What Can Companies Do to Adapt Their Business Models Toward a Circular Economy?

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1 Introduction

This chapter introduces the connection between environmental and economic issues and resource overexploitation. It also presents the demand for a new economic model and indications for change to a circular economy.

1.1 Background

Greenhouse gas emissions are increasing rapidly. By 2025, the demand for resources globally is predicted to double. In addition, 8 million ton of plastic are thrown into our oceans annually (Geng et al., 2019, p. 153). Speaking of water, according to the UN Environment program (2018), it requires 3781 liters of water to produce one pair of jeans. Cultivation of cotton, manufacturing, washing, and transportation was included in the calculation. Furthermore, to build a computer weighing a few kilograms, a ton of silicon, plastic, and metal is needed (Geng et al., 2019, p. 153). The conclusion? Industrial processes are extremely wasteful.

Waste is equal to lost economic value and profit. Simultaneously companies have experienced vulnerability in terms of unstable resource prices and supply disturbance, which may have a negative impact on economic growth. For example, during the last decade changing prices of metals have been the highest ever in the twentieth century. Longer globalized supply chains due to trade among countries cause supply risks. Yet, countries are depending on import and export. Nevertheless, to produce

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unrenewable resources and make a transition to a new economic model that emphasizes the need for circular economy would help to overcome the challenges of structural waste, price risk, and supply risks in the linear model (Ellen MacArthur Foundation, 2015, p. 3). Pollution, land degradation, pressure on natural resources, climate change, and decreased biodiversity are only a few of the environmental problems the world is facing because of resource overexploitation. These issues are highly linked to the linear economy and more and more requests are made for a new economic model. A model that is resistant and not associated with resource exhaustion and volatile systems (Ellen MacArthur Foundation, 2015, pp. 3–4). These problems will guide research onward to the possibilities of circular economy. Even though circular economy is more discussed when the issue of global warming is increasing, there are a lot of uncertainties regarding putting it into practice. This chapter will mostly focus on circular economy from a business perspective since there is a lack of knowledge on the topic. The aim is to investigate how businesses can adapt their business models to a circular economy. The objectives are as follows:

- Address the advantages and disadvantages of circular economy and how it influences markets and businesses
- Find out the challenges, difficulties, and complications of modifying a business model toward the circular economy.
- Present the key activities on how to adapt business models to a circular economy

2 Literature Review

2.1 Linear Economy

Linear economy has been a part of our society since the industrial revolution. In a linear economy, we produce, consume, and then throw away. Products get classified as trash once they served their purpose. This requires the use of an endless amount of natural resources. The materials often end up in nature and destroy important ecosystems (Naturskyddsföreningen, 2021). The world population and the demand for products are increasing; therefore, we overconsume limited resources and increase waste. Due to mass production and overconsuming, we would need 1,5 globes to maintain the linear economy on a global scale (Johansson & Edlund, 2018, p. 1). The current linear system is unstable and continues to damage the environment. Resources are scarce, the size and volume of ecosystems become smaller, and therefore contribute to the reduction in natural resources (Korhoen et al., 2018, p. 38). Moreover, materials in the linear economy often get mixed and diluted, which reduces their economic value. Resources that cost a lot in extraction are not useful anymore. One example that a lot of people can relate to is old electronic devices that are often stored in our homes for no use (Naturskyddsföreningen, 2021).

Most companies have linear business models, which means that they are not responsible for what happens to the product after the customer made its purchase

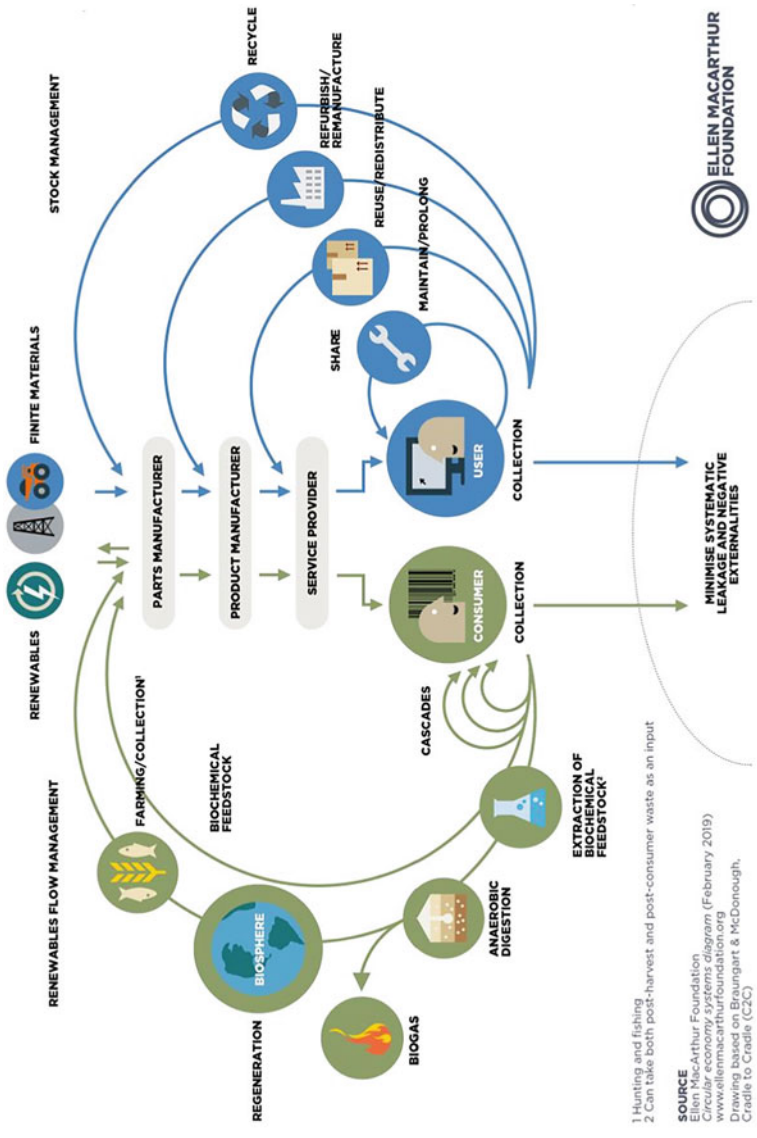
(Berg et al., 2018, p. 2). According to Papadopoulos and Balta (2022), pp. 3–4), there are several challenges businesses face due to climate change. Supply chain and resource problems can cause higher prices and a lack of product quality. Changing energy consumption, maintenance, adaptation, and investments into innovative solutions may bring extra costs and a reduction in profits. Furthermore, businesses can experience changing customer behavior and demand. For example, the need for climate-friendly products may increase. Extreme weather conditions can damage facilities, energy networks, and infrastructure that can cause transportation problems and other issues. Human migration due to climate disasters as well as diseases and infections related to climate change can affect customers and employees (Papadopoulos & Balta, 2022, pp. 3–4).

2.2 Circular Economy

The opposite of linear economy is circular economy. The idea of a circular economy is to reuse everything that has been manufactured for as long time as possible. Eventually, products and materials are recycled and reused repeatedly (Naturskyddsföreningen, 2021). The Ellen MacArthur Foundation (Ellen MacArthur Foundation, n.d.-b) explains on their website that circular economy makes it possible to reduce negative impact on nature and at the same time create jobs and wealth. The focus of circular economy is to maintain value and extend the lifetime of products and resources (Larsson & Saulo, 2019, p. 2). "We must transform every element of our take-make-waste system: how we manage resources, how we make and use products, and what we do with the materials afterward. Only then can we create a thriving circular economy that can benefit everyone within the limits of our planet" (Ellen MacArthur Foundation, n.d.-b).

Circular economy is based on three principles. "Design out waste and pollution," "keep products and materials in use," and "regenerate natural systems" (Ellen MacArthur Foundation, n.d.-a). The first one "Design out waste and pollution" is to terminate waste, pollution, and greenhouse gas emissions. The ideal would be if it never was generated (Ellen MacArthur Foundation, n.d.-a). The second is to design sustainable, rebuild, recycle, and reuse components, materials, and products (Ellen MacArthur Foundation, n.d.-a). The resources should be preserved at their most efficient and profitable value (Johansson & Edlund, 2018, p. 12). The last principle is to give back to the environment by protecting and improving it, like setting back nutrients to the soil for renewal (Ellen MacArthur Foundation, n.d.-a). Moreover, the last principle is not only about restoring nature, but also about ameliorating society and promoting system efficiency. This means less harm to systems like food, education, air, land, and health (Ellen MacArthur Foundation, 2015, p. 7) (Fig. 1).

The Ellen MacArthur Foundation has developed a model most known as the "butterfly diagram" explaining the cycle of resources in a circular economy, one for biological and one for technical materials. Biological materials can reenter the environment (Ellen MacArthur Foundation, n.d.-a). Biological materials can, for



Source: Ellen MacArthur Foundation

Fig. 1 Butterfly diagram of the circular economy system. (Source: Ellen MacArthur Foundation)

example, be used for fuel or nutrition after it has been used in multiple products (Wennborg & Berg Helgöstam, 2018, p. 8). Johansson and Edlund (2018, p. 14) explain the same principle, and the idea is that biological nutrients will be returned to the biosphere and eventually be reused in new cycles. In order to close the loop, the product must be designed in a way that enables the transition to raw material, which later can be used for new products. For instance, a consumer can sell his sweater made of cotton so it can be used for upholstery instead. In that way, value is created. Materials that are nonbiological are referred to as technical materials. In order to create a cycle for technical resources, remanufacturing, renovation, and recycling must be achievable (Johansson & Edlund, 2018, p. 14). Technical materials cannot be reentered into the natural world and must circulate in the system (Ellen MacArthur Foundation, n.d.-a).

In summary, the Ellen MacArthur Foundation (2015, pp. 7–8) explains the five characteristics of circular economy:

1. Waste is nonexisting, and products are designed in a way that makes no waste possible.
2. Diversity enables resilience. Different types of businesses in numerous sizes are essential to an economy. In that way, risks can be spread in the event of external disturbance.
3. The third principle explains how to use renewable energy to operate circular economy. This would reduce dependence on certain resources such as oil. As a result, the system becomes more stable.
4. Circular systems are based on a holistic perspective. All components (businesses, environment, etc.) are connected to each other. For maximal efficiency, this must be taken into consideration.
5. Costs for negative externalities are transparent and considered. The transition to a circular economy will slow down when the externalities are not revealed.

2.3 Economic Growth and Circular Economy

According to the Ellen MacArthur Foundation (2015, pp. 3–5), changing to circular economy has a lot of advantages such as economic growth, better resource management, and environmental benefits. Economic growth should be possible without an eternal connection to resource consumption. The Ellen MacArthur Foundation also claims that circular economy would increase GDP since circular activities require new circular businesses. Moreover, circular economy enables lower production costs and higher revenue due to effective recourse management. It will impact economic growth, for instance, wealthier households due to better salaries, which also will affect consumer behavior and the demand for products. Together, these direct and indirect effects would benefit economic growth and GDP (Ellen MacArthur Foundation, 2015, p. 11). The Ellen MacArthur Foundation estimates that Europe could increase its GDP by 11% by 2030 instead of the predicted 4% if the changeover takes place, and by 2050 27% versus 15%. They also calculated net material cost savings

for medium-lived products up to 630 billion USD yearly in Europe. Another study made by the Ellen MacArthur Foundation, SUN, and McKinsey (cited in Ellen MacArthur Foundation, 2015, p. 11) showed that there would be more employment opportunities in a society where circular economy is implemented, innovation goes hand in hand with employment and economic growth. Other advantages are better land use and soil health, resource preservation, and reduced pollution and carbon dioxide emissions (Ellen MacArthur Foundation, 2015, p. 12–13).

To enable the transformation, the focus must be on adapting companies' business models, even though laws, regulations, and governments also play a critical role (Berg et al., 2018, p. 8). Circular economy has a positive effect on resource optimization and supply chain risks (Ellen MacArthur Foundation, 2015, p. 5). Even though savings can be done, as little as 6% of materials are recycled. For instance, recycled plastic is calculated to be around 80% cheaper compared to producing it from new materials. Companies could benefit from cost reduction because of fewer disposals and new earnings from resources that otherwise would have been lost (Geng et al., 2019, p. 153). This is proved by different studies (Larsson & Saulo, 2019, pp. 11–12). A study made by Geng et al. (2007, cited in Larsson & Saulo, 2019, pp. 11–12) shows that companies could save money through reduced costs on waste disposals, incurrences connected to waste, and decreased purchases of raw materials. In another study by Noci and Verganti (1999, cited in Larsson & Saulo, 2019, p. 11), a business started to collect packages from its customers to reuse them, which made them save capital. A third research by Agyemang et al. (2019, cited in Larsson & Saulo, 2019, p. 11) showed that increasing profit was the main motivation for the requested businesses to implement circular economy. Nevertheless, there are also business leaders who think sustainability is important and do not think of it as a strategy (Larsson & Saulo, 2019, p. 16).

In comparison to the findings that recycling reduces the pressure on resources, Mayer et al. (2019, p. 63) discuss that recycling may not reduce the need for resource extraction. There is a risk that more energy and material must be used to enable recycling and therefore suggest a set of indicators to measure the total material and waste flows. Furthermore, the problem is that the use of stocks of manufactured capital is growing in most countries and an increase in overall resources is required. Therefore, the possibility of closing the loop in the circular economy is substantially limited (Mayer et al., 2019, p. 63), which is indirectly assumed in a 100% circular economy. In the current linear economy, we are dependent on new resources and mass production to grow capital and therefore it could be hard to maintain economic growth in a circular economy due to the occasionally extra energy needed to enable recycling. Yet, as specified by the Ellen MacArthur Foundation (2015), p. 14), using recycled materials reduces the risk of unstable raw material prices. Disrupted supply chains can happen in the event of natural disasters or political circumstances, but the development of more circular processes reduces the risk of disrupted supply chains thanks to more decentralized suppliers. Furthermore, a circular economy would create the demand for certain businesses like logistics to pick up products for reuse, remanufacturing, and recycling and industries that can rebuild them or use

their components (Ellen MacArthur Foundation, 2015, p. 14). There is still a long way to go; in 2014, EU countries processed material of 7,4 Gt and only 9,6% were the share of secondary materials in the processed materials (Mayer et al., 2019, p. 70).

Hannon et al. (2016) argued that the linear economy contains an incredible amount of waste when use products end their life either by incinerating them or dumping them in a landfill destroying all the value that was created in the process. Therefore, the implementation of the circular economy is important to create loops in the supply chain in order to retain that value that is otherwise lost in the linear economy. They argued that recycling is the least value-capturing loop in a circular economy because it is only incrementally better than disposal. Instead companies should create tighter loops to capture more of the original value by focusing on refurbishment or increased utilization, secondary life uses, and parts harvesting. One of their examples are cars that only have utilization of 5–8% of the time, and the capacity of the car is on average only used by one and a half people in a five-passenger vehicle. In sum, they argue that the circular economy should be seen as a value-creation driver that needs new forms of collaboration, partnering, and leveraging your ecosystem to find creative solutions.

2.4 Shared Value

Today, the world is facing environmental, societal, and local economic problems. These problems are shaking the economy and are viewed as threats to profit increases (FSGImpact, 2012). The concept of shared value, created by Michael E. Porter and Mark Kramer, suggests that these threats are in fact opportunities (Shared Value Initiative, n.d.). They mean that it could be risky for businesses to ignore the creation of societal benefits (FSGImpact, 2012). The argument is that companies can move beyond corporate social responsibility and create competitive advantages by incorporating environmental and social concerns into their strategies. Handling societal challenges as business opportunities was introduced as a new important dimension of corporate strategy and a significant approach to social change.

Akpinar (2020) suggests that creating shared value is part of the transition into the circular economy and shared value should expand the borders from a narrow focus on companies to a broader focus, including government, universities, and society. This proposal expands the original perspectives of Porter and Kramer and is specific to a circular economy and needs to have a clear leadership and activation of the society like Finland has done within government regulation and incentives to test business models, education, research at universities, and by the Finnish Innovation Fund Sitra. Overall this research highlights the link between the circular economy and shared value. Kramer and Pfitzer (2016) argued in line with the approach of Akpinar for a collective-impact approach that is needed because the social problems

arise from a complex combination of actions of actors and therefore need to be solved by coordination of their efforts.

Investments in shared value strategies are becoming more and more common for businesses around the world. Some companies use it to realize the opportunities in circular economy principles (Mahmud et al., 2017). Shared value means that corporations can create economic as well as societal value. Creating shared value is long-term thinking and does not only focus on immediate profit. It is based on three principles: reconceiving products and markets, redefining productivity in the value chain, and cluster development (FSGImpact, 2012).

Businesses' focus has mainly been on the creation of demand and how it is met, not if the products they sell are good for their customers. The first level that shared value operates in is about meeting customer needs and social needs. The first step is to identify needs and demands. Next, businesses should review their products and consider whether they bring benefits or harm to society (Aljibouri & Kurbegovic, 2018, pp. 7–8).

Level 2 identifies value chains, how companies can improve their productivity, and how that leads to shared value (Aljibouri & Kurbegovic, 2018, p. 9). According to Porter and Kramer (2011), pp. 9–11), energy use and logistics, resource use, procurement, distribution, employee productivity, and location are the most important areas when implementing shared value through value chains.

The third step represents supporting activities related to the business. No company works 100% independently; they are all affected by their surroundings such as suppliers, competitors, education, infrastructure, and laws. By improving communities, corporations can perform shared value as it gives rise to economic and social success (Porter & Kramer, 2011, p. 12). Focus should be on weaknesses that constrain business growth (Aljibouri & Kurbegovic, 2018 p. 12).

2.5 Cradle to Cradle

Cradle to grave implies that the death of a product enables another product to replace it. The components used in making the product become waste. The opposite perspective is called cradle to cradle, which means that the death of a product is also a new beginning for its resources (Wennborg & Berg Helgöstam, 2018, p. 9). Cradle to cradle is a philosophy formed by Michael Braungart and William McDonough (cited in Wennborg & Berg Helgöstam, 2018, p. 9) and covers three qualitative design principles. To start with, all biological waste should be composted. As a result, there is no need to minimize the use of resources since they would become nourishment for new ones. The second principle is to use renewable energy (Wennborg & Berg Helgöstam, 2018, p. 9). According to cradle to cradle, there is no shortage of energy, but the creation of energy needs to change. The third approach is diversity, which means more even resource extraction, greater stakeholder benefits, and more sustainable processes. It is possible for firms to C2C-certify products and materials (Ronneby Kommun, 2019).

2.6 ReSOLVE Framework

ReSOLVE framework is based on six business measures with the aim to help companies and governments to become circular. Moreover, the Ellen MacArthur Foundation (2015, p. 9) argues that the tool helps organizations to create specific circular strategies. ReSOLVE stands for regenerate, share, optimize, loop, virtualize, and exchange and is a model developed by the Ellen MacArthur Foundation. The Ellen MacArthur Foundation (2015, p. 9) declares the different parts of the model:

Re*generate* refers to businesses' transformation to renewable resources. This includes protecting and healing ecosystems as well as integrating biological recourses into the biosphere.

S*hare* assets like facilities and cars to maximize their use. Focus is also to extend the life span of a product by, for example, maintenance, reuse, and second hand.

O*ptimize* by developing products for the better that also will prolong its life. Furthermore, it is also about optimizing manufacturing by excluding waste and taking advantage of technology like automation and big data.

L*oop* touches on closing material cycles with, for example, reproduction and recycling.

V*irtualize,* for example, dematerialize, in other words using data to digitalize processes. For instance, music online rather than CDs.

E*xchange* to renewable resources and implement better technologies.

2.7 Business Model Canvas

To develop and ultimately implement the ReSOLVE framework in their business model, companies must engage in the process of business model innovation (Osterwalder & Pigneur, 2010). Through business model innovation, companies can develop business models that integrate circular economies into their model by integrating slowing and closing resource loops (Nußholz, 2018). This innovation is an important element in the shift toward a circular economy. The circular business model integrates environmental and economic value creation by capitalizing on the value embedded in reused materials and products.

The business model canvas is a well-applied framework that illustrates business models. It is developed by Osterwalder and Pigneur and consists of nine areas: value offering, target group, customer relationship, partnership, distribution channels, revenue streams, cost structure, key activities, and key recourses (Lewandowski, 2016, p. 10). The following part moves on to analyze the nine building blocks from a circular economy perspective.

2.7.1 Value Proposition and Delivery

Value offering, target group, and costumer relationship A business offer must meet customer needs. The life of a product is extended in a circular business model. They are designed in a way to enable the resources to be reused, recycled, remanufactured, or disposed of safely. Greenhouse gas emissions should be minimized in production (Lewandowski, 2016, p. 16). Moreover, companies can, when using circular business models, profile themselves as environmentally friendly, which can create a good reputation and image (Larsson & Saulo, 2019, p. 18). Research by Geng et al. (2007, cited in Larsson & Saulo, 2019, p. 18) shows that most stakeholders want companies to adapt to circular business models. The research by Geng et al. also claims that businesses that do so increase their customer base by attracting new ones and making old ones stay. The Ellen MacArthur Foundation (2015, p. 15) also claims that long-lasting products and high-quality items can lead to better customer satisfaction. Moreover, a circular model can allow companies to tailor products to meet customer needs. Additionally, there is a switch in the thinking of business models. Some markets observe a larger demand for renting and sharing instead of owning products and services (Ellen MacArthur Foundation, 2015, pp. 3–5). Customer and company advantages with sharing models are, for example, reduced cost for repairing, returns, and ownership as well as increased comfort (Ellen MacArthur Foundation, 2015, p. 15). Today, the average car in Europe is parked 92% of the time. Sharing or renting assets may lead to value creation and less economic losses (Ellen MacArthur Foundation, 2015, p. 3). Contracts like these are also likely to build long-lasting customer relations (Ellen MacArthur Foundation, 2015, p. 14). The Ellen MacArthur Foundation (2015, p. 13) presents that if washing machines were leased more people would have access to one. Consumers would save around 33% per wash and manufacturers increase earnings by around the same percentage. More than half of the world's population lives in cities and urbanization is predicted to increase even more. By 2050, 66% will live in urban areas according to the Ellen MacArthur Foundation (2015, pp. 4–5). Sharing and circular business models and reuse of materials will benefit from this because of more assessable pick and dropoffs as well as easier logistics.

Closed loops are essential in circular economy. Recollecting resources from customers and reverse logistics is vital in a circular business model (Lewandowski, 2016, p. 20). Adding closed loops to the business model canvas by Osterwalder and Pigneur is where the value delivery is connected back in a circular loop into the value creation of the model. Closing resource loops is concerned with recycling material and products and putting them back into the economy at the end of their functional life in order to revitalize the products and implement the philosophy of cradle to cradle (Wennborg & Berg Helgöstam, 2018, p. 9).

Slowing resource loops is aimed at prolonging product, component, and material life through, for instance, maintenance, reuse, and remanufacturing, and this strategy is typically more economically and environmentally profitable than closing them (Ellen MacArthur Foundation, 2013). Jensen (2018) demonstrated that slowing

loops by retrofitting for wind turbines improve energy and extend product lifetime and are economically and environmentally viable. Whereas closing loops are only viable for certain high-value components, for example, permanent magnets.

Distribution channels Virtualization is essential in a circular economy. Virtualization includes virtualized offers, deliveries, and customer communication, as well as selling via virtual channels (Lewandowski, 2016, p. 17). Circular economy is meant to close loops of material flows in the economic system. In order to do so, smart logistics are required. Logistics links resources, products, and customers (Ociepa-Kubicka & Seroka-Stolka, 2019, p. 472).

Revenue streams There are different ways for companies to collect revenue. Pay per product or service, pay per use, performance-based contracting, or availability-based product–service system (Lewandowski, 2016, p. 17). Circular economy enables the shift from selling products to service solutions offering multiple costumer value. Moreover, product service system is directed to improve the environmental aspects of consumption. PSS includes products and services, product use, maintenance, and valuation. However, PSS requires changes in relationships between producers and customers (Witjes & Lozano, 2016, p. 40). The integration of circular economy into a company's traditional business model can as an example mean to change from price per unit to value provided price per service, including shared responsibility of the PSS (Witjes & Lozano, 2016, p. 42).

2.7.2 SValue Creation

Partnership To enable circular businesses, partnerships that support circular principles are needed along the supply and value chain. Key resources and key activities in a circular economy are dependent on collaborations (Lewandowski, 2016, p. 18). A business has external and internal stakeholders that help them to move forward. Goni et al. (2021, p. 895) claim that there are key principles for stakeholder involvement: partnership, participation, communication, and consultation. When companies adjust their business models, they are driven to engage with stakeholders in a better way (Witjes & Lozano, 2016, p. 40). Moreover, they create competitive advantages for the business, customers, and society. Circular business models also change the relationship between the supplier and producer from product focused to service focused (Witjes & Lozano, 2016, p. 40). Witjes and Lozano (2016, p. 40) argue that there are both advantages and difficulties in collaborations. For example, collaborations can improve product performance and market access and increase innovation and efficiency. Although unproductive decision-making, conflicts, and complication in the coordination of costs and budget overruns are common problems. Partnerships have the potential to share assets (Ellen MacArthur Foundation, 2015, p. 9) and develop the shared value in these assets (Porter & Kramer, 2011).

Cost structure It is likely that changes in the other nine blocks will result in a changed cost structure (Johansson & Edlund, 2018, p. 23). Organizational changes

may be required when implementing a circular business model, and businesses could start by analyzing the cost structure (Lewandowski, 2016, p. 19). Firms must, in order to be circular, adjust their financial management. For example, by doing calculations on how circular systems can be profitable and measuring the economic growth of an investment (Wennborg & Berg Helgöstam, 2018, p. 10).

Key activities Value chains are activities to provide valuable services and products; they can be used to manage business activities. Suppliers, customers, resources, operations, logistics, services, marketing, and sales are all elements in a value chain (Goni et al., 2021, p. 894). According to Witjes and Lozano (2016), p. 37), resource efficiency is maintained in a circular business model by protecting the added value throughout the whole value chain. This can be achieved by organizing the use of energy and raw materials well. Nevertheless, the key activities are linked to the company's value proposition and may therefore vary (Johansson & Edlund, 2018, p. 23).

Today's increase in advanced technology can enable business adjustment. This may lead to better collaborations and knowledge sharing, improved material tracking, expansion of renewable resources, and superior logistic systems (Ellen MacArthur Foundation, 2015, p. 4). Better process controls can eliminate losses and spills and enable optimal conditions in production. Other key activities can be, for instance, the use of big data and machine learning, as well as management and leadership (Lewandowski, 2016, p. 18). Organizations should create common values and goals, as well as solidarity to improve business performance. It can be done through training and social activities. Management is therefore just as important when implementing circular economy into the business model according to Wennborg and Berg Helgöstam (2018, p. 10). Goni et al. (2021, p. 895) also argue that core values and organizational values are important for decision-making and strategy. These should set the direction for the corporate strategy. Moreover, the existence of a company relies on business achievements. Resource optimization and efficiency affect the result of a company. A business model requires performance measurements involving several indicators like management, quality, capacity, and service (Goni et al., 2021, p. 894–895).

To reduce waste and manage resources in the best possible way is essential in a circular economy. Businesses can achieve that through sustainable design, maintenance, repair, reuse, recycling, refurbishing, and remanufacturing. Additionally, efficiency, stakeholder, and economic value should remain high throughout the product life cycle (Goni et al., 2021, p. 894). Witjes and Lozano (2016, p. 38) also agree that organizational and technical innovation, resource management, design processes, stakeholder partnership, and financial instruments are essential for a company to adapt to a circular economy. They also mention capacity building, policy-supporting tools, logistics, new consumption models, citizen engagement, communication, and product and design services.

Key resources For producing operations, sustainable and recollected materials can be a key resource. Platforms, knowledge, and experience can be important resources for businesses that offer services and virtual products (Johansson & Edlund, 2018,

p. 22). Technology, both hardware and software, helps companies to control processes. For instance, it can improve interactions between suppliers and customers, as well as improving manufacturing and trading (Goni et al., 2021, p. 894). Technology is also an important aspect of recycling and remanufacturing (Johansson & Edlund, 2018, p. 23). Finance, production, human capabilities, intellectual property, and relationships are examples of intangible assets that contribute to value creation. A value-creating strategy enables resource adjustments to align with the goals of a business (Goni et al., 2021, p. 894).

Summarizing the analysis of the business model canvas, we have argued for where a linear model as the business canvas model can incorporate circular economy by applying the principles. Specifically loops should be created from the value delivery activities back into the value-creating activities, virtualization in the distribution channel, optimization in the key activities, share assets among partners, and apply regenerative resources within the key activities and upgrade technology.

2.8 Businesses' Potential Drawbacks

Companies are experiencing difficulties adapting their business models toward a circular economy. In order to investigate how to make it possible, we also need knowledge about the potential barriers. Research has shown that it is hard to implement circular economy because of how deeply rooted linear economy is in today's society (Johansson & Edlund, 2018, p. 15). The Ellen MacArthur Foundation is the leading circular economy organization. The foundation was created in Great Britain in 2010. Their mission is to create awareness and encourage the change of consumption habits in society toward a circular economy (Larsson & Saulo, 2019, p. 9). Although the Ellen MacArthur Foundation's definition is the most used interpretation, there is no set definition of circular economy. This may lead to confusion and a negative impact on implementation (Johansson & Edlund, 2018, p. 12).

Currently, businesses have not adopted circular economy to any great extent. One reason is lack of strategic guidance; however, it is hard to find a model that fits all organizations. Companies find it hard to think long term over current costs and experience difficulties with lack of knowledge and external market factors like customer demand (Berg et al., 2018, p. 7). Some businesses feel uncertain regarding if target groups will appreciate their attempt to adapt to a more circular business model. Another factor is cost. The transition requires investments and an expected payback period. Other barriers such as technology and resource management (e.g., time and human resources) can also complicate the process (Berg et al., 2018, pp. 7–8). Especially resistance arises if the business model already works great in its current form. It is also hard to calculate the environmental difference between a circular and a linear model since it requires time and other resources (Berg et al., 2018, p. 9).

The research by Haleem et al., (Haleem et al., 2021, p. 132) shows that laws and regulations are the most experienced barrier when adapting to a circular economy. Examples of restrictions are lack of tax policies for promoting circular economy, lack of implementation of environmental management certifications and systems, little government support, and lack of a system for measuring the performance of circular economy (Haleem et al., 2021, p. 116–117). Another example by Haleem et al. is that many countries do not have a standard for refurbished products, which may lead to inferior quality products. Management-level barriers such as resource optimization, planning, and organizational structures are the second most common drawback according to Haleem et al., (Haleem et al., 2021, p. 133). Technical complications show that there is a need for advancement in order to close loops. However, implementation of new technology can be costly, complicated, and time-consuming (Haleem et al., 2021, p. 118–119).

Another category of barrier Haleem et al. mentions are the social or customer-level barriers. The barrier includes customer perception and customer knowledge. Haleem et al. (2021, p. 135) argue that if consumers are aware of the circular economy advantages, they can influence corporations to adapt their business models. Furthermore, lack of short-term economic benefits and financial resources and investment costs also hinders organizations (Haleem et al., 2021, p. 121–122). Cannibalization is the problem of a product taking market shares from another product from the same seller, which could be the case in the transition to circular economy models according to Larsson and Saulo (2019, p. 13). Today, companies can use unsustainable materials because they do not want the product to last long so the customer must buy more often (Larsson & Saulo, 2019, p. 13). Recycled products with a lower price could also compete with newly produced products with a higher price. Therefore, these corporations, besides their products, should make sure to offer services to ensure that the contact with the customer continues (Larsson & Saulo, 2019, p. 14).

There are also environmental barriers. Circular business models can require further resource usage and energy. Tóth Szita (2017 p. 8–9) warns that when using renewable recourses the environmental impact can in fact be stronger, and the positive effect be decreased. Businesses need to measure the effect of circular economy. This can be done through a life cycle analysis (Tóth Szita, 2017 p. 5).

3 Discussion

The research question is “What can companies do to adapt their business toward a circular economy?” To answer that we need to sort out what circular economy is. Even though there is no set definition, it seems like organizations and researchers are explaining circular economy alike. Circular economy is about maintaining value and resources for as long time as possible. Including the whole cycle, from resource management, manufacturing, use, and what we do with materials afterward. This research demonstrates the importance of integrating circular economy into the whole

business. The literature review mentions different aspects throughout the whole value and supply chain.

Prior studies have noted the importance of economic winning and cost savings. This is, according to research by Agyemang et al. (2019, cited in Larsson & Saulo, 2019, p. 11), the main motivational factor for many businesses to become more circular. Savings can occur in, for example, production, when using circular materials or when reusing resources. Increasing a product's life through development contributes to slow loops and new materials do not need to be used to the same extent, which can lower costs. Profits can increase from materials that otherwise would have been wasted and from increased customer satisfaction. The literature review states that remanufacturing, reusing, reducing, and recycling are essential to a circular business model in order to close the loop and decrease waste (Jensen, 2018; Porter & Kramer, 2011; Hannon et al., 2016; Akpinar, 2020). Products and components need to be designed in a way that makes it possible. However, when using renewable resources, the environmental impact can be stronger. Therefore, companies need to measure the impact of their circular economy procedures. Another important finding was that logistics are important in a circular economy. Resources need to be brought back to businesses to be able to circulate them.

The findings indicate that organizational management competence is key in order to change a business model toward a circular economy. Internal communication is important to unify the organization. External communication is important as well to increase customer demand and differentiate the business from its competitors. Furthermore, this study has been able to demonstrate the importance of key suppliers for reliable value chains. Several reports have also shown that technology enables corporations to adjust their business models. Still, lack of knowledge and strategic guidance complicates the transition to circular models. Nevertheless, various laws and regulations in different countries can complicate the transition. It can thus be suggested that companies can start small and not make the whole organization totally circular at once. In conclusion, companies should think of circular economy as a long-time investment. Businesses that would like to implement circular business models need specific measures (Mayer et al., 2019) on how to do it in practice, but no model fits all organizations. The actions necessary can vary depending on the business industry and offer.

Circular economy relates and reinforces the notion of shared value. One shared value principle is that threats can be opportunities. The current linear economy comes with a lot of problems and in the view of shared value these problems can be business possibilities, which enables circular economy transformation. The three shared value principles could be applied to circular economy, product's effect on society, improved value chains, and supporting activities. This study found that circular economy most likely benefits society, economy, and business performance. Taken together, these findings suggest that there is an association between shared value and circular economy.

4 Conclusion

The purpose of this research was to find out how businesses can adapt their business models to a circular economy. This study has reviewed key aspects of transformation summarized below.

In order to adapt, businesses can design out waste and enable recycling, remanufacturing, and reuse. An important circular economy principle is to make the life of resources longer and close loops. This research shows the importance of product design, renewable resources, and sustainable materials. Businesses can therefore switch to those types of resources. Organizations can find ways to reduce costs and at the same time increase sustainability. This research shows that switching to recycled, reused, or remanufactured materials as well as the extension of a product's life can lower costs.

Circular economy can enable new revenue streams. Businesses can find new earnings in resources that would have been lost in a linear model. Circular economy enables the shift from selling products to service solutions offering multiple costumer value. The integration of circular economy into a company's traditional business model can as an example mean to change from price per unit to value provided price per service, including shared responsibility of the product service system. Circular economy creates a need for completely new businesses, for example, logistics to pick up already-used products. Special competencies for making reuse, remanufacturing, and recycling possible would also be needed.

Implementing a business model conducts to circular economy principles. Need an adaptation of the business canvas model with new principles to change the model from a linear economy model to a circular business model. The main change in the model is that the circular business model incorporates loops from the value delivery side to the value creation side of the model. It is important that some loops are profitable to engage in, but it need to be measured clearly to ensure the profit (Mayer et al., 2019). Recollection of already-used materials and products can be implemented. In a circular economy, customers can be suppliers when the business is buying back resources. Transportation and logistics to enable that are needed.

Corporations can find new creative ways to maintain a high costumer value and service. Firms can consider investing in long-lasting products and high-quality items rather than fast-moving consumer goods. Businesses can apply frameworks and models such as cradle to cradle, ReSOLVE, business model canvas, and shared value. The chapter discusses how key suppliers and partners make it easier for businesses to transform into circular models by applying the principle of *share assets*. How to *regenerate* by transform into renewable resources as input to key activities, but also *optimize* the development of the products to its lifetime and *exchange* to better technologies that reduces the need for input. Businesses can do a life cycle analysis to ensure environmental performance. Branding and marketing may be important to create customer demand. Digitalization and technology can help companies to adapt to a circular economy. *Virtualize* branding and marketing

reduces the need for physical inputs. Finally, circular principles must be implemented in the whole business, the value and supply chain by *loops*.

The results suggest that time, research, capital, and long-term thinking are important. Knowledge about laws and regulations in different countries facilitates the transition to a circular business model. This research indicates that cost structure and organizational management is a key factor in changing a business model. Finance, production, human capabilities, intellectual property, and relationships are examples of intangible assets that contribute to value creation. A value-creating strategy is vital to reach business goals and therefore also goals connected to sustainability and circular economy.

In conclusion, both internal and external business activities matter. Overall, the result of this study indicates that the possible benefits of a circular business model exceed the drawbacks. Even so, adapting takes time and requires resources. Businesses need to think of circular economy as a long-term investment.

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