



Implementing Circular Business Model Canvas for MSMEs in Indonesia

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Abstract. MSMEs in Indonesia have undergone notable expansion, resulting in enduring environmental harm. In response to this challenge, Indonesia has included the circular economy (CE) into the Indonesia 2045 agenda as a strategic approach to achieve development sustainability and promote the green economy. The circular business model canvas (CBMC) framework is a strategic approach towards achieving the goals of Advanced Indonesia 2045. Research on the CBMC framework remains limited, particularly in the context of MSMEs in Indonesia. Thus, the objective of this study is to propose a CBMC framework suitable for implementation across different SME sectors in Indonesia. The research finding introduce the CBMC framework created by Lewandowski, derived from the business model canvas (BMC) framework by Osterwalder and Pigneur. Lewandowski incorporated new elements, namely the take-back system and adoption factor, into the BMC model. As a result, the CBMC framework now consists of eleven components, with each component aligning with the principles of CE. Additionally, Lewandowski introduced three primary challenges known as the Triple Fit Challenge, which consist of ensuring (1) alignment of value propositions with customer segments, (2) alignment of cost structures with revenue streams, and (3) alignment of take-back systems with adoption factors. Overcoming these challenges is essential for the success of CBMC design.

Keywords: Circular Business Model Canvas, Circular Economy, MSMEs.

1 Introduction

Micro, small, and medium-sized businesses (MSMEs) in Indonesia serve as the foundation of the country's economy and contribute substantially to employment generation. According to the Ministry of Cooperatives and SMEs, the quantity of MSMEs in Indonesia grew to 65. 5 million business entities in 2023, marking a 1. 7% rise from the preceding year. Out of the total, 97% is made up of micro businesses, 2% is made up of small businesses, and 1% is made up of medium-sized businesses. According to the Ministry of Cooperatives and SMEs, data from the Central Bureau of Statistics indicates that SMEs contributed 61% to the Gross Domestic Product (GDP), totaling Rp 9,580 trillion. This figure experienced a 2. 3% increase compared to the preceding year. Moreover, MSMEs which employ 97% of the labor force nationwide, are important to the employment picture [1]. The rapid expansion of MSMEs has the

capacity to result in notable environmental effects within their operations, including climate change, biodiversity loss, waste generation, and pollution. The environmental impacts are a significant concern that requires attention from all economic actors globally in order to foster a green economy and sustainable business practices.

The circular economy (CE) is a recent strategic approach adopted by numerous economic entities to mitigate environmental impacts and transition towards a sustainable green economy and business practices. Kirchherr et al. The circular economy is a concept of economics that uses business models to reduce, reuse, recycle, and recover resources in the processes of production, distribution, and consumption in order to do away with the idea of "end-of-life." In order to achieve sustainable development, this system functions at three different levels: micro (products, businesses, and consumers), meso (eco-industrial parks), and macro (cities, regions, and nations). Its objectives are to promote social equity, economic prosperity, and a high-quality environment for present and future generations [2].

Indonesia has integrated the concept of the CE into its mission and development plans in order to facilitate swift economic transformation, particularly in advancing a green economy. The mission of Advanced Indonesia 2045 includes the implementation of the CE concept as a future policy. The Ministry of National Development Planning announced that the Indonesian government, in partnership with the United Nations Development Programme (UNDP), has prioritized five industrial sectors for the initial implementation of the circular economy concept. These sectors are food and beverage, construction, electronics, textiles, and plastics. The circular economy is incorporated into the 2025-2029 national medium-term development plan as part of the national action plan. The five main tenets of the CE concept have been established by the Ministry of Industry: reduce, reuse, recycle, recover, and repair. Reducing natural resource use (reduce), maximizing the use of recyclable materials (reuse), participating in recycling operations (recycle), recovering, or repairing are some ways to put these five principles into practice [4].

Because a fundamental shift in thinking is required across all stages of the product lifecycle, including design, operation, production, marketing, and end-of-life operations, the transition from a linear to a circular economic model can be difficult. Businesses require a robust business model framework to assess the value of products, operations, marketing, and product consumption within the context of the CE. The circular business model canvas has emerged as a key strategic framework for promoting and facilitating the adoption of CE principles, in alignment with Indonesia's vision for advancement by 2045. Inasovilizuari and Fontana stress the significance of the business model for MSMEs, illustrating how its elements interconnect within an organization to generate value for all stakeholders involved [5]. The development of CBMC for MSMEs in Indonesia is currently lacking. There is limited scholarly discussion on the adoption of the CBMC framework, particularly in Indonesia. The objective of this study is to fulfill this requirement by proposing a CBMC framework that is applicable across multiple MSME sectors in Indonesia.

2 Literature Review

2.1 Circular Economy (CE)

Feriyanto and Firdaus define the circular economy (CE) as an economic system that recycles spent materials and goods back into the production cycle in an effort to minimize waste and maximize the use of natural resources. This concept contrasts with the linear economic model in which natural resources are extracted, processed, used, and ultimately discarded as waste [6].

Achieving sustainable development through the balanced integration of economic, social, and environmental concerns requires an understanding of the CE. In order to maximize the utilization of natural resources and minimize waste and refuse, Geissdoerfer et al. consider the circular economy as an alternative model to reduce resource depletion, waste, and emissions by incorporating environmental, economic, and social aspects into a closed-loop production and consumption system. [7].

Benefits of adopting a circular economy encompass: (1) enhancing resource efficiency by utilizing reclaimed materials and products that undergo purification and reutilization; (2) minimizing waste and emissions by repurposing unused materials and products into raw materials for additional production; (3) fostering innovation by creating high-quality goods with sustainable materials; (4) encouraging social engagement through public involvement in collecting, processing, and selling recycled materials and products; and (5) stimulating economic expansion through enhanced production efficiency, advancement of new industries, creation of employment opportunities, and contributing to poverty alleviation [8].

2.2 Circular Economy (CE) in Indonesia

According to UNDP Indonesia and the Ministry of National Development Planning, a CE is an economic system that follows a closed-loop strategy that maintains raw materials, components, and products at their peak usefulness and value over the course of a cycle. The objective of this approach is to reduce waste and decrease reliance on new materials. The CE concept is based on the 3R principles (reduce, reuse, recycle), which has expanded to the 5R principles (reduce, reuse, recycle, refurbish, renew), and most recently, the 9R principles. Collaboration between producers, consumers, governments, and other society actors as promoters of sustainable development is necessary to achieve the CE. [3].

Indonesia is one of the world's leading producers of garbage, hence the idea of a CE is relevant to the goals of Advanced Indonesia 2045. This idea could help solve environmental problems and increase resource efficiency. Various circular economy applications can be utilized to facilitate the accomplishment of Indonesia 2045's goals. These include: (1) implementation of waste management strategies, such as waste separation, recycling systems, and advanced waste processing technologies, (2) utilization of renewable energy sources, including hydro power, solar, and wind, (3) enhancement of production systems by minimizing waste generation and adopting eco-

friendly production methods, and (4) improvement of product quality to promote durability and reusability [6].

Indonesia has launched several initiatives to advance CE practices. Some case studies of circular economy implementation in Indonesia include: (1) the Clean Indonesia Movement, which collects community waste, processes it into products, and sells it; (2) Waste4Change, a waste management company that gathers waste from various sources and recycles it into economically valuable new products; (3) PT Greenhope Indonesia, an electronic waste processing company; (4) PT Jababeka Tbk and Indorama Ventures Indonesia, companies that have integrated the 5R concept into a circular business model; and (5) the Indonesia Plastic Bag Diet Movement, which encourages the use of reusable shopping bags in place of single-use plastic ones [6].

For large businesses, integrating a chief executive into company operations can be readily facilitated due to their available resources. However, implementing a circular economy in MSMEs will result in a quicker impact than in large businesses, as they are more proximate to end consumers and operate with a decentralized production system. Nevertheless, SMEs believe that the implementation of a CE remains suboptimal [3, 8]. According to Nasoha et al. research, Indonesian SMEs are still applying the circular economy in a very basic way—for example, by using the 3R idea. They implement (1) reduction through trash reuse and efficient use of water, electricity, and raw materials;

(2) recycling by incorporating recyclable materials, raw materials, and production equipment; and (3) reuse by repurposing production waste for fertilizer, power generation, and product differentiation [9].

Joustra and colleagues delineate a set of five measures designed to aid SMEs in their shift towards the circular economy. The first two stages include reading up on the CE and assessing how ready companies, partners, and supply chain stakeholders are for the CE. The second stage is evaluating potential redesign possibilities that could shift products to a circular business model and understanding the services that businesses can obtain and the adjustments that are required to make this shift possible. The final step involves testing if the value offered aligns with customer expectations and is prepared for payment [10].

2.3 Circular Business Model

The Ellen MacArthur Foundation goes into detail about how the circular economy's guiding principles can be used to determine the essential elements and structure of a circular business model. The Resolve Framework lists six business actions—regenerate, share, optimize, loop, virtualize, and exchange—that may be put into practice to put the circular economy's tenets into practice and offer large circular business prospects.

- (1) Regenerate - restoring biological resources to the biosphere while switching to renewable energy and materials. Therefore, the goal of regeneration is to reclaim, preserve, and enhance ecosystem wellbeing.

- (2) Share - aims to optimize product usage through distribution among users. Sharing also includes reusing things that are still functional and extending their life through upkeep, durability enhancements, and repairs.
- (3) Optimize - Enhancing a product's performance or efficiency and cutting waste in the supply chain and manufacturing process are two aspects of optimization. Automation, control, remote sensing, and big data may also be used in optimization.
- (4) Loop - the goal of the loop strategy is to keep components and materials in a closed loop.
- (5) Virtualize - aims to offer specific utility virtually, as opposed to physically.
- (6) Exchange - focuses on introducing new technology, product options, and services in addition to swapping out antiquated materials with cutting-edge non-renewable materials. [11].

There exist multiple conceptual frameworks utilized in the business model domain. One of the most renowned frameworks was developed by Osterwalder and Pigneur. Known as a business model canvas (BMC), this framework for business models is made up of nine interrelated parts., which is well-known and widely utilized. The following nine components include:

- (1) Customer segments targeted by an organization.
- (2) Value proposition designed to address challenges and fulfill customers needs.
- (3) Channels utilized by the company to convey, distributes, and markets the value proposition.
- (4) Customer relationships that the company has made and is keeping with each customer segment.
- (5) Revenue streams produced as a result of successfully offeringthe value proposition to customers.
- (6) Key resources determined to be assets required to provide and deliver the previously indicated components.
- (7) Key activities carried out in order to supply and distribute the previously specified components.
- (8) Key partnerships relate to the network of partners and suppliers who, by providing a range of resources and carrying out multiple tasks, improve the execution of the business model.
- (9) The cost structure which includes all of the costs associated with running the business model [12].

One well-known and often used tool for creating circular and sustainable business models is the Business Model Canvas. Lüdeke-Freund employed the business model canvas within the framework of eco-innovation, wherein the canvas functioned as a pivotal element connected to antecedent and subsequent elements [13]. Dewulf proposed an enhanced business model canvas that incorporates two supplementary elements: social costs and social benefits [14]. Stubbs and Cocklin established a framework for sustainable business models through case study analysis, which

categorized attributes into two main types: cultural and structural. Every kind of trait has holistic, social, environmental, and economic qualities [15]. Lewandowski devised a BMC centered on the precepts of CE, incorporating two additional elements, namely take-back system and adoption factor [16]. This iteration of the BMC is tailored for the visualization and assessment of sustainable business models.

3 Research Methods

This study utilizes a thorough systematic literature review of academic publications on circular business models, published from 2020 to 2024. While the literature regarding circular business models is still developing, the concept of sustainability that forms the basis of circular economy principles began to emerge in the 2010s. A systematic literature review approach was utilized to identify, assess, and analyze academic publications that are pertinent to the inquiry: how can the CBMC framework be implemented by different sectors of MSMEs in Indonesia?

4 Results

4.1 Circular Business Model Canvas (CBMC)

The circular business model canvas (CBMC) developed by Lewandowski is a modification of the business model canvas (BMC) that highlights circular economy principles more prominently. While the BMC is commonly utilized to represent an entire business model, the CBMC is uniquely tailored to visually illustrate and assess sustainable business models. Lewandowski incorporated two additional elements into the business model framework to improve the development of circular business models: the take-back system and adoption factors. This led to a total of eleven constituent components within the CBMC. The constituent components of the CBMC were analyzed utilizing the six business actions of resolve to demonstrate alignment with the principles of the CE. The subsequent examination focuses on the implementation of CE principles within the eleven constituent components of the CBMC, utilizing the Resolve Framework [16].

Table 1. Circular economy principles are applied to the circular building blocks of the business model canvas (continued).

CBMC Components	Regenerate	Share	Optimize	Loop	Virtualize	Exchange
Value propositions and Customer segments		X		X	X	
Channels					X	
Customer relations			X	X		
Revenue streams		X		X		
Key resources	X		X	X	X	

Key activities	X		X	X	X	
Key partnerships		X		X		
Cost structure	X		X	X		X
Take-back system				X		
Adoption factors	X	X	X	X	X	X

The material loops that are essential to the circular economy are exemplified by a take-back system. This innovative component works under the assumption that goods, parts, and/or materials can be recycled, remanufactured, reused, or repurposed through a variety of processes that are made possible by reverse logistics' gathering process. The application of CE principles includes processing returns, providing incentives for returns and reuse, and gathering products at the end of their useful lives. [16].

Adoption factors refer to the strategies employed by companies to anticipate and address potential barriers to the implementation of a circular business model. Various internal and external factors impact the alignment of business models with circular economy principles. The ability of the corporation to move toward a circular business model is influenced by internal considerations. This competence requires organizational culture, team motivation, and transitional knowledge and procedures, among other intangible resources. Technological, political, sociocultural, and economic challenges are examples of external forces. The application of appropriate IT and data management systems to support material tracking and other specialized technologies is what is meant by technological difficulties. Political issues pertain to lobbying activities aimed at influencing legislative modifications and political incentives to expedite economic growth. Socio-cultural factors pertain to consumer behavior and societal viewpoints. Economic concerns pertain to the anticipated demand for upcoming products or challenges faced by businesses in applying corporate ethics principles [16].

The Circular Business Model Canvas (CBMC) Framework

The circular business model canvas (CBMC), an adaptation of the business model canvas (BMC) created by Osterwalder and Pigneur, has been customized to align with the principles of the Circular Economy (CE). It consists of eleven components for designing business models in alignment with CE principles, as suggested by Lewandowski [16]:

- (1) Customer segments - closely related to the aspect of the value proposition. The design of the value proposition aligns with customer preferences and expectations. Businesses need to alleviate concerns regarding recycled products and improve customer awareness and perceptions of circular products.
- (2) Value propositions - concept comprises collaborative consumption, virtual services, product-service systems, and circular products that enable product life extension. Additionally, this component comprises incentives and rewards provided to customers for returning used merchandise. The market awareness of

circular products and their benefits presents a challenge for businesses in crafting value propositions that promote market acceptance.

- (3) Channels - offering virtual value propositions, distributing non-virtual value propositions via virtual channels, and interacting virtually with clients are ways to virtualize this. Virtualization not only reduces resource consumption and highlights resource optimization but also enables the rapid delivery of products and services.
- (4) Customer relationships - production is driven by customer orders and/or decisions, alongside social marketing strategies and partnerships with community stakeholders when executing circular models. Businesses must cultivate strong relationships with customers to facilitate the implementation of circular models.
- (5) Revenue streams - these partnerships, which have their roots in the value proposition, entail payments for cyclical goods or services in addition to payments for the availability, application, or output of the given product-based services. The value of resources derived from the material cycle can also be linked to revenue. Businesses must establish a clear circular business model to generate revenue and ensure sustainability.
- (6) Key resources - Selecting high-performing material suppliers, making use of material virtualization, and locating resources that support natural capital restoration and regeneration, in addition to materials acquired from clients or other parties with the goal of circulating in the material cycle (ideally closed), are all crucial.
- (7) Key activities - crucial responsibilities include those related to generating, providing, and delivering value within the business model. Through efficient housekeeping, better process control, equipment improvements, technology advancements, sharing and virtualization, and improving product design to boost environmental sustainability and become ready for the material cycle, these actions may seek to improve performance. Lobbying may also be a key activity.
- (8) Key partnerships - these initiatives, which are centered on partner selection and cooperation across the supply and value chains, are crucial in promoting the circular economy and guaranteeing long-term sustainable growth.
- (9) Cost structures - They show the monetary shifts that are taking place in other CBM elements, such as the importance of consumer incentives. This component requires the application of particular accounting rules and evaluation criteria. Circular businesses typically incur significant initial costs, presenting a substantial barrier to the progress of the CE. But companies can achieve supply chain efficiency and save money by using circular inputs and reducing waste throughout the value chain.
- (10) Take-back system - the take-back management system's design takes into account the system's channels and customer interactions. Products are returned to the manufacturer when their useful lives are over, and after an assessment of their state, they are either recycled, repaired, refurbished, or reused. Businesses can utilize existing sales channels, engage directly with customers, or collaborate with partners for product collection.

- (11) Adoption factors - the shift to a circular business model requires support from multiple organizational capabilities and external factors. The extent of resources, knowledge, expertise, market acceptance, and government support will influence a business's ability to transition to a circular model.

Partners - Cooperative networks - Types of collaboration	Activities - Optimising performance - Product Design - Lobbying - Remanufacturing, recycling - Technology exchange Key Resources - Better-performing materials - Regeneration and restoring of natural capital - Virtualization of materials - Retrieved Resources (products, components, materials)	Value Proposition - PSS - Circular Product - Virtual service - Incentives for customers in Take-Back System	Customer Relations - Produce on order - Customer vote (design) - Social-marketing strategies and relationships with community partners in Recycling 2.0 Channels - Virtualization Take-Back System - Take-back management - Channels - Customer relations	Customer Segments Customer types
Cost Structure - Evaluation criteria - Value of incentives for customers - Guidelines to account the costs of material flow		Revenue Streams - Input-based - Availability-based - Usage-based - Performance-based - Value of retrieved resources		
Adoption Factors - Organizational capabilities - PEST factors				

Gambar 1. Circular business model canvas (CBMC) adapted from Lewandowski

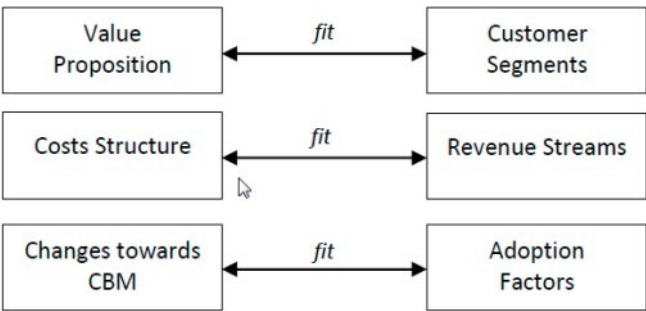
The circular business model canvas (CBMC) framework offers multiple MSME industries the chance to transition from linear to circular business models. By clarifying the connections between the elements of a business model and the CE concepts or business activities that apply them, this framework makes the design of business models easier. As a result, MSMEs can effectively use a unified canvas to create, review, and assess their enterprises in order to achieve circular business practices.

4.2 The Triple Fit Challenge in Implementing The Circular Business Model Canvas (CBMC)

To aid in the transition to a circular business model, Lewandowski developed the Triple Fit Challenge, which was created from the CBMC. The CBMC design functions primarily on the presumption that each of its parts is harmoniously compatible with the others. The value proposition's layout makes the case that some components are more important than others and need to be seen as essential to a business model's success.

Organizations need to handle three main challenges in order to enable the transition from a linear to a circular business model. The value proposition, which incorporates the take-back system, and the client categories initially fit each other. The alignment of the income sources and cost structure is the subject of the second fit. Revenues and expenses must match, and the company model needs to show that there is room for profit. This also applies to other product sales cycles, like recycling and reuse. The final

fit concerns how well the company's adoption of a more circular business model aligns with any potential obstacles to adaptation [16].



Gambar 2. The triple fit challenge adapted from Lewandowski

5 Discussion

The business model canvas (BMC) framework created by Osterwalder and Pigneur is deemed insufficient for formulating circular business models due to its lack of clarity on the integration of CE principles and business strategies aligned with CE within the various elements of the business model. On the contrary, the Resolve framework elucidates the translation of CE principles into CE operational strategies, without direct reference to the components of the business model and its development process. Thus, Lewandowski devised the CBMC by integrating these two components. CBMC addresses the limitations of the BMC or sustainable business model archetypes.

CBMC exemplifies the application of CE principles to every aspect of the business model. CBMC includes important components for CE, specifically the take-back system and adoption factor. Additionally, CBMC identifies three primary challenges associated with the shift from linear to circular business models, which are not addressed in the BMC.

The CBMC framework is a conceptual model that requires empirical testing to determine its utility in developing circular business models. Conducting case studies in the MSME sector to evaluate the efficacy of a designed CBMC framework as a strategic tool for developing circular business models is essential for potential adoption across various MSME sectors.

6 Conclusion

The substantial expansion of MSMEs in Indonesia has resulted in significant environmental consequences, such as biodiversity decline, climate change, pollution , and waste generation. Therefore, businesses are now required to shift from linear business models to circular business models. Businesses that previously utilized a "take-make-dispose" model are advised to transition to a model that focuses on resource

optimization and waste reduction through the return of unused goods and materials to the production cycle. Achieving sustainable development through the establishment of a superior environment, economic success, and social equality for present and future generations requires the adoption of the circular business model concept. The CE idea has been applied as a strategic policy to support sustainable development and a green economy, in line with the goals of Advancing Indonesia 2045.

Due to the necessity of a paradigm shift at several stages of the product lifecycle, such as design, operations, production, marketing, and end-of-life, the switch from a linear to a circular economic model can be difficult. Hence, businesses require a strategic business model framework for assessing product value, operations, marketing, and consumption within the context of the CE.

This study introduces a CBMC framework developed by Lewandowski through a systematic literature review. The CBMC is derived from the BMC created by Osterwalder and Pigneur. Lewandowski introduced two crucial elements to customer experience (CE): the take-back system and adoption factors. This led to the development of a CBMC framework comprising eleven components that utilize CE principles grounded in the Resolve framework to facilitate circular business practices. The eleven components of CBMC include: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships, cost structures, take-back system, and adoption factors. This CBMC framework can be implemented across various MSME sectors in Indonesia.

Lewandowski outlined three primary challenges encountered in the design of a CBMC, referred to as the triple fit challenge. This challenge entails ensuring that the value proposition aligns with customer segments, that cost structures are compatible with revenue streams, and that the take-back system aligns with adoption factors. These challenges are crucial for the success of CBMC design.

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