. Ahlstrom Glassfibre Oy
2. Helprint Oy
3. Company X

The interviews were conducted only on three organizations from different fields in order to compare the problems and opportunities between these different fields. This gives a more wholesome picture of the whole waste management process and helps tie together certain patterns that could occur in multiple organizations.

4.1.1. Ahlstrom Glassfibre Oy

Ahlstrom Oy is a fibre based product manufacturer and their glass fibre tissue factory, Ahlstrom Glassfibre Oy, located in Kotka in southern Finland, was visited to conduct the interview. The interview concentrated on their glass fibre tissue manufacturing and looks at their waste management procedures from this specific products' point of view.

Ahlstrom Glassfibre Oy's overall waste management concentrates mainly on sorting the produced waste: e.g. normal household waste, wood and metal in addition to glass fibre tissue. The main guiding factor for the organization's waste management (excluding glass fibre tissue) is pricing due to externalized waste collection and

management. Therefore, as the waste management plants are very strict and wish for the waste to be as pure and sorted as possible, the company needs to be very precise when sorting the type of waste in question. In comparison to glass fibre, the amount of other waste is very minimal and its processing does not compare to the one of glass fibre's.

4.1.2. Helprint Oy

Second of the interviewed organizations, Helprint Oy, is a gravure printing company located in Mikkeli, Eastern Finland and it is the largest gravure printer in the Nordic countries. The company has an environmental permit for their operations and, naturally, operates within these criteria. Their waste management principles are to minimize waste, recycle and promote re-use of waste materials.

The production processes generate a large variety of different types of waste, including e.g. coppering electrolyte and electronics waste, which are both classified as hazardous waste. The company's waste management procedures concentrate largely on the benefits of their by-products, recycling and reuse in different parts of their gravure process, and a big part of their overall waste is being exploited in a way or another.

4.1.3. Company X

Lastly, the third organization, Company X, is a service providing company with a few subsidiaries both in Finland and abroad in 24 countries. Although the main focus will be on their business and actions in Finland, some aspects of their operations will also be compared between their agencies in different countries.

For Company X, the material will be focusing mostly on their textile business and managing textile waste. Their textiles largely consist of hotel, workwear and restaurant textiles. The company produces a small amount of workwear textiles by themselves,

but has mainly outsourced this part of their business, and provides a fabric care service.

The organization follows the ISO 14001 Environmental Management System. The biggest burdens on the environment from their actions are water, energy and textile waste. Company X focuses on their environmental policies and sustainability in every country in the same manner.

Environmental issues are a big part of the organizations operations and a part of their everyday actions. On a daily basis, they try to find more environmentally friendly ways to operate, e.g. by fetching and delivering their products in canvas bags and therefore decreasing the amount of plastic etc. waste. One of their goals for 2020 is to be able to recycle 90% of their textile waste.

4.2. By-products and Reusing

Before looking at the by-products and reusing processes of the individual companies in more depth, the figure below (figure 4) lists all the relevant waste and by-products of all three companies in a simple form, explaining their management processes and potential benefits.

Type of Waste	Copper	Glass Fibre	Textiles (in overall)	Toluene	Used Terrycloth and Sheets	White Paper and Reel Core
Company	Helprint Oy	Ahlstrom Oy	Company X	Helprint Oy	Company X's subsidiary	Helprint Oy
Waste Type / Way of Managing	A by-product of their gravure printing process.	Delivered to a landfill by an external operator.	Mainly incineration, partly recycling.	Recycled via a recovery process.	Sold for another company in order to be recycled as a raw material for children's wear.	Separated from each other after the reel core is used.
Benefits	Suitable for copper raw material and can therefore be sold forward to other companies.	Does not benefit the company in any way.	Can be used to produce energy and new products.	Can be reused in the company's own process and sold forward as a by-product.	Used textiles exploited by selling them forward.	Can be sold as separate products.

Figure 4: Summary of Organizational Waste

Helprint Oy strives to make use of as much of their waste and/or by-products as possible. The company's material flows are rather big, and hence it is very important to gain all possible benefits that they can achieve by selling and reusing the waste or materials left over from different parts of the processes. Therefore, as this has both ecological and economical importance, it is important for the organization to be in control of.

One by-product of Helprint Oy's printing cylinder production is very pure copper, which can be directly sold to be used as a new copper raw material. In addition, they separate white paper from its reel core, which is a cardboard roll. In a process, printing paper is fed into the press from reel stand where the paper reel gets unwound into the press. Once the reel has been used, there is a remaining reel core with some paper on it.

After the separation process, the two products are sold separately. Thus, the price of both products is higher than if they were sold together. Unused materials, like paper rolls, can be sold back to the paper supplier and steel wire, which is used to bind the printed product, can be returned to the supplier if it gets tangled on the reel.

In addition to white paper, reel cores and copper, as their main in-house reusable raw material and sold by-product, Helprint Oy produces as a by-product toluene. It is "a clear, water-insoluble liquid" (www.pubchem.ncbi.nlm.nih.gov) and is used as a solvent in the printing process. When toluene vaporizes, it becomes a Volatile Organic Compound (VOC), which is a gas. It has some negative effects on the environment, and it is required in the organization's environmental permit that these VOC gasses must be collected in their own recovery plant in their own premises.

At the toluene recovery plant, the toluene vapour is absorbed into an active coal material and recovered by washing the active coal with hot water steam. The vapours are then cooled and condensed into a mixture of water and toluene. Next, the liquid is collected and separated in a decanter unit, where the toluene can be recovered. The outcome of the process is very pure toluene, which can be both sold and reused by the company itself. The recycled toluene, if used by Helprint Oy, will then be reused at press units as a solvent for the ink. The organization itself uses most of the recycled

toluene, as it has become reusable after the process. In addition to the recovered toluene, the heat from the process is recovered as well.

The same toluene can be used and recovered endlessly in the process. The excess toluene from the process is sold back to the factory which originally sells the printing inks to the organization. Unfortunately, not all of the used toluene or VOC gasses can be recovered, but as much as over 95% of used toluene can be recovered from the process. In every recovery process, approximately 2-4% of the toluene is released into the air as fugitive emissions.

What is noteworthy is that where the recovery of toluene is mandatory for the company due to the environmental permit, the recovered toluene, which could be treated as a waste, is instead reused by the company itself or sold as a by-product. But as can be seen, the benefits of reusing and selling toluene are quite clear. Not only does Helprint Oy save in material costs by reusing the same product several times over and over again, but in addition, they get some extra revenues by selling the extra toluene from the process to the colour producing factory.

For Company X, their textile waste consists of workwear, and restaurant and hotel textiles. All of their textile waste is suitable for incineration. Of the materials used, cotton is one of the easiest materials to handle, but they struggle in finding new recycling purposes for it. Products that include snaps and zippers etc. are rather hard to manage, as they usually require mechanical separation from the textile product and therefore make the process more difficult and complex.

This is one of the reasons why the organization wants to maximize the life cycle of their textile products. The waste management procedure in itself uses a lot of water and energy, and makes it therefore even more environmentally burdening. Abroad, waste can also end up in wastelands, and hence burdens the environment by its physical presence.

Apart from wastelands, their textile waste in itself does not burden the environment, although it should be noticed that e.g. the production of cotton burdens the environment in many different ways all the way from its farming to its actual

manufacturing into a product. Also, cotton has to travel long distances, as it can be grown only in certain parts of the world. In addition to cotton, other textile raw materials originate from nature and therefore burden the environment.

In Finland, their textile waste is partly being incinerated and used to produce energy and partly reused. In overall (in 2016), the percentage of their incinerated textiles was 73%. Company X is aware of the fact that incineration is not the best alternative for managing used textiles, and they are looking for new management techniques for textiles, as they strive to be a forerunner in the textile business.

Nonetheless, the most difficult part in their textile waste management procedures is finding targets for reuse. What also challenges the process is the variety among their products. Naturally, as there are several different types of e.g. work wear, this in itself makes the process a lot more difficult. Hence, solutions are being invented for smaller categories instead of trying to figure out one way to manage all of their textile waste.

Even though the rate of recycling and reusing of textiles at the moment for Company X is very small, they strive to find new solutions and targets all the time. One of their subsidiaries sold terrycloth and sheets that were no longer in their own use to another company. They, on the other hand, manufactured clothing for kids out of these used terrycloth textiles and sheets, as the multiple times washed material is very suitable for children's' skin. Hence, products that were unusable for Company X could be exploited by selling them to another company.

All in all, although they have outsourced their manufacturing, the organization is still somewhat in charge of the manufacturing process and their goal is to manufacture as sustainable products as possible. Therefore, to increase the sustainability aspect of their products and minimize the amount of waste, all of their products are being tested so that they do not leak or bleed colour and that the product does not shrink when washed. In addition, Company X does not buy textile for storage. They strive to buy the material only for purpose in order to avoid surplus textile.

As their principles lie in product maintenance and repair, the life cycle of the product is being extended as far as possible by repairing and transferring the product from one

user to another, trying to find use for it for as long as possible. Only after this comes the consideration of how to manage it as waste.

What comes to Ahlstrom Glassfibre Oy, in addition to the strictness of the waste management plants, the fact that waste is being generated all the time means that the organization needs to be efficient and quick in managing it and getting it out of the way in order to avoid slowing down or interrupting the manufacturing process.

When considering their raw materials regarding the waste management process, the materials recyclability has no value in the raw material decision making. Glass fibre tissue cannot be recycled and therefore there are no (or very minimal) benefits in choosing materials based on their recyclability.

Most of Ahlstrom Glassfibre Oy's waste, e.g. household waste, wood, metal, cardboard and mostly glass fibre tissue cannot be exploited in any ways and fail to bring any additional value to the company. Roughly 750 tons of their waste is glass fibre tissue and 100 tons of other household waste etc. Chemicals and laboratory waste, which is classified as hazardous waste, go to a water purification plant.

What comes to glass fibre tissue, approximately 10% of it is constructed of organic matter depending on the product. From the waste management perspective, the percentage of the organic matter is too high to use glass fibre as a filling. This restriction has been set by the Finnish government, since a reform to the original law was made in 2013, which states that waste including more than 10% of organic matter is not suitable for filling (the Finnish Waste Act, 2013).

On the contrary to having too much organic matter for filling, glass fibre tissue has too little organic matter in order to be burned and used as a source of energy. 10% is such a small percentage that the amount of burned product in comparison to combustion residue is very big. Hence, using glass fibre tissue as an energy source is not profitable either for Ahlstrom Glassfibre Oy.

The problem with handling glass fibre tissue as a source of energy or recycling it is global. So far, none of the existing glass fibre tissue manufacturers have found a

sustainable option or solution on how to deal with and manage glass fibre tissue that is faulty and unusable. The amount of glass fibre tissue waste that Ahlstrom Glassfibre Oy faces is a serious problem for the company and they are collaborating with external organizations e.g. universities in order to tackle the problem. The benefits that could be gained from either recycling or burning the left-over glass fibre tissue could be tremendous, as nearly daily emptying of the glass fibre tissue container comes at a cost.

As the quality standards at Ahlstrom Glassfibre Oy are quite strict, the glass fibre tissue manufacturing process is very precise. It is manufactured with a specific glass fibre tissue machine, which rolls the ready material into a roll. Any glass fibre tissue that is in any way defective is treated as waste. Glass fibre tissue that is qualified as waste by the company itself benefits only a very small portion of their clients, as some of them are satisfied with lower quality products. In these cases, the product can still be sold, otherwise it has no purpose. Also glass fibre chaff and edge strip from the manufacturing process end up as waste.

What is also problematic with waste glass fibre tissue treatment is that due to its burdening effect on the natural environment when delivered to landfills, the administrative side of it is rather stressful. Kymenlaakson Jäte Oy (the local waste management firm) has to apply for a permit of exception every year from the regional state Administrative Agency (in Finnish Aluehallintovirasto or AVI) in order to bury glass fibre tissue. Glass fibre tissue is not the only waste that needs the permit of exception, as also other companies operating in the same area create waste that require it. Due to rising awareness of environmental issues and new laws and regulations, getting the permit of exception becomes more and more difficult every year. Hence, finding a sustainable solution is crucial in order to retain the company's glass fibre tissue operations in Kotka and in Finland altogether.

4.3. Effect of Ecolabels

When choosing their raw materials, Ahlstrom Glassfibre Oy gives most prominence to how the material suits for the manufacturing process and the economic aspect of the

raw material. The raw materials they choose need to be as non-toxic as possible. This is to satisfy their customers, who most often want products that are as pure as possible in order to get environmental certificates for their own products. The organization needs to be able to prove that they do not use hazardous raw materials.

In addition to the requirements of their customers, it is easier for the organization itself if they avoid hazardous raw materials, as their usage is risky, more dangerous and different authorities are always more interested in the organization's procedures when such raw materials are involved in the processes. Moreover, the hazardous raw materials are difficult to handle.

The glass fibre tissue itself is not bad for the environment in a way that it does not include any harmful raw materials and nothing dissolves from it after being buried. On the contrary, it is manufactured from very pure raw materials. The organization does not use any toxic substances in the glass fibre tissue manufacturing process, and therefore their customers have the possibility to gain environmental certificates and ecolabels for their products.

The customers of Helprint Oy are quite environmentally conscious and they alone set rather high requirements for the company to operate in. Most of their customers are looking for organizations that perform well in their own environmental activities, and that are able to show that environmental matters are under control.

The organization has the right to use several ecolabels, including The Nordic Ecolabel (or The Nordic Swan Ecolabel, in Finnish Joutsenmerkki), which is well-established and the official ecolabel of the Nordic countries (Finland, Sweden, Norway, Denmark and Iceland) (www.nordic-ecolabel.org). It is noteworthy to mention, that the requirements for the ecolabels Helprint Oy has, have stricter criteria than the ones required in their environmental permit. As Helprint Oy has quite big companies as customers, it is crucial for them to be able to prove that they take into account and care of the environmental aspect of their business. These companies want to ensure that also the suppliers they use for their products, and in Helprint Oy's case catalogues etc., are following strict environmental regulations and don't violate the organization's own environmental policies.

The fact that the factory has the licence to use The Nordic Ecolabel shows that the company is taking good care of its waste management matters for someone who understands about it or who is aware of the criteria for the label. Usually for these clients who want assurance of the company's environmental performance, The Nordic Ecolabel and an Environmental Management System are enough to prove the point.

In some cases, though, the company faces situations, where their clients set their own requirements for the company's operations. These clients might have their own criteria, which might exceed those of e.g. The Nordic Ecolabel. The client usually wants to visit the factory on-the-spot and basically audit the company themselves to assure that they fulfil their criteria. At times, also benchmarking may be applied in order to compare different gravure companies among themselves.

According to the interviewees at Helprint Oy, when it comes to their overall interest in environmental issues and green standards, they do not bring that much more customers in itself but, instead of being a barrier, they are more of an opportunity. For example, in a situation where a customer is comparing different printing companies among themselves, such environmental merits allow better for Helprint Oy to be part of the competition if the customer has any criteria for such merits.

In addition to their clients, offset printing, which is not precisely from the same field as Helprint Oy, creates another kind of competitive force. The printing technique in question, which is nowadays one of the most popular printing techniques, brings additional competition to the gravure printing field. When comparing gravure printing and offset printing, gravure printing is usually perceived to burden the environment more. Therefore, it is in Helprint Oy and other gravure printers' best interest to differentiate themselves from offset printers, and the best way to do this is with the help of environmental certificates and labels.

For Company X, the discussion of ecolabels was not that thorough, but the main purpose of ecolabels for them is quite the same as for Helprint Oy. Due to their existence, the organizations operations and processes are certified. Therefore, in cases where the customer has demanded some sort of ecolabels or certificates, their presence has been pivotal.

4.4. Conclusions

In overall, the interviewed companies seem to benefit in a greater extent than lose in their current waste management procedures, with the exception of Ahlstrom Glassfibre Oy regarding their glass fibre tissue. Their waste management method regarding the particular waste is at the moment inefficient, as it cannot be exploited in any way and it creates additional costs.

5. DISCUSSION AND ANALYSIS

In this part of the thesis, the findings section will be analysed based on the literature review and three company interviews.

Regarding the conducted interviews and literature review, it seems that there are connections between efficient and environmentally friendly waste management and financial benefits. First of all, as the amount of waste decreases, there is less need for waste collection. Hence, costs related to waste transportation can be decreased, as is clear in Ahlstrom Glassfibre Oy's case, where any decrease in the amount of glass fibre tissue waste would bring the company great cost savings.

Secondly, by reusing or recycling their own products or raw materials, organizations can decrease material costs. A good example of this is how Helprint Oy is capable of using the same toluene multiple times due to its recovery process. This decreases their material costs and they also get some extra revenue by selling the additional toluene that they do not need.

5.1. Attitudes Towards Waste Management

What was common with all of the interviewed companies was their perception on waste management. None of the companies have based their business first and foremost on minimizing waste, but do see it as an essential part of their organization. Moreover, two out of the three companies also have their annual sustainability reports online, meaning that some information regarding their waste statistics and environmental procedures are available for the public. The reports show the direction of their development compared to the earlier year and also distinguish the different goals set for the company, both environmentally and in overall.

What is interesting based on the interviews is that all of the companies are very willing to find new solutions to their waste management problems, e.g. Ahlstrom Glassfibre Oy, who is collaborating with external entities, such as universities, in order to proceed forward with their problem regarding the glass fibre tissue waste.

On the other hand, of course, the main idea behind all processes of managing waste is first and foremost economic for these companies, and mostly for other organizations too. As the willingness to look into different processes and stages of manufacturing, and then finding those stages that can be reassessed in order to get use of by-products or find reuse and recycling targets takes a lot of valuable resources, e.g. time and money, this only increases the need for an economically beneficial outcome of the process.

Hence, when discussing waste management and its benefits, even though there would be an extremely environmentally friendly way to manage waste, if it is not economically beneficial to the organization or at least does not cover the costs that its maintaining requires, a company will not proceed to implement it.

A good example of this is Company X. The company has units also outside Finland, located in Europe and all the way up to Asia, where in most parts waste management procedures cannot be performed in the same manner as in Finland. Although their stand on sustainability is the same everywhere, some locations pose difficulties regarding implementation. For example in Asia, recycling is not at all popular among organizations or even at municipal level. In worst cases, such processes are not even possible due to the fact that environmental concerns have not been truly identified and there are insufficient measures taken on the issue. In other words, awareness and action towards environmental issues are lagging in this part of the world compared to e.g. the West.

Therefore, it would require a lot of effort from the company to, in extreme cases, build their own waste management facilities in a country. And even then, it is not certain that it would be economically wise, as the costs and effort used for this might be higher than the benefits and the external valuation for such measures might be non-existent, decreasing the already low value of the whole process.

On the contrary, waste management in general can be perceived as an opportunity for an individual organization to spread awareness of environmental consciousness by setting an example for other companies via their own processes.

From the customer's perspective, when looking at the main criteria for Helprint Oy's clients for choosing a gravure printing company, they are still mostly based on economic factors. Only a few of their clients stress heavily on the environmental perspective and are potentially ready to pay more for environmentally friendly products.

What also affects the decision making is whom the client is used to doing business with. Even though there would be another company that delivers the same service with better criteria, the client might have already established a certain kind of relationship with one company on the field and does not experience a need for a change. Usually these are long-term customer relationships with good relations and are difficult for other competitors to intervene in.

5.2. Ecolabels and Diminishing the Amount of Waste

When interviewing the organizations on their environmental certificates, ecolabels and EMS, the organizations tended to just briefly mention the (possible) existence of EMS, which in all cases was the ISO 14001 program, and concentrate more on their ecolabels. This could be due to the fact that ISO 14001 is an EMS that is more of a direct investment for companies, whereas ecolabels have criteria that require already existing proof in order to get them.

In addition, as stated in the literature review, the existence of ISO 14001 can at times be misleading, as it is more of an self assessment tool for the company itself, whereas ecolabels have actual, changing criteria that need to be constantly filled in order to be able to carry one.

Regarding ecolabels, they were discussed in a very different scope in the literature review and in the interview sessions. From the interview with Helprint Oy, it became clear that ecolabels do not specifically attract customers for their business, but instead are more of a supposition for a company to have. As mentioned, environmental consciousness is rising and both consumers and manufacturers are more aware of their own, personal environmental impact. Hence, it is rather expected in today's

society for an organization to have some environmental criteria and therefore labels and certificates for their operations. Therefore, they do not bring as much competitive advantage as maybe generally expected.

Without previous knowledge about the effects of ecolabels to customers, it is surprising to find that their existence is rather expected for an organization and that they possess quite a small value when looking at their feature as a differentiating factor among competitors. For companies, ecolabels are clearly not the main priority, although they do seem to play an important role for a fraction of customers who are very strict and particularly aware of their environmental policies. As mentioned by Helprint Oy, the fact that an organization has ecolabels naturally does not degrade the company's image, vice versa, but rather than bringing additional revenues and huge competitive advantage, they allow the organization to more likely be a part of the competing configuration. Therefore, ecolabels could be considered to be more order qualifying than order winning criteria. In addition, this seems to indicate that the original idea of ecolabels as a guiding factor for consumers is being implemented.

What comes to finding just the right waste management solutions for organizations, it can be considered as a crucial part of the whole process. It enables them to get the most benefits of the waste they create. As the final waste often consists of many different types of smaller parts (again highly dependently on the field the organization operates on), it would be recommended to reflect whether different methods could be exploited or combined in different phases of the manufacturing process.

By thoroughly analysing the whole manufacturing process and product life cycle, waste created can be minimized, which in itself can bring cost savings to organizations. Extra revenue can also be created by taking advantage of by-products. The benefits of by-products can be best achieved by reviewing all of the production phases and analysing what kind of "extra" material these phases produce. It is important to not neglect materials that might be considered as waste, as there could be some intended use for them, as there is for Helprint Oy's toluene.

In the literature review, different types of waste management procedures and their pros and cons were discussed. These can be implemented to the conducted interviews by

comparing the processes the organizations are carrying out, to the methods described in the literature review, such as reuse and recycling.

Although clear similarities can be found, it is somewhat difficult to compare the results regarding waste management benefits based on the interviews and on the literature review, as the waste management methods of the three companies are very unique and field-specific, e.g. Helprint Oy's reusing of toluene. On the other hand, all of the interviewed companies' waste management procedures are based on the ones presented in the literature review.

5.3. Benefits of Efficiency

For Company X, the maximization of the product life cycle brings benefits to the organization. By prolonging the life of the product, the organization doesn't need to buy as much textile. Hence, they create less waste and are able to make some cost savings on the waste processing sector.

What is also difficult with reusing and especially recycling is the fact that unlike in Finland where recycling is somewhat common nowadays, in other countries the concept of recycling can be very poor. Especially in Asia, recycling is not that trendy yet, and these societies have not yet woken up to the fact that organizations should have also environmental responsibilities in addition to economical. This makes it difficult for organizations from the West, as they might not have enough or at all resources to build their own recycling plants.

For Ahlstrom Glassfibre Oy, the organization has done some research and tried a burning process for the glass fibre tissue waste, but so far, the results have not been that encouraging. They have their own mill and an incinerator, which have been used for tests e.g. incineration. In the tested process for incineration, before burning, glass must first be separated from the organic material, which happens in the mill. The burning process itself is successful, but there are other aspects in the process that the organization has to think about.

Firstly, separating the organic matter from glass is a costly process. Secondly, the separated glass is not clean enough to be recycled and used again in a new process. The small amount of organic matter does not compensate for the bigger amount of glass, which is unusable for a new product, and therefore the whole process is not cost efficient.

However, if the process of separating would work, it would solve a lot of problems for the company. To begin with, it would decrease the amount of glass fibre tissue waste produced, if not even end it completely. Hence, the costs of delivering glass fibre tissue waste from the factory area to the waste management plant would decrease. In addition, it could bring energy and raw material cost savings to the company. The separated glass, if they managed to get it to an accepted quality level, would to some extent spare the organization from buying purely new glass and the burned product could be used as a source of energy and by doing so it would decrease energy costs.

Handling the product on the premises of the manufacturing plant would of course generate costs of its own, but would still most likely pay back itself, if it were possible to burn or recycle the product. If the process of separating glass from the organic matter would be possible, at least the glass part could be reused, either as a recyclable raw material or as filling due to glass being a purely inorganic material. (Ahlstrom Oy)

5.4. Overall Assessment of Findings

In conclusion, the study of waste management as a whole is very complex, as all of its aspects are so field-specific. Even though certain companies seem to have mastered the idea of implementing and getting some serious benefits out of waste management, it is still an area among organizations that needs more attention. There is no time to waste, but instead get serious with the matter of diminishing the amount of waste and see more action from organizations. Soon, in the near future, efficient waste management will not be an option anymore, but more of a compulsory act for organizations, due to the Earth not being able to continue accepting the amount of waste we produce and governments intervening on the issue.

Thankfully, though, we are headed in the right direction, as more and more organizations are beginning to consider the environmental aspect of their procedures as an even bigger part than before. Soon enough, those who don't, will be forced, as legislation will get stricter and stricter as time goes by. Also, via ecolabels, the responsibility for buying environmentally friendly products and services grows more and more on the consumers' side, which again forces organizations to pay more attention to the environmental aspect of their processes in overall.

In the literature review, the appearance and presence of ecolabels was not discussed at all, only defined. Therefore, comparing the data from the interviews with the literature review is not practical. The definition by Madu (2007) said, the idea behind ecolabels is to guide the consumers buying habits in to a more healthy and sustainable direction. In the near future, this will most likely increasingly be the case, as consumers become more and more aware of their own responsibility and potential for influencing via their own decisions and buying habits.

5.5. Limitations

In this thesis, only three companies were interviewed, and therefore only rough conclusions can be made. Also, as the whole subject of waste management and its potential benefits are very field-specific, it is difficult to compare the three companies with each other or make any general conclusions from their waste management procedures. These procedures are very personal and what works for one company might not work for another. Although there are universal waste management criteria that do bring cost savings to almost all companies dependent on the field of business, such as decreasing the amount of waste, the results and procedures are still very field-specific and each field should be assessed independently.

If the interviews were to be conducted again, it would be smart to modify some of the interview questions. A couple of them seemed somewhat difficult for the interviewees to understand and answer, e.g. when discussing the economic benefits gained from waste management procedures. Therefore, this specific question was answered quite differently by all of the company representatives.

Also, when asking about the effects of the company's ecolabels to their customers, it is difficult to say how precise the answers were, as they probably reflected more of how the company *itself* experiences how their customers' view their ecolabels and rank the company in comparison to their competitors. Hence, the answers might have been to some extent biased, although the answers and views on the subject of some of the company representatives were quite interesting.

In order to avoid misunderstandings and biased information, these questions should have been phrased differently or instead another person who is more knowledgeable of the specific field of information should have been contacted inside the companies. This, of course, would also might have burden the companies more regarding the interviews.

What comes to the literature review, it was very difficult to find researches that studied the direct benefits that organizations may gain through different efficient waste management procedures. Also, the difference between Corporate Social Responsibility (CSR) and waste management was at times difficult to distinguish, as the topics overlap to some extent. Therefore, it was partly unclear whether some positive economic results were gained as a result of CSR activities or purely by waste management procedures, e.g. recycling etc.

In addition, the literature regarding waste management is more heavily emphasized on municipal waste management rather than organizational. Research regarding municipal waste management can to some extent be used to look at e.g. waste management techniques that apply to both municipal and organizational procedures, but mostly it is a very different aspect of waste management and cannot be thoroughly utilized to the subject of organizational waste management.

Also, the benefits gained from efficient municipal waste management are very difficult to compare to those of organizational, as in municipal waste management the stakeholders that benefit are governments. Although governments are also looking for minimal costs regarding waste management, it differs from organizations in a way that for a government, it is more difficult to control the type of waste produced, as it is mainly

household waste from individual people. Moreover, for a government, waste management in itself is a business, whereas for a company waste is a side product of their main activity that has to be dealt with in a way or another.

Lastly, what is not further analysed in this thesis are the effects of ISO 14001 EMS and its benefits. This is due to the fact that when compared to e.g. ecolabels, the ISO 14001 is more of an implicit part of the organizations operations, and is not used in the same way to attract a consumer's attention or interest towards the organization as ecolabels. Ecolabels are more on the consumer level of knowledge, whereas ISO 14001 might be more difficult for the consumer to recognize or understand, hence diminishing its external effects. Also, due to time constraints, there was not enough timely resources during the interviews to discuss the matter of ISO 14001 in such depths that would have benefited this research. Hence, it would be an interesting point to be taken into account to compare the effects of ISO 14001 and ecolabels to consumers.

6. CONCLUSIONS

In this section, the thesis will be concluded based on the findings and literature review. In addition, implications for international business and suggestions for further research will be introduced.

6.1. Main Findings

The main findings of this thesis concentrate on the methods and benefits of efficient waste management. It seems that there is a link between handling organizational waste in a manner that is both environmentally friendly and sustainable and additional revenues generated to the organizations engaging in these activities. The fact that organizations are mainly not interested in investing in waste management techniques that do not benefit them economically, it could be concluded that to some extent, the waste management techniques they have implemented do bring cost savings by simultaneously diminishing the amount of waste. Although, it should be noted, that the link exists on a different scope depending on the field the organization operates on.

The additional revenues, which are highly dependent on the field the organization operates on and are in overall very field-specific, are not that great when compared to the overall revenue of the organizations. Therefore, these revenues do not clearly benefit or boost a company's profitability.

Regarding the qualitative research, two out of three companies interviewed for this thesis point out that the revenues from their waste management activities are quite minimal and do not bring huge additional revenues. On the contrary, they do not create any additional costs either that would not be covered in the waste management process itself. Hence, it is more accurate to refer to cost savings rather than additional revenues. Moreover, such waste management procedures make the processes smoother and quicker and create goodwill to the companies and their reputation.

At least for Ahlstrom Glassfibre Oy, the diminution of glass fibre tissue waste and its recyclability and reusability possibilities would bring cost savings, which of they are very aware of themselves too and are continuously acting on it. Therefore, even though

this thesis cannot provide a comprehensive and universal answer to the question whether efficient waste management processes bring benefits to organizations, it does give some insight into the specific fields of the interviewed firms, and especially to the precise firms on those fields.

6.2. Implications for International Business

The subject of waste management is very global, especially in developing countries, where waste administration in overall is quite weak and the amount of waste produced is becoming an increasing problem. It is a very timely concern also for countries in the West, as multiple organizations are known to manage their waste very poorly. In worst cases, waste created in one continent is delivered to another with the “out of sight, out of mind” policy.

Unfortunately, though, efficient waste management techniques often require expensive technology, investments and in overall good investigation and research on the specific materials and methods via which it can be managed most efficiently. Hence, it makes it even more difficult for developing countries. However, in most cases, investing into proper technique is worth the initial costs, as reusing and recycling materials does bring cost savings. Therefore, it would be desirable if research regarding the subject would be available for organizations to ease the implementation of these practices more effortlessly. In addition, awareness of efficient waste management and its benefits should be more highlighted.

6.3. Suggestions for Further Research

For further research, regarding the topic of organizational waste management, it is suggested that a more thorough analysis on the existing research and economical savings of waste management techniques would be carried out. Also, by possibly concentrating only on one field, the results could be better generalized for that specific field. On the contrary, the concentration could be implemented to a larger amount of organizations in different fields in order to be able to make more general conclusions.

Also, the topic of waste management overall requires quite extensive knowledge to be able to analyse and make very clear conclusions in a profound matter. In addition, high level of knowledge regarding the subject would make the interviews more meaningful and the interviewer could grasp some of the topics in a more in-depth matter during the interviews. In this thesis, such profound level could not be reached mainly due to time limits.

The research question regarding waste management procedures was not answered as largely as originally desired. This is due to some of the waste management procedures (of the interviewed companies) being rather difficult to understand without a more thorough knowledge of the processes beforehand. As they were highly interesting and useful for the thesis subject, it would be recommended for the researcher to look into these processes in a more in-depth matter if possible in order to be able to explain and look at them more closely and profoundly.

Regarding methodology, the best results could have been found by combining individual, semi-structured interviews for a few companies and a questionnaire to conduct information on a larger scale. This would have been ideal, as it would have allowed for more general results without getting too superficial and vague, as the interviews could have been used for more specific information (regarding e.g. waste management procedures) and the questionnaire could have enabled a more larger scope of results.

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APPENDICES

Appendix 1: Company Interview Questions (in English)

Basic

1. What does your company manufacture?
2. How much do you look at the environmental aspect in your business activities? / How do green values affect your way of doing business?
3. Do you choose your raw materials based on their recyclability/manageability?
4. What kind of a role do eco labels play in your company? (something you value, seek to achieve?)
5. What do you see important in waste management? /What does waste management/sustainable procedures mean to your company?

Procedures

1. What type of waste do you produce?
2. Can you return any unused raw materials to suppliers for re-processing?
3. Can any of the process waste be considered as “by-product” (i.e. is it saleable, can it be used as input to another business/process?)
4. Is the waste you produce difficult to get rid of/manage?
5. Do you sell it / process it / pay another company to take it away and process it?
6. In what ways does it burden the environment?
7. How do you manage your waste?
    a. What are the biggest problems/What cause the most trouble with waste management?
    b. Do you reduce the amount of waste that goes offsite e.g. by burning or burying?
    c. What types of waste if any go into the normal disposal channels e.g. waste liquid into the sewerage system, local refuse collection

Benefits

1. What type of benefits does your company achieve through your waste management procedures? (Long-term customers → Economic, financial benefits?)
2. How do your actions affect your customers? (How do they perceive your products, the organization?)

3. If you have any environmental accreditations, do you think that these matter to your customers?

Future

1. What are your future plans regarding waste management?
2. How could you improve your efficiency? (Do you see it necessary to become more efficient?)
3. Have you thought of using a specialist waste management contractor?
4. Do you plan to achieve any (other) environmental accreditations? Do you think they will become more important?

Appendix 2: Company Interview Questions (in Finnish)

Perustietoja

1. Mitä yrityksenne valmistaa?
2. Kuinka paljon kiinnitätte huomiota ympäristöasioihin yrityksenne toiminnassa? / Kuinka paljon ympäristöasiat vaikuttavat yrityksenne toimintaan?
3. Millä perusteella valitsette raaka-aineenne? / Valitsetteko raaka-aineenne niiden kierrätysmahdollisuuksien mukaan?
4. Mitä jätteen käsittely tarkoittaa yrityksellenne ja mitä koette siinä (jätteen käsittelyssä) tärkeäksi?

Menettelytavat/Prosessit

1. Minkälaista jätettä yrityksenne tuottaa?
    a. Onko tuottamanne jäte vaikeasti käsiteltävää/onko siitä helppo hankkiutua eroon?
2. Millä tavalla käsittelette tuottamaanne jätettä?
    a. Voiko mitään tuotannon eri vaiheista syntyvää jätettä käyttää sivutuotteena (ts. onko se myytävää, voiko sitä käyttää jonkun toisen tuotteen valmistamiseen?)
    b. Pystyttekö palauttamaan yhtään käyttämättömiä materiaaleja tavarantoimittajallenne uudelleenkäsittelyä varten?
    c. Vähennättekö laitosalueen ulkopuolelle vietävän jätteen määrää esim. polttamalla tai hautaamalla?
    d. Maksatteko toiselle yritykselle jätteen poisviennistä ja käsittelystä?

3. Mitkä asiat tuottavat eniten vaikeuksia prosessissa (jätteenkäsittelyssä)?
4. Millä tavoin tuottamanne jäte kuormittaa luontoa?
5. Minkälaista jätettä, jos mitään, kulkeutuu normaalin jätteenkäsittelykanavan kautta, esim. nestemäistä jätettä viemäriverkkoon, kiinteää jätettä paikalliseen jätteidenkeruuseen?

Edut

1. Minkälaisia hyötyjä yrityksenne saavuttaa tavastanne käsitellä jätettä?
    a. Ympäristömerkit?
    b. Saavutatteko taloudellisia säästöjä kierrätyksen tms. kautta?
2. Miten suhtautumisenne ympäristöön vaikuttaa asiakkaisiinne? Uskotteko, että he näkevät tuotteenne ja yrityksenne eri tavalla verrattuna muihin alalla toimiviin yrityksiin?
3. Onko yrityksellänne ympäristömerkkejä

Tulevaisuus

1. Mitkä ovat tulevaisuuden suunnitelmanne jätteen käsittelyn suhteen?
2. Kuinka voisitte vielä parantaa tehokkuuttanne jätteen käsittelyssä / Koetteko kehityksen tarpeelliseksi?
3. Oletteko harkinneet käyttävänne jätteen käsittelyn ammattilaisurakoitsijaa?

LIST OF FIGURES