The Circular Economy:

A Transformative Service Perspective

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ABSTRACT

The rising awareness of climate challenges and resource constraints has strengthened interest in the circular economy (CE), characterized as an economic system aimed to minimize the depletion of the world's natural resources through processes of value retention and value regeneration. Because CE research originated in the engineering field, studies to date have mostly focused on technical and management-related topics. However, due to increasing demands from customers, investors, governmental institutions, and regulatory bodies, companies are increasingly considering how to effectively implement the CE. Despite its increasing importance, the CE is a yet uncharted area of transformative service research (TSR), and little is known about how the CE can support change for greater well-being among individuals and collectives. To fill this research gap, we integrate notions of the CE with TSR and research on value co-creation. The purpose of this paper is to expand research on CE and services by taking a TSR perspective to delineate how value retention and regeneration processes for different levels and spheres in services can effect change for greater individual and collective well-being.

Keywords: circular economy; transformative service; value retention; value regeneration

INTRODUCTION

The rising awareness of climate challenges and resource constraints has strengthened interest in the circular economy (CE), characterized as an economic system aimed to minimize the depletion of the world's natural resources through processes of value retention and value regeneration. A circular system is one in which resources are kept in use rather than disposed and could include, for example, sharing, maintaining, reusing, redistributing, remanufacturing, recycling, and design for dis- and reassembly (e.g., Kirchherr, Reike, and Hekkert 2017; Velenturf and Purnell 2021). Because CE research originated from the field of engineering – in particular, industrial ecology – studies to date have mostly addressed technical and management-related topics. Recent research has suggested that service research could contribute to developing emerging economic concepts (Field et al. 2021). So far, however, little is known about CE's potential to support change for greater well-being among individuals and collectives (Velenturf and Purnell 2021) by means of a service lens. Awareness that unfettered consumption reduces quality and quantity of natural resources (Field et al. 2021) has resulted in increasing demand from customers, investors, governmental institutions, and regulatory bodies for companies to consider how to interpret and implement the principles of CE in their day-to-day operations and interactions with customers. One prominent example of a firm embracing CE in their customer service is IKEA, whose retail stores offered to buy back pieces of unwanted furniture from customers to recycle or donate to community projects on "Black Friday" in 2020 and 2021 (IKEA 2021). The firm saw it as "an opportunity to meet customers' needs in ways that contribute to a circular economy" (Ingka.com 2020).

The IKEA example illustrates how CE-based initiatives can infuse the interpersonal encounter and interactions between the provider and customer, such that the company and its frontline employees (FLEs) communicate the added value of using value retention and value regeneration as service options to customers. At the same time, this suggests that successful implementation of the CE principles involves establishing supportive service activities, such as a facilitative infrastructure

of value retention and regeneration loops or the engagement of supportive stakeholders (e.g., suppliers, customers, governmental institutions) in this process. This emphasis on the wider social context points to a need to transform the service area by designing and delivering services with a holistic view that includes the triple bottom line (social, environmental, and financial implications) to reduce negative impact on the environment (Ostrom et al. 2015). Thus, "understanding how the efforts of participants in service ecosystems can be orchestrated to significantly reduce resource consumption constitutes a key challenge" (Field et al. 2021, p. 468). Although many services are designed to be effective in delivering company value, they may lack the holistic and transformative view on value and resources in society (Ostrom et al. 2015), which is a challenge considering "services fundamentally affect our lives and well-being as individuals, employees, families and communities" (Anderson and Ostrom 2015, p. 243). Implementing CE principles involves creating environmental quality, economic prosperity, and social equity, to the benefit of current and future generations (Kirchherr, Reike, and Hekkert 2017) in an economic system that restores and regenerates resources, contributing to the sustainability of businesses and society at large (Khanra et al. 2021; Reike, Vermeulen, and Witjes 2018). This emphasis on the wider social context corresponds with the transformative service research (TSR) perspective, which has been identified as a key strategic priority for service research (Anderson and Ostrom 2015; Baron et al. 2018; Boenigk et al. 2022; Field et al. 2021; Ostrom et al. 2015; Ostrom et al. 2021). TSR aims to create uplifting changes for greater well-being among individuals (as both consumers and as employees), collectives (e.g., families, communities), and ecosystems (Ostrom et al. 2010).

Such a focus on critical themes of human concern like sustainability, access, inclusiveness, and justice could help shape a more responsible discipline (Field et al. 2021). TSR takes a broad and comprehensive perspective in which multiple actors take part and go beyond individual service provider–customer dyads (Blocker and Barrios 2015; Ostrom et al. 2021; Zhu et al. 2022); Field et al.'s (2021, p. 464) examination of the impact of service ecosystems on planet and human welfare

identifies “the impact of climate change on service and the role of service in reducing or exacerbating climate change” as a key service research priority. The authors call for research that sheds light on how the service systems can be (re)designed to reduce pollution and exploitation of natural resources (Field et al. 2021).

Thus, TSR could serve as a prospective lens to gain more insight into effectively applying the principles of the CE. The implementation of CE is deemed a fundamental change that implies essential changes in existing company practice (Heyes et al. 2018; Kirchherr, Reike, and Hekkert 2017). However, few extant studies have paid attention to CE’s potential to enhance greater well-being among individuals and collectives, and little is known about CE’s contribution to TSR, however (Velenturf and Purnell 2021). Recent work on CE and services has focused on the transition process toward circular service ecosystems, identifying six shaping strategies (Fehrer, Kemper, and Baker 2023), and on how to motivate actors (e.g., firms, customers, governmental bodies) to achieve “circular economy engagement” and embrace circular business models (Verleye et al. 2023). So far, however, little is known about the application of the key CE processes, value retention, and regeneration in services and how these processes can effect change for greater individual and societal well-being. The purpose of this paper is to expand research on CE and services by taking a TSR perspective, delineating how organizations, in collaboration with customers and other stakeholders, can use value retention and regeneration processes to effect change and achieve larger goals that go beyond their immediate self-interest (i.e., goal pursuit focusing on collective well-being).

In this paper, we develop a multilevel framework of CE-based value creation in which we detail and describe value retention and regeneration practices and challenges in services for three levels (individual service encounter, organization, organizational context) and three spheres (inner, outer and joint spheres). We conclude by offering several specific directions for future research.

THE CE AND THE TRANSFORMATIVE VALUE OF SERVICES

The CE Concept

The CE is a contested concept (Korhonen, Honkasalo, and Seppälä 2018), difficult to define unambiguously, and many definitions can be found (Kirchherr, Reike, and Hekkert 2017; Kirchherr et al. 2023; Korhonen, Honkasalo, and Seppälä 2018; Velenturf and Purnell 2021). One common ingredient in all definitions is that CE makes better use of the world's natural resources (Velenturf and Purnell 2021), such as metals, water, and biological fibers as inputs to production process. The focus is on retaining resource value after initial use, as it constitutes input for new value propositions, thus aiming to replace the "end-of-life" concept, which is considered degenerative (Raworth 2015), with the core CE concepts of resource value retention and regeneration.

In CE, one important notion is that resources are acknowledged as being limited and should therefore be reused or regenerated, which implies that value creation through resource integration focuses on two key processes: value retention and value regeneration. *Value retention* can be defined as processes designed to keep products in use for the most valuable amount of time (Nabil et al. 2018). Much existing CE conceptualization focuses on value retention, although resource value retention alone is not enough to offset the current deficit and depletion of natural capital stock (EU 2019). To go beyond retention to replenish and regenerate the natural capital stock, value regeneration is a necessary extension. *Value regeneration* can be defined as renewing or restoring biological systems after injury or as a normal process (e.g., by returning the natural system to its condition prior to overexploitation) (Oxford Languages 2022). Finally, we define *value* as the company's and customer's use of CE principles by rebuilding rather than destroying natural capital resources through retention and regeneration with the aim of uplifting change for greater individual and collective well-being.

The implementation of CE is based on three principles: (1) designing out waste and pollution (de Jesus et al. 2016; Ellen MacArthur Foundation 2015; EU Com 2015; Haas et al. 2015;

Kalmykova, Sadagopan, and Rosado 2018), (2) retaining products and material value at the highest possible level (Esposito, Tse, and Soufani 2018; Hopkinson et al. 2018), and (3) regenerating natural capital (Hawken, Lovins, and Lovins 1999; Meadows, Randers, and Meadows 2005). A retail setting provides a generic example of the implementation of the three CE principles, in which new products arrive at the shops and are placed on shelves and racks. In such settings, the products should be designed so that they can be repaired and regenerated (first CE principle) without losing value (third CE principle), which entails both consumers and FLEs emphasizing maintenance and contributing to returning the products via a service system and thereby enabling their regeneration (second CE principle). Taken together, these principles are the foundation of CE business models, as they influence key activities and organizational capability (Korhonen at al. 2018; Lacy and Rutquist 2015). Building on these notions and drawing on Kirchherr et al. (2023), we present the following simplified definition:

> *CE is a regenerative economic system which necessitates a paradigm shift to replace the "end-of-life" concept with reducing, alternatively reusing, recycling, and recovering materials throughout the supply chain, with the aim to promote value maintenance and sustainable development, enabled by an alliance of stakeholders (industry, consumers, policymakers and academia).*

Thus far, researchers have typically applied the CE concept in industrial engineering settings, particularly the manufacturing and production of goods, building on the idea of conservation of goods as resources for use in consecutive consumption cycles. We present a new perspective: understanding how the CE and its principles can contribute to TSR by supporting change for greater well-being among individuals and collectives. Thus, "expanding the boundaries of service research beyond the service encounters (e.g., employee-customer and organization-customer) to encompass the interrelationships among multiple stakeholders, including platforms, societies and ultimately the planet" (Field et al. 2021, p. 474). Many companies have begun to employ supporting services that

enable customers to reuse and share products. Return policies represent a good example of services that facilitate the recycling of used goods. Such services transport used goods to production facilities to be recycled and refurbished for reuse. The lack of research attention to the service provision aspect of the CE is surprising, as many of these value retention and regeneration initiatives encounter difficulties due to a lack of effective return policies as services. Therefore, the field needs an in-depth understanding of the implementation CE from a TSR perspective.

In addition, we draw on some key notions from the butterfly model, which involves a foundational visualization of the CE (Ellen MacArthur Foundation 2019) that emphasizes production and consumption patterns that, on the one hand, minimize the generation of waste and landfill disposal and, on the other, maximize the use of material resources (products, components, by-products, and waste) through retention and regenerative processes (Webster 2017). Two key features of this butterfly model are the presentation of the material resource flows by means of cycles and the distinction between technical resource flows, which reflect value retention processes, and biological resource flows, which reflect value regeneration processes (Batista et al. 2018; Baxter, Aurisicchio, and Childs 2015). We draw on these two features in our conceptual frameworks to explicate the joint responsibility for value retention and value regeneration processes and their circularity (Web Appendix A and Figures 1–3). Furthermore, we provide practical examples to illustrate how value retention and regeneration are currently taking place at different levels and spheres.

Transformative value

Our aim is to provide a better understanding of the *transformative* value of service experiences through CE. Value creation has become a pivotal element in marketing literature and practice. Two essential ideas about value creation are value-in-exchange and value-in-use (Grönroos and Voima 2013). First, value creation in marketing is traditionally associated with value-in-exchange, in which value creation is perceived as a key outcome of a production and service process with the

aim of establishing customer loyalty (Blocker and Barrios 2015). Over the past decade, however, driven by the service-dominant (S-D) logic view and related discussions, a shift toward value-in-use has occurred, with its focus on customers as active participants in the value creation process. Currently, value-in-use is typically perceived as a socially constructed process that takes place and advances through interactions with the customer (e.g., Grönroos and Voima 2013; Medberg and Grönroos 2020). With emergence of CE and the key notions of value retention and value regeneration, a need has arisen to expand the view of value-in-use and take it to the next level: considering how and why organizations, in collaboration with customers, can make use of value retention and regeneration to achieve larger goals that go beyond their immediate self-interest, or goal pursuit.

Second, whereas previously, value was mainly considered a static, one-point-in-time outcome, over the past decade this definition has shifted to a strong focus on its temporal dynamics (Grönroos and Voima 2013). Currently, value is typically considered an ongoing process that may fluctuate over time, which implies that it could increase or diminish over time (e.g., Heinonen et al. 2010; Helkkula, Kelleher, and Pihlström 2012). The rise of CE, with its focus on more efficient and effective use of natural resources by means of value retention and regeneration processes, implies an elaboration of the notion of value with a focal attention to its retainable, regenerable, and cyclic nature.

Third, value creation research has departed from an exclusively firm-centric perspective and shifted toward customer- and poly-centric perspectives (Blocker and Barrios 2015); in other words, value creation has moved beyond the customer–provider encounter. Hence, a broader conception and locus of value creation has emerged in which all social and economic actors are viewed as resource integrators (Grönroos 2011; Vargo 2008). Taking the CE principles as an important point of departure implies the relevance of considering value as a broad concept that goes beyond just the

organization and its direct customer to capture suppliers, governmental bodies, and other external stakeholders.

Extant studies have drawn on these advancements to conceptualize transformative values as a broad, multilevel concept (Zhu et al. 2022) that is dynamic and multifaceted, in which multiple actors take part, and that goes beyond individual service provider–customer dyads (Blocker and Barrios 2015). As a result of this broader scope of transformative value, Blocker and Barrios (2015) emphasize the social dimension of value creation that generates positive change for greater well-being among individuals and collectives. In the context of CE, the focus on the social dimension of value has gained even more relevance as multiple actors and entities – inside as well as outside the organization –can contribute to the value creation focus on retention and regeneration of resources for greater individual and collective well-being.

Recent TSR has emphasized the use and integration of resources to improve human well-being in terms of physical and mental health, financial well-being, marginalization, discrimination, literacy, inclusion, access, capacity building, and decreasing disparity (Anderson et al. 2013; Rosenbaum et al. 2011 in Ostrom et al. 2015). In conventional service encounters, resource integration is a relatively standard process through which employees can facilitate and create value in collaboration with the customer (Grönroos and Voima 2013). In contrast, in the augmented scope of transformative service, resource integration is a substantively more comprehensive value creation process in which multiple actors and multiple hierarchal layers are involved, with a strong emphasis on the social dimension (Blocker and Barrios 2015). CE with a focus on a more efficient and effective use of resources makes resource integration more relevant; however, it also becomes more comprehensive and consequently more vulnerable to pitfalls, implying a need to carefully delineate practices and related challenges (

Bieler et al. (2022) emphasize the importance of distinguishing between direct and indirect resource integration processes as drivers of transformative value co-creation. Furthermore, they

argue that resource integration can also have undesired consequences if integration of resources is harmful, leading to value co-destruction. In light of these findings, it is important to highlight that CE focuses on regenerative flows of natural resources and not on human resources. To date, TSR has paid attention to so-called social themes, like poverty reduction, access to social services, and service literacy (Anderson and Ostrom 2015; Anderson et al. 2013), or mainly consider social aspects of service provision to vulnerable people (e.g., refugees, homeless people; Boenigk et al. 2022; Nasr and Fisk 2019; Rosenbaum et al. 2011) and to patients in health care settings (e.g., Varman et al. 2022). In contrast, this research stream has paid virtually no attention to how the provision of services can be used to make more efficient and effective use of natural resources and as such improve well-being; indeed, Field et al. (2021, p. 464) reveal a need for research that focuses on "the impact of climate change on service and the role of service in reducing or exacerbating climate change." Similarly, Blocker et al. (2022, p. 3) emphasize the importance of examining how TSR "can promote sustainability of the natural environment." Moreover, in such situations of limited resources, the nature of the resource integration process is different in that has a stronger focus on systemic recurrence and reproduction of resource integration patterns (cf. Vargo et al. 2023).

In this paper, we integrate notions of the CE with TSR and research on value co-creation with the aim of delineating how transformative service initiatives could help enable value retention and value regeneration processes. TSR primarily draws on S-D logic, which emphasizes individual customer benefits, resource integration, and value co-creation (Varman et al. 2022). We show that S-D logic helps illuminate the CE's role in generating transformative value of service experiences for customers. At the same time, however, because we aim to delineate CE practices and challenges, we present a broader, more holistic perspective, which is required to capture the entirety of transformative value creation by different actors at different levels and in different spheres.

Following recent studies on TSR and/or CE with a multilevel approach (e.g., Blocker and Barrios 2015; Chandler and Vargo 2011; Kühl et al. 2023; Zhu et al. 2022), we present a multilevel framework in which we detail and describe three levels (individual, organizational, and organizational context). First, we identify the individual service encounter level with FLEs and customers as important actors. Recent research (e.g., Blocker and Barrios 2015; Zhu et al. 2022) identifies individual actors as key for transformative value creation. Likewise, Chandler and Vargo (2011) zoom in on the individual actors when studying value in services. We focus on the FLE and the customer as individual actors in the service encounter and the creation of subjective value through individual perceptions and experiences (cf. Blocker and Barrios 2015) and through individual interactions (Chandler and Vargo 2011).

Second, we discern the organizational level. At this level, one important feature is the organization's value proposition. Lewandowski (2015) suggests that the traditional value proposition of selling products be replaced with a more comprehensive value proposition with retention and regenerative services as key additional elements of CE business models. Furthermore, Blocker and Barrios (2015) emphasize the importance of the organizational level when it comes to the creation of value from a transformative service perspective, and Kühl et al. (2023) emphasize the organizational level in their study on circularity in business models.

Third, we distinguish the organizational context level, which focuses on service ecosystems. In TSR and CE research, the organizational context, with its focus on multiple actors as value co-creators, is critical (e.g., Chandler and Vargo 2011; Kühl et al. 2023), and Kühl et al. (2023) take into account the organizational context in their study on circularity in services. We acknowledge clear overlaps between the three levels; however, we focus on the distinctiveness of each level.

Finally, we follow recent research that conceptualizes (transformative) value creation processes as a matter of different spheres, or spatial settings (e.g., Blocker and Barrios 2015; Grönroos and Voima 2013). More specifically, we draw on Grönroos and Voima (2013), who emphasize the

importance of distinguishing between inner and outer spheres (in their context, company and customer spheres, respectively). In addition, they identify the joint sphere, which refers to value co-creation by the actors of the outer and inner spheres, as a separate sphere to clarify that value co-creation is distinct from value creation. Accordingly, we use these three spheres to delineate value (co-)creation processes using the CE, distinguishing between value retention and value regeneration. The *inner sphere* reflects actors (e.g., FLEs, back-office employees, managers, top management) and entities (e.g., resources, structures) *within* the company that are involved in the value retention and regeneration of resources for customers' extended use or reuse. In contrast, the *outer sphere* involves actors (e.g., customers, suppliers, governmental bodies, other external stakeholders) and entities (e.g., resources, structures) *outside* the company that are involved in value retention and regeneration. In the *joint sphere*, the focus is on the interaction between actors and entities from both the inner and outer spheres in retaining and regenerating value. Note that we focus on the distinctiveness of each sphere and that there may be overlaps present between the three spheres.

A MULTILEVEL PERPSECTIVE

In the following sections, we describe and detail CE-based practices (defined as what companies and customers do – physically and mentally – as part of everyday individual or organizational life; cf. Grönroos 2011) and challenges to create value in terms of effecting change for greater individual and collective well-being for the three identified levels and spheres.

Level 1: The Individual Service Encounter

At the individual service encounter level, the encounter between FLEs and customers as individual actors is the focal point for the creation of value. When examining their role in CE, researchers should explore "the interactions and interfaces at the point of contact between an organization and its customers that promote, facilitate or enable value creation and exchange"

(Singh et al., 2017, p. 3). This involves co-creation of value retention and value regeneration. We examine the service encounter in CE in three spheres: inner, joint, and outer (cf. Grönroos and Voima 2013). At this level, the focus is on the practices and challenges of the company's daily operational activities with a focus on the customer encounter.

Inner sphere (Level 1). Inner sphere (Level 1) is about developing knowledge of the CE, its values, and mechanisms with a focus on how individual FLEs (with help from their company) can use CE to facilitate and create value for greater individual and collective well-being. Here, *value retention* involves having access to knowledge of what can be returned and repaired, and the individual FLE's role is to build up knowledge and mechanisms that support the return of value. In addition, *value regeneration* involves having access to the knowledge of what can be reused and regenerated and how.

To begin, FLEs should learn about CE and develop a CE mindset by internalizing the knowledge and mechanisms for creating value retention and regeneration, identifying opportunities to do so, and demonstrating this knowledge through their own behavior (cf. Kühl et al. 2023). As FLEs (in contrast to other employees) interact extensively with customers, they are "uniquely positioned to be aware of customer needs and wants and cognizant of opportunities to extend offerings" (de Ruyter, Keeling, and Yu 2020, p. 13). In this sense, they possess a specific intermediator role in which they must – in addition to selling and servicing customers –transfer this specific CE knowledge and mindset to the customer (cf. Hogreve et al. 2022). For example, Flokk, a Scandinavian office furniture company, uses a short instructional movie that describes how design and sale based on CE principles can help its FLEs understand the transformative in CE principles. This illustrates how a CE-based service marketing can support the individual FLEs in the inner sphere.

Verleye et al.'s (2023) recent study argues for the need for FLE engagement with circular business models (CBMs) and puts forward six practices. Essential roles of FLEs are to develop and support engagement at the level of service encounter, in particular through the practices of signaling, or "highlighting the potential benefits of engaging with CBMs…," and convincing, or "persuading a focal actor to engage with CBMs" (Verleye et al. 2023, p 6). This requires access to the company's service solutions that support value creation by, for example, providing easy access to spare parts and/or return logistics. In addition, the selling or marketing task may involve the trade-offs between the value of having "the newest" (e.g., most fashionable) and the values arising from circular principles.

A challenge may arise from service–sales ambidexterity, in which sales associates are required to add service delivery to their role, frequently as part of a solution selling strategy. Adding CE principles as a part of the service offering may further exacerbate this dilemma (Linder and Williander 2017), and a tension between CE and existing marketing practices is likely to arise (Hofstra and Huisingh 2014; Tukker 2015). For FLEs, this means having to help customers understand that they do not necessarily need to make trade-offs between the functional value and the value arising from CE principles. For example, the company NORNORM sells access to the functionality of office furniture by designing and delivering fully furnished office spaces. Because the firm retains ownership of the furniture through a pay-per-service unit revenue model (e.g., pricing the number of square meters furnished), the FLE issues a guarantee on the functionality of furniture as insurance for the customer that they do not need to make a trade-off. Moreover, the customer has the option to change functionality if a solution does not fit the needs, without extra cost.

Outer sphere (Level 1). In the outer sphere at Level 1, the focus is on individual customers' use of the CE and how they create value for greater individual and collective well-being. Whereas *value retention* involves customers choosing to purchase refurbished products as an alternative to new

products, *value regeneration* pertains to customers choosing to use organizations that recover resources for regeneration.

Customers will experience trade-offs between the value arising from circular principles and just purchasing "new stuff" when the old is out of fashion or broken. Understanding the value propositions of the CE can help them realize the repercussions of their choices. For example, consider the trade-off between consumption related to mitigating or enhancing climate change: a critical aspect concerns customers' adoption of CE values and perspectives to achieve an increased focus on value retention (Kühl et al. 2023) – for example, rather than discarding old products, , returning them for refurbishment and recovery of materials.

Several challenges have been identified in customer acceptance of an extension of resource loops. For example, the international company Toolco learned that customers cared less about the product durability and quality value proposition than about the price (Kühl et al. 2023). Other examples relate to hygiene, where customers may feel disgust when using products others have used or perceive lower quality connected to the utility of recovered or refurbished products (Baxter et al. 2017). Another challenge for customers is the extra time and financial effort it takes to search for and choose companies that explicitly recover organic resources for regeneration. For instance, choosing eco-labelled restaurants and hotels (e.g., Nordic Swan, where unused food and food ingredients are returned to the soil to regenerate natural stock) (Eco-labelling Denmark 2023) may be more time consuming and costly.

Joint sphere (Level 1). In the joint sphere (Level 1), the focus is on how FLEs and customers can jointly use the CE to create value for greater well-being for individuals and collectives. *Value retention* involves FLEs and customers jointly enabling used products to be repaired and returned, and *value regeneration* is about FLEs and customers jointly identifying opportunities for recovery and regeneration of resources.

As value co-creation is a function of the interaction between FLEs and customers (Grönroos and Voima 2013), CE requires processes and mindsets that involve both FLEs and customers for co-creation of value retention and regeneration (cf. Kühl et al. 2023). The relative focus on value retention and regeneration may vary with context. For furniture manufacturers like IKEA and Flokk, the emphasis would be on value retention, such as returning used products rather than throwing them away and on making choices about whether to purchase new or refurbished products. Moreover, both companies provide opportunities for repairing damaged products (Flokk as a third-party service and IKEA as a do-it-yourself service consultancy).

A challenge for FLEs is to work with their customers to develop an understanding of these processes and to create a shift in customers' mindsets that will lead to these processes being used when appropriate (Kühl et al. 2023). Flokk has not experienced any significant difficulties in promoting CE principles and values; however, embedding them in customer behavior both during and after use has been more challenging. For example, concerning value retention, the firm found that customers seldom used maintenance and upgrade services if products were even slightly damaged, even though they had received these benefits through warranty as if they were making a new purchase.

In addition, concerning *value regeneration* through, for example, design for disassembly, customers often discarded whole chairs, making recovery of materials for new production difficult (Flokk 2019ab). Products from both Flokk and IKEA are designed for disassembly that enables recovery of materials through urban mining (e.g., on markets for recycled plastic or metals), but consumers are not always aware of this opportunity. Van der Borgh, de Jong, and Nijssen (2019) use role theory to argue that FLEs' behavior is mainly determined by their perception of role expectations communicated by stakeholders; in this context, if stakeholders convey risk aversion and negative perceptions of aspects of the CE, FLEs' behavior in communicating the CE principles will reflect these expectations. Their behavior is shaped by having to balance long-term

environmental gains with short-term goals (de Ruyter, de Jong, and Wetzels 2009): key employee roles are communicating and facilitating customers' experiences of value, and CE proposes new forms of value.

Researchers have identified the organizational frontline as where the interactions and interfaces at the point of contact between an organization and its customers take place (Singh et al. 2017). However, in the CE, FLEs should interact with and influence other actors in the system (e.g., Fehrer, Kemper, and Baker 2023). For instance, Flokk distributes through retailers, and it is important for these retailers to embrace CE values and be able to communicate them to their customers. Thus, FLEs at Flokk must collaborate with retailers and therefore have only an indirect influence on transforming end customer behavior. Another example is NORNORM: although the firm has set the tone as a subscription-based furnishing service company, the third-party delivery team is the one that handles asset management at the point of both installment and take-back, which requires skills beyond simply moving furniture to keep the value as high as possible – especially between use phases. Table 1 summarizes this discussion, and Figure 1 presents the service encounter butterfly model as it pertains to Level 1.

INSERT TABLE 1 AND FIGURE 1 HERE

Level 2: The Organizational Level

At the organizational level, a hallmark feature is the value propositions set by the organization. The focus is on service delivery as a way to create transformative value by means of the value propositions and develop circular business models for greater individual and collective well-being (cf. Blocker and Barrios 2015; Kühl et al. 2023). From a CE perspective, a focus on transformative services in terms of holistic value propositions (Blocker and Barrios 2015) can create incentives for designing and delivering products that are more durable as well as easy to repair and disassemble (Bocken et al. 2016). Tukker (2015) emphasizes the value in different approaches to ownership as a

way to add and extend service, and Bocken et al. (2016) explicitly describe service designs as a way to implement the CE principles and prolong product lifetime and durability. Types of ownership, such as possessing, leasing, renting, and sharing – and, more importantly, people's mindset behind this ownership – are central for analyzing CE and how values can be retained and regenerated in the three spheres.

Inner sphere (Level 2). In the inner sphere, the focus is on the organization's service design, where *value retention* involves the organization's involvement in designing services for refurbishing and reselling and *value regeneration* concerns designing for reuse of resources.

Ownership in relation to value retention can be viewed as an extension of the owner's values (Helkkula, Kowalkowski, and Tronvoll 2018), and any CE-based services related to value retention should encourage the owner to keep and maintain the product for as long a time as possible (Stahel 2010; Webster 2017). The service must be designed in a way that incentivizes customers to return the product or the resource after use by establishing value in the form of reselling (Guerra et al. 2021). For example, Caterpillar sells machines and adds global 24/7 online monitoring of machines by use of sensors as a service to capture need for maintenance and deliver it before it is necessary, thereby enabling customers to avoid expensive downtime. If customers use this service, they keep the material value of the asset, which by the end of the machine's optimal effective usage time will optimize residual financial value. Caterpillar pays up to 40% residual financial value (e.g., reduction in new price) to customers who want to change to a newer machine. At the same time, Caterpillar can harvest material resources for production of new machines at lower cost than market price.

A prevailing view on reselling may in many cases still be based on a linear approach, as most services are designed by the provider and lack the co-created values of reusing resources. An example of a linear way of thinking missing co-created value retention is the auto industry, in which the auto company provides cars that might be sold and resold several times (extended ownership),

but the cars lose value each time and eventually becomes worthless. An exception is Renault, which has been working with closed-loop take-back of components such as gearboxes for remanufacturing (Ellen MacArthur Foundation 2013). However, the majority of existing services related to buying, using, and reselling cars are not yet widely available for keeping the resources in a closed loop, as consumers, used car dealers, and car companies do not share any common values for retention.

In relation to *value regeneration*, the task in the inner sphere is to design a service based on the CE principle that keeps valuable resources in a closed loop. A transformative service with a return flow should enable a new user or the original equipment manufacturer to get the resources back and use them for regenerated products, through either internal company closed-loop restorative flows or a third party that recovers materials and components in open-loop cascading flows (Batista et al. 2018). An example is Signify, which sells lumens. In so doing, it provides lighting as a service that enables recovering and regenerating of used light bulbs materials into new products after effective use time ends. A third party collects and sorts the materials as a service for Signify before returning them to the original equipment manufacturer to produce new bulbs and lamps that Signify can install to provide more lumens (Ellen MacArthur Foundation 2013). Another example is NORNORM, which ensures that new users get access to furniture that was used in another office. This firm is a service provider for both customers and original equipment manufacturers like Martela, which are unable to implement the CE principles on their own (Martela 2017). In this context, an organizational challenge related to change in ownership may involve some unclear roles and misalignments among different departments *within* the organizations, which could inhibit the implementation of cross-functional CE practices (Bocken and Geradts 2020).

The outer sphere (Level 2). In the outer sphere, the focus is on customers' experiences related to circularity of the organization's products and resources. Whereas *value retention* involves customers' experience of prolonging product lifetime, *value regeneration* relates to customers' experience of reducing waste and loss of resource.

In the outer sphere, people can have many reasons for utilizing services, and the value of using them may be influenced by a wider network of family and friends. Such interplay between actors can be viewed as a transformative social dimension (Blocker and Barrios 2015), and the ownership can be described as a corporate ownership with the service as the glue that links users together. In the outer sphere, any CE as a transformative service should therefore facilitate a link to the value of being a decent citizen and contribute to the well-being of society, thereby enhancing the experience of corporate ownership. Customers should experience value in reducing the loss of resources and minimizing waste, which could and should be developed into a social norm in the community. A service designed as a *take-back system* in the inner sphere will be experienced as a *give-back system* in the outer sphere.

In the outer sphere, in relation to value retention, the customer should experience the value of prolonging product lifetime and reselling used goods. The challenge for a transformative service is that value creation in this sphere is an independent customer experience with a weak link to the provider (Grönroos and Voima 2013). The outer sphere is detached from the inner sphere, and the customer might be skeptical in joining the circularity of resources by questioning, "What's in it for me?" The value creation in the outer sphere is further challenged by a minimal level of dialogue with the provider, which is crucial for co-creating value retention (Grönroos and Voima 2013).

The joint sphere (Level 2). In Level 2, the joint sphere pertains to the organization's and customers' joint role in how to use limited resources and ownership of these resources. Whereas *value retention* involves extended ownership with retention through smooth take back services, *value regeneration* concerns corporate ownership that incentivizes consumers to give back used resources to the community.

Access-based services is an example of a change in ownership, in which physical ownership is substituted with psychological ownership (Fritze et al. 2020). The challenge for substituting physical ownership with owning product functionality is to incentivize users to take care of

products and resources that are only mentally owned and encourage them to keep the resource value high. Value retention in the joint sphere should therefore focus on the value of taking care of products and resources as long as possible, but not so long that they outlast their value on the used product market (Kazancoglu et al. 2020).

Ownership in relation to value regeneration has similarities with physical ownership: a consumer buys the product and ideally, resource regeneration should be ensured by enabling the customer to return the used product or any remaining parts that may be left after use. Food products are examples of such physical ownership: they cannot be shared after use, but the inedible leftovers or the packaging can be returned. This type of ownership is typical when people simply consume the physical product, and any related services such as storage, collecting packaging, or resource handling come as a service for value regeneration.

The challenge is that when a product is consumed, consumers are often left with what they perceived as worthless (e.g., packaging, peels, other leftovers), as they experience little or no value with these remains. Attention and interest in these resources are minimal, and the challenge in the joint sphere is to support and improve people's incentives to give back this "worthless" stuff. Examples of such services are public waste management systems with source separation of remaining resources and deposit refund systems for bottles and cans. A distinctive characteristic of these systems is that they rely on consumer and company involvement/engagement to accomplish regenerative value.

Table 2 outlines the types of ownership and types of co-creation of retention and regeneration values at the organizational level in the various spheres, and Figure 2 presents CE service delivery butterfly model for Level 2.

[INSERT TABLE 2 AND FIGURE 2 HERE]

Level 3: Organizational Context

TSR as well as CE studies identify the organizational context as a relevant level and emphasize that value is co-created by multiple actors (e.g., Chandler and Vargo 2011; Kühl et al. 2023). They argue that service ecosystems are pivotal to CE implementation (Batista et al. 2018; Konietzko, Bocken, and Hultink 2020a). The service ecosystem involves "a relatively self-contained, self-adjusting system of resource integrating actors connected by shared institutional arrangements and mutual value creation through service exchange" (Vargo and Lusch 2016, pp. 11–12). With circular service ecosystems as "ideal types of service ecosystems, regenerative and embedded within nature, where (material, intellectual, digital and financial) resources flow seamlessly within and between nested systems without creating any waste or leakage" (Fehrer et al. 2023).

Collaboration is essential for value retention and regeneration activities; a growing number of studies have outlined a variety of perspectives and interpretations regarding application of the CE principles through service ecosystems (Fehrer et al. 2023; Kapsalis, Kyriakopoulos, and Aravossis 2019; Konietzko et al. 2020a). Findings reveal that service ecosystems help enhance a circular bio-economy in agricultural systems (Berthet, Hickey, and Klerkx 2018) and enable closed-loop supply for aluminum beverage cans (Stewart et al. 2018). A service ecosystems perspective can yield better insight into the whole process of innovative food waste reduction (Baron et al. 2018) by presenting how interrelated actors such as suppliers, producers, service providers, regulators, end users, and civil society relate to one another to change a collective outcome (Jacobides, Cennamo, and Gawer 2018; Talmar et al. 2018). Service ecosystems based on resource exchange after first use phase are examples of how communities or groups enable value retention and value regeneration (Konietzko et al. 2020a).

Researchers argue that the process of developing transformative service experiences through the incorporation of CE depends not only on the physical object and related intangible service components but also on developing collaborative service ecosystems within the value chain (Dokter, Thuvander, and Rahe 2021). CE-oriented companies take a service ecosystem perspective

(Konietzko et al. 2020a) to include CE principles with support from essential actors (Köhler, Sönnichsen, and Beske-Jansen 2022). This implies a (re)design of institutional arrangement (Fehrer et al. 2023) that facilitates value co-creation by key actors (Vink et al. 2021 in Field et al. 2021). The following subsections first outline the role of companies in service ecosystems for enhancing resource value retention and regeneration. Next, we outline resource value retention and regeneration in the joint and customer spheres, respectively. Note that we focus on the distinctiveness of each sphere and that there may be overlaps present between the three spheres.

Inner sphere (Level 3). At Level 3, the inner sphere pertains to the market-level infrastructure that the company as a service provider uses to incentivize the ecosystem. Focusing on companies' use of the CE in the service ecosystem to create value for greater individual and collective well-being, *value retention* concerns developing the marketplace for extending product/material use, and *value regeneration* involves intermediate service provider processing residual streams.

From a company perspective, value retention relates to the output effects such as carbon emission mitigation and material savings within the service ecosystem and involves collaboration among multiple actors. An example is John Deere's open data innovation platform, which enables the integration of third-party services, such as the use of an intelligent farming service ecosystem enabling repair, replacement, and remanufacture of modules in heavy-duty machines before parts break. In doing so, the firm helps farmers avoid expensive downtime and, just as importantly, increases the likelihood that material resources are retained and can be utilized in new products (i.e., spare parts). Furthermore, the company as enabler of CE as service addresses the distribution of value created from retention practices and incentivizes collaboration, minimizes perceived risk, avoids suboptimal solutions, and optimizes collective customer inclusion within the service ecosystem.

In addition, companies can establish a system architecture as a service to regenerate technical and biological resources. One option is to enable the utilization of dis- and reassembly of products to obtain pure technical resource flows to substitute input from traditional sourcing of virgin materials. Fairphone is an example of a company that uses modular design to do so, which then constitutes a source of input for the production of next-generation smartphones. Another example is Schijvens, a Dutch textile retailer, which has reconfigured its service system architecture to enable a redesign of the business model by redistributing the added value from implementing CE principles to all involved actors. In the inner sphere, the company takes the role of intermediate service provider and, as such, must understand how individual business models in the ecosystem can be aligned. An example of value regeneration in the inner sphere is YARA, a traditional manufacturer of artificial fertilizers. Because of limited access to mining crude phosphate (a critical resource in food production), the company has begun offering a service to cities that involves taking care of their bio-waste, from which the company harvests nutrients that can substitute for crude phosphate. In other words, the company harvests nutrients (e.g., phosphate) as a service, processes the residuals, and creates new products with less environmental impact than traditional fertilizer, by substituting conventional mining and taking care of the bio leftovers from people in cities that need this processing anyway. Hence, cities might need to seek out different service suppliers than they are used to for sewage sludge, which should also be incorporated into the service ecosystem architecture.

Outer sphere (Level 3). In the outer sphere, at Level 3 the focus is on facilitating the engagement of customer communities and other external actors in CE. In this context, *value retention* concerns the occurrence of secondhand trading communities, and *value regeneration* involves all relevant external actors to support provision of biological and technical input for residual streams.

Collaboration between the company and customer in implementing CE principles requires that customers and other external partners jointly take part in emission reductions and resource savings. Customers are actors within a larger system, although their quantum and experience of contributing to the system is essential; importantly, knowing their incentives to take part in service ecosystem is critical for firms. Specific service ecosystem design that mitigates customer perceived pains, such as relief from wasteful consumption, is the focus of this sphere. For example, the conventional apparel industry causes high negative impact on the environment related to depletion of biodiversity, heavy loss of drinking water, and poor working conditions (Ellen MacArthur Foundation 2015). In response, Levi Strauss & Co has launched the campaign "Buy Better, Wear Longer" and a Tailor Shop as a service to help customers extend the lifetime of their denim clothes, making it easy for the customer to retain the value of the firm's clothes for an extended period and at the same time mitigate climate change potential. Similarly, customers and external partners in other industries should be jointly incentivized to take an alternative perspective on consumption, rather than just buying new. Finally, it is important to consider how customers and external partners in a CE service ecosystem setting engage in value regeneration. For example, Baron et al. (2018) points to how a societal service innovation perspective can prevent food waste and alleviate food poverty for thousands of citizens based on coordinated collaborative programs in service ecosystems. The incentives for engaging in value retention and value regeneration might be the same – to mitigate environmental harm and resource depletion. From a pragmatic point of view, this means that customers engaging in regenerative service ecosystems are already focusing on the after-use phase, even at the point of purchase. Companies like Patagonia, IKEA, and Levi Strauss & Co have started focusing on regenerative sourcing of cotton, by changing and adapting their demands to suppliers. These actions can help build a system architecture in support of "ideal" types of service ecosystems that are embedded within nature (Fehrer et al. 2023) through regenerative agriculture as production input. Yet, engagement and incentives in a service ecosystem with a

closed loop for value regeneration of the natural stock is reliant on blurred customer perceptions of material returns. The aim is to redesign the traditional wasteful and value destroying processes, and instead reconsider the role of all actors, including nature, in processes of material retention and regeneration,

Joint sphere (Level 3). In the joint sphere, the focus is on collaboration and relation as lever for transformation and adaptation. The focus is on companies', customers', and other external actors' use of CE in the service ecosystem to jointly create value for greater individual and collective well-being. Whereas *value retention* involves the occurrence of peer-to-peer platforms, *value regeneration* involves the system architecture enabling – disassembly and reassembly (technical flow) and return of nutrients to soil (biological flow).

Value retention in the joint sphere can be accomplished through, for example, peer-to-peer marketplaces as a service to extend product/material use value. Using the logic of exchange, peer-to-peer platforms connect individuals and provide access to unused resources, which potentially create more sustainable consumption patterns (Field et al. 2021). An example of a service ecosystem facilitating a joint sphere for resource value retention is Schibsted, an online secondhand peer-to-peer trading platform catering to 200 million consumers in 22 markets. Schibsted provides numerous business service platforms (e.g., Finn, Blocket, Tori, Oikotie, DBA) dedicated to reducing, reuse, repair, and recycle, saving 20.5 million tons of greenhouse gases in 2018 (Schibsted 2021). A challenge may arise from asymmetric information, in which users have limited access to information necessary for quality evaluation of the promised service (Field et al. 2021). Another challenge is the dark side of sharing services, in which use of platforms leads to rebound effects resulting in more consumption (Alcott 2005).

Value regeneration in the joint sphere primarily pertains to restoring biological/natural/ environmental resources that have been depleted from current production and consumption patterns

(Hawken, Lovins, and Lovins 1999). An example of a service ecosystem enabled by value regeneration is the biological flows in which nutrients resources coming from leftovers and biomass after human consumption help restore and regenerate farmland. This includes reconfiguration relations between individual companies and their business models, responsibilities of external actors, and the customer's role. The challenge is to redesign the wasteful traditional supply processes and clarify for all actors in the ecosystem their valuable role for resource regeneration. Another example is The Carbon Farm, an organization that helps farmers improve the health of the soil by providing simple solutions as a consultancy service on carbon sequestration and information on how to adopt regenerative agricultural practices (Carbon Farm 2023).

Table 3 summarizes this discussion, and Figure 3 presents the service butterfly model as it pertains to Level 3.

[INSERT TABLE 3 AND FIGURE 3 HERE]

IMPLICATIONS FOR THEORY AND PRACTICE

This paper contributes to research on CE and services by taking a TSR perspective detailing and describing how value-retention and regeneration practices (and coping with related challenges) for different levels and spheres in services can effect change for greater individual and collective well-being and strive for outcomes that go beyond their immediate self-interest. Our research involves (1) theory adaptation, by expanding TSR through the inclusion of CE, as well as (2) theory delineation, by detailing and describing the nature of value retention and value regeneration practices and challenges for different levels and spheres (cf. Jaakkola 2020; MacInnis 2011). In so doing, we shed new light on the use and applicability of the CE from a transformative service perspective. To date, TSR has insufficiently incorporated the CE aspect. We have developed three specific frameworks of CE from a transformative service perspective: at the individual service

encounter, organizational, and organizational context levels (Kirchherr, Reike, and Hekkert 2017; Zhu et al. 2022).

Several research questions emerge from our conceptualization of CE from a transformative service perspective, and we put them forward in the context of the three levels discussed previously. We also identify potential managerial questions and challenges.

Individual Service Encounter Level

Due to the emerging interface technologies and devices, recent organizational frontline research (e.g., Singh et al. 2017, p. 4) has emphasized the importance of examining the changed nature of "the interactions and interfaces at the point of contact that promote, facilitate, or enable value creation and exchange." The infusion of the CE in such a modern frontline involves co-creation of value retention and value regeneration. This leads to our first research theme: What behavioral changes must FLEs make to successfully promote, deliver, and support the CE? FLEs are essential actors who act on behalf of the firm as service providers to facilitate the retention and regeneration of resources for customers' extended use or reuse. The implementation of CE-based principles will expand the role of the FLE and may make their role more complex, leading to sales–service ambidexterity (de Ruyter, Keeling, and Yu 2020). A challenge is how to effectively market and sell CE principles in the context of their already existing service roles. This leads to the following questions: How do the changed FLE roles manifest themselves in the context of CE? What other challenges arise?

Our second theme concerns routines. Linder and Williander (2017) argue that CE has the potential to disrupt existing servicing and selling routines, which in turn can hinder CE adoption. How are these routines changed by adding CE promotion and facilitation, and to what extent does this cause disruption? How can these routines be adapted to minimize negative impacts on both FLEs and the organization more broadly?

Our third theme concerns understanding and mindsets on the frontline. Surprisingly, virtually no studies have paid attention to awareness of climate challenges and resource constraints in relation to the organizational frontline. A major challenge is to develop mindsets that embrace the principles of CE and in turn to help customers adopt these values and mindsets (see the Flokk example cited earlier). How can FLEs help customers adopt new mindsets and values? Do existing routines need to change to support new mindsets? We need to understand further how such mindsets can be created in FLEs. We also see a need for "scholarly research dedicated to understanding interfaces and how they influence customer interactions or outcomes" (Singh et al. 2017, p. 7). For instance, how can the FLE interface with the customer positively influence the adoption of CE mindsets?

Managerial challenges at the service encounter level also arise when firms embrace the CE. First, proper training and support for FLEs involved in the service encounter is necessary. This can involve redefinition of their roles and associated training with actions, such as defining promotion of circular values as part of their role and developing supporting training material (see the Flokk example cited earlier). Managers will also need support in areas such as the choices available to customers; the ability to work with customers to jointly identify opportunities for resource recovery, resource regeneration, and returning products; and the knowledge of the mechanisms for doing so. Second, when companies infuse the principles of CE, this will lead to more complex service encounters. Managers will need to revisit the service encounter in this context and, if appropriate, redesign the service encounter and its related processes. Third, CE brings new measurement challenges to the service provision process. In particular, as both FLEs and customers need to develop new mindsets, the firm will need to repeatedly measure the degree to which these mindsets are present. We have summarized these questions and the related managerial challenges in Web Appendix B.

Organizational Level

The extant literature has emphasized that well-designed service offers can be a way to effectively implement transformative services (e.g., Blocker and Barrios 2015), which has also been argued in relation to the CE (Tukker 2015). However, scholars have not explored the issue of change in ownership and the impact on related change in service dynamics. Designing a service that incorporates the CE principles should facilitate value retention and value regeneration in the joint sphere with customers as co-creators (Grönroos and Voima 2013). CE principles in a service ecosystem are closely embedded in building customers' mindset, helping them imagine being part of a community and using products designed for take-back and redesign. This new mindset might start as a conscious action (top-down) in which people must think about their interaction with the service and the products and then, over time, become natural and habitual, so that the decision-making process is automatic (bottom-up). Challenges within this type of service provision are related to customers' hesitation to take care of the resources and give them back. They may find it annoying and unpleasant (Helkkula, Kowalkowski, and Tronvoll 2018). We identify three research avenues of better understanding CE-based service.

First, expanding TSR research through the inclusion of CE implies a focus on changing FLEs' and customers' mindsets to accept new types of ownership, specifically in terms of a take-back and give-back system. Potential research questions should be related to the change of mindset for all stakeholders involved (e.g., secondhand dealers, resellers, waste handlers). Understanding how stakeholders can jointly develop value regeneration and value retention is critical, as is knowing how different types of ownership might influence the level of resources that stay in a closed loop.

Second, research should investigate ownership comprehensively – ownership of not only products but also resources, data, and repairing. Future researchers should investigate how a company and customers can jointly create, manage, and share data about buying, using, repairing, and returning the product, and they should make these data available for all embedded stakeholders. Fundamental to this research is the sharing of data. A portion of these data may be personal, which

may challenge current legislation about data protection and privacy. Researchers should investigate the value of data and the implications for product performance after repair or remanufacture. Research questions should clarify how organizations and customers can share these data considering intellectual property issues. It is possible that the right to repair becomes central and could be enshrined in law. Successful implementation of services based on CE principles requires a focus on managerial challenges and how managers can encourage customers to accept new types of ownership related to various types of take-back and give-back systems. One concrete issue on how services can effectively incentivize customers to use their products longer and be repaired is to include circularity as a way of thinking in the design phase. Products designed for easy repair and easy replacement of used parts fulfill the basic principles of the CE. In a service designed for the CE, it should be possible to retain control of the resources and fix the leaks in the circle where resources are being lost. Another issue is that managers should develop a view on an extended repair system with multiple independent service providers. How can data from product usage (e.g., about the degradation of key components) be shared and used? We have summarized the questions and challenges on the organizational level in Web Appendix C.

Organizational Context Level

Thus far, researchers have emphasized the value of the CE ecosystem, taking a firm-centric perspective (Konietzko, Bocken, and Hultink 2020b); in contrast, little is known about the role of the customer (Merz, He, and Vargo 2009). TSR scholars could engage with the many potentially worthwhile and relevant research avenues to better understand the role of the customer in service ecosystems that explicitly incorporate the CE principles. We identified three main themes.

The first theme relates to exploring how to develop a space for shared responsibility to keep resource value at the highest level possible. As the inclusion of CE notions in service ecosystems depends on cross-collaboration, it is essential to understand how to balance the responsibility

between companies and customers in efforts of effective resource value retention and regeneration (Webster 2017). From a theoretical perspective, it is relevant to investigate how the different service ecosystems actors can share responsibility for achieving the anticipated output of material value retention and fairly distribute the related effects. What value distribution system provides the most effective collaborative market performance (e.g., new service performance models)? Relatedly, how can firms optimize and align the distribution of shared value retained and regenerated among actors within the ecosystem? Applying CE principles therefore requires service ecosystem management to transform how interrelated actors (e.g., suppliers, producers, service providers, regulators, end users, society as a whole) relate to one another for a favorable collective outcome (Field et al. 2021; Jacobides, Cennamo, and Gawer 2018; Talmar et al. 2018). For instance, we need a better understanding of how management can distribute the shared service ecosystem responsibility as an incentive for collaboration, as well as how managers anticipate collaboration in CE-based service ecosystems to support material value retention. An example is Flokk, which struggles with getting customers to use repair options and return of worn-out furniture. These struggles have hampered the business opportunities for optimal use of CE service ecosystems.

The second theme involves the challenges emerging from determining which system architecture/service components in individual actors' business models need to be developed and aligned to actively involve customers in facilitating resource retention and regeneration (Konietzko, Bocken, and Hultink 2020a). Hence, the aim is to redesign the more wasteful traditional supply processes, in which the responsibility of keeping material value high relates to the individual firm, and instead reconsider the roles of all actors in processes of material value retention, thereby benefiting the service ecosystem. This implies the service ecosystem's architecture as essential in facilitating the reverse flows. A challenge is how to involve often-passive customers and change them into active providers of used product materials. From a theoretical perspective, this challenge highlights a need for better understanding which general architecture/service components individual

business models (e.g., different ecosystem actors) need to be implemented to facilitate the greatest retention of resource value.

Managers of individual companies should understand how various actors in ecosystems experience the material conservation process. For example, how can management (re)configure individual business models in service ecosystems to align processes that support material conservation for consecutive use cycles, as illustrated by the Schijvens example?

The third theme is focused on customers' experienced value and their role in service ecosystems. How can companies create a CE-based service ecosystem design that encourages customers to engage in CE-based value propositions instead of the currently used more wasteful value propositions (Lewandowski 2015)? Answering this question requires an in-depth understanding of customers' willingness to source separately and give back used materials. Service ecosystems are interorganizational, and practitioners need better understanding of how to (re)configure individual business models in the service ecosystem to align processes that support material conservation for consecutive use cycles. It is therefore essential that scholars engage in research that focuses on how material savings and actual reuse of materials in new value propositions can be measured as a service ecosystem endeavors to accomplish mitigation of resource loss and climate change potential. From a theoretical perspective, what specific service components can help the customer experience perceived gains (e.g., relief from wasteful consumption)? We have summarized the questions and challenges of service ecosystems in Web Appendix D.

CONCLUSION

In this paper, we have developed three specific frameworks of CE practices and challenges from a transformative service perspective: at the individual service encounter, the organizational, and the organizational context levels (Kirchherr, Reike, and Hekkert 2017; Zhu et al. 2022). In each of

these frameworks, we zoom in on two core processes of CE, value retention and value regeneration, by viewing and defining them from a transformative service perspective in the inner sphere, the joint sphere, and the outer sphere (cf. Grönroos and Voima 2013). These frameworks can provide sphere- and level-specific guidance and understanding for managers seeking to expand the transformative service perspective to CE. While we used practical examples to illustrate the processes of value retention and regeneration for the aforementioned spheres and levels, we did not observe active participation of actors in these spheres and levels. Because this paper is conceptual and addresses an emerging area, theory-in-use is an appropriate approach for this paper. However, we have put forward a significant number of questions for future research, for which we see theory-in-use as an adequate empirical approach to develop new constructs and theoretical propositions.

Acquiring a better understanding of CE from a TSR perspective is crucial; it will involve focusing on how individuals can contribute to a more efficient and effective use of natural resources with the aim of improving human and societal well-being. Our discussion on the processes of value retention and regeneration reveals the relevance of taking such TSR perspective. Implementing CE at the individual service encounter, the organizational, and the organization context levels cannot be successful without considering the broader organizational context. CE is not only a matter of individual FLEs, customers, or individual companies; it is also a matter of service ecosystems, and it will take the wider society to make it happen.

In addition, the majority of companies engage more in value retention processes. Providing the more fundamental, though more challenging, value regeneration processes is still a largely uncharted area of practice and research. Moreover, the extant CE-based research has primarily focused on the inner sphere, while less is known about the joint and the outer spheres. More research is needed to investigate the role of the customer and how FLEs and customers jointly participate in retaining and regenerating value of resources for the greater well-being of individuals

and how companies should deal with challenges related to the implementation of these CE-based processes.

Furthermore, in this article, the focus is on large and established companies (e.g., IKEA, Flokk) that are leading their sector or belong to the leading group of companies. As such, these companies have the financial strength and resources to implement CE. In contrast, small and medium-sized enterprises (SMEs) often lack the necessary resources and may therefore face more resource management constraints. At same time, SMEs are small and flexible and may therefore be more receptive to adopting CE principles. Considering that in most economies, including the United States, SMEs represent more than 70% of the businesses, more research is needed to consider the implementation of CE to SMEs.

Finally, our paper illustrates that management has two key responsibilities. First, managers should consider, design, and use business models that will generate value for the company through CE principles. The question then is: How can and will such companies make the transition based on our conceptualization? Second, this will also have implications for FLEs and how they co-create value (with the customer). Some significant investments are required here.

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FIGURE 1:

LEVEL 1 (INDIVIDUAL SERVICE ENCOUNTER): SERVICE ENCOUNTER BUTTERFLY MODEL

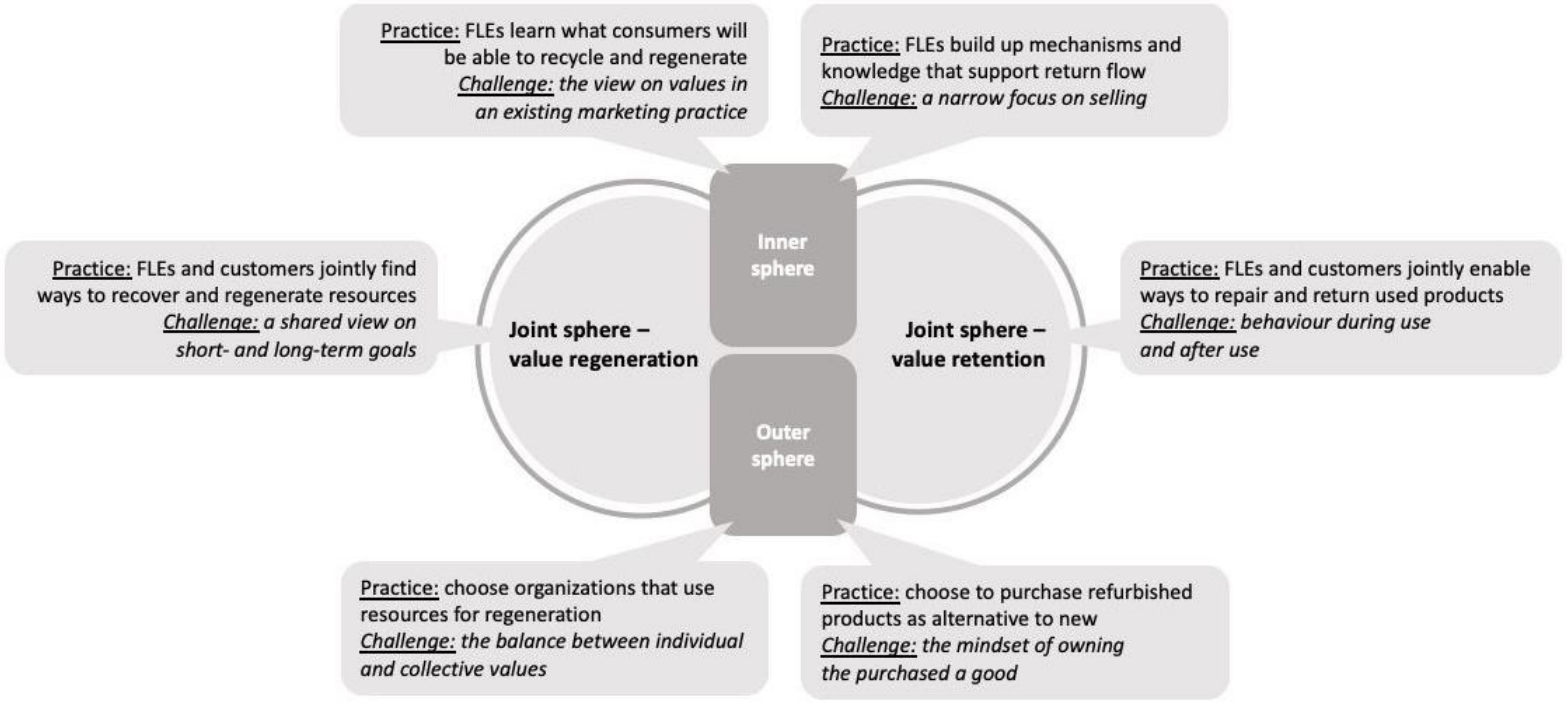

FIGURE 2:

LEVEL 2 (ORGANIZATION): SERVICE DELIVERY BUTTERFLY MODEL

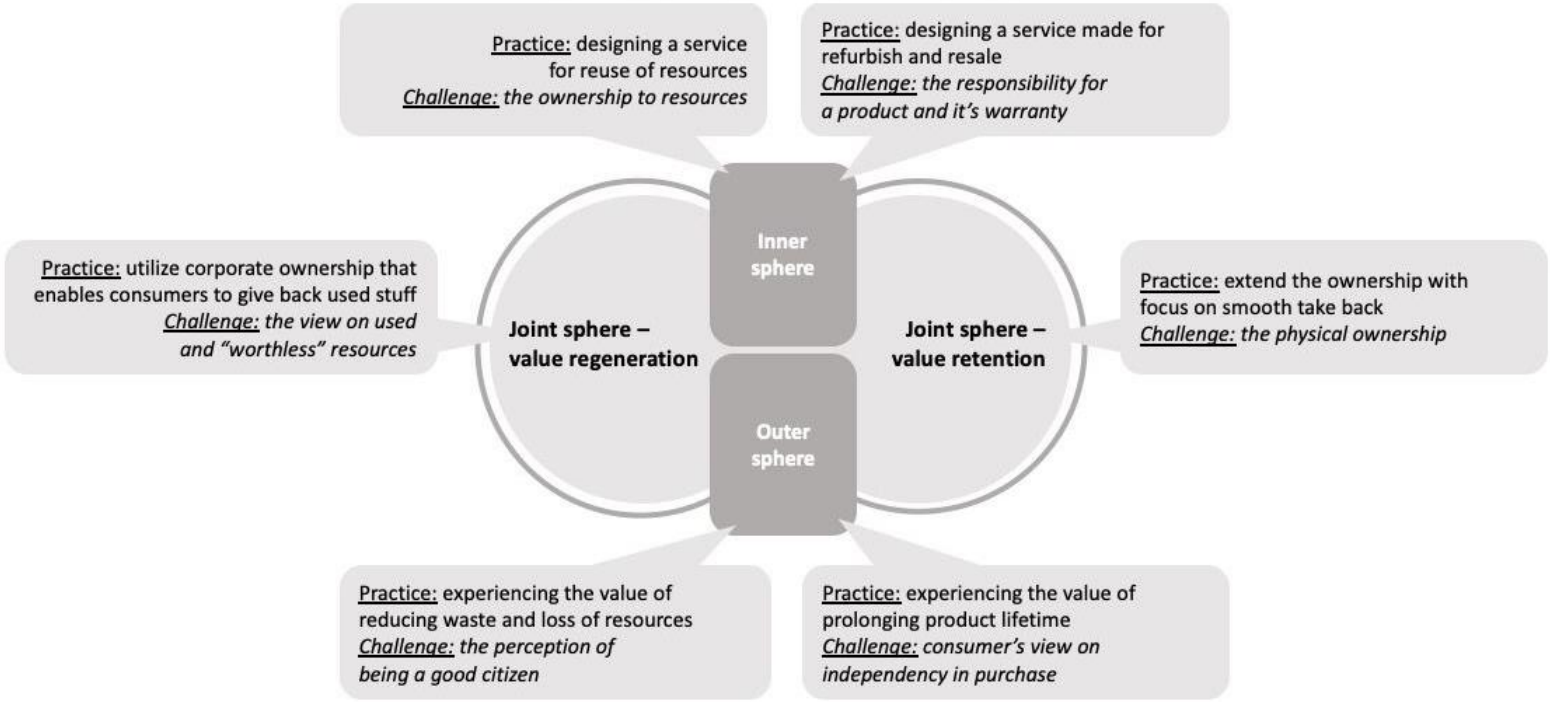

FIGURE 3:

LEVEL 3 (ORGANIZATIONAL CONTEXT): SERVICE ECOSYSTEM BUTTERFLY MODEL

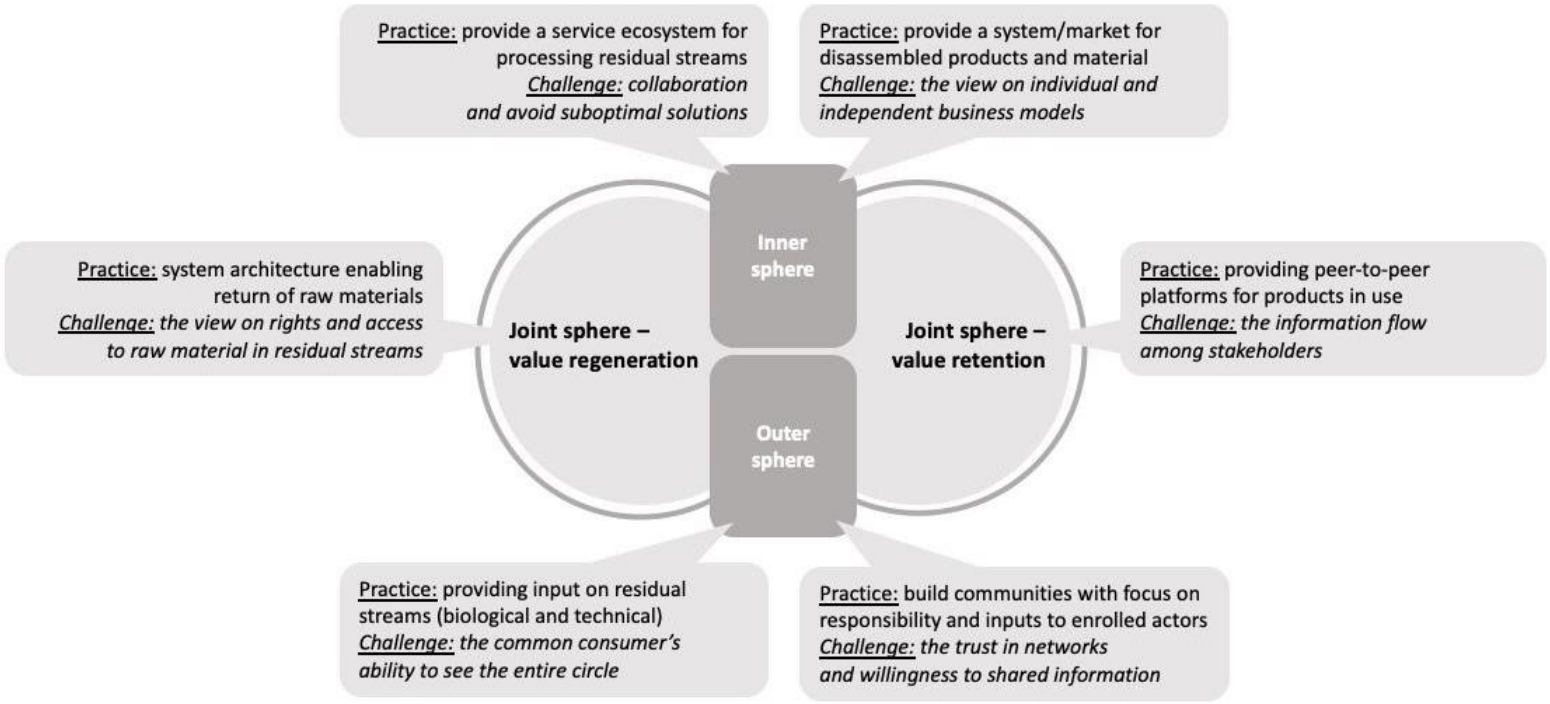

TABLE 1:

LEVEL 1: INDIVIDUAL SERVICE ENCOUNTER

	Inner sphere	Outer sphere	Joint sphere
Value	Developing knowledge and understanding of the CE, its values, and mechanisms	Adopting the mindset of the CE and the mechanisms for value retention and regeneration	Conversation with customers about co-creation of value retention and regeneration
Value retention	Having access to knowledge of what can be returned and repaired	Choosing to purchase refurbished products as an alternative to new	Jointly enabling used products for repair and return of products
The Rs as examples	Repair of products	Purchase of refurbished iPhones rather than new	Process for return of products at Flokk
Value regeneration	Having access to the knowledge of what can be recycled and regenerated and how	Choosing to use organizations that recover resources for regeneration	Jointly identifying opportunities for recovery and regeneration of resources
The Rs as examples	Recycling of food waste	Recovery of food waste	Use of recovered resources

TABLE 2:

LEVEL 2: ORGANIZATION

	Inner sphere	Outer sphere	Joint sphere
Value	Designing a service with focus on resources in a closed loop	Experiencing a shared value in circularity of products and resources	Joint view on limited resources and ownership to these resources
Value retention	Designing a service based on smooth take-back	Experiencing the value of prolonging product lifetime	Extended ownership with focus on retention through reselling
The Rs as examples	A return flow system embedded as a service, such as Martela, selling "space" instead of chairs and tables	Extended use of products (e.g., GoMore [private carpooling], Airbnb [residential])	Systems for ownerships based on sharing, renting, or leasing
Value regeneration	Designing a service based for reuse of resources	Experiencing the value of reducing waste and resource loss	Corporate ownership that incentivizes consumers to give back used resources
The Rs as examples	Waste-handling systems and deposit systems	Source separate resources for easy return flow	System that reduces loss of resources through "give-back" systems

TABLE 3:

LEVEL 3: ORGANIZATIONAL CONTEXT

	Inner sphere	Outer sphere	Joint sphere
Value	Market-level Infrastructure the firm as service provider use to incentivize	Market-level customer communities (collective aspect) as infrastructure to facilitate engagement	Collaboration and relation as lever for transformation and adaptation
Value retention	Provider of peer-to-peer platform	Secondhand trading communities	Marketplace for extending product/material use value
The Rs as examples	Redistribution of goods	Reuse or extended use of goods	Reduce, reuse, redistribute, remain in use, revaluation
Value regeneration	Intermediate service provider processing residual streams	Provide biological and technical input for residual streams	System architecture enabling - disassembly and reassembly (technical flow) + Return of nutrients to soil (biological flow)
The Rs as examples	Rethink the reintroduction of material input flow in value creating processes	Value being part of regenerating stock in the natural environment for future consumption possibilities	Regenerate biological systems depletion, return to a condition that supports self-sustaining nondestructive processes