

ENGAGING CONSUMERS AND FIRMS THROUGH CIRCULAR BUSINESS MODELS: FROM AWARENESS TO SUSTAINABLE ACTION

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Abstract

The transition toward a circular economy requires not only technological and organizational innovation, but also active engagement of consumers and business partners. Although circular economy principles emphasize resource efficiency, reuse, and closed-loop systems, their successful implementation depends on how firms design business models that translate sustainability objectives into tangible value for users and stakeholders. In this context, circular business models represent a key mechanism for aligning environmental goals with market expectations and consumer behavior. Existing research indicates that awareness of circular economy principles does not automatically lead to adoption or long-term behavioral change. Instead, the transition from linear to circular practices is shaped by the interaction of communication strategies, business model adaptation, and gradual changes in consumer perceptions and routines. Business models therefore play a dual role by structuring value creation and capture while simultaneously influencing consumer engagement with products, services, and circular practices. Despite growing academic interest, the literature often treats consumer behavior, business model design, and communication mechanisms as separate domains. In addition, diffusion-of-innovation approaches tend to focus on consumer segments without explicitly considering the role of business model transformation in enabling mainstream adoption. This fragmentation limits understanding of how circular solutions move from early awareness to sustained use. To address this gap, this paper examines how circular business models engage consumers and firms across different stages of adoption. By integrating insights from circular economy research, business model frameworks, and diffusion-of-innovation theory, the study proposes a conceptual framework that supports the transition from awareness to sustainable action.

Key words: *Circular business models; Consumer engagement; Business model innovation; Circular economy; Sustainable consumption; Adoption phases; Diffusion of innovation.*

Introduction

Developed economies and, increasingly, leading global companies are adopting the circular economy as a response not only to environmental pressures, but also to changing consumer expectations and market behavior. At its core, the circular economy is guided by the 3R principles (reducing, reusing, and recycling) which directly influence how products are designed, consumed, and returned into economic cycles. Beyond environmental benefits,

circular practices generate economic value through cost savings, extended product lifecycles, and reduced waste generation, creating incentives for both businesses and consumers to change established linear consumption patterns.

The implementation of circular economy principles relies on the adoption of appropriate business models that translate sustainability goals into concrete organizational and market practices. Business models serve as analytical tools that explain how companies create, deliver, and capture value, and they play a critical role in shaping interactions between firms, customers, and other stakeholders (Giourka et al., 2019). In this context, circular business models function as mechanisms that enable behavioral change by redefining value propositions, customer relationships, and consumption practices.

To successfully implement circular economy principles, managers must integrate value creation, value delivery, and value capture while actively engaging consumers and business partners. Three key factors influence this process: the role of policymakers and international institutions in setting regulatory and incentive frameworks; organizational and technological capabilities, including the support of Industry 4.0 technologies, which facilitate transparency, traceability, and resource efficiency; and continuous monitoring of circular performance to ensure long-term behavioral and organizational change (Guldmann, 2016).

Despite growing awareness, several barriers continue to hinder the transition from circular economy concepts to practical implementation. These challenges include limited access to reliable data, insufficient technological infrastructure, weak economic incentives, inconsistent regulatory enforcement, and low levels of consumer awareness and engagement (Korhonen et al., 2017). While existing literature provides guidance on adapting traditional business models to circular principles, there remains a lack of clarity on how these principles can be systematically embedded across all components of a business model framework. This gap highlights the need for a comprehensive conceptual approach that supports companies in engaging consumers and stakeholders and transforming awareness of circular economy principles into sustainable business and consumption practices (Lacy, 2014).

Value creation, value delivery, and value capture represent the core dimensions through which circular business models influence both organizational strategies and consumer behavior. Considering these dimensions raises a critical question: can circular business models serve as practical tools for guiding companies and societies from awareness to concrete action in the transition toward a circular economy?

To better understand how awareness of circular economy principles can be translated into concrete business practices and behavioral change among consumers, it is necessary to examine the tools companies use to design and communicate value. One of the most widely applied frameworks for this purpose is the Business Model Canvas (BMC), which provides a structured overview of how organizations create, deliver, and capture value. Comparing the traditional Business Model Canvas with its circular extension enables a clearer understanding of how business models can actively engage consumers and businesses in circular practices.

In the European policy context, consumer engagement has become a central pillar of the circular economy transition. Recent initiatives, including the European Green Deal and the Circular Economy Action Plan, emphasize not only sustainable production but also informed, empowered, and protected consumers as active participants in circular systems. Consumer rights related to durability, reparability, transparency, and access to information are increasingly recognized as key enablers of circular practices.

From this perspective, circular business models serve as an operational bridge between regulatory objectives and everyday consumption practices. By embedding consumer rights into value propositions, communication strategies, and product–service systems, firms can

reduce information asymmetries and lower perceived risks associated with circular solutions. This alignment is particularly important for overcoming consumer skepticism and fostering trust, which are frequently identified as barriers to adoption. Consequently, understanding how business models integrate consumer rights and engagement mechanisms is essential for translating policy ambitions into market-level outcomes.

In recent years, the transition toward a circular economy has become one of the central priorities of sustainable development policies worldwide. Growing concerns regarding climate change, resource scarcity, environmental degradation, and increasing waste generation have challenged the long-established linear model of economic development based on the "take–make–dispose" principle. While this traditional model has contributed to economic growth for decades, it has also resulted in excessive resource consumption, environmental pollution, and significant pressure on natural ecosystems. As a consequence, governments, international organizations, and businesses are increasingly recognizing that sustainable economic growth requires systemic changes in the way products are designed, produced, consumed, and recovered.

The circular economy has therefore emerged as a comprehensive framework aimed at maintaining the value of products, materials, and resources for as long as possible while minimizing waste generation throughout the entire product lifecycle. Rather than focusing exclusively on recycling, circular economy principles promote preventive strategies such as product durability, repairability, remanufacturing, reuse, and sharing models that reduce the need for continuous extraction of virgin resources. These principles not only contribute to environmental sustainability but also create opportunities for economic value creation, innovation, and improved competitiveness. Consequently, the transition toward circular systems is increasingly viewed as a strategic opportunity rather than solely an environmental obligation.

At the European level, this transition has been strongly supported through policy initiatives such as the European Green Deal and the Circular Economy Action Plan, both of which emphasize the importance of redesigning production and consumption systems to achieve climate neutrality and sustainable economic development. These initiatives highlight that businesses are expected to move beyond compliance with environmental regulations and actively integrate circular principles into their long-term strategies. At the same time, consumers are no longer perceived as passive recipients of products and services but as active participants whose purchasing decisions, usage patterns, and disposal behavior significantly influence the effectiveness of circular systems.

Within this context, business models have gained increasing attention because they determine how organizations translate sustainability objectives into market-oriented solutions. While technological innovations remain essential for improving resource efficiency, technological advancement alone cannot ensure successful circular transitions. Organizations must simultaneously redesign the mechanisms through which value is created, delivered, and captured while encouraging customers to adopt new forms of consumption based on access, sharing, repair, and product life extension. This shift requires companies to reconsider not only operational processes but also relationships with customers, suppliers, and other stakeholders across the value chain.

Consumer participation has consequently become one of the most important determinants of circular economy implementation. Numerous circular initiatives fail to achieve their intended impact because consumers often remain reluctant to modify established consumption habits despite expressing positive environmental attitudes. Previous studies repeatedly demonstrate that awareness of sustainability issues does not necessarily translate

into behavioral change. Instead, adoption depends on multiple factors, including trust, convenience, perceived value, economic incentives, social influence, and the effectiveness of organizational communication. This discrepancy between environmental awareness and actual participation highlights the importance of designing business models capable of reducing perceived risks while increasing consumer confidence in circular products and services.

From this perspective, circular business models should not be understood merely as organizational frameworks for managing resources but as mechanisms that actively facilitate interaction between companies and consumers throughout the product lifecycle. By integrating communication strategies, service innovation, reverse logistics, and customer engagement into a unified system, circular business models create conditions under which sustainable behavior becomes easier, more accessible, and economically attractive. Such an approach moves beyond viewing sustainability as an isolated organizational objective and instead positions it as a shared responsibility among businesses, consumers, policymakers, and society as a whole.

Despite the rapidly expanding body of literature on circular economy and sustainable business models, important conceptual gaps remain. Existing studies frequently examine business model innovation, consumer engagement, communication strategies, and diffusion-of-innovation processes separately, without adequately explaining how these dimensions interact over time during the transition toward circular practices. As a result, there is still limited understanding of how organizations can systematically transform initial consumer awareness into widespread adoption and long-term behavioral change. Addressing this gap requires a more integrated conceptual perspective capable of linking organizational design, stakeholder engagement, and consumer behavior within a single analytical framework.

Business Model Frameworks for Engaging Consumers and Businesses in Circular Practices

A business model describes the underlying logic through which an organization creates value, delivers it to the market, and captures economic returns (Osterwalder & Pigneur, 2010). In contemporary research, business models are increasingly viewed as dynamic constructs that support organizational transformation, particularly in periods of strategic change and innovation (De Reuver et al., 2013; Murray & Scuotto, 2016). Transitioning from an existing business model to a new one represents a complex managerial challenge, as it requires redefining value propositions, acquiring new resources and capabilities, and reconsidering existing partnerships and stakeholder relationships.

From a strategic perspective, business models also function as analytical tools that support decision-making and organizational positioning. Previous studies have demonstrated that the Business Model Canvas can be combined with complementary strategic instruments, such as SWOT analysis, to identify weaknesses and threats and translate them into actionable development strategies (Mustaniroh et al., 2020). This highlights that business models are not static descriptions of firm activity, but flexible frameworks that can be used to align internal capabilities with external market and stakeholder expectations.

Structure of the Business Model Canvas

One of the most widely applied frameworks for structuring business models is the Business Model Canvas (BMC), developed by Osterwalder and Pigneur. The BMC provides a visual and systematic representation of how organizations organize value creation, value delivery, and value capture through nine interrelated building blocks. This structure enables firms to

assess how value propositions are communicated to customers and how relationships with key stakeholders are established and maintained.

By integrating key elements such as customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, and cost structure, the BMC offers a holistic overview of organizational logic and strategic priorities. Its visual format facilitates internal communication, strategic alignment, and iterative refinement of business models, particularly in contexts characterized by innovation and market uncertainty.

In addition, the BMC supports comparative analysis by allowing organizations to evaluate existing business models and explore alternative configurations. As such, it is widely used not only as a descriptive tool, but also as a decision-support framework that helps managers identify opportunities for innovation, improve value delivery mechanisms, and adapt to changing market and stakeholder expectations.

In increasingly dynamic and competitive markets, organizations are required to continuously adapt their business models to changing customer expectations, technological developments, and sustainability challenges. The rapid digitalization of business processes, globalization of markets, and growing emphasis on environmental responsibility have significantly transformed the way firms create and deliver value. Under these conditions, companies are no longer expected to compete solely through products or services but through innovative business models that effectively integrate customer needs, organizational capabilities, and strategic partnerships. Consequently, business model design has become one of the central managerial tools for achieving competitive advantage and supporting long-term organizational growth.

Among the various frameworks proposed for business model development, the Business Model Canvas (BMC) has emerged as one of the most widely adopted approaches in both academic research and managerial practice (Osterwalder & Pigneur, 2010). The popularity of the framework stems from its ability to provide a clear and visual representation of how organizations create, deliver, and capture value while simultaneously illustrating the interdependencies among key business components. Unlike traditional business planning documents, which often focus on financial projections and operational details, the Business Model Canvas emphasizes the strategic logic underlying business activities and facilitates communication among managers, entrepreneurs, and other stakeholders.

The Business Model Canvas is particularly valuable for innovative firms operating in uncertain environments because it encourages experimentation, continuous adaptation, and customer-oriented thinking. Rather than viewing business models as static organizational structures, the framework supports an iterative process in which firms continuously evaluate and redesign their value propositions in response to market feedback. This characteristic makes the Business Model Canvas especially suitable for start-ups, technology-based companies, and organizations undergoing strategic transformation.

According to Osterwalder and Pigneur (2010), the Business Model Canvas consists of nine interconnected building blocks, each representing a fundamental aspect of organizational value creation. These elements collectively explain how a company generates value for customers while ensuring long-term economic sustainability.

The first component, Customer Segments, identifies the specific groups of customers that an organization intends to serve. Understanding customer characteristics, preferences, and needs enables firms to develop tailored solutions that address market demands more effectively.

The Value Proposition represents the central element of the framework by defining the bundle of products and services that create value for customers. It explains why customers choose one organization over another by highlighting unique benefits, problem-solving capabilities, and opportunities for creating additional value.

Channels describe how organizations communicate with customers, deliver products and services, and maintain interactions throughout the customer journey. Effective channels ensure that value propositions reach the intended market efficiently while supporting customer satisfaction.

The Customer Relationships block focuses on the type of relationships organizations establish with different customer segments. These relationships may range from personalized assistance to automated services and community-based interactions, depending on strategic objectives and customer expectations.

The financial dimension of the model is represented through Revenue Streams, which explain how organizations generate income from different customer segments. Revenue may originate from direct product sales, subscriptions, licensing agreements, leasing arrangements, or other innovative pricing mechanisms.

The operational foundation of the business model is reflected in Key Resources and Key Activities. Key resources include the physical, intellectual, financial, and human assets necessary for delivering value, whereas key activities represent the critical processes that enable organizations to develop products, provide services, and maintain competitive performance.

The Key Partnerships block emphasizes the importance of collaboration with suppliers, strategic partners, research institutions, and other stakeholders who contribute complementary resources and capabilities. In increasingly interconnected markets, partnerships frequently become essential for innovation, risk sharing, and access to new markets.

Finally, Cost Structure summarizes the major costs associated with implementing the business model, including investments in key resources, operational activities, partnerships, and customer relationships. Understanding cost drivers enables organizations to balance value creation with economic efficiency and long-term profitability.

Because all nine building blocks are interconnected, modifications in one component often influence the entire business model. Consequently, the Business Model Canvas should not be viewed as a static planning instrument but rather as a dynamic managerial framework that supports continuous innovation, organizational learning, and strategic adaptation. This holistic perspective has also provided the foundation for the development of several specialized extensions, including the Value Proposition Canvas and, more recently, the Circular Business Model Canvas, which further expand the original framework by incorporating customer-centric and sustainability-oriented dimensions (Lewandowski, 2016; Sibalija et al., 2021).

Circular Business Model Canvas as a Mechanism for Circular Action

The Circular Business Model Canvas represents an extended version of the traditional Business Model Canvas, redesigned to reflect the principles and logic of the circular economy. Rather than focusing solely on linear value creation, this framework emphasizes closed-loop systems, long-term resource use, and active stakeholder participation. By expanding the original canvas structure, the model introduces additional elements that explicitly address consumer involvement, resource recovery, and organizational readiness for circular transformation (Lewandowski, 2016).

The framework comprises a set of interconnected components that collectively support the design and implementation of circular-oriented business models. These elements guide organizations in translating sustainability awareness into operational practices and behavioral change across the value chain.

- **Circular value offerings** focus on products and services designed for durability, reuse, repair, and shared use, often supported by incentive mechanisms that encourage customers to return products after use.
- **Target user groups** are defined in close alignment with circular value offerings, ensuring that products and services correspond to user needs, usage patterns, and sustainability expectations.
- **Interaction and distribution channels** include both digital and physical pathways that facilitate access to circular products and enable continuous communication with users throughout the product lifecycle.
- **Engagement-oriented customer relationships** prioritize demand-driven production, social marketing, and collaboration with communities and local stakeholders, particularly in advanced recycling and reuse systems.
- **Circular revenue logic** is based on access, performance, or usage rather than ownership, with additional value generated through recovered materials and reintegrated resources.
- **Strategic resources** emphasize renewable, high-quality, and recoverable materials, as well as the regeneration of natural capital and the integration of customer-owned or third-party resources into closed loops.
- **Operational activities** include efficiency improvements, technological innovation, product redesign for recyclability, and organizational actions that support circular transition, including advocacy and stakeholder coordination.
- **Collaborative partnerships** are formed with supply chain actors and value network participants who actively contribute to circular objectives.
- **Cost configuration** reflects the specific financial dynamics of circular systems, including investments in return mechanisms, incentives, and monitoring processes, often requiring adapted accounting approaches.
- **Return and recovery systems** are explicitly incorporated to manage product take-back, reverse logistics, and user participation in reuse and recycling processes.
- **Adoption and enabling conditions** capture both internal organizational capabilities and external institutional, regulatory, and market-related factors that influence the successful implementation of circular business models.

Together, these elements ensure that circular principles are embedded across the entire value chain, positioning the Circular Business Model Canvas as a practical tool for engaging consumers and businesses in sustainable and circular practices (Lewandowski, 2016).

The Circular Business Model Canvas serves as a foundational mechanism through which consumer engagement is operationalized across different stages of adoption. By integrating communication channels, engagement-oriented customer relationships, and return and recovery systems, the CBMC supports the gradual transition from awareness to adoption and stabilization. This perspective highlights the role of business model design as an active driver of consumer participation and behavioral change in circular business model transitions.

Beyond its structural role, the Circular Business Model Canvas provides a practical lens for understanding how firms can actively engage consumers in circular practices. Several CBMC components directly shape consumer participation by influencing how users access, use, and return products and services. Engagement-oriented customer relationships, access-

based revenue models, and return and recovery systems transform consumers from passive buyers into active contributors within circular value chains.

These mechanisms support behavioral change by lowering participation barriers and reinforcing learning processes over time. For example, take-back schemes and repair services encourage repeated interaction, while transparent communication channels enhance consumer understanding of product lifecycles and environmental impacts. Incentive structures linked to reuse and return further strengthen motivation and commitment.

As a result, the CBMC can be interpreted not only as a design framework for circular value creation, but also as a behavioral interface that aligns business model elements with everyday consumption routines. This perspective highlights the role of business model design as an active driver of consumer engagement, rather than a static organizational blueprint. Such an interpretation provides a conceptual foundation for examining how circular business models facilitate transitions from awareness to adoption and, ultimately, to long-term stabilization of circular practices.

Business Model Transformation from Linear to Circular Practices

This comparison highlights how the transition from traditional to circular business models requires not only structural changes in business design, but also active engagement of consumers and businesses in circular practices.

<i>BMC Building Block</i>	<i>Traditional Business Model (BM)</i>	<i>Circular Business Model (CBM)</i>
<i>Customer Segments</i>	Customers defined mainly by demand and purchasing power	Customers viewed as users and co-participants in circular practices
<i>Value Proposition</i>	Product ownership and functional value	Extended product life, access-based value, repair, reuse, and sustainability benefits
<i>Channels</i>	Primarily physical or sales-oriented channels	Integrated physical and digital channels supporting communication, use, and return
<i>Customer Relationships</i>	Transaction-based and short-term	Long-term engagement, education, and behavior-oriented interaction
<i>Revenue Streams</i>	One-time sales and ownership transfer	Subscription, pay-per-use, leasing, and value from recovered resources
<i>Key Resources</i>	Virgin materials and internally owned assets	Renewable, recyclable, and shared resources within closed loops
<i>Key Activities</i>	Production, marketing, and distribution	Lifecycle management, product redesign, recovery, and monitoring
<i>Key Partnerships</i>	Supplier-focused and cost-driven	Ecosystem partnerships enabling circular flows and shared responsibility
<i>Cost Structure</i>	Focus on production and logistics cost efficiency	Costs related to take-back systems, incentives, monitoring, and circular infrastructure

Table 1. Comparison of the Traditional Business Model Canvas and the Circular Business Model Canvas

Table 1 provides a comparative overview of the traditional Business Model Canvas and the Circular Business Model approach across the nine core building blocks. The comparison highlights how circular business models redefine value propositions, customer relationships, and resource use by actively engaging consumers and partners in circular practices. By emphasizing lifecycle management, closed-loop resource flows, and long-term stakeholder engagement, the circular model illustrates the shift from awareness of sustainability issues toward concrete behavioral and organizational action.

Consumer and Business Engagement Mechanisms in Circular Models

Previous studies emphasize that effective circular transitions require the alignment of consumer behavior, business model design, and communication mechanisms. In this context, circular business models can be understood as integrative frameworks that coordinate these domains and support the shift from sustainability awareness to practical engagement (Gomes et al., 2024).

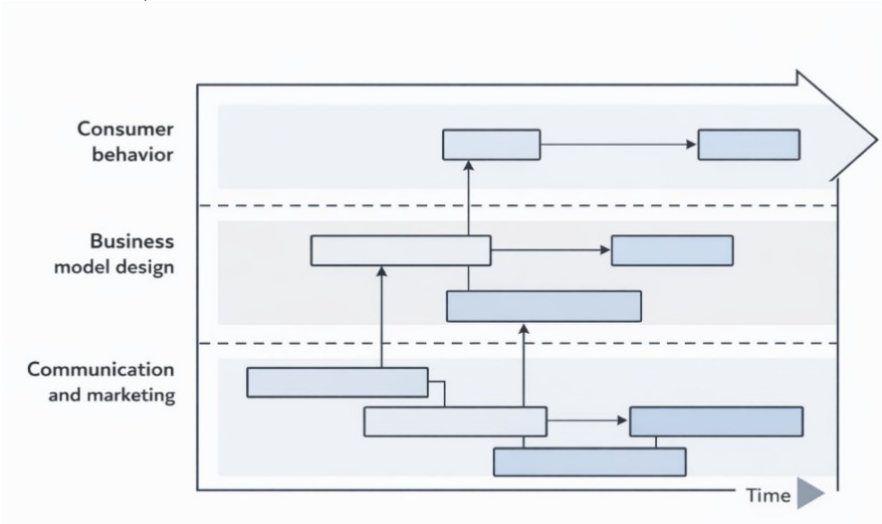


Figure 1. Conceptual interaction between communication & marketing, business model design, and consumer behavior over time (Gomes et al., 2024)

Figure 1 illustrates the dynamic and time-dependent relationship between communication and marketing activities, business model design, and consumer behavior. The model highlights communication and marketing as initial drivers of change, which stimulate adaptations in business model design. These adaptations subsequently influence consumer behavior, with a noticeable time lag. The dashed horizontal lines distinguish the three analytical levels, while vertical arrows indicate the direction of influence between them. Overall, the figure emphasizes the iterative and non-linear nature of circular business model transitions, where sustained communication efforts and business model adjustments are required before observable changes in consumer behavior occur.

The literature suggests that the successful adoption of circular business models depends not only on structural design choices, but also on how effectively consumer practices are integrated into the business model. Factors such as convenience, economic incentives, and opportunities for co-design have been identified as critical in motivating consumer

participation, highlighting the importance of aligning business model elements with everyday consumption practices. (Borrello et al., 2020)

In addition to business model design, communication plays a central role in transforming awareness into action. Clear, transparent, and practice-oriented communication helps consumers understand their role within circular systems, particularly in activities related to repair, reuse, and recycling. Digital channels, labeling, and feedback mechanisms can support learning and reinforce sustainable behavior by making circular practices visible and accessible to users.

From the business perspective, active engagement mechanisms such as take-back schemes, repair services, and participation incentives enable firms to move beyond passive sustainability messaging. By embedding these mechanisms directly into customer relationships and value propositions, companies can encourage repeated interaction and long-term commitment to circular practices. This approach strengthens business–consumer relationships and increases the likelihood of sustained participation in circular business models.

In the context of circular business models, consumer engagement is closely linked to the protection and empowerment of consumer rights. Rights related to access to information, product durability, reparability, and transparency play a crucial role in shaping consumer willingness to participate in circular practices. When consumers clearly understand how products can be reused, repaired, or returned, engagement mechanisms become more effective and trust in circular systems increases.

Moreover, engagement should not be understood as a one-time interaction, but as an ongoing process that evolves throughout the product lifecycle. Communication tools, feedback mechanisms, and participatory design approaches enable consumers to actively contribute to circular value creation. This continuous interaction supports learning processes and facilitates the internalization of circular practices, thereby strengthening the transition from awareness to sustained behavioral change.

A Multilevel Consumer Adoption Framework for Circular Business Model Transitions

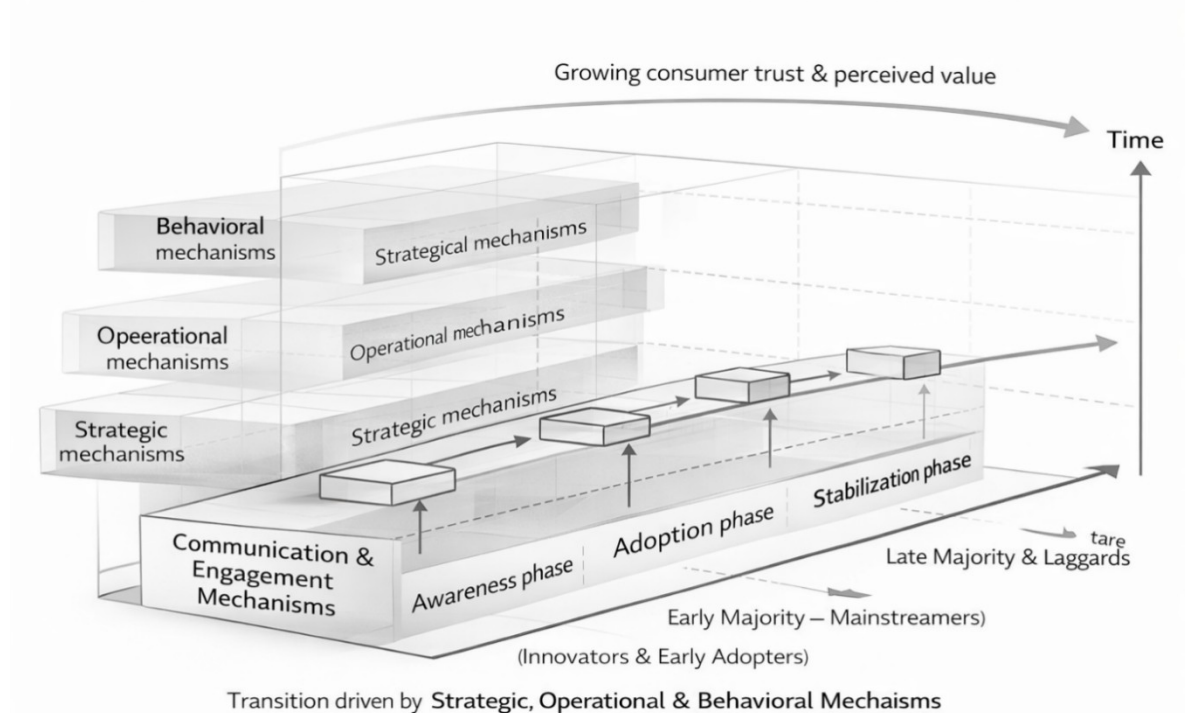


Figure 2. Three-dimensional conceptual framework illustrating the transition of circular business models over time. The model integrates temporal adoption phases (awareness, adoption, stabilization), multi-level interactions (communication and engagement mechanisms, business model design, consumer behavior), and innovation transition mechanisms (strategic, operational, and behavioral). The adoption phase corresponds to the transition toward mainstream adoption, aligning the framework with diffusion-of-innovation theory. Adapted from prior literature.

Figure 2 presents an integrated, three-dimensional conceptual framework illustrating how circular business model transitions unfold over time through the interaction of communication and engagement mechanisms, business model adaptation, and consumer behavioral change. The model aligns the temporal phases of awareness, adoption, and stabilization with diffusion-of-innovation logic and embeds them within strategic, operational, and behavioral transition mechanisms.

The adoption phase represents a critical transition point in circular business model diffusion, as it marks the shift from early adopters to mainstream consumers. While innovators and early adopters are often motivated by environmental values and experimentation, mainstream consumers tend to prioritize convenience, reliability, and perceived value. This difference explains why many circular initiatives struggle to scale beyond niche markets.

Within this phase, business model adaptation and communication mechanisms play a decisive role in reducing uncertainty and perceived risk. Clear value propositions, transparent pricing models, and accessible service infrastructures help normalize circular practices and integrate them into everyday routines. At the same time, consumer feedback and usage data enable firms to refine offerings and improve usability, reinforcing a positive feedback loop between adoption and business model design.

By explicitly positioning the adoption phase as a transition toward mainstream acceptance, the proposed framework advances diffusion-of-innovation theory by highlighting the mediating role of business models. This approach shifts attention from consumer segmentation alone toward the interaction between business model configuration and consumer behavior, offering a more nuanced explanation of how circular solutions achieve scale.

Building on prior research on circular business models and diffusion-of-innovation theory, this study proposes an integrated temporal–multilevel adoption framework to explain how circular business models transition from early awareness to mainstream acceptance and long-term stabilization. As illustrated in Figure 2, the framework combines three analytical levels—communication and engagement mechanisms, business model design, and consumer behavior—across three temporal phases: awareness, adoption, and stabilization. While existing studies often examine these dimensions in isolation, the proposed model emphasizes their dynamic interaction over time. In line with diffusion-of-innovation literature, the awareness phase is primarily driven by innovators and early adopters, whereas the adoption phase represents the critical transition toward mainstream acceptance by the early majority. The stabilization phase reflects the routinization of circular practices among the late majority and laggards. Unlike linear adoption models, this framework embeds these temporal phases within strategic, operational, and behavioral transition mechanisms, highlighting how communication intensity, business model reconfiguration, and consumer learning jointly contribute to increasing trust and perceived value. By integrating temporal dynamics, multi-level interactions, and innovation transition mechanisms into a unified three-dimensional framework, this model extends existing circular business model literature and offers a more comprehensive explanation of how circular solutions achieve sustained consumer adoption.

The proposed multilevel adoption framework provides an integrative perspective that goes beyond existing linear or single-level approaches to circular business model adoption. By explicitly combining temporal phases, multi-level interactions, and innovation transition mechanisms, the framework captures the complexity of real-world circular transitions.

In particular, the integration of strategic, operational, and behavioral mechanisms highlights that successful adoption depends not only on consumer motivation, but also on how firms design supportive infrastructures and engagement pathways. This perspective allows researchers and practitioners to better identify bottlenecks in the adoption process and to design targeted interventions that facilitate the transition from early adoption to long-term stabilization.

Discussion and practical implications

The proposed conceptual framework contributes to the growing body of literature on circular business models by integrating three research streams that are often examined independently: business model innovation, consumer engagement, and diffusion-of-innovation theory. While previous studies have extensively discussed the structural characteristics of circular business models and the importance of sustainable consumption, relatively limited attention has been devoted to explaining how these elements interact dynamically over time. By combining temporal adoption phases with business model adaptation and communication mechanisms, the proposed framework offers a more comprehensive understanding of the transition from awareness to sustained circular behavior.

One of the principal theoretical contributions of this study lies in positioning business models as active mechanisms that shape consumer adoption rather than merely describing

organizational structures. Traditional business model research has primarily focused on value creation, value delivery, and value capture from the organizational perspective. However, within circular economy contexts, business models also perform an educational and behavioral function by reducing uncertainty, facilitating participation, and encouraging long-term engagement. This perspective extends existing business model literature by emphasizing the interaction between organizational design and consumer decision-making processes.

From a managerial perspective, the framework highlights that successful implementation of circular business models depends not only on technological innovation but also on the ability of organizations to design customer experiences that facilitate participation in circular practices. Firms should therefore invest in transparent communication, user-friendly digital platforms, repair and maintenance services, take-back systems, and incentive mechanisms that lower participation barriers. Such initiatives increase consumer confidence while simultaneously improving the long-term viability of circular business models.

The framework also underlines the importance of collaboration across multiple stakeholder groups. Circular business models require coordinated actions involving manufacturers, suppliers, consumers, policymakers, recycling organizations, and digital service providers. Building effective partnerships enables organizations to develop integrated value networks capable of supporting resource recovery, product life extension, and closed-loop material flows. Consequently, collaboration becomes a strategic capability rather than merely an operational requirement.

For policymakers, the proposed framework demonstrates that regulatory initiatives alone are insufficient to accelerate circular economy adoption. Legislative measures should be complemented by educational campaigns, financial incentives, digital infrastructure, and policies that strengthen consumer trust through transparency and access to reliable information. Initiatives promoting product durability, reparability, and the right to repair may significantly enhance consumer participation while simultaneously encouraging firms to redesign their business models according to circular economy principles.

Finally, although the proposed framework remains conceptual, it provides a foundation for future empirical research. Researchers may examine how individual business model components influence different stages of consumer adoption across industries, countries, and cultural contexts. Longitudinal studies could further investigate how communication strategies, technological innovation, and organizational learning jointly contribute to the long-term stabilization of circular consumption systems.

Conclusions

This paper explored the role of circular business models as mechanisms for engaging consumers and firms in the transition from sustainability awareness to sustained circular practices. By examining the structure of the traditional Business Model Canvas and its circular extension, the study highlighted how circular business models redefine value propositions, customer relationships, and resource use in ways that actively involve users and partners throughout the product lifecycle.

Building on this foundation, the proposed integrated temporal–multilevel adoption framework advances existing literature by linking business model design, communication and engagement mechanisms, and consumer behavior within a unified conceptual structure. By aligning the phases of awareness, adoption, and stabilization with diffusion-of-innovation logic, the framework emphasizes the critical role of the adoption phase as the transition toward mainstream acceptance of circular solutions. The inclusion of strategic, operational,

and behavioral mechanisms further illustrates how trust, perceived value, and learning processes evolve over time and support long-term stabilization.

The study contributes to circular business model research by moving beyond static representations and highlighting the dynamic and non-linear nature of adoption processes. From a practical standpoint, the framework offers guidance for managers and policymakers by illustrating how communication strategies and business model configurations can be coordinated to foster consumer engagement and sustained participation in circular systems.

The findings underline the importance of aligning business model innovation with consumer engagement strategies. Managers designing circular business models should prioritize communication clarity, ease of participation, and trust-building mechanisms, particularly during the adoption phase. Embedding repair, reuse, and return options into customer journeys can significantly enhance long-term engagement and stabilize circular practices.

For policymakers, the framework highlights the need to support business model experimentation through regulatory incentives, standardization efforts, and consumer protection measures. Policies that promote transparency, durability, and right-to-repair can reinforce business-led engagement mechanisms and accelerate mainstream adoption. By coordinating policy interventions with business model innovation, institutional actors can strengthen the conditions under which circular solutions move from awareness to sustained market integration.

Future research could empirically test the proposed framework across different industries and geographical contexts, as well as examine how specific engagement mechanisms influence adoption dynamics. Such research would further enhance understanding of how circular business models can effectively support the transition toward a more sustainable and circular economy.

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