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Framework for Integration of Circular Economy into Business Models: A Study of Samsung

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Thesis abstract

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The goal of this study was to examine the benefits of incorporating Circular Economy (CE) principles in the business model of the South Korean electronics company Samsung. The research objectives included the exploration of the company's current business practices that integrate CE principles, an analysis and comparison of the CEBM approaches of Samsung, IKEA, and Nokia for benchmarking, and the assessment of extant literature on the obstacles and challenges of implementing CEBM to give Samsung some strategic recommendations.

Using a mixed-method approach, the study surveyed 59 respondents who were stakeholders of Samsung and interviewed circular economy and sustainable business practices experts.

According to the findings and analysis, there is compatibility between Samsung's business model and the CE model, which can make positive contributions to the sustainability concerns we see in today's world.

[1] Keywords: Circular Economy Business Model, Samsung, Sustainability, CEBM approaches

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1 Introduction

The current age is characterized by a scarcity of resources. Because once humans have used up all the natural resources, there will not be any more left to use (Ghisetti & Montresor, 2020). According to Ekins et al. (2019), humans are continuously depleting the earth's finite natural resources due to population increase and rising overall living standards. Under the current economic model, the cycle begins with the collection of resources, continues with their manufacturing and consumption, and concludes with their disposal (Sariatli, 2017). Though this method is harmful to the environment and the earth’s finite resources, it will leave a legacy for future generations. In order to maximize resource utilization while avoiding environmental degradation, business corporations need to reevaluate how they should use and recycle finite resources. As a result, the conventional take-make-dispose paradigm of business models needs to be changed (Pollard et al., 2023). This would significantly reduce the strain caused by the unpredictability of raw material and energy prices.

This problem was addressed by developing the model of the circular economy. Surprisingly, the concept is not novel; in fact, it was initially put forth in 1970 with the publication by Ellen McArthur Foundation. The concept gathered momentum when environmental concerns were brought to the attention of a wider audience (Lazarevic & Valve, 2017). There isn't a consensus on a definition of "circular economy" since the concept can be defined in many ways. To briefly describe a circular economy, one could say it's a way of doing business that prioritizes the reuse and recycling of materials (Stumpf et al., 2021). Also, it is a system of economics that aims to keep components, materials, and their utility at their maximum potential usage (Ghisellini et al., 2016).

1.1 Research Background

The implementation of circular economy practices has the potential to bring about numerous benefits for society. These include lowering the risks of resource scarcity (Wijkman & Skanberg, 2015), creating jobs (Popescu, 2019) which is often a contentious issue,

reducing spoilage by as much as 75% in water waste emissions, and energy (Yang et al., 2023) and developing valuable products and services that do not harm the environment (Rusch et al., 2023). This theory suggests that business models may be quite important when it comes to the sharing and transfer of business strategies from one company to another. Therefore, gaining a deeper understanding of the function of these circular economy business models will aid in the legitimization and widespread acceptance of such methods.

New business models based on what amounts to logical inference are required to facilitate the shift to the Circular Economy (Ferasso et al., 2020). A circular economy is a big concept, and circular business ideas are only little versions of it, thus, it can help organization in many ways. The two most visible characteristics of CEBMs are the organization of closed-loop systems and the generation of multiple values (Smol et al., 2024). Many believe that this kind of company model will be useful in their upcoming shift to a Circular Economy.

For this to work, the logic of the CEBM needs to be in sync with the two main reasons why value is created in the circular economy. The next step is to choose a set of components that can be used in a certain way to make models of the Circular Economy. However, there are no examples of these construction parts and prototypes being used in real-world settings. The overarching purpose of this research is to illuminate the fundamental elements and reasoning that, when combined, produce specific configurations that lend credence to a particular value argument. One possible way to facilitate testing and implementation of sustainability in the real world is to establish archetypes of business models (Pieroni et al., 2020).

1.2 Operation Summary of Case Organization: Samsung

The main research question is, “how can a corporation use the circular economy model to stay afloat in the current economic climate?” For the long-term viability of global business companies, economy and ecology, this issue should be one of the highest priorities. Companies might take a page out of the emerging trend of the circular economy as each

country gets its finite resources. As such, the case company in question is none other than Samsung, one of the most prominent names in technology. It is one of the largest electronics corporations in the world and has a presence in nearly every nation. For benchmarking and understanding best practices amongst businesses practicing the principles of CE in their business models, the research aims to include CEBM of IKEA and Nokia.

Samsung Electronics is actively participating in several programs that minimize waste and maximize resource efficiency as part of its efforts to support the circular economy. Samsung has been working on making it easy for consumers to fix and recycle its products since the planning and design stages. Chemicals and other potentially harmful substances are likewise off-limits in the company's products.

1.3 Study Rationale

According to the definition of the phrase "circular business models," it refers to the rationale behind how a firm distributes, collects, and creates value via the use of and inside closed physical loops (Lahti et al., 2018). Businesses can provide customers with more options by switching to a model based on the circular economy (Van Loon & Van Wassenhove, 2020). By the end of the research, competing businesses will have a better idea of how Samsung is cutting down on resource consumption and waste during production by making use of recycled materials. From the opposite perspective, this study aims to help readers comprehend the imminent economic shift that will be viewed as a turning point in history by people all over the world. Additionally, this research will usher in the long-awaited breakthroughs that have been preventing us from seeing the light at the end of the tunnel, bringing with them exciting new opportunities for humanity and renewing faith in the future for people everywhere.

The circular economy is very crucial to modern civilization. At the outset of this research project, a case company is chosen, and its business model and practices are used to demonstrate the company's implementation of circular economy. It would also cover the reasons behind implementing the circular economy and its benefits. The justifications for

sticking with the current approach would be laid forth once more. This would be particularly helpful since it would explain in detail why the circular economy is superior to the alternative model, linear business economy. Last but not least, it is necessary to demonstrate the model's practicability or application regarding the business at issue.

1.4 Research Aim

The incorporation of the principles of circular economy into Samsung's business model can provide many benefits, such as resource efficiency, cost-saving and reduction of environmental impact. The company may adopt strategies like recycling, refurbishment of product and remanufacturing to extend product lifecycle. It will also help the firm to minimize the generation of waste, so that a more sustainable method of production and consumption can be promoted. In addition, demonstrating effective integration of CE by leading companies such as Dell, Phillips or Apple can be inspiring examples for Samsung and others operating in the same sector.

Therefore, this study aims to explore how Samsung has incorporated circular economy ideas into its business strategy by analysing the Circular Economy Business Model (CEBM), offering a thorough analysis of current practices, and pointing out any potential drawbacks.

1.5 Research Objective

The objective of the research is to assist Samsung throughout the entire process. Not only will this benefit Samsung, but it will also set a benchmark for other organizations to follow in the future. Below are some objectives that we will analyse into to gain a better understanding of the concept.

• To explore Samsung’s current business practices incorporating the principles of Circular Economy.

• To analyse and contrast the approaches of Samsung, IKEA and Nokia in integrating CEBM principles into their operations for benchmarking.

• To evaluate extant literature on the limitations and obstacles of CEBM implementation to find strategic recommendations for Samsung.

1.6 Thesis Map

All of the research will be presented in five sections, with each section dedicated to demonstrating a certain aspect of the research. To provide readers an idea of what the research is all about, the first section discusses the study's background, research purpose, objectives, and justification. Next, the study will take a look at some of the literature on the topic of the circular economy business models and the problems that the linear economy causes. The research methodology builds up the third chapter of the study. Finding and analysing primary and secondary sources is the focus of the dissertation's fourth chapter. A discussion on the findings and justifications through relevant secondary data as well as participants' replies from survey and interviews with industry experts will occupy the fifth chapter of the dissertation. In the last section, the study will discuss the main findings and offer some suggestions to Samsung.

2 Literature Review

This section aims to look at the existing literature on business models adopting CE principles and synthesize the findings to highlight major research gaps.

2.1 Linear and Circular Economy

The concept of a Circular Economy (CE) challenges the traditional linear economy by focusing on sustainable practices and reducing waste. CE promotes circulating products and materials through various loops, extending their lifecycles, and decreasing the need for raw materials and waste production (European Environment Agency, 2017). Transitioning to a CE requires changes in both internal processes and external behaviours (Hanumante et al., 2019).

According to Kirchherr et al. (2017), CE is an economic system that replaces the 'end-of-life' (EoL) concept by emphasizing reducing, reusing, recycling, and recovering materials in manufacturing, distribution, and consumption. CE involves different loops that can be categorized into inner and outer loops. Inner loops focus on maintaining, prolonging, reusing, or redistributing products, while outer loops include refurbishing, remanufacturing, or recycling (Ellen MacArthur Foundation, 2015). The goal is to keep products in inner loops as long as possible to maintain their value and minimize the need for new inputs.

A product's potential for circularity depends on its design, and this potential is realized through actions taken throughout its lifecycle. To capture this potential, a system is needed to coordinate the collection, refurbishment, and redistribution of products based on their condition (Goltsos et al., 2019).

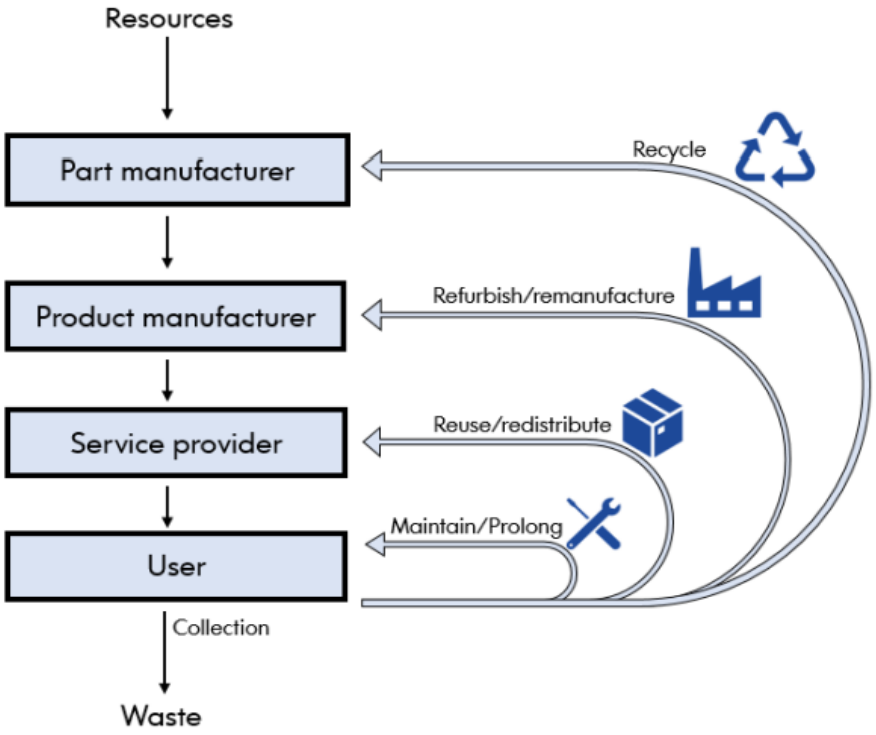

Figure 1. Framework demonstrating the flows created by a CE (adapted from Ellen MacArthur Foundation,2015).

2.2 Samsung's Current Business Practices incorporating the CE Principles

It is the assertion of this study that the aim of CE is to ensure economic prosperity and enhancement of environmental quality, as CE controls the resource loops and secures environmental and economic sustainability. As stated by Bocken et al. (2016), enterprises contribute to the advancement of CE through different means such as recycling, remanufacturing, reuse, repair, and refurbishing, with a view to managing resource cycles and minimizing resource consumption. South Korean Multinational electronics Samsung Electronics is an exemplary initiative in this regard, because the firm actively recycles and repurposes their End-of-Life (EoL) products and appliances. This initiative effectively reduces the need for new resources in ongoing production and consumption processes. Circular economy contributed to a paradigm shift in the electronics industry, influencing national policies and garnering increased research attention from scholars (Guo et al., 2017).

The vitality of sustainability highlights the "reverse logistics" idea of circular economy (CE). As CE emphasises production lines that are non-linear, waste-reducing and environmentally sustainable, manufacturing firms are able to support their organizations' internal transformation to Environmental, Social and Governance (ESG) framework principles and future commitment to them (PwC, 2022). Such actions include the application of net-zero energy and emission control along with regular supervision, deployment of technologies and equipment which empower the workforce resulted by automation of Industry 4.0 deeply rooted into the sustainability goals.

To name such a practice, the disclosure by Samsung Biologics department in their latest report that the company's corporate actions and measurements in response to challenges regarding economy, society and the environment, highly prioritises the climate change response strategies, claim (Kazakova & Lee, 2022). Samsung Biologics' long-term goal is to transform into a low-carbon and completely 3R carbon-neutral manufacturing, for which the company is making energy reduction plants, facilities for reusing chemical substance and water. These initiatives by Samsung have shown promising results, as in 2022 the firm reported 30% lower rate of emission than the previous year (ESG Report, 2022).

The biopharmaceutical sector stands as a major contributor to the generation of hazardous waste, such as different kinds of toxic, chemical, sharp and infectious litter that cannot be readily recycled or disposed of conventionally (Verma, 2022). To tackle the specific waste management challenges within the sector, Samsung Biologics unveiled an AI-driven recycling collection robot in 2022. This innovative solution aims to streamline the process of recycling potentially recoverable materials (ESG Report, 2022).

A circular economy (CE) fosters value generation through resource, cost, and impact reduction which enhances competitiveness and the emergence of novel business opportunities with innovative approaches to production and consumption (Ávila-Gutiérrez et al., 2020; Turunen, 2017). Eco-friendly innovations centred around the principles of CE are generally concentrated within the manufacturing domain (European Commission, 2021). The electronics industry holds significant potential to advance the objectives of a CE. For

instance, it can extract valuable materials from electronic waste to promote resource efficiency and diminish energy usage to improve energy efficiency (Cordova-Pizarro et al., 2019).

EU nations have a reputation of being the pioneer when it comes to environmental regulations. Therefore, these countries have drawn the attention of scholars in the issue of CE. This is evident in the work of researchers such as Pigosso et al. (2016) and Tecchio et al. (2017). The eco-design requirements, which founded the minimum energy performance standards and energy labelling system for televisions based on an energy efficiency index, was enforced by the European Commission in 2010 (ECEEE, 2021). These requirements were revised and reannounced in 9 years later in 2019, which included criteria for resource efficiency like repairability and launched a new scale for energy labelling. The decision and action of EU for including resource efficiency criteria in eco-design requirements reflect global trends that focus on resource efficiency. The expected rise in the demand of global resource, it is imperative that societies transition to circularity and efficient resource utilization (IRP, 2021; UNEP, 2021).

In the recent times, the European Commission (EC) has taken some major strides with its new Circular Economy Action Plan, according to Garcés-Ayerbe et al. (2019). This action plan is a vital element of the European Green Deal, the new blueprint for Europe’s sustainable development. It proposes a sustainable product policy legislative effort, aimed to enhance the scope of the Eco-design Directive more than energy-related items. Instead, it will encompass a broader range of products, focus on reducing single-use products and fighting the early obsolescence of goods. Nevertheless, it must be noted that the term "premature obsolescence" is mentioned only three times in the document without further elaboration. However, the Commission is committed to introducing a "Circular Electronics Initiative," which will leverage both existing and new measures to promote longer product lifespans. The initiative involves actions such as implementing regulatory measures for electronics and information and communications technology (ICT) devices (e.g., mobile phones, tablets, laptops), under the Ecodesign Directive. It will ensure that device design

considers energy efficiency, durability, repairability, upgradability, maintenance, reuse, and recycling (Polverini & Miretti, 2019).

According to the findings of Moon and Lee (2021), who investigated the shaping of CE in the digital television industry, the type I (closely linked to a firm's ability to innovate, seize opportunities and capitalise on them) “ecopreneurship” of major digital TV manufacturers like Samsung largely focus on enhancing energy and resource efficiency. Samsung's MicroLED technology uses numerous small LEDs to create images and individually turns off each LED. This does not only reduce energy consumption while delivering superior black reproduction, but also enhances resource efficiency by reducing the likelihood of burn-in. These initiatives by Samsung underscore the firm's environmental commitment through the integration of eco-innovative features and products, following the principles of CE. Mirzaei and Shokouhyar (2022) conducted a thematic analysis from social media data on customer perception patterns regarding mobile phone companies' triple bottom line. The study revealed that companies like Samsung consider CE as a way to enhance their advanced sustainable supply chain practices.

Two months following the Greenpeace incident (Leach and Boyd, 2017), Samsung made a public declaration about its aim to refurbish a portion of the recalled Galaxy Note7 smartphones. The company intended to repurpose those phones for resale, extracting raw materials and components for reuse in other products (Chun et al., 2022). This action epitomizes Samsung's CE approach, focused on the prolonging of product lifespans and maximization of the use of post-industrial materials during production phase.

This CE initiative allowed Samsung to extend the lifespan of the Galaxy Note7 by repurposing over 400,000 recalled devices into a refurbished but limited-edition Galaxy Note Fan Edition. Instead of dismantling all the recalled smartphones, the company opted to use unopened Galaxy Note7 devices along with new, smaller batteries to create the subsequent edition. Primarily launched in Korea, the Galaxy Note Fan Edition later became available in other selected countries. For the remaining phones, Samsung partnered up with third-party certified recycling firms and its internal recycling centres, so that the

reusable components such as semiconductors and camera modules can be repurposed for test sample production in future smartphone models (He-rim, 2023). The extraction of gold, silver, cobalt and copper found from the old phones consisted of 157 tons which were reused and sold afterwards (Burgess, 2017).

2.3 Key Concepts and Strategies Associated with Circular Economy

Circular Economy: A system of economy aimed to eliminate waste and the continuous use of resources through the design of products including recyclable, re-manufacturable and reusable materials (Kottaridou & Bofylatos, 2019).

The Value Hill Model: A framework demonstrating the way products can retain value through various stages of product life-cycle (i.e., design, production, use and EoL management). (Huang et al., 2022). The figure below shows the value hill model.

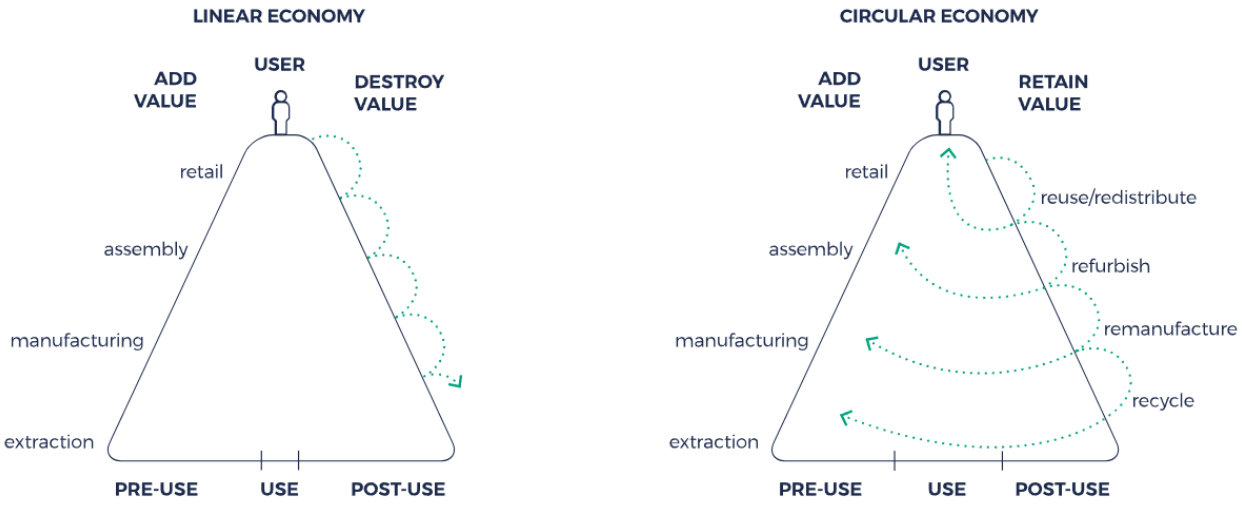

Figure 2.The Value Hill Model.

Ellen MacArthur Foundation's Butterfly Model: This model is a visual representation demonstrating the transition from a linear economy (take-make-dispose) to a circular economy (systems that are restorative and regenerative). (Ellen Macarthur Foundation, 2023).

The following figure illustrates the model proposed by the Ellen MacArthur Foundation, known as the Butterfly Model.

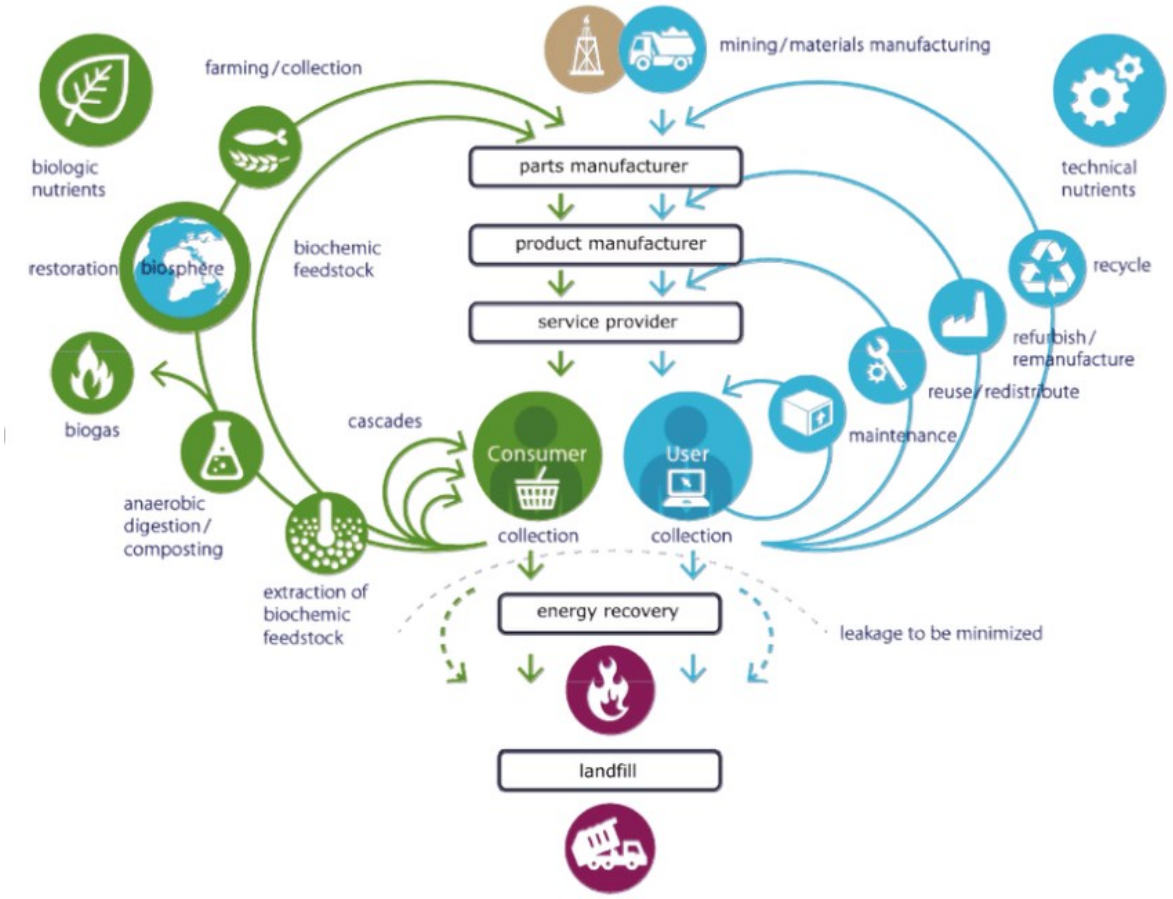

Figure 3: The Butterfly Model for Circular Production and Consumption

Circular Economy Strategies:

The contemporary literature on circular economy mention the following strategies that companies can use to ensure effective CEBM.

- Designing products aimed at durability and repairability (den Hollander et al., 2017)
- Recycling and reusing materials (Morseletto, 2020)

- Remanufacturing (Singhal, Tripathy & Jena, 2020)
- Refurbishment (Ma et al., 2023)
- Extended Producer Responsibility (EPR) (Campbell-Johnston et al., 2020).
- Prevention and Reduction of Waste (Cordova-Pizarro et al., 2019).

2.4 Analysis and Contrast of Approaches: Samsung, IKEA, and Nokia

Samsung demonstrates its commitment to Circular Economy (CE) principles through actions like repurposing devices and extracting valuable materials, reducing environmental impact. This section examines CE practices in the business models of IKEA and Nokia for benchmarking. Benchmarking compares a company's performance and strategies against competitors to identify best practices and areas for improvement. It involves assessing key performance indicators (KPIs) and methods used by other organizations to inform decision-making and drive development.

In terms of circular economy strategies employed by the three of the companies, IKEA has been a frontrunner. The firm's philosophy is in the creation of long-lasting furniture which can be assembled, disassembled and repaired easily. The modular designs of IKEA furniture let consumers replace certain parts instead of changing the product as a whole. As a result, the product life span increases and waste can be reduced. IKEA promises to offer spare parts for up to 10 years, which makes sure that consumers repair instead of discarding products completely. Recycling and reusing of materials is noticed in the implementation of recycling programs by Samsung which supports the firm's CE goals. Samsung's Galaxy Upcycling program repurposes old smartphones for new uses like IoT devices. Samsung's eco-packaging initiative transforms packaging waste into usable household items.

Nokia actively takes part in the remanufacturing process for product life extension. It takes back used equipment and resells to consumers after refurbishing. It is a cost-effective solution for customers and helps to reduce environmental impact. Nokia also conducts testing and quality assurance to make sure that the products that have been remanufactured

are up to the standards of new items. Samsung also excels in the refurbishment of its electronic products. The company resells items at a lower price point after collecting and repairing second-hand devices.

IKEA is a major example of companies implementing EPR by taking accountability for the complete product lifecycles, end-of-life management included. By embedding EPR into its business model, IKEA not only complies with regulatory requirements but also demonstrates its commitment to sustainability. Samsung actively works on preventing and reducing waste throughout its operations by enhancing recycling rates. Samsung's efforts in waste prevention are evident in the company's zero-waste-to-landfill certification for several of its manufacturing sites. Moreover, Samsung's eco-friendly packaging initiatives, such as reducing the size of packaging and eliminating unnecessary materials, significantly contribute to waste reduction and environmental conservation.

Table 1. Comparison of Key Metrics Among Samsung, IKEA, and Nokia.

Company	**Revenue (in billion USD)**	**Employees**	**Industry**	**Year Founded**	**ESG/Sustainability Report**
Samsung	Approximately 194 billion USD in 2023 (Laricchia, 2024).	270,000 people in 74 countries	Electronics Industry	1938	Yes
IKEA	More than 50 billion USD in 2023 (Statista, 2024).	219,000	Retail and Wholesale	1943	Yes
Nokia	24.9 billion USD in 2023	86,689	Telecommunications Industry	1865	Yes

Nokia

Nokia works in the same industry as one of Samsung's sub-sectors, telecommunications. Nokia has also incorporated CE principles into its business operations, especially in the area of product design and management of materials. When it comes to CEBM, Nokia focuses on longevity of products, their recyclability and responsible sourcing of materials (Wieser & Tröger, 2018). In this regard, Nokia's initiative included committing to designing recyclable products with recyclable materials which makes disassembly easier, and the product can be recycled at the end of its life cycle (Goldstein & Foulkes-Arellano, 2024). Additionally, the company has a "take-back" initiative for end-of-life products which let consumers return used devices for recycling or refurbishing. The aim of this program is to reduce the harmful effect of electronic waste and recovery of valuable materials for reuse in new products, just as Samsung's initiative.

Nokia's "Box-on-pallet" method for packaging telecom items decreased the use of packaging material by around 850 metric tons every year. According to Nokia's 2022 sustainability report, in 2022 the company processed 3400 metric tons of obsolete products and parts aiding in the refurbishment of almost 88,900 units and 3,000 metric tons of old telecom equipment (Nokia, 2022). In 2023, Nokia declared joining Orange in an effort in Egypt under UNIDO-run Switch to Circular Economy Value Chains initiative, co-financed by the EU and the Government of Finland (Lavannya, 2023). OSS (2023) states that this collaboration between Nokia and Orange will emphasize improving circular practices in network equipment, such as fixating a new repair center in Egypt. According to Hayrynen (2023), when it comes to e-waste from mobile telephones, durability is the foundation of sustainability. Nokia devices showed their robustness as third-party lab in Finland completed a testing by intentionally dropping Nokia phones until they turned inactive. All the devices were outperformed by Nokia C12 and some instanced endured almost three times as much damage. As damage caused by accidental drops is one of the major reasons behind a phone being replaced, Nokia works on making its devices more durable to ensure sustainability. Moreover, improvement of end-user repairability is another way of increasing

device lifespan for Nokia. The company made repairability more accessible as Nokia G22 (scoring 8/10 in repairability index) and Nokia G42 5G consumers could change their inactive battery, charging port and broken display while their 3-year warranty stay intact.

IKEA

IKEA works in a different industry than Samsung and Nokia, which is the global furniture industry. This company is included in the analysis due to its embracing of CE principles in its operations with a slightly different approach. The idea of "circular IKEA" is what is at the center of the company's sustainability strategy, focusing on extension of product life ranges, fostering resource efficiency with reduction of waste. When IKEA designs its products, the focus is on durability and reparability. Modular components are used in IKEA's product designs along with standardized parts so that consumers find it easier to repair and upgrade their items.

Moreover, IKEA provides spare parts and repair services so that product lifespan can be prolonged, and consumers do not need to make completely new purchases one their product has small defects or issues. Like Nokia, IKEA also has a "take-back" initiative where the company accepts used furniture from customers and refurbishes or recycles them to create new products. This is IKEA's way of ensure a closed-loop product lifecycle to ensure waste minimization and maximized resource utilization. Lehner et al. (2020) interviewed 24 Swedish consumers of IKEA and found that they choose several disposal options of IKEA items based on environmental concerns, convenience and economic reasons, including donation, discarding, reusing/storing, repairing and reselling.

Contrast and Critical Analysis

The three companies - Samsung, IKEA, and Nokia, they all have a shared goal which is to integrate CE frameworks into their business operations. However, there are some notable differences in their approaches to do this task. Samsung focuses on product refurbishment and material extraction, whereas the emphasis of IKEA is on product durability and reparability. Nokia’s interest is on recycling and responsible material sourcing.

The critical evaluation of all these approaches cannot be done without a comprehensive analysis of these three firms' strengths and weaknesses. Although a proactive approach to implementing CE, Samsung's focus on refurbishment and material extraction may present some limitations regarding scalability and impact. IKEA wants to have modular design and repair services to enhance product longevity, therefore consumer satisfaction. But the take-back program of IKEA can be challenged with regards to bulky furniture products. Nokia's promise to recycle and sourcing responsibly may require a high amount of investment in infrastructure and supply chain management.

2.5 Limitations of CEBM Implementation for Samsung

The integration of Circular Economy and Business Model (CEBM) principles into Samsung's operations has been praised for its likelihood in driving sustainable practices in business (Smol et al., 2024). Nevertheless, the organizational context of Samsung poses some limitations and challenges while applying CEBM. One of the examples include the complications of managing the supply chain and logistics in the electronics sector. Samsung's supply chain is a global network, there are several supplier webs including retailers and manufacturers. Applying the principles of CEBM across this complex supply chain requires immense collaboration and coordination among different stakeholders, which may give rise to issues related to logistics, say Awan and Sroufe (2022). Therefore, it hinders the seamless adoption of CE practices in business.

In addition, Bonsu (2020) adds that shifting to a CEBM needs major investment in research and development, infrastructure and technology. Design development of sustainable product and processes for material recovery along with reverse logistics systems need a lot of financial resources as well as professional expertise (Mishra et al., 2023). The upfront costs and resource distribution needed to apply CEBM efforts effectively may make Samsung face barriers (Hina et al., 2022). Laws and rules have a big impact on how Samsung can put circular economy principles into practice. In some places, there are rules that encourage businesses to be more sustainable and use circular economy ideas. But in other places, the rules might not be so clear, or they might make it harder for Samsung to

do things sustainably (Friant et al., 2021). Samsung has to figure out how to work within these different rules and make sure they're following them while still trying to be more sustainable.

Furthermore, the way people behave and the things happening in the market make it tough for Samsung to get everyone on board with circular economy practices. Even though more and more people care about the environment and want to be sustainable, some consumers might still hesitate to use circular products or services. It could be because they think they're too expensive, not easy to use, or don't seem valuable enough to them (Kuah & Wang, 2020). Samsung has to find a way to make sure their circular economy ideas fit with what people want and need, so they are more likely to use them. Organizational culture and mindset represent another potential limitation to CEBM implementation for Samsung. Transitioning towards CE does not only require substantial financial investment, it also needs fundamental change in mindset and organizational culture, focusing on collaboration and innovation with long-term thinking. Change resistance or inertia within organizations may impede progress of CEBM implementation (Kumar et al., 2021).

CE strategy implementation requires accurate collection, analysis and transparency of data throughout the entire product lifecycle (Nguen et al., 2023). Lack of these efficiencies can hamper material flows and lead to environmental impacts, hindering the evaluation and optimization of CE practices. When consumers, businesses and policymakers lack awareness and understanding of CE principles, it is quite impossible to foster a culture of sustainability and promote widespread acceptance of CE throughout industries. There are finite resources on this earth and companies are fighting through resource scarcity and competition. Securing access to critical raw materials and managing resource dependencies in a CE context can be challenge for industries with high resource intensity and limited alternatives, like the smartphone industry.

Another major limitation in CEBM implementation is the assessment of effectiveness and impact of CE efforts by choosing the right frameworks and performance metrics. Nevertheless, extant metrics may fail to adequately capture the multifaceted nature of CE outcomes

(e.g., resource efficiency, environmental impact, social benefits, and economic value creation). It is important to put more effort in this area to develop comprehensive evaluation tools and methodologies tailored to CE principles for proper monitoring of progress and making informed decisions.

2.6 Theoretical Frameworks

Extended Producer Responsibility

Among the factors shaping outcomes, this study focuses on the significance of extended producer responsibility (EPR) policies and their impact on circular economy (CE) strategies within the realm of electronic manufacturing, exemplified by companies like Samsung (Albertsen et al., 2021). EPR, as a guiding principle, is known as "a policy principle to promote total life cycle environmental improvements of product systems by extending the responsibilities of the manufacturer of the product to various parts of the entire life cycle of the product, and especially to take-back, recycling and final disposal of the product" (Lindhqvist, 2000).

Reverse Logistics Process

Reverse logistics refers to the process of moving products in the opposite direction of their initial flow, to either reclaim their value through reuse or recycling or to ensure proper disposal, as stated by Rogers and Tibben-Lembke (2002). Fleischmann et al. (1997) emphasize that this reverse flow can happen through various channels within an organization, such as traditional and separate channels or a mix of both, and may not necessarily mirror the forward flow. When integrating reverse logistics to recover the value of finished goods, the products are incorporated into a closed-loop network which is more intricate compared to traditional open-loop networks. This network encompasses both forward and reverse logistics operations (Fleischmann et al., 2000). CE100 (2016) further underscores the significance of reverse logistics as a fundamental component of the CE.

3 Research Methodology

3.1 Introduction

Identifying, selecting, processing, and analysing all material relevant to a research topic is what research methodology is all about. A "Research Methodology" outlining lays out this process. Pandey and Pandey (2021) assert that research articles' reliability and validity are entirely dependent on the methodology chapter's format. Scientific and systematic research results are backed by methodology, which ensures their reliability and authenticity. It aids the researcher in keeping on track and managing the study's activities, which makes the whole thing go more smoothly and efficiently (Carcary, 2020). Using this specific methodology, the researcher can employ an interview strategy to gather data using a qualitative approach. The following material in this chapter provides a comprehensive overview of all these approaches and processes, along with explanations of why they were selected. Accordingly, the researcher can use this chapter as a guide to follow throughout the study's different stages (Mukherjee, 2019). Ethical issues, data validity and dependability, study limits, and other research-related variables will also be covered.

3.2 Research Onion

Saunders, Lewis and Thornhill (2015) suggested a model called the ‘Research Onion.’ Brown (2022) states that this lends credence to the reasoning behind various research methods, including surveys, interviews, case studies, and systematic literature reviews. An investigation is structured according to the research onion model. According to Haydam and Steenkamp (2020) researchers are faced with decisions based on their research realities at each level of the hypothetical onion. There are a total of six layers to an onion, and each one must be revealed in turn. In reality, this is very similar to how an onion is peeled. The study onion diagram looks like this:

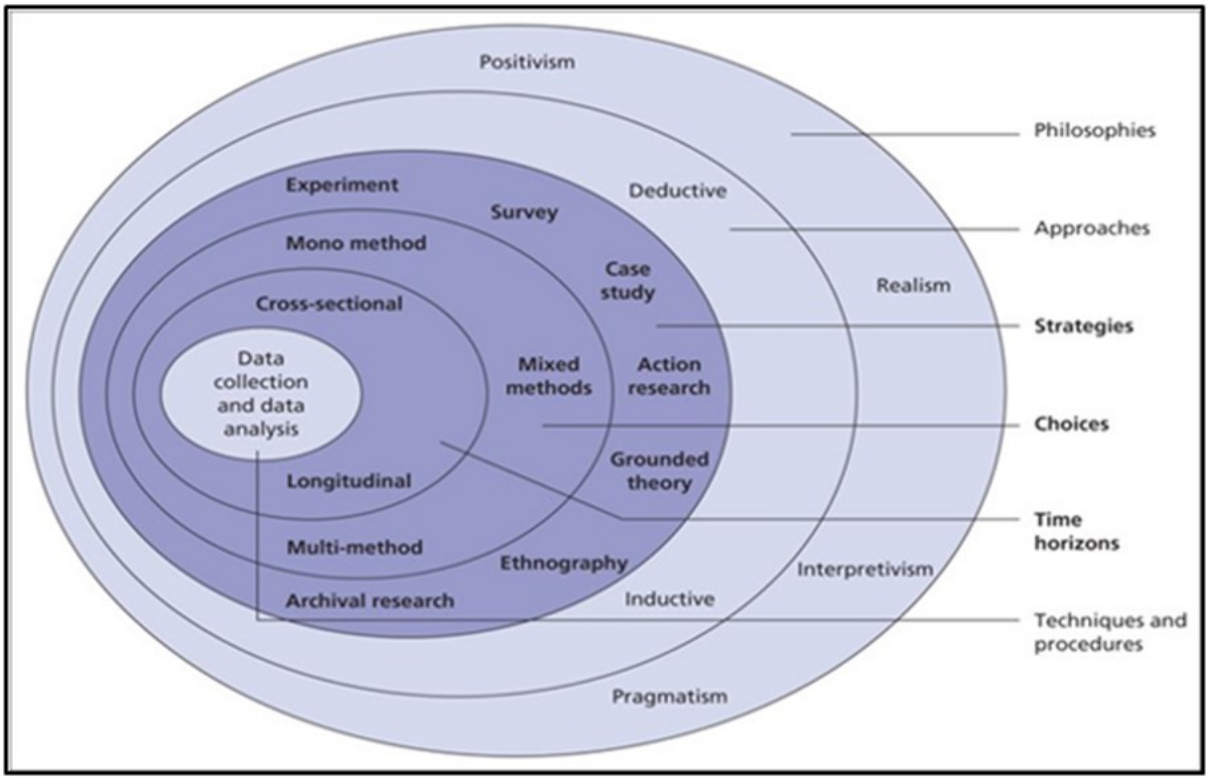

Figure 4**.** Research Onion (adapted from Saunders et al., 2015).

3.3 Research Philosophy

Research philosophy refers to the set of beliefs that underpin the research process, which include gathering, analysing, and applying evidence about a phenomenon and its type of reality. In addition, it can be seen as the researcher's preferred framework or structure that yields fresh insights into the research subject (Tracy, 2019). Bryman and Bell (2011) state that research philosophy can be categorized into four main subgroups. Here they are: Positivism, Realist, Post-positivism, and Interpretivism.

A person's subjective perspective can shed light on the social reality, says the interpretivist philosophical school (Levitt et al., 2022). Conversely, positivism maintains that empirical evidence may adequately characterize any field of study (Park et al., 2020). The researcher is granted complete autonomy to determine the veracity of a finding by highlighting trends or patterns in a phenomenon. Thirdly, realists simply care about the world as it

really is, which means they provide researchers with useful information (Hoddy, 2019). Finally, post-positivist philosophical orientation assists researchers to integrate post-positivist ideas and methods into their investigations; it emerged as a critique of the positivist paradigm.

This specific study has an interpretive philosophical foundation. According to Pervin and Mokhtar (2022), society's reality is "objective" (varying for individuals; influenced by personal viewpoints). According to Turyahikayo (2021), this belief system neither fully accepts nor rejects the existence of a universally knowable reality. Consequently, contrary to post-positivism, this work is heavily influenced by social constructionism. To enhance knowledge acquisition and better understand the research issue, the researcher will employ qualitative methodologies.

3.4 Research Approach

Drawing broad conclusions or hypotheses from more narrowly focused observations is known as the inductive method (Mukherjee, 2019). Without first formulating any theories or hypotheses, researchers in this method go headfirst into gathering and interpreting qualitative data. The data can be analysed in a systematic and iterative way to reveal themes, patterns, and insights. These discoveries can then be used to build new theories or conceptual frameworks. On the other hand, prior research or established theories provide the basis for the hypotheses or theoretical framework that the deductive approach builds upon (Casula et al., 2021). Following the formulation of these hypotheses, the study is structured to gather empirical data in order to examine them. In this step, we use structured data collection and analysis techniques to test whether the previously held beliefs and theories add up or not.

The inductive method is chosen for this investigation. Finding emerging themes, viewpoints, and obstacles connected to circular economy practices within Samsung can be accomplished by collecting survey data from Samsung customers and interview answers from Nokia specialists. Researchers at Samsung can learn more about the specific

experiences and circumstances of those with a stake in the company's circular economy activities by conducting inductive analyses of qualitative data. By keeping an open mind throughout data analysis, researchers can better explore different viewpoints.

3.5 Research Design

The study design is constructed from the researcher's chosen frameworks and procedures. Researchers can guarantee the project's success by honing their methodological attitude in accordance with the study issue with the aid of a specific research design (Roberts, 2020). Research designs can be categorized as either quantitative or qualitative, depending on the data type that is chosen for collection.

Data collection approaches include quantitative and qualitative methods. However, this study follows a mixed-method design (Taherdoost, 2022). A combination of survey and interview methods will be used to learn about Samsung’s CEBM incorporation in-depth. Surveys will allow the researcher to collect quantitative data regarding the scale and frequency of CE practices. Later, this data can help to determine trends or patterns. On the other hand, the perspectives of stakeholders, their motives and challenges when it comes to CE related projects can be examined thoroughly by using the qualitative interview method.

According to Bans-Akutey and Tiimub (2021), a study’s reliability and validity can be increased when the involvement of both quantitative and qualitative data is noticed, also known as data triangulation. The overall rigor of the study can be increased through triangulation as this process compare with combining survey findings with interview findings will help the researcher to analyse the research problem better and to reduce bias.

3.6 Data Collection Method and Instruments

The stage of data collection is important for all research project. This stage involves the systematic gathering of information relevant to the aim of a study. This study gathers both qualitative and quantitative data to fully understand the issue under investigation.

3.6.1 Quantitative Data Collection

Quantitative data will be collected for this study by sending out Samsung's consumer questionnaires. The goal of having structured questionnaires is to gather standardized responses from a large number of people, and this process is known as the survey method. In this study, the demographic questions will gather information about the background of the participants, along with factors such as age, gender, level of education and profession. According to Ahmad et al. (2019), such demographic characteristics are beneficial while assessing the survey responses among different consumer profiles.

In order to explore the sentiment of consumers of Samsung regarding the company's utilization of CE principles in its operations, the survey will have Likert-scale questions. The participants will be told to give their rating on agreement or disagreement with certain statements. The Likert-scale is able to offer quantitative data that can later be used for statistical analysis, therefore finding correlations, patterns or trends from them (Jebb et al., 2021). Likert-scale questions will be used to understand matters such as the level of awareness consumers have on Samsung's sustainability initiatives, consumer willingness to pay for eco-friendly products, their thoughts on Samsung following CE principles, as well as the possibilities of consumers buying Samsung products due to their environmental stewardship.

3.6.2 Qualitative Data Collection

In order to gather qualitative data for the study, the researcher has conducted in-depth interviews with industry experts from Nokia (Tavory, 2020). Researchers can delve more deeply into participants' viewpoints, experiences, and insights through interviews, a kind of qualitative data collecting. Drawing on Nokia's extensive knowledge of sustainable

business practices, this study interviews industry professionals to gather their thoughts on the difficulties, potential benefits, and best practices of incorporating circular economy principles into company models. While a list of questions will serve as a framework for the interviews, there will be room to delve more deeply into certain subjects or expand on recurring themes as the conversation progresses (Deterding & Waters, 2021). Supplementing the quantitative results from the surveys with rich, nuanced insights provided by the qualitative data collected through interviews will offer a more comprehensive grasp of the research issue.

Quantitative surveys were used to acquire structured responses from Samsung consumers, while qualitative interviews were conducted to delve into the complex opinions of Nokia industry professionals. These methods were used to gather data for this study. To ensure research validity, the researcher has triangulated results of data collected through mixed-method, which reflected Samsung's CEBM thoroughly.

3.7 Research Strategy

Primarily, interviews and questionnaires will be utilized to collect data as is appropriate in the interpretivist perception. Surveys are defined by Rahi, Alnaser and Abd Ghani (2019) as a rigorous instrument of collecting information from individuals through questionaries. They might be either open-ended; closed-ended or an amalgamation of the two, which is referred to as the "mixed research strategy". According to May and Perry (2022), surveys are effective in social research due to researchers' ability of discovering the opinions and behaviour of people. Thus, the study will inquire the stakeholders to share their views of how Samsung embedded the circle economy concept in its business models through a mixed survey.

In addition, in-depth interviews will be used to gather the opinions of stakeholders. In-depth interviews are invaluable to gather people's experiences and perceptions of the happenings in the real world. To facilitate keeping the interviews focused and asking relevant questions, the researcher will make use of an interview guide (Portigal, 2023). Interview

transcripts, offer a highlight on the subtle things about stakeholder point of view. It will also point out the success of Samsung's CEBM.

A chosen group of 5–10 people will be surveyed; their inclusion in the sample will depend on how relevant they are to the study's aims and how involved they are with Samsung or its goods. Because this is a qualitative study, a smaller sample size is more suitable for achieving in-depth analysis rather than broad coverage. Several professionals in the field who are well-versed in Samsung's business practices and the ideas of the circular economy will be interviewed. The participants' busy schedules will be accommodated by keeping each interview session to 10 to 15 minutes, which allows for a focused discussion.

Surveys and interviews, the data collection techniques for this study, are ideal to understand the qualitative findings regarding Samsung’s CEBM. The perspectives of the company’s stakeholders will also be comprehended using this mixed methodology.

3.8 Sample Size and Sampling Methods

For the purpose of producing meaningful and representative results, the research took great care in selecting their sample size and methods of sampling.

3.9 Sample Size

A smaller sample size is considered adequate because the research is qualitative, and the focus is on in-depth comprehension rather than statistical generalizability. The survey portion will use a sample size of 5–10 participants chosen for their association with Samsung or its products as well as their relevance to the research goals. Without compromising on breadth for depth, this sample size permits in-depth insights into participants' opinions and experiences. In a similar vein, the interview component will involve speaking with a wide variety of industry professionals who are well-versed in both Samsung's business practices and the ideas of the circular economy, a similar method used by Tunn et al. (2019).

Sampling Methods

Purposive sampling, sometimes called judgmental or selective sampling, was used as a sampling technique in this investigation. According to Cooksey et al. (2019), researchers use purposeful sampling when they seek for volunteers with particular traits or backgrounds that are pertinent to their study. People who have knowledge of, or experience with, Samsung's business models and circular economy activities will be chosen for this study's interviews and surveys on purpose.

For the survey component, potential participants will be identified based on their affiliation with Samsung, such as employees, customers, or stakeholders involved in sustainability initiatives. The selection criteria will ensure that participants have firsthand knowledge or experience relevant to the research topic.

Professionals in the field who have knowledge of sustainable business practices, the principles of the circular economy, and/or Samsung's operations will also be sought out for the interview portion of the process. Members of this expert group may hail from the academic community, NGOs, or the business world, and they will all bring unique perspectives and knowledge to the table.

3.10 Data Analysis

Finding, analysing, and interpreting recurring themes or patterns in a dataset is the goal of the qualitative data analysis technique known as thematic analysis (Braun and Clarke, 2006). It entails methodically classifying qualitative data to reveal hidden ideas, patterns, and meanings. The flexibility and versatility of thematic analysis lie in its ability to develop themes from the data itself, rather than relying on pre-existing theoretical frameworks. This makes it a great choice for research topics of many kinds. Commonly, the following procedures are included in thematic analysis:

Data Familiarization: Reading transcripts or texts multiple times helps researchers acquire accustomed to the subject and fully immerse themselves in the facts.

Initial Coding: Reading transcripts or texts multiple times helps researchers acquire accustomed to the subject and fully immerse themselves in the facts.

Theme Generation: Initial themes are formed by grouping codes together; these themes capture patterns or notions that emerge from the data.

Theme Review: In order to make sure that the themes are coherent and related to the research objectives, they are examined and developed through iterative analysis.

Theme Definition and Naming: The data is used to define and label the final themes, which are then backed up by examples.

Report Writing: A logical narrative is used to present the findings, with relevant quotes or extracts included to highlight important points.

The richness and variety of participants' experiences, views, and narratives can be captured using thematic analysis, a technique to qualitative data analysis that is both accessible and versatile. The study employs a mixed-methods design, although theme analysis will spearhead the analysis of qualitative data for a number of reasons. Using this data analysis technique, we can delve deeply into the viewpoints, experiences, and attitudes of Samsung's stakeholders as we work to incorporate circular economy principles into our business models. It can be adjusted to work with other kinds of qualitative data, such as textual data, interview transcripts, and survey responses with free-form questions. Researchers are able to study data from many sources cohesively because of this flexibility. By providing qualitative insights that enhance and interpret statistical trends, thematic analysis can supplement quantitative survey data (Cole, 2023). Researchers can provide a more comprehensive and strong interpretation of the study results by combining qualitative themes with quantitative data.

3.11 Ethical Considerations

Promoting research aims, accurate information or knowledge, and preventing mistakes are all aspects of research that should be ethically considered. The researcher's credibility and the reliability of the data they provide are both threatened by a lack of adherence to research ethics. Consequently, all research ethics are appropriately followed in this work. In doing this study, the researcher has followed all applicable rules and standards. Since no personally identifiable information was requested of research participants in any way, shape, or form, the Data Protection Act was strictly observed during the whole process (Hair et al., 2019). We assure you that we will securely store all participant information. No one other than the researcher will have access to those files, and no data will be tampered with. In order to adhere to the copyright act rules, secondary data is correctly credited and referenced.

4 Data Analysis

4.1 Survey Findings

In this chapter, the survey findings gained from 65 respondents and interview findings from one industry expert from Nokia is subjected to thematic exploration. As mentioned in the previous chapter regarding research methodology, the survey questions were structured around five demographic inquiries followed by thirteen questions focusing on Samsung's CEBM and how it would affect consumer perspective. Through rigorous investigating and interpretation, the researcher has revealed a few themes and sub-themes as underlying patterns from the survey data regarding circular economy integration in Samsung's business model.

Demographic Questions

The demographic questions of the survey asked participants about their age range, highest level of education completed, average yearly household income, country of residence and gender. The accounts of the sample’s demographic are summarized in the Table 3 below.

Table 2. Demographic Information of Respondents (N= 59).

Demographic Questions	Response Options	Number of Respondents	Percentage
Age	Under 18	2	3.39%
	18-24	10	16.95%
	25-34	30	50.85%
	35-44	20	20.34%
	45-54	2	3.39%
	65	1	1.69%
Education	Did not attend school	1	1.69%
	Graduated from high school	16	16.95%
	2 years of college	1	1.69%
	3 years of college	5	8.47%
	Graduated from college	29	49.15%
	Some years at graduate school	1	1.69%
	Completed graduate school	17	28.81%
Household income	$0-$14,999	41	59.32%
	$15,000-$24,999	10	16.95%
	$25,000-$49,999	9	15.25%
	$50,000-$74,999	4	6.78%
	$75,000-$99,999	1	1.69%
Country of residence	Chile	1	1.69%
	Finland	25	42.37%
	Sweden	1	1.69%
	India	34	47.46%
	Italy	1	1.69%
	US	1	1.69%
	Canada	1	1.69%
	Nepal	1	1.69%

The analysis of demographic of the 59 respondents offers the following major observations:

Age Distribution: The majority of participants fall within the age range of 25-34, comprising approximately 50.85% of the sample. This indicates that younger adults have more chance of engaging in surveys related to consumer perspectives on business models. The possible reason behind this could be the increased awareness of environmental issues and technological advancements.

Education Level: A significant portion of respondents, approximately 48.33%, have graduated from college, with an additional 28.33% having completed graduate school. This represents a sample that is well-educated, possible with a better level of comprehension about complex business ideas and principles of sustainability.

Household Income: Nearly 60% of the participants reported a household income ranging from $0-$14,999. This portion highlights the low-income range of the sample. Such a distribution may indicate that a considerable percentage of the participants may face financial constraints, which could affect their purchasing behavior and preferences when it comes to sustainable materials.

Geographic distribution: The geographical distribution of participants shows a wide range of locations, including India, Finland, and various other countries. Most respondents are from India (approximately 47.46%) and Finland (around 42.37%). This indicates the global reach of the study. The respondents from countries like Chile, Italy and Nepal adds to the international perspective of the study findings.

Representation of gender: The gender distribution among respondents presents a slight majority of females who comprises of 60% of the sample.

Analysis of Samsung CEBM-Related Survey Responses

In response to whether they would still purchase Samsung products if prices increased by 1 to 3 euros for circular economy initiatives, 45% of participants responded affirmatively, 16.67% negated, while 38.33% expressed that it depends on the situation. The results underline a significant readiness to advocate for sustainable practices, although dependent on cost considerations.

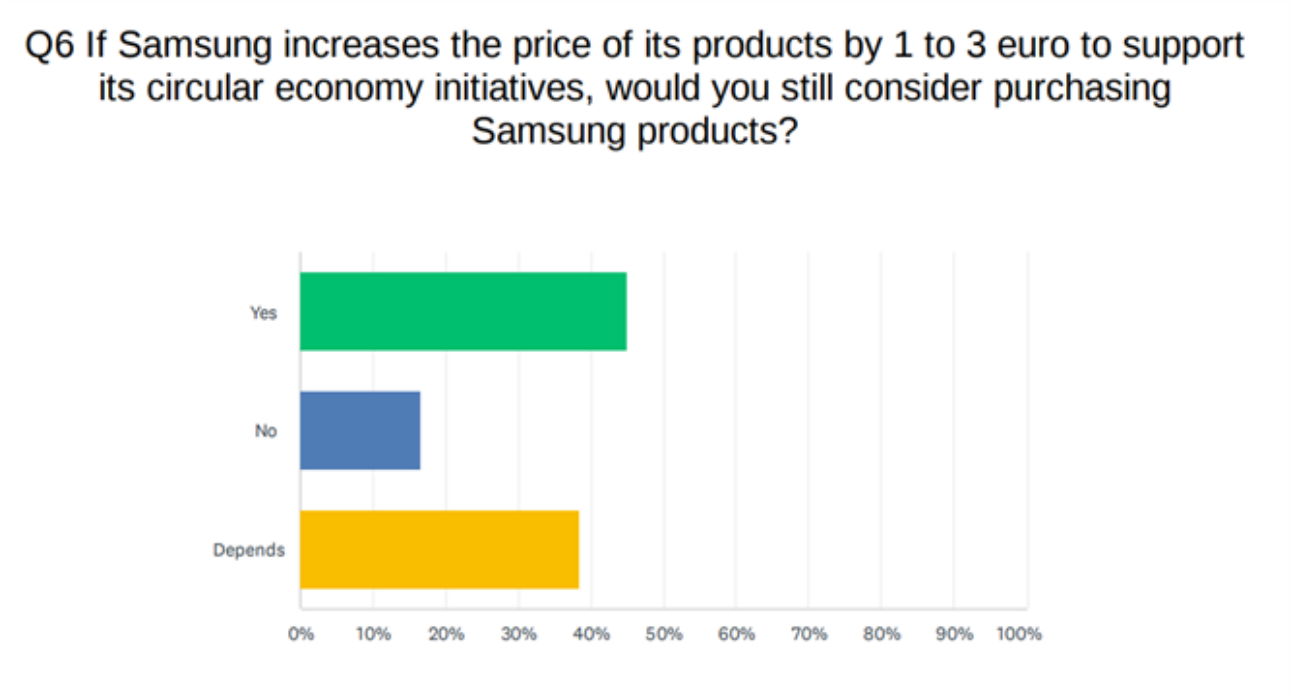

Figure 5. Willingness to buy Samsung products in case of price increase due to CE initiatives.

The results for the second question on Samsung's CEBM show a high level of support for the company's sustainability efforts. With 35% stating they are "very likely" and 37% stating "likely" to pay an additional 10 euros for products, it shows a high interest towards supporting circular economy practices. The 21.67% who expressed neutrality suggest a possible willingness to support such initiatives given further information or incentives.

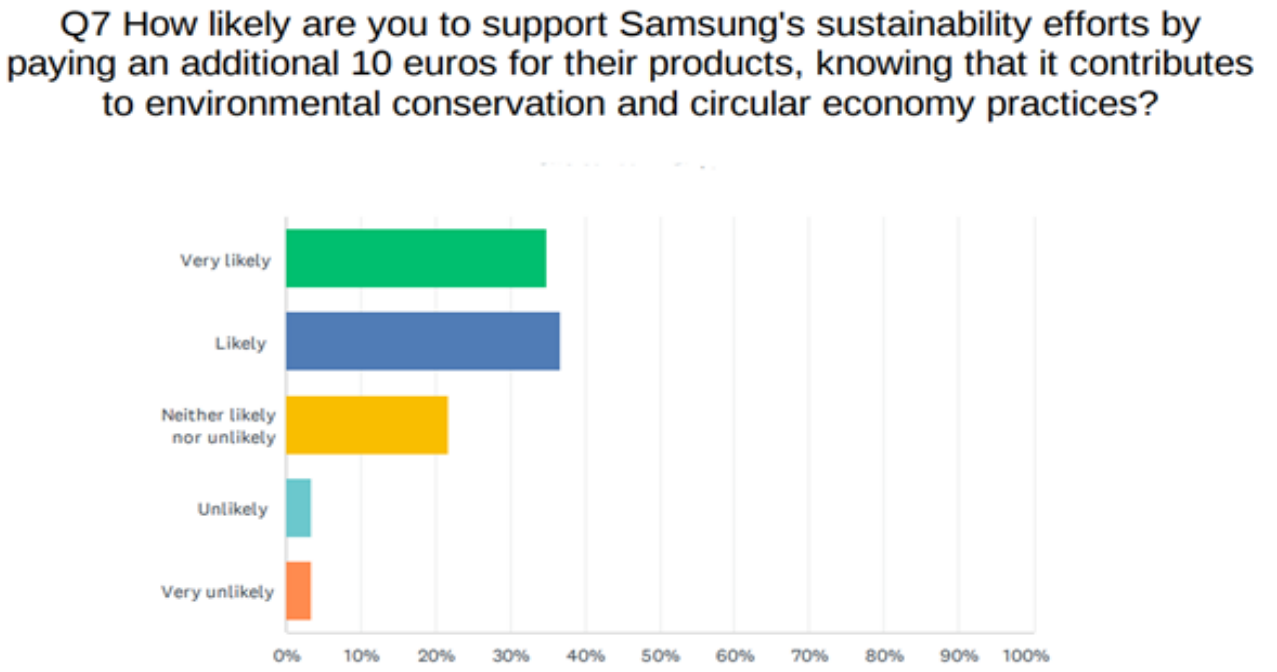

Figure 6. Consumer willingness to support Samsung's sustainability efforts.

The survey responses to the third question show a strong support for the necessity of applying CE principles in the manufacturing procedures of Samsung. 40.68% of participants perceive it as "extremely important," with additional 27.12% considering it as "very important." These results reinforce the importance associated with environmental practices. 27.12% view it as "somewhat important" and only a minority of 5% (3 people) regard it as "not so important." These segments show a minimal priority towards sustainability. However, no respondents deemed it "not at all important," which signifies a unanimous recognition of some degree of importance attributed to CE practices in businesses.

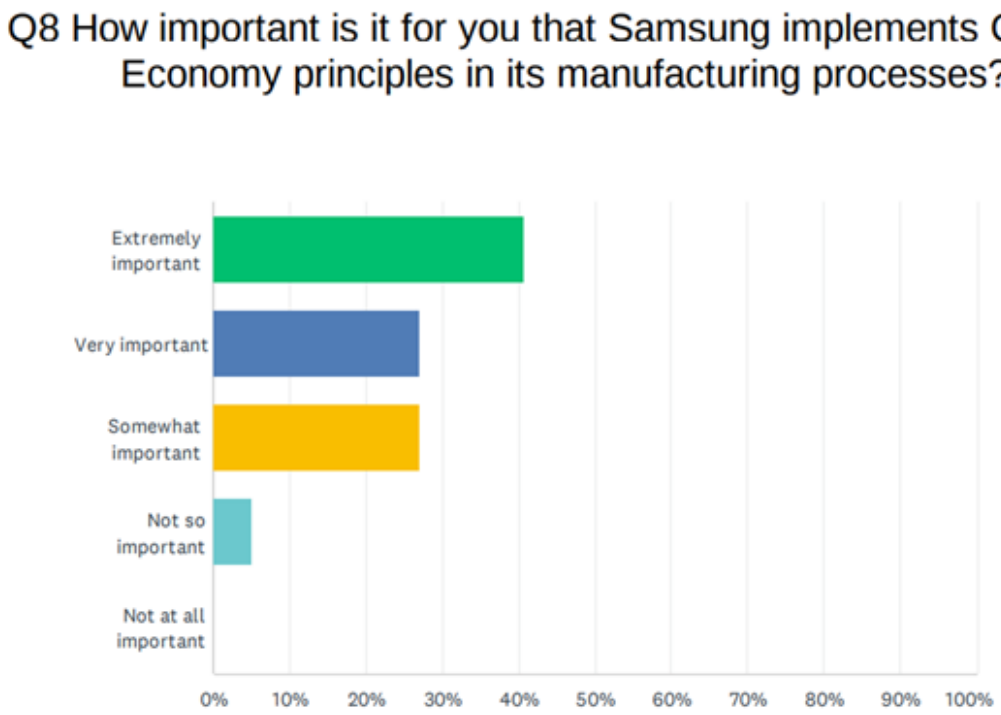

Figure 7. Consumer perception on the importance of CE principles for Samsung's manufacturing.

The responses to the fourth question tell us about how familiar consumers are with Samsung's $5 billion Euros sustainability plan. The data indicates that a minority of respondents, 7 people (11.86%) are "extremely familiar," whereas 4 respondents (comprising of 6.78% of the sample) consider themselves "very familiar." Moreover, 11 people are "somewhat familiar" which indicates a moderate level of awareness of CE among consumers. The concerning part is that most respondents, 28.81%, claims to be "not so familiar" and 33.90% reports being "not at all familiar" with the sustainability plan. This proves a major gap in consumer awareness about the sustainability initiatives by Samsung. This highlights the necessity for improved communication and awareness campaigns to inform consumers about Samsung's sustainability commitments and relevant activities.

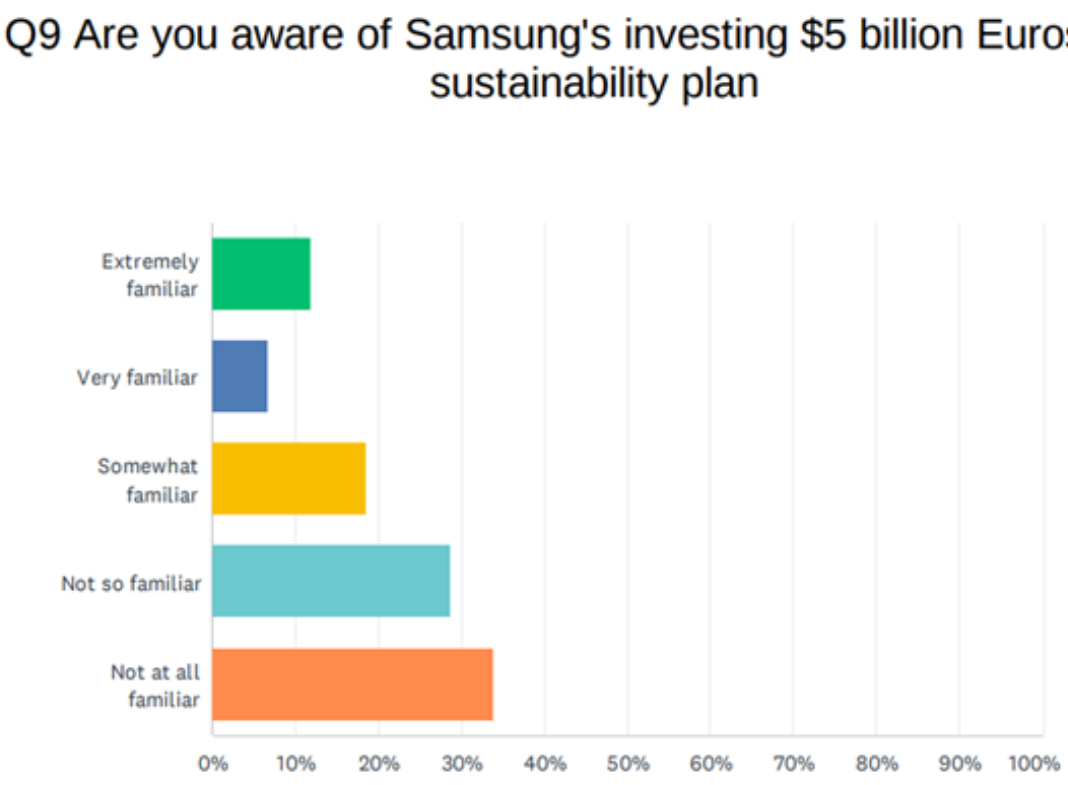

Figure 8. Familiarity with Samsung's $5 billion euros sustainability plan.

The fifth question's responses show the level to which Samsung's sustainability-related investments and initiatives affect consumer preferences for Samsung products. With 15 people (25.42%) choosing "a great deal" and 17 people (28.81%) selecting "a lot," a substantial proportion of respondents, perceive Samsung's sustainability efforts as highly influential. 16 people out of 59 consider these efforts to have "a moderate amount" of influence. However, a smaller segment, comprising 7 consumers perceive only "a little" influence and 6.78% reported that Samsung's sustainability efforts have absolutely no impact on their preferences for the company's products.

These findings may indicate that there is a mixture of consumers who consider sustainability initiatives as important actions by companies, and another segment that appears less influenced by such efforts. This again relates to the lack of sustainability communication and transparency with the broader consumer base.

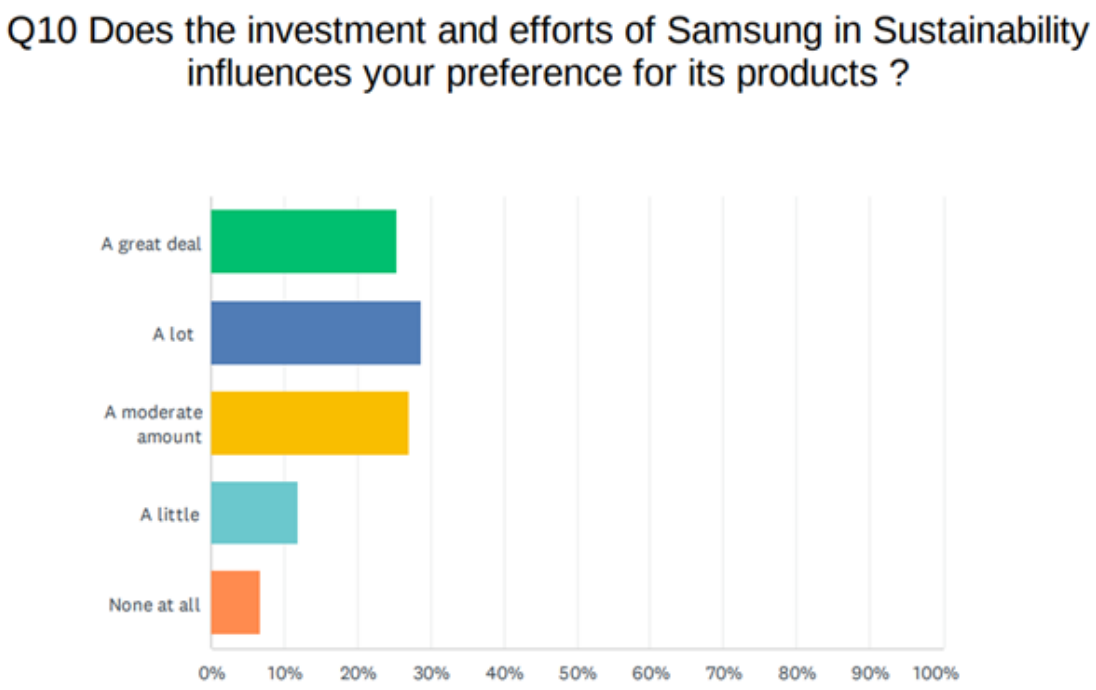

Figure 9. Influence of Samsung's sustainability initiatives on consumer preferences.

The sixth question asked the respondents to reflect on their attitudes towards buying Samsung products over competitors if the firm applies transparent processes to track its products' environmental impact. More than 55% of the sample (33 people) showed a willingness to switch to Samsung products under such circumstances, which means such measures will be positively received by most of Samsung's consumer base. Conversely, 10.17% (6 people) firmly reject the idea and 19 respondents (32.20%) remain undecided, as they opted for "Maybe."

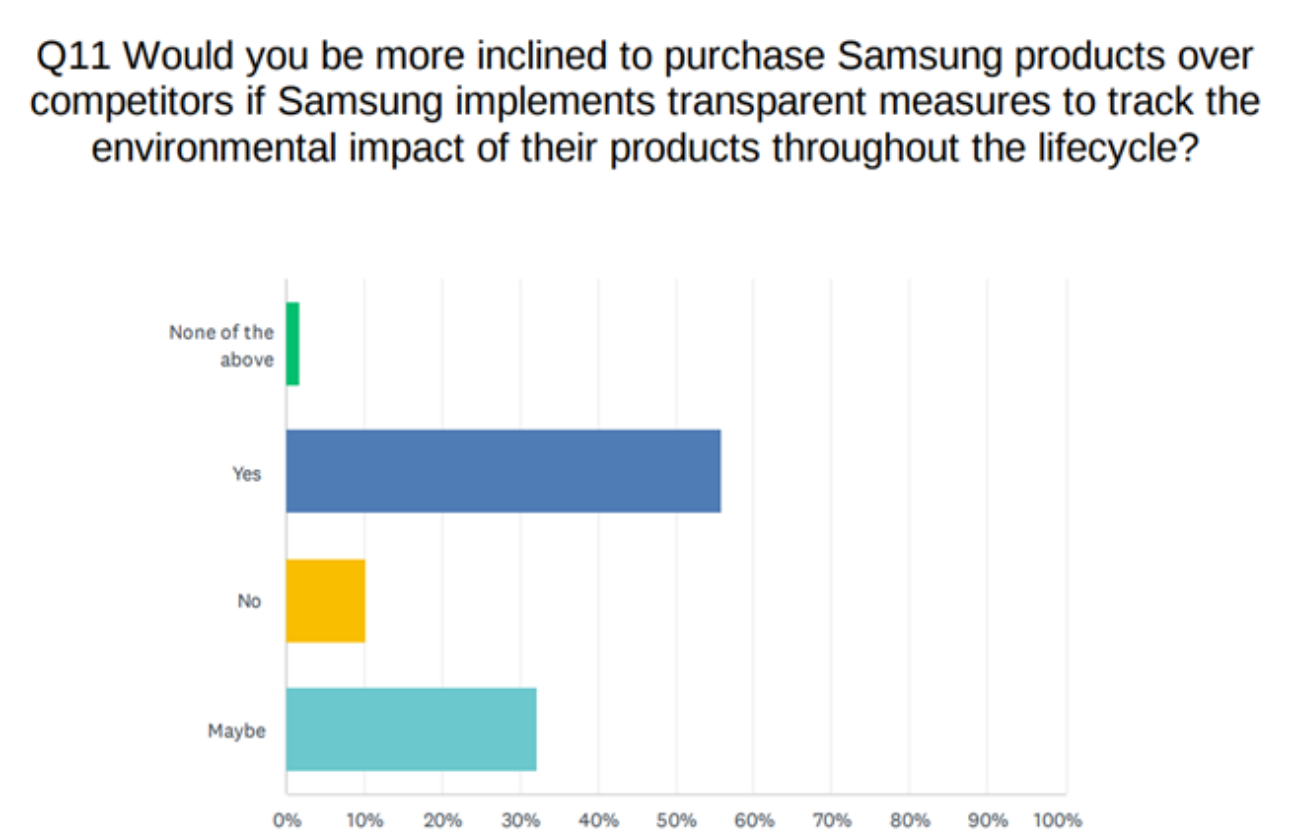

Figure 10. Consumer willingness to switch to Samsung products with transparent trailing of environmental impact.

Based on these findings, Samsung should utilize the scope to use transparency in tracking environmental effect as a source of competitive advantage. Nevertheless, the non-negligible portion of undecided respondents reflect why Samsung needs to further clarify the advantages of such measures to control consumer preferences decisively.

The seventh question on CE implementation efforts highlight the necessity of CE principles affecting consumer preferences for Samsung products compared to other brands. The data shows that majority of respondents attributes high importance to these principles (approximately 70% of the sample considering them "extremely" and "very important." This means that consumers are now highly inclining towards sustainability practices, therefore Samsung's efforts are appreciated.

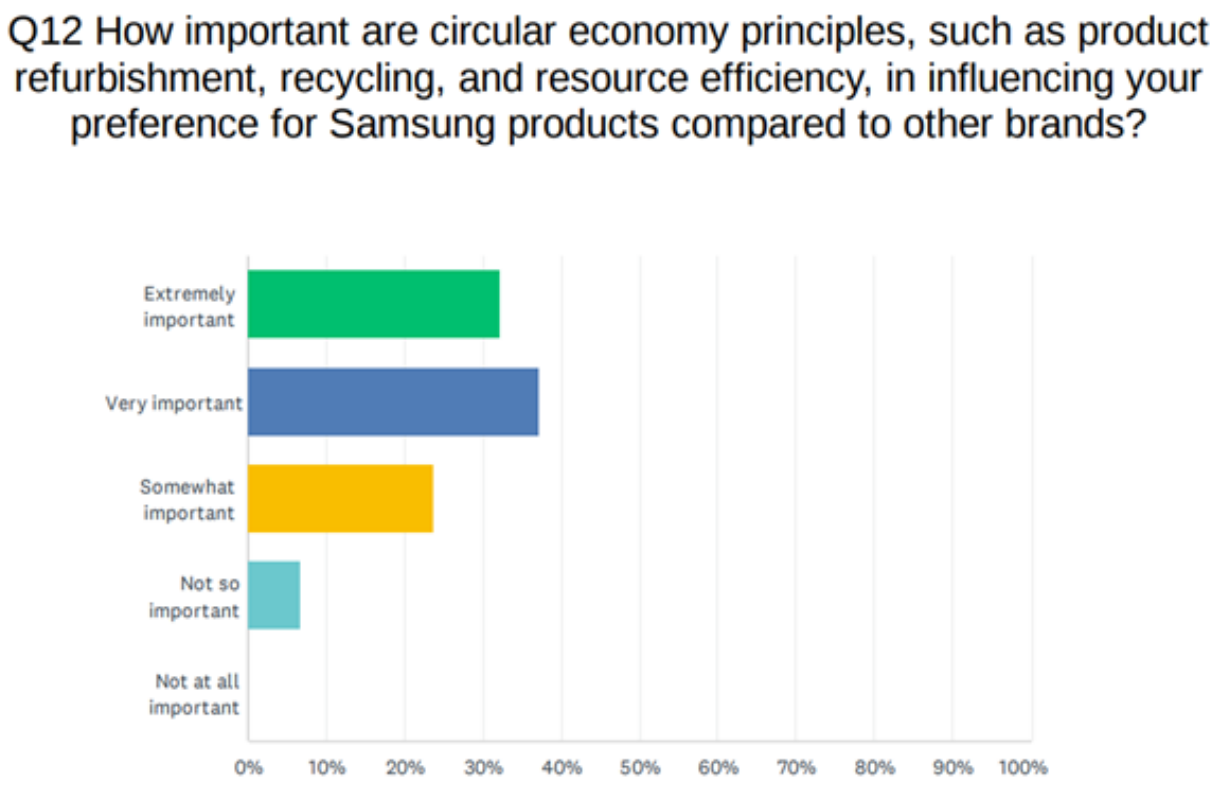

Figure 11. Importance of CE principles in influencing consumer preferences for Samsung goods.

The response of the next question shows a strong positive inclination of customers towards buying Samsung goods created from recycled materials. Almost 76% of the respondents are "very likely" and "likely" to make such purchases, which means they prefer eco-friendly products. Additionally, 11 respondents (18.64%) report being "neither likely nor unlikely," suggesting a possible openness to the concept. A minority of respondents, 3 people (5.08%), deem it "unlikely" to purchase products made from recycled materials, with no one indicating "very unlikely." Therefore, based on the findings, there is a strong likelihood of products made from recycled materials being purchased by Samsung clients.

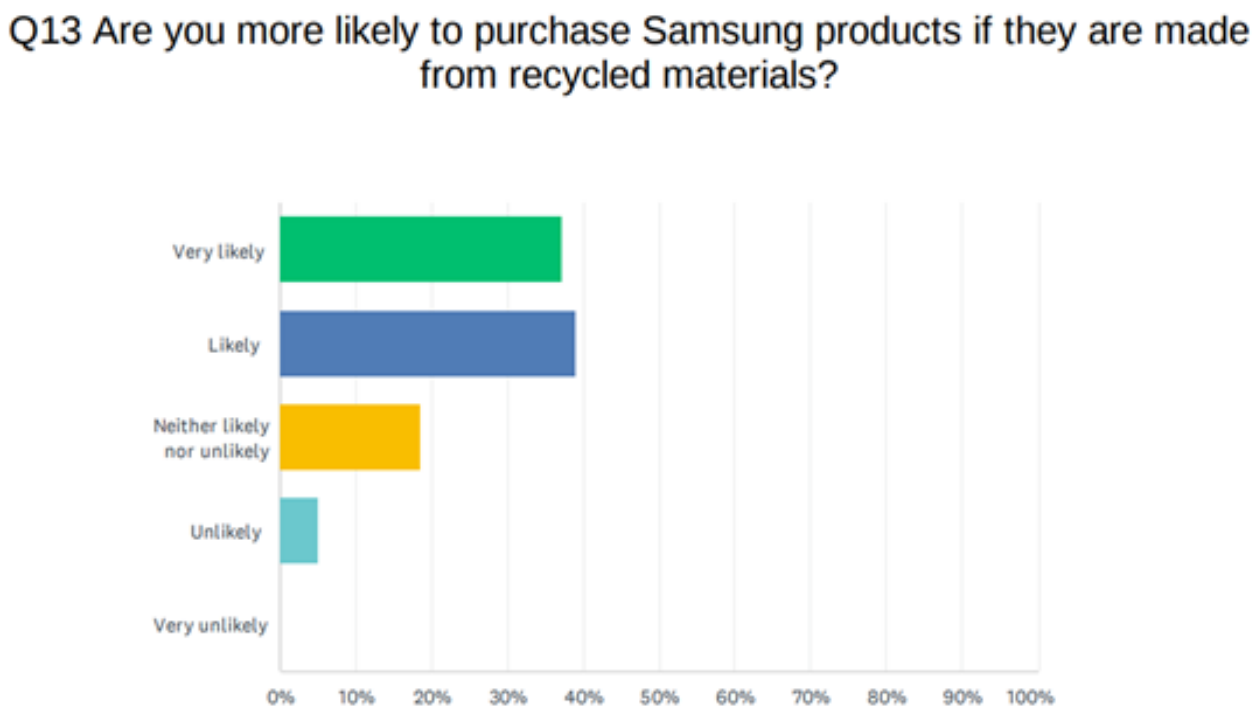

Figure 12. Consumer likelihood to purchase Samsung products made from recycled materials.

The following responses show a high level of support among the participants for Samsung offering incentives or discounts for returning old products for recycling or refurbishment. 59.32% strongly agree with this proposition while an additional 28.81% agree, highlighting a considerable consensus in favor of such initiatives. Moreover, 10.17% of respondents neither agree nor disagree, suggesting some ambivalence, while only 1 person disagreed with the idea. Therefore, there is a strong consumer desire for firms like Samsung to be proactive about taking sustainable measures like incentivizing the recycling and refurbishment of products because they align with the principles of CE and help in the reduction or electronic waste.

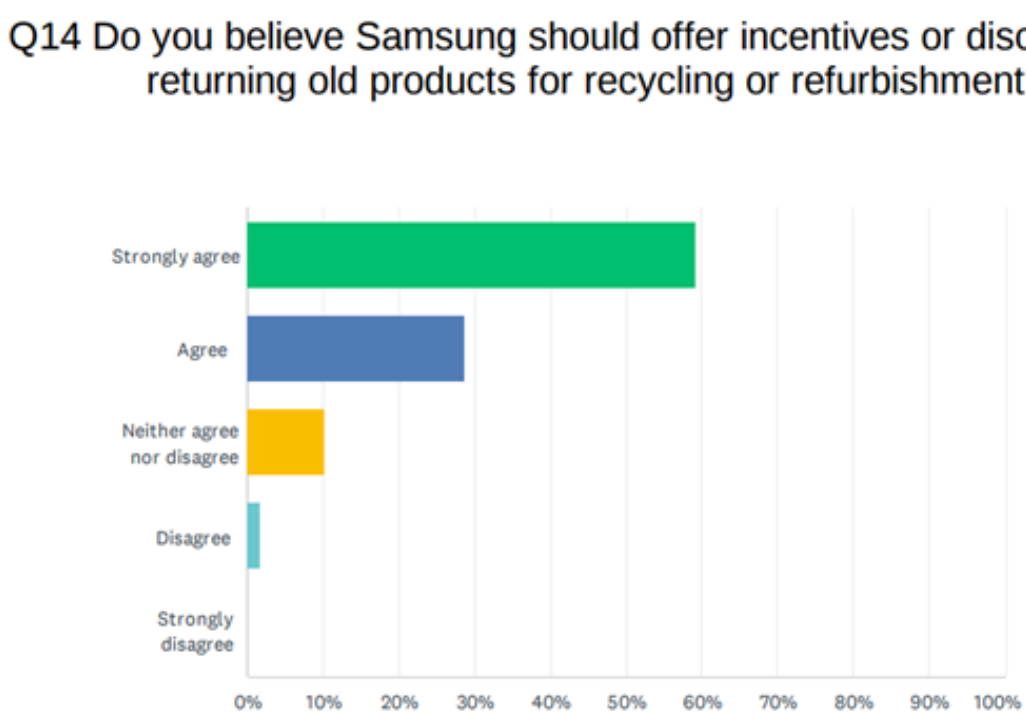

Figure 13. Consumer support for incentives or discounts for returning old products.

The responses to the question regarding the possible effect of price increases on Samsung's consumer loyalty reveal that almost 20% of the respondents are definitely willing to consider shifting to alternative brands if Samsung increases its product prices moderately. Moreover, a major portion of 39% express a conditional willingness to switch, which depends on the level of price increase they face. 27.12% of respondents affirm their loyalty to Samsung, stating they would remain committed regardless of price increases. Only 1 person firmly rejects the idea of switching, stating they are already committed to Samsung, while 7 of the 59 participants express neutrality or uncertainty. Therefore, the results indicate that price increases can affect the brand loyalty of some consumers while a sizable proportion remains loyal to Samsung, possible because of factors such as brand recognition and user experience.

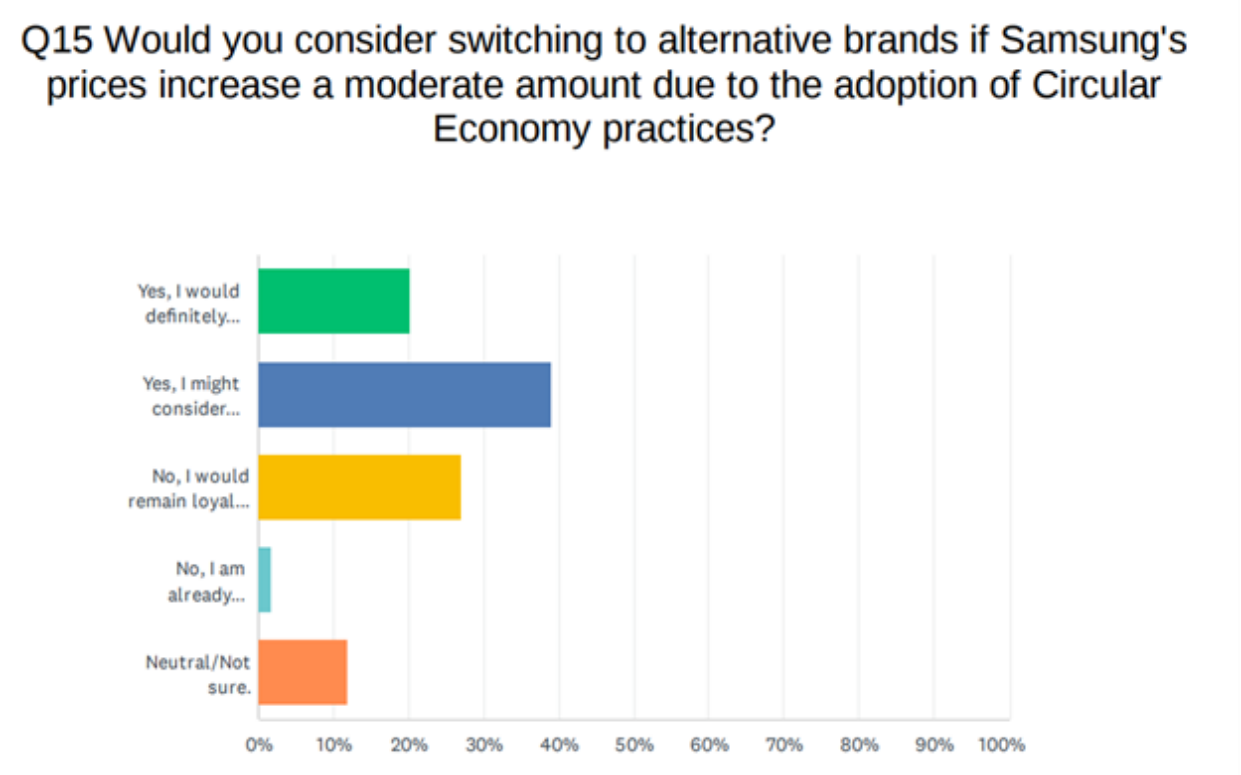

Figure 14. Consumer response to potential price increases and brand loyalty.

Consumers' perceptions of sustainability across various cell phone brands gave equal number of respondents going for Samsung and Apple (23 people voted for each brand). This shows that Samsung is perceived by the consumers on par with Apple, a brand known for its many sustainability initiatives. However, other brands such as Nokia, Motorola, Xiomi, and Oppo garnered fewer associations with sustainability, with Nokia being the closest contender with 5 people. For Samsung, this suggests a significant achievement in brand perception. However, the presence of other brands in the responses show that it is important to maintain the ongoing initiatives to enhance the practices to remain competitive in the sustainability-conscious market.

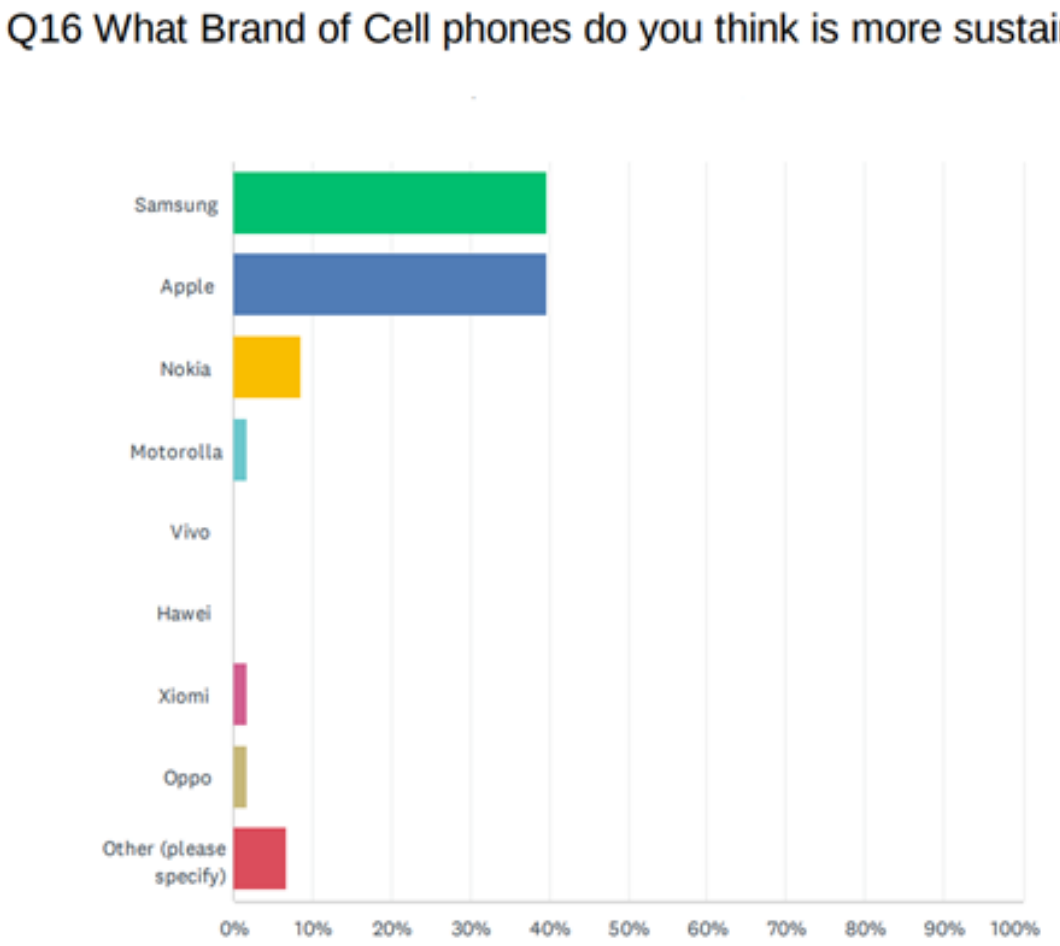

Figure 15. Perception of sustainability across cell phone brands.

Regarding consumers' preferences of the usability duration of cell phones, 67.24% prefer cell phones to remain usable for 3 to 5 years, suggesting a desire for durable and long-lasting products. Moreover, 13.79% show a preference for usability ranging from 1 to 2 years and another 13.79% for 6 to 10 years. Notably, no respondents chose a usability duration of more than 10 years. These findings indicate that Samsung as a scope to focus on extending product lifespan within the 3 to 5-year timeframe. The company can use strategies such as designing modular and repairable devices, offering software updates and trade-in programs to ensure the prolonging of its product usability.

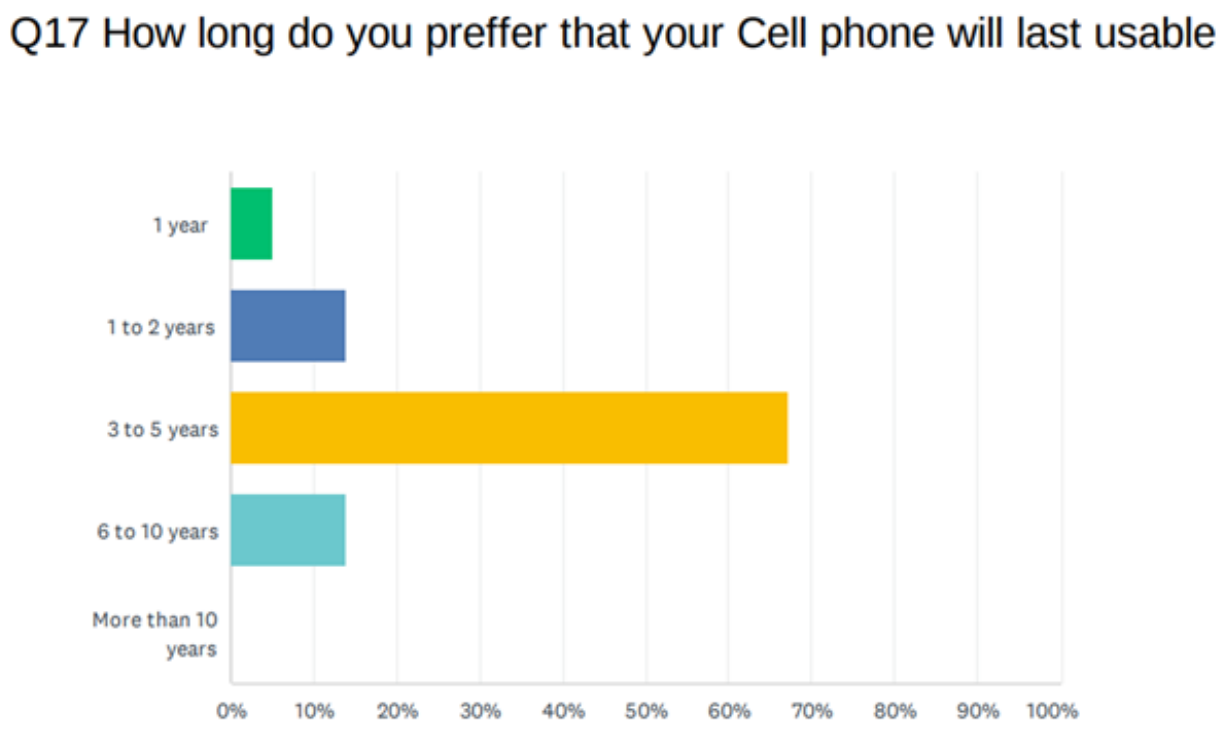

Figure 16: Consumer preferences for cell phone usability duration.

The responses to the last question asked for consumer recommendations or feedback for Samsung. One respondent suggests focusing on sustainability by offering older or second-market phones, indicating an appreciation for environmentally conscious practices. Another recommendation advises Samsung to decrease prices, which means consumers like this show a desire for more affordability. Some respondents acknowledged Samsung's performance improvements in recent years, highlighted the strength of its cameras and indicating overall competitive advantage of the company. Requesting for a care centre near their location, a respondent emphasizes the importance of convenient customer service. A suggestion to prioritize camera quality in new mobile series recognizes the market demand for enhanced photography features.

4.2 Interview Findings

This section shows the findings derived from an in-depth interview with an industry expert from Nokia, a leading telecommunications company. Nokia was added to the analysis due

to the research objective to create a benchmark by comparing Nokia's sustainability efforts with Samsung's.

Nokia's way of integrating CE principles into its business model: Nokia emphasizes sustainability throughout all its operations, including the designing of products with longevity and repairability in mind. The products are also supposed to promote reuse and recycling along with minimization of waste generation. Moreover, Nokia applies eco-design tactics to reduce its environmental impact.

Initiatives/Strategies by Nokia to promote sustainability and circularity: Nokia creates products that are energy-saving, durable and able to be repaired. As the product longevity is higher, Nokia can reduce the necessity of frequent replacements and therefore minimize environmental impact. The company has take-back programs in place where end-of-life products are gathered and recycled. In terms of product manufacturing, Nokia uses recycled metals, plastics and other materials to reduce dependence on non-renewable resources. The company has close collaboration with its suppliers to ensure sustainability throughout its supply chain, and there are regular audits with additional support and guidance to enhance environmental performance of the firm. More importantly, the company invests heavily in R&D to find renewable energy and resource solutions.

Primary challenges for Nokia in adopting CE practices: Nokia faces technological limitations, regulatory limitations and logistical complexities in adopting and scaling up CE practices within the telecom industry. The changing preferences of consumers are also responsible for the challenges related to the enhancement of widespread adoption of sustainable practices.

Nokia's collaboration with stakeholders to improve circularity across the value chain: Nokia takes initiatives such as supplier engagement programs, joint sustainability projects and industry alliances. By promoting cooperation and open dialogue, Nokia aims to use collective seeks to leverage collective expertise and resources to drive sustainable innovation and best practices.

Future trends and opportunities for Nokia: Looking ahead, Nokia sees major opportunities in improving CE principles, driven by emerging trends like the Internet of Things (IoT), 5G technology and digitalization. These trends help Nokia to develop smarter and more efficient solutions to promote circularity. Moreover, increasing awareness and demand for sustainable products are basically opportunities for Nokia to further differentiate itself.

5 Discussion

5.1 Theme 1: Samsung's Current Business Practices in Circular Economy

Samsung has been able to strategically embed CE principles into the company's business models. It is especially visible in the firm's product design and management of product lifecycle. The firm prioritizes eco-design principles and makes sure that the products are durable and repairable. By making the products more energy-efficient, their lifecycle can be extended to reduce environmental impact. Samsung has take-back programs and initiatives for recycling which fosters responsible disposal and promoting material reuse and recycling. In addition, Samsung closely engages with suppliers to foster sustainable source practices.

5.2 Comparison with IKEA and Nokia: Similarities and Differences

Comparative analysis reveals both similarities and differences in CE initiatives among Samsung, IKEA, and Nokia. While all three companies prioritize sustainability and circularity, differences exist in their specific approaches because of the companies working at different industries. Samsung has an excellent reputation in terms of product design and supply chain sustainability. The firm does it by using its large-scale operations and integration of eco-design tactics. IKEA's focus is on circular product design and closed-loop systems. For instance, the furniture take-back and resale initiatives of IKEA exemplifies. Nokia, on the other hand, is focused on the longevity of its products and recycling of materials.

All of these companies come with robust ESG frameworks encompassing environmental, social and governance aspects of the companies. This reflects the companies' commitment to responsible business practices. Nevertheless, there is a variety noticed in the focus and depth of the firms' efforts, highlighting major strengths and challenges in their approaches. Samsung has been following its ESG strategy for a long time, with a strong focus on the sustainability of the environment. By the year 2050, Samsung aims to achieve net-zero carbon emissions across its total global operations. The environmental strategies

of the company include making investments in renewable energy to achieve energy efficiency and sustainable product design. The extensive recycling programs are extensive with efforts like Galaxy Upcycling program, aiming to repurpose old devices and the creation of environment-friendly packaging materials. The social value is enhanced by Samsung as the company takes many initiatives for community engagement and the practice of social responsibility. Employee well-being, diversity and inclusion etc. are prioritized by Samsung. It invests in employee training and consumer education through programs such as Samsung Innovation Campus. Moreover, the company is committed to labour standards and human rights which is evident in its supplier code of conduct and collaborations established to improve labour conditions throughout its supply chain. Lastly, Samsung's governance framework deeply focuses on ethical conduct and transparency. As an accountable firm, it has several policies and procedures to make sure that it complies with the global regulations and standards. The Board of Directors (BoDs) of Samsung encompasses independent members who supervise corporate governance. Samsung engages with these stakeholders on a regular basis to address any concerns or for the improvement of governance practices.

IKEA's environmental practices include its aim to transform the company into a completely circular and climate-positive business by the year 2030. The company focuses on sustainable sourcing, use of renewable energy sources and circularity in product design. The goal of IKEA is to achieve a hundred percent renewable and recycled inputs of materials by 2030. The Circular Hub Stores by IKEA are known for selling second-hand and refurbished furniture, which exemplifies the company's promise to a circular future. On the other hand, social sustainability is managed by IKEA through its community impact, ensuring employee well-being and fair labour standards. IKEA fosters a culture of equality, diversity and inclusion within its workforce and supply chain. Moreover, the company supports refugees by providing them with employment and training programs to improve their skills. These social projects are the reflection of the way IKEA invests in local communities. Lastly, the governance structure of IKEA is supportive of its ambitions for sustainability, as they provide with clear accountability and oversight mechanisms. IKEA published yearly sustainability reports to outline its progress and to identify the challenges it is facing in

achieving its ESG goals. This allows the maintenance of accountability and trust with stakeholders.

Nokia's ESG strategy focuses on the reduction of the company's environmental footprint and the promotion of sustainable innovation in the telecommunications industry. Nokia has set ambitious targets to decrease greenhouse gas emissions in its operations and products. The CE efforts of Nokia involve product designing that consider longevity, recyclability as well as modularity. Moreover, like IKEA, Nokia also has take-back programs where materials are recovered and recycled from old devices. Positive social impacts by Nokia involves its efforts for engaging with communities. The company emphasizes digital inclusion by offering connectivity solutions in areas that are underserved. Ensuring a safe and inclusive workplace for its labour force is also a part of its social practices. The governance framework of Nokia is built to make sure there is ethical behaviour and transparency all around. The firm has policies to uphold labour standards, human rights as well as anti-corruption measures.

While all three companies demonstrate strong commitments to ESG principles, IKEA stands out for its comprehensive and integrated approach to sustainability. Besides sustainable sourcing practices, Samsung has clear targets, such as becoming climate positive and fully circular by 2030. The social initiatives of the firm are proactive. It has made major investments in technology and innovation for sustainability, has net-zero goals. However, its governance practices could be improved from greater stakeholder engagement and transparency. Nokia’s focus on sustainable innovation and digital inclusion is commendable, but its overall impact might not be as broad or deeply integrated as IKEA’s comprehensive strategy.

5.3 Limitations and Challenges in CEBM Implementation for Samsung

Although Samsung has made significant achievements in its implementation of CEBM practices, there are some future challenges that needs being addressed to improve the

scalability of the current initiatives. The challenges range from technological and economic to social dimensions, requiring Samsung to apply continued leadership in CE practices.

Technological Challenges: Samsung seeks to continue increasing the utilization of recycled materials. However, the company experiences the challenge of improving advanced recycling technologies to process a wide range of electronic waste in an efficient manner. This involves identifying the recovery rates of valuable materials and the reduction of environmental impact of recycling procedures. Moreover, although the company has made major progress in durable and repairable product design, it needs to enhance innovation to embed circularity in its product design fully. For this, Samsung needs to develop new materials that are not much difficult to recycle, and can be disassembled, reassembled, refurbished and reused easily.

Economic Challenges: There are high initial costs while implementing CE practices due to the need for investing in new technologies or product redesigning. Sometimes, even supply chain practices need to be revised and established newly. It is a major challenge for Samsung to balance these costs and also maintain competitive pricing at the same time. The company needs strategies for effective cost management or ways to monetize its CEBM. Moreover, although many consumers are now aware of the sustainability issues, their willingness to pay more for circular products shows some inconsistency. It is important that Samsung continues to educate and engage consumers on the value of circular products through marketing campaigns.

Policy and Regulatory Challenges: Samsung is a global company, which means it has to operate in several regulatory environments where the standards for CE practices and sustainability vary highly. It is a big challenge for the firm to successfully navigate such complexities to make sure that the company complies to rules across various regions. The firm needs to harmonize these practices while also considering the requirements of local regulations. In addition, Samsung can contribute to the shaping of public policy which support CE initiatives in business models. The firm may engage policymakers to advocate for regulations which foster recycling and resource efficiency in product design.

Socio-cultural Challenges: It is another major challenge to promote a transition in consumer behaviour towards more sustainable business practices. There must be significant investment made in encouraging consumers to take part in recycling programs, product returning for refurbishment. The company may hold educational campaigns, offer incentives and establish partnerships with other stakeholders to ensure a culture of sustainability. Moreover, it should make sure that the workforce of Samsung is well-equipped with the important skills and knowledge regarding CE practices. Therefore, the employees should be trained to improve in new processes and technologies.

5.4 Alignment with Theoretical Frameworks

The research findings align closely with the proposed theoretical frameworks of Extended Producer Responsibility (EPR) and Reverse Logistics Process (RLP). Firstly, the findings regarding Samsung's integration of Circular Economy (CE) principles into its business practices resonate with the concept of Extended Producer Responsibility. Samsung's initiatives reflects a proactive approach to assuming responsibility for the environmental impact of its products. Secondly, the research findings also align with the Reverse Logistics Process framework, particularly in terms of Samsung's recycling initiatives and material recovery efforts. Reverse logistics refers to the management of return, recycle and refurbishment of products, which are essential elements of CE efforts.

Table 3. Comparison of Circular Economy Practices, Benefits, and Environmental Impacts Among Samsung, IKEA, and Nokia.

Company	**Circular Economy Strategies and Practices**	**Estimated Benefits**	**Environmental Impacts**
Samsung	Durability and repairability in product design Recycling and reusing material	Reduction of resource consumption and waste generation	Reduction of electronic waste through recycling programs

	Remanufacturing and refurbishment Extended producer responsibility Reducing and preventing waste reduction	Saving cost by reusing and remanufacturing Improved brand reputation for sustainability	Lower carbon footprint as less energy is consumed
IKEA	Sustainable sourcing Product design for disassembly and recycling Take-back and recycling programs for furniture Adopting renewable energy in operations Reduction of waste and initiatives for resource efficiency	Reduced environmental impact Cost saving	Reducing deforestation by sourcing wood sustainably Lower carbon emissions because of using renewable energy
Nokia	Design for disassembly and recovery of material Using recycled materials in products Initiatives or programs for product refurbishment and recycling Take-back programs for EoL devices Eco-friendly packaging efforts	Resource consumption can be reduced Reduced waste generation Cost savings More brand reputation for environmental stewardship	Recycling programs for products to reduce electronic waste Lower carbon emissions

6 Conclusion and Recommendations

6.1 Summary of Research Findings

In this study, the researcher embarked on a journey to explore Samsung's current business practices incorporating Circular Economy (CE) principles, benchmarking its approaches against industry counterparts, and evaluating extant literature to provide strategic recommendations for the company. Through a comprehensive analysis of primary interview data from industry expert working under Nokia and survey responses of Samsung consumers, the study gained important insights into Samsung's sustainability efforts. The primary research objectives involved the understanding of Samsung's current business practices integrating CE principles, the analysis and contrast of Samsung's approaches with those of IKEA and Nokia. It also assesses the limitations for Samsung in scaling up their CE efforts and offering strategic recommendations.

The idea of circular economy (CE) has been introduced from the very start of the research project. Due to scarcity of resources, long-term sustainability often cannot be guaranteed. Therefore, the opposite of linear economy, circular economy model is the most feasible alternative in the current times. As Samsung is a renowned manufacturing company which has shown remarkable compatibility with the CE model, this study decided to use this organization as the case organization. The use of raw materials needs to be optimized because of the finite nature of this world’s natural resources. Therefore, manufacturing companies should use as less non-renewable raw materials as possible. This is why companies like Samsung needs to carefully investigate and explain the details of their supply chain and manufacturing procedures. All of the phases of CE model have been proven as essential components in maximizing the use of products while also reducing harm towards the environment. To conclude, the business model of Samsung is compatible with the CE model and may make good contributions in the world’s future sustainability concerns.

In order to prove the company as a sustainable one, it is important for Samsung to address problems in the fields of society, economy and environment. All in all, the problems

of environment mainly dominate the discussion around sustainable business operations. However, at current times, the concept of CE has been recommended a better approach which addresses all three parts of socio-economic and environmental aspects, otherwise known as the triple bottom line.

The aim of CE principles is to transform resource wastage into activities and products adding more value to the consumers' lives. However, at present there is very limited amounts of studies focused on the components of circular economy. This study aimed to investigate the connection between supply and procurement procedures to recommend a transformation from the product-selling method to a service-centred method. This is also a good technique to improve the use of efficiency through recovery. Additionally, the frameworks used in this study also considers the socio-cultural elements of the stakeholders engaged in the procurement process of Samsung.

The frameworks presented are based on collaborative events, which is an essential connection within the procedure of public procurement and the enhancement of more sustainable business model. The collaborative experience acts as a foundation for the procurers and procures to enhance their contributions regarding the implementations of CE, whereas also making sure that the financial advantages for all parties involved are insured. Although various specifications of the procedure can take a long time to be completed, the interrelations between the procurements and the suppliers become more robust and durable as a result. As per the findings of this research, if suppliers and procurers work together when they acquire procurement, it can lead to a reduction of consuming non-renewable raw materials and production wastage. This can also foster the improvement of novel and more sustainable business models in the same industry as Samsung operates in.

For benchmarking purposes, the study looked into the CE practices of two other organizations: IKEA and Nokia. Each of these companies has shown a strong commitment to the principles of CE, although their approaches and achievements vary. Samsung has made substantial investments in sustainability, such as through its $5 billion sustainability plan. The company focuses on efficiency of resource, product longevity and the practice of

recycling through extensive take-back and recycling programs. Nokia, on the other hand, focuses on product longevity by ensuring modular designs and easy repairability of products. The efficiency of materials and utilization of renewable resources are also prioritised by Nokia. Like Samsung, Nokia also has take-back programs and collaborative ventures with other companies to promote material recycling and reuse. Lastly, IKEA is unique because of its holistic approach towards CE. By incorporating circularity into the firm's core business strategy, IKEA aims to become completely circular by the year 2030. Efforts by IKEA to ensure circularity includes designing durable, repairability and recyclable products. The "Circular Hub" stores by IKEA facilitate resale and refurbishment of used furniture. Another noteworthy effort by Samsung to integrate sustainability principles is its operations in the supply chain. The firm forms collaborative relationships with suppliers and partners to make sure that the entire supply chain is able to uphold CE practices to ensure sustainability. These includes rigorous standards for environmental performance and ethical sources. Moreover, the use of renewable resources is emphasized by the company's efforts. The firm also fosters transparency and accountability in its way of achieving sustainability goals. Therefore, while Samsung and Nokia have made significant strides in integrating circular economy principles, IKEA's comprehensive and forward-thinking approach positions it as a leader in circular economy practices. Therefore, IKEA serves as a benchmark for other companies aiming to transition towards a more sustainable and circular business model.

Although there are numerous progresses, there are also many challenges that Samsung face as the company tries to scale up its CE efforts. These challenges include regulatory constraints, technological limitations and supply chain. Moreover, consumer awareness and behavioral shifts are crucial for widespread adoption of sustainable products and practices.

6.2 Recommendations for Samsung

From the findings and analysis assessed above, Samsung can have a few of the following recommendations:

• Samsung needs to change the way the company is thinking at present and work proactively towards a CE principle, where pollution and wastage can be prevented from happening in the very first place.

• Samsung needs to prioritize its customer service and behaviour towards customers. For many reasons, including the cause that CE focuses on the effective utilization of natural resources and many consumers consume intensely without thinking. This creates a better fit between the concept of CE and sustainability. As stated by the United Nations Development Program, the consumption of global raw materials was one the rise as much as double of the growth of population in the 20th century. Humans living in the richest countries are known to have an expenditure ten times over those of the poorest nation's citizens. It means that those citizens need to reduce their expenditures while other consumers can raise their consumption rate.

• In order to gain more competitive advantage in the sector through CE applications, Samsung needs to invest more and allocate more resources to the production of products that favour the CE principles. The lessening of consumption is just an essential part of the CE idea. It is also about the expenditure of consumers in a wiser and more sustainable way in the long-term. Customers may believe in their own values and select products that have been produced in a more environmental-friendly manner. It may also include products created with recycled materials. Samsung needs to reduce its carbon footprint.

• The success of Samsung also depends on the company's high emphasis on the take-make-waste business model. This business model makes a clear description regarding the paradigm underpinning the entire economy at present, where customers only have a limited amount of impact in the marketplace. Sustainable enhancement requires systematic transformation instead of depending on the decision of the client base.

• For Samsung, successfully transitioning from linear economy principles to the rules of CE will be quite a hard goal to achieve. If Samsung is able to ensure a collaborative environment that works well within the governments, politicians as well as the communities and

the civic society, the company will be able to reach out to a lot of more customers and also get a good name for its CE initiatives.

6.3 Future Research Directions

It is quite challenging to finish any research study when there is a limitation of time. Various procedures need to be implemented with relevant materials, improved hypothesis and advocacy is necessary for any research conducted in the future. Studies are more effective and accurate when the direct impact of primary data collection comes into play. Due to geographical characteristics, the researcher was not able to reach participants from various other regions. It is possible for future studies to emphasize variables that refer to more meticulous and subjective matters. The integration of Circular Economy Business Models (CEBM) into corporate strategies is a growing field with numerous avenues for future research. Based on the findings of this study, several potential research directions can be pursued to deepen understanding and implementation of CEBM practices across industries.

- Future research may focus on conducting longitudinal studies, so that the long-term impacts of CEBM practices across various firms and sectors can be compared. The tracking of performance metrics over time can help researchers to evaluate the results of sustainability as well as financial outcomes of companies like Samsung, Nokia and IKEA. This approach will be instrumental in the identification of best practices regarding circular strategies in business models.

- Further investigations may be interested in assessing consumer behaviour towards CE products. They can seek to understand the factors affecting consumer willingness to pay premium prices for sustainable products. Thus, how awareness of a firm's sustainability initiatives influence buying decisions can be understood.

- Future studies can investigate the contribution of technological innovations in the facilitation of the transition towards a CE. It may include studying advanced

recycling technologies, material science and digital platforms facilitating the management of product life cycle and circular supply chains.

- Assessing the effect of government regulations and policies on the adoption of CE practices can be a productive research area. There can also be comparative research across various regions and sectors to understand the most effective policy measures.

- Research may look into the role of stakeholder engagement and inter-organizational collaboration in advancing CE goals. There are also scopes to evaluate case studies of successful collaborations between companies, NGOs, and governments, focusing on how these partnerships facilitate the scaling of circular practices.

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APPENDICES

Appendix 1. Quantitative Data Collection Instrument: Survey Questions for Samsung Customers

Appendix 2. Qualitative Data Collection Instrument: Interview Questions for Industry Expert(s) from Nokia

Appendix 1. Quantitative Data Collection Instrument: Survey Questions for Samsung Customers

Demographic Questions:

1. What is your age?

(Under 18/ 18-24/ 25-34/ 35-44/ 45-54/ 55-64/ 65+)

2. What is the highest level of education you have completed?

(Did not attend school/ Primary School/ Graduated from high school/ 1 year of college/ 2 years of college/ 3 years of college/ Graduated from college/ Some years at graduate school/ Completed graduate school).

3. What is your approximate average year household income in euros/dollars?

($0-$14,999/ 15,000-24,999/ $25,000-$49,999/ $50,000-$74,999/ $75,000-$99,999/ $100,000-$124,999/ $125,000-$149,999/ $150,000-$174,999/ $175,000-$199,999/ $200,000 and up).

4. In which country do you reside?

5. What is your gender?

[Female/ Male/ Other (specify)]

Questions about CEBM and Samsung Products

1. If Samsung increases the price of its products by 1 to 3 euro to support its circular economy initiatives, would you still consider purchasing Samsung products? (Yes/No/Depends)
2. 2. How likely are you to support Samsung's sustainability efforts by paying an additional 10 euros for their products, knowing that it contributes to environmental conservation and circular economy practices?
   (Very likely/Likely/Neither likely nor unlikely/Unlikely/Very unlikely)
3. How important is it for you that Samsung implements Circular Economy principles in its manufacturing processes?

(Extremely important/Very important/Somewhat important/Not so important/ Not at all important)

4. Are you aware of Samsung's $5 billion Euros in its sustainability plan?
   (Extremely familiar/Very familiar /Somewhat familiar/Not so familiar/Not at all familiar)
5. Do the investment and efforts of Samsung and Sustainability influence your preference for its products?
   (A great deal/A lot/A moderate amount/A little/None at all)
6. Would you be more inclined to purchase Samsung products over competitors if Samsung implements transparent measures to track the environmental impact of their products throughout the lifecycle?
   (None of the above/Yes/No/Maybe)
7. How important are circular economy principles, such as product refurbishment, recycling, and resource efficiency, in influencing your preference for Samsung products compared to other brands?
   (Extremely important/Very important/Somewhat important/ Not so important/Not important at all)
8. Are you more likely to purchase Samsung products if they are made from recycled materials?
   (Very likely/Likely/Neither likely nor unlikely/Unlikely/Very unlikely)
9. Do you believe Samsung should offer incentives or discounts for returning old products for recycling or refurbishment?
   (Strongly agree/ Agree/ Neither agree nor disagree/ Disagree/ Strongly Disagree)
10. Would you consider switching to alternative brands if Samsung's prices increase a moderate amount due to the adoption of Circular Economy practices?
    (Yes, I would definitely/ Yes, I might consider.../ No, I would remain loyal.../ No, I am already.../ Neutral or not sure.)
11. What Brand of Cell phones do you think is more sustainable?
    [(Samsung/ Apple/ Nokia/ Motorolla/ Vivo/ Hawei/ Xiomi/ Oppo/ Other (please specify)].

12. How long do you prefer that your cell phone will remain usable?
    (1 year/ 1 to 2 years/ 3 to 5 years/ 6 to 10 years/ More than 10 years)
13. Please provide any recommendation or comments you may have about Samsung electronics.

Appendix 2. Qualitative Data Collection Instrument: Interview Questions for Industry Expert(s) from Nokia

1. How does Nokia currently integrate circular economy principles into its business model and product lifecycle management?

2. What specific initiatives or strategies has Nokia implemented to promote sustainability and circularity in its operations and product offerings?

3. From Nokia's standpoint, what are the primary challenges or barriers in adopting and scaling up circular economy practices within the telecommunications industry?

4. How does Nokia collaborate with suppliers, partners, and other stakeholders to enhance circularity across the value chain?

5. In your opinion, what are the future trends and opportunities for Nokia in advancing circular economy principles?