

Implementing sustainable circular economy innovations in private sector organizations

Introduction

The circular economy has gained popularity in later years, being framed at the core of the New EU Green Deal, strongly promoted by international observatories such as the World Economic Forum, and embraced by innovative and future-oriented firms, from large multinationals to start-ups. The adoption of a circular economy in the private sector is done through the implementation of value-retention strategies ranging from reframed classic corporate sustainability practices – long loop value-retention (e.g. improvement of energy or material efficiency during production) – to transformative approaches towards sustainability (e.g. servitisation or virtualization of physical products).

The adoption of value-retention strategies entails implications for corporate circular innovation. Innovating towards a circular economy is a complex process that faces multiple challenges and can be explored from different perspectives. This white paper identifies key cross-cutting elements to strengthen the sustainability outcomes of circular innovation: the adoption of a territorial perspective, multi-stakeholder integration, and the understanding of sustainable value creation. In addition, it aims at supporting companies on their journey towards circular innovation by providing recommendations for three main areas: product development processes, the design of product-service systems, and business model innovation. These are presented in an integrative framework at the end of the document.

Cross-cutting elements: Sustainable value creation, territorial approaches, integration of multiple stakeholders

Private sector organizations show financial and non-financial incentives towards the adoption of circular innovations and thus, these constitute the means towards sustainable value creation. Their outcomes need to be understood from a multidimensional (economic, social, and environmental) and multi-level (individual, organizational, network, and territorial) perspectives. Within private sector organizations, circular innovations span across different geographical scales, from local to global. Territorial approaches towards sustainability propose to integrate regional material (e.g. natural resources, infrastructure) and non-material (e.g.

norms, values, actors) assets in order to increase the effectiveness of sustainability interventions. As a result, private sector organizations build up compelling narratives that support the innovation process, from concept design to assessment. An important aspect of territorial approaches for product and service development processes is the exchange of information with multiple stakeholders. In order to pursue structural changes through new concepts, external cooperative relationships need to span beyond supply chain networks, including actors from the science, policy, and societal domains. In return, this asks for strong cross-functional management systems, increasingly facilitated through digital technologies and changes in organizational cultures.



WP2.1: Business strategies and practices for a circular economy

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All firms have a business model, even if they are aware of it or not. A business model synthesizes what a firm does and for who (value proposition), how it does it (value creation and delivery) and why it does it (revenue model). If a business model is rooted on a circular strategy, such that it is helping to narrow, slow or close the loop of resources in the economy, then this is considered a circular business model.

Firms can innovate a business model by embedding, implementing, and capitalizing on circular economy practices in four ways: creating a circular start-up, diversifying the current business with an added circular business model, acquiring an external circular business model, or completely transforming the current business model into a circular one. The process of conceptualizing and implementing a circular business model is complex, as it requires changing the key building blocks of a business model and to navigate against the dominant linear business logic of “take-make-waste”, requiring firms to develop specific organizational capabilities to remain competitive (Santa-Maria et al., 2021a).

We undertook a multiple-case study on 10 firms that were successful in bringing a circular business model innovation to the market, and we identified 33 specific practices that supported this type of innovation process. We proposed that the most relevant ones are (i) to adopt a lifecycle perspective -particularly important for identifying impacts and opportunities-, (ii) to use sustainability-oriented

instruments, such as life-cycle-analysis, (iii) to design and develop value propositions with positive environmental or social impacts, (iv) to develop a sustainability-oriented strategy and organizational culture, (v) to identify and engage key stakeholders in collaboration and co-creation along the value chain and (vi) to integrate and coordinate the business ecosystem (Santa-Maria et al., under review).



WP2.2: Sustainable product lifecycle management in a circular economy

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The inclusion of circularity principles impacts the Product Development process, i.e the series of tasks that allow to deliver a new product or improve an existing one. Both business model innovation and the inclusion of territorial resources enable a socio-technical approach towards sustainability for circular economy-oriented product design and pose two key implications for the design practice. First, business model innovation makes design acquire a strategic role within the organisation (Diaz et al., 2021a). Since one of the new goals is to re-orient consumption patterns towards sufficiency, companies need to move away from designing products made for business models seeking high sales volumes to designing products where value preservation is optimized throughout products' lifecycle. This involves making decisions that are strongly intertwined with the competitive strategy of a company and thus, implies the inclusion of a strategic perspective to design decisions. Hence,

product planning activities play an important role in a company that aims at designing products oriented to value-retention (Diaz et al., 2021b). Second, the inclusion of territorial resources during design of products for a circular economy plays an important role in ensuring sustainable outcomes. In this task, designers act as cultural intermediaries able to understand geography-dependent values, attitudes and needs from users and consumers and adapt design elements oriented to value-retention accordingly. The consideration of territorial values adds a cross-cultural lens to user design approaches, an essential factor to ensure lifecycle actors are engaged in value-retention loops. Finally, a territorial perspective is also needed for strategic managers to identify the local actors involved in the exchanges of value surrounding a product or a service and establish effective partnerships (Lechner et al., 2021). Through our research it has been identified that main factors enabling the inclusion of circular economy principles during product development are: a) a stronger emphasis on product planning and early design phases, where product tasks can be discussed; b) integrating circular economy indicators in product evaluation routines; c) engage with stakeholders covering the entire lifecycle; d) engage with an extended team that can provide insights about all lifecycle actors in order to assure intended value-retention options are fulfilled, e) align organisational culture to integrate circularity goals into corporate strategies and adapt coordination mechanisms according to new needs.



WP2.3: *Integration of local resources into sustainable product-service system design*

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Product-service systems (PSS) are integrated offerings of products and services which can bring innovative potential, satisfying users through the delivery of functions or performance instead of products. PSS are essential strategies for companies as they allow companies to secure competitiveness while addressing environmental and societal concerns. To this end, PSS can act as catalyzers for developing territorial cooperative ecosystems at the city or regional level. As a result, the actions of companies and other local economic actors can converge with the interests of public actors and society at large. Geographical embeddedness enhances the creation of shorter and closed material loops (material efficiency), and organizational proximities (e.g., culture, sharing strategies, and organizational structures) are essential enablers for territorial stakeholder relationships (Delgadillo et al., 2021). The creation of territorial synergies positively influences the adoption of the PSS while enhancing trust of communities and public authorities in these new business models.

In the design process of PSS for territorial sustainability, companies need to understand how they create material and immaterial value at an organizational, value network, and territorial levels from early stages. This implies an involvement of designers on more strategic decisions concerning corporate sustainability. In addition, designers and managers should aim at integrating key territorial stakeholders from early stages of the design

process for developing competitive strategies that meet the social needs of the territory(ies) where the PSS are implemented. Design tools and methods are essential to support PSS development that supports the sustainability transition of territorial systems. Therefore, we developed "SysTER," a collaborative approach aiming to help companies and organizations design sustainable Product-service Systems that incorporate the territorial dimension. This method is participatory, and it supports the early PSS design phases. It allows companies to understand: (a) the complex systems they and their particular PSS offering belong to, (b) how they can create material and immaterial value at an organizational, network, and territorial levels. (c) Develop concepts that tackle customer and territorial needs, (d) and evaluate concepts' value perceived by different system actors. SysTER was tested with four companies in France and Taiwan. The implementation and diffusion of PSS it's growing, enabling the collaboration with territorial actors from the public, industrial and civil spheres in the design and implementation of innovations is essential to foster sustainability transitions and resilience of cities and regions.

Practical recommendations

In order to develop sustainable circular innovation, private sector organizations should embrace "Glocal" approaches in which production systems involving global actors are aligned with the societal needs of the local territories in which they operate. However, this approach can only be successful when collaboration for circular innovations integrates diverse stakeholders, including the industrial, science, policy, and societal domains. In this process, designers and managers are key actors in identifying and actively integrating key stakeholders in the innovation process. This results in the evolution of the designers' roles towards strategic decisions concerning corporate sustainability. From this perspective, companies should realize that designers are not only restricted to the product level. They are also concerned with the product-service system, business model, ecosystem, and territorial design levels. The collaboration among stakeholders for designing and implementing circular innovation happens at early stages, which implies developing



organizational alignments for enabling the right environment for coordination and orchestration of efforts and resources. A shared circular economy vision is crucial for guiding collective efforts. This vision should, in addition, be anchored and correspond to the local, territorial sustainability transitions vision to ensure the alignment with the territorial needs. Circular innovations incorporating systemic levels such as the territorial and socio-technical have the most significant potential for sustainability impact. Thus, companies need to develop value propositions for shared value creation jointly. From a sustainability perspective, companies need to understand both the material and the immaterial value they create through their innovations. This is relevant for developing a holistic understanding of the impacts of their innovations and for creating compelling narratives that allow them to engage with different stakeholders.

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