

Interrelating circularity strategies and multiple value creation

Exploring the interrelationship of circularity and multiple value creation and the role of a Circular Kickstart Program



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Preface

It is with great pleasure that I present my Master thesis on circularity and multiple value creation from the perspective of several organisations. This research is a case study carried out at Lentekracht. My personal goal was to experience how organisations in practice think about and work with theoretical concepts such as circularity and multiple value creation. By creating the space to explore all organisations that participated in a Circular Kickstart Program and inspiring me with positive information, Lentekracht gave me the opportunity to do this research in their organisation, for which I am very grateful.

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Summary

Nowadays, there is a growing scarcity of natural resources, which requires a new way of handling these by organisations (Meadowcroft, 2009; Meadows, 2007; Raworth, 2017). One way to do this is to apply circularity strategies where value retention is the main goal (Potting et al., 2017; Reike et al., 2018). Another way is to apply the strategy of multiple value creation (MVC), where multiple capitals are combined simultaneously to create a balanced value (Croes, 2018; Jonker & Linden, 2013). Organisations want to develop a purpose next to their financial goals by steering in the direction of circularity and being more thoughtful with their resources (Craig & Snook, 2014). The Circular Kickstart Program (CKP) is a programme of Lentekracht which helps organisations to develop and implement their circular business opportunities. In addition to circularity, multiple value creation is another strategy that can improve the purpose of an organisation and, thus, the more careful and better use of resources.

This qualitative research aims to fill the research gap on circularity strategies and multiple value creation in practice and explores whether there is an interrelationship between circularity strategies and multiple value creation by researching organisations that have participated in a CKP. Furthermore, it also examines the role of the Circular Kickstart Program on the interrelationship of circularity strategies and multiple value creation. The research question of this research is as follows: *What is the interrelationship between circularity strategies and multiple value creation in organisations that have completed a Circular Kickstart Program and how does the Circular Kickstart Program influence this interrelationship?* Considering the research question and aims, three types of circularity strategies are examined through ten value retention options (Potting et al., 2017; Reike et al., 2018). In addition, multiple value creation is explored through the six-capitals method and the integrated thinking method (Westerdijk, 2021; VRF, 2022). The data is collected through semi-structured interviews and document analysis and analysed accordingly.

Six organisations are analysed, one of which is a product-oriented Circular Kickstart Program, three are an organisation-oriented Circular Kickstart Program, and two are a supply-chain-oriented Circular Kickstart Program. Four out of six organisations focused on service as their primary business activity with a corresponding output, while two out of six organisations focused on the creation of products. The organisations had different mixes of motivations for participating in a Circular Kickstart Program, ranging from intrinsic motivation, strategic view, internal pressure, external pressure and possible subsidy. For the organisations, all circularity strategies are applied with most of the focus on CS1, smarter product use and manufacturing. In addition, it differs between organisations whether CS2, extending the lifespan of products and their parts, or CS3, the useful application of materials is followed as the most used circularity strategy. This depends on the type of Circular Kickstart Program and its objective. For multiple value creation, most organisations focused on investing in human and intellectual capital because of (a) the constraints on organisations with these capitals and (b) their relatively significant impact on the other capitals. Next to investing in these capitals, natural and material capitals were the most used capitals. The least focus was on financial and social-relational capital, excluding one organisation that had used social-relational capital most to achieve their goals within their Circular Kickstart Program.

As both strategies are applied by the organisations studied, an interrelationship between the strategies can be identified. Both strategies focus on the long-term and futureproofing of an organisation. The difference between the strategies lies in the focus of the strategy within an organisation; circularity

strategies focus on input-throughput-output and multiple value creation focus on input-throughput-output-outcomes of an organisation. In addition, in principle, circularity strategies focus on balanced value retention and multiple value creation on value creation in balance. It is valuable to apply both strategies because they can reinforce each other. First, multiple value creation can create more and broadly balanced value for an organisation. Second, by applying circularity strategies, the broader value created can be maintained for as long as possible. However, it appears that the studied organisations do not apply both strategies in harmony with each other since it also faces several difficulties. There is organisational complexity, besides which cooperation between supply chain partners is needed to fulfil the strategies properly. Although its complexity, applying both strategies is essential because, without collaboration and coherence between organisations, the purpose of an organisation is foreseen. The aim should not be to apply a strategy, but the ambition and, therefore, the purpose of an organisation should be to reduce resource scarcity and improve resource allocation and use.

Furthermore, the Circular Kickstart Program has an active role in the application of circularity strategies and an unconscious role on the application of multiple value creation at the organisations. All circularity strategies are addressed by the Circular Kickstart Program, aligned with the needs of an organisation. For multiple value creation the capitals are addressed separately, yet not in balance and coherence with each other. The role of the Circular Kickstart Program on the interrelationship between the circularity strategies and multiple value creation remains limited; the most effective order of application – first multiple value creation then circularity strategies – is not followed, whereas circularity strategies are pursued first and multiple value creation is only addressed gaining awareness and urgency on creating value based on multiple capitals.

Keywords: circularity strategies; multiple value creation; circular kickstart program; value retention options; capitals

Abbreviations

CE	Circular Economy
CKP	Circular Kickstart Program
CS	Circularity Strategy
MVC	Multiple Value Creation
ROs	Value Retention Options

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1. Introduction

The Anthropocene is a new epoch materializing in places where the earth's systems and atmosphere experience negative impacts from human activities (Steffen et al., 2004). The exponential growth of the human population and their economic activities pressure the earth's natural resources irreversibly (Rockström et al., 2009). The Club of Rome released the Limits To Growth report in 1972 as the first international report to acknowledge this climate impact, which discussed that economic growth could not continue indefinitely due to resource depletion (Meadows, 2007). Exponential economic growth, along with finite supplies, will ruin the earth (Meadows, 2007).

Traditional production and consumption systems rely on exponential economic growth with a linear economy model: take-make-waste. In this model, new resources and materials are taken to produce single-use-lifetime products, resulting in resource depletion and significant lumps of waste (Ellen MacArthur Foundation, 2013). The circular economy is a reaction to and counterpart of the linear economy (Ellen MacArthur Foundation, 2015). A circular economy can be defined as "an industrial system that is restorative or regenerative by intention and design. It replaces the 'end-of-life' concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models" (Ellen MacArthur Foundation, 2013, p. 7). Within a circular economy, organisations are expected to develop a purpose alongside the traditional way of working. A purpose refers to including social and environmental value next to a financial value within the company's vision (Craig & Snook, 2014). One way of approaching a meaningful purpose is to focus on the strategy of multiple value creation (MVC) (Jonker, 2012). Both the strategy of circularity and MVC invest in the futureproofing of an organisation to become more resilient in a changing world with fewer natural resources available (Ranta et al., 2018). This research will elaborate on the interrelationship between the circular economy, here conceptualized as circularity strategies, and MVC. Next to that, the influence of a Circular Kickstart Program on this interrelationship is researched, which will be elaborated on in the following section.

The Circular Kickstart Program

This research is carried out in parallel with an internship at Lentekracht. Lentekracht is a social enterprise specialised in project management located in Nijmegen that offers the Circular Kickstart Program (CKP) as a service. The CKP assists an organisation in exploring circular business opportunities. The focus of a CKP can be on a product or service, the organisation as a whole, with optionally the inclusion of the supply-chain the organisation is situated in. Three steps are followed within a CKP, namely a) a quick scan of the organisation, b) selection of circular business opportunity and working sessions and c) development and execution of circular business opportunity. In the context chapter, the CKP and Lentekracht will be elaborated on in more detail.

1.1 Research problem

There is increasing pressure on the earth's natural resources as they are limited (Meadowcroft, 2009). These limited resources present both opportunities and difficulties for organisations in their practices, as organisations use resources to create products and services and, thus, the continuity of their organisation. In addition, there is a trend for organisations to seek a purpose alongside their continuity (Bocken et al., 2016). A purpose describes how an organisation's practices contribute to solving

problems for society and the earth (Craig & Snook, 2014). In other words, a purpose defines how an organisation creates environmental and social value alongside its known economic value.

How to approach a purpose differs for organisations (Bocken et al., 2016). The issue of limited earth resources can be linked to an organisation's purpose; how to create continuity with scarce resources while improving environmental and social value (Abdul Rehman Khan et al., 2021). Circularity focuses on maintaining as much value as possible while conserving resources with an organisation's activities (Reike et al., 2018). In addition, while preserving resources, an organisation's performance is prioritised to continue in a positive way. Circularity, therefore, enhances the preservation and maintenance of the value(s) of a product or service for an organisation (Geissdoerfer et al., 2020). The need and, therefore, the importance of circularity strategies is further demonstrated by the actions of the Dutch government, which demands that the Dutch economy should be 30% circular by 2030 and 100% circular by 2050 (Rijksoverheid, 2016). Moreover, the way in which circularity strategies are applied to an organisation can differ from one organisation to another (Garcés-Ayerbe et al., 2019). One organisation may only focus on the output of its business activities, while others go further and close their material loops and thus become eco-effective (Reike et al., 2018).

However, organisations today are trapped in old patterns of value creation, which can also affect the way they apply circularity strategies (Porter & Kramer, 2011). The strategy that can help overcome these value-creation patterns is MVC (Jonker & Linden, 2013). MVC addresses the process of value creation within an organisation in an integrated way, where as much gain as possible is created for multiple aspects of an organisation (continuity, environmental- and social value) while as little loss as possible is made to these aspects in the process of value creation. In conclusion, besides value retention as an objective, an organisation can focus on reviewing its value creation process for MVC. Circularity strategies and MVC can complement and influence one another. This cooperation between circularity strategies and MVC is often mentioned in the literature. However, how exactly these strategies work together remains understudied (Croes, 2018; Hoeven & Bossert, 2019; Jonker & Linden, 2013; Westerdijk, 2021). In particular, it remains unclear whether it is essential to apply both strategies as an organisation, which influence one strategy has on the other - positively or negatively - and whether there is an order of application.

Overall, much research has been done on the opportunities (Korhonen et al., 2018) and barriers (Garcés-Ayerbe et al., 2019) of circularity, as well as on the importance and possibilities of MVC (Bocken et al., 2016; Croes, 2018; Jonker & Linden, 2013; van Dorssen & van Alphen, 2020) to achieve an organisation's purpose. However, a practical translation of circularity strategies and MVC and their interrelationship remains understudied. Therefore, there is a knowledge gap on the interrelationship between circularity strategies and MVC in practice and research is needed to fill this gap. This research will add to the existing scientific information and attempt to minimise the knowledge gap.

1.2 Research aim

This research aims to explore the interrelationships between circularity strategies and multiple value creation for organisations that completed a Circular Kickstart Program. Furthermore, this research aims to elaborate on the role that the Circular Kickstart Program has on this interrelationship by actively addressing circularity strategies.

1.3 Research questions

Summarizing the aim of this thesis, the following research question is stated:

What is the interrelationship between circularity strategies and multiple value creation in organisations that have completed a Circular Kickstart Program and how does the Circular Kickstart Program influence this interrelationship?

To answer the research question, the following sub-questions are formulated.

1. *What are the motivations of the above-mentioned organisations to get involved in a Circular Kickstart Program?*

This research question explores the different motivations the organisation have for implementing and participating in a Circular Kickstart Program. These motives can be grouped into five categories: intrinsic motivation, strategic view, internal pressure, external pressure and a subsidy.

2. *What are the business activities and main outputs of the above-mentioned organisations?*

This research question examines the business activities that organisations provide to their consumers. It also explores what outputs are created by these activities. From these business activities and outputs, one single flow is selected by the organisations and the Circular Kickstart Program. This flow will also be analysed in this research.

3. *Which circularity strategies are applied by the above-mentioned organisations?*

This research question identifies which circularity strategies are applied in the organisations according to ten value retention options. Next, the coherence between the circularity strategies is examined. Finally, the three types of Circular Kickstart Program are discussed according to their application of the circularity strategies.

4. *To what extent is multiple value creation executed at the above-mentioned organisations?*

This research question explores how multiple value creation is executed according to the application of the six capitals. It discusses which capital is invested in to create positive outcomes and which additional negative outcomes are produced. Next, the three types of Circular Kickstart Program are examined for their implementation of multiple value creation. Finally, the complexity of multiple value creation is discussed, in particular, the valuation paradox.

5. *How are the circularity strategies and the multiple value creation at the above-mentioned organisations interrelated?*

This research question examines whether there is an interrelationship between the circularity strategies implemented and the multiple value creation executed in the selected organisations. First, the extent of similarities and differences between the two strategies will be discussed. Next, it considers whether an order of application can be determined and, if so, which order works best. Furthermore, the influence of multiple value creation on circularity strategies and vice versa will be explored, and the importance and challenges of applying both strategies for an organisation will be discussed. Finally, the interrelationship and the three types of Circular Kickstart Program are elaborated on.

6. *To what extent does the Circular Kickstart Program influence the interrelationship between circularity strategies and multiple value creation for the above-mentioned organisations?*

This research question examines how the Circular Kickstart Program influences the interrelationship between circularity strategies and multiple value creation in the selected organisations. It will examine what role the Circular Kickstart Program has in the a) application of circularity strategies, b) execution of multiple value creation, and c) the interrelationship between circularity strategies and multiple value creation at the organisations.

1.4 Societal relevance

This research is relevant to society in a number of ways. Firstly, the world is facing climate change, and its consequences are more evident than ever (Steffen et al., 2004). We as humans are seen as the most significant problem, and therefore we should contribute to solutions to this problem (Meadows, 2007). Organisations have a substantial impact on the use of resources and raw materials and how they are treated before and after the use of a given product or service. Given these flows, organisations should adopt circularity strategies in their operations to address material flows of concern, such as natural resources (Ellen MacArthur Foundation, 2013). Secondly, organisations face the challenge of not only creating a single financial value with their operations but also fulfilling a purpose. This can be expressed through the performance of MVC. This research examines which values companies create and how they are balanced in the process of MVC according to six capitals. Considering social and environmental aspects when making financial decisions is essential to contribute to the constantly changing world we live in (Croes, 2018).

Linking the strategies of circularity and multiple value creation, and exploring their interrelationship, leads to organisations thinking and working more consciously with natural resources. Circularity provides a more conscious view of value retention (Reike et al., 2018), and multiple value creation offers a more conscious view of how value is created and in which aspects of organisations it is made (Jonker & Linden, 2013). Exploring this interrelationship contributes to the development of organisations and enables them to become more sustainable, both internally and in terms of their external performance and the reduction of their negative externalities. This is important for society because a) its living environment is determined by which organisations are active in its supply and b) the negative externalities of organisations pollute the world, and if these can be reduced, the world will remain cleaner and thus more liveable for people. Finally, this research also distinguishes the contribution of a social enterprise, Lentekracht, with its Circular Kickstart Program to the improvement of conscious steering towards circularity strategies and the possibility of unconscious steering towards MVC within organisations. Understanding the contribution of Lentekracht shows the power of cooperative collaboration between organisations rather than the competitive atmosphere that prevails. Together, people can enhance the contribution of organisations to making our world more thriving and valuable. This research aims to provide scientific insight and recommendations on how to achieve this.

1.5 Scientific relevance

The scientific relevance of this research lies in finding out the interrelationship between circularity strategies and MVC. For each of these concepts, scientific and practical research has been conducted. First, the importance of the circular economy (Ellen MacArthur Foundation, 2013, 2015) has resulted in the formation of several circularity strategies (Jawahir et al., 2006; Potting et al., 2017; Reike et al., 2018). The role of circularity is acknowledged in the business world based on proactive and reactive companies (Garcés-Ayerbe et al., 2019), circular business model strategies (Geissdoerfer et al., 2020) and closing or slowing circular loops (Bocken et al., 2016). Furthermore, the barriers (Garcés-Ayerbe et al., 2019) and opportunities (Korhonen et al., 2018) regarding circularity strategies are discussed. However, it is acknowledged that little scientific literature is present on how to make circularity strategies practical (Potting et al., 2017; Reike et al., 2018). Therefore, this research contributes to researching the circularity strategies in practice for the organisations that completed a CKP. Moreover, MVC is mainly introduced as a new business model (Jonker & Linden, 2013; Jonker, 2012), yet also acknowledged as a strategy that can be implemented by organisations (Croes, 2018). MVC receives a lot of attention in the Netherlands (Croes, 2018) as well as in international studies with, for example, theories on sustainable MVC (VRF, 2022). Although the increasing attention of researchers, there remains a shortage of research on MVC and its implications for practice (van Dorssen & van Alphen, 2020).

This research focuses on the interrelationship between the strategies of circularity and MVC. However, the scientific literature on the combination of these strategies remains limited. Croes (2018, p.18) acknowledges that “a transition from a linear economy to a circular economy is needed, as well as sustainability as a starting point for an organisation, leading to a shift in focus from single to multiple value creation”. Both are described as transitions towards sustainability, yet how the two can reinforce or weaken each other remains undescribed. Identifying both of the strategies as necessary for organisations and their development towards sustainability is done more often ((Boon & Kievit, 2020; Jonker & Faber, 2019; van Dorssen & van Alphen, 2020; Willekes et al., 2019). However, how these two strategies can influence each other is not elaborated on. In addition, the interrelationship between value creation and sustainability has been researched (Kamm et al., 2016; Šimberová & Kita, 2020). However, sustainability is not the same as circularity, and the combination of circularity with different types of value creation is not much researched, except for Nußholz et al. (2020), who look at the combination of material reuse and four types of value creation, but not for organisations in particular and only focus on reuse out of all circularity strategies.

All in all, the combination of executing circularity and MVC is often mentioned, yet how their interrelationship exists remains unclear (Croes, 2018; Hoeven & Bossert, 2019; Jonker & Linden, 2013; Westerdijk, 2021). Not only the interrelationship of the theoretical strategies but also the interrelationship in practice is underexamined (Croes, 2018; Hoeven & Bossert, 2019). Therefore, this research will contribute to the literature on circularity strategies and MVC as separate strategies while also in interrelationship with each other in practice. Next to that, this research will contribute to fulfilling the research gap on the interrelationship of circularity strategies and MVC in practice.

1.6 Reading guide

This research starts with contextual background information on the Circular Kickstart Program and Lentekracht, after which an introduction to relevant literature and scientific theories is given. The literature review will work towards a conceptual framework with operationalisations to help answer the research questions. Hereafter, the methodological choices made in this research will be elaborate on. After this, results from the document analysis and interviews will be discussed, from which a conclusion, discussion and recommendations will be formulated. Lastly, a reflection is given on this research.

2. Context chapter

This chapter provides an overview of the context in which this research takes place. First, Lentekracht's background and business activities are discussed. Second, the specific service of the Circular Kickstart Program is elaborated on, detailing the aims, approach and intended outcomes of the program. Third, the three types of CKPs are discussed.

2.1 Lentekracht: a social enterprise

Lentekracht is a project management agency in the field of sustainability, liveability and circularity. Lentekracht's services focus on a clean living environment, climate adaptation and circularity. Next to that, Lentekracht is a social enterprise, that is reflected in the way they conduct sustainable entrepreneurship with a social mission. This social aspect manifests itself in Lentekracht's belief that sustainability only works when people are engaged consciously and proactively (Lentekracht, n.d.). In addition, Lentekracht works with people who are distant from the labour market and enables them to reintegrate into the labour market. Lentekracht's target group consists of small and medium-sized enterprises (SMEs) and governments for which Lentekracht develops and implements innovative and sustainable solutions. In addition, they actively involve stakeholders and partners in the supply chain around the SMEs as well as governments reasoning that co-creation is inevitable and powerful.

2.2 The Circular Kickstart Program

The Circular Kickstart Program (CKP) is a project management service that Lentekracht offers. The CKP assists organisations in examining how their existing processes can be made more circular. Specifically, the CKP looks at how a product, a service or even the entire operation can be optimised using circularity. The CKP is available for any company or organisation, thanks to its flexible approach. The program is characterised by a hands-on approach that is flexible for each organisation and ultimately aims to achieve concrete implementation of one or more specific circular initiatives, opportunities or a single business case.

The CKP follows three steps for an organisation that are implemented through working group sessions:

1. Quick scan
2. Select circular business opportunities
3. Develop circular business opportunities

During step one, the quick scan, the organisations' ambitions and their activities regarding circularity are examined. In addition, insight and overview of raw materials, resources and waste streams are obtained. Think about what streams the organisation buys in terms of resources and raw materials, how the organisation uses them but also what remains of these streams and is labelled as waste. The organisation's employees, work processes and flows with chain partners such as suppliers or customers are also observed, if relevant, to get a complete overview.

Hereafter, during step two, several working group sessions are organised with different stakeholders throughout different layers of the organisation. Potential chain partners are also involved in these sessions, if needed. The circularity ladder as described by Potting et al. (2017), forms the basis of the circular analysis throughout the program. During the working group sessions, the circularity ladder is

used in a group discussion for the organisation and its employees to experience what circularity is and what it could mean in different parts of the business process. Several ideas and initiatives, conceived by the stakeholders, emerge from these working sessions. Lentekracht filters these ideas with the help of an opportunity matrix. In addition to a circularity score, the opportunities are also given additional scores at the client's request, which are considered when choosing the best opportunity.

Finally, the third step is to implement one or more selected circular business opportunities. This is characterised by low-threshold, small steps where the quickest impact can be achieved. This manifests itself in the implementation of an activity for a certain period to see what the results are, such as a pilot project. When a pilot is implemented, Lentekracht can be called upon to support this process. In addition, it is common for a CKP to result in follow-up trajectories to implement a selected circular business opportunity that could not be implemented within the timeframe of the first trajectory. Follow-up trajectories are also undertaken to take a broader view of the whole chain, for example, if the first CKP focused only on a product or the organisation itself.

2.3 Types of Circular Kickstart Program

Within the CKP, three types of programs can be distinguished. These are manifested in what the CKP focuses on within an organisation or chain. This also relates to who the CKP actively involves in the development and implementation of the CKP.

- I. Product-oriented**
- II. Organisation-oriented**
- III. Supply-chain-oriented**

Firstly, a product-oriented CKP focuses on the development of a specific product within an organisation. This product is specifically chosen as a case with a development where a circular component is always at the forefront. The focus is on how this product can be developed optimally, while other issues related to the organisation or cooperation within the chain are not considered in this particular CKP.

Secondly, an organisation-oriented CKP focuses on the entire spectrum of an organisation. An organisation is examined in a variety of dimensions, such as the procurement of raw materials and resources, and the efficient use of these materials. It also looks at the behaviour and awareness of the employees of an organisation, or how the organisation deals with waste streams for instance. Taking a comprehensive look at an organisation allows the process of production or service to be addressed more holistically.

Thirdly, a supply-chain-oriented CKP is the most integrated approach to examining an organisation, including the complete supply-chain. It looks at where an organisation is in the supply-chain, what is in front and what comes after, from sourcing to the processing of residual products. This type of CKP also looks at how the use of residual products can be optimised throughout the supply-chain partners.

In the following table, the six selected organisations that are studied in this research are categories according to the three types of CKP as discussed before.

Type of Circular Kickstart Program	Organisations
<i>Product-oriented CKP</i>	Bakery
<i>Organisation-oriented CKP</i>	Healthcare institute
	Painting company
	Hospital
<i>Supply-chain-oriented CKP</i>	Food supplier
	Cooperative

Table 1: Type of Circular Kickstart Program and organisations

3. Theoretical framework

This chapter discusses the existing literature and theoretical concepts relevant to this research. Firstly, the circular economy is elaborated, leading to circularity strategies with ten value retention options. This is followed by a discussion of the concept of value, after which value creation is discussed in detail. Furthermore, multiple value creation is addressed with the related concepts of integrated thinking. Finally, the discussion of theoretical concepts leads to a conceptual model upon which this research is built.

3.1 Circular economy

We live in a world where scarcity of resources and raw materials is an increasing concern (Meadows, 2007). This results from a take-make-waste perspective that most organisations have held for a long time (Korhonen et al., 2018). A change in this perspective is needed, with the implementation of this change mainly in the way an organisation works with the production of products and services. CE has already been defined in the introduction, as its purpose contributes to the replacement of the concept of end-of-life within organisations by adding products that are restorative by design (Ellen MacArthur Foundation, 2013). However, these new ways of working do not happen overnight, so an evolution of the circular economy can be identified.

Evolution of the circular economy

The CE evolution can be divided into three phases, namely CE 1.0 characterised by the concept of eco-efficiency, CE 2.0 characterised by the concept of eco-effectivity and finally, CE 3.0 characterised by the concept of eco-innovation, visualised in table 2.

CE	Time period	Concept	Characteristics
CE 1.0	1970-1990	Eco-efficiency	Recycling Reduction of waste Polluter pays
CE 2.0	1990-2010	Eco-effectivity	Integration input-output Prevention of waste Environmental problems framed as economic opportunities
CE 3.0	2010+	Eco-innovation	Retaining value of resources Decoupling growth from resource use

Table 2: Evolution of Circular Economy (Reike et al., 2018)

The first CE phase is introduced by the Club of Rome with their limits to growth report (Meadows, 2007). This phase is determined by a focus on the output side, with waste as the main issue to be diminished (Reike et al., 2018). The concept of recycling is introduced where end-of-life products can be reformed into new products instead of being dumped in landfills (Derksen & Gartrell, 1993). In this period companies operate as usual, only with little adjustments in their model in terms of waste and thus circularity.

The second CE phase focuses on a stronger integration between preventive and output measures with the ambition to prevent waste. This is supported by the Brundtland Report and its view of the world in such a way that future generations can enjoy it the same way, under the motto of 'pollution prevention

pays' (Brundtland, 1987). From a business perspective, environmental problems are framed as economic opportunities in addition to the core business operations (Reike et al., 2018).

The third CE phase is the most recent and involves the concept of eco-innovation, supported by transformative thinking (Visseren-Hamakers et al., 2021). Growth is decoupled from resource use. Hence, instead of only using new resources, old or refurbished resources can be reused for 'new' products. The focus goes beyond closing the loops: it's also focused on slowing the loops (Bocken et al., 2016). When slowing the loops, the values of resources are retained for as long as possible. Business-wise, in this phase, organisations that operate more circularly will see it as adding to their core business and therefore as a unique selling point (Croes, 2018).

All in all, the evolution of the circular economy throughout several decades has changed the importance of circularity for organisations. Circularity evolves through time by first only the tackling of waste, second closing materials loops to finally circularity being the core activity of a company. With each new circular phase, the focus on circularity becomes bigger and bigger, with it becoming an increasingly important part of an organisation.

3.2 Circularity strategies

The evolution of the circular economy over time has been described above. Each phase is characterised by different concepts with associated activities. These activities can be divided into three groups, which will be referred to as circularity strategies from now on in this research. Potting et al. (2017) distinguish three categories of circularity strategies: (CS1) smart manufacturing and usage of products, (CS2) extending the lifespan of products and their parts and (CS3) the useful application of materials. Hereby, the strategies are listed in order from highest to lowest impact on a circular economy.

Smart manufacturing and usage of products is the most transformative strategy, where the traditional thinking about materials and products is challenged (Potting et al., 2017). It questions whether a new product is needed at all. It also looks at increasing the efficiency of the material used for the product and whether the product can be used more intensively, including sharing the product. In addition, extending the lifespan of products and their parts means that when a product reaches the end of its life with one customer, it can be passed on to the next customer instead of being thrown away. If the product has some shortcomings or defects, it can be repaired. Some parts of the product can be reused to create a new product or the product can be given a completely new function (Geissdoerfer et al., 2020). Finally, the useful application of materials implies that when no part of the product can be used for consumer use or as the purpose of a new product, the product has an end-of-life (Potting et al., 2017). This strategy focuses on the aftermath of the product and placing the same materials together for recycling. Ultimately, if recycling is no longer an option, the product and its materials will be incinerated (Geissdoerfer et al., 2020).

From strategies to value retention options

Within the circularity strategies, various 'R-imperatives' can be considered. The idea of 'R-imperatives' is a common spanning operationalised in the form of a hierarchical 'R-ladder'. The R stands for the different terms starting with 're-', which defines in Latin as 'again' (Reike et al., 2018). Reike et al. (2018, p. 254) suggest the terminology of resource value retention options (ROs) as will be referred to samewise in this thesis. The ROs are defined as "conservation of resources closest to their original

state, and in the case of finished goods retaining their state or reusing them with a minimum of entropy as to be able to give them consecutive lives” (Reike et al., 2018, p.254).

The first ROs became popular during the period of CE 1.0 with 3Rs. The 3Rs represent Reduce, Reuse and Recycle and are the most simple distinction based on waste-management principles and thus end-of-life processes. These three ROs all dedicate to the circularity strategies as discussed before. Jawahir et al. (2006) suggest including three more ‘Rs’ to create a more comprehensive and complete overview.

The 6Rs are as follows: Reduce, Reuse, Redesign, Remanufacture, Recycle and Recover (Jawahir et al., 2006). Reike et al. (2018) have explored the diversity of the different ROs in an interdisciplinary literature review and finally proposed a 10R typology. These ten ROs include a comprehensive way of maintaining value as high as possible is retained. These ten ROs can be categorised according to the three circularity strategies defined by Potting et al. (2017). Figure 1 provides an overview is given of the circularity strategies with accommodating ROs with an explanation of the activities that belong to each RO.

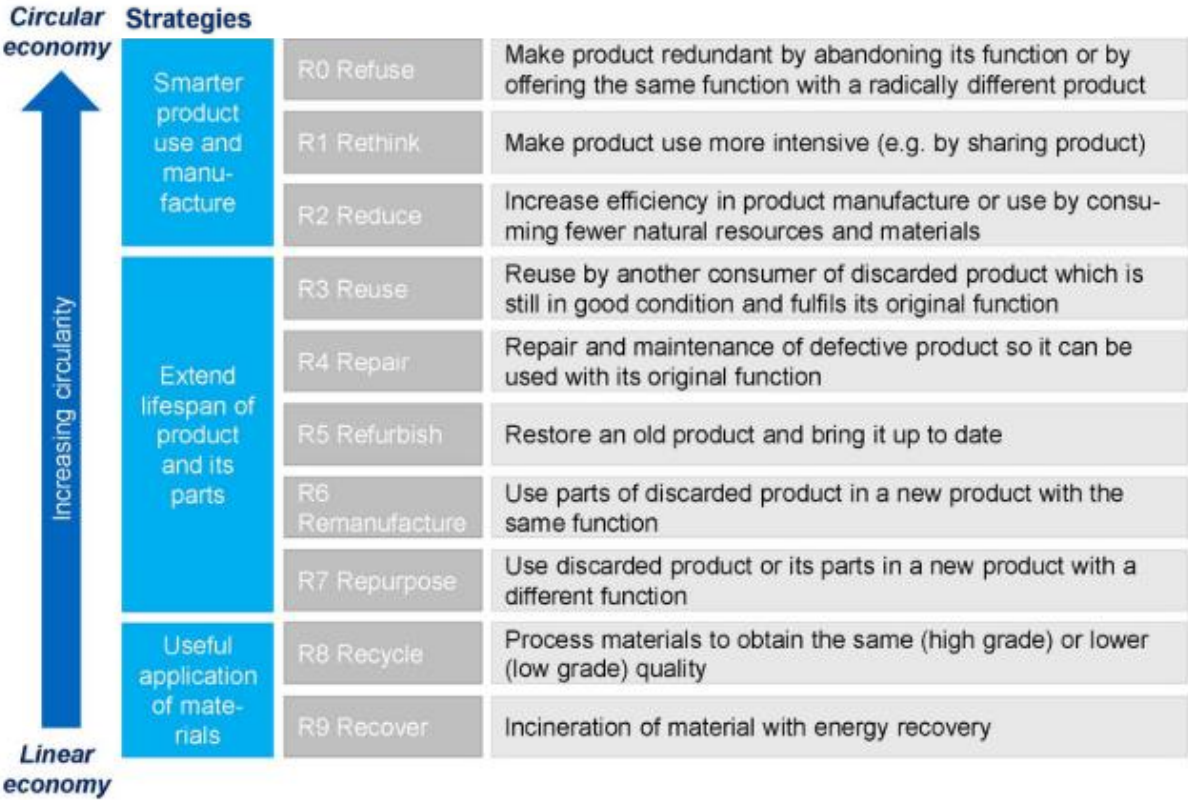


Figure 1: Circularity strategies (Potting et al., 2017)

In figure 1, the left arrow indicates that the higher one goes in the list of circularity strategies and accommodating ROs, the more circular one becomes. This can be explained by the fact that the higher ROs hold value at a higher level than the lower ROs and can therefore be described as more circular than the lower ROs. The contribution of value retention options within circularity strategies is substantiated. However, what can be understood when speaking of value? The definition of value and the thinking behind the concept will be elaborated in the following section.

3.3 Value

Over more than 2000 years the concept of 'value' has been studied by various philosophers and economists (Sinha, 2018). Philosophers study the values that are held by society, such as individuals or groups of individuals (Haksever et al., 2004). Plato was the first philosopher to distinguish the use and exchange of value (Dooley, 2020). Next to philosophers, economics are primarily interested in the value of things. Adam Smith discussed the greatest value in use in those things that have no value in exchange and the other way around (Sinha, 2018). It can be debated that the previous ways of considering value are stated in an anthropocentric way. Therefore, an ecologist view is distinguished for the concept of value in this research, supported by the deep ecology. Ecologists present a non-anthropocentric value that includes "intrinsic value of both individual organisms and a hierarchy of higher order organism entities, such as ecosystems" (Golley, 1986). This way, value is considered more than an exchange between humans (economists) or society (philosophers), value is viewed in a larger context. Value is thus defined in this research as "the total field of biospheric relationships ... the unity of life and nonlife in a widening circle of relationship. All life and nonlife is linked into patterns of energy, matter and information flow and is a vital need for any organism to fit into this system and to maintain it" (Golley, 1986)

When considering value to an organisation, different types of goods, acts or services are included when thinking about value. These can be distinguished by tangible or intangible assets. Tangible assets are physical items that have monetary value and are materially present (Allee, 2008). Examples are land, equipment, inventory and machines. Oppositely, intangible assets are valuable assets that cannot be touched or seen but do exist (Greco et al., 2013). This includes goodwill, brand value and self-developed software. Both tangible and intangible assets create significant value. However, some authors state that at some point in history tangible assets contributed a large share of the company's value, but today intangibles rule the greater value (Allee, 2008; Greco et al., 2013; Low, 2000).

3.4 Value creation

Over the last decades the priority of business activity is mainly focussed on single value creation; profit maximisation (Croes, 2018). Business models were based on traditional thinking connected to neoclassical economics, empowered by economists Adam Smith and David Ricardo (Sinha, 2018). The conventional way of thinking about value creation is when production is at full speed and maximal value is created for the organisation in terms of financial advantages to the organisation. However, climate change and its problems for the earth have become significantly more important since the 1980s (Steffen et al., 2004).

This has led to a new and modern translation of value creation, which also includes environmental and social value: the triple bottom line of Elkington (1977). The triple bottom line consists of people, planet and profit and has been of significant inspiration for organisations to think about what sustainability means for their organisation, next to creating financial value (Jonker & Linden, 2013). Figure 2 presents the triple bottom line based on Elkington (1977).

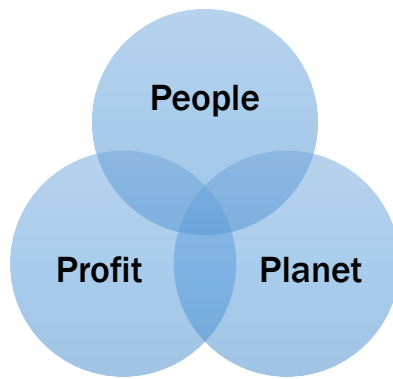


Figure 2: Triple bottom line (Elkington, 1977)

However, critique is given on the triple bottom line as it is often called without explanation for an organisation, the P's are changed or supplemented with other P's for the better of an organisation which calls out quickly for greenwashing with organisations (Jonker & Linden, 2013)

Next to the significant attention for the growing problems of the earth, that followed in the new thinking of the triple bottom-line, the role of companies and their negative contribution to climate change also became more visible, damaging the image of companies (Croes, 2018). In the 2000s a movement in companies emerged to fix this broken image: Corporate Social Responsibility (CSR) (Dashwood, 2012). CSR is about companies being responsible for society, making their business futureproof by becoming carbon-neutral, circular and making fair-trade systems be part of their activities and processes (MVO Nederland, 2022). This way, companies try to make up to social norms of climate change.

Porter & Kramer (2011) grasp the thoughts behind the CSR movement into a concept, so-called 'shared value'. Shared value is defined as "operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities it operates" (Porter & Kramer, 2011, p. 6). Hence, next to economic value also social value must be created within a business operation. However, Jonker & Linden (2013) state that the concept of shared value defined by Porter & Kramer (2011) is incomplete as the relationship between the economic and social value is way more complex than suggested. There is a variety of values which must be balanced. The differentiation between economic and social value is only one of them. Therefore, Jonker (2012) suggests that value creation consists of three aspects: shared value, multiple value and collective value (figure 3).

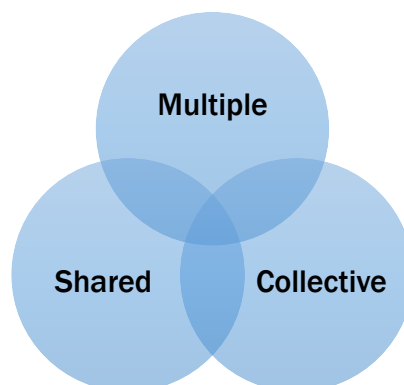


Figure 3: Aspects of value creation (Jonker & Linden, 2013)

First, shared value builds further on the concept of Porter & Kramer (2011). Second, multiple value signifies that different values can be achieved simultaneously within one activity and no longer have to be realised separately (Jonker, 2012). A company can therefore achieve social, environmental and economic value at the same time. Third, collective value refers to companies organising value creation collectively (Jonker, 2012). Competition slackens and collaborations can ensure that companies grow together while creating a sustainable result; one for which the world will be less burdened (Croes, 2018).

3.5 Multiple value creation

This research focuses on the MVC of organisations. Thinking outside traditional business models is beginning to receive significant attention in which new ways of organising around sustainability often take stage (van Dorssen & van Alphen, 2020). This emerges as new business models that characterise themselves by letting go of the traditional, single financial-economic notion of profit and are determined to strive for multiple ways of values (Hoeven & Bossert, 2019).

While MVC is not stated as new to business strategies, it is relatively new to the business area (Jonker & Faber, 2019). Nonetheless, the ideas behind MVC have been around for a while and are already scientifically acknowledged by Frederick in 1960. Frederick (1960, p. 60) proposes that “social responsibility in the final analysis implies a public posture toward society’s economic and human resources and a willingness to see that those resources are used for broad social ends and not simply for the narrowly circumscribed interests of private persons and firms”. The main thing that Frederick points out is that using resources should create value for all stakeholders and not just those at the end line with power.

MVC can be defined as “taking into account the social and environmental impacts of an organisation's actions from a holistic perspective, in addition to managing for economic results” (Croes, 2018, p. 147). The premise here is that balanced growth emerges, where economic gains grow in harmony with environmental gains and the associated social needs (Croes, 2018). Jonker (2012, p.12) adds that MVC is also mainly about “creating multiple values simultaneously in different ways in win-win situations”.

Next to defining MVC, the concept also brings particular possibilities while also opposing difficulties for companies when applying it. With performing MVC, social and environmental values are drawn into the business case. Beforehand, only financial values were included in the business case. By adding these intangible values, the business case becomes more accurate in a way that externalities are accounted for (Hoeven & Bossert, 2019). Additionally, MVC often goes hand in hand with a shared and collective value as suggested by Jonker & Faber (2019). Cooperation between companies producing multiple value facilitates more and better partnerships because they can handle the complexity together (van Dorssen & van Alphen, 2020). Oppositely, MVC also presents several difficulties. The first difficulty is that intangible social and environmental values in the business case are difficult to quantify (Šimberová & Kita, 2020). In addition, current laws and regulations in the Netherlands offer a focus on single value creation, also called single politics, which makes the process of applying MVC more difficult for companies (van Dorssen & van Alphen, 2020). Last, there are many different value interests at play when taking a broader view of the value creation field (Jonker & Faber, 2019). This process is very complex and requires the right skills to deal with.

Practicalities of MVC

When focusing on creating multiple values at the same time, an often-used method is the six-capital model (figure 4). Each capital in the model is as necessary as the others in such a way that “the economic system should lead to the creation of ecological, social as well as physical value” (Westerdijk, 2021). A balance should be created between the different capitals, where value creation of one capital cannot go at the expense of all the other capitals in the model. This is in line with MVC thinking, whereas the six capitals form the basis of this research.

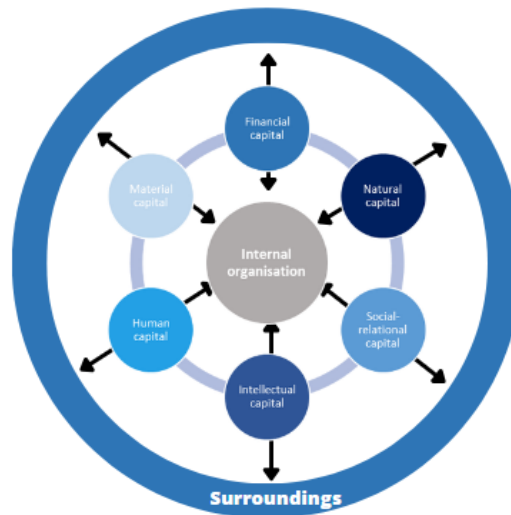


Figure 4: Six capitals model based on Westerdijk (2021)

The capitals that are included in the model are financial-, natural-, social-relational-, intellectual-, human- and material capital. It is discussed that every organisation will use these six capitals for their input, as well as their output reflects these capitals (Croes, 2018). The capitals circulate between the internal organisation and the external surroundings, and back again. In table 3, the six capitals are elaborated on with their main activities.

Capitals	Activities
<i>Financial capital</i>	Financial resources available to the organisation
<i>Natural capital</i>	All renewable and non-renewable natural processes and raw materials that contribute to the organisation's past, present or future prosperity
<i>Social-relational capital</i>	Institutions and relationships within and between communities, stakeholders and other networks
<i>Intellectual capital</i>	The knowledge-based, intangible assets of the organisation
<i>Human capital</i>	The competencies, skills, experience and motivation (to innovate) of the organisation's employees
<i>Material capital</i>	Material resources produced and/or available to the organisation for production and/or service provision

Table 3: Six capitals (Westerdijk, 2019; VRF, 2022)

Integrated Thinking

Furthermore, the International Federation of Accountants (IFAC) developed the terminology of integrated thinking (IT) that can be connected to MVC and is supported by the Value Reporting Foundation (VRF). According to the IFAC, “integrated thinking leads to the integrated decision making and actions that consider the creation, preservation and erosion of value over the short, medium and long, term” (VRF, 2022, p. 2). IT highlights the importance of creating value in plural capitals, as compared to focusing on a certain one.

The Integrated Reporting Framework (IRF) grasps the thinking of IT into a theory (figure 5). The IRF shows that there are several steps within a company which ensure value over time (from left to right). Input is created through the use of six capitals that are interconnected, which can be explained by MVC. Inputs result in business activities which subsequently result in output. Both business activities and output create outcomes that can be positive, negative, and over the short, medium, and long term. A particular business model determines how these activities take place. There are four change factors (risk and opportunities, strategy and resource allocation, and performance and outlook) arising from a company's purpose, vision, and mission that influence the governance and subsequent possessed business model of a company. Ultimately, the outcomes result in the six capitals again. These capitals are the basis for the subsequent input where the circle starts all over again.

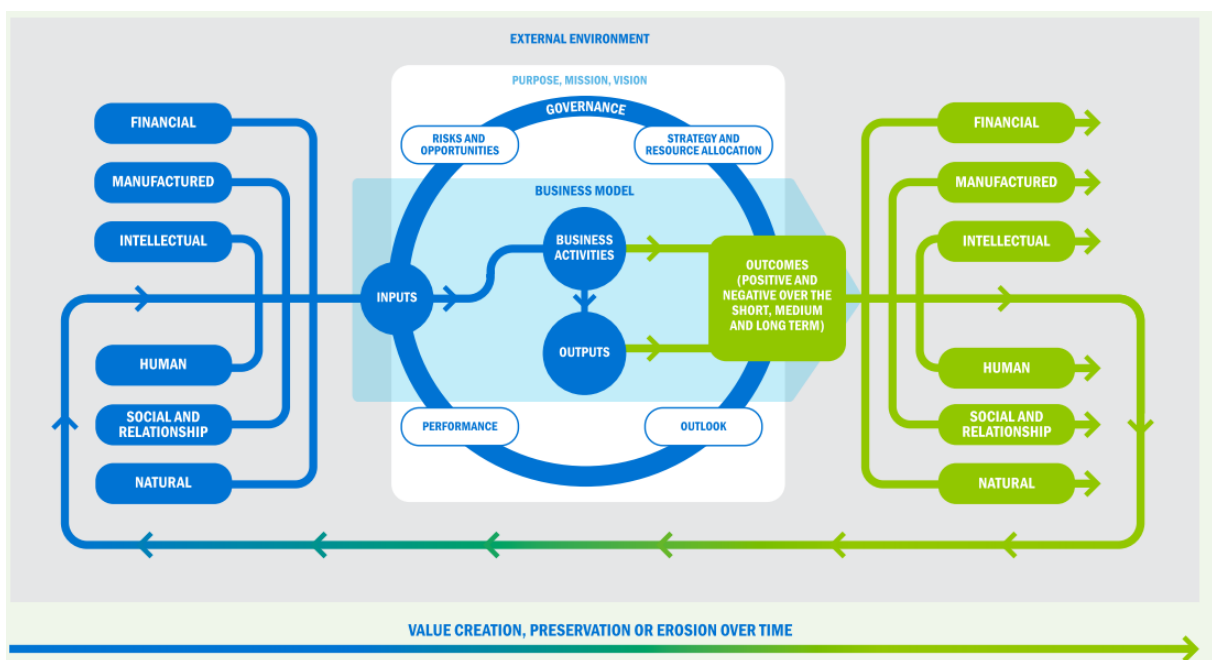


Figure 5: Integrated Reporting Framework (VRF, 2022)

In this research, the focus will lie on the extent to which various capitals are used for inputs and outputs and the value creation that results from this. The focus will be on the particular change factor ‘strategy and resource allocation’ will be manifested. In this research, the strategy and resource allocation can be measured through the (non)-application of a) the strategy of circularity or b) the strategy of MVC for an organisation. An example of applying circularity might be that an organisation builds its business model around taking back products after use in order to reuse them, rather than producing disposable products. This can be manifested by providing customers with deposits that can be returned after use. An example of using the strategy of multiple value creation might be that an organisation wants to

create fewer negative outcomes in terms of natural capital - for example, less polluted water. To achieve this, the organisation changes the way it executes its business activities by using post-use filters for all the water it uses. The investigated organisations will possess a specific business model. This will be omitted in this research, as well as the other change factors (risks and opportunities, performance and outlook) and how governance plays out for the organisations.

3.6 Conceptual model

In the conceptual model, one organisation is elaborated on in their process of creating value over time. Six organisations are studied in this research, whereas for every organisation the steps that are elaborated on in the conceptual model are followed separately. Therefore, the conceptual model applies to every one organisation on their own. Each organisation will have the six capitals as an input to its business model, which will then be followed through an input-throughput (business activities)-output-outcome model. Each organisation can apply two main strategies to its business model, namely Circularity Strategies (CS) or Multiple Value Creation (MVC), which will affect its organisation and the business model that it accommodates. Circularity strategies is applied according to three strategies, namely: 1) Smart manufacturing and usage of products, 2) Extending the lifespan of products and their parts and 3) the useful application of materials. MVC is applied by investigating the cooperation, exchange and mutual influence of capitals.

If an organisation applies both circularity and multiple value creation strategies within its business model and following input-business activities-output, then the outcomes will result in as many positive outcomes for the six capitals as possible in combination with as few negative outcomes for the six capitals simultaneously. The hypothesis of this research is that there is an interrelationship between the strategies of circularity strategies and MVC. Both strategies have a different focus within the organisation. Therefore, the strategies can reinforce or strengthen each other by activating an organisation to manage its capitals most effectively. In addition, the strategies can also have an order of application for best effectiveness, whereas they can also create difficulties for applying both strategies or one or the other. In addition, CKP actively steers the application of circularity strategies for organisations as it is part of their approach. MVC is not part of their approach and therefore the CKP does not consciously steer towards it, however the CKP may steer towards it indirectly. However the CKP may also unconsciously steer towards MVC in organisations. This research will discover the role of the CKP on both strategies separately, but also the role of the CKP on the interrelationship with each other.

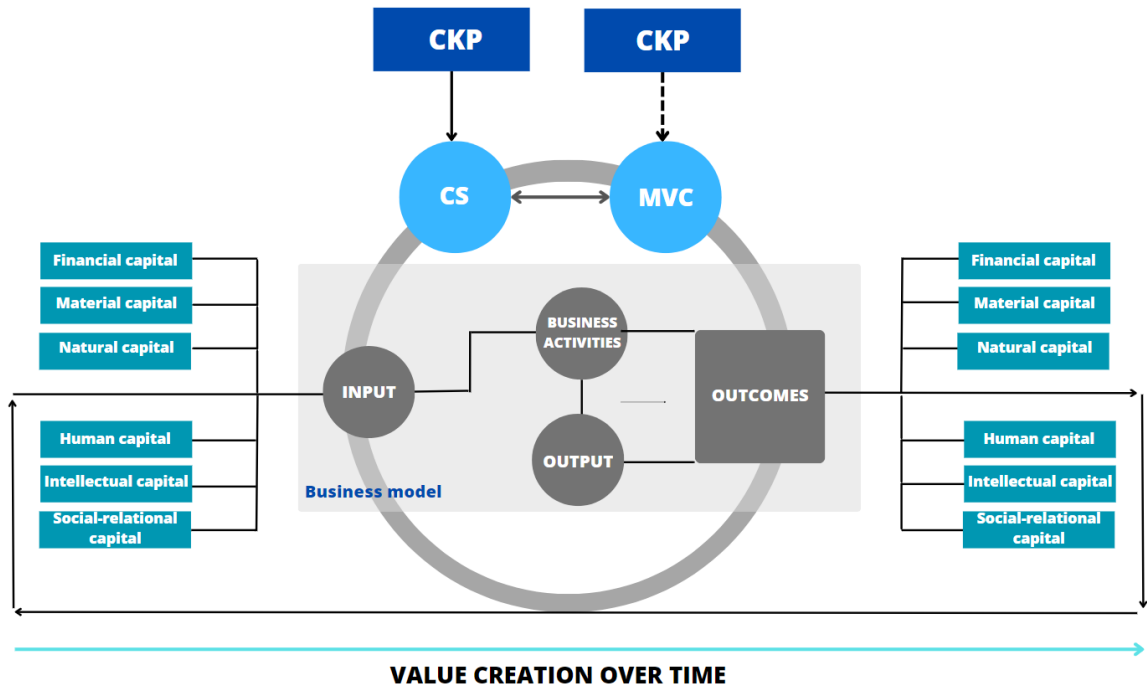


Figure 6: Conceptual model

4. Methodology

In this chapter, the methodological choices are elaborated on. First, the philosophical perspective and research strategy are discussed. After that, the methods used for data collection and analysis are discussed. Finally, the validity and reliability of the research are addressed.

4.1 Research strategy

4.1.1 Research philosophy

The philosophy behind this research can be explained according to ontology and epistemology. Overall, this research will build on a post-positivistic perspective, that accommodates objectivity and generalizability of results as an ideal. The researcher tries to grasp reality, while accepting the imperfect methods and measurements available (Guba & Lincoln, 1994). Ontology concerns how reality is shaped and what is out there for people to know (Moon & Blackman, 2014). This research will assume that one true reality exists, however, we as humans can never understand it perfectly (Guba & Lincoln, 1994). This can be linked to the ontological perspective of critical realism (Moon & Blackman, 2014). Next, epistemology concerns how people create knowledge and what knowledge is there for humans to know (Moon & Blackman, 2014). This research follows a post-positivist view as starting point in the epistemological field because some generalisation of the results is the goal. However, bridge-building towards a constructivist way of thinking will be done as certain things in this reality only occur during a dialogue between the investigator and the subject of inquiry (Harrison et al., 2017).

For this research, a post-positivist view will be the starting point. The intention is to present results in a post-positivist framework. This connects to the goal of postpositivist research where research is “a way to apprehend the nature of reality while understanding that all measurement is imperfect” (Harrison et al., 2017, p. 9). However, to discover the knowledge of some concepts within companies bridge-building is done towards constructivism. Thus, this research will use a more constructivist attitude to extract the information and see the connections between concepts as imperfect measurements.

4.1.2 Research design

This research will have a qualitative research design as it will describe and understand reality in the context where actors operate and certain phenomena occur (Thiel, 2014). How one, true reality is created in this research is complex. Therefore, this reality is best expressed with words instead of numbers, as commonly done with oppositely quantitative research (Moses & Knutsen, 2019). First, a search for qualitative data forms the basis of the literature review. Therefore, this research is a deductive study (Thiel, 2014). The conceptual framework is created based on the existing literature and theoretical concepts. This framework guided the way how empirical data is collected. Next to that, the CKP is unique; therefore, research on this program is also executed before the data collection. Figure 7 presents the design and different steps of this research.

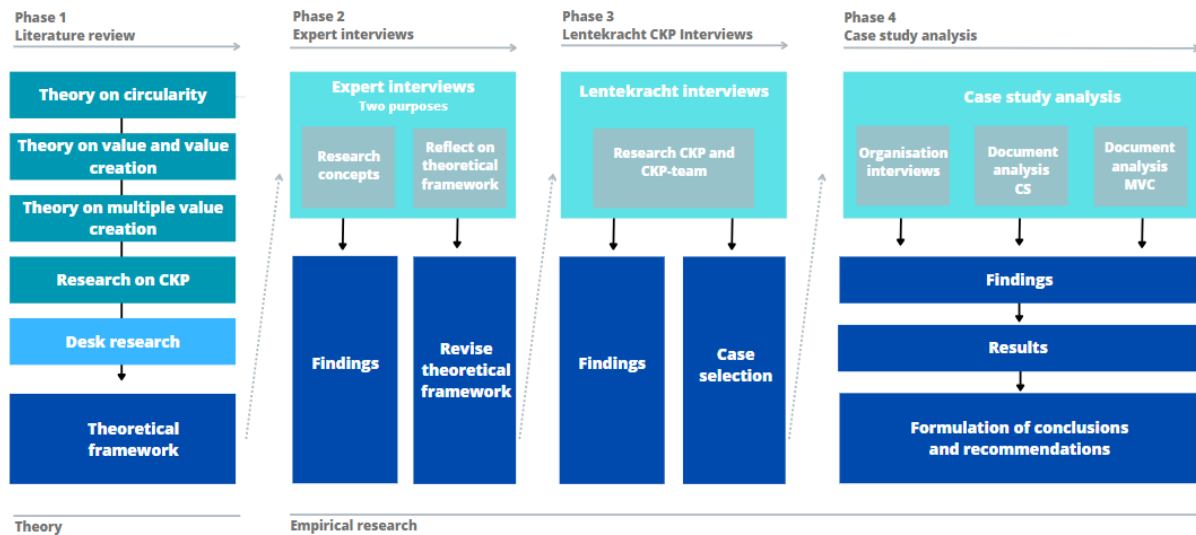


Figure 6: Research design with CKP as Circular Kickstart Program, CS as Circularity Strategies and MVC as Multiple Value Creation

Furthermore, this research is formed as a case study, whereas a case study creates practical knowledge that is important to get a nuanced view of reality (Flyvbjerg, 2006). This research presents an embedded, single-case study design as Yin (2012) defined. It is a single case because the CKP can be described as a rare or ordinary case (Yin, 2012). Only the CKP of Lentekracht is investigated, and no other similar programs from competitors, so a multiple-case design is not fitted. In addition, this single case has an embedded arrangement where the main case is the CKP and the organisations that have completed a CKP are the secondary units of analysis.

Case selection

In total, ten organisations and CKPs have been executed. Four organisations were not included in this study. The reasons for this are that one CKP has not been fully completed, and another CKP is only based on a small consultancy for a thesis project of another organisation. Moreover, two CKPs are considered by Lentekracht to be unreliable projects due to a general lack of final reporting in the early stages of the CKP. Therefore, six organisations that completed the CKP are studied in this research.

Embedded units of analysis

In the six selected organisations, a particular flow was examined that was also used in the CKP. The CKP decided together with the organisation what the scope and thus the investigated flow of the project would be. For example, Organisation 2 is a bakery producing multiple baked goods. For the CKP, the selection is made for a particular carrot cake that will be packed within a jar; a cake-in-jar. The bakery thus produces more products next to the cake-in-jar, but these products are not examined as particular flow in the CKP of the bakery. This research examines the situation of the particular flow before, during and after the CKP. In example of the cake-in-jar, it is examined what circularity strategies and MVC is implemented on the cake-in-jar before, during and after the CKP.

4.2 Data collection

When conducting a case study using different methods to collect data is encouraged to provide a “more synergetic and comprehensive view of the issue being studied” (Harrison et al., 2017, p. 12). In this research, two ways of data collection are used: document analysis and interviews.

4.2.1 Document analysis

A document analysis is a research technique that involves the interpretation and evaluation of documents, to understand their meaning and develop insights based on the information provided by the documents. Analyzing pre-existing texts can allow studies to be completed within specific time frames that would not otherwise be possible (Morgan, 2022). In this research, however, it is not a lack of time, but the fact that the completed CKP projects are in the past. The analysis of the documents produced before, during and after the CKP, as well as the analysis of the documents that served as preliminary information, provided an opportunity to understand and explain the respective projects in different ways. The information from the documents served as a basis for the information on the CKP projects, which was later explored in more detail in the interviews.

Two document analyses were carried out for this study, based on documents provided by Lentekracht relating to the CKP. For the content analysis, the same documents were searched twice with a different perspective and focus. The first document analysis focused on circularity and the second on MVC. Before each content analysis, a document analysis protocol was written, which included a) the aim with a corresponding main question, b) the selection of texts, c) the operationalisation and d) the method. There is a bias between different CKP projects, as each project is documented in a (slightly) other way. The list of documents and the document analysis protocol can be found in Appendix 1.

4.2.2 Interviews

In this research, three rounds of interviews are held by the researcher. The first round of interviews is conducted with experts from various disciplines specialising in circularity and MVC. The second round of interviews is held with employees of the CKP from Lentekracht, to select the organisations as cases for this research, investigate the CKP, and discuss their findings on the theories of circularity and MVC. The third round of interviews is held with the selected organisations, whereas the process of the CKP, in what way and frequency circularity is applied and how MVC is executed at the organisations regarding the decided flow of the CKP. For all interviews, semi-structured interviews were chosen. This is because a semi-structured interview provides the certainty that specific topics would be covered, while at the same time allowing the interviewee to speak freely and make arguments, as well as allowing the interviewer to ask spontaneous questions. In the following part the interviewees are presented, and the interviews and their subjects are further elaborated.

Expert interviews

There are several reasons to first interview experts, namely a) to investigate the relevance of this research, b) to investigate the concept of MVC, as there is relatively little literature on this concept and c) to investigate the possible interrelationship between circularity and MVC. All five interviewees were familiar with both the concepts of circularity and MVC. Table 4 shows the list of experts interviewed. The interviewees were asked in advance if they wanted to be anonymous; none of them did.

Name	Function and career	Specialisation	Date of interview	Length of interview
Sjors Witjes	Lecturer Radboud University with specialisation in Corporate Sustainability and circular economy	Circularity	24-02-2023	1:09:08
Frank Croes	Program manager Circular Economy HAN with specialisation in Multiple value creation	Circularity, Multiple value creation	28-02-2023	57:32
Fons Claessen	Director of centre of Expertise Circular Transitions Fontys & Developer Multiple value creation toolkit for SMEs	Circularity, Multiple value creation	01-03-2023	54:56
Iulian Barba Lata	Lecturer Radboud University with specialisation in placemaking and transitions, such as the circular economy	Circularity	02-03-2023	1:03:45
Jan Jonker	Specialist in sustainable entrepreneurship, Multiple value creation and new business models	Multiple value creation	08-03-2023	52:22

Table 4: Expert interviews

Lentekracht interviews

The aim of interviewing employees of the CKP was to find out the vision of the Circular Kickstart Programme and its practical implementation. Two Lentekracht employees involved in the Circular Kickstart Programme were interviewed and will be mentioned anonymously in this research. Both were interviewed twice, whereas the first round focused on gaining an in-depth understanding of the CKPs that had been completed in the past, the progress of these CKPs and the challenges they faced. The second round of interviews focused on exploring the theoretical concepts of circularity and MVC in combination with the practical approach of the CKP. Finally, it explored employees' views on a possible interrelationship between circularity strategies and MVC and how this would work in practice in the CKP. The Lentekracht interviews are listed in table 5.

Function	Date interview	Length interview
Founder Lentekracht and CKP	09-03-2023	30:18
Employee CKP	16-03-2023	33:09
Employee CKP	30-03-2023	44:06
Founder Lentekracht and CKP	31-03-2023	40:15

Table 5: Lentekracht interviews

Organisation interviews

The six selected organisations examined in this research, are listed in a table below. From each organisation, the most involved person from that organisation during the CKP is interviewed. The organisations and the respondents from the organisations are anonymously named according to the type of organisation. The organisations are listed in table 6.

Organisation	Type of organisation	Function interviewee	Date of interview	Length of interview
Organisation 1	Food supplier	Site manager	04-04-2023	44:29
Organisation 2	Bakery	Founder	05-04-2023	36:45
Organisation 3	Healthcare institute	Sustainability coordinator	07-04-2023	52:45
Organisation 4	Cooperative	Director of innovation	13-04-2023	1:07:05
Organisation 5	Painting company	Founder	19-04-2023	1:00:30
Organisation 6	Hospital	Sustainability coordinator	21-04-2023	52:37

Table 6: Organisation interviews

Prior to the interviews, a short survey was sent to the interviewees. The survey aimed to gain insight and preliminary information about MVC in organisations. MVC is a significant and subjective concept the organisations had no prior knowledge of. This survey served as an investigative questionnaire to test different aspects and examples of MVC in organisations. The questionnaire consisted of 16 questions, based on the six capitals in which MVC is operationalised in this research, which are listed in table 7.

Capital	Subjects of questions	Nr. of questions
Material capital	Resources and raw material	3
Financial capital	Healthy economic situation, financial investments	2
Human capital	Healthy working environment, intrinsically motivated employees	2
Social-relational capital	Reputation, co-creation and supply chain	3
Intellectual capital	Efficiency and protocols, sustainability, circularity	3
Natural capital	Waste, energy consumption, CO2 emissions	3

Table 7: Survey for organisation interviews

For each question there was a Likert scale - from 1 to 5. The distribution of the Likert scale was 1) Strongly disagree, 2) Somewhat disagree, 3) Do not agree, do not disagree, 4) Fairly agree, 5) Strongly agree, 6) Don't know. Each question was followed by a test question concerning the influence of the CKP: "Did the CKP have an impact on this?" The researcher only used the input from this questionnaire to prepare a more specific interview guide and have preliminary information to ask about in the interview. The responses to the questionnaire will not be further processed or reflected on in any way in this research.

4.3 Data analysis

All interviews were recorded with permission of the participants. Hereafter, the interviews were transcribed in detail. Next to that, the transcripts were coded with the Atlas.Ti program based on a scheme of codes based on the themes found in literature. Also, open coding was used when other factors or arguments came up, which were then added as new codes. The coding process can be divided into two parts: 1) transcript and notes coding exhaustively and 2) axial coding to find patterns in codes and order them into sections.

Next to the data analysis of the interviews, the document analysis was coded in Atlas.Ti. In tables 8 and 9, the most common codes for MVC and circularity strategies are presented resulting from the document analysis. In the results section, several tables are based upon this information and added with interview information.

<i>Organisations</i>	Capitals					
	Natural	Material	Financial	Human	Intellectual	Social-relational
<i>Food supplier</i>	8	8	3	30	20	17
<i>Bakery</i>	4	4	1	1	1	0
<i>Healthcare institute</i>	26	10	8	19	15	5
<i>Cooperative</i>	13	4	6	7	7	14
<i>Painting company</i>	11	13	8	12	15	1
<i>Hospital</i>	19	7	5	33	29	7

Table 8: Document analysis of multiple value creation

Value Retention Options	CS1			CS2					CS3	
	Refuse	Rethink	Reduce	Reuse	Repair	Refurbish	Remanufacture	Repurpose	Recycle	Recover
<i>Food supplier</i>	9	3	11	8	0	0	0	4	8	4
<i>Bakery</i>	2	2	2	4	0	0	0	2	0	0
<i>Healthcare institute</i>	8	0	11	2	0	2	1	2	2	0
<i>Cooperative</i>	0	4	12	4	0	0	0	2	4	3
<i>Painting company</i>	5	0	7	5	0	0	0	0	4	0
<i>Hospital</i>	6	0	7	6	0	0	0	3	7	3

Table 9: Document analysis of circularity strategies

4.4 Validity and reliability

The validity and reliability of research are important as they indicate how well a method measures a phenomenon, or in this case the multiple cases. On the one hand, validity concerns the accuracy of the results in research. Internal validity of research examines whether the study design, execution and analysis answer the research question without a bias and will be strengthened by collecting data using different methods, also called triangulation (Moses & Knutsen, 2019). In this research, methodological triangulation is applied where two types of qualitative methods for data collection are used, namely document analysis and interviews.

The external validity of research examines whether the findings can be generalized to other contexts in the world and will be strengthened through an accurate selection of companies with a similar size within the same section (Yin, 2013). In this research, it must be considered that there will be no statistical generalisation, but an analytical generalisation. The research will not draw inferences from data to a population as done in statistical generalisation. In an analytical generalisation, the results of the multiple case study are compared to a developed theory (Thiel, 2014). Here, the six selected organisations that completed the CKP and how the interrelationship between circularity strategies and MVC comes forward will be tested to the different theories of circularity and MVC. Additionally, specific information on how the CKP influenced this interrelationship will be supplementary and not connected to any theory as the CKP stands on itself as unique.

On the other hand, reliability concerns the consistency of the results in research. To ensure the degree of reliability of the research, attention is paid to the consistent application of the methods and research philosophy, e.g. while coding the results. In addition, the conditions of the research must be standardised accurately. This is considered by operationalising essential terms and concepts, such as circularity strategies and MVC, based on relevant literature and theories to convey a generic and correct picture during data collection and subsequent data analysis. This is done by correctly operationalising the concepts within the interview guides for data collection and within the document analysis protocols for data analysis.

5. Analysis of results

In this chapter, the data and information collected will be analysed as results. First, the organisations and their primary business activities and output are discussed, whereafter the motivations for organisations to participate in a Circular Kickstart Program are elaborated. Next, the application of circularity strategies are analysed for the organisations, as well as the execution of multiple value creation at the organisations. Finally, the interrelationship between circularity strategies and multiple value creation is examined, whereafter an order of application, the importance of both strategies and also difficulties of applying both strategies are discussed. Throughout the parts, the strategies are evaluated according to the three types of CKP and a discussion of the role of the Circular Kickstart Program on both single strategies and the interrelationship.

5.1 Primary business activities and output

In this section, the organisations that completed a CKP are introduced. Each organisation is different in discipline, activities and output. The organisations and their CKP with accommodating business activity and output are elaborated.

The food supplier mainly supplies food to various healthcare institutions. They produce pre-packed food in plastic packaging. The food supplier's CKP is based on these meal packages with the creation of a bring-return service for these meal packages. The packaging is not destined for waste but is returned to the food supplier by the customer so that the plastic packaging and the swill inside the packaging can be recycled.

The bakery is a social bakery that produces different types of baked goods and simultaneously contributes to society by employing people who are distant from the labour market and using leftover vegetables for their recipes. The bakery's CKP focuses on improving a carrot cake recipe packaged and shipped in a glass jar - the cake-in-a-jar.

The healthcare institute provides services to its clients by coaching them in living, working and learning in their daily lives. For their CKP, one location where clients of the healthcare institute work is selected to explore circularity. On site, the flow of all materials, resources and waste streams is considered that the clients work with.

The cooperative provides food from local farmers to a regional network of healthcare institutions, restaurants and hotels. Their CKP is focused on creating a regional and circular food system with all these partners that focus on the flow of food and organic waste. The food system focuses on creating a closed regional and circular food system, linking the customer back to the farmer, where the customer's food waste can be used as a resource for the farmer.

The painting company provides painting services to its customers and operates in the retail sector. Its services are focused on new orders or the maintenance of orders already completed. Their CKP focuses on their organisation entirely with the flow of resources, tools and materials they use on a daily basis.

The hospital specialises in posture, movement and rehabilitation and provides services to its clients. The CKP does not focus on the services offered by the hospital in terms of content, but rather on the food and organic waste flows present within the hospital. These flows mainly take place in the main restaurant within the hospital, which is the particular case within the hospital for this CKP.

In table 10, the organisations and the business activities with according output flows, are listed.

Organisation	Sector	Business activities	Output flow determined in CKP
<i>Food supplier</i>	Retail	Production of packaged meals	Flow of meals and meal packages
<i>Bakery</i>	Retail	Production of baked goods	Flow of cake-in-jars
<i>Healthcare institute</i>	Healthcare	Service in coaching clients in living, learning and working	Flow of materials, resources and waste streams
<i>Cooperative</i>	Retail	Service in facilitating food from farmer to consumer	Flow of food and organic waste
<i>Painting company</i>	Retail	Service in paintwork	Flow of tools, resources and materials
<i>Hospital</i>	Healthcare	Service in posture, movement and rehabilitation	Flow of food and organic waste

Table 10: Overview of organisations

5.2 Motivations for participating in a CKP

An organisation may have several motivations to participate in a CKP. The most common motivations can be grouped into five types: intrinsic motivation, strategic view, internal pressure, external pressure and a subsidy. These motivations will be elaborated on in the following section.

5.2.1 Intrinsic motivation

First, organisations may have the intrinsic motivation to participate in a CKP, i.e. the motivation to start working on circularity within their organisation. The bakery sees its mission as “the activities of the bakery take up as little space on the earth as possible and give back as much goodness as possible in the social sphere” (Bakery, personal communication, 2023). Regarding sustainability, the bakery aims to be fully circular in every possible area. It manifests itself, among other things, in working with rescued vegetables, electric delivery and packaging in bio-based packaging materials.

Long-term thinking is also considered an intrinsic motivator, especially by the painting company. They argue that it is natural for humans to act in the long term and thus cause as little damage as possible to the earth for people and nature and that short-term thinking does not fit into this picture. Linked to long-term thinking, the cooperative argues that we must move towards society like the old days, and organisations should contribute similarly. The cooperative argues that in the past people didn't travel all over the world to get their food and that the current system, with its large number of transports, is very polluting for the environment and society. “Why get your food from far away when you can get it close by?” (Cooperative, personal communication, 2023). For them the motivation is that local and sustainable food supply is the norm that society needs to return to.

Finally, providing sustainable care and cleanliness of the living environment is a final intrinsic motivation for the healthcare institute. They argue that everyone should keep their living environment as healthy, tidy and environmentally friendly as possible, and nothing less applies to their clients' houses and locations. Therefore, the healthcare institute feels responsible for starting to work on circularity for the sake of their clients.

5.2.2 Strategic perspective

In addition to intrinsic motivation, organisations see the importance of implementing a CKP from a strategic point of view. Organisations' main strategic benefit is to become a frontrunner in sustainability, including circularity, compared to other organisations in the same sector. Organisations notice that competitors or peers are also committed to sustainability and specifically to circularity. An organisation needs to be a frontrunner to retain existing customers, attract new customers and be well 'positioned' in their sector. In its case, the cooperative has chosen to pioneer the local food supply, allowing farmers to make their farming operations more sustainable. The cooperative is already a frontrunner in its kind, however, it wants to invest in staying ahead of competitors. Another example is the food supplier that wants to be progressive for its customers and, when delivering its products, wants to leave as little waste at the customer as possible. The food supplier's CKP is focused on a bring-return service for plastic meal packages, which is not yet common in the food supply sector. The food supplier wants to be in the lead with their bring-return service.

Cost efficiency is another strategic benefit organisations may want to gain from a CKP. There is a stigma that if you invest in sustainability you always lose more money (Valor et al., 2022). However, several organisations participating in the CKP see a cost-benefit to investing in sustainability, particularly circularity. The healthcare institute focuses on this as their primary aim is not to make a profit but to provide and secure a social and safe environment for their clients. It is precisely by investing in waste separation, sustainable partnerships and a more sustainable procurement policy that the healthcare institute expects to gain a cost advantage.

Finally, seeing a potential circular business opportunity is also motivation to implement a CKP from a strategic point of view. The bakery intended the development of a circular business opportunity with its participation in a CKP. The bakery wanted to start delivering their cakes nationally, but they had a logistical problem as they could not execute this sustainably on this scale. Working with a company with the same vision and the potential for sustainable delivery was the starting point for the CKP. For the bakery, supplying their products on a national scale and thus expanding their organisation can be seen as a circular business opportunity and a strategic step in developing their organisation.

5.2.3 Internal pressure

Internal pressure from within an organisation can play a significant role in altering the organisation's direction. Therefore, the internal pressure within an organisation has also been a motivation for the CKP for several organisations. Internal pressure can play out differently for every organisation, as every organisation is unique and has specific goals. For example, in one organisation internal pressure offers the prospect of positive change, while in another organisation internal pressure feels like a necessity to meet the demands of its employees.

An example of the abovementioned motivation is the cooperative, which wants to create a circular and regional food system. This means that from the food production to the processing of the leftovers, the food is used circularly and therefore at the highest possible quality. Setting up this network of producers, users and, most importantly, producers where the leftover food, i.e. organic waste, can be returned to be used as raw material is too complex for them. This is why the CKP is being used to support the creation of this network and the subsequent implementation of the circular, regional food system.

The hospital's motivation is an excellent example of the latter, namely the need to meet the demands of its employees. A hospital's primary goal is to support, help and heal people. Within the hospital, hygiene is an important aspect that must always be guaranteed. The hospital points out that because of the focus on hygiene, there was talk of hiding the problems these hygienic measures caused for the environment for a very long time. "We noticed, especially from the floor, that there was a movement within healthcare where people were thinking; we are doing a lot for healthcare, but the way we are doing it also has disadvantages for healthcare because of the footprint we are leaving behind" (Hospital, personal communication, 2023). There was a lot of attention from the employees and a demand for new hygiene practices less harmful to the environment. In this case there was a call from the employees that led the organisation to start working on sustainability and circularity, which is how the CKP came about.

In addition, internal pressure can also be an issue within an organisation where management cannot get a grip on structural employee behaviour. This was the case at the painting company, where employees were handling paint, tools, materials and raw materials in an unsustainable way. An unsustainable way means that tasks were not handled efficiently, many products and materials were lost and the employees were unaware of it. In this case, the CKP was seen as an opportunity to make employees aware of their behaviour and to find simple but effective solutions for handling paint, tools, materials and raw materials.

5.2.4 External pressure

External pressure can also be seen as a motivation for an organisation to implement a CKP. External pressure in the selected organisations concerns laws, regulations and certification. The motivation to comply with certification applies primarily to organisations working in the healthcare sector, such as the healthcare institute or the hospital or having healthcare as their largest customer target group, which was the case of the food supplier.

In the Netherlands, the Environmental Thermometer for Healthcare is the most common and therefore most respected certification for the healthcare sector. At the hospital, a follow-up trajectory has been carried out to obtain the bronze certification of the Environmental Thermometer for Care. The healthcare institute has also set its sights on this certification but has explicitly decided not to pursue this with the CKP. This is because the Environmental Thermometer for Care focuses mainly on reducing CO₂ emissions, and they also wanted to develop circularity, which is the focus of their initial CKP studied in this research.

The food supplier has another motivation for participating in a CKP regarding certification. The food supplier used the CKP primarily to help their healthcare customers in the food sector. Their clients must meet the conditions for reaching Environmental Thermometer for Healthcare. The food supplier explains: "As a supplier to the healthcare sector, we actually wanted to help the healthcare sector become more sustainable, which meant looking directly at us to take the pain away from our customers. To keep them happy and to help them achieve the sustainability goals they have set." (Food supplier, personal communication, 2023).

Finally, the cooperative provides for future legislation and regulation on nitrogen issues at the national level. Creating a regional and circular food system helps farmers reduce their carbon emissions. In

addition, the cooperative is also committed to fair prices and believes it is essential that enough money goes back to farmers to invest in making their farms more sustainable.

5.2.5 Subsidy

Finally, the RVN@ has released a subsidy opportunity to fund part of the CKP. The RVN@ is an organisation that stimulates the innovative power of SMEs in the Rijk van Nijmegen region. The conditions for the subsidy are that the organisation is situated in the municipality of Nijmegen, it is registered with the KVK, one voucher can be issued per organisation and there is a minimum own investment of 1500 euros. The subsidy can be seen as an additional financial incentive to implement the CKP, or at least at a lower overall price. Four of the six selected organisations made use of the subsidy. For these organisations, the subsidy covered between 20% and 50% of the total amount to be paid for the whole CKP.

Table 11 summarises the organisations and their motivations for participating in a CKP.

<i>Organisations</i>	Motivations				
	Intrinsic motivation	Strategic view	Internal pressure	External pressure	Subsidy
<i>Food supplier</i>		X		X	
<i>Bakery</i>	X	X			X
<i>Healthcare institute</i>	X	X		X	X
<i>Cooperative</i>		X	X		X
<i>Painting company</i>	X		X		X
<i>Hospital</i>			X	X	

Table 11: Motivations for participating in a Circular Kickstart Program

5.3 Circularity strategies

The following section discusses how each strategy is applied, according to the value retention options used in the organisations. Subsequently, the relationship between the circularity strategies will be discussed, whereby by focusing on one strategy, it is expected that possible changes in the other strategies will occur. Furthermore, for each type of CKP, which circularity strategies are used most is examined. Finally, the role of the CKP on the application of circularity strategies is elaborated on.

As discussed in the literature review, this research considers the application of the circularity strategies as defined by Potting et al. (2017). The circularity strategies are operationalised according to the ten value retention options described by Reike et al. (2018). The circularity strategies and value retention options are summarised in table 12.

Circularity strategies		
CS1 <i>Smart manufacturing and usage of products</i>	CS2 <i>Extending the lifespan of products and their parts</i>	CS3 <i>Useful application of materials</i>
Refuse	Reuse	Recycle
Rethink	Repair	
Reduce	Refurbish	Recover
	Remanufacture	
	Repurpose	

Table 12: Circularity strategies (Potting et al., 2017)

5.3.1 CS1: Smart manufacturing and usage of products

5.3.1.1 Refuse

Refuse is the most impactful, yet also the most drastic, value retention option to apply (Reike et al., 2018). The option to refuse is often already present in an organisation, but the refusal of something may not be apparent. The organisations therefore need to be made aware of the refuse options, to act on them. For example, it looks easy to consider refusing plastic packaging, however, in practice this is often more difficult than expected. This is due to habits and existing systems. Refuse is therefore not yet commonly applied by all organisations reviewed in this research, however several organisations are trying to pursue it actively.

The food supplier tries to offer less animal-based food in its food, send meals without packaging, or even refuse to use plastic and replace it with bio-plastic. However, they concluded that these options will not be implemented for now, as they are too big a step for them to take now. Also, applying these refuse opportunities would create new problems, such as a reduced shelf life for their products. Next to that, the healthcare institute commits to a small-scale refusal by refusing to buy products they can produce themselves in the vegetable garden. They will soon refuse disposable items such as plastic or paper cups and encourage customers to bring their items themselves. Finally, the bakery is committed to rejecting packaging materials per se: they ship their cake-in-a-jar without disposable packaging, opting instead for a reusable glass jar. “When I think about circularity, I think there is so much pressure on raw materials and their waste and space. That is why I want to create as little waste as possible” (Bakery, personal communication, 2023). The bakery also refuses to use palm oil in its recipes on environmental grounds.

5.3.1.2 Rethink

The value retention option of rethink focuses on the fact that a product or service is used more intensively by rethinking the product or service. It is often characterised by literally thinking out of the box. Rethink is relatively little applied among organisations, although two organisations have tried to give this out-of-the-box thinking a chance.

The food supplier believes their bring-return service can contribute to seasonal, local and organic food. This means that local and seasonal food is used more intensively, without the burden of transporting food internationally, with the externalities that this entails. However, this idea has not yet been realised in their operations. In addition, the cooperative is considering how to better use a product, such as the food it supplies and its leftovers. They are also investigating whether consumers are willing to

contribute financially to promote sustainable production and consumption of food, thus creating a circular food system.

5.3.1.3 Reduce

The application of the value retention option reduce can focus on many aspects. It can be regarding materials, tools or resources or, for example, the quantity used. Reduce can also be applied to working time or costs. When an organisation chooses to apply the reduce option, the original way of doing things may continue, but the organisation will make minor adjustments to the behaviour or quantity of something used. The interviews and document analysis show that reduce is the most widely used value retention option by almost all six organisations – except for the bakery. Reduce does not require significant structural changes to operations but instead focuses on adjustments to the organisation's current system. It can therefore be seen as a relatively easy value retention option to apply where no significant operational changes are required.

There are many examples of organisations applying the reduce retention option. These examples can be found across the whole range of organisations and vary widely. The hospital focuses on reducing food waste and improper waste separation, while the healthcare institute focuses on reducing the use of raw materials of paper and water. The painting company focuses not only on reducing the use of raw materials, but also on reducing the use of tools and the amount of these raw materials in nature through pollution. Next to that, the cooperative focuses on reducing CO2 emissions, fertiliser use and energy consumption.

5.3.2 CS2: Extending the lifespan of products and their parts

5.3.2.1 Reuse

By reusing materials, raw materials, tools, or other items, they can last longer. This results in buying and using new items unnecessary. Reuse is a relatively easy option for value retention to apply where the essence and benefits are clear. However, it is not possible to reuse everything within an organisation. For example, the water you put into a product is processed into the product and cannot be reused. In addition, new systems are often needed to make it easier to reuse things properly. The bakery and the painting company have found proper ways to reuse certain parts of their product or service flow.

The bakery has built its new cake-in-jar business around the rejection of disposable packaging and has chosen to work with a company that only sells items in reusable glass jars. Of all the cake-in-jars sold, the jars will be reused again until they reach the end of their life. In addition, the painting company sees several possibilities for reusing raw materials, such as leftover paint, and reusing tools, such as paint brushes and insert trays. However, reuse is only possible if employees handle them carefully and clean them correctly and on time. This requires new working systems to make reuse successful. The painting company, therefore, installed a CRM (Custom Relation Management) system. “The CRM system is designed to make us work smarter. We keep a record of each customer, including location, type and colour of paint. This allows us to reuse leftovers better and we need to buy less if we organise this conveniently.” (Painting company, personal communication, 2023). This system gives the painting company more insight to reuse its materials more efficiently.

5.3.2.2 Repair + Refurbish + Remanufacture

The value retention options of repair, refurbish and remanufacture are not applied within the organisations of this research. This can be explained by the fact that four of the six organisations' primary output is focused on service, where there are no products capable of higher value customisation. In addition, for the two organisations whose primary output is products, there are no products suitable for repair, refurbishment and remanufacturing. This is due to the single-use nature of the products. The food supplier and the bakery have disposable content of their product. For the bakery, the cake can only be eaten once. Although the jar will be reused, it will have little or no function in repair/refurbish/remanufacture as it is made of glass, which is not desirable to repair with current techniques for the bakery. The food supplier's food and packaging are also unsuitable for repair, refurbishment or remanufacturing. Again, the food is eaten once by the customer, and the packaging is a disposable item that will be recycled and cannot be upgraded currently.

5.3.2.3 Repurpose

The value-retention option repurpose concerns repurposing parts of existing products into a new product with a new function. The bakery and the cooperative do support the potential for repurposing. The cooperative actively pursues a circular and regional food system, creating a new stream of food residues and organic waste flows. Whereas in the past this was considered waste, in the future this flow will be regarded as a raw material for the farmer in the form of food for livestock or fertiliser for the soil. The same concept applies to the bakery. They use vegetables from the supermarket that have officially passed their sell-by date but are still usable. They also use deformed vegetables from the farmer that do not even make it to the supermarket to be sold. These vegetables are labelled waste, but the bakery uses them as raw material for their cakes, such as carrots for the carrot cake-in-jar.

5.3.3 CS3: The useful application of materials

5.3.3.1 Recycle

All six organisations are aware of the opportunities for recycling, as is the public. When a product or the resources and materials used in service reach the end of their life, they are referred to as waste. The possibility of dealing with waste by separating and processing it, thus recycling, is actively pursued by several organisations. By separating waste, streams such as plastic or paper can be recycled. The painting company and the hospital are actively working to improve waste separation, enhancing recycling.

Besides, it appears that commercial waste on site, such as at the healthcare institution or the customers of the food supplier, is not yet separated into organic waste or plastic, but into a single stream of residual waste. Separating these streams is less financially advantageous than maintaining a single residual waste stream. The food supplier and the healthcare institute believe this should change and are actively working to separate these waste streams despite the higher costs. This could be supported by legislation and regulations reducing the cost of separating commercial waste.

5.3.3.2 Recover

Using waste streams to generate energy concerns the value retention option of recover. All organisations have already taken care of processing their waste streams, either themselves or through municipal means. However, two organisations want to take this into their own hands and generate energy from their waste streams in a higher-quality way.

For instance, the food supplier has agreed with its bring-return service that food residual, i.e. swill, may be returned along with food packaging. The plastic packaging and swill are separated when the products go into a waste processor. The packaging is recycled at a high level, and the organic waste and swill are now used to make biogas. The food supplier thus regulates recover externally. The hospital also wants to work internally on recovering by installing a pharma filter. The hospital is actively stimulating to separate organic waste and food residues from the other waste within their organisation and wants to process this waste stream into biogas itself. However, the pharma filter has not yet been purchased due to the high, financial investment.

Table 13 lists the value retention options from most to least used by the organisations.

<i>Organisations</i>	Order of application of value retention options						
	1	2	3	4	5	6	7
<i>Food supplier</i>	Reduce	Refuse	Reuse	Recycle	Recover	Repurpose	Rethink
<i>Bakery</i>	Reuse	Reduce	Refuse	Repurpose	Recycle	Rethink	
<i>Healthcare institute</i>	Reduce	Refuse	Recycle	Reuse	Repurpose		
<i>Cooperative</i>	Reduce	Reuse	Repurpose	Rethink	Recycle		
<i>Painting company</i>	Reduce	Reuse	Recycle	Refuse			
<i>Hospital</i>	Reduce	Recycle	Reuse	Refuse	Recover	Repurpose	

Table 13: Overview of value retention options per organisation

The value retention option reduce is the most used, with five out of six organisations using this option. The following most frequently used options are refuse and reuse. Two of the three most used options, refuse and reduce, can be classified as CS1 smart manufacturing and usage of products. The following most used value retention options are reuse which comes from CS2, expanding the lifespan of products and its parts, and recycling from CS3, the useful application of materials.

Next to the value retention options in order from most to least used by organisations, table 14 lists the most used circularity strategy from most to least used by organisations.

<i>Organisations</i>	Order of application of circularity strategies		
	1	2	3
<i>Food supplier</i>	CS1	CS2	CS3
<i>Bakery</i>	CS2	CS1	CS3
<i>Healthcare institute</i>	CS1	CS3	CS2
<i>Cooperative</i>	CS1	CS2	CS3
<i>Painting company</i>	CS1	CS2	CS3
<i>Hospital</i>	CS1	CS3	CS2

Table 14: Overview of circularity strategies per organisation

It can be concluded that CS1 smart manufacturing and usage of products is the most common strategy used by the organisations at the beginning, followed by a mix of CS2 extending the lifespan of products and their parts and CS3 the useful application of materials, depending on the organisation and its flow of activities and outputs. Initially, the theory of circularity strategies was developed to be implemented

according to a cascading effect, from top to bottom (Potting et al., 2017). This order of application of circularity strategies is based on the highest value retention of a material, resource, or product at CS1 and lowering the retention of value when going to CS2 and finally to CS3. The organisations follow the intended order relatively well, with CS1 being the first circularity strategy to apply for five out of six organisations and CS2 and CS3 following this order for three out of six organisations.

5.3.4 Coherence between circularity strategies

This section will explain how the circularity strategies influence each other and how they support or contradict each other. This will be done using the organisations of the food supplier, the bakery, the cooperative and the painting company as they are the most prominent examples of coherence between circularity strategies.

Application primarily on CS1: Smart manufacturing and usage of products

The bakery refuses the disposable packaging around its cakes by selecting a reusable glass jar as a replacement. Thus, the choice of refuse (CS1) makes it possible to reuse the jars several times (CS2). In addition, the production of the cake-in-jar generates relatively little waste by avoiding the largest source of waste, disposable packaging. As a result, the need for waste treatment (CS3) is relatively low compared to other organisations.

Application primarily on CS2: Extending the lifespan of products and their parts

The cooperative aims to repurpose organic waste flows as raw materials for farmers (CS2). In doing so, it hopes to initiate change and implementation of CS1, where reductions can be made on several aspects, such as CO₂ emissions, amount of waste and procurement of primary raw materials. Ultimately, what cannot be used in this organic waste stream will remain as residual waste and will be further processed using recycle (plastics) and recovery (residual waste) (CS3).

Furthermore, the painting company actively pursues CS2 to achieve CS1. They are strongly committed to reusing tools and materials (CS2). By reusing these products and materials, they hope to reduce the procurement and use of such tools and raw materials (CS1). In the painting company's situation, they also focus on low-grade recycling (CS3) what cannot be reused (CS2) anymore.

Application primarily on interaction between CS1: Smart manufacturing and usage of products and CS3: The useful application of materials

The food supplier is actively pursuing the interaction between CS1 and CS3. CS1 is mainly about reducing several organisational issues regarding circularity so that the bring-return service can operate properly. This, in turn, will prevent these issues from being resolved later in conjunction with CS3, where the packaging can be recycled. Thus, the food supplier focuses on making the entire chain circular, from procurement to disposal. And it is precisely by combining the two that they can make the system more circular. Unique about this project is that the CS also mainly apply to the chain partners. For example, the implementation of CS1 applies to customers, while CS3 is in the hands of the waste processor.

5.3.5 Circularity strategies according to the types of Circular Kickstart Program

Product-oriented Circular Kickstart Program

Extending the lifespan of products and their parts (CS2) appears to be the most effective circularity strategy with the highest achievable gain for a product-oriented CKP. This is the case for the bakery, the only product-oriented CKP in this research, particularly in terms of reuse for the jars the cake is made in. Next, the value retention options reduce and refuse, which fall under CS1, are applied to this product-oriented CKP. Refusing certain items and reducing use and volume may be important. Finally, a product-oriented CKP also generates waste, but this remains limited in the bakery, yet this waste can be applied correctly through CS3 with recycling or recover.

Organisation-oriented Circular Kickstart Program

An organisation-oriented CKP mainly looks at the whole organisation and its operations. Because it takes a broad view, all three circularity strategies are addressed in such CKPs. The focus lies most on the application of CS1, in which the value retention option of reduce is most used. As mentioned above, reduce is an effective and relatively non time-consuming option for maintaining value where existing systems can continue with minor adjustments. For an organisation there are quick opportunities and gains on many different fronts. After CS1, it can be noted that the order in which CS2 or CS3 is applied varies from organisation to organisation. This depends on which stream of products, raw materials and resources is chosen to focus on during CS1. For example, the hospital decided to focus on recycling as CS3 because, in addition to reducing food waste and organic waste, recycling and recovery of this stream was the next priority. At the painting company, on the other hand, you can see that they are focusing on CS2 as a second circularity strategy, by actively focusing on the reuse of materials and raw materials.

Supply-chain-oriented Circular Kickstart Program

The focus of supply-chain-oriented CKP is on the entire supply chain working together while the interrelationship, flows of resources, raw materials and products are well coordinated. This type of CKP also focuses primarily on CS1 and the value retention option reduce. It also looks at what can be removed from the current system through waste. The next step is to increase the frequency of a product, resource or raw material through circularity strategies, in particular through the value retention option reuse. If it can no longer be used in its original form, other options are considered, such as repurpose in the case of the cooperative. The food stream and organic waste have ended up with another partner in the chain and try to link this stream back to the producer, in this case, the farmer, where the original waste regains its new purpose of raw material. When there is an end of life for products, raw materials and materials, CS3 is considered, where recycling is preferred to recovery. Closer cooperation with the waste processor is sought in the case of the food supplier, where the residual stream can be recycled to a greater extent. Overall, the three circularity strategies are fully covered in the supply-chain-oriented CKPs. The focus is on connecting and overlapping partners to implement the circularity strategies most appropriately for all involved stakeholders.

5.3.6 Role of Circular Kickstart Program on circularity strategies

In all organisations, the CKP directly impacted which circularity strategies were applied and in what capacity. This is because the circularity strategies are part of the approach of the CKP with the same ten value retention options as used in this research.

In essence, the CKP uses all the circularity strategies. Each strategy has a different importance and the CKP recognises this importance. In addition, the CKP also follows the reasoning of Reike et al. (2018) with the cascading effect of value retention options; the higher up the ladder, the more value is retained. This is also how the CKP frames the working sessions with organisations, when it first looks at what is possible in CS1 through refuse, reduce and reuse, then discusses CS2 where this is applicable, and then covers CS3 to see how an organisation's residual flows can be put to high value use. The CKP mainly looks at where an organisation's needs lie and what circularity strategy and associated value retention options can be used for these needs. This is expressed in several ways. An example of how the CKP works in practice with the circularity strategies is the allocation of work sessions based on either the entire R-ladder (at the hospital) or three work sessions belonging to refuse, reuse and recycle (at the painting company).

All in all, the CKP directly influences which circularity strategies are used by consciously addressing this topic with the organisations. In doing so, the CKP applies each circularity strategy, as each has different importance. The CKP simultaneously follows the cascading effect, moving from top to bottom on the R-ladder.

5.4 Multiple value creation

This section discusses the concept of MVC in detail. It is based on the flow created when positive investments are made in one particular capital. MVC is then elaborated for each type of CKP, after which the role of the CKP in executing MVC is discussed. Finally, the complexities of MVC are discussed, particularly the valuation paradox.

As discussed in the literature review, MVC in this research is based on the triple bottom line defined by Elkington (1997) and operationalised in six capitals described by Westerdijk (2021) which is visualised in table 15.

People	Planet	Profit
Human capital	Natural capital	Financial capital
Intellectual capital	Material capital	
Social-relational capital		

Table 15: Overview of six capitals (Westerdijk, 2019) according to the triple bottom line (Elkington, 1977)

5.4.1 Influence of capitals on each other

5.4.1.1 Natural capital

For the food supplier, the healthcare institute, the cooperative and the hospital, a change in natural capital is central to their CKP. Solutions such as more efficient use of raw materials and resources, improved waste separation and waste reduction are the guiding principles of these CKPs.

The cooperative is working on a circular and regional food system. The food flows from the farmer to the customer, and the residual food and organic waste ideally flows back to the farmer. These

recirculating food and organic waste streams can be seen as natural capital and better utilised as raw fertiliser or animal feed materials. The volume of the use of natural capital is not addressed in this organisation; the focus is on linking these flows. This is primarily achieved through social-relational capital, as discussed later in 5.4.3.6. At the healthcare institute, on the other hand, the focus does lie more on efficient use of materials and raw materials. In the past, the remaining waste streams were not separated on-site, and the healthcare institute believes this must change as waste is visible for everyone on-site. "We wanted to invest in waste reduction actively, as waste is one of the most visible issues for the organisation itself, the clients who work here and the visitors" (Healthcare institute, personal communication, 2023). The focus is therefore on more waste separation and less waste of raw materials. Using human, intellectual and material capital creates a positive change for this natural flow at the healthcare institute. Besides, the hospital also focuses on natural capital, particularly food and organic waste. For food, this ranges from the preparation of food to the use of food - how, where and how much food is thrown away. In addition, the organic waste flow is analysed for better segregation and later higher-value use. But again for the hospital, changing the flow of natural capital is made possible by investing in other capitals, such as human and intellectual capital.

Concluding, positive changes in natural capital are actively addressed at several organisations. From table 16, it can be pointed out that natural capital scores relatively high for most organisations and predominates for the healthcare institute and the cooperative. However, changes in natural capital are not made directly, but always through other capitals. Changes in natural capital are implemented through a) human capital, such as changes in behaviour and awareness within an organisation and its customers, b) intellectual capital through protocols, training and nudging, c) material capital with enabling for example waste separation through the creation or facilitation of multiple waste bins, or d) social relational capital in the way that higher value uses of natural capital and residual flows only come about when collaborations are created to facilitate these flows. How each of these flows create changes in natural capital, will be elaborated on in the corresponding parts.

5.4.1.2 Material capital

Material capital is manifested through investment in machinery, tools and waste bins. Investing in material capital can have a positive impact on the other capitals, however, also negative outcomes result from using more material capital such as using more energy for a machine. Investment in material capital is most present for the painting company and the healthcare institute.

The painting company has invested in installing cleaning tools, in their case paint brushes, so that the contaminated water is separated from the sewage system. The result is that employees learn a new way of working (intellectual capital) through new protocols for handling their tools after use. They are also intrinsically motivated to do so (human capital). This results in a less polluted water system (natural capital) and longer tool life because brushes are less dirty and can be reused more often (material capital). This reduces the need to purchase tools in the first place, leading to cost savings (financial capital) and ultimately less raw material required to make these tools (natural capital). However, to start this flywheel of positive capitals, first, a relatively huge investment was made in the installation (material capital) funded with financial investment (financial capital). Next, the installation will use energy to work (natural capital).

The healthcare institute is committed to providing waste bins to enable waste separation. Investing in waste bins (material capital) makes better behaviour possible towards waste for both employees and customers (human capital), which leads to better waste separation and therefore better-quality post-

waste use, which is better for the environment (natural capital). The waste bins are made from residual products from surrounding wood and paint companies (material capital through social-relational capital). In addition, the healthcare institute has links with a technical school to have the litter bins designed and manufactured (social-relational capital) at an affordable price (financial capital).

All in all, investment in material capital can lead to different behaviours as human capital, with different rules for dealing with it, as intellectual capital, which can set in motion a flywheel of positive effects on natural capital and material capital, ensuring less pressure on nature. However, investment in material capital requires a relatively significant financial investment most of the time. Furthermore, using more machines can increase energy use, which must be proportionate to the positive effects on the other capitals. When a relatively high investment in financial capital is combined with a significant increase in energy use, this may result in too many negative outcomes and not lead to positive MVC.

5.4.1.3 Financial capital

It depends on whether financial capital is considered a restraint among the organisations. For example, the food supplier, the cooperative and the painting company do not set a financial precondition at the CKP for investments in other capitals. However, financial capital remains a bottleneck for other organisations and investing in other capitals. Examples include the hospital, which has no financial preconditions, but some major investments with a relatively significant positive impact on natural capital, such as a pharma filter, have not yet been implemented due to a lack of budget. Next, the healthcare institute cannot implement all opportunities for improving their waste streams due to lack of financial resources.

Moreover, the bakery does set a precondition on increase in costs for their cake-in-jar recipe, that is revised by the CKP. Additionally, a contradiction regarding financial resources can be found with the painting company. They state that “the CKP is used purely in the interest of the environment and not to achieve cost savings” (Painting company, personal communication, 2023). However, they also states that “if we have sufficient financial resources, we will always make the green choice”. The phrase “financial resources left” is striking. Only if the painting company has enough financial capital left, next to the organisation's continuity, will they make the green choices. If they do not have financial resources left due to it being invested for continuity for the organisation, the green decisions may not be chosen.

For five out of six organisations, continuity is still the most crucial goal and investing in MVC is secondary. This can be reflected as a conscious choice by the organisations: if organisations can no longer exist, nothing will be created as well as the green initiatives. However, thinking in this way can also be considered short-term thinking. When an organisation invests in MVC, it is investing in future-proofing the organisation. Claessen, Croes & Jonker (personal communication, 2023) also reason this argument, that to implement MVC not only when an organisation is thriving financially, but to implement MVC continuously and as a guiding principle for your organisation, where financial results can flow from, but should not be the goal.

5.4.1.4 Human capital

Investing in human capital manifests itself in investing in human power, such as employees or customers. People seem to be able to initiate positive change and activate MVC by having a positive effect on the other capitals. The organisations with the most significant human capital opportunities were the food supplier, the healthcare institute and the painting company.

The food supplier's bring-return service cannot exist without active cooperation of both parties – the food supplier and their customers. Both have to invest time and work by their employees to make the service successful: the food supplier needs to pack and bring the meal packages properly and the customer needs to return them properly. Active cooperation is also required at the healthcare institute, where participation of their clients and the employees on-site is required to properly use the different flows of waste, materials and resources.

The painting company identified a problem relating to the human capital in its organisation, and invested on human capital actively. Their employees had a careless attitude towards the use of tools and materials. This issue is elaborated on through the example of trays where paint is put onto. Employees are now instructed to handle the trays more carefully by allowing the exterior paint to dry (human capital). The plastic layer can be removed (material capital) and recycled (natural capital), whereas the dried paint can be removed and properly separated, resulting in less environmental pollution (natural capital). The original trays can last longer (material capital), which means fewer trays need to be bought (material capital), which saves money (financial capital) and less has to be thrown away (natural capital). However, the painting company says it does not have enough space for this new system in its current premises. It will include this action when the organisation uses its new premises. The constraint of the limited space in the building, thus material capital, is the limiting factor in starting this flywheel of MVC for the painting company.

All in all, investing in human capital is investing in creating and changing behaviour. Investments in people can be seen as a long-term investment. It can also be seen as the driving force behind MVC; for example, without people, an organisation can buy materials, invest money or establish protocols, but this is without success if it is not executed properly by the employees. Therefore, the behaviour of an organisation's employees and customers is crucial to correctly following protocols and using materials.

5.4.1.5 Intellectual capital

Intellectual capital comes in various forms such as training, protocols, nudging and information provision. It is intended to drive change in human capital and thus influence the other capitals. Intellectual capital has mainly been used at the food supplier, the painting company and the hospital.

The hospital wanted all employees and customers to change their behaviour and awareness around food waste and organic waste positively. Intellectual capital was used in various ways to strengthen human capital, thus behaviour and awareness. For example, staff training was organised in the restaurant, several sign-off lists and prompts were initiated. Also, nudging posters, informative posters and prompts were placed throughout the hospital, mainly in and around the restaurant. The effect of these intellectual interventions was significant; people are actively made to think, leading the hospital to suggest that this has also changed people's behaviour for the better. Ultimately, less food waste leads to a minimised need for natural capital and therefore a minimalised need for financial capital to pay for it.

Training is the main form of intellectual capital actively deployed with customers at the food supplier. They also point out that training is necessary for the success of the new bring-and-return service of meal packages, which will also generate financial cost benefits for customers. “In our bring-return service, we assume a full return rate of packages of 100%. If the return rate is significantly lower and ends up in the residual waste stream, the customers will not take advantage of that. So the revenue model may not be achieved. That's why internal training of employees of our customers is crucial and

necessary.” (Food supplier, personal communication, 2023). So through training (intellectual capital), the customer's employees are trained to use the new system (human capital), which leads to better waste separation (natural capital) and the customer achieving its associated revenue model (financial capital). The food supplier’s ongoing contact with customers also increases their relationship and trust with their customers (social-relational capital).

Besides, the painting company also focused actively on intellectual capital to structure and permanently change the behaviour of their employees, The solutions needed to be quick, simple and effective. Among other things, this led to the introduction of tool sign-off lists to give employees more responsibility for tool management. These solutions help encourage employees and support new working methods, thus human capital.

In conclusion, intellectual capital can have many positive effects on the other capitals and the execution of MVC. Investing in intellectual capital, which has to be implemented by human capital, has positively impacted several CKP projects. Through protocols, instructions and training, processes can be easily improved and thus positively affect other capitals - thus creating positive value at multiple levels.

5.4.1.6 Social-relational capital

Social-relational capital has been of significant value in initiating MVC only at the food supplier and the cooperative. This is particularly the case for the cooperative, where social-relational capital is the basis for their circular and regional food system.

For the cooperative, previously, there was almost no cooperation to speak of between supply chain partners, except that the food cooperative delivered the food to its clients. The customers then dealt with the resulting waste, in most cases not separating it properly and thus not creating an organic waste stream. The cooperative is trying to change this by investing significant effort in social-relational capital: a network of customers and different farmers with mutual connections and flows. The organic waste streams should be correctly separated and collected at customers to be brought to several farmers who can make high-quality use of this waste stream (natural capital). By making the connections and building the network (social-relational capital), less organic waste is lost and more high-value organic waste can be used (natural capital). This also reduces the amount of raw materials needed by the farmer (natural capital), which leads to cost savings (financial capital). However, setting up this circular, regional food system creates more transport movements, which require more trucks (material capital) and generate more CO₂ emissions (natural capital), in addition to which these transport movements have to be paid for by someone (financial capital) and carried out by someone (human capital). Next to that, the bring-return service of food supplier was created to support customers in their sustainability efforts. This service proactively maintains the relationship with the client and continues investing in it as food suppliers are consistent with investing in this social-relational capital.

All in all, the use of social and relational capital, and thus the building and maintenance of networks, customers and connections, can also be a potential flywheel of capitals and thus MVC. However, this was not important for every organisation at the stage of its development during the CKP. As a result, social-relational capital is irrelevant for most organisation’s CKP. Yet, the relevance can be very valuable as more and more will be done in co-creation and collaboration, according to Witjes and Claessen (2023).

The following table (table 16) identifies the capitals that are most likely to be invested in during and after the CKP for each organisation.

Organisations	Order of application of capitals					
	1	2	3	4	5	6
Food supplier	Human	Intellectual	Social-relational	Natural	Material	Financial
Bakery	Material	Intellectual	Natural	Financial	Human	Social-relational
Healthcare institute	Natural	Human	Intellectual	Material	Financial	Social-relational
Cooperative	Social-relational	Natural	Human	Intellectual	Financial	Material
Painting company	Intellectual	Material	Human	Natural	Financial	Social-relational
Hospital	Human	Intellectual	Natural	Material	Social-relational	Financial

Table 16: Overview of multiple value creation per organisation

It can be noted that a wide variety of capitals is used to execute MVC in the organisations that have completed a CKP; almost every capital is used as the first capital to initiate MVC, except for financial capital. The financial and social-relational capitals are used relatively little to start the flywheel of MVC, except for the cooperative. Therefore, it can be said that there is little attention to these two capitals, while human, material, natural and intellectual capitals are more frequently used and primarily focused on. Each organisation has a unique order of the capitals it invests in, which can be reflected in the fact that each organisation is different, has its norms and values, and therefore has different manners as to which capital to invest in most. Therefore, no general conclusion about which capital primarily drives MVC can be drawn. However, there are combinations of capitals that are used more often and are mutually reinforcing; for example, human and intellectual capital reinforce each other by working smarter and harder for customers and employees. These two capitals are also closely related to natural and material capital. Creating better ways of working, where people make better use of all kinds of materials, raw materials and products, often positively impacts natural and material capital. These four capitals are therefore generally the most often and frequently used as the first four capitals.

5.4.2 Multiple value creation according to the types of Circular Kickstart Program
Product-oriented Circular Kickstart Program

MVC occurs at the bakery, the product-oriented CKP, during and after the CKP. The cake-in-jar is optimised on many fronts, while allowing as little loss of capital as possible to make it a success. The equipment used, the reusable jar, is implemented to limit materials, alongside which natural capital is produced with as few new raw materials as possible and as many local, sustainable and reused raw materials as possible. It also limits financial capital to a certain amount. Intellectual capital was used to develop the recipe for the cake-in-a-pot, but little human capital is used and no social-relational capital is used. Overall, the product-oriented CKP implements MVC to the extent that it invests in making positive gains from its product in all capitals, while accepting as few losses as possible.

Organisation-oriented Circular Kickstart Program

To make a comparison between the organisation-oriented CKP and how MVC is executed, it is necessary first to distinguish what kind of business activities and associated outputs the organisations provide, and then what kind of capitals are required for their respective outputs that lead to results in a flywheel of MVC. This research has three organisation-oriented CKPs, each with a different initialisation of MVC according to a particular capital. For the healthcare institute, natural capital is the starting point for its MVC, where material and natural capital is then handled differently by human and intellectual capital. The painting company focuses on minimising the use of resources, raw materials and tools – material and natural capital – followed by intellectual and human capital that are used to create this efficiency. Furthermore, the hospital invests most in human capital influenced by intellectual capital, to get changes in mainly natural and material capital.

Remarkably, financial and social relational capital are less prominent in the organisation-oriented CKPs. The minimal presence of financial capital may be because the organisations consciously work to achieve progress and thus gains for the other capitals in addition to financial progress as they are already used to. The non-presence of social-relational capital may be related to the fact that in these examples, the organisation-oriented CKPs keep their service to the organisation itself. Collaboration with others is often seen as a next step, with the organisation preferring to focus on internal processes first within a CKP.

Supply-chain-oriented Circular Kickstart Program

The supply-chain-oriented CKPs focus mainly on the human, intellectual and social-relational capitals related to 'people'. At the cooperative, for example, social-relational capital is central to creating multiple value and profits for other capitals. Relationships between chain partners are much more linked in this CKP. In addition, the food supplier will need to become and remain active in involving its customers in its bring-return service – social-relational capital – as well as training – intellectual capital – and continuing to encourage good behaviour among its customers' employees – human capital.

In addition to people capitals, natural capital is also present in the supply- chain-oriented CKPs, but it does not take the lead in these CKPs. Positive changes in natural capital are desired by both the food supplier and the cooperative, however, to create changes in natural capital, both organisations believe that changes in people capitals are needed first. In addition, material and financial capital are used relatively little for chain-oriented CKPs. For financial capital they suggest that financial investment is needed to create change in other capitals, so this investment is counted in. In addition, material capital was not as applicable to the business activities and outputs of these CKPs.

5.4.3 Role of Circular Kickstart Program on multiple value creation

The CKP does not deliberately steer on MVC, as this is not part of its original approach, although it is steered on unconsciously. When approaching an organisation, the CKP tries to create an overview of all the flows and select opportunities from them. It then links some of flows together to implement the opportunities. In a sense, this linking of flows can be seen as a part of executing MVC. In addition, the CKP addresses all six capitals to some extent, and for most capitals there is an opportunity to optimise the use of that capital and reduce its negative outcomes. It is noticeable that most is invested in the people capitals (human, intellectual and social-relational capital). This can be due to the CKP team that

believes that the strength of the CKP lies in the execution of people and stimulates the elaboration of cooperation possibilities in a positive way (Founder Lentekracht, personal communication, 2023).

Next to that, there are several issues relating to MVC that the CKP has not yet addressed. For example, the creation of gains in all capitals in balance has not yet been actively addressed. The focus is mainly on what would be a meaningful improvement per capital. The balancing of capitals against each other is central to the strategy of MVC, but has not yet been addressed to this extent by the CKP. There is mainly insight created into what flows exist, and from these, an opportunity is usually selected to be worked out. Making the processes transparent is the first step to working on them through the strategy of MVC. However, the translation of these processes into actions related to MVC is lacking.

Overall, the CKP does not consciously focus on MVC, but by implementing the CKP, organisations are unconsciously addressed to focus on enhancing their MVC. All six capitals are addressed in CKP's projects with organisations. The CKP actively steers the most on investments in people capitals, as they believe strength comes from people. However, the capitals addressed within the organisations are only partially linked and not balanced against each other.

5.4.4 Complexity of MVC

Creating multiple values is a complex task requiring much attention, knowledge and human resources. Almost all experts cite this importance as a significant challenge in executing MVC (Claessen, Croes, Jonker, Barba Lata, personal communication, 2023). This section explains the complexity of MVC and comes up with the valuation paradox.

Complexities

In an organisation, it is complex to involve and encourage everyone to work following the strategy of MVC (Croes, personal communication, 2023). Developing a strategy, let alone implementing it across an organisation, is significant. When doing this at the supply-chain level, it becomes even more complex. Witjes (personal communication, 2023): "Organisations and people are not used to taking responsibility for everything we do. You can't say MVC, but it should be multiple-value co-creation. Simply because as an organisation you don't do anything alone, you do everything in co-creation." When more stakeholders are involved and it is desired to tackle, design and implement whole systems through MVC, it can become very complex. Not every organisation has this knowledge, but perhaps if organisations work together and become more transparent, this can be achieved together (Claessen, personal communication, 2023). There is also the question: who is responsible? Is it at the beginning of the chain, the producer, the seller or the consumer? MVC must happen collectively; everyone takes responsibility for their part. If the intention is clear, if organisations are all trying to generate as few losses as possible on the six different capitals and generate as many profits as possible simultaneously, then the implementation is also straightforward, which will increase the MVC outcomes.

Valuation paradox

The valuation paradox is present in today's society, whereby everything is valued from a money- and economic perspective. This leads to an inability to focus on multiple outcomes. The valuation paradox is addressed by Jonker (personal communication, 2023): "As soon as people value something, they use the concept of value that underlies valuing. Valuing is an activity that leads to determining value. And we, as people in society, have a little mechanism in our heads that translates everything directly into

economic value. The paradox is that we have a much broader understanding of value; often, we just see the function of something. Instead, we have to balance that against other values. So the valuation paradox shows that when society talks about value, it talks about economic value on autopilot. This way of thinking is quite ingrained and you can't get rid of it overnight." Barba Lata (personal communication, 2023) confirms this way of thinking in society: "The things we value, consciously or unconsciously, tend to be expressed in cost or financial terms because we are stuck in this one system. Valuation and the value of something thus should not only be expressed in economic terms but much more broadly."

Thinking in terms of MVC is a helpful step in changing current economic 'value thinking'. MVC in principle is to look at value in balance. In the organisations that have completed the CKP, a difference in the way they think about value can be discovered compared to the organisations that Jonker (personal communication, 2023) is talking about. Most of the organisations in this research are working on circularity, giving a higher value to environmental aspects. Four of the six organisations express this regarding CO₂ emissions, three in the healthcare sector, with certification playing an increasing role. This research showed that environmental aspects are measured and evaluated in terms of CO₂, for which the organisations try to achieve a "higher" certification level step by step. However, the social field is still left out. There is no specific social impact or value measure, so it seems out of sight. Currently, the social issues do not seem to be measured and, as a result, they are not aligned with the financial aspects when an organisation has to make decisions. Therefore, the social aspects are not aligned adequately with the economic and environmental elements within MVC for the organisations in this research.

5.5 Interrelationship of circularity strategies and multiple value creation

The following section explores the interrelationship between circularity strategies and MVC in general and for the organisations that completed a CKP. First, the extent of similarities and differences between the two strategies are discussed. Next, the influence of circularity strategies on MVC is concerned, and vice versa, the influence of MVC on circularity strategies. After that, it will be evaluated whether a specific order of application between the circularity strategies or the MVC is to be preferred in terms of effectiveness. It also explains the importance of applying both concepts and the challenges of applying both. Finally, the different types in combination with the interrelationship and the role of the CKP on the interrelationship is discussed.

5.5.1 Extent of similarities and differences

Similarities

The common feature of both circularity strategies and MVC is that when an organisation embarks on one or both strategies, it invests in long-term thinking. Both strategies require an examination of an organisation's long-term vision because they cannot be implemented in the short term due to a lack of (human) resources, prospects and results. In the short term, the strategies will produce little or no results (Croes, personal communication, 2023). Following on from the previous point, both strategies also consider the futureproofing of an organisation. The earth's natural resources and materials are becoming increasingly scarce, which requires changing how people interact with the earth (Meadows, 2007). To actively engage with this changing earth as an organisation, futureproofing is a spearhead.

Both strategies focus on futureproofing and more carefully using an organisation's capitals to preserve its value. The aim is to achieve balance and equilibrium between what an organisation produces as inputs and what it produces as outputs and outcomes, resulting in a neutral or positive balance.

Differences

One of the main differences between the two strategies is that, in essence, circularity strategies have value retention as its goal, whereas MVC has value creation as its goal. MVC is a little more nuanced, with value creation being part of balancing the six capitals. However, one focuses on preserving existing value and the other on creating new value. Moreover, there is a difference in where the strategies focus precisely in the scope of the business model. The circularity strategies focus mainly on value retention within input, throughput and resulting output. For input, the focus is primarily on CS1 and for throughput and output, CS2 and CS3. In contrast to circularity strategies, MVC also focuses on the outcomes that result from these organisational processes in addition to the input, throughput and output. The essence of MVC is that during and after use, the outcomes should also be included when you as an organisation reflect on your value creation process; otherwise, it is out of balance (Jonker, personal communication, 2023).

5.5.2 Influence circularity strategies on multiple value creation

When an organisation starts to apply circularity strategies, it starts to work on maintaining the value of its raw materials, resources and products for as long as possible. How an organisation achieves this is what needs to be designed next. In terms of these flows, an organisation can focus on a) the front end of the process during the input, b) the throughput with the production of products or services, or c) the output in the form of products or waste. When this is linked to MVC, the focus is on the use of material and natural capital, especially linking it to the outcomes resulting from organisations' outputs. For example, at the painting company, the focus is on tools and paint materials, at the bakery, on ingredients and cake packaging, and at the healthcare institute, on material, water use and all possible waste streams. Applying circularity strategies to value retention also makes an organisation think differently about how it uses its capital. An organisation wants to retain the value of natural and material capital for as long as possible when it focuses on circularity. And retaining natural and material capital is accomplished through investing in other capitals. How organisations implement this, in ways of investing in other capitals, varies from organisation to organisation. For example, the painting company and hospital focus on intellectual and human capital. In contrast, the cooperative actively focuses on social and relational capital through a network to achieve an improvement in the other capitals.

In summary, applying and actively thinking about circularity strategies leads to thinking about and implementing MVC. Thinking about value retention leads organisations to consider how they can facilitate this value retention, who they need to do this, internally or externally, and what tools can drive this value retention.

5.5.3 Influence multiple value creation on circularity strategies

MVC refers to looking at how the capitals in an organisation are balanced in harmony with each other, minimising losses for each capital and maximising multiple wins. An organisation actively thinks about how it creates value, what capitals are needed to create that value and how that value is created in balance with other capitals. By thinking about this, an organisation starts to think about how it creates value at the level of people, profit and planet, with the six capitals underneath and balancing them. How to optimise the capitals during value creation can be addressed through circularity strategies. Not only during value creation but especially in maintaining value after the creation process. When an organisation thinks of multiple values, it also aims to retain the gains in all areas for as long as possible. This can be done by applying circularity strategies. For example, the food supplier wants to make its food packaging as effective as possible with as little negative impact on capital as possible. To avoid the consequences of using the meals in packaging, end-of-life and recycling are actively pursued through the bring-return service set-up. By actively focusing on CS1 in interaction with CS3, the food supplier can reduce the negative impacts of its bring-return service while keeping the multiple value of its product as high as possible. Next, the bakery aims to create maximal gains on all capitals while allowing as little loss on the capitals and their outcomes. By focusing on this goal, the circularity strategies assist the strategy of MVC with applying refuse and reduce strategies.

In conclusion, an organisation's thinking in terms of MVC encourages it to invest in long-term thinking. And that means thinking first and foremost about value creation and immediately and proactively about value retention. Value retention helps maintain multiple positive outcomes for your organisation compared to negative outcomes when circularity strategies are not applied. Both circularity and MVC are strategies that an organisation can adopt. However, it may not be possible for an organisation to focus on both strategies simultaneously. If an organisation cannot do both simultaneously, it must first decide which to focus on: circularity strategies or MVC? The following section discusses whether to focus first on circularity strategies or MVC.

5.5.4 Order of application of the strategies

Suppose an organisation is motivated to think more carefully about using all types of capital and the value retention of these capitals. In that case, it can be argued that the organisation should focus first on MVC and then on circularity strategies. MVC encourages thinking about how the use of your capital is currently flowing, where there are losses and gains. It can then look at how this flow of capital can be redistributed. An organisation can then start to apply circularity strategies to either maintain this value as much as possible by applying CS1, re-create the value as much as possible in the product by applying CS2, or then usefully apply it as much as possible by applying CS3. However, MVC must first be applied to create value as evenly as possible across all capitals. An example is the bakery, which creates the cake-in-jar as an output. The bakery creates the cake-in-jar that simultaneously creates as much profit as possible on all capitals and as little loss as possible on the capitals, primarily natural and material capital. After use, the optimal circularity strategies can be applied to keep the value created as high as possible for as long as possible.

Croes and Witjes (personal communication, 2023) argue that investments in MVC should always be made first to achieve circularity in an organisation. Croes (personal communication, 2023): "If an organisation still has a short-term linear starting point, extending the life cycle is negative for the organisation's short-term profits. As a result, from MVC you will always have to move from more-more-

more to less but better and from short-to-long. MVC is the starting point for working with circularity. So circularity flows from the execution of the MVC strategy. So to make the shift where an organisation is looking not only at a financial profit but also at the profit of the other capitals and valuing this in a circular way, a commitment to MVC is first required. Witjes (personal communication, 2023) also confirms the argument that MVC must be used to put circularity into practice: “To ultimately enable the most optimal situation in the use of natural resources, we have to work towards the most optimal mix of R-options, value retention options, and you can only achieve that by using multiple value co-creation.” It can therefore be concluded that MVC broadens the way value is created at multiple capitals, and thus also broadens the possible gains on these capitals. Circularity strategies build on this by retaining these broader gains for the capitals for as long as possible.

5.5.5 Importance and challenges of applying both strategies

Importance of applying both strategies

The previous sections show that the most effective and logical order is to work first on MVC and then on circularity strategies. In this context, it can be concluded that organisations are interested in working on and investing in both strategies. But why?

“If organisations are working on circularity strategies, applying the value retention options, and not working on MVC, it makes no sense. Then you work within your organisation to get things done without looking at the bigger picture. The other way round, if you start doing MVC without linking it to the output you are ultimately creating, it makes no sense either” (Witjes, personal communication, 2023).

When organisations focus on the "bigger picture" as elaborated by Witjes (personal communication, 2023), they are investing in the long term of their business and thus their continuity in the future. circularity strategies and MVC are both strategies that can help organisations to see and act on their "bigger picture". The interplay of MVC and circularity strategies is important for several reasons. Circularity strategies actively engage with the outputs you create as an organisation. MVC actively engages with the positive outcomes of your outputs on the various capitals, but even more so with the positive outcomes associated with your business activities and outputs. Circularity strategies preserve the value in your outputs; MVC preserves the value in your outcomes and limits their negative externalities. Claessen (personal communication, 2023): “It's an extension of each other. I don't think you can make a circular product if you don't look at MVC, if you don't include outcomes in your decisions.”

Cooperation between chain partners in implementing both strategies is also crucial (Claessen, Witjes & Barba Lata, personal communication, 2023). In current practice, it is mainly seen that circularity strategies pay little attention to the social aspect, as they focus primarily on the tangible output and little on intangibles, such as how it affects people or the change and impact it has on society (Barba Lata & Witjes, personal communication, 2023). In addition, it is also seen that circularity strategies are still very much about materials and products, but not about the value side, i.e. how the economic side of the circular economy should be classified. One way to shape this social part and to look beyond the technical issues is to apply the strategy of MVC. MVC shows a more comprehensive mapping of products with social aspects through the capitals of human capital, intellectual capital and social-relational capital. MVC also ensures the active inclusion of the results related to the technical output on which circularity focuses.

Challenges of applying both strategies

Besides the importance of applying both strategies, there are also challenges in doing so. The complexity involved is the main challenge in applying both strategies, whether simultaneously or sequentially. “The complexity is very high, mainly because organisations have to do it together in co-creation when you apply both strategies correctly. If you look at an organisation's whole value chain, they don't do it alone. The most effective way is to apply these strategies with all the partners involved, but it is also the biggest challenge because there is very little transparency in the chain at the moment.” (Claessen, personal communication, 2023) . Again, this highlights the importance of collaboration, co-creation and transparency between partners in a chain. The fact that organisations are working on their own with the strategies of circularity and MVC is a big step in the right direction. Internally, this already involves several complex issues for an organisation. However, to make the strategies even better, cooperation with the chain is also essential (Claessen & Witjes, personal communication, 2023).

Next, most organisations have a linear business model by nature (Claessen, personal communication, 2023). This is also evident in the organisations that have completed the CKP. There needs to be a shift from a linear to a circular business model, which has implications for circularity strategies, but also for MVC. In this way, capital can retain its value for longer and is less likely to reach its end of life, which also means fewer outcomes are associated with it. These changes must be mapped to proactively target these gains and fewer losses.

Finally, a significant challenge is to link the strategies to reinforce each other. Witjes (personal communication, 2023): “The big challenge is to link the two. The fact that they are not currently linked is a bigger challenge.” This understanding still exists within organisations, where the CKP can play an important role. The CKP's current role in linking the strategies for organisations will be discussed in the next section.

5.5.6 Interrelationship according to the types of Circular Kickstart Program

Product-oriented CKP

In the product-oriented CKP, the interrelationship between circularity strategies and MVC is relatively small. The simple explanation for this is that the interplay of capital for the product at the bakery does not interact with the overall MVC of an organisation to the extent that it interacts much with the circularity strategies used for the product. Because the circularity strategies only address a product and not the entire organisation or supply chain, there is relatively less interrelationship because it has and will have less potential potency.

Organisation-oriented CKP

In addition, the organisation-oriented CKP includes an interrelationship between circularity strategies and MVC. However, this varies from organisation to organisation and the extent to which the organisation wants to work with it actively. Linking and seeing multiple strategies you apply as an organisation is challenging. This is also supported by Claessen and Croes (personal communication, 2023). Organisations actively pursue circularity strategies through the CKP, which is relatively new information for most regarding sustainability. The overarching MVC strategy, in which outcomes also play an active role, is not for every organisation. For example, the healthcare institute and the hospital focus relatively more on this, while the painting company produces a less complete picture and results.

This may also be because the healthcare institute and the hospital employ a sustainability coordinator already experienced in this type of issue. In contrast, the painting company does not employ anyone for this purpose.

Supply-chain-oriented CKP

The supply-chain-oriented CKP has the most potential to see and actively engage in the interrelationship between circularity strategies and MVC. The food supplier and the cooperative, the supply-chain-oriented CKPs, see the importance of linking multiple stakeholders in a supply chain. In doing so, they also recognise that it is a complex process to connect everyone to do the “right thing” together, and are therefore better able to deal with the complexity of applying both strategies at a strategic level and thus better able to apply the interrelationship. The cooperative (personal communication, 2023) says: “In building the circular and regional food system, we settle for nothing less than gains with as few losses as possible”. In this one sentence, the cooperative explains that they are actively committed to both circularity strategies - a circular food system - and MVC - making profits with as few losses as possible.

5.5.7 Role of the Circular Kickstart Program on interrelationship

The CKP consciously steers towards circularity strategies, but unconsciously towards MVC. This distorts the extent to which the CKP influences the interrelationship. For example, the CKP focuses mainly on circularity strategies, whereas the experts (Claessen, Croes, Witjes, personal communication, 2023) argue that MVC should be focused on first. Although the CKP does not actively focus on MVC, it prepares an organisation to a certain extent by helping to make its various flows transparent. The CKP also helps to bring all capitals to light and discuss their potential separately, although not in connection with each other, which is at the core of MVC. Therefore, it can be argued that the role of the CKP on the interrelationship is to create awareness and urgency for MVC within the organisations while actively steering the application of circularity strategies, which in turn increases the correct output and outcomes on multiple capitals.

6. Conclusions and discussion

In this chapter, the conclusions will be made based on the analysis of the results. Next, the discussion follows where the interpretation of results and the research limitations are discussed. Furthermore, the critiques on the methods used are described. Finally, several theoretical reflections are made.

6.1 Conclusions

Six organisations were examined in this research, each of which completed a CKP. The primary output and business activities of four organisations are focused on services, and two are focused on the production of products. This determined which flow was studied for each organisation in this research. In addition to this distinction between organisations, a distinction is also made between different types of CKP, namely a) product-oriented CKP, b) organisation-oriented CKP and c) supply-chain-oriented CKP. This research studies one product-oriented CKP, three organisation-oriented CKPs and two supply-chain-oriented CKPs. Table 17 gives an overview of the organisations with their a) motivations, b) order of importance of applying circularity strategies, and c) order of importance of applying MVC.

Type of Circular Kickstart Program	Product-oriented	Organisation-oriented			Supply-chain-oriented	
Organisation	Bakery	Healthcare institute	Painting company	Hospital	Food supplier	Cooperative
Motivation	Intrinsic motivation Strategic view Subsidy	Intrinsic motivation Strategic view External pressure Subsidy	Intrinsic motivation Internal pressure Subsidy	Internal pressure External pressure	Strategic view External pressure	Strategic view Internal pressure Subsidy
Circularity strategies	1.CS2 2.CS1 3.CS3	1.CS1 2.CS3 3.CS2	1.CS1 2.CS2 3.CS3	1.CS1 2.CS3 3.CS2	1.CS1 2.CS2 3.CS3	1.CS1 2.CS2 3.CS3
Multiple value creation	1.Material 2.Intellectual 3.Natural 4.Financial 5.Human 6.Social-relational	1.Natural 2.Human 3.Intellectual 4.Material 5.Financial 6.Social-relational	1.Intellectual 2.Material 3.Human 4.Natural 5.Financial 6.Social-relational	1.Human 2.Intellectual 3.Natural 4.Material 5.Social-relational 6.Financial	1.Human 2.Intellectual 3.Social-relational 4.Natural 5.Material 6.Financial	1.Social-relational 2.Natural 3.Human 4.Intellectual 5.Financial 6.Material

Table 17: Overview of motivation, circularity strategies and multiple value creation of organisations

Motivations

Each organisation had a unique mix of different motivations for participating in a CKP. Strategic view and subsidy are the most used motivations for participating in a CKP (4x), while the organisations use the other three motivations equally (3x). Firstly, the product-oriented CKP is motivated by intrinsic motivation, strategic view and subsidy. This can be explained by the fact that the bakery itself is intrinsically motivated to work on circularity and the product development focuses on creating a new product that has a positive strategic impact. Secondly, the organisation-oriented CKPs are mainly motivated by internal and external pressures. This can be explained by the fact that their organisation is at the centre of the CKP and the pressure from their organisation, internally from employees or externally from regulation, was the motivation to change and thus implement a CKP. They are also motivated by intrinsic motivation, the subsidy and the strategic view. Finally, the supply-chain-oriented CKPs are both motivated by the strategic view, which can be explained by the fact that focusing on the whole supply chain is strategically complex, as there are many stakeholders, values and things to consider. The supply-chain-oriented CKP has a more strategic view as a motivation than other CKPs because these CKPs are more strategic at heart compared to a single product or organisation as a CKP focus. In addition, internal and external pressures as well as subsidies are also motivations for the supply-chain-oriented CKPs.

Circularity Strategies

In terms of the application of circularity strategies, most organisations have committed first and foremost to CS1 smart manufacturing and usage of products, particularly to the value retention option reduce. Reduce is a relatively simple option to implement, where structural processes do not need to be changed. This explains why it is the most used option for five of the six organisations. Refuse was also widely used, making CS1 the most used strategy for almost every organisation in this research.

Next, CS2 extending the lifespan of products and their parts and CS3 the useful application of materials were used alternately, and this differed depending on a) the type of CKP and b) the purpose of the CKP. For example, the product-oriented CKP, the bakery, next had CS2 with the reuse of the jar and the repurposing of vegetables, but also a supply-chain-oriented CKP, the cooperative, with the repurposing of organic waste as raw material. The organisation-oriented CKPs mostly had CS3 as the most frequently used circularity strategy after CS1, with a higher degree of internal or external recycling and recovery.

Ideally, the circularity strategies are used in the order CS1-CS2-CS3, with the highest value retention at CS1 and the lowest at CS3. The circularity strategies are deployed most effectively for almost all organisations; nearly every organisation applied CS1 first, the strategy with the most significant impact on value retention, then half applied CS2 and the other half applied CS3 as next strategy. Besides, most organisations' primary output and business activities did not lend themselves to most of the value retention options at CS2, which may also explain why not all organisations followed the cascading effect of CS1-CS2-CS3 in order.

Multiple Value Creation

In addition to circularity strategies, all organisations have a degree of MVC implementation. What varies from organisation to organisation is which capital is focused on first to create a flywheel effect of positive (and limited negative) outcomes. Natural capital is relatively much invested in for several organisations to achieve change and create MVC, although this is mainly achieved by focusing on all the other capitals. In addition, the people-related capitals, such as human and intellectual capital, are actively used because of their relatively significant impact on the other capitals and partly because of their current problems in the organisations. However, there is limited focus on social-relational capital, except for one supply-chain-oriented CKP organisation. The fact that the product-oriented and organisation-oriented CKPs focus relatively less on social-relational capital can be explained by the fact that the focus of the CKP is mainly within the organisation's processes and internal change is foremost. Finally, there is a limited focus on financial capital, which can be explained by organisations implementing a CKP to look beyond their financial matters to what they already do regularly.

Interrelationship

What is common to both circularity strategies and MVC is that they both focus on futureproofing an organisation, taking a long-term view rather than a short-term one. They also require organisations to take a broad perspective. For both strategies to be most effective, it is best to look as broadly as possible, including supply chain partners. This is mainly the case for the two organisations that have completed a supply chain-focused CKP. The main difference between the circularity strategies and MVC strategies is that circularity strategies focus on value retention in balance, while MVC focuses on value creation in balance. Circularity strategies focus on input-throughput-output and MVC includes outcomes next to input-throughput-output. Therefore, MVC creates a more complete picture, looks

beyond the technical focus of circularity strategies, and includes more aspects of transforming an organisation with its full view of the six capitals.

Therefore, an order of application is considered between circularity strategies and MVC: organisations should first focus on MVC to grasp the whole picture of their organisation to understand how they create value. Organisations should then concentrate on circularity strategies to ensure that the value created is retained at the highest possible quality for as long as possible. Among the organisations that have participated in a CKP, the use of MVC as a first strategy is relatively low compared to circularity strategies. This may be because the CKP actively steers towards applying circularity strategies, yet not consciously towards MVC. Despite this, there does seem to be MVC execution within the organisations, triggered by a different capital in each organisation.

Notably, the exploration of both circularity and MVC strategies shows that for every organisation, there is co-creation and collaboration with partners in the supply chain. As a result, strategies need to operate with this in thought. Transparency in an organisation is essential to enable collaboration. The CKP drives collaboration in each type of CKP, although this elaboration remains mainly with the supply-chain-oriented CKP compared to the product and organisation-oriented CKPs. It is also essential to measure both strategies to assess progress, but this remains difficult due to the valuation paradox, where most things are now measured only in financial terms. For environmental aspects, CO₂ emissions are a tolerated metric, but the social component is undervalued here because there is no valid metric for it yet generally.

In conclusion, there is indeed an interrelationship between circularity strategies and MVC. Creating value in a balanced way and then preserving it effectively benefits an organisation in environmental, social and financial terms. The organisations apply both strategies; however, the extent to which the strategies reinforce, affect or constrain each other remains limited.

Role CKP on circularity strategies, multiple value creation and their interrelationship

The CKP deliberately steers towards circularity strategies as part of its approach. In this way, the CKP steers the application of any circularity strategy for an organisation aligned to the needs of an organisation. In addition, the CKP unconsciously steers towards MVC because it visualises all the different capital flows in an organisation that were not visible before and connects it to opportunities. All capitals come into play, yet the people capitals of human, intellectual and social-relational capital have been invested in by the CKP the most. This can be explained because the CKP believes in the power of people behind change. However, the CKP tends to address change in one capital at a time and not so much in coherence with each other. Therefore, the CKP does not address the balance between capitals and the influence of one on the other in organisations, which is core to MVC. Finally, the role of the CKP in the interrelationship between circularity strategies and MVC is that it steers first to circularity strategies and then slightly to MVC. In contrast, the most effective application of order is vice versa. The CKP mainly addresses the interrelationship by creating awareness and urgency for MVC, but not the actual execution of MVC, while actively steering on circularity strategies and retaining the value created by the organisation.

Overall, the 'bigger' the type of CKP (in order from small to large: product-oriented, organisation-oriented and supply-chain-oriented CKP), the more opportunities there are for interaction between circularity strategies and MVC. However, the larger the project, the greater the complexity of partners, products and flows, which makes the execution of both strategies also more complex. In addition, both circularity strategies and MVC theoretically have a shortfall in the social part, which becomes particularly apparent when the scope of a CKP also increases. However, the CKP sees the strength behind the social aspect, which is particularly evident in the CKP's focus on the people-sided capitals of MVC for the organisations. As a result, most organisations invest relatively heavily and proactively in human, intellectual and sometimes also social-relational capital to positively impact other capitals. The value MVC creates on other capitals, such as natural, material and financial capital, is then integrated as much as possible according to the use of CS1 and CS2 and CS3. The experts interviewed for this research also emphasise the importance of using both strategies of circularity and multiple value creation, as they state, 'one is not possible without the other'. Investing in both strategies has enormous potential for futureproofing an organisation and is therefore important.

In conclusion, there is an interrelationship between circularity strategies and MVC and the importance of applying both strategies to an organisation has become apparent. However, the interplay between the two strategies is still limited in the organisations that have completed the CKP. Circularity strategies is actively applied, especially CS1. In addition, MVC, especially the people-related capitals, is also actively addressed to achieve positive outcomes for the other capitals. Furthermore, the CKP has an active role in influencing the application of circularity strategies and a passive role in applying MVC in organisations. As a result, the CKP has limited influence on the interrelationship between circularity strategies and MVC, but there are significant opportunities to actively manage this and make the cooperation of both strategies flourish.

6.2 Discussion

6.2.1 Interpretation of results

This research interprets MVC from the perspective that MVC is, on the one hand, stimulated by actively and positively investing in one capital, creating a flywheel of consequences, preferably positive for the other capitals. On the other hand, it is interpreted so that an order can be made for the capitals in which capital is invested chiefly, or the most opportunities are seen per organisation. This choice of interpretation is made due to the particular flow being invested per organisation, compared to an investigation of MVC for an organisation as a whole. When organisations are measured as a whole for the strategy and outcomes of MVC, other methods of interpreting MVC could be using the Multi-Capital-Scorecard connected to thinking of multi-capitalism (McElroy & Thomas, 2015). The Social Impact Measurement Model is a model that also measures social or environmental impact (Rawhouser et al., 2019). These theories could improve the interpretation of the qualitative way of measuring MVC.

6.2.2 Limitations of research

This research has some limitations. First, this research has relatively much dependence on the CKP and the choices made by the CKP. The CKP only has ten organisations that completed the program, which was the pool of organisations available for organisations to be researched for this research. Not all ten organisations had appropriately executed CKPs, and four were therefore unsuitable for this research.

This narrowing of the possible cases resulted in a non-proportional distribution of organisations representative of the three types of CKP. Thus, only one product-oriented CKP was studied, in addition to three organisation-oriented CKPs and two chain-oriented CKPs. Besides, the CKP also determined the flow of business activities and the resulting output and outcomes studied in this research. In the CKP, this flow is chosen in agreement with the organisation itself. However, that determined that this research could only research circularity strategies and MVC for that particular flow. Therefore, a biased image of organisations could be presented as the studied flow may not represent all the organisation does in its breadth. Furthermore, subjective opinions next to personal experiences of the respondents of the organisations make it hard to state “fixed” or entirely unambiguous results. From every organisation, one respondent is spoken to that was present with the execution of the CKP. However, speaking to one person in an organisation may not represent how others or the organisation is.

Moreover, the current interpretation of circularity strategies and MVC in the analysis can be seen as a limitation of the results, as the results remain somewhat abstract. It was not easy to find and describe the literal interplay between the circularity strategies and MVC strategies. This is because some organisations have not yet implemented the strategies but intend to do so. Therefore, if one or even both strategies are not yet implemented, it is difficult to find an interplay that could happen in the future between these strategies. For example, there could be a link between investment in material and natural capital in relation to CS2 extending the life of products and their parts, as high investment in products, materials and machinery would also affect the extent to which these products and materials are reused, remanufactured or refurbished in an organisation. These links are not made in this research, which explains why the results can sometimes be seen as abstract.

6.2.3 Critiques on method

In this research, the conceptual model follows the IIRC theory, where the six capitals “enter an organisation” where there are inputs, throughputs, outputs and outcomes, which in turn lead to the six capitals again. However, a critical look at this model suggests that it still assumes a black-box view of an organisation. Black box thinking suggests that an organisation on paper only produces its raw materials, materials and products from start to finish (Hargreaves, 2005). Cooperation with other parties is therefore not included. Jonker (pers. com., 2023) and Müller (2012) argue that input-throughput-output-outcome thinking, as black-box thinking, is thus linked to the linear model. One option to include the circular economy in the MVC model could be to replace the black box part of the organisation (input-throughput-output-outcomes) with a life cycle model. Through replacing this, the transparency and co-creation between organisations are stimulated, as explained by Witjes (personal communication, 2023), as central to a circular economy.

6.2.4 Theoretical reflections

This research contributes to the broader scientific debates on circularity and MVC by giving insights into how these strategies are implemented in practice, how they interrelate with each other, and how a program focused on circularity interferes with this interrelationship in practice. Some theoretical reflections will be elaborated on in the following section.

Firstly, this research has chosen to operationalise MVC according to the six capitals method described by the IIRC (VRF, 2022) and Westerdijk (2021). However, this method does not distinguish for whom the capitals can be used in an organisation. By distinguishing between internal and external capital, it would become more apparent by whom and for whom the capitals are used and deployed (internal capitals) and for whom the result is (external capitals). CIRCLES (2021) presents the six-capital method for MVC, including the difference between internal and external capital (figure 8).

<i>Capital</i>	Internal	External
<i>Financial capital</i>	Liquidity Profitability	Shareholders value
<i>Material capital</i>	Quality installations Productivity Machinery	Buildings Installations Integration into surroundings
<i>Human capital</i>	Skills Development Training	Employment Social inclusion Participation
<i>Natural capital</i>	Energy consumption Wasting	Product and packaging CO2 Residual flows
<i>Social-relational capital</i>	Forms of cooperation Mutual atmosphere	Customer satisfaction Local commitment
<i>Intellectual capital</i>	Innovative capacity Structure Execution of processes	Intelligent cooperation Chain collaboration

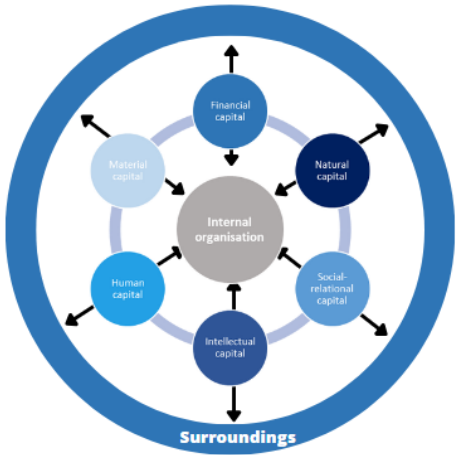


Figure 8: Renewed multiple value creation model by CIRCLES (2021)

In this research, both the internal and external aspects of natural capital are used as natural capital. Therefore, it may seem unclear who uses the capitals and for whom the capitals have what outcomes. This distinction between internal and external capitals could be even better operationalised, for example, by applying the distinction of value creation discussed by Jonker & Witte (2013) to MVC. To this end, Jonker & Witte (2013) identify five entities for which value is created: 1) the individual, 2) society, 3) the customer, 4) the organisation and 5) the team. Here, the internal part is then operationalised from the perspective of an organisation, which is the organisation and its team itself. In addition, there are three external entities for which value can be created: the individual, society and the customer.

Secondly, this research supports the growth perspective in the thinking behind value creation, specifically that organisations still aim to create growth with their organisation. One of the most common criticisms of the circular economy concept is that it embeds the growth narrative (Corvellec et al., 2022). This research could also have been approached from a degrowth perspective, arguing that there is no need to create more in the world but less (Kallis et al., 2015). This theoretical debate can be linked to Hopwood et al.'s (2005) theory, distinguishing between status quo, reform and transformation perspectives. This research does not commit to fundamental societal changes, such as the disappearance of certain organisations, thus supporting the reform perspective. One could argue that to achieve a real transition to circularity and MVC, including within organisations, significant change and a transformation perspective are needed. If this research had followed a transformation perspective, for example, MVC might have focused less on gains in all possible areas and more on mitigating negative impacts on outcomes. The aim would not have been to maximise gains in all areas, but rather a growth path that, on the contrary, creates more with less. Circularity strategies do fit well

with the degrowth perspective and would have stimulated it in a positive way, because they focus on preserving value as much as possible and reducing the demand for new value.

Finally, using the terminology of “capitals” within the six-capital method of MVC may give the illusion that the research supports capitalist thinking. However, the opposite is true. Instead, MVC does not support the single focus on making a profit at the expense of everything else that can be imagined within capitalism. Instead, MVC supports multiple values, not sacrificing one thing for another and trying to make a profit in every area with the least possible loss. To avoid this illusion, perhaps a different terminology for “the six capitals” would be more appropriate, such as “the six values”.

6.3 Recommendations

A first recommendation is to explore the concept and strategy of MVC further as it interacts with circularity strategies. MVC is a complex concept, especially when measuring and researching it (van Dorsen & van Alphen, 2020). In addition, it is still a relatively new concept that organisations have heard little about in practice, so it needs more time and depth to be fully understood by organisations and explored in organisations. A more integrated approach to MVC could possibly be explored with a different model that is more inclusive than the six-capital method. It could also be decided to study fewer organisations in total but to study these fewer organisations more in-depth. This can be done by interviewing several people from an organisation, ideally from different levels and disciplines of an organisation. This will allow you to explore more of the MVC across the organisation.

It could also be important to look at this research in a quantitative way, where circularity strategies and MVC are measured in numbers. However, this brings up the problem of the valuation paradox, where everything is seen in financial terms. I would suggest measuring environmental capital regarding CO2 emissions, as this is the most commonly used environmental metric, for example, in certification programmes. Furthermore, the social aspects can be measured through, for instance, Organisation Network Analysis, using surveys or analysis of meeting schedules (Hawe et al., 2004). In addition, linking the quantitative conclusions with a qualitative analysis of the organisation remains important to connect the organisation and the results correctly. Concluding, I propose a mixed method research, where circularity and MVC can also quantitatively provide information, with this information then being tested against the reality of the organisation and its ins and outs qualitatively.

Another recommendation is to compare the interrelationship of circularity strategies and MVC and the influence between organisations like Lentekracht and different programmes like the CKP. For example, Copper8 or The Circular Hub also offer similar programmes for organisations. Such research would therefore consist of two parts: on the one hand, it would focus on the interrelationship between the application of circularity strategies and the realisation of MVC. On the other hand, the research would focus on comparing the impact of different programmes such as the CKP, the COPPER8 programme and the Circular Hub programme.

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Appendix

Document analysis documents

Organisation	Nr. docs	Name of documents
<i>Food supplier</i>	7	Notulen werksessie (3x) Missie CO2 neutraal Kansenoverzicht Cirulaire aanpak Haalbaarheidsrapportage breng-retour service
<i>Bakery</i>	5	Notulen werksessies (3x) Advies houdbaarheid Eindrapportage
<i>Healthcare institute</i>	5	Notulen werksessie (1x) Advies CK Plan van aanpak Zorg en Duurzaamheid document Eindrapportage
<i>Cooperative</i>	5	Notulen werksessies Kansenoverzicht Cirulaire aanpak Eindrapportage Statuten met missie
<i>Painting company</i>	6	Notulen werksessies (3x) Kansenoverzicht Duurzaamheidsdoelen Eindrapportage
<i>Hospital</i>	7	Notulen werksessie (2x) Cirulaire kansen overzicht (2x) Plan van Aanpak Implementatie rapport voedselverspilling en GFT

Document analysis on circularity strategies

Protocol document analysis on circularity strategies	
Aim	To a) get an in-depth understanding of the circularity strategies applied at the organisations in order to formulate preliminary information for the interviews with organisations. To b) get an in-depth understanding of the influence of the CKP on the seizing and application of circularity strategies at the organisations during the CKP.
Research question	RQ: In what way are circularity strategies applied during the CKP and how does the CKP steer for this?
Selection of texts	Opportunity matrix, minutes of working sessions, circular approach (action plan) and final report

Operationalisation	Circularity strategies defined by (Potting et al., 2017) divided into ten value retention options, also called the R-ladder, as defined by (Reike et al., 2018)
Method	Frequency of exact words related to circularity strategies + implication of words that relate to and indicate circularity strategies considered on content and importance to the CKP

Document analysis on multiple value creation

Protocol document analysis on multiple value creation	
Aim	To a) get an in-depth understanding of the multiple value creation performed at the organisations in order to formulate preliminary information for the interviews with organisations. To b) get an in-depth understanding of the influence of the CKP on the seizing and execution of MVC at the organisations during the CKP.
Research question	RQ: In what way is MVC executed during the CKP and how does the CKP steer for this?
Selection of texts	Opportunity matrix, minutes of working sessions, circular approach (action plan) and final report
Operationalisation	MVC defined by (Croes, 2018; IIRC, 2013; Jonker, 2012) and divided into six capitals as defined by Westerdijk (2021)
Method	Frequency of exact words related to MVC + implication of words that relate to and indicate MVC considered on content and importance to the CKP