# Putting boundaries in the middle of business model innovation: A framework to face megatrends in the digital and sustainable landscape

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Rosita Capurro and Raffaele Fiorentino
*Department of Business and Economics, University of Naples "Parthenope", Naples, Italy, and*
Stefano Garzella
*Department of Economics and Management, University of Pisa, Pisa, Italy*

## Abstract

**Purpose** – The paper aims to analyse the construct of business model innovation (BMI) in the digital and sustainable landscape, investigating the key role of boundary strategies. The paper advances a comprehensive framework aimed at further understanding the overlap among digitalization, sustainability and BMI development, by a "boundary approach".

**Design/methodology/approach** – The paper follows a theoretical approach based on an in-depth review of relevant literature on BMI, digitalization and sustainability as relevant megatrends and, boundary management. By critically integrating the literature, a framework is developed with the objective of supporting firms in the current transformation challenges.

**Findings** – The paper highlights the interplay among BMIs, megatrends and boundary management. The pressures and opportunities driven by the technological changes have made even more relevant the management of resources placed in the boundary area. Our study shows how firms can rethink their BMs in the digital and sustainable landscape by providing a boundary-based framework.

**Practical implications** – The framework offers insights and guidelines to help practitioners manage the change processes dictated by digitalization and sustainability. The authors encourage a focus on boundary resources/capabilities to increase the effective management of the digitalization and sustainability processes, to grasp the external stimuli driven by these two megatrends and to develop new/renewed BMIs.

**Originality/value** – This study emphasizes the importance of developing new BMIs in the current digital and sustainable landscape starting from the analysis of firm's boundaries. The paper enriches the BMI literature supporting the enhancement of boundary management, leading firms to overcome challenges in the digital and sustainable landscape.

**Keywords** Business model innovation, Digitalization, Sustainability, Boundary management, Value creation processes

**Paper type** Research paper

## 1. Introduction

Environmental and digital dynamics are radically changing our societies and how firms do business. New competitive contexts, network dynamics and digitization present a continuous



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stimulus to renew the sources of competitive advantage (Fosso and Mishra, 2017; Chen, 2019; Veiga *et al.*, 2021).

Questions about the innovation process (Pérez-Luño *et al.*, 2019), the success factors of innovation (Dewangan and Godse, 2014) and business model innovation (BMI) (Fjeldstad and Snow, 2018) are increasingly relevant. Therefore, there has been great hype that has led organizations to make considerable investments to explore the latest megatrends (Naisbitt, 1982) for innovative business processes (Chesbrough, 2010; Foss and Saebi, 2018). In this scenario, the managerial capability to understand – or even better to anticipate – the basic assumptions and the future development of megatrends is one of the most important challenges for firms to increase their value proposition.

Currently, scholars and practitioners agree in recognizing the processes of digital transformation and sustainability as two of the main megatrends characterizing the business landscape (Mittelstaedt *et al.*, 2014; Lee *et al.*, 2019; IFF, 2022). Indeed, the existence of increasing relationships among digital innovations, sustainable attitudes and successful competitive positions has led to relevant changes in existing business models and/or in the implementation of new ones (Fiorentino *et al.*, 2020; Capurro *et al.*, 2023).

(Re)New innovative business models, which exploit – often in combination – digitalization and sustainability as enabling processes, require continuous changes in activities and resources as well as in knowledge and capabilities, modifying frequently the overall firm's structure (Rachinger *et al.*, 2019; Capurro *et al.*, 2021a). Specifically, strategic changes are usually required regarding operational processes, administrative practices, supply chains and organizational structures, with interesting implications for companies' governance structures (Brenner and Hartl, 2021).

Digitalization and sustainability issues affect several aspects of business, pushing firms toward the use of new paths of corporate growth (Roden *et al.*, 2017). These megatrends have accelerated the already rapid increase of activities that were traditionally within firms being realized by outsourcing processes (Abeysekara *et al.*, 2019; Patrucco *et al.*, 2020). The search for success pushes frequently towards partnerships and strategic alliances (Reuer *et al.*, 2016; Li *et al.*, 2017; Aggarwal and Kapoor, 2019). At the same time, firms have an increasing amount of information on environmental dynamics (Trantopoulos *et al.*, 2017) and digital technologies push new forms of interactions among firms and external stakeholders (Zerbino *et al.*, 2018; Mikalef *et al.*, 2020).

Recognizing the power of the digital process and socio-environmental issues to face the variability and the volatility characterizing the competitive context, managers need to understand how to formulate and implement more innovative business models (Yang *et al.*, 2017; Fiorentino *et al.*, 2020; Pan *et al.*, 2023). In this sense, recent studies have introduced the strategic role of firm boundaries in rethinking the business model (Andreini and Bettinelli, 2017; Teece, 2018; Nason *et al.*, 2019; Garzella *et al.*, 2021) shifting the focus from the boundaries of management to the management of boundaries (Caputo *et al.*, 2019; Capurro *et al.*, 2021b). Scholars highlight the value of boundary resources and capabilities, placed in the business periphery area, that are characterized by difficulties of imitation and acquisition by the competitors (Yang *et al.*, 2010).

In this sense, digitalization and sustainable paths of growth should be based on business models able to exploit all firm's resources and capabilities – both internal, external and boundaries – in a synergic way. However, analysing the literature streams on strategic management and innovation, yet still, little is still known about how firms could embrace these two megatrends into their business models exploiting the opportunities offered by the management of boundaries (Broccardo *et al.*, 2023). Firms need new frameworks and tools that can overcome this lack of integration.

In an attempt to bring the literature gap, the paper aims to advance a comprehensive framework that allows us to further understand the overlap among digitalization,

sustainability and BMIs development, by a "boundary approach". In this sense, the study posits the following research questions: how do the recent megatrends of digitalization and sustainability affect the development of new business models? What contribution can boundary strategies offer to face current megatrends? How should boundary resources and capabilities be developed by firms to embrace digitalization and sustainability?

In answering these questions, the paper follows a theoretical approach based on a structured literature review; relevant studies on growth strategies, digitalization and sustainability as currently relevant megatrends, the construct of BMI and, boundary management are analysed and assessed. In this way, the critical dimensions of these topics are identified and integrated into a comprehensive framework for the strategic management of firm boundaries in the development of BMIs in the current digital and sustainable landscape.

Specifically, the study contributes to several literature streams. Indeed, the advanced conceptual framework bridges fields – such as digitalization, sustainability and boundary management – which had not previously been analysed in their interplays.

Specifically, our contribution is relevant for strategic management studies because it proposes an analysis of the construct of BMI, highlighting the impacts of digitalization and sustainability, to increase the firm value creation processes. Concerning digitalization and sustainability literature streams, the study points out the similarities and intersections between the two megatrends to enhance the firms' positions of competitive advantage. Moreover, concerning boundary management studies, the framework provides a conceptual model able to identify boundary resources and capabilities to rethink firms' business models in the current digital and sustainable landscape. Finally, the study suggests implications for practitioners to support an evolution of business models through boundary strategies to increase the firm's capability to manage the digitalization and sustainability processes and, to grasp the external stimuli driven by these two megatrends.

This paper is structured as follows. The next section provides a theoretical background on the relevant megatrends of digitalization and sustainability, the construct of BMI and boundary management. Section 3 proposes an integrated framework highlighting the strategic role of the firm boundaries in the BMI in the current digital and sustainable economy. Section 4 presents and discusses the findings. Finally, Section 5 summarizes the main conclusions, the study's implications and the ideas for future research.

## 2. Theoretical background

The current wave of digital and sustainable transformations has created new business opportunities and represents an important driver of novel – and often disruptive – innovation and value creation (Rachinger *et al.*, 2019; Llanes, 2019; Apostolov and Coco, 2020). These processes affect several aspects of business, pushing firms toward new paths of corporate growth. The traditional distinction between "internal growth" and "external growth" strategies is becoming less useful for analysing corporate growth strategies (Caputo *et al.*, 2019; Garzella *et al.*, 2021; Capurro *et al.*, 2021b); the firm's growth "mainly" based on the external acquisition of resources and capabilities or "mainly" based on the joint use of a firm's resources and capabilities with those of other organizational systems, do not allow to fully exploit the opportunities offered by the most recent megatrends. Scholars increasingly emphasize the need to implement "mixed" paths of growth compared to the above alternatives (Lombardi, 2019).

In this scenario, digital technologies and socio-environmental issues promote new forms of interactions among firms and external stakeholders (Volschenk *et al.*, 2016; Mikalef *et al.*, 2020). The search for success pushes firms frequently towards partnerships and strategic alliances

(Aggarwal and Kapoor, 2019); the internal R&D activities are more and more frequently developed in a way not alternative to the simultaneous exploitation of external sources of innovation and knowledge (Chesbrough, 2003; Abdulkader *et al.*, 2020; Capurro *et al.*, 2021b).

Therefore, the awareness that the successful corporate paths of growth cannot be exhausted within the firm's boundaries has led scholars to consider the management of firm boundaries as a key variable (Foss *et al.*, 2013; Fiorentino, 2016; Caputo *et al.*, 2019; Garzella *et al.*, 2021); the management of firm boundaries is relevant to seize the market opportunities, that today are increasingly influenced and interconnected to changes dictated by the evolution of the main global megatrends.

In this sense, and according to the research aim, the paper analyses the theoretical background concerning the following main literature streams: (1) the megatrends of digitalization and sustainability; (2) the construct of BMI in the digital and sustainable landscape and (3) the boundary management. Insights from the literature review were used to develop research questions.

### *2.1 The relevant megatrends of digitalization and sustainability*

The term "megatrend" was coined by John Naisbitt (1982) to describe "*large social, economic, political, and technological changes (. . .), they influence us for some time – between seven and ten years, or longer*" (Naisbitt, 1982, p. 9). This concept, therefore, identifies long-term change processes that can determine relevant social, economic, political and/or technological impacts at the global level by shaping consumer behaviour, influencing government policies and redesigning the business landscape (Naisbitt and Aburdene, 1990).

Thus, the megatrends, as potentially disruptive forces in the global economy, are able to affect the current and future market competitiveness by driving innovation processes and redefining existing business models. In this sense, scholars and practitioners constantly focus their attention on the analysis of global megatrends, and the related future prospective evolutions, to identify new paths of growth and investment opportunities (Lee *et al.*, 2019; EY, 2020; Gajdzik *et al.*, 2021; IFF, 2022).

Firms will need to explore new megatrends to be able to intercept – even to anticipate – the potential structural changes in business contexts; the understanding of these dynamics is nowadays considered the precondition, the starting point, for the overall strategy formulation process and the identification of new business opportunities (Fosso and Mishra, 2017).

Currently, sustainable development and climate change, artificial intelligence and big data, extended reality and Metaverse, cyber warfare, ethics and inequality in societies, space economy, are just some of the key topics aimed at impacting the global economy and the business practices of the near future (EY, 2020; IFF, 2022; PwC, 2022). In general, these themes seem to lead to two guiding principles, namely the digitalization and sustainability processes; theoretical and practical studies agree in considering these processes as two of the main megatrends characterizing the modern business landscape (Jeflea *et al.*, 2022).

In particular, digitalization – correlated with technological development and the Industry 4.0 paradigm – and sustainability, are nowadays considered critical success factors and growth drivers able to trigger new competitive dynamics and increase profits and market shares (Lanzolla and Giudici, 2017; Geissdoerfer *et al.*, 2018).

In this sense, firms have begun to recognize the range of opportunities offered by sustainability and new digital technologies placing these topics at the top of their strategic agendas (Ghobakhloo, 2020). Thus, digitalization and sustainability are changing firms by transforming products, services and operations.

Specifically, digitalization produces the creation of – and consequent changes in – market offerings, business operations or models that result from the use of new technology fostering the innovation processes (Schallmo and Williams, 2018; Capurro *et al.*, 2023). Digital technologies have radically changed the nature and structure of new products and services by enabling the development of innovation collectives that involve dynamic sets of actors with diverse goals and capabilities (Rachinger *et al.*, 2019). Thus, a new breed of innovation processes and novel value creation and value appropriation pathways are established (Garzella *et al.*, 2021).

In the same way, the sustainability topic, intended as a wide recognition by firms of the legitimacy and importance of the social, environmental and ethical issues in the strategic process, has become increasingly vital (Garzella *et al.*, 2020); research on social, environmental and ethical issues and green management has rapidly expanded (Schiederig *et al.*, 2012; Garzella and Fiorentino, 2014; Lo and Liao, 2021). The implementation of proactive approaches by firms to socio-environmental concerns has been proposed as urgent and profitable to face the variability and the volatility characterizing the current competitive context (Porter and Kramer, 2006). The development of products, services, processes and initiatives focused on the social needs of people and environmental preservation can be considered a success factor for firms able to trigger new competitive dynamics (Capurro, 2020). These aspects should be considered as an "opportunity" for firms that could be paid off in terms of social reputation, corporate image, compliance, sustainability reporting and customer preferences (Lamboglia *et al.*, 2018).

Therefore, although digitalization and sustainability are concepts different in their basic assumptions and logic, they often appear as two increasingly interconnected aspects of a single synergistic strategic path of growth to enable BMIs (Capurro *et al.*, 2023). Thus, the harmonious exploitation of these two megatrends fosters the innovation process increasing R&D investments, new forms of strategic alliances, changes in firms' business models, firm's portfolios business and technology and production decisions.

While the growth of a digital and sustainable economy may increase firm value, these new megatrends also raise potential challenges for firms about the overall system of strategies (Fiorentino *et al.*, 2020). Prior studies on topics, in fact, capture the strategic relevance of digitalization and sustainability at corporate and business levels (Garzella *et al.*, 2020). In this sense, firms should develop an integrated approach to digitalization and sustainability by managing structural relationships with several players, both economic and non-economic, and the required changes in the operational processes, the organizational models and rules, roles and procedures of corporate governance.

In this scenario, a deeper understanding of the underlying opportunities in the development of megatrends of digitalization and sustainability allows firms to grasp – at best anticipate – market trends to direct and speed the innovation process and acquire new positions of competitive advantage. Therefore, the main megatrends in the global economy should be not only identified but also analysed in the right future perspective to recognize potential changes in the customers' preferences and perceptions, to guide the firms in the definition – or renewal – of their value proposition. The overall strategy should be developed by searching for a balance between deliberate strategy and emergent strategy (Mintzberg, 1987) by strictly considering the firm's distinctive resources and capabilities and key external data and information. Moreover, nowadays these processes are more and more enriched by relationships with several external actors by pursuing information sharing and increasing resources and knowledge portfolios of firms (Chesbrough, 2007; Ciampi *et al.*, 2021).

Consequently, (re)new strategic models are required to promote an evolution in the value creation process; proactive and "alternative" value propositions based on megatrends of digitalization and sustainability could support firms in the processes of transformation and adaptation to changing environmental conditions.

### 2.2 The BMI in the digital and sustainable landscape

In a context characterized by a high level of dynamism and by increasing competition, one of the most relevant issues for firms is to define more innovative and co-creational business models to support the growth processes and to survive the competition.

Stemming from prior studies on topics, the study follows a comprehensive definition which sees the business model as a modelling and representation tool that: "... *describes an architecture for how a firm creates and delivers value to customers and the mechanisms employed to capture a share of that value*" (Teece, 2018, p. 40).

The definition and development of a business model should not be considered as separate stages, isolated and unique, but as a process, continuous and dynamic (Teece, 2018). The business model's architecture should be able to evolve and constantly change transmitting a value proposition that is perceived as "superior" by consumers and ensuring an economic-financial and competitive balance durable over time (Foss and Saebi, 2018; Bouwman *et al.*, 2019). This process requires, on one side, a model characterized by both internal efficiency and effectiveness and, on the other side, a coherent and balanced system of relationships with external actors (Lamberg *et al.*, 2009).

In this sense, business model literature has successfully developed frameworks and practices to capture the complex interrelationship between the creation and appropriation of value and to understand the logic of an organization for value creation (Zott *et al.*, 2011; Massa *et al.*, 2017). Business models help innovation since they turn market opportunities into profits, delivering the value of a service or product through commercialization (Amit and Zott, 2012); firms commercialize new ideas and technologies through their business models.

Thus, scholars have integrated the studies on product and process innovations with those related to the radical rethinking of the business model (Sarooghi *et al.*, 2015); nowadays, promoting innovation in a single direction – acting exclusively on products or processes – may often prove unable to obtain successful competitive and financial results. Thinking in terms of business models, rather than products or processes, significantly extends the potential scope of innovation (Chesbrough, 2010; Zott *et al.*, 2011). The possibility of crystallizing innovations in an overall innovative business model seems to increase the shelters against imitation, the sustainability of the competitive advantage and, the period of time in which to benefit from a Schumpeterian yield (Teece *et al.*, 1997). In line with these assumptions, more firms now are shifting from "traditional" business models to BMIs – increasingly creativity-oriented – as an alternative or complement to product or process innovation and because it can translate to a sustainable advantage (Chesbrough, 2010; Brehmer *et al.*, 2018).

Specifically, the BMI involves the redefinition of "who" (customers?), "what" (products?) and "how" of business models developed by firms (Markides, 1997). Thus, the BMI refers to a new activity system of a firm (Foss and Saebi, 2018) and innovative structures for value creation and value capture (Chesbrough, 2010). From a strategic management perspective, the aim is to think of new customers, new products and new processes altogether; BMI occurs when a firm identifies new sources alternately or simultaneously: e.g. in market opportunities, linked to new customer segment or neglected customer segments; in the creation of innovative products/services, in the development of customer needs; in rethinking the corporate structure, linked to new skills or processes. In this sense, an innovative business model can allow the firms to change the "rules of the game" to compete through a business model that is not only better than its competitors but so radically different as to acquire a privileged position in a competitive context.

Recent developments emphasize a need for a more dynamic perspective on BMI (Saebi *et al.*, 2017; Ancillai *et al.*, 2023). Furthermore, relevant megatrends, such as digitalization and sustainability, are pushing firms towards the use of more innovative business models (Fiorentino *et al.*, 2020; Capurro *et al.*, 2023).

Specifically, the digitalization process has led firms to make considerable investments to explore how they could use digital technologies to build or improve their business models (Trischler and Li-Ying, 2023); the rapid development of digital technologies has opened up unforeseen possibilities to create not only radically new products and service but also business models (Rachinger *et al.*, 2019; Apostolov and Coco, 2020). Furthermore, these processes have blurred the boundaries between the "physical (or traditional) world" and the "digital world" by increasingly offering opportunities for firms to conceive and create innovative business models in two-sided markets (Garzella *et al.*, 2021; Capurro *et al.*, 2021a).

In the same way, sustainability is profoundly reshaping the way firms think and go about BMI for competitive advantage. Indeed, the crossover analysis on sustainability highlights the key role in strengthening the competitive positioning of the firms-customers and firms-stakeholders and in increasing the firm's social value (Garzella *et al.*, 2020; Capurro, 2020). Firms have progressively reoriented their management processes from the perspective of sustainability by conforming their strategic, organizational and governance models with the adoption of socio-environmentally sustainable techniques, technologies and production processes (Freeman and Dmytriyev, 2017; Nave and Ferreira, 2019).

In this sense, several studies have linked sustainability themes with digitalization processes by providing new methods to support the process of sustainable transformation (Brenner and Hartl, 2021; Holzmann and Gregori, 2023; Rusch *et al.*, 2023). Firms are exploring the use of digital technologies to build or improve their sustainable practices by confirming that the development of adequate digital technologies could have an important and positive impact on sustainability. Moreover, digitalization can be considered a promising approach to improve the processes of social consensus building (Fiorentino *et al.*, 2020; Yang *et al.*, 2023). The digital revolution can help to change preferences and habits, including consumer habits, thereby encouraging more conscious and responsible choices – for instance, the "smart labels" – that can inform customers about the socio-environmental impact of products or on the sustainability policies applied by firms. At the same time, firms have an increasing amount of information on environmental dynamics (Trantopoulos *et al.*, 2017); digital technologies enable firms to gather information through data collection and data analytics (Borges *et al.*, 2021). This information can guide strategic decisions and corporate marketing activities by creating differentiation benefits about socio-environmentally sensitive customers. Scholars have highlighted the effectiveness of digitalization processes in supporting sustainability goals by increasing not only credibility and risk prevention but also the overall value creation process (Yang *et al.*, 2017).

Digitalization and sustainability are identified as powerful forces, better still if developed jointly, to push firms toward new business models. These two megatrends pervade every business operation and characterize most of the industrial sectors by pointing out that the digital technologies and socio-environmental practices should be embedded in the overall strategy (Schuelke-Leech, 2018; Garzella *et al.*, 2020; Abdulkader *et al.*, 2020).

Indeed, digitalization and sustainability affect several aspects of businesses pushing firms towards new "sharing economy" business models. These megatrends offer firms the opportunity to complement BMI processes by involving dynamic sets of actors with different goals and capabilities in new value-creating activity systems (Bouncken *et al.*, 2020). Understanding new value creation and value appropriation pathways which include external partners in firm's activities exerts pressures on the management of the business processes concerning firms' boundaries (Andreini and Bettinelli, 2017; Velter *et al.*, 2020). In fact, in contexts where new innovation paths are established, the firm's boundaries are already considered as a central element in network dynamics, digital and sustainable innovations and sharing economy perspectives (Nambisan *et al.*, 2017; Garzella *et al.*, 2021). The current challenge is to shed light on the influence of boundary management on supporting the development of BMI.

*2.3 The boundary management*

The socio-environmental and digital evolutions are pushing firms towards collaborative decisions in resource, knowledge and business process management. Recent studies in the field of strategic management argue that cooperation strategies could often lead to relevant benefits to firms, which hardly can self-generate innovation, because of the lack of know-how or funds, to effectively respond to market needs (Aggarwal and Kapoor, 2019; Bouncken *et al.*, 2020). Firms should reconsider and redesign the boundaries of their corporate structure; successful firms, in fact, appear increasingly as entities with blurred boundaries and able to manage the relationship with the environment to maximize their competitive advantage and the identification of new paths of growth (Costa *et al.*, 2016; Busse *et al.*, 2017).

Thus, scholars increasingly focus on the firm's boundaries as a third alternative, over integration and market, emphasizing the joint use of skills and knowledge between firms (Caputo *et al.*, 2019; Capurro *et al.*, 2021b). In this way, boundary management should be the way to integrate the benefits of internal and external growth strategies.

Specifically, the topic of boundaries was analysed by scholars from economics, management and business organization (Garzella, 2000; Roy and Sarkar, 2016; White *et al.*, 2022). The firm boundaries should be viewed as a continuum area that represents an intermediate form of hybrid governance in network dynamics, digital innovations and sharing economy perspectives. This continuum constitutes a "border area" in which it is not easy to distinguish the firms from the external environment. These studies have referred to the boundary concept to analyse resources, activities and processes that cannot be considered either internal or external and that can be jointly controlled and influenced by many organizations (Yang *et al.*, 2010; Nason *et al.*, 2019). In this sense, scholars have found that "control" should be the most useful criterion to define where firm boundaries should be placed: "*the organization ends where its discretion ends and another begins*" (Pfeffer and Salancik, 1978, p. 32). As such, boundaries are defined as transitional areas between the inside and the outside of an organization, circumscribing resources and capabilities over which governance and control are extended (Fiorentino, 2016).

Specifically, the management of resources, knowledge and activities on the firm boundaries should be a new paradigm to obtain and sustain competitive advantage. Analysing the studies on topics, the main boundaries resources can be identified in intangible assets – such as corporate image, social capital, management relationship skills and so on – and in technological and digital assets (Caputo *et al.*, 2019 Garzella *et al.*, 2021; Capurro *et al.*, 2021b). The strategic importance of intangible resources depends largely on their difficult reproducibility and their incremental character. We mean to refer to the ability of most immaterial elements to simultaneously produce inputs and outputs of the production process. Most resources are consumed during the production process, while intangible resources instead of diminishing as a result of their use, if well used, increase or at least retain their potential (Parmigiani and Mitchell, 2009).

Consequently, it is increasingly necessary to use the concept of boundaries and the "boundary zone" as a central element in business process management (Garzella *et al.*, 2021). In this sense, scholars suggest shifting the focus from the boundaries of the management to the management of the boundaries (Caputo *et al.*, 2019). This process is designed to create value by focusing on business processes and activities that occur at a firm's boundaries (White *et al.*, 2022).

In this sense, the growing attention to the firm's boundaries has led scholars to re-interpret the "traditional" strategic models for business analysis (Foss *et al.*, 2013; Fiorentino *et al.*, 2020); for instance, the strategic model of Strategic Formula (Coda, 2012; De Luca *et al.*, 2016; Zollo *et al.*, 2018) is re-designed and enriched by highlighting the key role of boundaries into the overall system of strategies to increase the firm value creation process in the firm-customers, firm-investors and firm-social actors relationships (Garzella *et al.*, 2020).

Thus, the development of boundary strategies acquires a key role in the new competitive context. The implementation of boundary strategies allows firms to capture weak signs from the external environment and promote the joint fertilization of knowledge and innovation capabilities by fostering cooperation processes among several actors, internal and external to the firm (Caputo *et al.*, 2019; Velter *et al.*, 2020; Capurro *et al.*, 2021a).

However, typical management and organizational issues of boundary strategies are represented, above all, by the difficulty of "controlling" over time organizations and individuals who are gravitating in the boundary area and that represent in the strategies, by definition, strategically relevant resources (Garzella *et al.*, 2021).

To identify the best ways of managing and organizing the network and the various partners involved or to be involved in the innovation implementation process, firms should implement "linking" and "bearing" strategies (Capurro *et al.*, 2021b). Specifically, the "linking strategies" seek to internalize the resources and skills of the partners, allowing them to redesign the entire supply chain innovatively to satisfy the customer more effectively and improve the overall operating efficiency. At the same time, however, firms need to supervise business processes by developing "bearing" strategies that allow protection from the risk that external actors of the supply chain should acquire key information by the relationship with the firm.

In this sense, boundary strategies lead to a win-win approach for organizations in a supply chain where each actor collaborates to compete with other chains. The choice of bringing to the boundaries the centre of the strategy can be the source of great creative stimulus and strong pushes for innovation.

These considerations, as well as the changes in the competitive contexts and the offered opportunities of new megatrends, confirm – as already intuited in some previous studies (Garzella, 2000) – the pivotal role of the firm's boundaries in the development of new successful business models.

## 3. A boundary-based framework for BMI in the digital and sustainable landscape

The rise of digitalization and sustainability has created new business opportunities and continuous stimuli to renew the sources of competitive advantage. In the alignment of internal business processes to the external dynamic evolution, firms are transforming innovatively their business models (Zhu *et al.*, 2019) to identify new paths of growth and increase their value proposition.

The joint analysis of these two megatrends reveals unifying elements in the pursuit of digitalization and sustainability strategies highlighting future perspectives in BMI development.

Thus, in an attempt to bridge the gap in the literature, correlate theoretical and operational guidelines, and analyse the power of business models, exploiting the opportunities offered by these two megatrends, we propose a framework (Table 1). With respect to these megatrends, the review of the existing literature enables the identification of the main advantages related to the implementation of boundary strategies and their impact on BMI development in the current digital and sustainable landscape. It is necessary to integrate the perspectives of the several literature streams: each advantage contributes to suggest a specific BMI development that decision-makers should consider when facing the current digital and sustainability challenges. Based on this perspective, in the framework construction we followed the logic underlying the already widely appreciated conceptual models on environmental and sustainability issues: the strategy-action-performance approach (Micheli and Manzoni, 2010; Garzella and Fiorentino, 2014).

This boundary-based framework forms the basis of a comprehensive and integrated approach to adequately exploit resources, capabilities and activities placed on the firm's

| The main advantages of boundary strategies → | for BMI development → | in the current digital and sustainable landscape |
|---|---|---|
| *To gain access to resources* | *To extend competitive advantage sustainability* | *To speed up the access to resources* |
| Access to resources/capabilities that are difficult to replicate and/or to acquire on the market | Obtain more defensible and sustainable competitive advantage positions | Sooner access to critical resources for increase competitive advantage and compliance with regulatory changes in sustainability and digital transformation |
| *To increase creativity and innovation* | *To expand the know-how* | *To foster open innovation through new touch points* |
| Increase creativity and innovation outside of the corporate boundaries by improving the firm-environment relationship and enhancing the corporate image and reputation | Develop new knowledge, increase building blocks fit and improve corporate culture | Foster sharing knowledge and open innovation processes thanks to digital connections. Allow to activate actions and strategic reactions to socio-environmental dynamics |
| *To perk up your ears* | *To change the rules of the game* | *To catch and "make sense" of weak signals* |
| Foster the firm's capability to grasp external stimulus driven by current and emerging mega-trends | Opportunity to acquire privileged competitive positions and even to rewrite the "rules of the game" | Permit to capture weak signals from the business market thanks to the relations among different actors by defining more impactful strategies related to digital and sustainability |
| *To exploit ICT* | *To exploit predictive analysis for decision-making* | *To speed up information analytics* |
| Exploit information technologies to manage a large amount of data by increasing firms' portfolios of resources and knowledge | Support the information and control systems and decision-making processes especially in a long-term – and in a predictive – view | Guide an easier and faster interpretation of information, as well as their quicker use in inter-firm systems, essential to managing the firm's process complexity in the digital and sustainability-oriented world |
| *To improve operations performance* | *To increase the value creation from innovation* | *To improve the reaction capability to the external shocks* |
| Improve the supply chain's flexibility, reduce time to market and maximize potentiality and speed of operations processes to create more innovative outputs | Reduction of risks of the innovation process with positive impacts on the firm's competitive and financial performance | Increase the reaction capability along the entire supply chain facilitating the quick adaptation of the overall operating production processes to changes in the market and regulatory references |
| *To reduce costs* | *To achieve cost advantages* | *To support supply chain redesign* |
| Share processes and activities by minimizing operating costs and implement a cost control plan and budgeting | Acquire competitive advantage positions through the implementation of cost strategies and systems of inter-organizational strategic cost management | Allow to adapt to the changes required by the environment and to redesign the entire supply chain to satisfy more effectively conscious and technological customers |
| *To promote new value systems* | *To develop linking and bearing strategies* | *To foster information sharing* |

(*continued*)

**Table 1.**
A "boundary approach" for BMI development in the current digital and sustainable landscape

| The main advantages of boundary strategies → | for BMI development → | in the current digital and sustainable landscape |
|---|---|---|
| Promote new inter-organizational relationships based on the cooperation, collaboration and communication between firms' networks | Manage the relationships with external partners thanks to linking" and "bearing" strategies | Rise the connection among corporate teams/units of several firms permanently digital-connected favouring the circulation of information and the joint fertilization of knowledge |
| *To promote the training of managers for inter-organizational management* | *To exploit the value proposition* | *To exploit the boundary managers* |
| Exploit the capabilities of top managerial figures devoted to the management of boundaries, namely boundary managers | Generate new ideas and skills to enrich the value proposition and the value creation process by creating successful inter-organizational links between different firms | Exploit the boundary managers' capabilities through international relational and/or exchange systems to use digital technologies and manage the sustainability processes |

**Source(s):** Table by authors

**Table 1.**

periphery to develop BMIs able to conform to digital transformation and sustainability orientation.

This framework identifies boundary strategies and boundary management as key actions for exploiting opportunities and for facing threats related to the most relevant variables – megatrends such as sustainability and digitalization – affecting BMI in the current landscape.

Specifically, the theoretical analysis shows that the development of successful BMIs that exploit – in many times jointly – digitalization and sustainability as enabling processes, requires new inter-organizational relationships (e.g. cooperation and collaboration between the firms' networks), by emphasizing strategic approaches based on the management of immaterial resources, relational and communicational skills, as well as new leadership styles, which increasing difficulty could be considered internal nor external but rather placed in the firm's boundary area.

Boundary strategies add specific potential to the strengths that characterize other "traditional" BMI development. In the current digital and sustainable landscape, the decision to be oriented towards a BMI development path that sets its success in the ability to strategically manage boundaries has led, firstly, to understanding the opportunities of this model of growth and then to impose considerations regarding its effective, efficient and correct implementation.

Specifically, the analysis of the role of the boundary strategies – and boundary management – for the development of BMIs digital and sustainable oriented is powered by the greater autonomy that characterizes boundary elements and resources. The management of resources, which are neither internal nor external but physiologically placed in the boundary area, can play a great role in improving the competitive positions of the firms; the poor reproducibility and the incremental character that characterize these resources support firms in reaching more defensible and sustainable competitive advantages.

The implementation of successful boundary strategies guides firms in grasping the external stimuli driven by current and emerging megatrends by pursuing promptly – or better in advance – alternative paths of growth. Likewise, the establishment of "boundary" strategic processes draws attention to the deepening of the role played by information and, in

particular, information technology. The firm's proactive ability to reinvent existing and novel knowledge requires the selection and management of several sources and varied amounts of data (Côrte-Real *et al.*, 2017; Merendino *et al.*, 2018); the information technologies, supported by digital infrastructures, can be considered a promising tool to capture weak signals from the environment and use them to predict market and consumer trends.

In this sense, managing boundaries, together with the push of digitalization and sustainability issues, could support firms to implement innovative and creative actions to create and expand markets rather than just reacting to customer demand; previous studies, indeed, highlight the important role of boundaries strategies as the bridge between research on "technology-push" and "demand-pull" innovations (Capurro *et al.*, 2021a). These change processes can drive firms in BMIs development with the aim to rewrite the "rules of the game" in a competitive context (Leeflang *et al.*, 2014).

Therefore, the boundary management commitment is to create balance and harmony between the various elements and activities that lie in the boundary zone, combining them effectively and efficiently with the mix of internal and external forces (Parmigiani and Mitchell, 2009). As seen, the boundary strategy emphasizes the relevance of the mechanisms of collaboration and networking (Schotter *et al.*, 2017); indeed, recent studies underline the link between the management of the firm's boundaries with the most modern paths of growth such as the open innovation processes (Capurro *et al.*, 2021b). The "fertilization contributions" with external subjects and/or organizations make firms able to ensure creativity, flexibility and to more readily achieve resources, capabilities, know-how and technologies by fostering the innovation processes (Chesbrough, 2010).

For example, Apple, when in 2008 opened up their "app" platform to third-party IT developers, has leveraged its creativity and innovation by expanding the company know-how and the success of the company's BM. Indeed, the exploitation of the boundary strategies was useful to foster innovation through new "touch points" and digital connections by supporting the Apple BMI development (Bergvall-Kåreborn and Howcroft, 2013; Weill and Woerner, 2013).

Moreover, implementing more innovative and co-creational BMs based on boundary management improves the efficiency and production flexibility of business processes with positive impacts on the firm's competitive and financial performance; exploiting boundary strategies and promoting new interactions among firms and among firms and customers, firms can lower risks by tending to share processes and activities in order to reduce the risk of interruption of flows along the supply chain, minimizing operational risk and contingent operating costs. The management of boundaries includes the decisions to define the activities and operation processes integrating and interfacing the firm and the external environment; also, the boundary strategies guide in redirecting resources from profitable but dwindling businesses to support emerging ones that are potentially more profitable. For instance, the strategic alliance between Toyota and Tesla is a compelling example of how partnerships can drive BM innovation. In 2010, Toyota invested $50mn in Tesla and began collaborating on the development of electric vehicles. Toyota provided its manufacturing expertise, while Tesla contributed its cutting-edge technology. The result of this partnership was a fully electric SUV that combined Tesla's electric powertrain with Toyota's popular car model; thus, fostering innovation and remaining competitive in the rapidly evolving automotive industry. Toyota gained valuable insights into electric vehicle technology and development from Tesla and it diversified its risk and embraced new technologies (Liu and Meng, 2017).

In this sense, boundary strategies drive decision-making process transformations fostering the positive impacts of digitalization and sustainability on the resources and operations of firms.

The digital evolution has pushed firms to develop managerial and dynamic capabilities to identify and assess opportunities existing on the boundaries between the physical and digital

worlds and between the inside and the outside of the firm. The management of boundaries, together with digital technologies and big data analytics systems, can play a key role in identifying and shaping opportunities at the crossroads between investment in research activity and learning about customer/user. As an illustration, the Accenture and Intel Partnership – based on co-innovation processes – has been accelerating positive change for clients and companies across industries since 2014. Intel, known for its research and development resources and technology innovation, offers Accenture early access to new technology by providing the right expertise to drive and accelerate digital transformation. Clients have direct access to Accenture's industry experts and Intel's engineering talent particularly in six priority areas: Analytics and AI; Multicloud; Digital Workplace; Network; Blockchain; and Edge/IoT (Zurawski, 2018).

In the same way, through partnerships and strategic alliances among the actors operating on the boundaries, firms could potentially access external green resources, technologies and know-how hardly to develop internally; at the same time, working on boundaries, firms could externalize their knowledge and green ideas to achieve the market faster than they could through internal development. In this sense, fuel efficiency improvements in cars, implementation of hybrid cars, encouragement of car sharing, increased use of recycled materials in packaging, growth in fairly traded products and organic foods and passively heated houses are just some examples of sustainability innovations carried out in cooperation with target consumers group, non-government organizations, policymakers, suppliers, complementary firms and even competitors.

However, in this scenario, firms should identify new integration and coordination opportunities among the value chains of the firm and the value chains of external partners but also the best ways of governing the relationships involved in the innovation implementation process (Caputo *et al.*, 2019). Indeed, typical management and organizational issues of boundary strategies are represented, above all, by the difficulty of "controlling" over time organizations and individuals who are gravitating in the boundary area and that represent in the strategies, by definition, strategically relevant resources.

To reduce the risk of dangerous centrifugal pushes and of opportunistic behaviours, firms need to constantly seek ways and arrangements to give relative cohesion to resources and boundaries organizations, often emphasizing the research of a strategic convergence of interests, although starting from dissimilar, and sometimes even apparently conflicting, positions. In this sense, as previously stated, firms should implement "linking" and "bearing" strategies for managing relationships with suppliers and customers. Thus, innovation process timing and inter-organizational conflicts seem to be reduced, and boundary resources and activities are directed to question consolidated thinking models used in the firm.

Therefore, boundary strategies strongly propose the importance of governing relational, organizational and technological factors. The skills and professionalism required by management become complex and articulated. In the implementation of boundaries, the critical issues are first managing relationships between processes, activities and people. The identification of top managerial figures devoted to the management of boundaries, namely boundary managers, thus becomes one of the cornerstones of boundary strategies. Alongside the typically technical knowledge, leadership, communicational and relational abilities are emphasized, as well as entrepreneurial attitudes become fundamental. Boundary managers have to take care to organize an innovative relational system, interpreting a new way of managing both the processes that move resources from the inside to the boundaries (think, for example, of issues related to the development of smart working), as well as those that approach resources from the outside (e.g. creation of inter-companies networks).

In line with these considerations, the analysis identifies the ability to capture weak signs, anticipate the future, generate innovation and govern change, the key elements to implement more innovative and co-creational BMI. Management must be able to manage a system of

increasingly complex and varied factors, giving rise to a harmonious combination capable of interpreting the environment and competitive dynamics. Thus, the concept of BMI is strictly linked with boundary management, finding support in the diffusion of new digital technologies and current sustainability challenges.

## 4. Findings and discussion

The pressures and opportunities driven by the relevant global megatrends have swept away the traditional views about firms' competitiveness, survival and profitability. In line with these considerations, future perspectives in BMI development are required for increasing firm performance and growth. In this sense, our study analyses how firms could successfully implement more innovative and co-creational business models by highlighting the value of the management of a firm's boundaries and exploiting the opportunities offered by boundary strategies in the current digital and sustainable landscape.

Specifically, in the development of BMI, firms should give autonomous relevance to boundary management and boundaries strategies; firms need to pay attention to internal resources and capabilities, to external resources and capabilities and to resources and capabilities that are collocated on the boundaries. Moreover, according to innovation and strategic management studies, the analysis confirms digital transformation and sustainability as two of the main megatrends characterizing the business landscape which are able more and more frequently affected by the current transformation challenges facing firms.

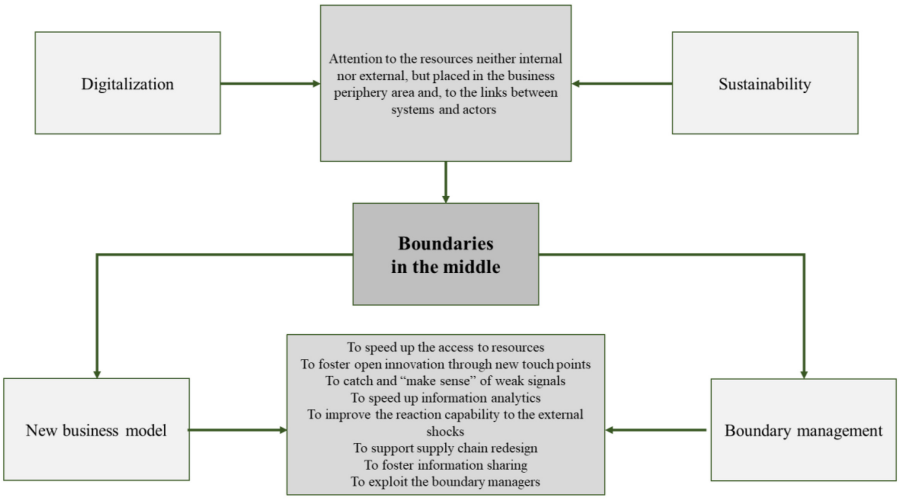
By explaining the key variables and critical factors in a boundary perspective, the framework delineates a line of actions and solutions on how firms can develop more innovative and co-creational business models in the new digital and sustainable landscape. Thus, the analysis offers a comprehensive and integrated approach to adequately exploit resources, capabilities and activities placed on the firm's boundaries enhancing the growth processes and success; firms are guided to affirm BMIs able to conform to digital transformation to sustainability orientation.

Given the above, Figure 1 illustrates and summarizes the centrality of boundaries to face megatrends in the digital and sustainable landscape.

The findings push firms to give even more attention to how boundaries are impacting their business models currently and in the future; the corporate and business strategies should be defined by carefully considering the management of the boundaries and the development of boundary management capabilities. Implementing BMIs based on boundaries amplifies the creative process and leads firms to overcome fundamental challenges in the current business landscape; the management of boundaries affects the overall supply chain by boosting new ways of creation and appropriation of value. Therefore, new paths of growth should be based on BMs able to manage the change processes dictated by digitalization and sustainability; as output, the study encourages a focus on boundary resources and capabilities to grasp external stimuli driven by megatrends.

## 5. Conclusions

The paper develops a comprehensive framework for driving firms in the development of BMI in the current digital and sustainable landscape by employing a "boundary approach". The framework offers insights and guidelines both to scholars and to practitioners highlighting the change processes dictated by digitalization and sustainability; the results encourage putting boundaries in the middle of BMI increasing the firms' capabilities to effectively manage the digitalization and sustainability processes, to grasp the external stimuli driven by these two megatrends and to develop new/renewed BMIs.




**Source(s):** Figure by authors

**Figure 1.**
The centrality of boundaries in BMI to face megatrends in the digital and sustainable landscape

Starting from the definition coined by Naisbitt (1982), the study has identified digitization and sustainability as two of the main megatrends characterizing the modern business landscape. The analysis has been focused on the identification of points of contact and common qualifying variables of these two megatrends to guide scholars and practitioners in the management of the related processes in a single, synergistic and virtuous way. The study also highlights the management of firm boundaries as a key variable to enhance the business processes opening the door to additional – and new – managerial implications.

Thus, the study proposes a broader and more unified understanding of the two megatrends, and it emphasizes the central role of the firm boundaries in the strategic planning processes; the analysis presents a privileged focus on resources and capabilities that cannot be considered neither internal nor external, but placed in the firm's boundary area, to support digital and sustainability business processes, both during the phases of the strategic information collection and in those of physical technical transformation.

In this way, it emerges the relevance of the boundary strategies and the boundary management that monitor the entire supply chain and, also, the various actors involved in the collaborative network.

Based on the literature review, a boundary-based framework for BMIs development able to overcome the current transformation challenges was theoretically developed.

This research extends current knowledge in several ways. First, the paper contributes to strategic management studies. Specifically, it confirms sustainability and digitalization as key factors in formulating and implement more innovative business models. Indeed, the study highlights the relationships among digital innovations, sustainable attitudes and BMI. Implementing BMIs based on the joint exploitation of digitalization and sustainability as enabling processes could support firms in the acquisition of successful advantages in competitive and financial positions.

Second, the study contributes to the literature on corporate social responsibility and digital innovation, underlining the several contact points of these two megatrends. In fact, sustainability nowadays represents a relevant element to support digitalization strategies both in the physical and in the digital worlds. Many modern firms' paths of growth – such as

home banking, teleworking, networking, new supply chains, e-commerce, etc. – are characterized by a strong commission between sustainable and digital aspects. Similarly, the analysis emphasizes the key role of digitalization in pursuing sustainability strategies, allowing to redesign and control of the entire supply chain innovatively to satisfy the more conscious customers; moreover, the exploitation of new emerging technologies supports the overall production process driving firms in the waste reduction, in the resource consumption and in the minimize the product's lifecycle impacts.

Third, the study contributes to boundary management research. Previous studies on these topics confirm the relevance of boundary size and capabilities to the elaboration and implementation of innovative BMs; studies increasingly focus on firm boundaries as a third alternative to integration and the market, and the boundary management should be used to integrate the benefits of internal and external growth strategies. Our analysis enriches the literature by identifying the boundary strategies as key variables to intercept relevant megatrends and, thus, by connecting factors for new BMs development in the current digital and sustainable economy.

Finally, this study also offers important practical implications; the proposed "boundary-based framework" could help scholars and practitioners in BMI development to promote digitalization processes and sustainable paths for firms by suggesting the link between boundary strategies, digitalization and sustainability actions and performance improvements. The study, indeed, shows that on the one hand, many modern paths of growth are connected to a firm's boundaries, and that on the other hand, boundary management plays a key role in rethinking firms' value propositions in accordance with the external stimuli driven by these two megatrends.

Based on the results of this study, future research should be directed to empirically test the proposed boundary-based framework for BMI development. The several variables and factors of boundary strategies could be analysed by classifying firms for size and/or business sector. More precise analysis can be carried out to search the relationship between digitalization and sustainability as megatrends on BMI, and the central role of boundaries, as well as the impact on performance and on paths of growth of firms.

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## About the authors

Rosita Capurro is assistant professor in strategy and business administration at the Department of Business and Economics of the University of Naples "Parthenope". She holds a PhD in "Governance, Management and Economics" from the University of Naples "Parthenope", Italy. She is a member of SIDREA (Italian Association of Professors in Accounting and Management), AIDEA (Italian Academy of Management) and SISR (Italian Association of Accounting History). Her research focused on strategic innovation, strategic management, corporate social responsibility and green management, digitalization and big data. Rosita Capurro is the corresponding author and can be contacted at: rosita.capurro@uniparthenope.it

Raffaele Fiorentino is a full professor in strategic management and business valuation at the Department of Business and Economics of the University of Naples "Parthenope". He holds a PhD in Business Administration from the University of Naples "Parthenope", Italy. His research interests are related to strategic management, performance measurement, innovation, mergers and acquisitions and green management. He published in several international journals, including *Small Business Economics*, *Management Decision* and *Journal of Cleaner Production*, among the others.

Stefano Garzella is a full professor of strategic management at the Department of Economics and Management of the University of Pisa. He is also visiting professor at the University of Naples "Parthenope". He received his PhD in "Business Administration" from the University of Pisa in 1998. He is a member of SIDREA (Italian Association of Professors in Accounting and Management), AIDEA (Italian Academy of Management) and SISR (Italian Association of Accounting History). He has published research articles in several peer-reviewed national and international journals. His research focuses on strategic management, M&As and valuation approaches.