



SUSTAINABLE BUSINESS MODELS IN THE FOURTH INDUSTRIAL REVOLUTION

Gabriela Andrișan
Andra Modreanu

The Bucharest University of Economic Studies, Bucharest, Romania

Abstract: Recent events have significantly influenced the evolving nature of the opportunities and adaptability that the business sector must employ in order to continue pursuing profitable business strategies. These constructs have facilitated a more appropriate strategic approach, and many businesses have begun to innovate and repurpose their resources, enabling them to remain solvent, even during the recent pandemic in the world. This article aims to present the concept of sustainable business models in the context of the Fourth Industrial Revolution. It also helps to build a better understanding of how this type of business models has evolved under the current industrial revolution and how it has managed to adapt to the changing market conditions. As a result of the established review of the literature, a synthesis of the most prevalent features and the principle implies would be inferred, leaving room for any additional analysis in future research in which each component proffered in this article can be elaborated on. The findings indicate that business models are a broad subject that can be approached in numerous ways. While the scientific community as a whole has not agreed on a single definition, certain universally accepted characteristics are critical in defining this concept. The results of this research can be also used to gain a better understanding of the state of today's business models and the critical role their adaptability and sustainability play in this turbulent business environment.

Keywords: Business model, Fourth Industrial Revolution, Sustainability, Innovation, Value Creation.

JEL Classification: M1, M19

Introduction

Business effectiveness is contingent upon the continuously evolving environment in which it operates. Personal and organizational motivations, as well as economic reliance and assimilation, all contribute to this viability. It is critical to be able to properly assess how technologies produce profitable, efficient, and quality products, services, operations, and activities, as well as how they fail to perform. Today's hypercompetitive business world imposes companies, irrespective of their size and field of activity, to gain and preserve as long as they can their competitive advantage (Toma and Marinescu, 2015). This is why they identify and implement various business tools and methods (Toma, 2008; Toma and Naruo, 2009; Marinescu and Toma, 2013; Grădinaru et al., 2016) but also various business tactics and strategies (Toma, 2013; Toma et al., 2016).

The premise is that efficient and sustainable business cannot be achieved unless there is a broader social advantage and value added, and only if it is incorporated into every component of business evaluation, planning, and growth. As a result, it is critical to examine the connection between society and technology in depth, particularly in terms of the how and why technology solutions stand or fall; the value that technological advances deliver, or do not manage to deliver; and the broader role of technology in society (Pettinger, 2021). Since its emergence, the Fourth Industrial Revolution has already had

a major impact on the business strategies and models of companies around the world (Tohănean et al., 2018; Toma and Tohănean, 2018; Toma and Tohănean, 2019).

On the basis of the previous viewpoint, the following sub-questions were developed for this research: Q1: How does one define a sustainable business model? Q2: What are some of the central features of the Fourth Industrial Revolution? Q3: What are the possible consequences of contemporary events, and how do they affect sustainability?

This article aims to present the concept of sustainable business models in the context of the Fourth Industrial Revolution. It also helps to build a better understanding of how this type of business models has evolved under the current industrial revolution and how it has managed to adapt to the changing market conditions. The paper is structured as follows: the following chapter illustrates the literature review that summarizes some of the main achievements of this topic. The third section displays the research methodology. The authors confirm the study's findings of the study in the fourth part, and the final section serves to present the conclusions.

Literature review

Given the complexity and fluidity of contemporary business environments, businesses require powerful tools that can translate essential points into an all-encompassing solution. While traditional business models have been efficient in a variety of application areas, they occasionally fell short of providing the comprehensive solution required to incorporate and examine diverse, intricate, and frequently changing circumstances. Business complex nature continues to increase, driven by innovation, streams, competition, and customer needs. This context is evident in both the breadth of use instances that necessitate an analytic view and the speed with which analytics teams must convey those insights. While there is no consensus upon a unique definition for what a business model stands for, there is understanding that this framework is a representation of how a business operates. The topic has grown in popularity and has become a priority for businesses that, motivated to incorporate a favourable sustainable development into their values, have started to confront economic development that considers social and environmental factors, as well as research how to prolong the longevity of a business, rather than just financial gain to shareholders. The term “model” refers to an abstract concept of how a company's business activities operate, while “business” refers to the structured conversion of variable inputs into goods and services. A business model is a simplification of value creation processes, responsibilities, and interplay that are used to create customer value by ensuring competitive advantage as well as generating revenue. It is based on a comprehensive aggregated perspective that can incorporate political, legal, financial, socioeconomic, technical, and environmental aspects into the translucent architecture to manage complexity. Additionally, Geissdoerfer et al. (2018) conducted a review of the literature on sustainable business models. According to their interpretations, sustainable business models are an alteration of the conventional business model concept that incorporate concepts, principles, or goals aimed at integrating sustainability into the value proposition, value creation, but also value capture mechanisms, which aligns with the perspectives of other researchers on this subject (Gomes et al., 2022).

Diving deeper into the literature review, this suggests that the majority of the research conducted in this scientific discipline has taken either a macro dimension, technological, or even an environmental approach to sustainable business models, but also connects them to the benefits of the business, its customers, community, or the world. To apply the theoretical business model framework to assessing the sustainable development of business models, it must be combined with a set of sustainability evaluation metrics. Aagaard (2019) defines sustainable value creation as the assets, actions, and collaborations that businesses adhere and enforce in order to achieve their sustainable value propositions. As a result, sustainable value capture has been defined as an organization's economic and non-financial value gains that are inextricably tied to its sustainable value propositions. When examining a company's business value propositions and value creation, it is critical to delve into the company's internal logics and determine which objectives and levels of focus sustainable business models are geared at, as well as which specific activities are undertaken to start realizing the company's sustainable business model. Furthermore, according to Bokken et al. (2014, 2015), business models have been examined through the lens of the

sustainable value they create and are composed of three central components: the value proposition, value creation and delivery, and value capture. The value proposition is related to the capacity of a product or service to generate economic return. Value creation is concerned with how businesses create value through the pursuit of new economic prospects, emerging markets, and new sources of revenue (Teece, 2010; Beltramello et al., 2013). The term “value capture” refers to the process by which a business earns revenue by providing commodities, services, or knowledge to customers and users (Teece, 2010). The concepts of value as well as value creation have been widely addressed in the writings on business strategy, organizational and partnership theory, and, more recently, in discussions about how to achieve financial goals while also achieving social objectives through sustainability and business models. The concept of value in use is expanded beyond consumer perceptions as target users to encompass a broader context in which target users and subjective assessments exist among a variety of stakeholders at all levels – individual, organizational, and societal (Aagaard, 2019).

The next concept this paper has focused on is that of the Fourth Industrial Revolution. The Fourth Industrial Revolution is a continuation of the previous one, which is the digital revolution that began in the mid-nineteenth century. It is defined by a technological paradigm that blurs the distinctions between the tangible, virtual, and biophysical realms. There are several reasons why today’s changes are not simply a continuation of the Third Industrial Revolution but the onset of a Fourth and differentiated one: rate of change, scope, and systemic impact. The frequency at which current breakthroughs are occurring is unprecedented in human history. In comparison to earlier industrial revolutions, the Fourth has been progressing exponentially rather than linearly. Additionally, it is upending nearly every sector in every nation. And the magnitude and scope of these developments usher the conversion of entire operation, strategic planning, and governance structures. (Xu et al, 2018).

As with the preceding Industrial Revolutions, this one is yielding a Schumpeterian process of creative destruction. It is propelled forward by a number of disruptive technologies that are reshaping markets (Eden, 2018). To comprehend current trends and capitalize on the Fourth Industrial Revolution, it is essential to illustrate this general pattern from a variety of perspectives. Such massive transitions imply paradigm shifts. This organizing premise and foundational assumptions is shared by everyone involved in and associated with industry. When a new paradigm occurs, industries and their stakeholders must realign, rethink, and possibly recreate themselves. Considering that innovations and shift patterns do not occur in isolation but are tangled up with companies, other technological advances, sector interactions, and society’s expectations and reactions, a multilevel viewpoint can be extremely useful for examining how the perspective of innovation and changes affects organizational dynamics. Taking a multi-tiered perspective entails situating the industry in a frame of reference that extends beyond its purely economic dimensions. This perspective incorporates the political, technological, and material components of innovation, as well as pertinent sociocultural dimensions (Schiele et al., 2021).

Entities that thrive in the ambiguity of ultra-rapid shift do so through intelligent coordination of a diverse set of skills. For instance, they combine the abilities of humans and technology and assign tasks that play to their respective strengths. Another example is the notion of open innovation, which entails utilizing both internal and external knowledge and assets (Lanteri, 2021). As per Csath (2012), innovation is an advancement in any aspect of the business; not just in product lines, services, and operations, but also in leadership, human resources, communication, organization, and market research. It is critical for businesses to remain actively engaged in the innovation process in order to thrive in today’s competitive environment. As a consequence of their internal motivation, business owners take chances to introduce innovative products into their businesses. Business owners’ organizational citizenship behaviours and relationship-oriented management styles both contribute to their firms’ innovativeness (Yan and Yan, 2013). According to Bozkurt and Kalan (2014), innovation can take the form of new or improved products, new manufacturing techniques, emerging markets, new advertising or sales methods, new distribution channels, or organizational innovation. Product innovation is the process of creating and developing new goods and services or significantly improving existing products to meet market demand. Process innovation can take the form of modifications to methods, equipment, and/or software. Selling or developing a product in new market or attracting new clients for existing products are examples of

market innovations. The importance of creating and/or instituting new or enhanced organizational systems and subsystems is referred to as organizational innovation. Whether a product, service, operation, or organizational innovation, it is the result of active innovation process that incorporates both internal and external factors (Taneja et al., 2016).

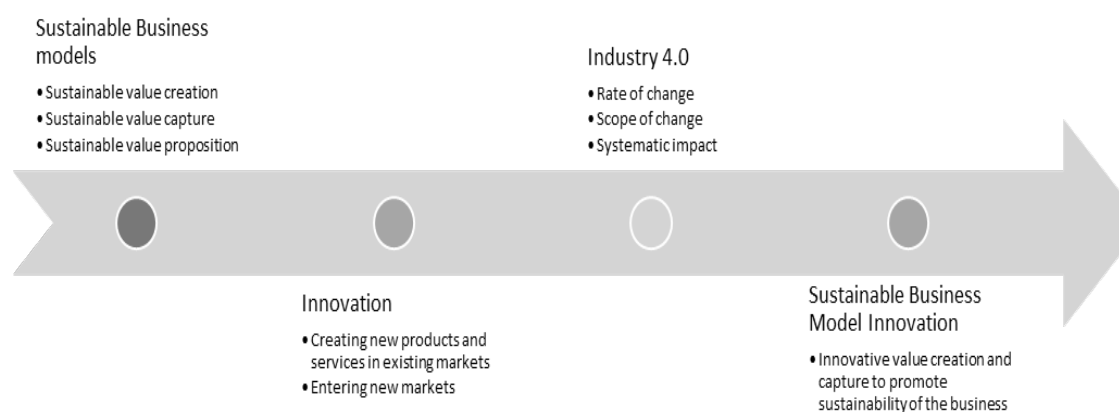
One can say that the Fourth Industrial Revolution is a term used to describe a series of continuous and impending changes in the processes that surround us and that we take for granted on a daily basis. While this may not seem substantial to those of us who deal with a series of modest but important changes in our lives on an everyday basis, this is not a trivial change. The Fourth Industrial Revolution is a game changer in human development, comparable to the First, Second, and Third Industrial Revolutions, and pushed once again by the growing availability and interplay of a collection of extraordinary technological advances. The Fourth Industrial Revolution's new technologies construct on the understanding and systems of previous industrial revolutions, most notably the Third Industrial Revolution's virtual prowess. The Fourth Industrial Revolution's technologies offer us a chance to mitigate the externalities of previous revolutions by taking a more sustainable approach (Schwab and Davis, 2018).

Research methodology

The present study has taken a quantitative research approach, gathering and analysing secondary data on the topic, such as scientific papers and previously published books. The authors begin by examining the various definitions of the notions of business models, sustainability, and Fourth Industrial Revolution. As a result, several relevant theories were implemented during this process, including sustainable business models, business model innovation, and value creation and capture. As is standard practice in previous research, the study began with a briefing and clarification of the definitions that were subsequently assimilated in order to achieve the stated aim of this research. This viewpoint on the structure's evolution enhances prior findings undertaken by a number of prominent scholars in the scientific field over the last decade.

Discussion

After establishing a theoretical foundation for the concepts under discussion, the authors compared the key characteristics of both sustainable business models and Fourth Industrial Revolution in order to ascertain how one has influenced the other. The authors have attempted to construct a conceptual framework for sustainable business models within the context of the Fourth Industrial Revolution.



Source: Authors contribution

Fig 1. Sustainable business models in the Fourth Industrial Revolution

source: Authors contribution

The authors have transposed the primary characteristics of the researched concepts that emerged from the literature review into the above figure. To begin, the authors emphasize the critical nature of value creation, capture, and proposition from a sustainability perspective. Subsequent to this, one can observe that the two primary approaches to innovation are to create new goods and services within an ex-

isting market or to enter a new market. Innovation has always been one of the primary characteristics of an industrial revolution, as this is the main catalyst that drives its main factors: the rate of change, scope and systematic impact. As such one can conclude that it is essential to take an innovative approach when creating or capturing value in order to ensure a business's sustainability and longevity in the context of the Fourth Industrial Revolution. The current pandemic exemplifies why such a framework is pivotal. Businesses have had to focus on not only their continued survival and sustainability on the market over the last two years, but also on adapting and innovating to overcome the new challenges posed by this pandemic. One could see businesses altering their whole *modus operandi* or developing new products and services in response to changing market demands. As such, the authors believed that this was a prime example of how sustainability and innovation needed to be integrated into a business strategy in order to ensure the company's continued progress toward profitability. The fact that the business world is constantly changing demonstrates that adaptability and innovation will always have to be incorporated into business strategies to some extent. As a result, sustainability becomes increasingly difficult to maintain in such a volatile market, demonstrating the importance of integrating these concepts into future business models. This leaves open for future research on this subject.

Conclusions

The concept of sustainable business models in the context of the Fourth Industrial Revolution has proved to be complex and multifaceted. The authors succeeded in establishing a common overview of the essential terms discussed and in showcasing the natural progression when taking the circumstances into consideration. In this respect, this article included a synthesized systematic review that supplied an outline of the subject's published literature of the last decade. The following chapter described the method for conducting quantitative research for this research paper. The fourth section encapsulates and discusses the study's discoveries and observations, as well as hypothetical directions. The authors have appropriately outlined the research paper's primary questions and have illustrated their responses throughout. Nevertheless, the study discussed above is not without limitations. One such constraint is that it is solely concerned with socioeconomic variables. Moreover, the ongoing current state of affairs allows for examination from a variety of perspectives. A militaristic-economic viewpoint could provide useful input into the Fourth Industrial Revolution's progressions and could be debated in future researches. Recent developments demonstrate the digital front's impact, showing how it can be used to cause significant damage to the physical world, impacting companies and economic systems on a global scale. The media itself has a greater influence on today's economy than ever before, as it is enough to launch a topic, regardless of whether the information is true or not, and people will act on said information in an attempt to prevent certain happenings, thereby creating a new problem, thereby creating instability and uncertainty. These merits additional research in future studies.

REFERENCES

1. **Aagaard, A. 2019.** *Sustainable Business Models: Innovation, Implementation and Success*. Cham: Springer International Publishing.
2. **Beltramello, A. et al. 2013.** *Why New Business Models Matter for Green Growth*. Paris: OECD Publishing.
3. **Bocken, N.M.P. et al. 2014.** A Literature and Practice Review to Develop Sustainable Business Model Archetypes. *Journal of Cleaner Production*, 65 (15), pp. 42–56.
4. **Bocken, N.M.P. et al. 2015.** Value Mapping for Sustainable Business Thinking. *Journal of Industrial Production Engineering*, 32 (1), pp. 67–81.
5. **Bozkurt, C. Ö. and Kalkan, A. 2014.** “Business strategies of SME's, innovation types and factors influencing their innovation: Burdur model”, *Edge Academic Review*, 14(2), pp. 189–198.
6. **Csath, M., 2012.** “Encouraging innovation in small and medium sized businesses: learning matters”, *Development and Learning in Organizations*, 26(5), pp. 9–13.
7. **Eden, L. 2018.** The Fourth Industrial Revolution: Seven Lessons from the Past (July 18, 2018). Forthcoming in Rob van Tulder, Alain Verbeke and Lucia Piscitello (Eds.), *International Business in the Information and Digital*

Age, Progress in International Business Research, Volume 13, Tribute to Lorraine Eden. Bingley (UK): Emerald. Available at SSRN: <https://ssrn.com/abstract=3244096>

8. **Grădinaru, C., Toma, S.-G. and Marinescu, P. 2016.** Marketing mix in services. *“Ovidius” University Annals, Economic Sciences*, XVI(1), pp. 311–314.

9. **Gomes, J.G.C. et al. 2022.** Analysis of Sustainable Business Models: Exploratory Study in Two Brazilian Logistics Companies. *Sustainability*, 14(2), p. 694.

10. **Lanteri, A. 2021.** Strategic drivers for the fourth industrial revolution. *Thunderbird International Business Review*, 63(3), pp. 273–283.

11. **Marinescu, P. and Toma, S.-G. 2013.** Training programs- Training and development alternatives for Students. *Procedia Economics and Finance*, 6, pp. 306–312.

12. **Pettinger, R. 2021.** *The socio-economic foundations of sustainable business: managing in the fourth industrial revolution*. Basingstoke: Palgrave Pivot.

13. **Schiele, H., Bos-Nehles, A., Delke, V., Stegmaier, P. and Torn, R.-J. 2021.** Interpreting the Industry 4.0 future: technology, business, society and people. *Journal of Business Strategy*, (ahead-of-print).

14. **Schwab, K. and Davis, N. 2018.** *Shaping the future of the fourth industrial revolution: a guide to building a better world*. S. L.: Portfolio / Penguin, Cop.

15. **Taneja, S. et al. 2016.** Leaping innovation barriers to small business longevity. *Journal of Business Strategy*, 37(3), pp. 44–51.

16. **Teece, D. J. 2010.** Business models, business strategy and innovation. *Long Range Planning*, 45 (2–3), pp. 172–194.

17. **Tohănean, D., Toma, S.-G. and Dumitru, I. 2018.** Organizational performance and digitalization in industry 4.0. *Journal of Emerging Trends in Marketing and Management*, 1(1), pp. 282–293.

18. **Toma, S.-G., 2008.** What is Six Sigma? *Manager*, 8, pp. 152–155.

19. **Toma, S.-G and Naruo, S. 2009.** Quality assurance in the Japanese universities. *Amfiteatru Economic*, 11(26), pp. 574–584.

20. **Toma, S.-G. 2013.** *Economia Întreprinderii*. București: Editura Universității din București.

21. **Toma, S.-G. and Marinescu, P. 2015.** Strategy and change. *Manager*, 21(1), pp. 145–150.

22. **Toma, S.-G., Marinescu, P. and Grădinaru, C., 2016.** Strategic planning and strategic thinking. *Revista Economică*, 68(5), pp. 168–175.

23. **Toma, S.-G and Tohănean, D. 2018.** Internet of Things, digitalization and the future of business models. *Strategii Manageriale*, IV(42), pp. 130–137.

24. **Toma, S.-G and Tohănean, D. 2019.** Green business models: The case of a German automaker. *Quality-Access to Success*, 20(S2), pp. 635–640.

25. **Xu, M., David, J. M. and Kim, S. H. 2018.** The Fourth Industrial Revolution: Opportunities and Challenges. *International Journal of Financial Research*, [online] 9(2), pp. 90–95. Available at: <https://doi.org/10.5430/ijfr.v9n2p90>.

26. **Yan, L. and Yan, J. 2013.** Leadership, organizational citizenship behavior, and innovation in small business: an empirical study. *Journal of Small Business and Entrepreneurship*, 26(2), pp. 183–199

За контакти:

Gabriela Andrișan

Andra Modreanu

The Bucharest University of Economic Studies, Bucharest, Romania

E-mail: gandrisan31@gmail.com; andra.modreanu@yahoo.com
