



A BUSINESS MODEL FOR SUSTAINABILITY: REFURBISHED HOME APPLIANCES AND ITS ENVIRONMENTAL, SOCIAL, AND ECONOMIC VALUE

Sustainable Entrepreneurship Project

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Abstract: In the transition to a more sustainable world, one of the activities to support the sustainable practices is to extend the product life cycle. Particularly, to reduce the rapid growth of the waste electric and electronic equipment (WEEE). Although WEEE contains hazardous elements, it also contains valuable ones which can be reuse if handled properly. Thus, the usage natural resources are maximized while no new raw materials are harvested resulting in the avoidance of further natural depletion. Organization focusing on extending the products' life cycle can contribute to the transition to a circular economy. Wasgoed.com desires to contribute to this process by realizing a refurbish center, specializing in home appliances, in Leeuwarden (the Netherlands). This study aims to research the social, economic, and environmental value creation by realizing such initiatives. Additionally, the interest from all concerned stakeholders are being explored. The contribution of this study is to provide the organization and stakeholders in this case with evidence if the realization of a refurbish center is supported. More important, if so then what added value should it have?

Keywords Electric and electronic waste, value creation, business model innovation, refurbished home appliances

INTRODUCTION

The current production-consumption-system has a negative impact on resource utilization, energy usage, and waste management. The linear production and economy have proven to be harmful to the planetary boundaries (Steffen et al., 2015). Therefore, the importance of setting common goals for the world to combat climate change is emphasized by various concepts. The Paris Agreement, Sustainable Development Goals (SDG), and Intergovernmental Panel for Climate Change (IPCC) aim to provide such a common goal. They call for the implementation of actions to reduce the decrease of the natural resource depletion and greenhouse gas emission to persevere the earth system. The concept circular economy (CE) has increasingly gained attention from practitioners and scholars for its system to close, narrow, and slow down the loop for product life cycle (Bocken & Short, 2019). The CE includes activities to extend the product life cycle which translates to activities as repair, refurbishing, remanufacturing, cannibalization, and recycling (Thierry, Salomon, Van Nunen, & Van Wassenhove, 1995).

The complex transformation from today's status quo (the linear economy) to circular economy, characterized by its wicked nature, requires fundamental change in the societal and economic structures from a holistic point of view (Hofmann, Marwede, Nissen, & Lang, 2017). Conventional business model tends to focus on maximizing profits excluding both environmental and societal dimension, whereas a circular business model includes all concerned stakeholders supplemented by environmental and social dimensions. Hofmann et al. (2017) argue that circular business enterprises are deeply involved in the product usage phase, meaning that they mainly generate their revenue from extending the product life cycle. Such business models redefine the value creation and proposition in the producer-consumer-relationship in which the societal and environmental dimension complement the overall business model. In this research, value creation refers to an essential aspect of any business model relating to how businesses seize new opportunities, new markets, and new revenue streams (*OECD Green Growth Papers*, 2013). Boons and Lüdeke-Freund (2013) differentiate the sole focus of value proposition for conventional and sustainable enterprises. Whereas conventional enterprises mainly focus on offering a product or service to generate economic return, a sustainable enterprise include measurable environmental

and societal value along with economic value.

Multiple studies (Akram et al., 2019; Babu, Parande, & Basha, 2007; King, Burgess, Ijomah, & McMahon, 2006) argue that the increased economic growth coupled with urbanization and growing consumer demand as a driver to the increase waste production. Notably, studies highlight (Guo & Yan, 2017; Talens Peiró, García Fernández, & Gabarrell i Durany, 2022) the annually increase from 3% to 5% of waste electric and electronic equipment (WEEE) in economic cooperation and development countries (OECD). WEEE mostly contain hazardous substances that pose a risk to the environment and health (King et al., 2006; Ongondo, Williams, & Cherrett, 2011); however, it also contains valuable waste (Sepulveda, 2012). WEEE is a type of waste that consist of valuable metals such as copper, aluminum, and gold (Ongondo et al., 2011). When these materials are not recovered, raw materials must be mined and processed to manufacture new products, resulting in severe resource loss and environmental harm due to mining, manufacturing, transportation, and energy usage (Cui & Forssberg, 2003). Thus, concepts comparable to the CE reduces waste arising from what would otherwise have end up on landfills. Accordingly, King et al. (2006) emphasizes on the 'closed loop design' as a key component to true sustainability, where waste streams are diverted to become new raw material compatible for new product designs. Legislation as the extended producer responsibility (EPR) aim to constrain the producer to bear a significant degree of responsibility for the environmental impact of a product's life cycle to the post-consumer stage (OECD, n.d.).

As it is not the producer, an organization that focuses on refurbishing home appliances does not have to comply with the EPR. It does, however, help to reduce the WEEE and extend the product life cycle. Wasgoed.com is such organization based in the Netherlands offering rental home appliances, particularly refurbished washing machines, tumble dryers, refrigerators, and dishwashers. As partially broken home appliances contain components which are still compatible, Wasgoed.com extracts these components enabling other partially broken appliances to fully function. Consumers often lack the knowledge to identify which component is not functioning, resulting in them disposing home appliances sooner than the designed intended product life cycle. King et al. (2006) identifies two reasons why home appliances are being disposed: functional obsolescence and fashion obsolescence. The former relates to the physical condition which

fails to meet its standards. While the latter refers to home appliances losing their appeal as new products with different or additional features enter the market.

While studies emphasize on extending the product life cycle of electric and electronic equipment (EEE), it has not been evident what the average life cycle of EEE is. For this reason, by creating a refurbish center for home appliances Wasgoed.com will be able to extract and construct components compatible for refurbishing.

Currently, disposed home appliances are being collected by a national waste collector resulting in materials not being r

This qualitative research focuses on realizing new business case for a refurbish center specializing in home appliances in the Netherlands. Subsequently, the research question is: "*Which components are required to be modified for a local refurbishment initiative by Wasgoed.com to enable environmental, social, and economic value creation?*". This research consists of a comprehensive analysis of the value creation and proposition in a social and environmental dimension arising from realizing a refurbish center. The findings result in a possible implication for support whether such concept should be established.

The realization of a refurbish center specializing in home appliances is in line with the offer of Wasgoed.com. This initiative will contribute to the reduction of the WEEE while simultaneously contributing to the closed loop system, resulting in an environmental value creation. As for the social value creation, local job opportunities will be created to serve a purpose of allowing those with a distance to the labor market to be trained and educated. Lastly, the economic value creation can be expressed in terms of profit for the organization. However, if the quantity of those with a distance to the labor market is being reduced, the costs of social benefits will also be reduced. Therefore, another economic value creation is the reduction of social benefits of the community. Additionally, semi-structured interviews have been conducted to determine the business components relevant for business model design of this initiative. These interviews are conducted with several experts in circular economy and consumers. The aim is to establish the required business components for the business model design to establish the refurbishment initiative.

This paper is organized as follows. First, section 2 provides the theoretical background and

framework. Second, section 3 provides the methods for acquiring the results. Subsequently, section 4 present the results of the semi-structured interviews. Lastly, section 5 provides conclusions, recommendations, limitations, and further research options.

LITERATURE REVIEW

Circular Economy

In 2015, the Circular Economy Strategy from European Union (EU) COM/2015/0614 provided an action plan to determine the strategies enabling the transition to a circular economy in Europe *reference*. Adopting the CE will boost the EU's competitiveness while simultaneously help to avoid the irreversible damages caused by extracting natural resources. The CE aims to boost the competitiveness by protecting the scarcity of resources and volatile prices, create new opportunities and innovative initiatives, and efficient methods of production and consumption. The Circular Economy Strategy consist of seven principles, including: (1) Production, (2) Consumption, (3) Waste Management, (4) From Waste to Resources, (5) Priority Areas, (6) Innovation, Investment, Other Horizontal Measures, and (7) Monitoring Processes. These principles are in harmony with the key EU priorities, specifically the aim to create jobs and stimulating growth, the preservation of climate and energy, the social agenda and industrial innovation, and with global efforts on sustainable development.

Additionally, the Circular Economy Strategy emphasizes on the role of waste management (principle 3) as a means of achieving the best overall environmental outcome and reintroducing valuable resources in the economy. The process of waste management and recovery starts in the production phase. To increase the recycling rate it is essential, among others, to increase the recyclability of products through product design. The barrier that occurs with an inappropriate product design for recycling, is the uncertainty of the quality of the material. Thus, materials with an increased quality are appropriate for recycling resulting in an increase of the recycling rate. In the CE, materials that can be recycled and reintroduced to the economy are referred to as "secondary raw materials". The extraction of critical raw material, often present in electric and electronic equipment, causes significant environmental impacts. The European Commission listed critical raw materials, amongst them are rare earth elements and precious metals (European Commission, n.d.).

Waste Management and Reduction

The waste hierarchy has an order of preference from prevention, preparation for reuse, recycling and energy recovery through to disposal (e.g., landfills) *reference*. Recycling consists of closed-loop recycling and open-loop recycling. Pires and Martinho (2019) defines the former as recycling and upcycling, while the latter refers to downcycling. The distinction between these methods lies in the usage of secondary raw materials. Accordingly, Haupt, Vadenbo, and Hellweg (2017) argue that closed-loop recycling implies that secondary raw materials is used back into the same product, whereas in open-loop recycling secondary materials are used to manufacture products different than the previous products. In addition, in open-loop recycling the secondary raw materials are often conjoined as one rate instead of communicating them individually (Haupt et al., 2017).

There seem to be no universal definition of refurbishing as the definition can vary from category to category (Durgee & Agopian, 2017). Multiple terms such as restore, remanufacture, reuse, and refurbish are being used interchangeably. In this research, the term refurbish refers to products being transformed to a like-new condition, allowing it a second (or third, or fourth) life *reference Hauser*. In a similar case of study, the reuse of washing machines in Barcelona, conducted by Talens Peiró et al. (2022) suggested two significant implementation in such business model. Firstly, implementing the traceability of the refurbished components (e.g., type and number) to enable calculations of the performance measurements. Secondly, communicating the organizations' repair and refurbish activities to increase the consumers awareness of recycling. Subsequently, a notable result in the study, was the threefold increase of economic benefit arising from the use of refurbished components.

Business Model Innovation

The literature presents various perspectives on multiple business model which holds the potential to embed sustainability into the business purpose and success: Bocken, Short, Rana, and Evans (2014) presents a review to develop a sustainable business model which modifies the value creation, value proposition, and value capture. In particular, the eight business model archetypes were provided to develop a sustainable business model. The aim is to link theoretical concepts of

business model innovation to the practical information supported by exemplars. More specifically, the archetype create Value from Waste specifically targets converting waste streams into useful and valuable input to other manufacturing processes and maximizing under-utilised capacity (Bocken et al., 2014).

Groupings	Technological			Social			Organisational	
	Maximise material and energy efficiency	Create value from waste	Substitute with renewables and natural processes	Deliver functionality rather than ownership	Adopt a stewardship role	Encourage sufficiency	Repurpose for society/environment	Develop scale up solutions
Examples	Low carbon manufacturing/solutions	Circular economy, closed loop	Move from non-renewable to renewable energy sources	Product-oriented PSS - maintenance, extended warranty	Biodiversity protection	Consumer Education (models); communication and awareness	Not for profit	Collaborative approaches (sourcing, production, lobbying)
	Lean manufacturing	Cradle-2-Cradle	Solar and wind-power based energy innovations	Use oriented PSS- Rental, lease, shared	Consumer care - promote consumer health and well-being	Demand management (including cap & trade)	Hybrid businesses, Social enterprise (for profit)	Incubators and Entrepreneur support models
	Additive manufacturing	Industrial symbiosis	Zero emissions initiative	Result-oriented PSS- Pay per use	Ethical trade (fair trade)	Slow fashion	Alternative ownership: cooperative, mutual, (farmers) collectives	Licensing, Franchising
	De-materialisation (of products/packaging)	Reuse, recycle, re-manufacture	Blue Economy	Private Finance Initiative (PFI)	Choice editing by retailers	Product longevity	Social and biodiversity regeneration initiatives ('net positive')	Open innovation (platforms)
	Increased functionality (to reduce total number of products required)	Take back management	Biomimicry	Design, Build, Finance, Operate (DBFO)	Radical transparency about environmental/societal impacts	Premium branding/ limited availability	Base of pyramid solutions	Crowd sourcing/funding
		Use excess capacity	The Natural Step	Chemical Management Services (CMS)	Resource stewardship	Frugal business	Localisation	"Patient / slow capital" collaborations
		Sharing assets (shared ownership and collaborative consumption)	Slow manufacturing			Responsible product distribution/promotion	Home based, flexible working	
		Extended producer responsibility	Green chemistry					

Figure 2.1: The Sustainable Business Model Archetypes

Alternatively, Alcayaga and Hansen (2017) provide an explicit business model that addresses life cycle improvement in innovation management and allows for the implementation of circular activities along the life cycle. The service business model can lead to: (1) a higher usage rate of capital goods, (2) a product design that considers for the true cycle cost, optimizing energy and consumables, (3) less use of energy in the use phase, (4) enhancing efficiency due to economies of scale and (5) application and implementation of radically disruptive technology (Tukker, 2004). Stahel (2010) argue that the adoption of a service business model require the implementation of a product life cycle extension strategy.

While these perspectives of various authors provide how sustainability can be embedded in

business models, Belz and Binder (2017) argue that the sustainable entrepreneurship process is an ambiguous and complex process. It is a process in which the entrepreneur is simultaneously trying to create economic, social and economical value. In other words, the entrepreneur is balancing the main aspects within the triple bottom line approach. Accordingly, the development of the triple bottom line approach is a process after the implementation of a double bottom line approach. The main reason is the reduction of complexity of the sustainable entrepreneurship process. Therefore, achieving the triple bottom line approach takes place successively rather than simultaneously (Belz & Binder, 2017).

Consumers’ Behaviour

To promote the adoption of refurbished products, the behavior model of Fogg (Dr. B.J. Fogg, n.d.) is used, as the aim of Wasgoed.com is partially to persuade consumers to recycle their home appliances and to adopt refurbished appliances rather than purchasing a new one. The model, as shown in 2.2, implies that a certain behaviour generally occurs if three elements converge simultaneously. If a desired behaviour does not occur, it means that at least one of those elements are missing. The elements are motivation (if people want to do it), ability (if people can do it), and triggers (a stimulus driving them to do it). Additionally, the model implies that motivation and ability can be traded off (e.g., if motivation is low, ability can be high).

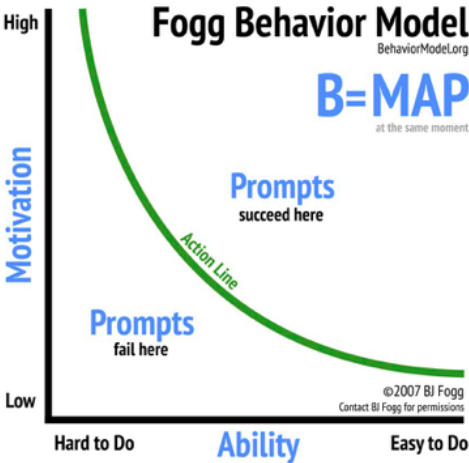


Figure 2.2: Fogg Behavior Model

2.4.1 Social Performance Measurements

Since the aim of this research is to explore the social and environmental outcomes of the realization of a local refurbish center, the questions remains how one would measure these outcomes and why it should be done in the first place. Firstly, accounting and reporting social impact can be valuable to an organization in the sense that it informs whether the strategy and operations are in line with the organization pursuing the strategy (Nicholls, 2018). Secondly, Nicholls (2018) argue that such data supports the organization’s legitimacy and thus can act as a part of sustainable resource strategy with key stakeholders. On the other hand, social performance measurements also function as a metric to the funders. However, this is only applicable for organizations driven by social purposes such as nonprofit or nongovernmental organizations.

Commonly known approaches of social performance measurements entail assessing impact or results, often described as "impact evaluation" and "outcome measurement" (Ebrahim & Rangan, 2014). The distinction between impact and outcome is the level affected by the results. While outcomes refer to the lasting changes on an individual level, impact refers to the lasting change on a community level. Social organization have been using the logic model to evaluate their performance. Ebrahim and Rangan (2014) have highlighted a notable observation of the use of the logic model. He argues how the assessment is often conducted after the implementation. The key components of the logic model are shown in figure 2.3.



Figure 2.3: The Logic Model

METHODS

Case Description

The current recycling of WEEE is being handled by the foundation "Organisatie Producentenverantwoordelijkheid E-waste Nederland" (OPEN). The objective of the foundation is to act upon the EPR on behalf of the producers of EEE in the Netherlands. Wecycle has been the operational brand to promote the collection of WEEE (Stichting Open, 2021). The operation is based on four pillars: Collecting, Campaigning, Recycling, and Reporting (Stichting Open, 2021). The core values of recycling is to create jobs, opportunities, and the creation of raw material. By campaigning, they aim to increase the knowledge of recycling activities amongst the Dutch and to enhance the customer trust in the process of recycling. Subsequently, reporting is to measure the targets of recycling processes. However, the last available report is from 2020 (Wecycle, n.d.). Wecycle collects WEEE generated by households and retailers by outsourcing the transportation of EEE to Vonk and Co (Wecycle, n.d.). The WEEE that has been brought to retailers are being collected and sorted. For consumers, Vonk and Co installs new EEE and collects what is no longer being used.

Wasgoed.com aims to execute the operational activities similar to Wecycle on a local level in the location of Leeuwarden. The current approach of the organization is a double bottom line approach in which the focus is on economic and environmental domain. However, with this initiative the triple bottom line approach will be executed.

The entrepreneur of Wasgoed.com claims that the industry is in need of mechanics specialized in home appliances. Thus, with the realization of a refurbish center the entrepreneur wishes to contribute to reducing the WEEE by extending the product life cycle and creating local job opportunities. Additionally, since the industry is in need of mechanics the organization wishes to train and educate future mechanics by implementing a course at a local post-secondary vocational education. The entrepreneur wishes to execute the operational tasks as Wecycle on a local level. For this reason, Wasgoed.com will collect the WEEE from retailers by exploring the opportunities to collaborate with the local waste processor, Omrin. Since Omrin provides the service to collect commercial waste in a sustainable method, the collaboration between Wasgoed.com and Omrin

will strengthen the legitimacy of their alliance (Kishna, Niesten, Negro, & Hekkert, 2017).

Sampling Selection

The purpose of the interviews is to gain insight of the stakeholders' interests. Particularly, focusing on what added value the realization of refurbish center in Leeuwarden can generate for the individual stakeholder. A qualitative approach allows the researcher to explore the different point of views Luborsky and Rubinstein (1995).

The two sampling methods that are considered in this research are purposive and quota sampling. The goal of quota sampling is to include those who may be underrepresented by purposive sampling (Luborsky & Rubinstein, 1995). However, the subjects in quota sampling represent the conditions to be studied rather than to represent the proportion of people in the universe. In contrast, the subject in purposive sampling represent predefined conditions. In this case, the chosen subjects represent each of the stakeholders' interests. The goal of purposive sampling is to provide equal numbers of people to enable the exploration of the conditions and meanings in this study (Luborsky & Rubinstein, 1995). Thus, subjects are intentionally selected to represent the conditions. Therefore, purposive sampling is suitable for this study as the goal is to explore the stakeholders' interests. As the stakeholders have varying interest, the study group is exploring diversity rather than homogeneity. Accordingly, Luborsky and Rubinstein (1995) argue that all members of a certain community can provide useful information about the daily life whereas experts provide detailed and specialized information. Ultimately, the stakeholders who have been interviewed are consumers, employees of the municipality of Leeuwarden specializing in economy, circular economy and waste reduction, provincial councilor, and policy advisor circular economy.

Data Collection and Analysis

The data collection consists of conducting interviews with participants. The participants are divided into two divisions. The first division consisted of five participants who are experts on how to implement a circular or sustainable approach in conducting business. Ultimately, the participants in this division consisted of the following: Employees of the municipality of

Leeuwarden (specializing in Circular Economy and Waste Reduction, Economic Affairs), a Purchaser of the Public Domain, Provincial Policy Advisor Circular Economy, and a Governor of Province. This perspective provides possible barriers and effects the organisation can encounter. The second division consisted of consumers. Since consumers are one of the key stakeholder, this perspective provide their current behavior. With this insight, the organisation is able to design its tools to create awareness and enable adaptation of refurbished appliances.

Considering that the perspectives from the various stakeholders are different in its nature, two semi-structured interview guides have been designed. This resulted in one interview guide focusing on unforeseen effects and possible barriers which the organisation could encounter while the other is focused on current consumer knowledge, behavior and expectations. The main goal of conducting these interviews were to gain knowledge of barriers, practicalities and consumer behavior. Secondly, the interviews have provided the expectations from each stakeholder to determine what added value they expect from such initiative. The interviews were conducted and transcribed in Dutch. The interviews were transcribed with the help of a transcription tool, Amberscript. To assure the accuracy of the transcriptions, I will go through the individual transcription to correct any errors.

Subsequently, the transcripts are being coded with the help of a tool, ATLAS.ti, to analyse qualitative data. The coding process consisted of three phases based on the data structure used by Corley and Gioia (2004), which is illustrated in figure 3. To begin with the first-order analysis, meaning that the preliminary concepts and codes were identified. It is then followed by the second-order analysis where the connections between the emerging themes are being grouped. The last stage is to make sense of the emerging themes from the second-order analysis.

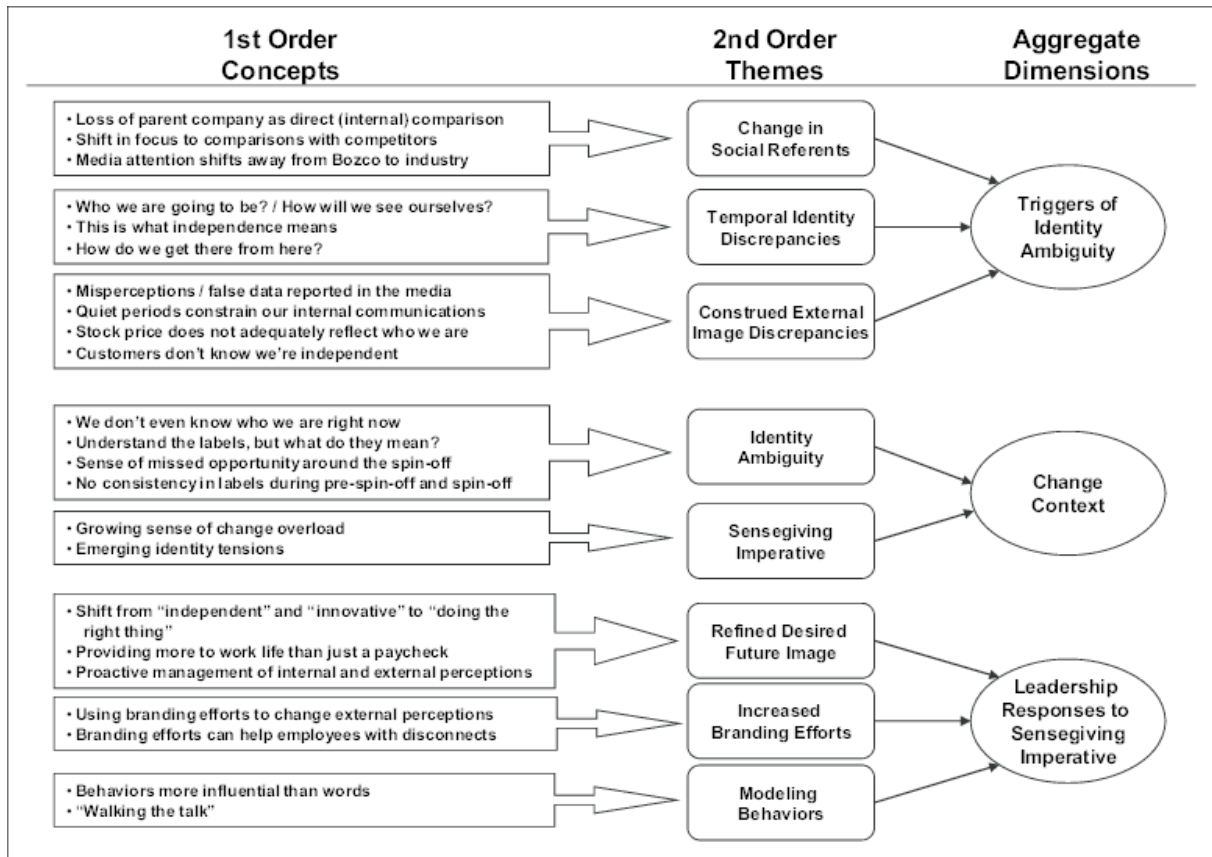


Figure 3.1: Data Structure Based on Corley and Gioia (2004)

RESULTS

This section provides the results from the empirical research. The empirical data is provided by several stakeholders. On the one hand, consumers have given their perspective on refurbished appliances. On the other hand, experts in circular economy have given their perspective on the implementation of such initiative locally. Both of these perspectives have been analysed individually as conjoining them would not highlight the essence of the perspectives. The perspectives of experts are provided to define the business components enabling the organisation to adopt a business model to enable value creation. Subsequently, the perspectives of consumers were provided to highlight their motivation and trigger to adopt refurbished appliances as shown in the Dr. B.J. Fogg (n.d.).

In the below, the transcripts have been coded accordingly to the method of Corley and Gioia (2004). The first order concepts consists of quotes provided by experts in circular economy resulting into second order themes. Quotes which have been selected for the first order concepts are remarkable as they have been mentioned several times by different stakeholders or they contain new information that is relevant for the organisation.

Business Components

This section provides the perspectives of experts in circular economy. Ultimately, their perspectives have been grouped into business components providing Wasgoed.com significant components to take into consideration during the design of its business model for the refurbishment initiative.

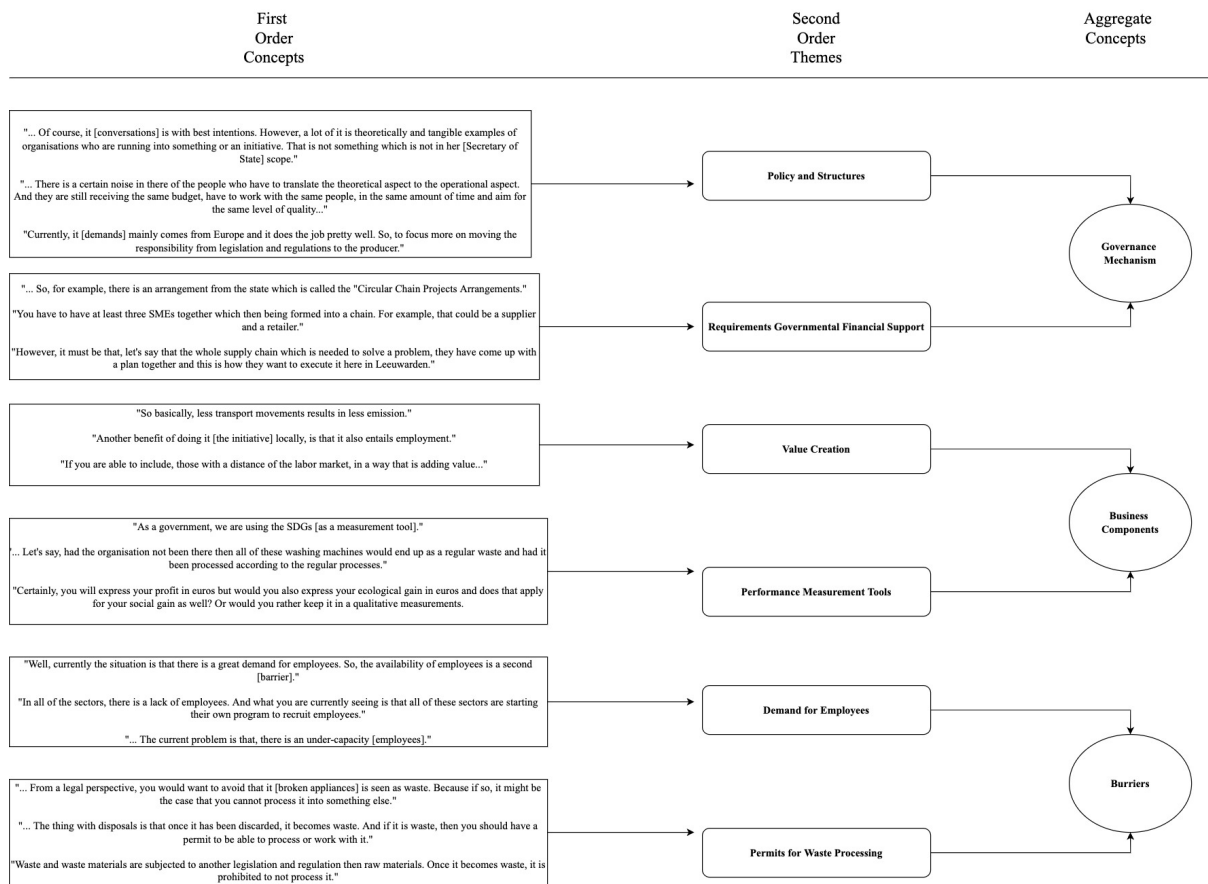


Figure 4.1: Coding Scheme Experts in Circular Economy

Governance mechanisms consist of two emerging themes being Policy and Structures and Requirements Governmental Financial Support. The former being the political structure of legislation and regulations affecting the nature of conducting business. Multiple participants have given examples of how policymakers often lack tangible examples of modifying policies in order to enable sustainable practices. This results into a certain noise in the theoretical design phase and execution on the operational level, hindering the process of the implementation of sustainable practices. One of the regulation supporting innovative initiatives by sustainable entrepreneurs is the financial support for "Circular Chain Projects Arrangements". However, there are several requirements to be met to qualify for this particular regulation.

As outlined in 2.3, Wasgoed.com its current business model is a double bottom line approach targeting economic and environmental dimensions. For the transformation to a triple bottom line approach, two business components are crucial. The value creation of the refurbishment initiative is a business component enabling the entrepreneur to transform the current double

bottom line approach into a triple bottom line approach. For the organisation to monitor its processes in the environmental and social dimension, experts have provided how they monitor such dimensions. Several participants have mentioned the usage of Sustainable Development Goals (SDGs) as a performance measurement tool for the environmental and social dimensions. By weighing a certain initiative against each of the individual SDGs, one is able to map out both the positive and negative outcomes. Accordingly, participants using this method highlight its benefit for providing unintended side effects.

During the interviews, it became evident that the organisation could encounter some barriers hindering the process of implementing the refurbishment initiative. The barriers are further explored in the section 4.3.

Consumer Behavior Adaptation

The perspectives given by consumers have led to the analysis of the three elements of the Behavior Model of Dr. B.J. Fogg (n.d.). The presence of these three elements should result into consumer adopting a new behavior. In this case, the default behavior is to purchase a new appliance in case the current appliance is broken. New does not necessarily mean the state of the appliance as it could also refer to the need of a substitute. In that case, the consumer can purchase an appliance second hand or through a subscription leasing model.

As discussed in 2.4 the Dr. B.J. Fogg (n.d.) consists of three elements which enables consumers to adopt a new behavior. The three elements are ability, motivation, and triggers amongst which two elements can be traded off. This concerns the elements ability and motivation. For example, the element motivation can be low if the element ability is high.

The element ability consists of two components being Availability and Financial Considerations. This particular element translate to whether consumers are able to carry out a certain behavior. Availability comprise of the known availability of refurbished appliances to the participants. Three out of four participants were familiar with the concept of refurbished appliances in a subscription model. Another factor contributing to one's ability is their financial situation. The participants all take their financial situation into consideration when purchasing home appliances. It strongly depends on the financial situation and living situation in what kind of state one would

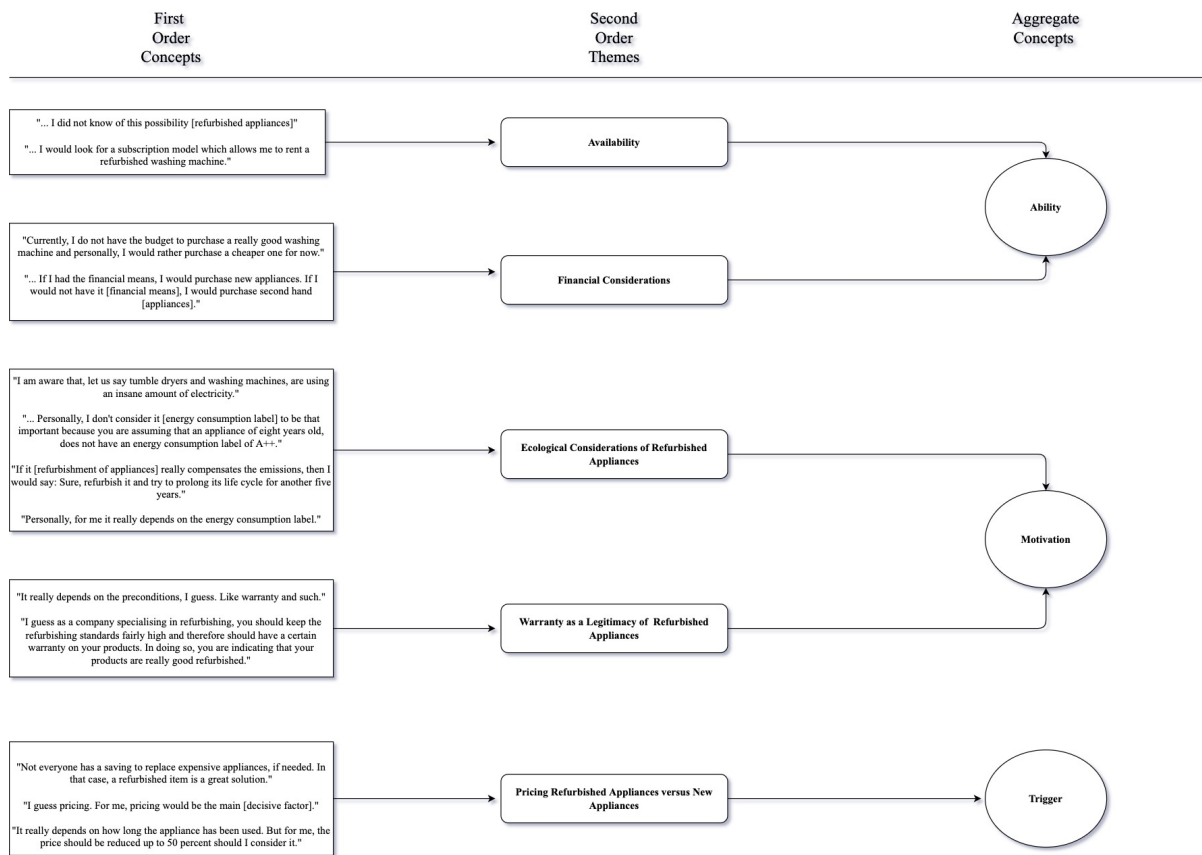


Figure 4.2: Coding Scheme Consumer Perspectives

purchase the home appliances. Several participants have mentioned that their financial situation does not allow them to purchase home appliances in new conditions. Therefore, they would purchase home appliances which are lower in price or in used conditions.

The next element, motivation translate to whether consumer would want to carry out a certain behavior. It consists of two components Ecological Considerations of Refurbished Appliances and Warranty as a Legitimacy of Refurbished Appliances. These two components constitutes to the motivation of the participants whether they would consider to purchase refurbished appliances. The ecological considerations mainly involve the energy consumption of two appliances, washing machines and tumble dryers. In order for the participants to purchase refurbished appliances, one of the conditions would be warranty. Participants have strongly emphasized the presence of warranty of refurbished products.

Concluding with the last element, trigger, participants have mentioned the price as the most significant factor. The pricing of refurbished appliances should be significantly lower than new appliances. It varies per participant what their willingness to pay is. Some have mentioned 50

percent while others find 20 to 30 percent reduction of the price, as opposed to new appliances, to be acceptable.

Business Model Modification

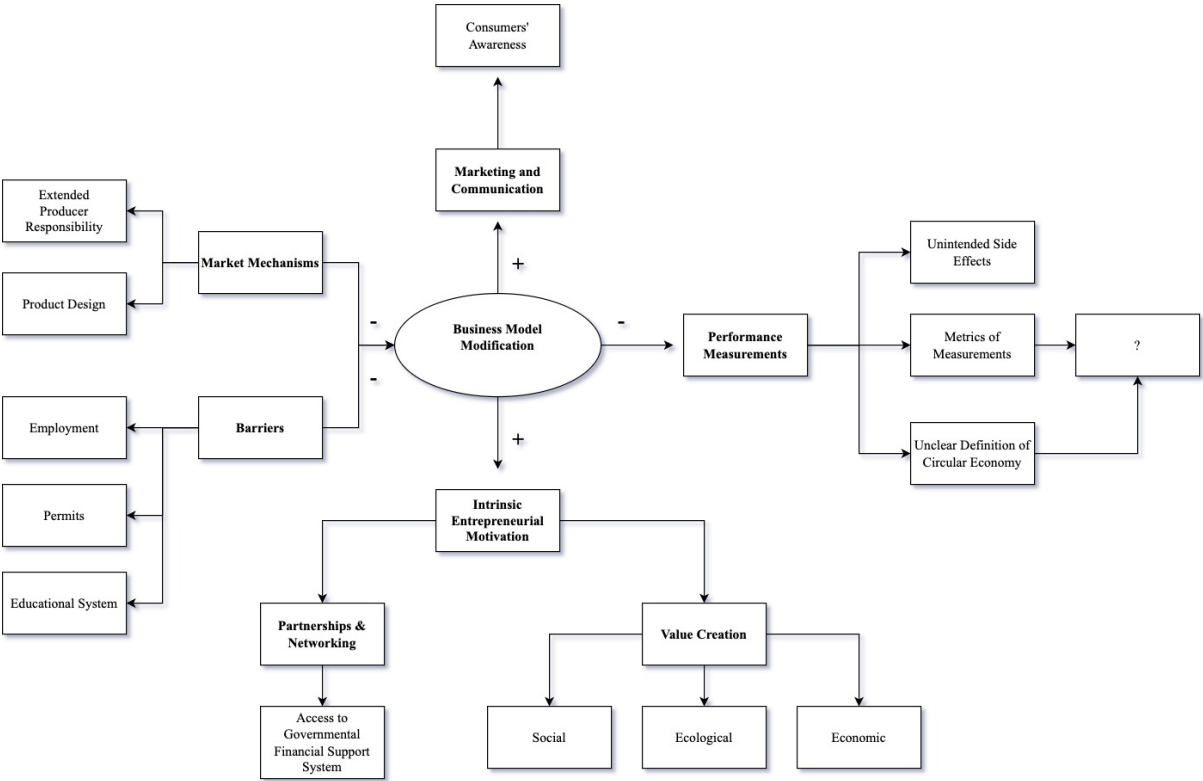


Figure 4.3: Required Components for Business Model Modification

In the following, the findings arising from the conducted interviews with both consumers and experts in circular economy are presented in 4.3. It provides the business components which needs to be modified for the new business model of Wasgoed.com with the refurbishment initiative. In doing so, the organization will be able to achieve value creation in the triple bottom line approach.

After analysing empirical data, two business components needs to be modified in the new business model of the organization. These consists of the Performance Measurements and Marketing and Communications. As presented in 2.4.1, social performance measurements can be distinguished in two levels. It is in these levels that differentiate affected performance. If the affected performance result into lasting changes on an individual level, it is refer to as an outcome. If the affected performance concerns the community level, it translates to impact (Ebrahim &

Rangan, 2014).

However, participants who are experts in circular economy all have different tools to measure their social impact. One of them explicitly mentioned that the social aspect within their organisation is under-reported. The concerned organisation wishes to put more emphasis on the social measurement by supplementing their current measurement tool, quantitative measurements, with qualitative measurements. Participants have mentioned the usage of SDGs as a measurement tool to map out unintended side effects of their actions. Another remarkable finding, is that there is no universal definition of what being circular means.

Two noticeable components, which could possibly complicate the business model modification are Market Mechanisms and Barriers. Experts in circular economy have mentioned the current product design of home appliances as a factor. Participants have mentioned how the current product design should be adapted to a circular method enabling the components to be reusable or modular. Should there be legislation and regulations forcing producers to enable their product design to a sustainable manner, it will negatively affect the refurbishment initiative of Wasgoed.com.

Barriers complicating the establishment of this initiative are Employment, Permits, and Educational System. Various participants have explicitly mentioned the phenomena of the lack of employees in the labor market affecting multiple sectors. Additionally, for Wasgoed.com to be able to work with and process disposed home appliances, the organization could encounter complications with permits. Participants have mentioned the process of disposed home appliances becoming waste materials. In these cases, disposed appliances are legally seen as waste materials for which the organization would need permits to work with. As Wasgoed.com desires to implement a course at a local post-secondary vocational education, several participants have foreseen barriers the organization could encounter. The main reason being interest in this particular course. Participants have highlighted that should the interest be low to medium, it could result into non-implementation of the course in the local educational system.

DISCUSSIONS

This concluding chapter provides the insights deriving from conducting this research. The evidence suggests what business components should be modified in the business model of Wasgoed.com to enable social, ecologic, and economic value creation with the refurbishment initiative. Subsequently, recommendations are given to the organization to implement the evidence into practicalities. However, there are some limitations to take into account with this research. Therefore, limitations will be discussed as how the chosen methods has resulted in these evidence. Ultimately, should the organization require further research options, recommendations are being made based on the results of this research.

Conclusions

For Wasgoed.com to design a new business model, the components enabling the refurbishment initiative to achieve environmental, social, and ecologic value creation are being discussed below. Summarizing all of the components, an answer will be given to the research question: "*Which components are required to be modified for a local refurbishment initiative by Wasgoed.com to enable environmental, social, and economic value creation?*".

The components the organization should take into accounts are presented in 4.3. Firstly, performance measurements (i.e., using SDGs as a measurement tool) can provide the organization unintended side effects by the realization of a refurbish center. As several participants have mentioned this particular benefit of using the SDGs as a guideline, Wasgoed.com can use the SDGs as a benchmark. During the interviews, it became evident that there is no universal measuring tool used for environmental or social values. This results into several metrics being used to express the value of environmental and social initiatives. There is no clear relation between the undefined universal definition of circular economy and the lack of universal measuring tool, which could result into unknown metrics of measurements. However, several participants have expressed the importance of measuring these initiatives despite of the lack of a universal measuring tool.

Participants have given examples of how social initiatives are being measured in their

organization or what measuring tools they have encountered. One participant proposed the usage of both quantitative and qualitative measuring tool to supplement the outcome. By expressing social initiatives in quantitative metrics, the communicated metrics can be perceived by multiple stakeholders. The supplementation of qualitative measuring tool is to give insights in how the social initiatives has contributed to the respondents' life (i.e., what factors contributed to these changes and how has it helped the respondent). The same ambiguity regarding universal measuring tool concerns environmental initiatives as well. Participants have provided multiple examples of how the various method of how ecological initiatives are being measured. A remarkable result, is that it mostly revolve around the input and output of materials. In both dimensions, the question remains in what metric the value creation should be expressed. Participants have expressed their feelings towards quantifying social and environmental value creation in monetary value. However, by doing so the default of expressing values in monetary value, the linear economy will be sustained. A benefit of expressing these values in monetary value, is the perception of this metric is the same for every recipient allowing the value to have the same measuring tool.

During the interviews, multiple participants have mentioned the availability of governmental financial support system (see section 4.2). For an organization to qualify for this subsidy, there are certain requirements that need to be met. First, participants have strongly emphasized the importance of forming a supply chain. In other words, when the organization is able to partner in a supply chain, the probability of qualifying for a subsidy is higher than when the organization is working individually. Additionally, for a specific arrangement (Circular Chain Projects Arrangements) it is required to include at least three supply chain partners. This implies for the organization to participate in local partnership and network to establish a supply chain. Multiple participants, have mentioned the utilization of their network which can help the organization to engage in possible partnerships.

Another requirement to qualify for the governmental financial support system, is the innovative initiative of what the supply chain could do. Specifically, what value would they add to society with their initiative? As this refurbishment initiative derives from intrinsic motivation from the entrepreneur, the organization wishes to transform its business into a triple bottom line approach. Therefore, the value creation concerns three dimensions being environmental, social,

and economic. Environmental value creation consist of the organization prolonging the life cycle of home appliances by refurbishing partially broken appliances. This is in line with the concept of the CE Thierry et al. (1995) of extending the product life cycle by refurbishing the components. Subsequently, social value creation is achieved by job creation. With the realization of refurbish center, those with a distance to the labor market or the unemployed are given a purpose of social value. Had they not been given a purpose, this would also result into loss of value. If the organization would be able to implement a course of mechanics at a local post-secondary vocational education, the social value would be sustaining the field of mechanics specializing in home appliances. Future mechanics would be trained and educated, sustaining the craftsmanship. Economic value creation can be divided into value to the organization itself expressed in profit and the reduction of social benefit.

For the organization to market their offers of refurbished home appliances, it is evident that the trigger for participants is pricing. If the prices of refurbished home appliances are significantly lower than home appliances in new condition, participants would consider the purchasing of refurbished products. Additionally, it is of essence that Wasgoed.com provides a warranty as it has been mentioned to be a condition for participants. Thus, warranty acts as a legitimacy for the standards of refurbished appliances offered by the organization.

The organization could create consumers' awareness by designing its marketing and communication tools around the ability and motivation of the participants. For example, participants have mentioned availability of such business model to be an ability. Participants who were not familiar with the existence of such concepts, did not take purchasing refurbished products into consideration. Therefore, Wasgoed.com can create brand awareness to increase the consumers' awareness of its offer.

In concluding, after conducting interviews and analyzing data it can be clearly stated that such sustainable initiatives are highly supported by the municipality and province. Thus, the organization have their support to execute this initiative. However, a business plan must be clear how the organization can contribute to society to qualify for governmental financial support system. Additionally, the organization must engage in partnerships with at least three SMEs. The components that are needed to be modified for this refurbishment initiative includes: Performance

Measurements, Partnerships and Networking, Marketing and Communications. Modifying these components allows the organization to design a sustainable business model for the realization of the local refurbishment initiative.

Recommendations

In order for Wasgoed.com to qualify for the governmental financial support system, it is strongly recommended for the organization to engage in a partnership to establish a supply chain of at least three partners. This will increase the probability for qualifying for the financial support system. Therefore, utilizing the accessible network of participants will increase the probability of finding suitable partners. Several participants have mentioned "Circular Friesland" to be one of the crucial network actor along with the municipality of Leeuwarden.

The organization Circular Friesland can provide the organization network and tools to design their business case to qualify for the governmental financial support system. During the interviews, the participants have explicitly mentioned the support Circular Friesland can provide. Amongst them being "finding the financial support and the suitable partners, if needed" (participant of Circular Friesland"). Additionally, Wasgoed.com will be able to access their network system. Therefore, the recommendation is to register for a membership at Circular Friesland to utilize their services and resources.

The municipality of Leeuwarden has been mentioned by all of the participants, including employees of the municipality themselves. The support the municipality can offer includes the utilization of their network and recruitment of employees, specifically those with a distance to the labor market. Participants have expressed the importance of including the municipality along the journey of implementing this refurbishment initiative and therefore the organization should include the municipality, along with Circular Friesland, as guidance. As the Social Domain of the municipality has an offer of employees, Wasgoed.com will be able to easily access and recruit its employees. Subsequently, the municipality will also be able to provide guidance in the search for the concerned permits enabling the organization to work with disposed home appliances before it is legally seen as waste materials. As this is the core in the business model, it is of essence that the organization explore further which permits are required. In not doing

so, it could result in complications when the organization applies for the governmental financial support system.

The ambiguity around performance measurements should not withhold the organization from measuring its social and environmental values. Participants have provided various examples of how their organizations are measuring these values. It is evident that there is no universal measuring tool, resulting in the lack of a benchmark. However, Wasgoed.com can use the SDGs as a benchmark to design their customized measurement tool. Participants have expressed the benefit of using the SDGs as a measuring tool, which is to allocate unintended side effects with their actions. For social values, the organization can set targets for its own values (i.e., "By the end of 2025, three new employees will be recruited, trained, and educated within the organization"). As for environmental measuring tools, there is no clear evidence how Wasgoed.com can measure their environmental value creation accurately.

Limitations

There are several limitations to take into consideration in this research. Firstly, several participants were not available or did not respond in time to be included in this research. These participants were crucial to explore the possibility of partnerships. This results into an uncertainty whether the crucial actors would be interested in cooperation in this local refurbishment initiative. From the perspective of the organization, it is of essence these actors engage in a partnership as it would strengthen their legitimacy and enables logistical planning.

Additionally, the data collection method has been revised along the process in consultation with the organization. Thus, conducting focus groups was no longer an option and has been replaced with consumer perspectives. Conducting interviews to explore consumer perspectives could provide more insights had there been a consumer analysis. The chosen participants for consumer perspectives includes peers. Therefore, they may have been biased as these participants have a green mindset. One participant who is not a peer has a less green mindset. This particular participant was not familiar with the concept of refurbished home appliances subscription.

Measures have been taken to prevent biases during this research. Amongst them being that participants have received the processed codes and transcription and have agreed to verify

whether the information has been processed accordingly. If they had objected to the data, there modifications could have been discussed. Fortunately, this has not occurred.

Further Research Options

To determine whether consumers would adopt the behavior of purchasing refurbished home appliances, quantitative research to explore the demand is needed. To enhance the results, qualitative study can supplement as in this research the participants may have been biased due to their background. Additionally, Wasgoed.com can explore similar sustainable initiatives executed on the same scale. Participants have mentioned several local initiatives which can acts as a benchmark. The organization can learn from their perspectives of barriers and drivers.

Further research options, is to look into required permits for the organization allowing it to process and work with disposed home appliances. A qualitative study could provide evidence how the organization could avoid disposed home appliances to be labelled as waste materials, preventing them to process and extract the components. Since this research has no legal background, a legal qualitative study could provide these insights to explore possible complications.

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