

Sustainable Business Models

Subjects: Business

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Over the years, researchers have presented different concepts regarding business models. There is no unanimity, but there is a general agreement that a business model is the representation of how a company conducts its business. Subsequently, interest in the topic has increased and has come to be considered by companies that, driven to incorporate a positive contribution to sustainability into their values, began to face economic development that considers social and environmental aspects instead of worrying only about profit for the shareholders.

Keywords: business models ; sustainable business models ; merger of companies ; logistics ; sustainable economy

1. Business Models

In the context of the business model, the “model” is the abstract representation of how an organization’s business activities work, and “business” can be understood as the structured transformation of input factors into products and services ^{[1][2]}. A business model provides a simplified representation of value-creation processes, roles, and interactions to create customer value by ensuring competitive advantage and generating revenue, using a comprehensive aggregated picture of reality that can integrate political, legal, economic, sociocultural, technological, and ecological aspects into the transparent architecture to manage complexity ^{[3][2]}.

According to Dolesky ^[3], the complexity and dynamism of modern business environments have led to companies needing powerful tools that translate all relevant aspects into a comprehensive solution. Old business models do not offer the broad solutions needed for so many different, complex, and changing environments ^[3]. Business complexity continues to grow with new business models, channels, competitors, and customer needs that drive performance expectations. These areas require excellence and innovation in planning and execution across all business functions. This complexity is visible both in the variety of use cases that require an analytic view, and in the speed and relevance of how analytics teams must deliver those insights ^[4].

2. Conceptual Model

A business model is defined by three main elements: value proposition, value creation and delivery, and value capture. Creating value is at the heart of any business model. Companies often capture value by taking advantage of new business opportunities, markets, and revenue streams ^{[5][6][7]}.

A business model is projected through the perception of customers with unsatisfied (or unmet) needs. Successful projection provides a product or service to the customer who is willing to pay more for that product or service ^[8]. The customer thus covers all costs and generates enough profit to sustain the business and its growth ^[9].

The conceptual approach to business models is presented in different ways in the literature. However, three main value-based elements can be distinguished: value proposition, value creation and delivery, and value capture ^[10].

The conceptual model describes the value that a company provides to customers and its partner network to create, sell, and deliver that value to generate profitable revenue streams ^{[11][12]}.

Table 1 presents the construction of the business model blocks.

Table 1. Nine business model building blocks.

Pillar	Business Model Building Block	Description
Product	Value proposition	Overview of a company’s package of products and services ^{[11][12]} .

Pillar	Business Model Building Block	Description
Customer interface	Customer segment	Describes customer segments to which a company wants to provide value ^{[11][12]} .
	Relationship with customers	Explains types of links that a company establishes between itself and its different customer segments ^{[11][12]} .
	Distribution channel	Describes the company's various ways to contact its customers ^{[11][12]} .
	Key resources	Describes the arrangement of activities and resources ^{[11][12]} .
Infrastructure management	Key activities	Describes needed competencies to run the company's business model ^{[11][12]} .
	Key partners	Depicts the network of cooperation agreements with other companies to offer and commercialize with value efficiency ^{[11][12]} .
	Cost structure	Summarizes monetary consequences of employed means in the business model ^{[11][12]} .
Financial Aspects	Revenue stream	Describes how a company earns money through various revenue streams ^{[11][12]} .

Source: Based on Osterwalder and Pigneur ^{[11][12]}.

According to Alegre and Berbegal-Mirabent ^[13], business models provide a consistent and integrated picture of a company, describing the rationale for how an organization creates, delivers, and assesses value captures, and identifying the elements and relationships that describe how the business operates.

3. Sustainable Business Models

According to Bocken et al. ^[14], sustainable business models incorporate in their financial considerations the interests of the involved parties, including those concerning the environment and society, thus differentiating themselves from the concept of the business model, which only considers the cost structure and the revenue stream in its financial considerations.

Due to the growth of academic and business interest in sustainable business models, Geissdoerfer et al. ^[15] conducted a literature review on the topic. According to the authors' definitions, sustainable business models are a modification of the conventional business model concept that incorporates concepts, principles, or goals that aim to integrate sustainability into its value proposition, value creation, and delivery activities, and/or value-capture mechanisms ^[15].

One of the differences between conventional and sustainable business models ^[16] is that sustainable business models allow for a holistic view of how business is conducted, considering the interests of shareholders and environmental and social sustainability metrics ^{[16][17]}. According to Bocken et al. ^[14], their importance also lies in driving and implementing corporate innovation for sustainability, helping it to be incorporated into both corporate purposes and business processes, contributing to the achievement of a competitive advantage.

Due to the growing concerns about sustainability summarized in the UN's Sustainable Development Goals, sustainable business models are of interest to researchers and companies ^{[18][17]}. Adopted by all UN member states in 2015, the Sustainable Development Goals provide that all countries should promote prosperity while protecting the environment, social needs, equality, and employment opportunity, combating climate change and preserving nature ^{[18][17]}. Thus, sustainable business models incorporate the creation of monetary and nonmonetary value into this framework for a wide range of stakeholders from a long-term perspective ^{[15][16]}.

Sustainable business models are very helpful to Industry 4.0, which can be conceptualized as a new stage of industrial maturity for product firms, based on the connectivity provided by the industrial Internet of Things, where the products and processes of companies are interconnected and integrated to obtain greater value for customers and internal company processes ^[19].

Industry 4.0 is increasingly being explored by academics, researchers, practitioners, and other relevant stakeholders. The idea of Industry 4.0 is supported by the advancement of information and communication technologies (ICTs) and data storage ^[20].

Industry 4.0 offers potential for new and innovative business models. However, established manufacturing firms tend to be more oriented towards improving the efficiency of their processes through Industry 4.0 [21].

Müller et al. [22] consider that the business model concept thereby generates an understanding of how organizations can use Industry 4.0 to provide value offerings and appropriate pricing models to their customers.

The technical innovations associated with Industry 4.0 offer the possibility to adapt existing business models or develop new ones. Furthermore, other companies can enter the market and influence the value chain. For business models to adapt, data must be stored in such a way that suppliers and manufacturers are functionally integrated into the value chain [23].

Another important point for the sustainable business model is the environmental issue. Therefore, it seems logical that environmental thinking should be included in the business model and that it should be the object of business model innovation [24].

From the literature, the authors identified that the primary objective of establishing a sustainable business model is environmental issues, but achieving economic performance and gaining market share increase competition among companies. The authors also identified that increasing financial performance results in the development of a competitive business model [25].

4. Business Model Canvas and Sustainable Business Model

Osterwalder [26] developed a doctoral thesis in 2004 titled The Business Model Ontology—the Proposition in a Design Science Approach, under the supervision of Yves Pigneur; the objective was to approach the concept of business models ontologically to provide the basis for new management tools. Based on their thesis, Osterwalder and Pigneur [12] launched the book Business Model Generation, presenting the Business Model Canvas for the first time; according to Burkett [27], it offers a simple, visual, and one-page canvas on which it is possible to design, innovate, and discuss business models.

For Osterwalder and Pigneur [12], the business model represents parts of the planned strategy to be implemented within their organizational structures, processes, and interdependent systems.

Osterwalder [2][26] developed a study evaluating and comparing the most common construction models in the literature, and on that basis identified the most frequently mentioned components. The result of this research consisted of a synthesis with nine building blocks, covering all components of the business models mentioned by at least two authors, excluding elements related to competitors.

The aim of the authors in developing the business model canvas was to allow anyone interested to create or modify a business model, since its screen has a clear language, allowing for the exchange of ideas among those involved in the business modeling process [28].

Figure 1 shows the interaction among business model canvas blocks.

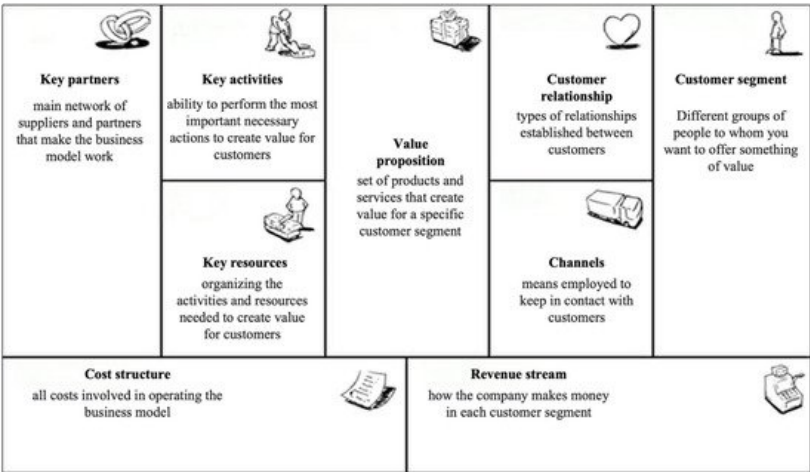


Figure 1. Business model canvas blocks. Source: Based on Osterwalder and Pigneur [12].

According to Figure 1, five blocks of the business model refer to the external aspects, namely, value proposition, customer relationship, customer segment, channels, and revenue stream, while the others refer to the internal aspects:

key activities, key partners, key resources, and cost structure. Bocken ^[18] considers that the first groupings of the best-known sustainable business models were oriented towards the combination of products and services such as leasing and renting. To expand this list and capture emerging practices in the field, archetypes of sustainable business models were developed and classified according to more technological, social, and organizational types ^[14].

To illustrate sustainable business models, different elaborations have emerged in recent years, such as the flourishing screen by Jones and Upward in 2014, and the screen of the sustainable business model ^[29]. **Figure 2** illustrates an example of this screen from the sustainable canvas business model.

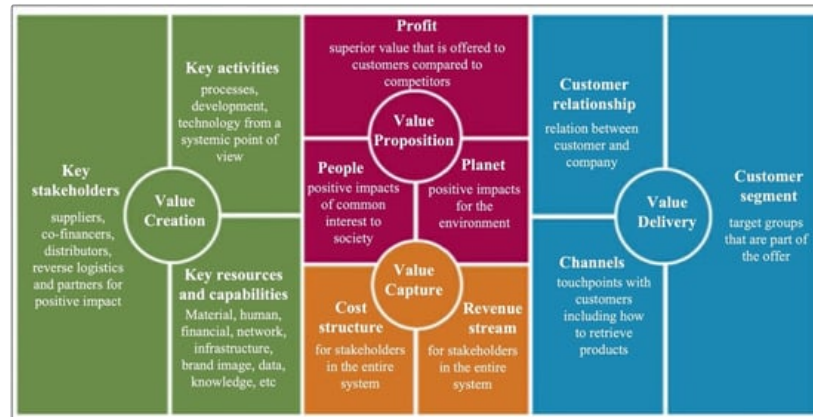


Figure 2. Screen of sustainable business model canvas. Source: based on Bocken et al. ^[29], Osterwalder and Pigneur ^[12], and Richardson ^[30].

According to **Figure 2**, three archetypes are incorporated into the conceptual business model of Osterwalder and Pigneur ^[12]. Thus, in the value proposition structure, the elements of profit, people, and planet appear, categorizing the holistic approach necessary to face the challenges of a sustainable future, focusing on environmental changes in parallel with economic and social changes ^[14].

Sustainable business models use the triple base (people, profit, and planet) to measure the performance of companies, in addition to promoting environmental management in a systemic way, significantly impacting business growth prospects ^[18].

Interest in the topic has expanded and is part of the agenda of companies, which, driven to incorporate within their values a positive contribution to sustainability, have begun to seek not only profit for their shareholders, but to face the challenges of development, considering social and environmental aspects.

The Sustainable Development Goals illustrated by the UN and faced by companies and by society in Brazil and globally are ^[31]: (1) No poverty; (2) Zero hunger; (3) Good health and well-being; (4) Quality education; (5) Gender equality; (6) Clean water and sanitation; (7) Affordable and clean energy; (8) Decent work and economic growth; (9) Industry, Innovation, and Infrastructure; (10) Reduced inequality; (11) Sustainable cities and communities; (12) Responsible consumption and production; (13) Climate action; (14) Life below water; (15) Life on land; (16) Peace, justice and strong institutions and (17) Partnership for the goals.

Sustainable Development Goals drive global actions to eradicate poverty and protect the environment and the climate, guaranteeing people everywhere the possibility of enjoying peace and prosperity ^[31]. Launched in 2015, the 2030 Agenda is the joint work of governments, companies, and citizens towards the creation of a new sustainable global socioenvironmental model.

5. Logistics, Supply Chain, and Sustainable Supply Chain

In today's business world, it is very difficult for a company to become competitive without the collaboration of external partners. The concept of supply chain management emerged in this direction and seeks to better manage the physical and changed information flow among all supply chain participants whose objective is to achieve simultaneous cost reduction through the supply chain and increase the value of goods and/or services ^[32].

According to Arredondo and Tanco ^[33], the origin of supply chain management (SCM) mainly depends on logistical reality. This is how SCM and logistics are strongly connected, although they are not identical. Strategic vision, internal integration, and relationships that transcend company boundaries represent an integral part of SCM. **Figure 3** shows this evolution.

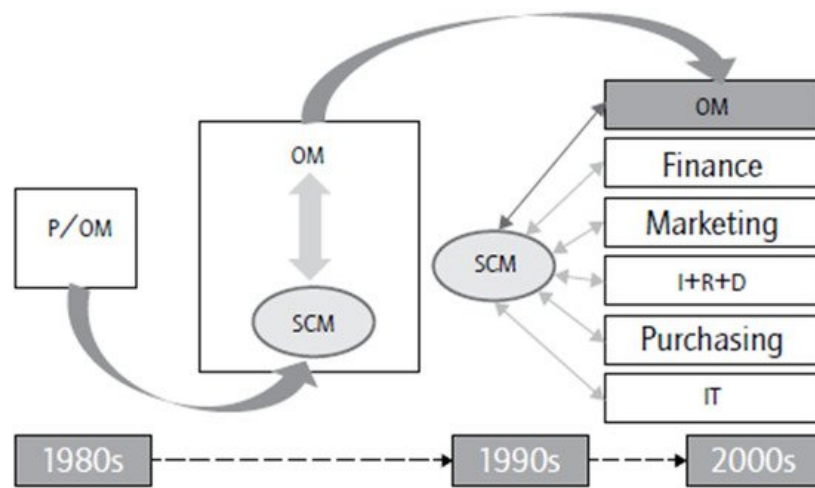


Figure 3. SCM evolution. Source: Based on Arredondo and Tanco [33].

According to Copacino [34], supply chain management or logistics refers to the art of managing the flow of materials and products from origin to user. Ballou [35] believes that integrated logistics management is strengthened in the rationalization of operating costs, improving services and changing the environment, promoting global logistics and organizational strategic growth.

Organizational disputes occur at various operational levels, such as innovative products and processes and reducing operating costs and investments, in addition to increasing customer expectations. In this case, the logistical process that alternates between a completely vertical position and partnerships with several professional suppliers stands out [36].

Bowersox and Closs [37] highlighted that the movement of materials is not limited to moving, boxing, and storage, but extends to the performance of these functions, considering the available time and space. Production support activities should not be stand-alone procedures, but should be integrated into the activity system to maximize the total productivity of the facility or warehouse.

In this scenario, according to Aguezoul [32], logistics companies can be highlighted, as they have benefited widely from the phenomenon of outsourcing, accelerating their growth. This growth is mainly attributed to benefits related to cost reduction, performance improvement, a focus on the core business, and the construction of virtual ventures through strategic alliances. **Table 2** presents activities associated with contract logistics.

Table 2. Associated activities with contract logistics.

Logistics Processes	Activities
Transportation	Transportation by road, rail, air, or sea, intermodality management, shipping, forwarding, package express carrier, customs brokering, (de) consolidation, perishable/hazardous goods management, freight bill payment/audit.
Outbound (Distribution)	Merge in transit, order fulfilment/processing, picking, sorting, dispatching, post-production configuration, installation of products at the customer's site.
Warehousing	Storage, receiving, cross-docking, (de)consolidation, perishable/hazardous goods.
Inventory management	Forecasting, slotting/lay out design, location analysis, storage/retrieval management
Packaging	Design, labeling, assembly/packaging, palletizing
Reverse logistics	Pallet-flow management, recycling, reuse, remanufacturing disposal management, repair, testing/product serving, return shipment management.

Source: Based on Aguezoul [32].

Even though the chain structure and business processes remain in their traditional form, the dynamics of how organizations pursue integration across supply chains has changed. In addition to requirements for satisfactory economic performance, organizations are now responsible for the positive socioenvironmental performance of their operations and, indirectly, of the activities of their partners and suppliers [38].

The standout factor is sustainable supply chain management (SSCM) or green supply chain management (GSCM), which has received much attention due to the increased awareness of climate change and global environmental and social issues ^[39]. GSCM can be defined as the coordination of the supply chain to integrate environmental concerns and consider interorganizational activities ^[40].

For the past two decades, SSCM has focused on integrating environmental, social and economic objectives into all the supply chain processes of large companies ^{[41][42]}. Herrmann et al. ^[43], reported that, in recent years, around 70% of the leading companies in any given sector emphasized sustainable development in their work programs. Reports from leading companies confirm that the success of sustainability efforts also depends on collaboration between supply chain actors ^{[44][45]}.

Green supply chain management ensures the effectiveness of public and corporate policies to make their operations cleaner, increasing market share and profits and improving their images and reputations ^[43].

The SSCM aims to integrate the triple-baseline (TBL) premise in the development of adequate strategies for supply chain management ^[38].

The formal definition of TBL in sustainability includes environmental, social, and economic dimensions, indicating that traditional performance measurement based on economic profit should be extended to include the environment and people's wellbeing ^{[46][47]}.

Pagell and Wu ^[48] explain the introduction of sustainability practices in the supply chain and indicate that a company can be proactive and committed only when the business model is consistent with the environmental and social elements of sustainability.

6. Innovation in Sustainable Management

According to Rocha et al. ^[49], sustainable management is premised on incorporating economic, social, and environmental factors into an organization's strategy and operations, making it a new challenge for companies.

This challenge becomes greater as a company seeks to obtain a competitive advantage and simultaneously considers the social and environmental impacts associated with its productive activities, as well as the adoption of sustainable management that incorporates economic, social, and environmental factors into its strategies and organizational operations. Sustainable management must exist in the composition of the entire production chain of industrial activities. Therefore, the sustainability strategy must range from suppliers of raw materials and other supplies to final consumers ^[50].

To understand how to implement sustainability in supply chains, it is first necessary to understand its general dynamics. The supply chain is not in fact a linear chain, but is a complex network with many connections among different participants. The globalization process has strengthened this feature, and the relationship between different participants is extremely complex and diverse ^[50].

The management of the supply chain and the incorporation of sustainability into management are measures that have been adopted by different organizations and different market segments, whose objective is competitive differentiation and the reach of long-term development in the markets ^[49]. Some authors define supply chain management and the incorporation of sustainability as a sustainable supply chain.

In recent decades, compared to traditional models that focus on economic returns, the literature has emphasized the importance of incorporating the concept of sustainability into a company's business model ^[51]. For Jabłoński ^[52], it is very likely that the future starting points for achieving a sustainable market advantage are the right business model, location in the market, and a continuous hierarchical organization. The growing importance of business models is a result of the combination of information and communication technologies, the deregulation of markets, technological changes, globalization, the role of sustainable development, and the growth of corporate social responsibility.

Business model innovation has recently increased in academic research and business practice. Changes in business models are the basic method for achieving sustainable innovation. However, little is known about the successful adoption of sustainable business models (SBMs) ^[53]. The SBM concept focuses on creating ecological, social, and economic value for key companies ^[54].

Sustainable innovation can be defined as the introduction of novelties or modifications in production processes, techniques, systems, organizations, and products to reduce environmental damage ^[55].

González-Torres et al. ^[56] considered that the traditional financial theory has the sole mission of maximizing shareholder value. However, companies are currently under strong pressure to improve their corporate social performance (CSP) and integrate sustainability into their business practices. In previous research and practice, most theories and ideas used to assess the effectiveness of mergers and acquisitions are rooted in the old competitive environment previously dominated by manufacturing. In high-tech mergers and acquisitions, the integration of technological capabilities is the best indicator of business synergy, as opposed to evaluating the relationship between the market and the product portfolio ^[57].

This research considered mergers and acquisitions (M&A) as sustainable innovation, considering that a merger occurs when two or more companies decide to pool their resources under a common entity, and that acquisition occurs when a company exercises effective control over the assets or management of another company without merging their businesses ^[58].

Mergers and acquisitions can alter activities that span the entire supply chain, including sourcing, manufacturing, distributing, and delivering materials. Supply chain management under mergers and acquisitions continues to be widely studied as a source of operational coordination ^[59]. In fact, improving supply chain performance represents the greatest cost-saving advantage, especially in the context of horizontal consolidation ^{[60][61][62]}.

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