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- A literature review on sustainable business models
- Circular economy in the construction sector
- Factors influencing circular economy in SMEs business
- Sustainable business models in smart agriculture
- The impact of the blockchain on the sustainability. A case of a small winery

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EDITORIAL

BUSINESS MODEL, SUSTAINABILITY, AND INTANGIBLE RESOURCES: CHALLENGES AND OPPORTUNITIES FOR SMES

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Abstract

During the last decades, studies on small-medium enterprises (SMEs) and sustainability have increased, because of widespread awareness of the role of the implementation of sustainability in the business models. Sustainable business models can allow SMEs to change radically processes, products, and organizational forms to assimilate sustainability into their core business more successfully. However, there is little empirical research on the participation of SMEs in developing sustainable business models. Thus, this special issue welcomes five papers that aim to contribute to this stream of research. The first paper presents a structured literature review on circular economy and green economy. Then, the special issue includes two studies regarding the barriers and the factors that affect the application and the adoption of circular business models. Finally, two case studies that focus on the impact of the application of the Triple-Layered Business Model Canvas and on the impact of new technology on the sustainability of SMEs complete the special issue. This editorial summarizes the studies presented in the special issue, pointing out their methodology and main findings.

Small and Medium-sized Enterprises (SMEs) are a heterogeneous group in terms of sector and business models diversity. Previous studies pointed out that SMEs are increasingly conscious of the role of sustainable business models, especially on the improvement of resource efficiency to support overall sustainable development. Therefore, the capability to innovate and to develop new and sustainable business models is crucial for SMEs. Business model innovation can allow SMEs to change radically processes, products, and organizational forms to assimilate sustainability into their core business more successfully.

In this context, there is little empirical research on the participation of SMEs in developing the circular economy (CE). To connect, create, and conserve value, a manager can consider the CE as a tool to grow sustainably. Companies and collectives are increasingly willing to move towards a more circular and sustainable economic and business model as a way of commercial differentiation, competitive advantage, and potential growth with economic spinoffs.

Then, green economy (GE) represents another context that SMEs have to assess to stay competitive on the market. In recent years, many citizens (and cities) have begun to accept the "living green". GE is playing a fundamental role in proposing business models based on sustainable practices, to bring benefits to SMEs.

In addition, sustainable business models require new design capabilities to foster SMEs to incorporate CE and GE principles into their business models. Therefore, intellectual capital and – more generally – intangible resources play a fundamental role to implement these strategies. In this line, emerging digital and smart data technologies such as the Internet of Things (IoT), Blockchain, along artificial intelligence can overcome the challenges and barriers, helping SMEs to implement sustainable business models.

PAPERS IN THE SPECIAL ISSUE

This special issue welcomes five papers that deal with the themes discussed above, addressing some of the key questions raised by our call.

The first paper of this special issue is a structured literature review. In this work, *Trequattrini et al.* aim to reveal the benefits that the CE and GE can bring together in the environmental and social perspective and also in the economical perspective. Thus, they review the literature that connects sustainability-oriented business models (BMs) with the CE and GE, also focusing on 4.0 technologies that may encourage this process of business productivity change. The authors provide a useful basis for the academic and professional implications on the evolution of sustainability-oriented BMs in the direction of CE and GE.

Then, the special issue presents two studies regarding the barriers and the factors that affect the application and the adoption of Circular Business Models (CBMs).

The study of *Scipione et al.* focuses on the application of CBMs in SMEs. In particular, the authors investigate the barriers to implementing circular economy learning processes in the construction sector. The results of the study point out that contextual features related to the external environment, supply chain context, organizational features, and culture are emphasized as the main barriers to a CE-oriented evolution of construction SMEs. Finally, the authors argue that the contribution of specific learning processes oriented towards developing a CE-oriented culture is highlighted as a possible solution to overcome the identified barriers.

A second study is provided by *Cano-Rubio et al.* The authors investigate the factors influencing circular economy implementation in SMEs' business models. Analyzing the Spanish context and using both a quantitative and qualitative analysis, the authors argue that SMEs sampled are characterized by an inappropriate lack of technical and technological resources of olive oil mills, even though they consider innovation crucial to achieving a competitive advantage. Therefore, the authors conclude that policymakers – such as European Union – should support the "green economy" and address SMEs to incorporate circular economy principles into their business models.

Finally, two case studies complete this special issue. Sustainable business models require new design capabilities to foster SMEs to incorporate CE and GE principles into their business models. Therefore, intellectual capital and – more generally – intangible resources play a fundamental role to implement these strategies. The study of *Basile* fits into this line of research. The paper focuses on the application of the Triple-Layered Business Model Canvas (TLBMC) on the startup EVJA. Adopting a qualitative analysis, the author finds that TLBMC brings several advantages to EVJA, especially linked to technological, product, and business features. Based on the author's view, the TLBMC represents the new tool that would need to more explicitly integrate economic, environmental, and social value into a holistic view of corporate sustainability.

In the last study of this special issue, *Di Cuonzo et al.* focus on the impact of blockchain technology on the sustainability of SMEs. In particular, they focus on four important aspects of the sustainable business model: i) sustainable performance, ii) value proposition and business strategy, iii) key resources and activities of the new business, and iv) sustainable disclosure. Using a case of an Apulian wine company, on one side the authors argue that there are cultural obstacles to the adoption of new digital technologies. On the other side, using a questionnaire and interviews, they find that increasing attention of SMEs to digital innovation, recognizing their potential advantages in terms of improving corporate sustainability policies.

RESEARCH ARTICLES

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BUSINESS MODELS, CIRCULAR AND GREEN ECONOMY TOWARDS SUSTAINABILITY. A SYSTEMATIC LITERATURE REVIEW.

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Abstract

The paper presents a systematic literature review (SLR) on the connection between business models and the adoption of the circular economy and the green economy towards sustainability. A classification is offered through which it is possible to understand the environmental, economic and social advantages that these components would be able to bring to the enterprise. We used the Scopus, Web of Science, PubMed and Google Scholar databases as the main source to collect papers. Initially, 387 papers were collected. Subsequently, we proceeded to review the contributions and, once the selection criteria were outlined, we analyzed and classified 84 publications as priorities. The SLR is performed through a bibliometric analysis using VOSviewer software. Finally, we elaborated the state of the art of this research topic for the future agenda.

1. Introduction

The industrial revolution carried out between the 18th and 19th centuries creating the "linear economy" (Alonso-Almeida et al., 2020; Kryshtanovych et al., 2020; Qiao and Quiao, 2013; Sharma et al., 2020).

It is based on the extraction of raw materials, production and mass consumption, and the disposal of waste once it is reached the end of the product life (Bonviu, 2014; Esposito et al., 2018; Jawahir and Bradley, 2016; Sariatli, 2017; Stahel, 2016). Over the years, the linear economy has had vast environmental and social consequences (Esposito et al., 2015). Therefore, the development of the so-called "circular economy" (CE) arises from the need to create an eco-sustainable economic system. Thus, the materials are used in subsequent production cycles, minimizing waste, and avoiding the creation of products with low-value materials or poor quality (Bocken et al., 2016; Koszewska, 2018; Rizos et al., 2017). However, the interest by enterprises for the green economy (GE) raised in recent years connected to the previous issues (Barbier and Markandya, 2013; Krugman, 2010; Loiseau et al., 2016).

The motivation of this research derives from the scarce use of the sustainability-oriented business model (BM) within the enterprises (Breuer et al., 2018; Carayannis et al., 2014; Lüdeke-Freund et al., 2018). Statistical data on research conducted in Europe on consumer habits show how the resources available to the community often end up wasted: for example, in just one calendar year, only 40% of the garbage and waste produced in Europe are being recycled (Esposito et al., 2015). With the adoption of these BMs by the European enterprises, they would save in terms of production costs and use of resources, a sum of 1,800 billion euros per year by 2030 (Esposito et al., 2015). Additionally, the GDP (Gross Domestic Product) growth up to 7 percentage points and higher levels of employment is revealed (Di Maio and Rem, 2015; Lacy et al., 2016; Marciano, 2017).

This paper aims to show the benefits that the CE and GE can bring together in the environmental and social perspective and also in the economical perspective. Thus, the purpose of this paper is to review the literature that connects sustainability-oriented BMs with the CE and GE, also focusing on 4.0 technologies that may encourage this process of business productivity change (Bocken et al., 2016; Lewandowski, 2016; Passaro et al., 2020; Pieroni et al., 2019; Saita and Franceschelli, 2016). Following our research questions, the analysis is aimed at highlighting the advantages of BMs oriented towards sustainability and the adoption, within them, of the "circular economy" (CE) and "green economy" (GE). The reason for interest in this issue derives from the scarce use of the sustainability-oriented business model (BM) within the enterprises (Bagnoli et al., 2021; Lombardi et al., 2020a; Lombardi et al., 2020b).

We applied a systematic literature review (SLR) (Kraus et al., 2020; Lombardi and Secundo, 2020c; Massaro et al., 2016; Petticrew and Roberts, 2006; Tranfield et al., 2003), using Scopus, Web of Science, PubMed and Google Scholar databases. We collected 131 journal papers from Scopus, 121 journal papers from Web of Science, 124 journal papers from PubMed and 30 documents from Google Scholar (the first 3 pages of results available from the search) for twenty years (2000-2020). A final list of 84 papers published in a variety of high-quality (peer-reviewed) scientific journals has been analyzed through the content and bibliometric analysis. Findings show the focus of the CE's potential and sustainability-oriented BMs as the main areas of interest. Activities and applications are also traced. The results are a useful basis for the academic and professional implications on the evolution of sustainability-oriented BMs in the direction of CE and GE. Besides, this paper is intended to identify lessons learned and research gaps, and thereby provide a program for future research.

This paper is structured as follows: i) Section 2 presents the theoretical approach; ii) Section 3 outlines the research methods; iii) Section 4 reports the results; iv) Section 5 provides implications and conclusions; v) Section 6 proposes limitations and Future Research Agenda.

2. Theoretical background

Many definitions of the business model (BM) exist (Baden-Fuller and Morgan, 2010; Demil et al., 2015; Morris et al., 2005; Shafer et al., 2005; Zott et al., 2011). One stream of research is focused on enterprises producing profits and creating values for customers (Johnson et al., 2008; Magretta, 2002). BM is a scheme answering to customer needs, determining customer value within the corporate strategies and providing value with appropriate cost (Drucker, 1994). BM combines business ideas, technologies and business performance (Chesbrough, 2010; Lombardi et al., 2020a; Lombardi et al., 2020b), and determines how enterprises can translate their potential into a new value (Ostelwarder and Pigneur, 2010; Zott and Amit, 2010). The most recurrent themes in the BM's analysis (Pucci, 2016) are i) the value creation; ii) the relationship network; iii) the role of partners and stakeholders; iv) the strategic, organizational and technological activities; v) the structure of costs and revenues.

Analysing BM, three key aspects (Andreini and Bettinelli, 2017) emerged: i) the BM is useful for boundary-spanning research (Zott and Amit, 2007); ii) the BM is used to describe how enterprises make their business dynamic (Zott et al. 2011); iii) the BM represents a tool aimed at the creation, capture and delivery of value (Amit and Zott 2001; Baden-Fuller and Morgan, 2010; Bagnoli et al., 2021; Chesbrough, 2007; 2010; Johnson et al.

2008; Teece 2010). Identifying the BM's relevance, the most important definitions seem highlighted by Coombes and Nicholson (2013) (Table I).

Table I - Selection of business model definitions in the literature

Authors	Definition
Afuah (2004)	"A business model is a framework for making money. It is the set of activities which a firm performs, how it performs them, and when it performs them to offer its customers benefits, they want and to earn a profit".
Amit and Zott (2001)	A business model depicts "the content, structure, and governance of transactions designed so as to create value through the exploitation of business opportunities".
Chesbrough (2007)	"At its heart, a business model performs two important functions: value creation and value capture. First, it defines a series of activities, from procuring raw materials to satisfying the final consumer, which will yield a new product or service in such a way that there is a net value created throughout the various activities". "Second, a business model captures value from a portion of those activities for the firm developing and operating it".
Johnson et al. (2008)	A business model "consists of four interlocking elements that, taken together, create and deliver value". These four interlocking elements consist of "customer value proposition", "profit formula", "key resources" and "key processes".
Osterwalder and Pigneur (2010)	"A business model describes the rationale of how an organization creates, delivers and captures value".
Shafer et al. (2005)	A business model is "a representation of a firm's underlying core logic and strategic choices for creating and capturing value within a value network" and it is this core logic for creating and capturing the value that is the basis of a business model.
Teece (2010)	"A good business model yields value propositions that are compelling to customers, achieves advantageous cost and risk structures, and enables significant value capture by the business that generates and delivers products and services".
Zott and Amit (2007)	"A business model elucidates how an organisation is linked to external stakeholders, and how it engages in economic exchanges with them to create value for all exchange partners".

Source: Coombes and Nicholson (2013), pp. 656-664.

BMs are inspired by the linear economy as the "take, do and dispose" model developed between the 18th and 19th centuries with mass production (Meadows et al., 1972). A new paradigm focused on the CE was introduced later (Geissdoerfer et al., 2017; Geng et al., 2009; Webster, 2017; McDonough and Braungart, 2002; Witjes and Lozano, 2016; Xue et al., 2010), within an economic orientation that considered the environmental challenges of the so-called "green economy" (Loiseau et al., 2016). CE uses resources in a profitable way pushing the whole economic system towards a circular approach, conceiving waste as a resource, rather than linear, based on the use of products rather than on consumption (Allwood, 2014), Thus, CE is characterized by the enhancement of consumer discard, the extension of the life cycle of products, sharing of resources, use of recycled raw materials, use of

energy from renewable sources (Hu et al., 2011; Kama, 2015; Mathews and Tan, 2011; McDonough and Braungart, 2002; Murray et al., 2017; Salonitis and Stavropoulos, 2013; The Ellen MacArthur Foundation, 2012). BM have logic within the production processes towards the reuse and regeneration of products. (Webster, 2017).

The CE's paradigm originates from the GE, also perceived as a path towards sustainability (Loiseau et al., 2016) oriented to safeguard the environment and the society in the long term. GE has been widely used to address the financial crisis and climate change (UNEP, 2011). GE was first presented by Pearce et al. (1989) in response to the underestimation of environmental and social costs in the current price system (Le Blanc, 2011). GE pursues the achievement of well-being and social equity, significantly reducing environmental risks and ecological scarcities (UNEP, 2011). The purpose of the CE is aligned to the GE's ones, sustaining the BM's creation oriented towards the sustainability path (Chertow and Ehrenfeld, 2012; Lombardi et al., 2019; Maglio et al., 2020; Mattila et al., 2012; Roberto et al., 2020; Yu et al., 2014; Yuan et al., 2006; Zhu et al., 2011). Thus, our research questions are the following:

- RQ1 How is the literature on the business models, circular and green economy?
- RQ2 What is the literature's focus within the business models, circular and green economy?
- RQ3 What are the implications coming up for organizations and decision-makers?

3. Research methods

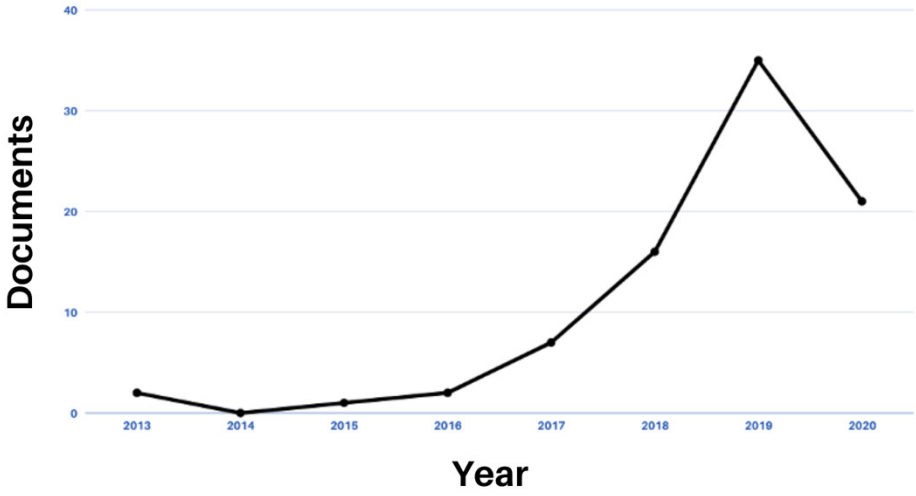
Our structured literature review (SLR) was intended to create a connection between BMs, CE and GE through a bibliometric analysis using VOSviewer software (Lombardi and Secundo, 2020c; Kessler, 1963; Waltman et al., 2010; Van Eck and Waltman, 2009; 2010; 2017). Defining the research protocol (Kraus et al., 2020; Massaro et al., 2016; Petticrew and Roberts, 2006; Tranfield et al., 2003), we answer the previous research questions. Thus, we defined the literature to obtain our results using Scopus, Web of Science, PubMed and Google Scholar databases under the time 2000-2020. Our query was aimed at creating the connection between BM, CE and GE using the Business, Management and Accounting area. We collected 131 journal papers from Scopus, 121 journal papers from Web of Science, 124 journal papers from PubMed and 30 documents from Google Scholar (the first 3 pages of results available) according to the fixed criteria. After extracting the files from previous databases, the research has been developed through a database implemented on an excel file spreadsheet. We deleted the duplicate papers and collected only research papers using the "Article Title, Abstract, Keywords" considering documents in English.

Finally, we collected 84 papers published in a variety of high-quality (peer-reviewed) scientific journals analyzed through the content and bibliometric analysis. Our SLR provides the first background that connects the BM, CE and GE, providing the state of the art supporting a great understanding of forthcoming issues.

4. Results

The distribution of 84 research papers over time and across countries is represented below. Figure I propose the number of research papers published between 2013 and 2020 emphasizing an increasing trend in the last years. Thus, the search stream appears to be relatively recent and no studies are found before 2013 in the horizontal time fixed by this research.

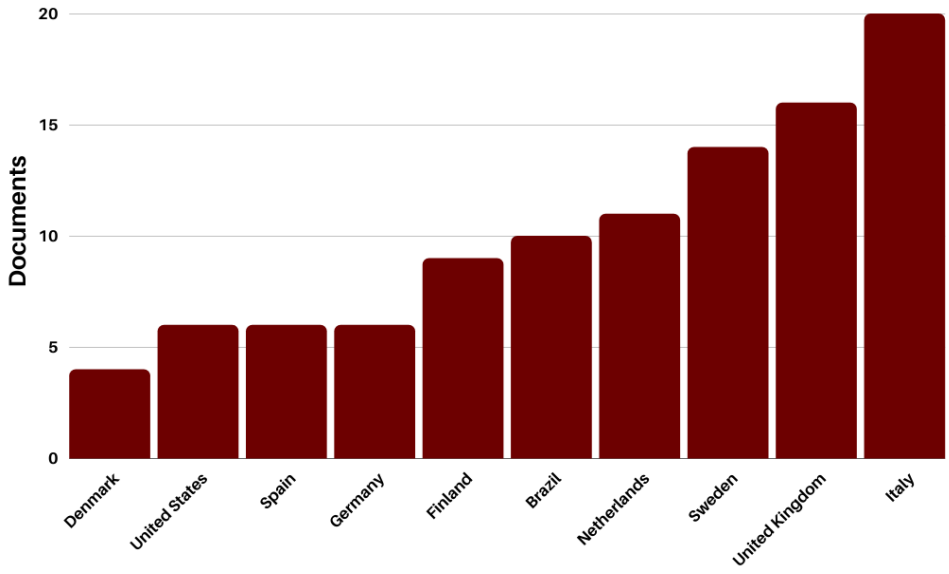
Figure I – Publishing trend in the collected research paper



Source: Own Elaboration

Assuming the countries' perspective, Italy tops the list with 20 research papers, followed by other countries with fewer research papers and less interest in the topic analyzed, such as United Kingdom (16), Sweden (14), Netherlands (11), Brazil (10), Finland (9), Germany (6), Spain (6), United States (6) and Denmark (4).

Figure II – Research papers distribution (per countries)



Source: Own Elaboration

Table II confirms the papers publications and citations' primacy of Italy with 20 papers and 618 citations, followed by the United States with 16 papers and 1184 citations and Sweden with 14 papers and 645 citations. Other countries are represented in the list. The number of citations per country does not align with the increasing/decreasing number of published research papers.

Table II - Top ten countries in term of citation

Country	N° of Papers	N° of citations
Italy	20	618
United Kingdom	16	1184
Sweden	14	645
Netherlands	11	569
Brazil	10	502
Finland	9	354
Germany	6	189
Spain	6	71
United States	6	371
Denmark	4	158

Source: Own Elaboration

The analysis of the sources highlights the fragmentation of the publications into different journals: several accounting, auditing and accountability journals publish from 1 to 3 contributions (table III), only "Journal of Cleaner Production" and "Business Strategy and the Environment" published respectively 36 and 9 research papers. Although the number of journals in which the documents are published is relatively high, the journals' list is mainly focused on the area of accounting research and in some cases on technology management.

Table III – Journals/citations

Source title	N° of paper	N° of Citations
Journal of Cleaner Production	36	1352
Business Strategy and the Environment	9	426
Management Decision	I5	53
California Management Review	3	117
Thunderbird International Business Review	3	97
Quality - Access to Success	3	6
Production Planning and Control	2	42
Technological Forecasting and Social Change	2	202
Journal of Manufacturing Technology Management	2	136
Journal of Evolutionary Economics	2	2
Journal of Business Ethics	1	535
Supply Chain Management	1	9
Benchmarking	1	15
International Journal of Production Research	1	52
Business Horizons	1	71
Journal of Business Research	1	27
Contaduria y Administracion	1	6
E a M: Ekonomie a Management	1	2
Industria	1	2
International Journal of Business and Globalisation	1	16
Journal of Business Economics and Management	1	9
Manufacturing and Service Operations Management	1	21
International Entrepreneurship and Management Journal	1	15
R and D Management	1	22
Small Business Economics	1	31
Social Responsibility Journal	1	4
WSEAS Transactions on Business and Economics	1	0

Source: Own Elaboration

The greatest number of citations per journals are i) Journal of Cleaner Production (1352 citations; 36 papers); ii) Business Strategy and the Environment (426 citations; 9 research papers); iii) Management Decision (53 citations; 5 research papers). We adopted the citation index (CI), the citations

per year (CPY), the citations and collaborations among authors. Table III proposes the top five cited papers and Table IV shows the number of citations per authors/documents. The most interesting research papers and influential authors are Murray et al. (2017), Linder and Williander (2017), Urbinati et al. (2017), Geissdoerfer et al. (2018) and Scheepens et al. (2016).

Table IV – Top five cited papers

Authors	Title	Citations	CPY	Source	Country
Murray, A., Skene, K., Haynes, K. (2017)	The Circular Economy: An Interdisciplinary Exploration of the Concept and Application in a Global Context	535	133,75	Journal of Business Ethics, 140(3), pp. 369-380	United Kingdom
Linder, M., Williander, M. (2017)	Circular Business Model Innovation: Inherent Uncertainties	208	52	Business Strategy and the Environment 26(2), pp. 182-196	Sweden
Urbinati, A., Chiaroni, D., Chiesa, V. (2017)	Towards a new taxonomy of circular economy business models.	168	42	Journal of Cleaner Production, 168, pp. 487-498	Italy
Geissdoerfer, M., Morioka, S.N., de Carvalho, M.M., Evans, S. (2018)	Business models and supply chains for the circular economy.	160	53,33	Journal of Cleaner Production, 190, pp. 712-72	United Kingdom
Scheepens, A.E., Vogtländer, J.G., Brezet, J.C. (2016)	Two life cycle assessment (LCA) based methods to analyse and design complex (regional) circular economy systems. Case: Making water tourism more sustainable.	132	26,4	Journal of Cleaner Production, 114, pp. 257-268	Netherlands

Source: Own Elaboration

Murray et al. (2017) draw the conceptualisations and origins of the CE, tracing its meanings, and exploring its antecedents in economics and ecology. The authors discuss how the CE has been operationalized in business and policy. In addition to the advantages of the CE, the authors discuss how this tool can contribute to more sustainable BMs. Finally, they define the CE as "an economic model wherein planning, resourcing, procu-

rement, production and reprocessing are designed and managed, as both process and output, to maximize ecosystem functioning and human well-being" (Murray et al. 2017). Linder and Williander (2017) also underline the great utility of circular BMs based on regeneration and reuse, as they can produce significant savings on costs and in terms of environmental impact. The authors demonstrate that circular BMs imply significant challenges for proactively reducing uncertainty for the entrepreneur. Urbinati et al. (2017) propose the novelty of BMs oriented towards the CE as the way to reuse and maintain resources in a production and use cycle that allows generating value for a longer time. The authors identify four ways of adopting the CE: Linear, Upstream Circular, Downstream Circular and Full Circular. Urbinati et al. (2017) explore how enterprises exploit CE principles within their BM.

Geissdoerfer et al. (2018) discuss the sustainability performance of circular BMs (CBM), defining the circular supply chains to implement the concept at an organizational level and proposing a framework for integrating circular BMs towards enterprise's sustainable development. The results highlight how the case studies have aspects of circularity incorporated in their BMs and supply chains. However, the latter still face challenges to change the paradigm of corporate BMs from linear to circular. Scheepens et al. (2016) argue that life cycle assessment (LCA) is the best system for analyzing environmental aspects, and can evaluate circular systems, product-service systems and recycling system. The authors apply the LCA-based Eco-costs Value Ratio (EVR) Model to identify potentially negative environmental effects of commercial initiatives at the system level. This model shows useful for the design and implementation of a sustainable recreation system in the context examined.

We performed the occurrence analysis identifying the most relevant keywords (Table V). Sustainability, BM innovation, sustainable development and value creation are prominent words in investigating and answering our research questions.

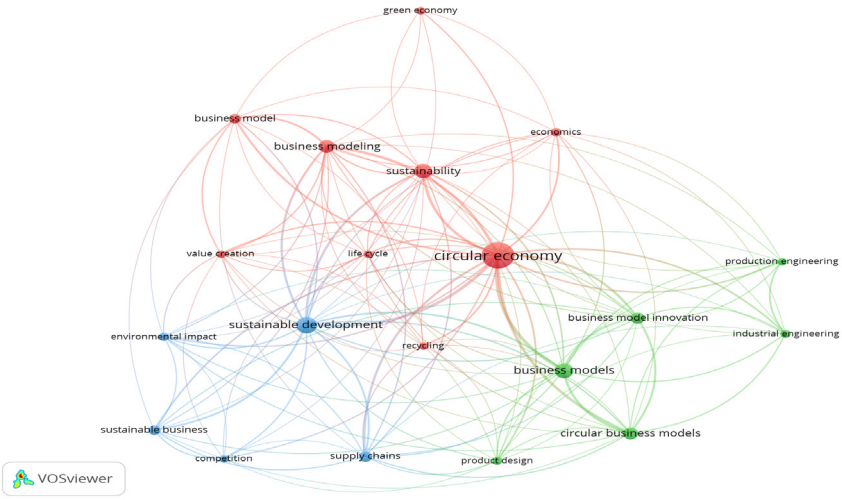
Table V – Authors' keywords occurrence

Keywords	Occurrence
Circular Economy	64
Sustainability	17
Circular Business Models	13
Sustainable Development	11
Business Model Innovation	10
Business Model	8
Green Economy	7
Value Creation	4

Source: Vosviewer Elaboration

All keywords clusters are investigated through the co-occurrence's (Figure III).

Figure III – All Keywords' occurrence



Source: Vosviewer Elaboration

Table VI shows the group of keywords occurrence identifying three main clusters. We identify cluster 1 (red colour) with 9 items, cluster 2 (green colour) with 6 items and cluster 3 (blue colour) with 5 items. However, we deleted duplication keywords owing to the usage of singular and plural form or being embedded in another keyword. Cluster 1 seems to assume a prominent role in the adoption of the CE in sustainability-oriented BMs. Cluster 2 seems to assume an important role in detecting relevant models of this new virtuous management through the identification of new technologies that can bring tangible and intangible benefits for the enterprise's life cycle. Cluster 3 identifies the current state regarding the adoption of these new management models within enterprises.

Table VI - Groups of keywords occurrence

CLUSTER	KEYWORD	OCCURRENCES
Cluster 1 (9 items - red)	Circular Economy	65
	Sustainability	20
	Business Modelling	14
	Business Model	8
	Green Economy	7
	Economics	6
	Recycling	6
	Life Cycle	5
	Value Creation	5
Cluster 2 (6 items - green)	Business Models	19
	Circular Business Models	13
	Business Model Innovation	12
	Product Design	6
	Industrial Engineering	6
	Production Engineering	5
Cluster 3 (5 items - blue)	Sustainable development	28
	Supply chains	11
	Sustainable business	8
	Environmental impact	8
	Competition	5

Source: Vosviewer Elaboration

The first area reveals a great interest from scholars towards these topics. The authors sought to outline the advantages that the CE and GE can bring to BMs (Lieder et al., 2020; Dijkstra et al., 2020; Esposito et al., 2018; Galati et al., 2018; Geissdoerfer et al., 2017). The main advantages include reduction of production and purchase prices of products, introduction of new rules, physical and climatic changes, modification of customer preferences and limits of resources for production (Gilbert et al., 2017; Lacy and Rutqvist, 2016; Osterwalder and Pigneur, 2010; Nasiri et al., 2018; Mylan et al., 2016). Problems regarding sustainability, innovation and competitiveness are central fields for enterprises not only for scholars but also for managers, entrepreneurs and business leaders (Cohen and Winn, 2007; Dean and McMullen, 2007; Parida and Wincent, 2019; Schaltegger 2002). Among the papers included in the first cluster, the researchers discussed introducing new BMs (Mont, 2002; Reim et al., 2015) and capability development (Parida et al., 2015; Ulaga and Reinartz, 2011), connecting these compo-

nents to the possibilities of creating value for customers (Lenka et al., 2017; Sjödin et al., 2016).

Also, to provide a further summary of the potential of CE and GE, in the second area, the authors outline the methodologies for delivering circular products and BMs capable of adapting to sustainability (Bocken et al., 2016; Franco, 2019; Manninen et al., 2018). The authors try to understand the general business dynamics and the frameworks oriented to the CE and GE adopted on case studies, also conducting structural and behavioural tests (Kirchherr et al., 2017; Murray et al., 2017; Saidani et al., 2017). Linder and Williander (2017), Rizos et al. (2016), and Vermunt et al. (2019) are some of those who discussed the obstacles and tools for the implementation of circular BMs, tracing the central role of sustainability and resource efficiency (Hofmann, 2019; Manninen et al., 2018; Whalen, 2019) and also trying to classify the degrees of intensity and application of the components mentioned above (Bocken et al., 2014; Rosa et al., 2019; Urbinati et al., 2017).

In the third area, current practices related to sustainable BMs are traced (Centobelli et al., 2020). Three practices are identified: i) to create value, ii) to acquire value and iii) interdimensional practices. i) In the practices aimed at creating value, those most used are the activities for recycling, regeneration and re-assembly (Marconi et al., 2019), trying to avoid the end of product's life cycle (Mendoza et al., 2017; Moreno et al., 2016). The corporate goal, as well as significant economic savings, is to prevent contamination of the environment and the biosphere (Moreno et al., 2016). ii) The practices aimed at acquiring value, on the other hand, are those that try to give value to materials that no longer have any, such as waste (Goyal et al., 2018; Pezzotta et al., 2017). In this case, the enterprises, in addition to offering customers products at significantly more advantageous prices, avoid expensive waste management costs (Krystofik and Gaustad, 2018; Lewandowski, 2016; Ranta et al., 2018). iii) In conclusion, the interdimensional practices are those aimed at mixing the activities described above, trying to use innovative emerging digital technologies (de Sousa Jabbour et al. 2018; Despeisse et al., 2017; Rajala et al., 2018; Trequattrini et al., 2016).

5. Implications and conclusions

This paper examines the literature on the topic of sustainability-oriented BMs, concerning the CE and GE. First, in this section, we will try to discuss the main results providing implications for theory and practices deriving from the three research questions.

Implication 1. How is the literature on the business models, circular and green economy?

The CE and GE are new emerging economic paradigms (Geissdoerfer et al., 2017; Geissdoerfer et al., 2018; Runfola et al., 2020; Sehnem et al., 2020), capable of replacing growth models focused on a linear vision. They focus on reducing waste and a radical rethinking in the conception of products and their use over time safeguarding the environment and the society in the long term. They represent an important challenge for the production system and society, as they require the adoption of sustainable production and consumption activities and processes, as well as being able to manage the planet's resources consciously and efficiently (Allwood, 2014; Di Maio and Rem, 2015; Scheepens et al., 2016). Through the adoption of strategies and BMs oriented to the CE, enterprises redesign internal processes, supply chain relationships, promoting innovative products related to new materials or eco-design, as well as how consumers can enjoy it. The scenario is linked to the use and development of digital technologies connected to industry 4.0, from robotics to 3D printing, from the Internet of Things (IoT - Internet of Things) to big data, which can further push enterprises towards the adoption of models related to the CE (Bag et al., 2020; Massaro et al., 2021; Salvador et al., 2021). Furthermore, since these are innovative paradigms in which investors and stakeholders are particularly interested, also social networks are fundamental in terms of voluntary and involuntary disclosure of the company, to enhance and raise awareness of the adoption of these BMs at an entrepreneurial level (Lardo et al., 2020). Observing the evolutionary trend of scientific papers addressing the topic of sustainability-oriented BMs through CE and GE, we note the increasing growth of papers in the last three years: it has gone from 15 papers in 2018 to 32 papers in 2019 and 19 papers in 2020, with only 4 papers in the first 5 years (2013-2017). The growing number of scholars' contributions over the years demonstrates the originality and innovation of the field of investigation. The main geographical areas in which the greatest number of authors are present are Italy, Sweden and Netherlands. Italy is among the most active countries and is seeking to make the impact of corporate productivity environmentally sustainable. Finally, the papers included in our analysis allow us to derive some indications and recommendations on how an enterprise can organize sustainable BMs oriented towards CE and GE or modify its own to make them such.

Implication 2. What is the literature's focus within the business models, circular and green economy?

We highlight as scholars pose attention towards practical possibilities of making BMs sustainable, through the development of frameworks to be used or already used within enterprises (Centobelli et al., 2020; Marconi et al., 2019; Mendoza et al., 2017; Moreno et al., 2016). The most used venue for

publication is the Journal of Cleaner Production (36 papers published with the highest number of citations). Scholars have focused on the analysis of many case studies and BMs already oriented to the CE. The results define: i) an active role of enterprises in rethinking production processes and supply chain relationships, seeking to enhance and improve the relationship between technical, commercial and marketing skills; ii) a leading role of 4.0 technologies for monitoring and sparing use of resources and products; iii) the importance of loans capable of evaluating the innovative and profitability potential of CE strategies; iv) the importance of regulatory measures that simplify and make the use of materials reused and recycled more and more indispensable with a view to "closing the circle".

Implication 3. What are the implications coming up for organizations and decision-makers?

Some main implications and advantages for organizations and decision-makers seem to include: reduction of production and purchase prices of products, the introduction of new rules, physical and climatic changes, modification of customer preferences and limits of resources for production (Gilbert et al., 2017; Lacy and Rutqvist, 2016; Osterwalder and Pigneur, 2010; Nasiri et al., 2018; Mylan et al., 2016). Also, at the legislative and political level, especially the European Union, the promotion to convert the corporate production towards the CE and GE has been activated (Bonviu, 2014; Smol et al., 2017; Türkeli et al., 2018). The main strategic guidelines adopted by the Member States were: to think of a product design to foresee their destination from the beginning once they have become waste, to reduce the number of materials suitable for providing a specific service, to give rise to production processes capable of extending the useful life of products, design products that are easy to maintain in good condition, repair, modernize or recycle, define indicators and objectives to evaluate the efficient use of resources. Precisely to encourage this transition from a linear economy to EC and GE, for firms able to put these guidelines into practice, the European Commission has decided to allocate funds in the coming years so that companies can be stimulated to make this transition (Marino and Pariso, 2020; Taranic et al., 2016). Following our analysis of the clusters, i) there is a leading role in the adoption of recycling, the life cycle and the GE, as adequate strategies to support circular BMs oriented towards sustainability (Loiseau et al., 2016; Stubbs and Cocklin, 2008; Tulebayeva et al., 2020;). The relevant activities used to achieve these objectives are recorded in the supply chains, in operations aimed at optimizing the environmental impact and promoting healthy competition between companies to improve production. Another relevant field concerns ii) issues relating to the right technologies adopted by organizations and institutions

to implement an adequate circular BM. Proposing a longitudinal study analysis, our review emphasizes the relevance to find a way that leads to the creation or modification of corporate BMs towards sustainability, to avoid unnecessary waste of resources and money, to safeguard the environment and society in the long term.

Our key findings outline three main significant streams originated by the i) CE (cluster 1), ii) sustainable development (cluster 2), and iii) circular BMs (cluster 3), confirming our initial keywords. Valuable implications and information are processed which seek to transform the corporate environment globally.

6. Limitations and Future Research

Through this research agenda, we invite scholars to investigate:

- sustainable BMs oriented to the CE and GE emphasizing real benefits in terms of environment and society;
- technologies useful in the CE and GE to develop guidelines on sustainability;
- promising challenges by enterprises.

Therefore, this paper has limitations especially in the dataset, i.e. only those in English, and the topics of the GE and technologies capable of implementing the sustainability of corporate BMs. Our research proposes a static representation of the advantages provided by CE and GE oriented BMs. However, the issues addressed are concepts in continuous evolution. The survey could be extended to the political and economic strategies of the various countries, aimed at studying the initiatives promoted by them to favour the application of the following BMs at the company level. These fields of study are therefore still immature and will be subject to further research. Our future research agenda is directed to answer the previous question as well as to investigate the evolution of sustainability and the role that it will play in the development of enterprises.

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BARRIERS TO IMPLEMENTING CIRCULAR ECONOMY LEARNING PROCESSES IN THE CONSTRUCTION SECTOR: AN ANALYSIS OF ITALIAN SMES

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Abstract

This paper examines the application of circular economy (CE) solutions in the Italian construction sector, particularly in small and medium-sized enterprises (SMEs). Specific attention is given to identifying barriers that influence the development of organizational learning (OL) processes related to circular business model (CBM) implementation. Using a qualitative method informed by grounded theory, top managers' perceptions in Italian construction SMEs were investigated using a focus group methodology. The data analysis followed a rigorous method for iterative coding and interpretation relying on the theoretical insights found in OL and CE literature. The study highlights CBM-oriented OL barriers in the external environment, the supply chain context, and individual organizations. In particular, the study identifies culture as a critical multilevel barrier embedded in the other three dimensions. The paper offers several theoretical, managerial, and policy implications, answering a call for CE-related studies in industrial contexts. It furthermore underlines the relevance of OL processes as an essential preliminary step for CBM implementation.

1. Introduction

In recent years, the circular economy (CE) has become a prominent topic in organization science as a new way to understand the relationships between firms and society and pursue a more environmentally oriented business model. Organizations need to learn how to develop and implement this new perspective of a sustainable economy, characterized by different economic paradigms, innovative business models, and novel supply chain (SC) management strategies. Starting from these premises, this paper aims to analyse the barriers to the learning processes needed to implement circular business models (CBMs) in the construction sector. In this context, the organizational learning (OL) theory – here conceived as multiple processes of creating, retaining, and transferring knowledge (Argote, 2011) – is useful to understand the contextual elements that can hinder extensive application of CBM-oriented OL processes. OL theory is also valuable for highlighting the critical role that learning processes play in supporting organizational resilience (Buheji & Ahmed, 2020).

The study focuses on the application of CBMs in small and medium enterprises (SMEs). SMEs represent the largest portion in terms of the number of firms and added value to the national economy. As a key result, contextual elements related to the external environment, supply chain context, organizational features, and culture are emphasised as the main barriers to a CE-oriented evolution of construction SMEs. Additionally, the contribution of specific learning processes oriented towards developing a CE-oriented culture is highlighted as a possible solution to overcome the identified barriers.

This paper provides a theoretical background of OL and previous literature on CE, CBMs, and related barriers, focusing particularly on SMEs. The paper then introduces the research context and methodology, followed by the presentation and discussion of the results. The last section outlines the implications of the research, limitations, and avenues for further research.

2. Theoretical background

2.1 The circular business model and implementation issues

The transition towards a circular conception of the economy and, in connection, CBM implementation can be considered a radical change for traditional firms. CE is a novel economic approach oriented to replace the existing linear production model, where "raw materials are extracted, processed into finished products and become waste after they have been consumed," with a system "that reuse[s] resources and conserve[s] ener-

gy" (Urbinati et al., 2017:488). Several CE definitions (e.g., Kirchherr et al., 2017), taxonomies (e.g., Urbinati et al., 2017), and business models (e.g., Bocken et al., 2014) have been proposed and discussed in academic and practitioners' debates, leading to conceptual confusion and challenging the applicability of this paradigm.

Several different business models are available and under discussion (Bocken et al., 2014; Lewandowski, 2016; Pieroni et al., 2019), but they give "no clear and authoritative guidance on CE principles, strategies, implementation, and monitoring" to organizations (Pauliuk, 2018: 81). This undefined panorama of CBMs' definition and application at the practical level is worsened by the presence of CE-related barriers highlighted in specific studies (Tura et al., 2019), some of which are related explicitly to SMEs (Rizos et al., 2016). Some specific barriers are generally linked to CE application – such as local culture, regulations against CE, or conservativeness of business practices (Tura et al., 2019) – while others are related to intrinsic characteristics of SMEs, such as limited personnel and scarce financial and structural resources to dedicate to CE solutions (Rizos et al., 2016).

In our study, CBMs are defined as the way companies "create, capture, and deliver value with the value creation logic designed to improve resource efficiency through contributing to extending the useful life of products and parts (…) and closing material loops" (Nußholz, 2017:12), underlining the necessary inter-organizational relations among the CE-relevant actors of the supply chain. We propose that to effectively apply CBMs, organizations – and most of all SMEs – need to activate precise learning processes across the different OL levels (individual, team, organizations, and external networks) that are oriented to clarify how to use the most appropriate CBMs in a specific organizational context and to overcome the actual barriers related to CE.

In this context, the British Standards Institution (BSI, 2017) has developed and launched a new standard called "BS 8001:2017 - Framework for Implementing the Principles of the Circular Economy in Organisations" (BSI, 2017; Pomponi & Moncaster, 2019). The BSI standard conceptualizes six different CBMs and offers a valuable framework to provide conceptual and practical clarification of CBMs (Pauliuk, 2018). Taking into account the actual debate on the BSI's standard (Pauliuk, 2018) and answering the call for a better understanding of CBM application in specific contexts (Pieroni et al., 2019), our study focuses on analysing the barriers to implementing OL processes related to CBMs in the construction sector, which is considered the first step for CBM application. Considering the relevance of those organizations, this analysis explicitly examines SMEs (European Commission, 2019) and managers' perception of the contextual elements that influence CBM-oriented OL processes in the construction sector.

2.2 Organizational Learning and the Circular Economy

Organizational learning (e.g., Argote, 1999) focuses on a comprehensive understanding of learning processes, the actors involved, and contextual factors at individual, group, organizational, and inter-organizational levels (see for review, e.g., Bapuji & Crossan, 2004). In this analysis, we understand OL to include multi-level processes of knowledge creation, transfer, and retention (Argote, 1999), a definition that shares several perspectives of the knowledge management (KM) literature (e.g., Nonaka, 1994). In particular, we mainly focus on the organizational and inter-organizational OL levels; The general application of CBMs requires that all the relevant stakeholders be embedded in those two dimensions and, thus, the related preliminary activation of OL processes. In this regard, our aim is to identify the main barriers to CBM-oriented OL processes at the organizational and inter-organizational levels and possible OL processes related explicitly to those levels.

Proposition 1: SMEs need to activate OL processes – i.e., knowledge creation and transferring and retaining processes – as a preliminary step in CBM implementation at organizational and inter-organizational levels.

The OL literature has a long tradition of analysing contextual elements that might hinder learning processes. A seminal work by Fiol and Lyles (1985) identifies a set of contextual factors – or barriers – that influence OL processes. Informed by this conceptualization, we aim to identify the most relevant contextual elements that might hinder CBM-related OL processes. In particular, in the light of OL and CE literature, we propose three main sets of contextual factors: external environment, supply chain context, organizational features, and culture.

First, it is well known that the external environment influences an organization's learning capability; in fact, usually learning processes might not be developed when the external environment is too much stable to stimulate them, or when too much change occurs (March & Olsen, 1975). Here, the external environment is considered the macro-level environment composed of external stakeholders, from institutional bodies to customers and competitors. In CE, considering the level of uncertainty due to evolving regulations and the lack of shared guidelines, the external environment might negatively influence CBMs' implementation. Additionally, external stakeholders – such as commissioners, customers, and general society – can act as a specific barrier if CE-related knowledge and environmental, economic, and social value are not adequately diffused and promoted among society (Hueske et al., 2015).

Proposition 2: The external environment – represented by external stakeholders, such as customers, public institutions, and representative bodies – acts as a macro-level contextual element in CBM-oriented OL processes at the organizational and inter-organizational levels.

Second, though embedded inside the external environment, the supply chain context needs to be analysed as a separate dimension. It is considered a specific cluster of related organizations working together to manage materials and information from suppliers to the final customer (Christopher, 2011). This choice is due to the necessary inclusion of supply chain actors in CBM application, and this particular group of stakeholders might act as a barrier to learning processes in a different way respect to the general external environment actors. CE asks supply chain actors to collaborate and contribute to the environmental, economic, and social advantages related to CE (Geissdoerfer et al., 2018). Concerning inter-organizational OL processes, the characteristics of the internal operations of the organizations involved in the relationship (Szulanski, 1996; McLaughlin et al., 2008), the availability of organizational resources (Barson et al., 2000; McLaughlin et al., 2008), and the presence of boundary spanners (Schilling & Fang, 2014) and informal structures (Wenger, 1999) might influence the occurrence of OL processes within relationships developed among supply chain organizations. Thus, we propose to identify a supply chain-related subset of contextual elements linked to OL processes.

Proposition 3: The supply chain context – represented by interconnected organizations working together to manage specific product- or service-related flows of materials and information – is embedded in the external environment and identifies a separate set of contextual elements related to CBM-oriented OL processes at organizational and inter-organizational levels.

Third, organizational features – here identified as a set of organizational in/formal structures, management, and processes (Dalton et al., 1980) –influences the occurrence of OL processes of knowledge creation, transfer, and retention at the organizational level. For example, OL usually develops from planned activities to transfer knowledge, such as training and runs of practices (Nembhard & Tucker, 2011). Thus, the absence of dedicated structures (Kane & Alavi, 2007; Dodgson et al., 2013) and related activities is an organizational element that might act as a barrier in OL processes.

Organizational barriers related to internal structure can also affect inter-organizational learning processes. For instance, a lack of formal KM processes for knowledge transfer and retention (Cerchione & Esposito, 2017; Styhre et al., 2006) might affect the activation of collaborative learning processes among organizations. Concerning CBM implementation, overcom-

ing these barriers can be considered essential to create, diffuse, and retain CE-related knowledge among organizational and network actors.

*Proposition 4: A single organization – characterised by organizational in/formal structures, management, and processes – is embedded in a specific supply chain context and identifies a set of contextual elements related to CBM-oriented OL processes at organizational and inter-organizational leve*l.

Fourth, some contextual elements can be explicitly related to different conceptualizations of culture. Here, we consider culture to be a multi-dimensional element (Erez & Gati, 2004) that encompasses external, inter-organizational, and organizational levels. In particular, we identify three different concepts: national, collaborative, and CE-oriented organizational culture. For the first dimension, we identify stakeholders' culture to relate to a national society's cultural disposition for sustainable and CE-related solutions. This macro-level culture is generally critical for OL, as external contingencies often stimulate OL processes for legitimacy and contribution to isomorphic change in organizations (Powell & DiMaggio, 2012); in addition, national culture is considered a known CE-related barrier that should be taken into account (Tura et al., 2019).

As for the second dimension, the collaborative supply chain culture – here represented by top management's cultural orientation towards collaboration at the inter-organizational level – is a relevant aspect for collaborative OL processes (Feller et al., 2013). As collaboration among supply chain actors is considered essential for full application of CE principles, identifying this specific culture is vital to fully apply CBMs and related learning processes along the supply chain (Silvestre et al., 2020). For the third dimension, we focus on CE-oriented organizational culture, as promoted by top management. Organizational culture is proven to be a critical element for the introduction of technical innovation and effective OL (Sanz-Valle et al., 2011), as cultural resistance to change is one of the most prominent barriers in changing environments (e.g., Smith & Elliott, 2007).

In this context, managerial and cultural orientation towards sustainable and CE-related solutions seems essential for the development of CBM-related learning processes – especially in SMEs where management has a critical role (Durst & Wilhelm, 2012).

Proposition 5: A multi-level representation of culture – composed of external environment-related, supply chain context-related, and organization cultural dimensions – represents a critical contextual element related to CBM-oriented OL processes at the organizational and inter-organizational levels.

Overall, the activation of CBM-oriented OL processes and consideration of the proposed OL contextual elements – the external environment, the supply chain context, organizational features, and multi-level culture – seem to foster a better understanding of the preliminary phases of CBM implementation in specific contexts. In our study, we explore our propositions on Italian construction SMEs concerning CBM introduction.

3. Methodology

This exploratory analysis focuses particularly on construction SMEs since they represent an essential part of the European and Italian economy[1]. Italy has peculiar aspects related to CE, such as being the third country in Europe to register products with the European environmental mark "Ecolabel" and being one of the seven most advanced European nations in terms of eco-innovation and CE activities. Furthermore, Italy is fifth in Europe in terms of reusing secondary raw materials, with a 17.7% utilization rate (Circular Economy Network & ENEA, 2020). Therefore, Italy is an interesting case to study CE initiatives, also due to the lack of specific studies on construction firms concerning the application of CBMs and related learning processes. (Scipioni, 2021)

In this research context, a qualitative methodology was used to understand the most relevant characteristics of CBM-oriented OL barriers in Italian SMEs. The focus group methodology (Freeman, 2006; Morgan, 1997) was chosen to investigate different perspectives on this particular topic and initiate in-depth conversations among informed participants (Cassell & Symon, 2004; Morgan, 1997). Considering that personal points of view can significantly influence perceived barriers, focus groups help identify more objective shared concepts – here, barriers – by comparing the participants' responses. The focus group method facilitates forming a shared perspective of analysis resulting from the interactions among participants.

To develop this analysis, we contacted the leading professional association related to the Italian construction sector[2] to evaluate its associates'

[1]In the Italian context, SMEs are an essential part of the economy; in 2018, 97.7% of Italian firms were SMEs, and in the construction sector, SMEs represented 95.3% of all firms (ISTAT, 2019). Italian SMEs are extremely competitive on a global level, thanks to their ability to innovate and create local and international commercial activities (Della Torre & Solari, 2011). It's no coincidence that Italian SMEs produce 66.9% of the overall added value of the Italian economy (European Commission, 2019). Among SMEs, construction firms have an important impact on the Italian economy. In fact, in 2019, the production in the construction sector grew by 3.7%, as compared to 2018 (Banca d'Italia, 2019).

[2]ANCE is the Italian Association of Building Constructors, a part of the General Confederation of Italian Industry (Confindustria). It includes all relevant construction stakeholders, including manufacturers and retailers of building materials, technicians, professionals, public and private builders (ANCE, 2020)

perceptions of CBM-related OL barriers across the country. On the basis of previous studies (Cassell & Symon, 2004; Freeman, 2006; Morgan, 1997), four focus group discussions were conducted over two days to ensure an adequate discussion on the research topic. The health emergency related to the pandemic crisis presented a significant challenge to both organisations and research activities (Braun et al., 2020) and influenced this planned data collection methodology. Nevertheless, the focus group discussions took place virtually on the Zoom platform, which allowed a valuable video and audio interaction between the participants.

Among the associates' responses received, a balanced sample of 24 executives was formed (6 in each focus group) to guarantee balanced coverage of Italian territory. During the discussions, the six CBMs from the BSI were presented to allow participants to precisely examine the related OL barriers. A focus group methodology can limit the generalisability and replicability of results, as some participants' possibly dominant position in the discussion risks limiting the overall interaction (Guest et al. 2017; Smithson, 2000). To manage this possible limitation, one researcher coordinated the sessions and moderated the participants' discussion and interventions, while another was responsible for providing technical support and time management.

After each session, the discussions were fully transcribed and double-coded by two researchers using NVIVO 12 plus a computer-assisted qualitative analysis program. The coding and interpretation phases were conducted by the authors, who examined the data through an iterative comparison process informed by the logic of grounded theory (Suddaby, 2006). The data analysis consisted of three main phases. Initially, based on the participants' observations during the focus group – the primary data (Fig.1) – by using the NVIVO software, the first-order concepts were extracted as context-specific meanings related to the observers. Then, the second-order themes were identified by the researchers by aggregating the first-order concepts as higher-order themes. Finally, three overarching dimensions were determined from the second-order themes as the main theoretical concepts capable of exploring the research topics. To guarantee the interpretations' acceptability (Langley, 1999), this identification process was accomplished through an interpretive and non-mechanical process of examining the data using the theoretical background of OL and CE as a reference. Iterative discussion among researchers was used to question the interpretations' plausibility (Mantere et al., 2012).

4. Results

The discussions among SME managers revealed three main clusters of barriers that impact the actual and perceived introduction of CBMs in the Italian construction sector, related to external environment, supply chain context, and organizational level. As a transversal element, a fourth element – more specifically, a cultural one – is considered to be embedded in the other three dimensions.

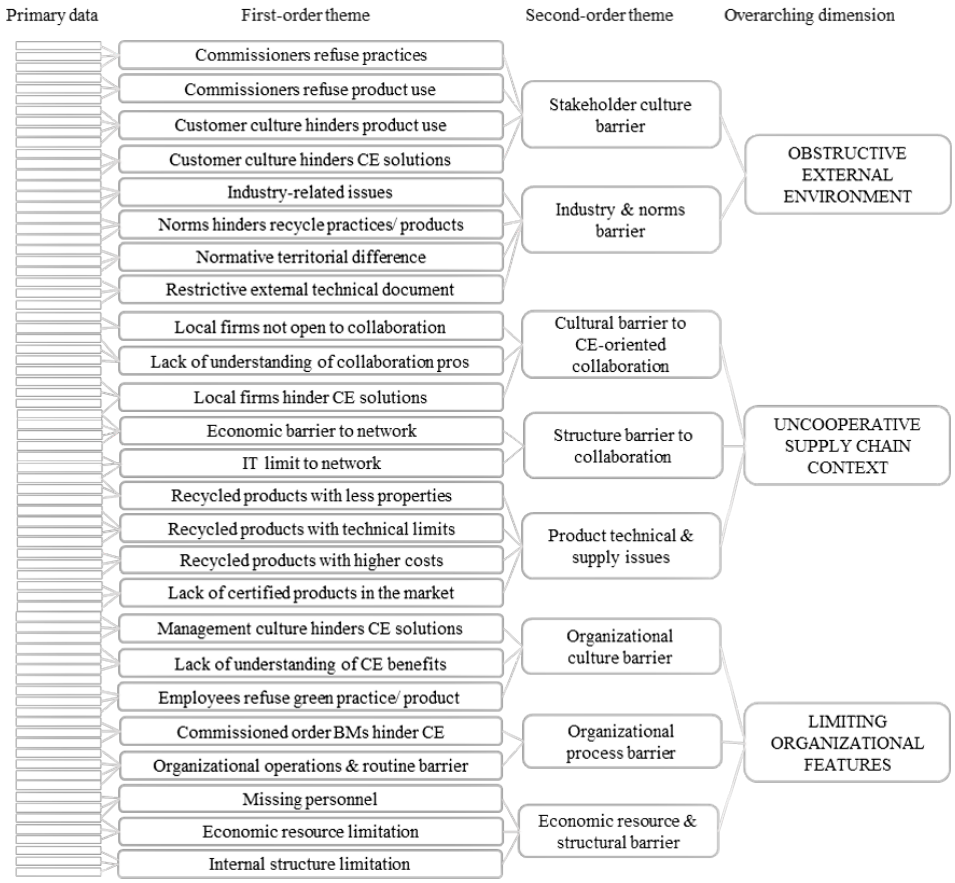
4.1 Obstructive external environment: stakeholders' culture, industry and norms barriers

The analysis provides insight into macro-environment limitations in terms of public laws and regulations, general characteristics of the sector, and stakeholders' propensity towards CE.

First, cultural stakeholders' resistance – mainly identified in customers and commissioners – to circular products and processes hinders the implementation of CBM-oriented OL processes. Customers' lack of acceptance of specific construction-related circular solutions, such as modular buildings or social housing, also hinders the diffusion of specific CBMs. Unlike the citizens of other countries, Italian customers prefer tailor-made solutions and consider "traditional" (i.e., non-modular) houses to be more trustworthy. Similarly, private and public commissioners tend to limit the application of recycled materials and practices when they are not compulsory. This seems to be due to low cultural openness to circular solutions, perhaps due to a limited understanding of the related benefits.

This kind of market [i.e., renting solutions] in Italy is not only a utopia [but also] pure science fiction. It would be impossible to sell it to the Italians. –
Focus group 2, G., private building construction

Figure 1. *Data analysis process: first-order themes, second-order themes, and overarching dimensions.*



Source: Elaborated by the authors (2020)

Second, the actual Italian norms concerning public procurements mandate the introduction of green requirements for materials that must respect a specific percentage of CAM, Italian acronym for "Minimal Environmental Criteria" (European Council directive 2004/18/CE, 2004; GU D.Lgs 19 Aprile 2017 n. 56). However, those requirements are not extended to private commissioners, thus resulting in different approaches towards CE. Concerning public tenders, some contradictory norms hinder the use of specific types of materials. The use of recycled materials and the provision of recycling activities during construction operations need to be prescribed in official technical external documents related to public tenders that report the required materials' precise characteristics. A significant number of technical documents still refer to the 'traditional' list of materials that do

not include innovative and recycled materials. Additionally, construction firms are usually forced to send aggregates to landfills as the only possible recycling activity. Thus, alternative solutions are not allowed, such as the reuse of aggregates extracted in construction sites, which is expected in a circular approach.

Third, the sector's specific characteristics – such as the presence of a significant number of firms working with traditional approaches in some territories – discourage and hinder construction firms from proposing sustainability-oriented innovative solutions.

One thing is that one hundred companies all think and work in a certain way. Another thing is that ten companies work in a certain way, and the other two hundred thousand still work the same as one hundred years ago. – Focus group 3, S., private building constructor

Furthermore, territorially different – or missing – regulations related to specific waste management activities differentiate the possibility of easily recycling materials from construction operations.

In summary, stakeholders' resistance to CE solutions and industry-related issues represent the main barriers to CBM-oriented OL processes at the macro level, thus comprising the first dimension: obstructive external environment.

4.2 Uncooperative supply chain context: cultural and structural barriers to collaboration and product-related issues

As mentioned, collaboration among supply chain actors has been identified as a potential solution to SMEs' resource constraints (Akintoye & Main, 2007), and is required for a complete application of CBMs. This cluster of barriers relates to inter-organizational learning activities inside the building construction supply chains (SCs) for CBMs.

First, strong cultural resistance to collaboration is rooted in specific territorial areas, such as in supply chain organizations in some Northern and Southern Italian regions; this has resulted in a preliminary barrier to CBM application and related OL processes. Additionally, it is seen that the limited propensity to participate in collaborative solutions is connected to a limited understanding of network-related benefits.

Second, some barriers refer to structural limitations to inter-organizational collaboration networks, mainly economic and information-technology (IT) barriers. Financial resources' unavailability to be invested in conjoint activities was highlighted by managers as the main barrier, which is in line with typical limitations of SMEs.

In Piedmont [a Northern Italy region], there is very little collaboration […] It is part of the companies' mindset […] You prefer to keep it [machinery] in the courtyard [rather] than renting it to your competitor. – Focus group 4, M., public-private constructor, quarry extraction

Additionally, collaboration activities related to technical projects need to be carried out through specific sectoral information systems – for example, Building Information Modelling systems (BIM, i.e., a cloud-based information system for projecting, planning, and managing construction projects; Bryde et al., 2013). In this sense, collaboration is obstructed by the often-limited interoperability of IT systems across organizations.

The first reticence I find in those colleagues we try to involve [in the collaboration] is 'how much does it cost me?' without really understanding the benefit […] The involvement of other colleagues is seriously challenging. It is difficult for different reasons. First, economic [ones] […] the network operating cost. – Focus group 3, F., scaffolding projecting and renting

Third, the use of recycled products is hindered by specific issues related to technical and supply-related issues. On the one hand, recycled – or secondary – materials sometimes contain inferior technical properties or aesthetic attributes that make customers prefer the virgin one. On the other hand, the low availability of specific products that offer both an adequate quantity of recycled materials and the required certification (e.g., UNI certification; UNI, 2020) limits secondary materials to specific areas for particular activities. In conclusion, stakeholder cultural barriers, economic and operative restrictions on collaborative solutions, and product-related issues comprise the second dimension of CBM-oriented OL processes barrier: an uncooperative supply chain.

4.3 Limiting organizational features: management, processes, personnel and resource barrier

Several barriers to CBM-oriented OL processes relate to organizational features, particularly organizational culture, processes, organizational resources, and structures.

First, as identified in top management culture, organizational culture (Durst & Wilhelm, 2012) can be a critical barrier to the implementation of CBM-oriented OL processes. Top managers tend to be very conservative concerning construction techniques and materials and generally show a willingness to consider innovative solutions only if they have a personal sensibility towards environmental issues. Another critical obstruction is posed by internal personnel and in particular by responsible figures – such

as site managers and technicians – who refuse to change their ordinary routines. Technicians who have administrative responsibilities for specific processes tend not to trust recycled material if certifications recognized by the law do not discuss them. They fear that recycled materials will not perform as well as virgin ones. Additionally, the daily use of pure material and traditional solutions hinders the implementation of innovative solutions related to CBMs.

T*ell me why a private [constructor] should utilize it [recycled material] […] unless they do not have a very ecological vocation. Otherwise, they do not think about it in the slightest.* – Focus group 1, A, private building constructor

This unwillingness seems to be linked to a limited understanding of available CBMs in the sector and the related economic and organizational benefits. There is little knowledge among construction managers of the practical application of CE principles through innovative BMs, which leads to territorial differences in the application of CBMs across the country. The applicability of CBMs is also hindered by a poor understanding of the economic benefits related to the implementation of CBMs; in fact, CE solutions are typically only considered additional operative costs instead of potential opportunities.

Second, one crucial aspect of organizational processes was highlighted by managers: the applicability of certain CBMs – such as secondary material reuse and circular supply – is strictly limited in work-on-commission companies and commissioners (e.g., suitable materials, operations, and logistic solutions). This situation leaves firms to manage internal operations only under the commissioners' directives. From an operative point of view, the often-hectic organizational routines, which are also related to limited planning activities among construction companies (Sweis et al., 2008), hinder not only involvement in networks but also the consideration of innovative solutions in general. Most attention is given to short-term earnings (Betts et al., 1991) through known solutions.

The moment construction firms win a project […] inevitably, the project has been already commissioned in a certain way, and with related materials, and so […] there is a difficulty linked to the fact that the company needs to attain what is said in the technical document. – Focus group 1, P, private construction and construction material supplier

Third, the economic barriers are particularly relevant at the organizational level for secondary material supplies and collaborative solutions development and for internal competence development processes to be introduced for CE-related solutions. Construction firms are traditionally

characterized by several limitations related to their organizational structure, such as a lack of organizational resources (Blayse & Manley, 2004). The limitations identified – low availability of personnel and lacking economic and physical resources – are aligned with those usually related to SMEs' characteristics (e.g., Barson et al., 2000).

In conclusion, the barriers related to managerial culture, organizational processes, internal staff, and economic resources represent the last dimension: limiting organizational features.

5. Discussion

The identified dimensions – the external environment, the supply chain context, the organization and the embedded cultural elements – encompass the main contextual elements that construction firms need to overcome to implement CBM-oriented OL processes.

At the external environment level, structural barriers do not seem to stimulate the application of some CBMs. Normative restrictions, together with territorial differences concerning waste management regulation, cause discrepancies among CBMs' applicability at the national level, limiting the managers' propensity to consider these kinds of approaches. However, the main hindrance is the insufficient attention given to circular solutions by construction stakeholders, such as customers and commissioners, limiting the macro-level application of CBMs from a cultural point of view.

At the supply chain level, collaboration among SC actors – which is essential for CBM application – is hindered from a resource-related point of view, which underscores the lack of economic, human, and technological resources to dedicate to network activities. There is also a cultural aversion towards cooperation related to specific territories, and a limited understanding of the intrinsic value of collaborative consumption, which seems to be associated with a general cultural disregard for and lack of knowledge of circular-related advantages and, consequently, CBM application.

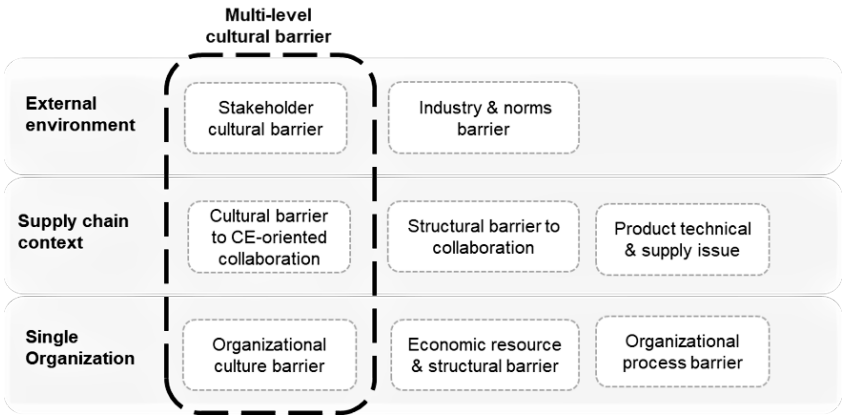
At the organizational level, organizational constraints hinder the application of CBMs among SMEs. Many barriers are strictly related to constraints typical of SMEs (Barson et al., 2000), such as a lack of economic resources invested in specialized competence development or traditional organizational processes. However, the main obstacle is related to internal resources, namely responsible persons and top management. In particular, top managers lack knowledge regarding practical CBM application and display a cultural lack of interest in CE solutions.

Embedded in those three dimensions, a multi-level cultural element emerges as the most critical contextual factor to be managed during CE application in SMEs. As proposed in the theoretical discussion, culture has

mainly been analysed in the OL literature as a critical contextual element of the organizational level (Fiol & Lyles, 1985). It is also generally considered a necessary conduit for achieving an 'ecologically rational society' (Plumwood, 2005:91). Here, the definition of culture as composed of macro, supply chain, and organizational levels expands the understanding of this critical contextual element in particular settings, specifically in CE applications in the construction sector.

Figure 2 presents the theoretical interrelation of results concerning the developed propositions.

Figure 2. CBM-oriented OL contextual elements: the external environment, the supply chain context, organization features, and a transversal multi-level cultural dimension.



Source: Elaborated by the authors (2020)

6. Implications

This study offers some theoretical, political, and managerial implications. From a theoretical point of view, the proposed OL theoretical lens in CE analysis aids in the identification of main contextual factors related to CBM-oriented OL processes, acting as barriers to their implementation. Construction firms seem to require the introduction of intra and inter-organizational OL processes as a preliminary phase in CBM application to understand which specific CE-oriented processes to activate, and related economic advantages (Prop.1). The identification of external, and supply chain-related elements, together with organizational features, and a transversal multi-level cultural dimension able to hinder OL processes activation would enable an enhanced awareness of SME managers on potential barriers to be overcome in the transition towards CE.

Additionally, the paper contributes to the discussion of the application of CBM in a specific context, highlighting multiple dimensions – the macro level, the supply chain, and the organizational level (Prop. 2,3,4) – that are capable of hindering the activation of CBM-oriented OL processes among construction SMEs. In addition, the study contributes to the identification of relevant cultural elements in the external environment as well as in the supply chain and organizational levels; this lays the foundation for individuating a multi-level and transversal cultural barrier for the application of CBM-oriented OL processes (Prop.5).

From a managerial perspective, the study highlights the importance of organizational and inter-organizational elements for sustainable development of the CE. In particular, internal OL processes (e.g., knowledge creation, transfer, and storage between workers and technical managers) and participation in collaborative networks are highlighted as useful for overcoming cultural and structural limitations in applying CBM-oriented OL processes. The OL theory proposes for construction SMEs the activation of transversal processes for the transfer of knowledge through the external environment, supply chains, and organizations (e.g., recourse to consultants, training activities, and sharing of acceptable practices) for a progressive cultural reorientation towards innovative solutions, such as the implementation of CBMs at intraorganizational and interorganizational level. The analysis implies that a broader and better understanding of CE-oriented evolutions' economic benefits, - enabled by OL processes of knowledge creation, transfer, and retention, - should increase acceptance of CE in the Italian construction sector. This implication might be cautiously expanded to other sectors, considering the alignment to previous literature on the relevance of culture in CE applications and technological innovations (e.g., Sanz-Valle et al., 2011).

The paper also has significant policy implications. The activation of creation, transfer, and storage of knowledge in the external environment can support the overall evolution of the CE's Italian construction sector. Macro-level OL processes can help achieve more standard regulations, more circular solutions, and greater awareness of the environmental, technical, and economic benefits of CBMs. From this perspective, the possible links between individual SMEs, supply chains, and the entire sector could be facilitated by corporate representation bodies, such as professional associations. In fact, at a sectoral level, these entities could influence CE solutions' regulatory evolution and represent SMEs' interests, helping them overcome the limitations due to their size. Furthermore, at the inter-organizational level, these bodies could connect actors and spread CE knowledge throughout the sector, facilitating a more comprehensive application of CBM in Italy. These interventions are particularly relevant at this time, considering how the healthcare crisis due to COVID-19 has highlighted the need to relaunch

economies from a CE perspective. Managers have the opportunity to redefine work processes (Sarkis, 2020), such as shortening supply chains and developing a more localized economy to ensure greater entrepreneurial resilience (Panwar et al., 2020; Tseng et al., 2020).

7. Limitations and further research

This study has some limitations. For instance, the choice of a single context of analysis and the focus group methodology could limit the results' generalisability. However, the Italian context is undergoing a phase of significant CE growth, albeit in a preliminary stage (Circular Economy Network & ENEA, 2020); this provides a valuable context for in-depth qualitative research (Yin, 2017). Regarding the focus group methodology and possible subjectivity of the interpretations, the iterative protocol followed for interpretation should limit such bias increasing the study's methodological efficacy (Cassell & Symon, 2004; Freeman, 2006; Morgan, 1997). Furthermore, the inherent subjectivity of qualitative research was accounted for throughout the interpretation and coding process also by using the NVIVO software.

A further consideration concerns the obligation to carry out the focus group sessions virtually due to the restrictions related to the COVID-19 pandemic. This potential limitation can also be seen as an interesting reflection of the virtual methodologies that may be developed in the future (Dodds & Hess, 2020). Based on the results obtained in this study, it would be useful for future research to further examine which activities would prospect an effective implementation of OL processes and CBMs in this sector. Specifically, the identification of enablers of CBM-oriented OL processes would be particularly valuable in light of the possible recovery period following the COVID-19 pandemic period that may lead to a "new normal" (Buheij et al., 2020) characterized by changes in the organizational approaches and activities from SME, together with a transition towards more circular cultural norms of societies. Accordingly, further research could investigate the multi-level cultural element, highlighting the relationships between the different dimensions and their relative influence; it is relevant to underline that the organizational culture – as part of the organizational level – could be significantly influenced by the other cultural elements present in the higher-level dimensions, and thus prospect an interesting avenue for further research on the topic. In addition, the employment of longitudinal studies oriented to test the proposed model in different national contexts rather than Italy, or different Italian sectors should increase the generalizability of the results offering a novel interpretation of the preliminary phases of CBM introduction inside SMEs.

Italian summary: Il presente studio è finalizzato ad esaminare le condizioni organizzative che possono condurre ad una più efficace applicazione dell'Economia Circolare nelle piccole e medie imprese. La ricerca ha portato all'identificazione di barriere che influenzano l'implementazione dei processi di apprendimento relativi ai Business Model Circolari. Attraverso l'approccio teorico della grounded theory e la metodologia del focus group, è stata analizzata la percezione dei top manager delle piccole-medie imprese del settore delle Costruzioni italiano. Muovendo dalla prospettiva offerta dalla letteratura dell'Organizational Learning e quella relativa all'Economia circolare, i dati ottenuti sono stati analizzati tramite una rigorosa tecnica di codifica ed interpretazione iterativa. Lo studio identifica specifiche barriere che spaziano da alcune caratteristiche del settore stesso, delle catene di fornitura, e della singola organizzazione, e sottolinea la rilevanza della variabile culturale che sembra limitare l'applicazione di Business Model Circolari in tutti i livelli di analisi. Lo studio presenta implicazioni teoriche e manageriali sottolineando come i processi di apprendimento siano fondamentali all'applicazione dei Business Model Circolari.

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FACTORS INFLUENCING CIRCULAR ECONOMY IMPLEMENTATION IN SME BUSINESS MODELS: THE CASE OF SPAIN

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Abstract

Nowadays, Europe has to add more value to the resources it uses and make all sectors more productive. Hence, the transition to a circular economy (CE) requires a stronger link between waste reduction and resource efficiency. Small and medium-sized enterprises (SMEs) are increasingly aware of the benefits of closing loops and improving resource efficiency, creating competitive advantages, and accessing new markets. In the learning of valuing waste as a resource and apply the lessons of the natural world, in which nothing is wasted, SMEs embraces the CE to achieve sustainability. In this regard, the agro-food system plays an important role since it needs agricultural practices aimed at optimising yields and improving the natural resources, which are crucial for embracing CE. We use a mixed methodology, a survey, where 161 SMEs took part, together with six interviews to characterise the sector. The main findings point to the lack of technical and technological resources of olive oil mills, even though they consider innovation crucial to achieve a competitive advantage. Therefore, the European Union (EU) policies, in general, and the Spanish ones, in particular, should reinforce the "Green Economy" and help SMEs incorporate CE principles into their business models.

1. Introduction

In the current global situation of a growing population and an increasing shortage of resources, the European Union (EU) is promoting policies to combat its dubious distinction of being the only region that imports more natural resources and pollution than exports (Tukker et al., 2016). Specifically, the EU is dependent on imports of energy and natural resources, while conversely, other parts of the world are increasing the consumption of resources, which indirectly increases the emissions of other countries (Margarita et al., 2020).

Therefore, Europe has no choice but to add more value to the resources it uses and to make all sectors more efficient in their use. To this end, and in order to meet its long-term emission reduction objectives, the transition of production systems towards the circular economy (CE) is being promoted, which requires a stronger link between waste reduction and efficiency of the resources. We must learn to value waste as a resource and apply the lessons of the natural world, in which nothing is wasted. Along these lines, the current approach of extracting limited raw materials from the earth, using them only once to make a product and then burying them back underground must be replaced by a sustainability-oriented approach.

Thus, during the last decade, there has been a clear trend to promote sustainable production and consumption considering the need to introduce CE principles and practices in the companies' business models (Tseng et al., 2018).

Circular Economy can be considered a pre-requisite for sustainability (Geissdoerfer et al., 2017). Kenneth E. Boulding first proposed the concept of CE in 1966 and, after decades of research and development, the connotation and concept of CE has become commonplace and are applied to the development of families, companies and countries (Wang et al., 2014).

In recent decades, the industry has evolved, but is always framed within the linear economy model governed by the "make-use-throw away" or "take-make-use-destroy" (Ghisellini et al., 2016) principle that has been increased by globalization. This is characterised by homogenization and increased demand, which have ultimately led to a global increase in the use of resources. Therefore, moving towards a CE is not only possible, but also profitable; however, this does not mean that the switch to CE can be made without implementing and adopting appropriate policies.

CE must be accompanied by the design of the business model for the success of the company (Bocken et al., 2016), where small and medium-sized enterprises (SMEs) play a crucial role. According to the World Bank (2020), SMEs represent around 90% of companies and more than 50% of employment worldwide. Formal SMEs contribute up to 40% of national income (GDP) in emerging economies. These figures are significantly higher when informal SMEs are included. Further, statistics show that 600 million

jobs will be needed by 2030 to absorb the growing global workforce, making SME development a high priority for many governments worldwide (World Bank, 2020).

SMEs operate and create opportunities in a wide range of geographic areas and sectors; and some SMEs are driven by social impact and triple bottom line goals, where CE can be found. However, it is known that SMEs do not usually link well with the concept of CE (Rosa et al., 2020). In this line, agricultural SMEs play an important role, since they need practices that allow them to optimise yields and at the same time improve natural resources such as soil, water and air quality, a crucial aspect for the adoption of the CE.

These practices are designed to last in the long term, ensuring long-lasting performance (Kristensen et al., 2016). The goal of an established performance could be achieved through innovation, technical and technological resources, which play an intertwined role in SMEs in the agrifood sector. The pressure towards sustainability from the external environment drives innovation by SMEs to maintain or improve their performance.

Innovation in the food sector is of special interest, since this industry could exploit the synergies generated thanks to the relationships between agro-industrial production and innovations in product and process design. However, few studies analyse the relationships between the drivers of the transition towards sustainability and the CE of companies in the olive oil sector (Siciliano et al., 2016: Barón et al., 2020).

Consequently, this paper proposes to increase understanding of the role of CE in the development of SMEs models, paying special attention to the technological resources of SMEs.

The factors selected to study the level of implementation of the CE and the barriers in the business models developed by SMEs are the following: the company's R&D expenditure in five years (2013-2018), the endowment of production technologies and product innovation or the application of its know-how. Literature commonly applies these factors. Therefore, this study tries to answer the following research questions:

- R.Q. 1 How does R&D investment affect the transition of SMEs towards the CE?
- R.Q. 2 Could the provision of production technologies and product innovation influence the implementation of CE by SMEs?
- R.Q. 3 From the point of view of ownership and management, what variation is there in the behaviour of family companies, compared to non-family companies in the implementation of the CE?

To achieve the objective of our study, we carried out an electronic survey of a sample of 1,266 Spanish olive oil companies, with a response rate of 12.72%. From these companies, we selected the market leaders for six in-depth interviews.

The remainder of this paper is organised as follows. Section 2 reviews the literature about the concept and key insights of CE principles related to SMEs. Section 3 presents the methodology for characterising the technological resources of Spanish Olive Oil Mills, combining quantitative and qualitative methodological tools. Section 4 presents the main findings of this research. Finally, Section 5 presents the conclusions, a brief discussion about the topic, the main limitations of the paper, and suggests some future research lines.

2. Literature Review

Before the introduction of CE, the only process followed during product conceptualisation, design, development, use, and disposal was traditional/linear. However, these closed-loop standards focused entirely on balancing economic, environmental and social impacts, have replaced old industrial practices and, therefore, strategies (Rosa et al., 2020). For this reason, different schools of thought have mentioned CE, we consider it a section of sustainability science, rooted mainly in industrial ecology (Erkman, 1997) and cleaner production research currents (Ünal et al., 2019) shaping an innovative industrial model, what could help SMEs to be successful and help future generations to improve their well-being.

2.1 Circular economy approach

CE is an industrial economic model that is restorative and regenerative by intention and design (Ellen MacArthur Foundation, 2013; Lieder & Rashid, 2016; Haas et al., 2015), such that the production system regenerates the inputs used and tries to reduce its negative externalities (Núñez-Cacho et al., 2018). Its objective is to efficiently manage resources, minimize waste with renewable energy and reduce the quantum of chemical pollutants and toxic waste through careful design of the entire process.

An efficient CE in the use of resources can be achieved only with the participation of all bodies and entities, state and non-state. The industrial sector plays a crucial role as an engine of technological development and innovation involving better and more careful use of natural resources. All these in turn improves the competitiveness of SMEs (Jabbour et al., 2019).

The CE received promotion and encouragement from global corporations, the Ellen MacArthur Foundation, NGOs, academics and researchers from the EU. However, SMEs have always found implementation very difficult due to their lack of several components that larger companies have, such as capital and technical and/or technological know-how. The CE presents diverse antecedents. The first is the theory of Industrial Ecology,

developed by authors such as Frosch and Gallopoulos (1989) or Allenby (1998). The latter points to the need to develop technologies and strategies to work comprehensively with complicated natural systems coupled to different scales.

Second, the field of industrial symbiosis also acts as a precursor to CE, where Chertow (2007) highlighted the conscious effort to identify companies from different industries and locate them together, so that they can share resources, laying the foundation for the emergence of eco-industrial parks.

A third origin is found in biomimicry innovation inspired by nature, by respectful imitation (Benyus, 2002). This author considers that, unlike the Industrial Revolution, the Biomimetic Revolution introduces an era based not only on what we can extract from nature, but also on what we can learn from it.

The fourth origin is that the cradle to cradle reformulates design as a positive regenerative force that seeks to create footprints to delight in. This paradigm shift reveals opportunities to improve quality, increase value, and stimulate innovation (McDonough & Braungart, 2002). This school of thought is closely related to the pursuit of the objectives of the Triple Bottom Line and the promotion of awareness in companies of the environmental and social impacts of their activities.

This awareness drives them to minimize their ecological footprint. That quest begins with the recognition of the deep-seated business value of natural and social capital and fosters the achievement of potential synergies among economic, environmental, and social business goals (Braungartet al., 2007). Further, the field of eco-efficiency (Schaltegger & Sturm, 1989; Schmidheiny, 1992) can be seen as an indicator of environmental performance or as a business strategy for sustainable development (Koskela & Vehmas, 2012). Finally, we must mention the CE that considers waste as food, that is, inputs for a new process (Andersen, 2007).

Unlike the traditional extensive form of economic development of "high input, high consumption, high pollution and low efficiency", the principle that governs a CE is "reduce, reuse, recycle", which consists of the characteristics of low consumption, low emission and high efficiency. Therefore, the system can reduce pressure on resources and the environment, preserve natural resources, reduce environmental pollution, and prevent the destruction of environmental resources and systems. (Wang et al., 2014).

According to Rizos et al. (2016), the transition to the CE in the sectors of mobility, food and the built environment could reduce emissions by 48% by 2030 and 83% by 2050, vis-a-vis to 2012 levels. Further, the CE concept has been an essential component of the resource efficiency initiative of the EU2020 strategy (Skene, 2018). This author highlights how the adoption of circular business models is related to significant employment potential, particularly in the recycling and re-manufacturing industries, basic metals and metallic products, and the electronics and household appliances in-

dustry, inter alia. More than 50,000 jobs could be created in each sector per country. Additionally, in terms of environmental benefits, becoming more circular would help avoid emissions, reduce resource loss, and ease the burden on global ecosystems. Resource and environmental problems have also been major limiting factors for sustainable development.

However, the development of the CE can be carried out from different spatial dimensions such as the business level, regional level, city level and national level. The business level plays a relevant role in the development of CE that will directly affect the regional and national levels of CE development (Wang et al., 2014). These dimensions have been summarised in three levels. The micro-level includes products, companies and consumers; the meso-level is related to eco-industrial parks and the macro-level refers to the city, region, nation and supranational spheres (Núñez-Cacho et al., 2020).

This change is required towards a new "circular" paradigm based on "Reduce, Reuse and Recycle" resources. Companies have implemented various practices within the CE, such as prioritising regenerative resources, converting and disposing of waste, designing durable and re-assemblable products, combining products and services in "pay-per-use or product-service (PSS) systems" that could, in turn, generate opportunities and income streams (Ghisetti & Montresor, 2020; Ünal et al., 2019).

2.2 Resource-based View (RBV)

The Resource-based vision (RBV) is an intersectoral approach applied to the study of business strategy. It is based on the idea that the possession and management of certain resources can generate a competitive advantage for the company (Penrose, 1959). This advantage could become durable in the long term when its resources are valuable, rare, inimitable and irreplaceable for companies (Barney, 1991). Most of these advantages are related to the company's intangible resource endowment, which, according to the RBV, can become the source of its strategic advantage. RBV helps the changes of a business model based on CE, since building and complementing the portfolio of resources of a company provides a sustainable advantage (Lahti et al., 2018).

Several authors, such as Grant (1991) and Bueno (2003; 2011), classify intangible resources as technological, human, relational and organizational. Thus, the issue of sustainability and its relationship with R&D has received less attention. Regular evaluation of technological advances could give SMEs a sustainable competitive advantage.

Ecological issues have had a direct effect on R&D, concerning product innovation (Foster & Green, 2000). Along these lines, the new concept of eco-innovation connects technological development with environmental aspects (Smol et al., 2017). Further, Dangelico and Pujari (2010) pointed to

green product innovation as one of the crucial factors to achieve growth, environmental sustainability and a better quality of life.

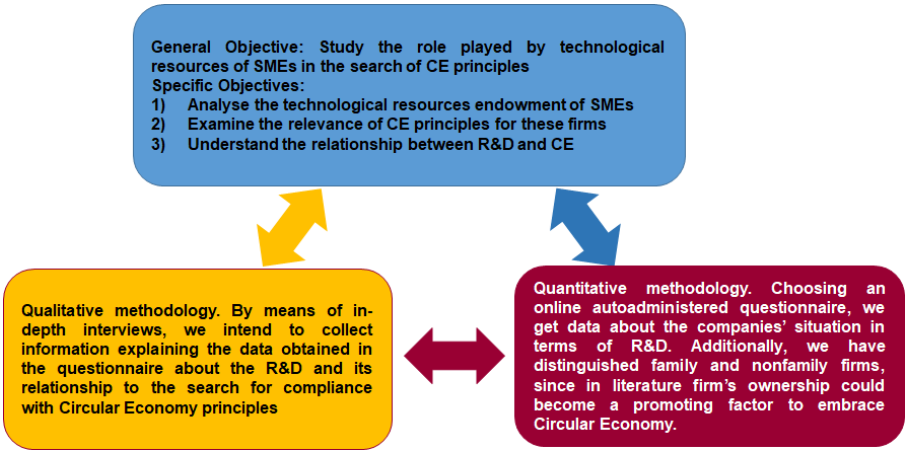
However, the literature indicates the lack of technical and technological knowledge as one of the main factors hindering the transition of SMEs from linear to circular business models. In fact, linear technologies are widely implemented by businesses, keeping the economy locked in its current form. Therefore, this transformation and change of day-to-day operations would require that new technologies for sustainable production and consumption (in the fields of eco-design, clean production and life cycle assessment) be integrated into current linear business models. Additionally, human capital must be transformed in parallel to catch up with the new models of management, creating new job opportunities. However, consumers have not yet changed their mind about what does not attract the demand for environmentally friendly technologies. Together with inadequate technical, capacities play a crucial role in the underdevelopment of the CE.

Lack of technical know-how can lead SMEs to adopt linear technologies and familiar business models, based on their suppliers' suggestions for innovative technical solutions. Rizos et al. (2015) point out how for SMEs to successfully implement CE, it is necessary to know the challenges they face, especially the problem of lack of resources. Lieder and Rashid (2016) emphasise that the development of business models is essential for that implementation. Agyemang et al. (2018) indicate that the availability of financial resources, lack of experience, insufficient technical and technological capacity pose obstacles to SMEs' transition to the CE (Binek & Al-Muhannadi, 2020).

3. Methodology

In this work, we applied a qualitative-quantitative triangulation (see Figure 1). This combined research strategy requires the application of tools from both research traditions, qualitative and quantitative, in searching the determinants of CE implementation by SMEs.

Fig. 1 - Methodological triangulation.



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3.1 Design of the sample

This study investigates a sample of 1,266 of Spanish olive oil mills, both registered in Denominations of Origin, and those not covered by any Denomination. Among the companies selected, 36% are registered with twenty-two Regulatory Councils of Denominations of Origin.

3.2 Methods

The study has a descriptive scope, using both a quantitative and qualitative analysis.

Regarding the quantitative analysis, it uses the widely accepted methodology of Churchill and Surprenant (1982) for the construction of measurement scales that made up the questionnaire.

This questionnaire was validated through a pre-test sent together with a cover letter to the Spanish oil mills included in the sample. Additionally, an individualized link was attached, highlighting the objectives of the research, its interest and importance, seeking to involve the largest number of oil mills in the study.

After the pre-test and the adjustments derived from it, the self-administered electronic survey was finally sent to a population of 1,266 Spanish olive oil mills, reflecting the main interests of the project: the nature of the mill and its resources and technological capabilities.

The companies completed 161 questionnaires in total, resulting in a response rate of 12.72%. The data received were analysed using the SPSS

software to check the reliability and validity of the scales, using Cronbach's Alpha, resulting in all the values obtained being above 0.7.

The analysis used qualitative methodology too. Thus, once the quantitative information was analysed and for a better understanding of the results, we deepened the implementation of the CE by the companies that made up the sample. For this, six case studies were selected, and the corresponding in-depth interviews carried out between 2018 and 2020. The companies to be interviewed were selected for their leadership position in the sector. The main data collection method involved semi-structured interviews with six informants, as this is a common and powerful way of understanding other human beings (Glover & Reay, 2015). Initially and before the date, time and place of each interview, we obtained preliminary information and additional sources for triangulation (Miles & Huberman, 1994). These sources are their websites, articles published in the press, observations, informal discussions, business websites, company brochures, informal telephone follow-ups, industry publications and information provided by various business databases, including the Sistemas de Análisis de Balances Ibéricos (SABI).

Before conducting the interviews, an open, flexible questionnaire was prepared according to the requirements of each. The order of the questions was illustrative, facilitating the passage through certain aspects not previously considered or even in those to which the informant paid special attention.

4. Findings

Technological progress helps to improve production processes, making the business sustainable. In this regard, the factors selected to identify and evaluate the technological resources of a company refer to its the degree of research, development and technological innovation (R&D), technological endowment, intellectual and industrial property and the results of the innovation.

The technological resources of the selected Spanish oil mills refer to the following aspects, frequently used in the literature: the company's R&D expenditure, the provision of production technologies, product innovation and the application of its know-how.

In particular, we have analysed the spending of the SME on R&D as a percentage of its total sales, in a period of five years (2013-2018).

Subsequently, the production technologies of SMEs were compared with the rest of the companies in the sector, the development of new products and the improvements they make in their production activities and the application of their know-how.

First, our results show that 66.5% of Spanish oil mills do not allocate resources to R&D (see Figure 2), considering the percentage of R&D ex-

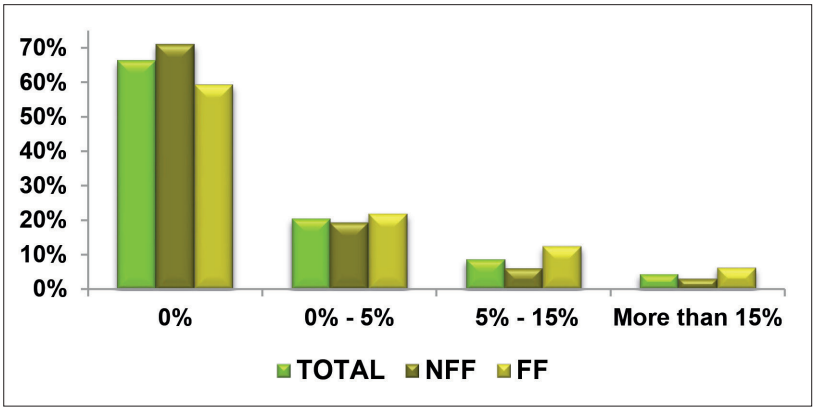
penditure by olive oil companies during 2013-2018 in relation to their total sales. Thus, almost 90% of Spanish oil mills allocate less than 5% of their sales for R&D and only four out of every hundred companies spend 15% or more of their sales on R&D expenses.

Additionally, since ownership is included in corporate governance and plays a crucial role related to property rights, characteristics and interrelationships (Wang et al. 2014), we consider this variable one of the main that could determine the differences when deciding to go from linear model to CE model. Due to the basic ownership position in the corporate governance structure, we have included this distinction when describing our results on this part of technology resources.

Additionally, when ownership and management overlap, incentives to protect their investment and monitor managers have also increased (Wang et al., 2014). Therefore, we analysed whether there were differences in SMEs based on their family nature. In this regard, the results on R&D indicate that when family and non-family oil mills are compared, 6.3% of the former allocate more than fifteen percent of their total sales to R&D expenses, while in the second group this percentage is lower at 3.1%.

This lower investment in R&D by non-family businesses is also found in the fact that 70% of them do not intend to invest in R&D, while family companies in the same situation do not exceed 60%.

Fig. 2. - R&D Expenditure vis a vis total sales (2013-2018).

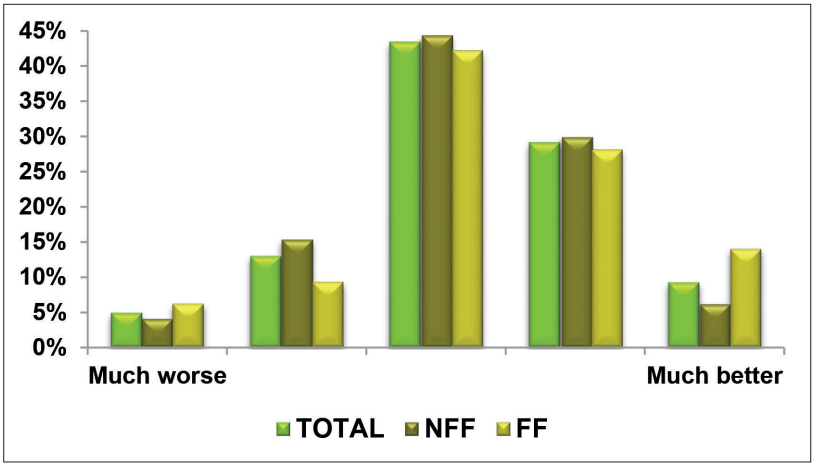


Source: own elaboration

The second factor analysed is the production technology of the Spanish oil mills included in the sample. Specifically, from the results, it is observed that 38.5% of the companies consider their production technology to be better or much better than that of their main competitors. Only eighteen companies out of hundred have considered it lower (see Figure 3).

When evaluating the technological resources of companies in the sector, we can find no differences of businesses' perceptions depending on their family nature. 14.1% of family businesses believe that they have a much better position in their production technologies compared to non-family businesses (only 6.2%).

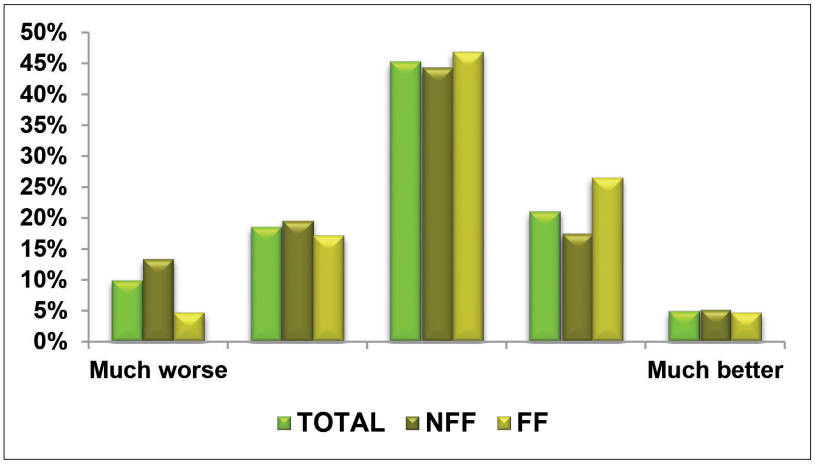
Fig. 3 - Production Technology.



Source: own elaboration

Further, the development of new products is also one of the variables used to examine the intangible resources of companies. In the Spanish olive oil sector, our results show that the level of new product development of 28.5% of companies is lower than that of their main competitors, that is, respondents consider it worse or much worse (see Figure 4) than their competitors. A higher figure of 31% family olive oil mills considered themselves better or much better positioned in this aspect than their main competitors, while non-family companies that declared this perception were almost 22%.

Fig. 4 - Development of new products.



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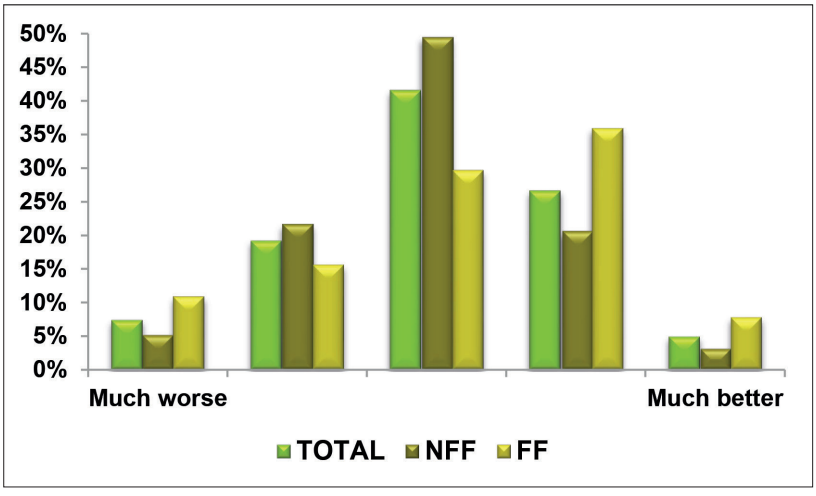
Finally, compared to their main competitors, 31.7% of the Spanish oil mills are considered superior concerning the improvements they make in their production activities and in the application of their know-how. In this sense, there are also significant differences between the results obtained and reflected in Figure 5, examining the family or non-family nature of the olive oil mills.

Fig. 5 - Improvements in production activities and know-how application.



Source: own elaboration

Thus, while almost 40% of family businesses claim to have developed better or much better productive activities and application of know-how than their competitors, this percentage does not reach 24% when non-family businesses are considered.

One of the explanations given by the respondents about this capacity improvement is: *"The most demanding markets are requesting products adapted to a changing lifestyle and, at the same time, are increasingly concerned about health, well-being and the environment. Our priority is to ensure the highest quality standards. For this reason, 20% of our profits go to our internationalization department"*. (E4-1).

This argument underscores how international customers and suppliers could push the company to adopt CE principles, supporting the interest in analysing the role that supply shift examination plays in CE adoption (Dubey, 2019).

A diametrically opposite point of view comes from some firms that believe it unnecessary to launch new products or seek new uses. They highlight new commercial strategies as crucial to obtain a source of competitive advantage: *"Well, it is not that olive oil has new uses, it had them in ancient times. We have not discovered anything new, but we are looking for new strategies to launch and we introduce products, but olive oil, formerly lampante olive oil, acquires the name from the lamp and balm that is given to gladiators. So, it is nothing new, so it is nothing new, but now it is more sophisticated for cosmetics and for all kinds of soaps, gels, creams... Now, you have been giving all the uses that the product has, which were not given before. In all products, it is about looking at different lines of business. The mentality changes and you stop doing some things because you do others. So, well, it seems to me that everything you should try to add value to the product ... is what you have to do"*. (E3-1).

A significant increase in R&D investment is necessary, since most of the SMEs analysed acknowledge that their investment is lower than that of their direct competitors. R&D not only applies to the processes of obtaining olive oils, but also to the management of companies and crops to make them more productive and thus fight against the rise in production costs that the sector has been experiencing. The proposals can be espalier or super-intensive; however, they are not compatible with most olive oil landers.

One of the interviewees highlighted how innovation is needed in all the links of the value chain to achieve a competitive advantage: "*Because [the sector] operates in a context that does not support anything, I believe innovation is the basis that this [business model] begins to awaken and companies can achieve an advantage of differentiation*". (E2-1).

New producers with significant future power such as Australia, South Africa, Argentina, Chile and China seem to invest in R&D mandatory if companies want to continue being spearhead in the sector. To compete with the new international players, many companies are aware of the relevance

of R&D for their success. For this reason, one of the respondents points out: "*And for us the future revolves around two key elements: one is innovation and the other is research. Innovation… it is difficult to innovate a product where it has 5,000 years of history and even because a boat has recently been discovered in the area of Syria, which seems to be the oldest in the Turkey area… but in the Middle East that has about 8,000 years of history, a pot of oil, that is, supporting my idea. Well, it is possible to innovate and it is necessary to innovate. When we speak of innovation… we speak of innovation in all fields of our activity… innovation in the agronomic part. Fortunately, we are harvesters, fortunately, we can act and interact in the agronomic part, in the trees, on how to prune, how to water, how to fertilize, how to treat the vegetation cover, how to enrich the habitat, how to enrich, say, the zoo component, etc. There is a beastly field of innovation. We know very little about the agronomic part; to innovate on the industrial side… I think that, right now, industrial farmers, collectors, we are facing challenges that our parents were completely unaware of, even those who never had it, one thing called early harvest added with another exogenous factor that is climate change*". (E1-1).

In this line, eco-friendly products should have quality embedded, in fact another respondent pointed out that: "*We try to make the customer fall in love with our olive oil, because of… the concept of quality… the issue of pesticide-free, because it is a very important issue in the agricultural enterprise agro-community policy is going that way. You are producing respect for the environment or you're going to be ruined [out of the market]. Unless you're looking at it, rural areas are depopulated because people are leaving the countryside, now it's coming back because of the healthy and socioeconomic crisis due to COVID-19"*. (E6-1).

Additionally, several authors highlighted that Industry 4.0 tools could drive the deployment of a new generation of CE initiatives (Tseng et al., 2018), as well as the mutually beneficial relationship that exists between Industry 4.0 and the CE (Lopes de Sousa et al., 2018).

These authors also pinpoint the contribution of the industry 4.0 to sustainable operations management decisions and new business models by means of integrating value chains through data collection and sharing.

Moreover, Rajput and Singh (2019) identified Artificial Intelligence, Service and Policy Framework as significant enablers connecting CE and Industry 4.0.

Thus, new technologies that make up Industry 4.0 should be considered, whose paradigm is closely related to the CE: big data and analytics, autonomous robots and vehicles, additive manufacturing, simulation, augmented and virtual reality, horizontal/vertical system integration, the Internet of Things (IoT), cloud, and edge technologies, and blockchain and cyber-security (Rüßmann et al. 2015). Data-driven analysis can potentially be used to optimize the sustainable solutions intended to reduce the resource and emission intensities of industrial systems (Tseng et al., 2018).

Therefore, sustainable operations management decisions contribute to implementing the connection between the principles of CE and Industry 4.0 approaches (Lopes de Sousa et al., 2018).

Some of these technologies are cheap and accessible. This could enable SMEs with a set of important improvements in competitiveness when these new technologies are applied to production (Zhou et al., 2015), market growth (Sanders et al., 2016), supply chain and product lifecycle (Porter & Heppelmann, 2014), to enable workforce (Oesterreich & Teuteberg, 2016), and to implement business models (Lee et al., 2014).

Companies are conscious of the competitive advantage to be attained by acquiring technical and technological knowledge: *"At the technological level, we have enormous challenges. Why? Because every day we are learning more about oils, that is, 20 years ago nothing was known about biophenols, no one understood what europein was, no one knew what oleocantal was, drexityroxol and tyroxol were only known to scientists. These challenges call for us. Then we realize that Virgin Extra Olive Oil (VEOO) is not only a seasoning or foods that are enormously rewarding from a sensory point of view; there is an important hedonistic pleasure in consuming it because it is a gourmet food, a food that fills us."*. (E1-1).

The CE is very relevant in the Olive Oil sector due to its being land-rooted, and its strong attachment to the territory, up to the point that some firms help to change environmental mindset of their community. One interviewee highlighted how they teach their community to recycle, for example: "*The relationships that are maintained [with its community] are good, because they know that here they have their home for what they need, when they want knowledge, do recycling, learn to track the product down... there we are*". (E3-1).

However, our SMEs sample complaints about the lack of financial support by government bodies to R&D investment: "*And it's a mistake, the real innovation, for example, here in E [autonomous community to which the olive oil mill belongs], and [innovation] in oils comes from the industrial sector, where we are spending money, each one [invest] depending on their possibilities.*". (E5-1).

Therefore, the inclusion of the CE in business models should be analysed as one of the main challenges of SMEs to develop a long-term lasting competitive advantage: "*What's behind that H [element associated with the company and brand] ...? It is rigor, product quality, quality in its human resources, quality in its management, sustainability, corporate social responsibility, involvement with the environment, correct and cordial relations with the governmental bodies, good corporate governance*". (E1-1).

5. Discussion, Conclusions, Implications, Future Research Lines and Limitation

The paradigm shift that the transition to the CE implies is a need that SMEs have to transform into reality. A new way of managing and producing emphasizes the efficient organization of limited resources, the pursuit of reducing environmental impact and the abandonment of a model that generates waste and emissions and consumes resources.

CE, together with industrial symbiosis, share a restorative system approach. Its objective is to repair the previous environmental damage by designing better production systems. At this point, companies should be able to include CE principles in their business models to achieve a better balance and harmony between the economy, the environment and society (Ghisellini et al., 2016).

Spanish olive oil SMEs must increase their investment in R&D to overcome their lack of technical and technological knowledge to efficiently manage resources, minimize waste by using renewable energy and reduce the number of chemical pollutants and waste toxic through careful design. This will translate into a reduction in their CO2 footprint and a better use of their resources.

Although these companies are perceived better or much better in almost all the indicators analyzed, the truth is that they are not technology-based companies and they do not allocate sufficient funds to R&D activities. Specifically, the majority invest less than 5% of total sales in R&D. These figures should be reversed if they want to maintain the leadership position they have occupied in recent years. The current health crisis has revealed their weaknesses in terms of technological resources and application of know-how. This lack of capabilities is evident even when they are related to the implementation of the CE principles.

On the other hand, we find that firms more attached to and rooted in their territory are also more committed to the circular economy, sustainability and the creation of a restorative production system. Along these lines, future research should delve into the role of family businesses, that are intertwined with their community. Ownership and management of the business in family or non-family hands could determine the fastest adoption of the circular economy. Thus, the study of the different levels of implantation of CE between family and non-family businesses, due to their link with the community, constitutes another line of future research.

From this research, we can state several practical implications. In the near horizon, SMEs must transition towards more sustainable models than the current ones, with the CE being an instrument for implementing this process. The transition will result in a lower carbon footprint and a resource-conscious production system.

The Spanish olive oil SMEs need greater investments that allow them to develop the new production models. The lack of financial resources poses an important barrier for Spanish SMEs when undertaking these processes of change. This work has shown how the lack of capital represents one of the most prominent barriers to the introduction of innovation and adoption of CE by SMEs (Rizos et al., 2015). This change from a linear production / business model to a circular one requires substantial time and investment on the company's part (Lahti et al., 2018).

This financial barrier goes hand in hand with the need for high levels of time and human investments, which are usually very relevant for SMEs (Rizos et al., 2016). Green business elements represent an additional monetary investment, to which SMEs are more sensitive than large companies, which is why SMEs often look for technology already available on the market (European Bank for Reconstruction and Development, 2020; Grant et al., 2014; Rizos et al., 2016).

Therefore, SMEs could take advantage of Industry 4.0 which is based on nine pillars (big data, autonomous robots, simulation, additive manufacturing, IoT, cloud computing, augmented reality, horizontal and vertical integration and cybersecurity), some of them accessible and inexpensive, enough not to become a technological barrier. These are implications for future work on Industry 4.0 and future business models for SMEs.

Finally, this work presents its limitations. The main limitation of our study is the use of only one kind of resource to approach the study. Future lines should include other resources in addition to technological ones. Further, future research should examine what type of technology has been included in the technological resources. Further, we do not know to what extent our findings will apply beyond the Spanish olive oil industry, which constitutes another avenue of future research.

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THE TRIPLE LAYERED BUSINESS MODEL CANVAS IN SMART AGRICULTURE: THE CASE OF EVJA STARTUP

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Abstract

In recent years, the studies of Business Model Innovation (BMI) and Circular Economy (CE) have been issues much debated in the literature. Moreover, the sustainable development enhanced by the Green Economy (GE) and by smart technologies represents a huge opportunity for generating profit in new and environmentally way. Actually, was not widely investigated in academic literature, what is the impact of the Sustainable Business Model (SBM) in terms of competitive advantage for the firms, especially for small and medium-sized enterprises (SMEs) beyond big companies. The main research question was: "There's a sustainable or circular business model in the literature that can be used in the smart agriculture industry?" Moreover: "How the emerged managerial model can be applied to the case of an Italian firm?" The research design is based on the following phases. Firstly, give a literature review of significant and emerging studies on BMI and SBM. In a second step, access to a conceptual and managerial model, in order to compare it in the scientific community and expand the debate on sustainable development also in managerial perspective. The proposed conceptual model has been tested on EVJA company, a leading Italian innovative start-up operating in the smart agri-food industry. The methodology adopted was a qualitative analysis. Earlier, starting with a deep literature review in order to identify and classify the main contributions on the topic of sustainable and circular business models. Later, by in-depth interviews and focus group to a firm's key informants (namely the CEO and Co-Founder and Chief Technology Officer and Co-Founder of the firm) and on experts and practitioners deriving from the academic and managerial community including the smart agriculture industry. Lastly, the desk research on the case study was enriched by the recurs to primary and secondary sources on the topic of smart technologies and sustainable agriculture. The final aim is to suggest a managerial tool, namely the Triple-Layered Business Model Canvas (TLBMC), in the reference framework of the circular economy, to support the farm manager to figure out an appropriate course of action to promote energy-saving and reuse practice for fighting climate changes. In a managerial way, this could provide better services and products in terms of value for money to the customers. The TLBMC tool in agri-food industries can foster the SMEs to captures value by evaluating the potentials of SBM and producing in a more economical and responsible manner. In a holistic vision, that would involve its customers, suppliers, employees, and communities, as well as its shareholders.

1. Introduction

Has become very current, at the beginning of the XXI century, what Albert Einstein said: *"Serious natural disasters demand a change of mentality that forces us to abandon the logic of pure consumerism and promote respect for creation."* Surely the COVID-19 pandemic has changed existing Business Models (BM). Finding new normality means reviewing the current paradigm in respect of the environment and in a social dimension of the entrepreneur (eco-sustainable products, better working conditions). These effects will accelerate the digitization process of SMEs responding to the new purchasing habits. There are many quick solutions and incremental innovations fostering by the new technologies that will have a strong impact on new products and services. Therefore, firms need new business models to grasp the opportunities offered by the Circular Economy (CE). This paper investigates to what extent existing frameworks, methods, and tools for Business Model Innovation (BMI) are useful to cope with the challenges of designing and implementing Circular Business Models (CBM). The continuing growth of global resource consumption is a challenge in today's resource-intensive economies and for the level of competition. Firms are confronted with an uncertain supply of resources, due to scarcities on the market, increased government intervention and geopolitical tension to secure resources, and increased damage to global ecosystems. CE is an economic system aimed at eliminating waste and the continual use of resources. Circular systems employ reuse, sharing, repair, refurbishment, remanufacturing, and recycling to create a closed-loop system, minimizing the use of resource inputs and the creation of waste, pollution, and carbon emissions (Geissdoerfer et al., 2017). The CE tries to set the products, equipment, and infrastructure in use for longer, in order to improve resource productivity. All wastage should become useful for further processes: either a by-product or recovered resource for another industrial process or as regenerative resources for nature (Invernizzi et al., 2020). This regenerative approach is in contrast to the traditional linear economy, which has a *"take, make dispose"* of production model (MacArthur, 2013). CE Scholars (Andersen, 2007; Stahel, 2016; Lacy and Rutqvist, 2016; Bocken et al., 2016; Lieder and Rashid, 2016; Kirchherr et al., 2017) suggest that a sustainable world does not mean a drop in the quality of life for consumers and can be achieved without loss of revenue or extra costs by firms. Then, the CBM can be as profitable as linear models, allowing us to keep enjoying similar products and services. The intermediate step between circular and linear (horizontal) models is represented by the Triple Layer Business Model Canvas (TLBMC). According to Joyce and Paquin (2016), the TLBMC provides an integrative approach to support those seeking to understand existing BM and creatively explore potential sustainability-oriented BMI.

Integrating the economic, environmental, and social layers supports (vertical coherence) a more robust and holistic view of an organization's business model through its actions and relationships, which can support a more systems-level perspective of sustainability-oriented innovation (Zott and Amit, 2009). The 2030 sustainable agenda is pushing the industry to develop new solutions, transforming and re-designing our infrastructures by focusing on innovative technologies that enable doubling food production, infrastructure growth, and urban development in a sustainable way. At the same time, the demand for smart agriculture technology is increasing and new CBM is emerging. A trend becomes stronger by the increasingly stringent regulatory requirements, and by a growing interest from producers and consumers. In the wider context of the shared-value, the business and social goals could be realized better and at the same time, the impact on the environment minimized (Michelini, 2012). In this scenario, the evolution of agriculture 4.0, also called smart farming (Walter et al., 2017) is linked to the industry 4.0 topic. The rising of big data, drones, and the Internet of Things (IoT) are spreading development processes and connections between products and production, territory and environment, logistics, and commercial networks (Gubbi et al., 2013). Smart agriculture (Campbell et al., 2014), precision farming (Auernhammer, 2001), and precision agriculture (Stafford, 2000) are increasingly common terminologies in the field of technologies applied to the world of agriculture. Following the guidelines suggested by FAO, become more and more significant develops new cultivation ways and smart agriculture offers innovations methods of production. A novel approach to agriculture to satisfying the growing demand of the nine billion people who will populate the planet by 2050. The new logic founded on data-based decision-making structures becomes the frontier for the development of predictive solutions that can provide indications on where, when, and how to operate in an increasingly efficient and effective manner. As a result, smart farming surrounds itself with technologies such as software applications, IoT sensors, data analytics, and end-user services that open up new technological scenarios and BM. On the other side, farmers do not receive a different view of their cultures than they do today, but they do have more precise, real-time-generated sets of information that can be compared, via the cloud and open data, to historical elements, as well as cross-fertilized environmental factors. Collecting data is, however, only the first step towards smart farming: it is necessary to start processing these datasets using machine learning algorithms that can, if properly trained, generate future predictions and, consequently, provide feedback to make data-driven decisions for agriculture. This paper aims to provide conceptual insight on CBM by exploring the concept and potential approaches to pursue. The CE can be a successful driver for change by focusing efforts on economic and environmental issues while

also addressing socioeconomic challenges such as (un)employment. The business model of firms is viewed as a systematic driver for change in a company, bringing together the various elements of the way of doing business: the value proposition (what value is proposed and to whom); value creation and delivery (how this value is provided) and value capture (how money is made and other forms of value are captured). To develop and validate new business models, experimentation is needed. The technological evolution increasingly at the service of agricultural businesses is evaluated by the case of an innovative start-up that has devised a system to support precision and sustainable agriculture. According to World Bank figures, in 2016, more than 700 million hectares (1.7 billion acres) were devoted to growing corn, wheat, rice, and other staple cereal grains nearly half of all cultivated land on the planet. In the coming decades, however, meeting the demand for accelerated agricultural productivity is likely to be far more difficult than it has been so far. The need to reduce chemical inputs to aim for "zero residues" is pushing the agricultural industry to look for increasingly innovative solutions capable, at the same time, of ensuring economic sustainability mainly for the SMEs. Moreover, the environmental impact of agriculture involves a variety of factors (Van der Werf and Petit, 2002) from the soil, to water, the air, animal and soil variety, people, plants, and the food itself. Some of the environmental issues that are related to agriculture are climate change, deforestation, dead zones, genetic engineering, irrigation problems, pollutants, soil degradation, and waste. Sustainable agriculture means farming in sustainable ways, which means meeting society's present food needs, without compromising the ability of current or future generations to meet their needs (Reganold et al., 1990).

2. Business model in smart agriculture

Technological innovations will play a prominent role in the transition to smart agriculture. However, technological innovation diffusion is subject to socio-economic barriers. The success of innovations is partly dependent on the business models that are used to diffuse them. Within the context of innovations for smart agriculture, the role that innovation providers' business models play in the successful adoption and diffusion has received limited attention (Long et al., 2016). The concepts of Business Models (BM) and, more recently, Business Model Innovation (BMI) have become influential in management research in recent years (Zott et al., 2011; Ricart, 2014; Geissdoerfer et al., 2016; Foss et al., 2017). BM literature has highlighted the usefulness of the BM construct in research on e-commerce, strategy, and technology management. Teece (2010) offers a notion of BM as the *"design or architecture of the value creation, delivery, and capture mechani-*

sms" of a firm. BMI is a mainstream in the study on business models, Schallmo (2013) and Foss and Saebi (2017) provided an extensive literature review on the topic, which was updated and complimented for this research. A summary overview of the main contributions on the Business Model (BM) and Business Model Innovation (BMI) are shown in table 1 (see appendix). The concept of BMI is deeply enquired by Schallmo (2013) to understand the analysis and planning of transition from one BM to another. The capability to realize a successful BMI can increase an organization's resilience to changes in its environment and create a sustainable competitive advantage (Mitchell and Coles, 2003). These definitions refer to BMI as a mutation in some elements of BM, both as a reaction to opportunities or challenges in the organization's environment or as a way to diversification and innovation. Accordingly, to that, the topic's fields of application have been in corporate diversification (Ansoff, 1957), business venturing (Shane, 1993), and start-up contexts (Kuivalainen et al., 2021). In a holistic vision, the BMI is related to the conceptualization and implementation of new business models. This latter can comprise the development of entirely new BMs, the diversification into additional BMs, the acquisition of new BMs, or the transformation from one BM to another (Geissdoerfer et al., 2018). The conversion can affect the full BM or a combination of its blocks: value proposition, revenue or cost model, delivery and value capture elements, and further the interrelations between the elements, of the value network (Fjeldstad and Snow, 2018). The need for greater sustainability, in terms of social and environmental impacts, can be considered a major antecedent of BMI. The popularity of the sharing economy or collaborative consumption has given to innovative forms of BMs that facilitate the exchange of underutilized assets among individuals (e.g., Airbnb, Zipcar, Rent the Runway). Similarly, the need to facilitate inclusive growth (Spiess-Knafl et al., 2015; Yunus et al., 2010) or target low-income consumers (Anderson and Kupp, 2008; Sánchez and Ricart, 2010) can result in significant BMIs. The need for sustainability pushes the creation of sustainable BMs, and the question of: *"How managers can innovate their BMs toward greater sustainability"* has not been addressed sufficiently to date. Thus, a more explicit and systematic investigation of the BMI construct is warranted to further this research field.

2.1 Sustainable business model innovation

Italian agricultural companies, especially small farms, are struggling to be profitable in difficult economic times. It is a challenge for Italian farmers to compete with imported products on prices. The agricultural industry, however, supports the view that through business model innovation, farms can increase their competitive advantage. Moreover, Sustainable de-

velopment is an increasingly important concern for business managers. If current population and consumption trends continue, by the 2030s we will need the equivalent of two Earths (Global Footprint Network, 2014). Empirical studies have shown that CEOs see sustainability as more important than ever for long-term success, and believe sustainability issues should be fully integrated into the strategy and operations of a company (Lacy et al., 2012). To address this, radical and systemic innovations are needed (Boons et al., 2013). Sustainable Business Model Innovation (SBMI) is an approach for firms to re-conceptualize the purpose of the firm and its value-creation logic to improve its environmental and social sustainability (Bocken et al., 2014). Existing research on Sustainable Business Models (SBM) has identified several archetypes of strategies firms can pursue SBMI, such as promoting eco-efficiency, creating value from waste, or delivering functionality rather than ownership. Although the question: *"How companies can transform their business models to become more sustainable"* is highly relevant for society and management, it is yet poorly understood (Sommer, 2012), and the harmonization by firms to the sustainable mainstream has been slow. More research is needed on the wider social and political changes required to make these archetypes mainstream (Bocken et al., 2014). Recently, research on sustainable innovation has become more focused on the coevolutionary process in which technologies, social practices, and institutions change towards sustainability (Boons et al., 2013). Organizations can only be sustainable when the whole societal system is sustainable. Both structural and cultural changes are required to facilitate firm- and system-level sustainability (Stubbs and Cocklin, 2008). Business model innovation is conventionally focused on the firm's internal strategic activities, but these activities are greatly affected by the institutional environment in which the firms operate (Zott and Amit, 2007). It is thus important to take a step beyond the business model of the individual firm and identify and analyses the structural and cultural driving forces and barriers that have an impact on SBMI. Bocken et al. (2014) has introduced a more comprehensive view of how firms should approach embedding sustainability in their business models by introducing SBM archetypes that are groupings of mechanisms and solutions that may contribute to BMI for sustainability. These archetypes are introduced to develop a common language that can be used to accelerate the development of SBMs in research and practice. We have adapted the SBM archetypes by Bocken et al. (2014) as follows. The archetypes are (1) Pollution control, (2) Maximize material and energy efficiency; (3) Create value from 'waste'; (4) Substitute with renewables and natural processes; (5) Deliver functionality rather than ownership; (6) Adopt a stewardship role; (7) Encourage sufficiency; (8) Re-purpose the business for society/environment, and (9) Develop scale-up solutions. Further, the archetypes are classified in higher-order groupings, which describe the main type of busi-

ness model innovation: Technological, Social, and Organizational oriented innovations (Boons and Lüdeke-Freund, 2013). Different archetypes lead to divergent sustainability benefits, and firms can use one or a selection of SBM archetypes for shaping their own transformation. Real sustainability almost certainly demands the combined use of different archetypes. (Bocken et al., 2014). Lately, following this new perspective, takes greater attention to the above-mentioned Triple-Layered Business Model Canvas (TLBMC). A model is a practical tool for coherently integrating economic, environmental, and social concerns into a holistic view of an organization's BM (Joyce and Paquin, 2016). The TLBMC builds on Osterwalder and Pigneur's (2010) original BMC by explicitly integrating environmental and social impacts through additional business model layers that align directly with the original economic-oriented canvas. Actually, the TLBMC is an easy-to-use tool that supports creatively developing, visualizing, and communicating SBMI (Stubbs and Cocklin, 2008). The TLBMC ensues a triple-bottom-line approach to organizational sustainability (Elkington, 1994), explicitly addressing and integrating economic, environmental, and social value creation as core to an organization's BM. According to Joyce and Paquin (2016), the TLBMC leverages life-cycle analysis and stakeholder management perspectives within newly created environmental and social canvases to conceptualize and link multiple types of value creation within a BM perspective. A summary overview of the main contributions to the Sustainable and Circular Business Model is represented in table 2 below.

2.2 Circular business model

Sustainability is interpreted in this research as *"the balanced integration of economic performance, social inclusiveness, and environmental resilience, to the benefit of current and future generations"* (Geissdoerfer et al., 2017). According to Blomsma and Brennan (2017), Circular Economy is understood as an umbrella concept (a phenomenon that creates a relation between pre-existing independent concepts) that aims to develop a regenerative economic system by intentionally slowing, closing, and narrowing material and energy loops. The relationship of sustainability and the circular economy is not quite clear in literature and still calls for theoretical consensus (De Pádua Pieroni et al., 2018). Since the industrial revolution the economic system was mainly based on "linear production" outputs, basically operating in a one-way manner (Coman and Ronen, 2000). Nowadays, is very tricky to go back to the old source of firm's value to ensure long-term sustainability. Following this mindset, the Circular Economy (CE), fully accepts that sustainable economic growth must be based on the model ''resource outputs and regenerated resource'', that is the logic of efficient resource use and waste reduction (Murray et al., 2017). The CE is a concept

already existing in the natural eco-systems therefore we should be inspired by the idea of circularity in production by imitating natural cycling. The reduction of resource, energy, and waste loops in the product's lifecycle and the increasing of efficiency and efficacy can be achieved simultaneously by improving resource productivity. The CE business model pillars are: a) *Product life extension*. Lowering of the need to replace products by their improved quality and extended usability (Sauerwein et al., 2019); b) *Recovery of end-of-life products*. Restoration of products that are no longer usable into the manufacturing loops (Gregson et al., 2015); c) *Circular supplies*. Supply of fully renewable or biodegradable materials/products (Govindan and Hasanagic, 2018); d) *Sharing platforms*. Use of shared resources such as logistics, equipment, and knowledge (Sposato et al., 2017); e) *Reduction of energy consumption*. Promotion of energy conservation and improved efficiency (Hara et al., 2011). The literature on CBMs is growing rapidly and contains a variety of different typologies. There are considerable differences in the level of granularity, as well as the classification approach that is taken. Some authors take a value chain perspective that structures BMs into the circular design, optimal use, and value recovery types (Achterberg et al., 2016). Others distinguish BMs according to the material flows they address. Van Renswoude et al. (2015) focuses on short loops, long loops, cascades, and pure cycles while Lewandowski (2016) focuses on regeneration, sharing, optimization, or looping. The activities implicit in all of these typologies overlap significantly but are often given different names.

Tab. 2: The main existing literature on Sustainable and Circular Business Model

Authors	**Focus**	**Main empirical evidences**
Svensson et al., (2011)	A corporate effort towards a sustainable business model	*«The company's efforts towards a more sustainable business model can broadly be divided into factors within the company and factors outside the company. The case study demonstrates how the carbon footprint on the Earth can be reduced by focusing and influencing factors outside the company 'sown production facilities»*
Boons et al., (2013)	Business models for sustainable innovation: state-of-the-art and steps towards a research agenda.	*«As the current literature does not offer a general conceptual definition of sustainable business models, we propose examples of normative requirements that business models should meet in order to support sustainable innovations. Finally, we sketch the outline of a research agenda by formulating a number of guiding questions»*
Laukkanen et al., (2014)	Analysing barriers to sustainable business model innovations: Innovation systems approach	*«The central idea of this paper is to examine how the societal transition towards sustainable business models can be achieved. Through a qualitative Delphi study, we assess and categorize the key structural and cultural barriers to sustainable business model innovation. By applying innovation system approach, we explain how to overcome existing barriers by strengthening the functions of innovation system»*

Planing, (2015)	Business model innovation in a circular economy reasons for non-acceptance of circular business models	*«For practitioners working on new innovative business models in the realm of the circular economy this paper provides a basic framework for clustering their concepts. By learning about consumer motives leading to non-adoption, this paper also provides support for designing better and more successful business models»*
Joyce et al., (2016)	The triple layered business model canvas: A tool to design more sustainable business models.	*«The Triple Layered Business Model Canvas is a tool for exploring sustainability-oriented business model innovation. It extends the original business model canvas by adding two layers: an environmental layer based on a lifecycle perspective and a social layer based on a stakeholder perspective. When taken together, the three layers of the business model make more explicit how an organization generates multiple types of value economic, environmental and social»*
Antikainen et al., (2016)	A framework for sustainable circular business model innovation	*«Currently, there is a lack of frameworks for supporting business model innovation in companies in the context of a circular economy. The current tools do not offer the needed understanding in the changing business environment and breaking up of current value chains. Furthermore, the impact of the circular economy models and sustainability should be understood through value creation for all stakeholders. The challenge of redesigning business ecosystems is to find the "win-win-win setting" that balances the self-interests of involved actors and sustainability impacts»*
Linder et al., (2017)	Circular Business Model Innovation: Inherent Uncertainties	*«Circular business models based on remanufacturing and reuse promise significant cost savings as well as radical reductions in environmental impact. Variants of such business models have been suggested for decades, and there are notable success stories such as the Xerox product–service offering based on photocopiers that are remanufactured. Still, we are not seeing widespread adoption in industry. This paper examines causes for reluctance. Drawing on a hypothesis-testing framework of business model innovation, we show that circular business models imply significant challenges to proactive uncertainty reduction for the entrepreneur. Moreover, we show that many product–service system variants that facilitate return flow control in circular business models further aggravate the potential negative effects of failed uncertainty reduction because of increased capital commitments»*
Yang et al., (2017)	Value uncaptured perspective for sustainable business model innovation	*«This paper contributes to theory by proposing the concept of value uncaptured and offers a framework for using it as a novel perspective for sustainable business model innovation. Four forms of value uncaptured are used to trigger innovation: value surplus, value absence, value missed and value destroyed. In the context of sustainability, each value is considered not only from the perspective of economic value, but also from the perspectives of environmental and social value»*

Evans et al., (2017)	Business model innovation for sustainability: Towards a unified perspective for creation of sustainable business models	*«The paper examines bodies of literature on business model innovation, sustainability innovation, networks theory, stakeholder theory and product service systems. We develop five propositions that support the creation of SBMs in a unified perspective, which lays a foundation to support organizations in investigating and experimenting with alternative new business models. This article contributes to the emerging field of SBMs, which embed economic, environmental and social flows of value that are created, delivered and captured in a value network»*
Baldassarre et al., (2017)	Bridging sustainable business model innovation and user-driven innovation: A process for sustainable value proposition design	*«This research aims at combining principles from both sustainable business model innovation and user-driven innovation to develop more successful, radical and user-centered sustainable value propositions. Sustainable business model innovation entails developing value propositions that create value for multiple stakeholders at the same time, including customers, shareholders, suppliers and partners as well as the environment and society. User-driven innovation allows developing solutions that are meaningful for people and profitable for business by involving potential customers, users and/or other stakeholders in an experimental and iterative design process»*
Lüdeke-Freund et al., (2017)	Sustainable business model research and practice: Emerging field or passing fancy?	*"We argue that the sub-field and the stand-alone positioning may hamper the unfolding of the field's full potential. Instead, we propose that the SBM field needs to assume the role of an integrative field to break existing academic niches and silos and maximize practical impact ("integration hypothesis"). Our observations indicate that the SBM field is indeed developing into an integrative field and force. But we need to better understand and strengthen this development, for example by crafting a dedicated SBM research program. A series of critical reviews could be a starting point for such an endeavor."*
Bocken et al., (2018)	Experimenting with a circular business model: Lessons from eight cases	*«Experimentation is an important capability in the transition to a sustainable business. We focused on 'circular economy as a driver for sustainability. The process and role of business model experimentation were analyzed. A circular business experimentation framework was developed and applied. We found that 1) experimentation creates internal and external engagement to start business sustainability transitions 2) experiments can help test assumptions in every building block of the business model 3) collaboration with external partners can ease experimentation, and 4) experimentation processes are iterative and require regular learning and sustainability checks»*

Breuer et al., (2018)	Sustainability-oriented business model development: Principles, criteria and tools	*"The theoretical discussion feeds into a comparative analysis of the six currently available practitioner tools supporting the exploration and elaboration of sustainability-oriented business models. By synthesizing findings from theory and available tools, we define four guiding principles (sustainability-orientation, extended value creation, systemic thinking and stakeholder integration) and four process-related criteria (reframing business model components, context-sensitive modelling, collaborative modelling, managing impacts and outcomes) for the development of sustainability-oriented business models."*
Guldmann et al., (2019)	A Design Thinking Framework for Circular Business Model Innovation	*«Circular business model innovation (CBMI) can support sustainable business transitions, but the process is poorly understood and there is a lack of tools to assist companies in CBMI. This article aims to contribute to closing this gap by developing a framework for CBMI based on a design thinking approach, which can support the CBMI process. A design thinking process typically consists of three innovation spaces, an exploratory, an ideation, and a prototyping and testing space. (...) this paper identifies two additional spaces, an introductory and an alignment space, for CBMI. The results derived from the six case companies indicate that the developed framework including its tools and techniques are useful for CBMI»*
Furqon et al., (2019)	Business Development of Coffee Farmers Group Using Triple Layered Business Model Canvas	*"The results show that the business conditions of the coffee farmers group were in a position of growth. Therefore, the right strategy for this condition is the harvest strategy or divestiture strategy. The TLBMC design carried out supports the development of sustainable businesses for the coffee farmers group. Novelty –Business development for coffee farmer group using triple layered business model canvas is expected to help increase business on a broader scale. This study is important for business owners and other related parties who seek to develop the business in various aspects including social and environmental aspects."*
Guldmann et al., (2020)	Barriers to circular business model innovation: A multiple-case study	*«The purpose of this article is to provide an overview of the barriers that hinder adoption of circular business models to facilitate circumvention of the barriers and a faster uptake. The research shows that barriers to circular business model innovation are found at all socio-technical levels and, overall, most barriers are encountered by companies at the organizational level, followed by the value chain level, the employee level and, finally, the market and institutional level»*

You et al., (2020)	The business model of Do-It-Yourself (DIY) laboratories–A triple-layered perspective.	*"We have applied the triple-layered business model canvas (TLBMC) to explore and understand DIY laboratories from the economic, environmental, and social value creation aspects. Based on our comprehensive literature review and exploratory case studies, our research findings reveal that DIY laboratories are essentially technology hubs offering technology enthusiasts and entrepreneurs physical and social spaces and business incubation to help them survive and thrive. Engaged with all the Triple Helix stakeholders, DIY laboratories offer a platform of science innovation and technology incubation at the grassroots level for technology entrepreneurs to grow economically, socially, and sustainably."*
Diana, (2020)	The Triple Layered Business Model Canvas Meets The Beekeeping Sector. General And Particular Considerations From The Romanian Industry	*"Beekeeping, as an agricultural branch, has indispensable contributions at societal and environmental level through a number of activities related to food and medicinal product supply and pollination. Sector's dynamic, however, demonstrates that businesses are facing a series of challenges, and therefore, they need to showcase a proactive managerial approach in order to respond to risks and opportunities given by sustainability. Consequently, this paper looks to obtain a better understanding of sustainability management in the beekeeping sector by applying the triple layered business model canvas and featuring a series of facts from the Romanian industry."*

Source: own elaboration.

3. Research methodology

The research methodology adopted in this study had a qualitative analysis and descriptive approach (Nassaji, 2015). Firstly, was carried out an analysis of the relevant academic literature (for the number of citations on Google Scholar, Scopus, and the Web of Science and for the quality of the academic Journals publishing the articles) on the sustainable and circular business models. The in-depth review (Rowley and Slack, 2004) mentioned above was useful in selecting the managerial tool that is the Triple-Layered Business Model Canvas (TLBMC). Among the various conceptual models proposed in the literature on BMs, the TLBMC was the one that best fits with the proposed case study. In the next step, it has been conducted in-depth interviews (Legard et al., 2003) with key informants of EVJA company following a pre-established framework structured on 27 questions to investigate and validate the building blocks of the TLBMC model (9 questions for each layer). In addition, it was made broad desk research on the EVJA case study both with original sources of information[1] than by the recurs of secondary sources[2]. EVJA is an innovative start-up company

working in an agro-tech industry that better represents the new challenge of Italian SMEs for competing in international markets. In the initial phase, main data was collected thanks to multiple semi-structured interviews (Schmidt, 2004) with the Founder and CEO of EVJA, Dr. Davide Parisi, and Dr. Antonio Affinito. The individual interviews, one-hour for each, have been organized in the time starting from March to July 2010. Furthermore, have been made several focus groups (Corrao, 2005), more than an hour each, in order to more comprehensive elicitation of individuals' views and to expand the information already emerged from the interviews with other informants. Therefore, were involved experts who have worked directly or indirectly with the company as well as with practitioners deriving from the academic and managerial community (Bertrand et al., 1992). The focus groups' members were the following: 1) Dr. Domenico Giuseppe Crispo - Agronomist and Fellow Researcher at CNR - IPSP[3](plants sustainable production and seedlings protection); 2) Ph.D. Niccolò Loret - Theoretical Physics and Modelist (EVJA R&D activities and climate models); 3) Dr. Marco Matascioli - Engineer and EVJA Technical Advisor (IT infrastructure, product development, process control and, budgeting); 4) Dr. Loet Rammelsberg – Entrepreneur and Program Director at StartLife (hands-on coaching in the early-stage phase, design and, implementation of EVJA acceleration program). The focus group research conducted within a social constructionist epistemological framework does not utilize the notion of pre-existing ideas, opinions, and understandings, located inside the heads of individuals, but, rather, presupposes that sense-making is produced collectively, during social interactions between people (Wilkinson, 1998). Within this framework, then, the particular advantage of focus groups is the opportunity they offer for researchers to observe how people engage in the process of collective sense-making: how views are constructed, expressed, defended and, (sometimes) modified within the context of discussion and debate with others (Kitzinger, 1994). Later, other information was collected from the company's leaflets, official presentation material, and company institutional website[4]. Furthermore, by analysing the posts on the company's social pages (Facebook and LinkedIn) it was possible to collect information on the community and on the customers, who use EVJA's products and services. This allowed investigating the issues related to the social and environmental impacts limited to the business model canvas,

[1] In journalism, a primary source can be a person with direct knowledge of a situation, or a document written by such a person ("Journalism: Primary Sources". Pepperdine University. Retrieved 17 January 2018).

[2] A secondary source is a document or recording that relates or discusses information originally presented elsewhere ("*Secondary sources*". James Cook University.).

[3] National Research Council (CNR) - Institute for Sustainable Plant Protection (IPSP).

which had already emerged in the focus groups. Starting from the consideration that today's linear economic model (Gale, 1989) is increasingly problematic. Creating a closed-loop model in production and consumption is a preferred alternative to address environmental and social damages associated with the linear economy. This case study proposes the TLBMC as a tool backed by a methodology for enabling SMEs to coherently formulate unique circular value propositions based on a lifecycle perspective. The tool is valuable for rethinking and personalizing sustainability and circular economy by more practically tackling the three dimensions of sustainable development while being adaptable to the organization's context (Joyce and Paquin, 2016). To a better understanding of the TLBMC blocks, this application wants to describe the tool's key features and elements through a detailed analysis of EVJA firm.

3.1 The EVJA case study

According to FAO[5], agriculture remains central to the world economy, 60% of the population depends on agriculture for survival. Designing a Decision Support System (DSS) for crop cultivation enables the farmers to make effective decisions for higher yield. The parameters that are considered for the enhancement of seasonal crop growth are a type of soil and season, insect-pests management, irrigation methodologies. The main objective of EVJA start-up[6] is to develop a system that can provide information about the expected yield in each season with better accuracy. The decisions available to them currently are only a shallow guide for farmers due to them being unaware of various methodologies. Inefficiency in a farmers' decision results in the low production rate of the leaf (salads and vegetables fourth range organic) than the expected rate. The growth of seasonal crops is decided basically by two factors, namely the soil type and the season. Also based on the crop type the farmer must adaptively use the insecticides and fertilizers. According to Dr. Davide Parisi (CEO & CO-Founder) and Dr. Antonio Affinito (CTO & Co-Founder): *"The OPI system (Observe, Prevent, Improve) represents an excellent decision support for farmers who want a healthy and high-quality harvest"*. Thus, the parameters to be considered are identified and the simulation is tested using a proprietary patented tool called "OPI". Based on the performance the Intelligent-DSS

[4] www.evja.eu/it

[5] Food and Agricultural Organization, 2013 Statistical Yearbook.

[6] EVJA start-up born in Acerra (Na) in 2015, has taken part in several international accelerator programs, like Startupbootcamp FoodTech Rome in Rome (IT), Agro-Innovation Lab in Vienna (AT), Deutsche Telekom Hubraum IoT in Bonn (DE), Star Life Wageningen University & Research in Wageningen (NL) and it is participated by BayWa (DE) and RWA (AT), major players of the German and Austrian agricultural markets.

guides the farmers to improve the crop growth. The simulated results can be extended for real-time usage in mobile applications. OPI is based on the Internet of Things, artificial intelligence, and advanced agronomic models, and provides real-time monitoring of the crops, both from desktop and mobile devices, everywhere the farmer is. OPI allows to cut the farm management costs and forecast the quantity of yield, giving farmers an edge in their relationships with mass distribution channels and other commercial partners. The result is a more abundant, healthier produce, grown with a minimum environmental impact. OPI-EVJA is among the best agri-tech systems in the world and was a finalist in the FoodTech Challenge[7], the competition managed by the United Arab Emirates Food and Water Safety Office and by Tamkeen which received 437 proposals from companies, research institutes, and entrepreneurs from 68 countries. The EVJA CMO Paolo Iasevoli said: *"Our company was born in 2015 and we immediately realized the need to develop a system technologically advanced that would support agri-food companies to optimize production, with the aim of making them more efficient from an economic and environmental point of view"*. Protection, nutrition, and irrigation are the cornerstones around which OPI develops, which is a constantly evolving system, with great experience in sectors such as engineering, physics, agronomy, precision farming, artificial intelligence, and business development. *"Through the analysis of data and the use of the most advanced sensors for agriculture, it helps make the best decisions, prevents plant diseases and the effects of climate change. OPI is the most advanced decision support system for farms, thanks to sensors and agronomic models enhanced by artificial intelligence"*, explained Davide Parisi, CEO of EVJA.

4. Results

The analysis of EVJA through Osterwalder and Pigneur's (2010) original Business Model Canvas (see figure 1 in appendix), forms the economic layer of the Triple Layer Business Model Canvas (BMC). Osterwalder's BMC does not cover aspects such as environmental impact and stakeholder management (Joyce and Paquin, 2016). As known, the BMC disaggregates an organization's business model into nine interconnected components: customer value proposition, segments, customer relationships, channels, key resources, key activities, partners, costs, and revenues. Although using it may help managers align profit and goals to support more sustainability-oriented value creation on its own (Osterwalder and Pigneur, 2011), practically, environmental and social value is implicitly de-emphasized behind the canvas's more explicit 'profit first' or economic value orienta-

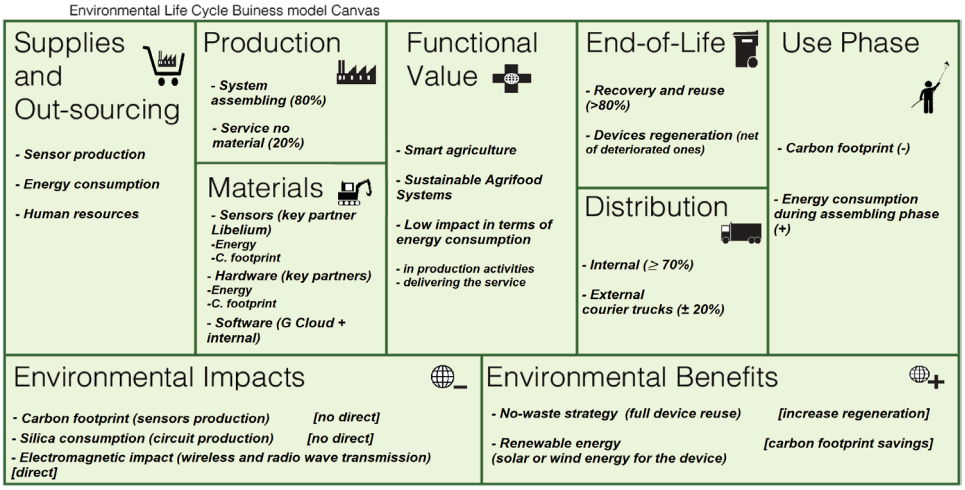
[7] https://foodtechchallenge.com.

tion (Coes, 2014; Upward and Jones, 2016). This has led to the criticism (Marrewijk and Werre, 2003; Bocken et al., 2013) that implementing more sustainability-oriented business models likely either requires an expert or practitioners to support this orientation. The Triple Layered Business Model Canvas (TLBMC) application on EVJA, represents the new tool that would need to integrate economic, environmental, and social value more explicitly into a holistic view of corporate sustainability. The TLBMC may offer the opportunity for managers to explicitly address a triple bottom line where each canvas layer is dedicated to a single dimension and together, they provide a means to integrate the relationships and impacts across layers. In the same way, that original BMC is used to understand how revenues overpass costs, the main objective of the environmental layer of the TLBMC is to appraise how the organization generates more environmental benefits than environmental impacts. That allows users to better understand where the organization's biggest environmental impacts lie within the business model; and provide insights into where the firms may focus their attention when creating environmentally-oriented innovations. The EVJA Environmental Life Cycle Layer (ELCL) consists of 9 blocks (see figure 2), as follows: 1) **Functional value**. The functional value describes the focal outputs of a service (or product) by the organization under examination. It emulates the functional unit in a life cycle assessment, which is a quantitative description of either the service performance or the needs fulfilled in the investigated product system (Rebitzer et al., 2004). For example, the functional unit of EVJA is the smart agriculture approach; 2) **Materials**. The materials component is the environmental extension of the key resource's component from the original BMC. Materials refer to the bio-physical stocks used to render the functional value. For EVJA, materials are first and foremost the sensors which represent the biggest part of its carbon footprint (key partner *Libelium*[8]). 3) **Production**. The production component extends the key activities component from the original BMC to the environmental layer and captures the actions that the organization undertakes to create value. Production for a manufacturer may involve transforming raw or unfinished materials into higher-value outputs. For EVJA, 80% of industrial processes refer to assembling system to make the sensors. 4) **Supplies and Outsourcing**. Supplies and out-sourcing represent all the other various material and production activities that are necessary for the functional value but not considered core to the organization. Like to the original BMC, the distinction here is between is considered core versus non-core to support the organization's value creation. In the available car-

[8] *Libelium* designs and manufactures wireless sensor network devices so that system integrators, engineering, and consultancy companies can deliver reliable Internet of Things (IoT), M2M and Smart Cities solutions with minimum time to market.

bon footprint data of the sensor's manufacturer, most of the supplies and outsourcing impacts such as silica components and energy are involved in the use phase. **5) Distribution**. As with the original Business Model (BM), distribution involves the transportation of goods. In the case of a service provider or a product manufacturer, the distribution represents the physical means by which the organization ensures access to its functional value. Thus, within the environmental layer, it is the combination of the transportation modes, the distances traveled, and the weights of what is shipped which is to be considered. As well, issues of packaging and delivery logistics may become important here. For EVJA, the distribution is for 70% internal via service providing and for physique devices external by trucks or express couriers, its impact more or less 20%. 6) **Use Phase**. The use phase focuses on the impact of the client's partaking in the organization's functional value, or core service and/or product. This would include maintenance and repair of products when relevant and should include some consideration of the client's material resource and energy requirements through use. Many electronic products incur use phase impacts when charging a device and using an infrastructure needed to support the network of users. For EVJA, the use phase consists of two elements. First, a client's carbon footprint has less impact. Second, the energy consumption is concentrated in the assembling phase. 7) **End-Of-Life**. End-of-life is when the client chooses to end the consumption of the functional value and often entails issues of material reuse such as remanufacturing, repurposing, recycling, disassembly, incineration, or disposal of a product. From an environmental perspective, this component supports the organization exploring ways to manage its impact through extending its responsibility beyond the initially conceived value of its products. For EVJA, end-of-life means addressing the impacts of its obsolescent devices consisting of silica sensors. The alternatives are the recovery and reuse of used devices (by replacing some components) and the regeneration (net of deteriorated ones).

Fig. 2: The EVJA Environmental Life Cycle Layer (ELCL)

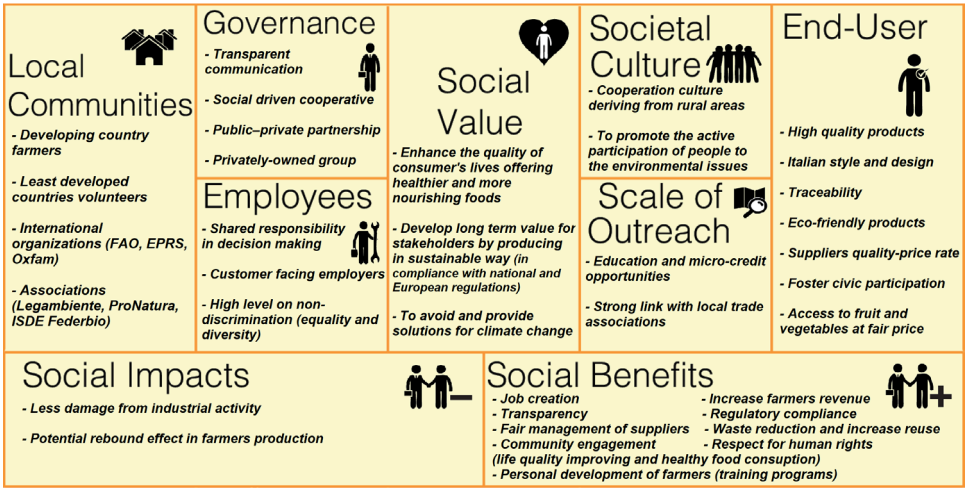


Source: own elaboration based on Joyce and Paquin's (2016) canvas.

8) **Environmental impacts**. The environmental impacts component addresses the ecological costs of the organization's actions. While a traditional BM often summarizes organizational impacts primarily as financial costs, the environmental impacts components extend that to include the organization's ecological costs. For EVJA, its environmental impacts are indirect for carbon footprint sensor production and silica consumption. Otherwise, are direct for the electromagnetic impact caused by wireless and radio wave transmission. 9) **Environmental benefits**. Similar to the relationship between environmental impacts and costs, environmental benefits extend the concept of value creation beyond purely financial value. It encompasses the ecological value the organization creates through environmental impact reductions and even regenerative positive ecological value. For EVJA, an example of this would be the no waste strategy (full device reuse). By evaluating environmental impacts with a life cycle based on renewable energy with carbon footprint savings (solar or wind energy for devices). A crucial facet of using the social layer of the TLBMC is to extend the original BMC through a stakeholder approach to captures the mutual influences between stakeholders and the organization. Also, this layer seeks to capture the key social impacts of the organization that derives from those relationships. Doing so provides a better understanding of where are an organization's primary social impacts and provides insight for exploring ways to innovate the organization's actions and business model to improve its social value creation potential. The practical application of EVJA Social Layer (SL) canvas is represented in figure 3 below. Leveraging the stakeholder approach discussed above, the nine components

of the social layer make up the third layer of the TLBMC and are as follows: 1) **Social value**. Social value regards the aspect of an organization's mission that focuses on creating benefits for its stakeholders and society more broadly. For sustainability-oriented firms, creating social value is likely a clear part of their mission. However, even the most profit-oriented organizations likely consider their value-creating potential beyond simply financial gain (Collins and Porras, 1996). For EVJA, the social value can be arguing through the roadmap for sustainable growth, enhancing the quality of consumer's life offering healthier and more nourishing food. A broader understanding of the company's social value can be extrapolated from its corporate business principles to develop a long-term value for stakeholders producing in a sustainable way and in compliance with national and European regulations. Lastly, to avoid and provide solutions for climate change. 2) **Employees**. The employees 'component provides a space to consider the employee's role as a core organizational stakeholder. Several elements may be included here such as amounts and types of employees, salient demographics such as variations in pay, gender, ethnicity, and education within the organization. As well, it provides a space for discussing how an organization's employee-oriented programs (e.g., training, professional development, additional support programs) contribute to the organization's long-term viability and success. EVJA's goals are to shared responsibility inside the firm in decision making and towards customer-facing employers.

Fig. 3: The EVJA Social Layer (SL)



Source: own elaboration based on Joyce and Paquin's (2016) canvas.

Thanks to EVJA's global reach and rapid growth, maintaining a positive workplace and strong customer relationships likely need to be considered a core part of its business. That is a high level of non-discrimination in terms of equality and diversity. 3) **Governance**. The governance component captures the organizational structure and decision-making policies of an organization. In many ways, governance defines which stakeholders an organization is likely to identify and engage with and how the organization is likely to do so (Mitchell et al., 1997). As a start-up business, EVJA has transparent communication as a social-driven cooperative. The governance is mixed by public and private partnerships although at the beginning the company started out as a privately owned initiative of an entrepreneurs' group. 4) **Communities**. While economic relationships are built with business partners, there are social relationships built with suppliers and their local communities. These two stakeholders come together as communities when aligning the three layers of the TBLMC. EVJA aims to help the developing country farmers and promote the volunteer cause in the least developed countries. Therefore, the EVJA actions affect both the international Organizations (FAO, EPRS, Oxfam) than national Associations (Legambiente, FAI, Isde Federbio, ProNatura). 5) **Societal culture**. The societal culture component recognizes the potential impact of an organization on society as a whole[9]. The culture of your company always determines success regardless of how effective your strategy may be. Torben (2014) pointed out the importance of the human factor in any company. No matter how detailed and solid your strategy is, if the people executing it don't nurture the appropriate culture, your projects will fail. EVJA, spreads the cooperation culture typical of rural areas and promotes the active participation of people in environmental issues. 6) **Scale of outreach**. The scale of the outreach describes the depth and breadth of the relationships an organization builds with its stakeholders through its actions over time. For EVJA, the scale of outreach is represented by growth in education for farmers operating with smart agriculture over the world. Its outreach also encompasses micro-credit programs for SMEs to encourage new sustainable business models. Therefore, it's crucial to a strong link with the local trade associations. 7) **End-users**. The end-user is the person who takes advantage of the value proposition. This block concern how the value proposition addresses the needs of the end-user, contributing to its life quality. For EVJA, the end-user often happens to be the customer who seeks high-quality products with Italian style and design. In the social canvas, EVJA tries to provide value by offering eco-friendly and traceable products with a high level of supplier's quality-price rate. Moreover, the company fosters

[9] *"Culture eats strategy for breakfast"*, a quote originated by Peter Drucker and made famous by Mark Fields, President at Ford, in this sense is exhaustive!

civic participation allowing access to fruit and vegetables at a fair price. 8) **Social impacts**. The social impacts component addresses the social costs of an organization. It complements and extends the financial costs of the economic layer and the biophysical impacts of the environmental layer. For EVJA, the social impacts could stem from the less damage rate of industrial activity but not considering the key partner (*Libelium*). Furthermore, could be considered, the potential of a rebound effect in farmers' productions, regarding conservation and energy economics (Grubb, 1990). 9) **Social benefits**. Social benefits are the positive social value-creating aspects of the organization's activities. This component is for explicitly considering the social benefits which come from an organization's actions. For EVJA, social benefits may include job creation, transparency, fair supplier management, community engagement, that is the improvement of life quality and promoting healthy food consumption. Moreover, the increasing revenues for farmers, the regulatory compliance, the waste reduction (raising the reuse), respect for human rights, and the personal development of farmers through the training programs.

5. Discussions

The main benefits of EVJA ELCL (Environmental Life Cycle Layer) derive from a vast set of data (temperature, relative humidity, deficit of vapor pressure, leaf wetness, solar radiation, carbon dioxide concentration, and soil moisture) that are continuously collected, submitted to a local control unit, and processed through algorithms specifically developed for different crops. On the other hand, farmers can access EVJA from their PC and mobile devices, and they may monitor complex agronomic data analysis presented in a user-friendly interface. The ELCL consists of sensors managed by software that is aimed at making the farmers' jobs more efficient and in an ecological way. Some smart farming products focus on robotics, machine automation, location technology, or data analysis. ELCL is based on IoT systems and assure precision farming. This latter follows a four-step cycle that starts with the plants monitoring via sensors, followed by the diagnostics of the collected data, and ending either with the decision-making of the farmer or with the activation of another system. For example, in automatic irrigation systems connected to the precision farming platform. The result is a more controlled crop cycle, with plant and weather conditions monitored meter by meter, and a more accurate intervention by the farmers, with action undertaken only when it is really needed. The advantages are significant: 1) fewer pesticides and fertilizers are used; 2) irrigation is more efficient, and 3) the final product is healthier and more abundant. This goal is achieved with minimum impact on the environment, leading

to a win-win situation for the farmers, consumers, and the environment. The EVJA sensors help farmers to optimize the usage of chemical products and water in this way facilitate reuse and waste reduction. By using IoT and artificial intelligence (Jha, 2019), EVJA allows farmers to monitor their fields in real-time, wherever they are. EVJA gathers data from a network of customizable sensor nodes connected to servers, which can fully operate with radio frequencies. The EVJA system is based on a Software as a Service (SaaS) model, which offers an array of features, including real-time monitoring, forecasting, management, business intelligence, and social features like chat and media sharing (Loret et al., 2020). Farmers can monitor and manage everything, in each field, directly from their desktop, tablet, or smartphones. They can mark every event, like an above-average harvest, and go through the history to see trends and correlations between such events and the key factors registered by the sensors. If a field worker identifies a plant (or leaf) affected by a parasite, they can take a picture and share it with the agronomist (through OPI proprietary patented device) in order to check the disease type and take immediate action. IoT has the potential to monitor irrigation and productivity, and the data gathered by IoT sensors can to provide information about the overall performance of the crops. The EVJA impact on the environment is very strong, the main innovation counts as the first predictive algorithm for horticultural products in the European Union, while the direct competitors commercialize solutions that address generally all types of crops, without focus and verticalization on specific crops and weak results. On the other hand, greenhouse monitoring systems are often designed for fully climate-controlled environments, closer in concept to a scientific laboratory than a farmhouse, while EVJA's "rugged" sensor nodes are designed to be handled roughly, in any kind of working conditions. The main features characterizing the EVJA (ELCL) system are a) *technological*: the integration with advanced predictive models; b) *product*: the bundling of hardware and software in a single solution, which allows for a seamless user experience; and c) *business*: the high scalability of EVJA, which allows for targeting agricultural businesses anywhere in the world. In addition, also the EVJA social impacts are very important and they are represented in the EVJA Social Layer (SL) Canvas. EVJA gives training slots to better explain how the system works and how farmers can use it to rationalize their activities and spearhead resources. The basic EVJA functions to works need just temperature, humidity, leaf wetness, and solar radiation sensors. However, the entire system is easily customizable, and new sensors can be added depending on the user's requests. EVJA is equipped with several generic functions that are useful for defining plant status and needs, keep parasites under control and improve the leaf well-being. Consequently, this also causes positive impacts on the consumer by improving the life quality and promoting a citizen commitment towards

more sustainable agriculture. Therefore, using the EVJA interface, the local communities can check the conditions of a crop in real-time. The system allows fixing thresholds for temperature, humidity, leaf wetness, solar radiation, and other customizable observables (depending on the kind of sensors mounted on the device). For the end-users offers high-quality products (e.g., in case of safety thresholds are exceeded, the system sends a warning email to the farmer). The EVJA system processes data in order to calculate the functions that are fundamental for depicting a clear picture of the plants' health status, such as dew point, Vapour Pressure Deficit (VPD), Growing Degree Days (GDDs), and evapotranspiration (Loret et al. 2019). Moreover, water wastage in agriculture and excessive fertilization are two important issues in present-day agriculture. Problems related to the excessive and non-rational use of nitrogen fertilizers are related both to the accumulation of nitrates and nitrites in soil and plants as well as to the leaching of these nutrients to ground and surface water. While nitrates and nitrites in food are precursors of carcinogenic substances to humans, from an environmental point of view, a high concentration of these ions in water sources favours the phenomenon of eutrophication. Management of water and nitrogen fertilizers in agriculture are strongly interconnected practices: the optimal absorption of fertilizers by plants depends mainly on temperature and soil moisture. EVJA is being upgraded with a dynamic forecasting model that simulates the mineral nitrogen content in the soil within an integrated sensor-based irrigation system that provides data on atmospheric climatic conditions, integrated with soil moisture, soil temperature data, and weather forecasts. This will potentially be a key tool for high-tech agriculture aiming to reduce the adverse environmental impacts thereof. The system eliminates the difficulties in reading and interpreting data, facilitating the involvement of farmers in the field, who will receive real-time updates on soil water content and crop water needs directly on their mobile device, allowing for effective and efficient interventions. The system will acquire data from wireless soil moisture sensors to run computer simulations, which are validated through chemical analysis of the soil to determine the actual nitrogen content in its different forms (total, organic, nitrate, and ammonium, which may be quantified through more advanced sensors).

6. Research limitations

The major limitations of this contribution are related to the theoretical nature of the study and the qualitative enquire. Moreover, it is associated with a case study approach (Eisenhardt and Graebner, 1989; Feagin et al., 2001; Yin 2017) and qualitative methods during the first explorative step.

A case study approach is the most suitable in situations where the main research questions are depicted (Yin, 2011), and is also known as a method where data triangulation is often used to increase the quality of the study. Instead of using sampling methods, the case selection maximizes what can be learned in the period of time available for the study. Yin (2013) claims multiple case studies may be better than a single case study. In this study, only one case is analysed for gaining in-depth knowledge on sustainable business model innovation. The other limitation is the exploratory nature of this research. Exploring a relatively new research field on strengths and limitations based on theoretical and practical investigation leads to a broad view of the topic. The wide aim of the research gives a lot of information but statements about relationships and causalities cannot be made. To investigate the topic in higher detail, empirical research should be conducted to find the effects of the Triple-Layered Business Model Canvas (TLBMC) on specific topics or other industries. In addition, while the TLBMC offers a novel approach for analysing and conceptualizing sustainability-oriented innovation and sustainable business models, there are also some clear limitations to consider. One, the TLBMC is simply a tool. It does not do the work of exploring and assessing potential innovations. Furthermore, a limitation could be the small sample size of four interviews and four focus groups. This leads to a low external validity of the results. To cope with this limitation, future research is recommended to investigate different strengths and limitations on a larger scale directed at specific strengths and limitations.

7. Conclusions and managerial implications

Today, more than ever, it is necessary to rethink our habits in daily life so that virtuous behaviours prevail, both towards ourselves and others and towards the environment. This paper wants to contribute to the existing research on sustainable business models by providing a framework in the form of the TLBMC to enable a triple bottom line perspective to sustainability that of economic, environmental, and social impact applied to a business model. Therefore, the TLBMC expands the economic BM's approach to developing environmental and social canvas layers based on lifecycle and integrating stakeholder perspectives into an extended BMC. This expanded canvas moves towards more engaging and holistic perspectives on sustainability-oriented BMI. The TLBMC could have the capacity to help those searching for ways to change firms and organizations for sustainability (Joyce et al., 2015). The patented EVJA system (OPI) is currently working with top Italian farmers and monitoring more than 600 hectares.

Using EVJA devices, farmers have been able to substantially reduce

the number of chemical treatments required to hold off parasites and to save a large amount of water. Moreover, such intelligent management of chemicals and water saves important economic resources. Everyone becomes an active part of a new process aimed at achieving more sustainable economic, social and environmental development. First of all, implementing policy actions to support the business in terms of demand and consumption are needed immediately, to trigger a virtuous circular path. But implementation policy actions are also needed to incentivize companies to adopt new business models with an approach to sustainability and social responsibility in their commercial operations and in their relationships with stakeholders. With an increasing population, a growing middle class, and intensive resource use, our current ways of living and doing business are unsustainable. BMI can allow SMEs to change radically processes, products, and organizational forms in order to assimilate sustainability into their core business more successfully. Next to the implementation of innovative technology, sustainable development based on innovative business models, better understating of customer needs and behavioural change are crucial.

8. Directions for future research

The spreading of agriculture 4.0, also called smart farming, is linked to what was happened with industry 4.0. The rising of big data, drones and the Internet of Things (IoT)[10] will activate increasingly processes of innovation and connection between products and production, territory and environment, logistics and retailing network. Smart agriculture and precision farming (or precision agriculture) are technologies that increasingly shaping the agriculture industry. Following slavishly the guidelines suggested by FAO, became necessary to experiment with new cultivation methods and implement a sustainable approach to agriculture in order to meet the growing food demand by consumers. Furthermore, the new perspective based on data science (and its relationship to big data) and data driven decision making (Provost and Fawcett, 2013) offers predictive solutions that could ensure indications on where, when, and how to operate in a more efficient and effective manner. Therefore, smart farming based on novel technologies (software applications, IoT sensors, data analytics, and end-user services) inspires new scenarios and the generation of sustainable business models. In addition, farmers have more accurate and real-time-generated sets of information to compare with old data, as well as cross information, 's on environmental factors and benefits from fertilizing process

[10] We can refer to IoT devices and drones for data collection in agriculture.

or products. Collecting data via the cloud and open-access platform isn't the only step towards smart farming. It's necessary to elaborate and processing datasets by machine learning and algorithms that can, if properly trained, generate future predictions and, consequently, provide precision feedbacks to make data-driven decisions for the agriculture industry. In the near future, EVJA plan to add many useful functions and algorithms in order to improve the service quality provided to the users: multi-spectral and hyper-spectral analysis to directly monitor plants' health; intelligent insect traps to keep track of many dangerous species; and a novel predictive model for the *Fusarium graminearum* fungus for adapting the EVJA system to work on outdoor crops (specifical cereals). Future research should be aimed at optimizing business model tools that maximize the strengths and adapt to the limitations of the BMC. To acquire an improved tool should be done a dept case research of different successful TLBMC. This research should be focused on the elements in the TLBMC which are seen as essential and as important for a company's success and which considers the strengths and limitations of this research. A research question could be: *"What are the essential elements of a sustainable business model and what kind of impacts in terms of environmental and social facets have on the success of business model?"*. Another suggestion for future research could be to achieve a sustainable business model integrating diagnostic indicators for each block (e.g., KPI) and by recurs to the accounting standards (Akisik and Gal, 2011) to measure some positive and negative aspects of TLBMC. The factors volatility outside and inside an organization can push to change a business model, without a system monitoring (TLBMC dashboard reporting) could be difficult to prevent potential risks (Gaug and Pascarelli, 2008). A further research question could be: *"What can be improved in the TLBMC blocks to adapt to internal and external changes over time?*

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Appendix

Tab. 1: The main existing literature on Business Model and Business Model Innovation

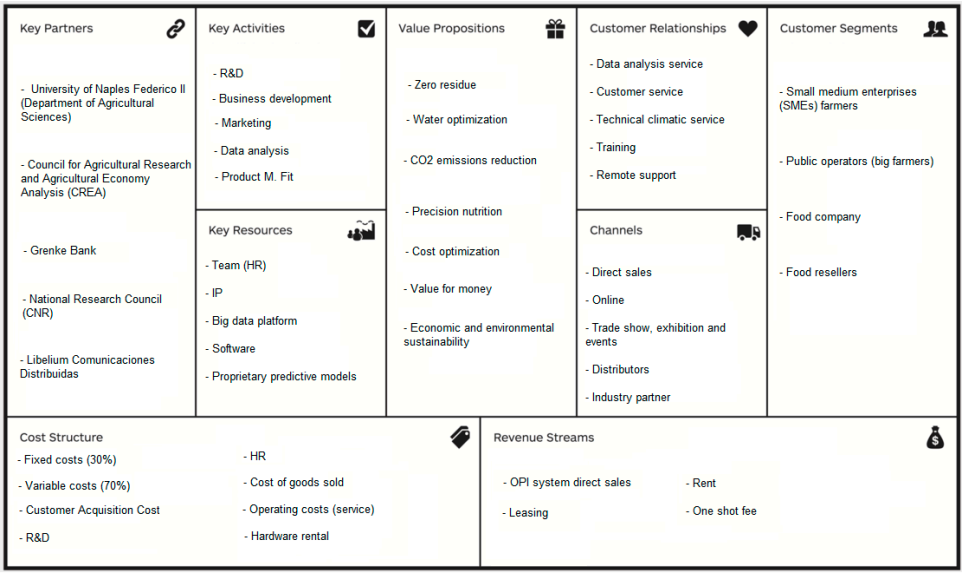
Authors	Focus	Main empirical evidences
Chesbrough et al., (2002)	The role of the business model in capturing value from innovation	*«This paper explores the role of the business model in capturing value from early-stage technology. A successful business model creates a heuristic logic that connects technical potential with the realization of economic value. The business model unlocks latent value from a technology, but its logic constrains the subsequent search for new, alternative models for other technologies later an implicit cognitive dimension overlooked in most discourse on the topic»*
Chesbrough, (2007)	Business model innovation: it's not just about technology anymore	*«… shortening product lives mean that even great technologies no longer can be relied upon to earn a satisfactory profit before they become commoditized. Today, innovation must include business models, rather than just technology and R&D. Business models matter. A better business model often will beat a better idea or technology. Consider Wal-Mart in retailing, Dell in PCs, or Southwest Airlines. But business models are not all the same. To innovate your business model, you must first understand what it is, and then examine what paths exist for you to improve upon it.»*
Johnson et al., (2008)	Reinventing your business model	*«A successful model has these components: customer value proposition, profit formula and key resources and processes. To determine whether your firm should alter its business model, Johnson, Christensen, and Kagermann advise these steps: 1. Articulate what makes your existing model successful; 2. Watch for signals that your model needs changing, such as tough new competitors on the horizon and 3. Decide whether reinventing your model is worth the effort. The answer's yes only if the new model changes the industry or market»*
Lindgardt, et al., (2009)	Business model innovation. When the Game Gets Tough, Change the Game	*«Business model innovation is especially valuable in times of instability. BMI can provide companies a way to break out of intense competition, under which product or process innovations are easily imitated, competitors' strategies have converged, and sustained advantage is elusive. It can help address disruptions such as regulatory or technological shifts that demand fundamentally new competitive approaches. BMI can also help address downturn-specific opportunities, enabling companies, for example, to lower prices or reduce the risks and costs of ownership for customers. In our experience, the companies that flourish in downturns frequently do so by leveraging the crisis to reinvent themselves rather than by simply deploying defensive financial and operational tactics. Moreover, during times of crisis, companies often find it easier to gain consensus around the bold moves required to reconfigure an existing business. BMI may be more challenging than product or process innovation, but it also delivers superior returns»*
Casadesus-Masanell et al., (2010)	Competitiveness: business model reconfiguration for innovation and internationalization	*«The paper reflects on competitiveness by using the business model concept and to understand the need to adapt business models to changes in the environment»*

Chesbrough, (2010)	Business Model Innovation: Opportunities and Barriers	*«Business model innovation is vitally important, and yet very difficult to achieve. The barriers to changing the business model are real, and tools such as maps are helpful, but not enough. Organizational processes must also change. Companies must adopt an effectual attitude toward business model experimentation. Some experiments will fail, but so long as failure informs new approaches and understanding within the constraints of affordable loss, this is to be expected-even encouraged. With discovery driven planning, companies can model the uncertainties, and update their financial projections as their experiments create new data. Effectuation creates actions based on the initial results of experiments, generating new data which may point towards previously latent opportunity»*
Osterwalder et al., (2010)	Business Model Generation: A Handbook for visionaries, game changers and challengers	*«Formal descriptions of the business become the building blocks for its activities: infrastructure (key activities and resources, partner network); offering (value propositions); customer segments, channels; customer relationships; finances (cost Structure and its characteristics); revenue streams. Many different business conceptualizations exist; Osterwalder's work and thesis propose a single reference model based on the similarities of a wide range of business model conceptualizations. With his business model design template, an enterprise can easily describe their business model»*
Zott et al., (2010)	Business Model Design: An Activity System Perspective	*«The authors conceptualize a firm's business model as a system of interdependent activities that transcends the focal firm and spans its boundaries. The activity system enables the firm, in concert with its partners, to create value and also to appropriate a share of that value. They suggest two sets of parameters that activity systems designers need to consider: design elements content, structure and governance that describe the architecture of an activity system; and design themes novelty, lock-in, complementarities and efficiency that describe the sources of the activity system's value creation»*
Markides, (2013)	Business model innovation	*«Redefine the business. Redefine the who. Who is our customer? A company should think of new customers or new customer segments and develop a game plan that serves them better. Redefine the what. What products or services are we offering these customers? A company should think of new customer needs or wants and develop a game plan that better satisfies these needs. Redefine the how. Companies should leverage existing core competencies to build new products or a better way of doing business and then find the right customers. Start the thinking process at different points. For example, instead of thinking, "This is our customer, this is what he or she wants, and this is how we can offer it," start by asking: "What are our unique capabilities? What specific needs can we satisfy? Who will be the right customer to approach? »*

Björkdahl et al., (2013)	Business model innovation the challenges ahead	*«A business model innovation can include a process innovation, a new revenue model or other types of innovation. Therefore, we argue that a business model innovation is a new integrated logic of how the firm creates value for its customers (and users) and how it captures value. In this view, a business model innovation is not a 'mere' product or service innovation, nor is it a process innovation. In the general case, a business model innovation may include new ways for the firm to create value and new firm offers, new ways for the customers to view the firm's offers (positioning innovation), changes to how the firm views its activities (paradigm innovation) and operations (process innovation). Thus, a business model innovation is a new integrated logic of value creation and value capture, which can comprise a new combination of new and old products or services, market position, processes and other types of changes»*
Foss et al., (2017)	Fifteen years of research on business model innovation: How far have we come, and where should we go?	*«We argue that the literature faces problems with respect to construct clarity and has gaps with respect to the identification of antecedent conditions, contingencies, and outcomes. We identify important avenues for future research and show how the complexity theory, innovation, and other streams of literature can help overcome many of the gaps in the BMI literature»*
Anwar, (2018)	Business model innovation and SMEs performance does competitive advantage mediate?	*«...this study examines the importance of BMI in SME performance and the mediating role of competitive advantage. Data were collected through structured questionnaires using a sample size of 303 manufacturing SMEs operating in the emerging market of Pakistan. Hypotheses were tested through Structural Equation Modelling (SEM) using AMOS.21. The results indicate that BMI has a significant positive impact on competitive advantage and SME performance. Competitive advantage partially mediates the relationship between BMI and SME performance. Firms are required to create an effective business model to acquire competitive advantage and superior financial performance. Implications for practice have been discussed.»*
Ghezzi et al., (2020)	Agile business model innovation in digital entrepreneurship: Lean startup approaches	*«Digital startups in the early stages of their development frequently undergo innovation to their value architecture and Business Model. A set of pragmatic methods drawing on lean and agile principles has recently been proposed to support digital entrepreneurs facing Business Model Innovation (BMI), known as Lean Startup Approaches (LSAs). (…) our study draws on an exploratory multiple-case study based on three digital multisided platform startups to craft a unified framework that can disclose the relationship between BMI, LSAs, and Agile Development (AD), within the context of Strategic Agility. Our findings,» which emerge from the unified framework, show that LSAs can be employed as agile methods to enable Business Model Innovation in Digital Entrepreneurship.*

Source: own elaboration.

Fig. 1: The EVJA Business Model Canvas



Source: own elaboration based on Osterwalder and Pigneur's (2010) canvas.

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THE IMPACT OF BLOCKCHAIN ON SMES' SUSTAINABILITY. THE CASE OF AN APULIAN WINE COMPANY

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Abstract

The Italian business system, characterized mostly by the presence of SMEs, makes interesting the analysis of the tools that promote their growth, including through investments in new digital technologies. Among these, the blockchain has the potential to ensure greater transparency of business processes, supporting their competitiveness and sustainability. SMEs show an attitude of closure towards the digitization process, very often neglecting the benefits both in terms of economic-financial performance and improving competitiveness and corporate sustainability. In light of the limited theoretical contributions on the subject, this study aims to analyze the relationship between sustainability and digital technologies in SMEs, analyzing a case study operating in the wine sector. The results show an increasing attention of SMEs to digital innovation, recognizing their potential advantages in terms of improving corporate sustainability policies.

1. Introduction

Blockchain is an emerging technology potentially capable of revolutionizing the way companies operate by modifying traditional business models (Überbacher et al., 2020; Zalan, 2017). This technology benefits from the unchangeable nature of annotated records and facilitates disintermediation (Crosby et al., 2016) by allowing suppliers to negotiate directly with customers, avoid reconciliations, track resources efficiently and ensure data integrity (Lacity, 2018). Therefore, it is considered a valid support tool for the pursuit not only of economic and financial objectives (Hughes et al., 2019; Lemieux, 2016; Morkunas et al., 2019) but also of corporate sustainability objectives (Adams et al., 2018; Nayak & Dhaigude, 2019). In terms of sustainable performance, blockchain can guarantee respect for human rights and fair and safe working practices by tracing possible social and ecological conditions that could interfere with safety, health or the environment (Adams et al., 2018).

In light of consumers' growing concerns about environmental issues, companies have become increasingly interested in digital technologies, recognizing their instrumentality for obtaining economic and sustainable advantages to the entire business. However, these advantages seem only to apply to large companies: small and medium-sized enterprises (SMEs) find it more difficult to implement new digital technologies (Crosby et al., 2016; Lemieux, 2016; Überbacher et al., 2020; Yli-Huumo et al., 2016).

Although SMEs are characterized by a structural flexibility that allows rapid adaptation to changes (Ritchie & Brindley, 2005), the number of SMEs that have decided to start a digital transformation process is very small (Dawn et al., 2002; Houghton & Winklhofer, 2004; Smallbone et al., 2003). Some main causes of the low interest in the adoption of new technologies are an absence of individuals with the necessary professional background (Oyelaran-Oyeyinka & Lal, 2006), a high level of risk aversion and insufficient financial resources to support investments in innovation (Lal, 2007).

For these reasons, as well as a lack of knowledge about potentials advantages, SMEs are reluctant to commit to digital transformations (Bi & Cochran, 2014), very often missing out on advantages in economic-financial performance, competitiveness, and corporate sustainability.

However, the importance of SMEs to the economic and social development of several countries—particularly Italy, where more than 90% of enterprises are SMEs (Prometeia, 2019)—makes it interesting to analyse the impact of new technologies, blockchain in particular, on sustainability. In this study, we investigate sustainability through its three criteria: environmental, social and governance (ESG) (Buallay, 2019; Drempetic et al., 2019).

Nowadays, most studies focus on the potential advantages of blockchain, and only a few examine how this technology can support companies in

pursuing sustainability objectives (Massaro et al., 2020). The present study intends to fill this gap, and it focuses on understanding the degree of technological knowledge by analysing a case study from the wine sector, which is particularly interested in the development of blockchain applications. By bringing real-life evidence to light through case analysis, we are able to make a contribution both to the theory and practice of sustainable business model development. These practical contributions lie in being able to offer market operators elements for appraising effects on the traceability of products and in posing some preliminary ideas about how the adoption of blockchain can support sustainable development strategies.

This work is structured as follows: section 2 presents the literature review; section 3 describes the development of the research questions; section 4 outlines the the research methodology; section 5 discusses the results, deepening in the perception of users of the technology and the impact of blockchain on corporate sustainability; and section 6 presents the conclusions drawn from our investigation.

2. Technological innovation and sustainability in SMEs: a literature review

2.1. Technological innovation and SMEs

A recent Prometeia study (Prometeia, 2019) reports that SMEs are the engine of Italian economic growth: SMEs make up 92% of active businesses and 82% of employment, a percentage that is well above the EU average. Despite being the driving force behind the economy of Italy, small and medium-sized Italian companies, especially those in the south, continue to occupy marginal positions in the world of international business, an absence that is mainly due to SMEs' lack of investment in innovation (De Felice et al., 2007). Artificial intelligence, big data, blockchain and the Internet of things have all contributed to the advent of a Fourth Industrial Revolution (or Industry 4.0), which currently represents a significant challenge for companies operating in all sectors (Schwab, 2016). The spread of new digital technologies has radically transformed every aspect of corporate life and, more generally, the way of doing business (Jovanović et al., 2018). In particular, changes have been observed in operating processes (Maresova et al., 2018), in the way activities are conducted within industrial value chains (Parida et al., 2019) and in the promotion and marketing of products. Although the prior literature portrays SMEs as having greater flexibility from a structural and process point of view (Ritchie & Brindley, 2005) - a flexibility that facilitates their ability to respond and adapt to changes - the number of sSMEs that has benefited from digital transformation is

very small (Dawn et al., 2002; Houghton & Winklhofer, 2004; Smallbone et al., 2003). By digital transformation, we mean the application of digital capabilities to processes, products and resources (Schmarzo, 2017) in order to make business processes more efficient, increase customer value and minimize the risks associated with business. SMEs, unlike large companies, tend to show a low propensity towards the adoption of new digital technologies, mainly due to inadequate organizational skills (Markus & Robey, 1988; Whyte et al., 2002) causing a not fully efficient use of innovation, even at the implementation level (Anderson & Schaan, 2001; O'Farrell & Miller, 2002). The absence of figures with the professional backgrounds necessary for the achievement of digital transformation could compromise companies' competitiveness and durability (Oyelaran-Oyeyinka & Lal, 2006). Investment in the employee training process increases companies' ability to implement digital transformation (Lundvall et al., 2002; Malerba, 1992) since inadequate knowledge of digital tools frequently contributes to these low adoption rates (Houghton & Winklhofer, 2004). However, the lack of experience and Information and Communication Technologies (ICT) skills on the part of those responsible for business management (OECD, 2019), the high level of risk aversion and the limited availability of financial resources are the factors that limit investment in research and development and, consequently, the growth of SMEs (Lal, 2007). In order to benefit from digital transformation, companies must invest in technology and put into effect any organizational or managerial changes that may be required by these technologies. Smaller companies often have a capital endowment that cannot guarantee the financing of investment projects in corporate growth. In addition, the excessive traditionalism and conservatism that characterizes the culture of small businesses, especially family businesses (Sharma et al., 1997), negatively affects their ability to innovate. Other limits to the digital transformation of SMEs include risk aversion, which severely restricts growth and innovation, and the closure of capital, which has negative implications for a company's investment capacity (Peake & Marshall, 2017; Raymond, 2005; Songini & Gnan, 2013).

As mentioned above, there are countless barriers to the adoption of new technologies by small enterprises, but the process of adoption of new technologies is very fast. This acceleration is linked to a high level of flexibility and adaptability to change (Chrisman et al., 2015; Classen et al., 2014). Indeed, despite being more rooted in tradition and less capable of innovation than larger companies, many small businesses have begun to move towards digitalisation (Beugelsdijk et al., 2018; Duran et al., 2016). At the same time, some highly innovative small firms are attached to tradition.

They are particularly able among business in general to internalise and reinterpret their historical knowledge and re-contextualise it within the current and digital scenario. In other words, these companies do not dis-

sipate their past knowledge but rather diffuse it within the company (Miroshnychenko et al., 2020; Suddaby & Jaskiewicz, 2020). The real challenge to supporting small business innovation is identifying the mechanisms behind their decisions and behaviours, which are different from those of other types of companies (Erdogan et al., 2020).

Digital technologies, in addition to promoting greater production flexibility, contribute significantly to the reduction of costs and the creation of high-quality products, allowing SMEs to achieve ever greater competitive strength (Oyelaran-Oyeyinka & Lal, 2006). In addition, there are advantages for automation and process optimization, with regards to time savings, error reduction, risk resources and corporate sustainability (Grubic & Jennions, 2018). However, according to some studies, SMEs do not always recognize the added value deriving from the application of new technologies (Bi & Cochran, 2014), and the tendency to formulate short-term strategies severely limits the medium-to-long-term investments required for the adoption of new technologies (Mintzberg & Waters, 1982). To fully reap the benefits of Industry 4.0, management should interpret these investments not as a cost but as an opportunity to improve their business models, productivity and corporate competitiveness (Moeuf et al., 2017).

2.2. The role of blockchain technology in SMEs' sustainable development

Blockchain is traditionally dated to the publication of a 'white paper' by Satoshi Nakamoto (Nakamoto, 2008), in which he introduced a peer-to-peer version of bitcoin. Technically, 'block chain' indicates a series of transactions recorded on a public virtual database, decentralized and shared among all users without the intervention of third parties to validate the operations (Drescher, 2017; Hughes et al., 2019; Lacity, 2018). Transactions are grouped into blocks, and the set of all blocks forms a chain. Therefore, blockchain describes a logical sequence of transactions with the addition of new blocks being validated by a combination of peer-to-peer networks, consensus and encryption mechanisms to ensure the integrity of the data entered (Feng et al., 2018; Guo & Liang, 2016). The smart contract, one of the key features of blockchain, allows agents to conduct an authenticated transaction without the involvement of third parties by automatically checking whether the contractual terms are respected (Delmolino et al., 2016).

In Distributed Ledger Technology (DLT), users can be anonymous ('permissionless blockchain') or visible ('permissioned blockchain'). Public and private networks fundamentally differ in their access to the ledger.

In a public network, all peers have access to the ledger and participate in transactions independently, while in a private network, participants need permissions to keep the copy of the ledger and participate in confirmation transactions. In the latter case, consent, or permission to write the

blocks in the chain, is entrusted to one ('private') or more subjects ('consortium') who perform the function of validator (Dicuonzo et al., 2020).

Blockchain technology has the potential to gradually, but significantly, revolutionize the way companies operate (Überbacher et al., 2020; Zalan, 2017). The decentralization of the database allows for high transaction volumes and the disintermediation of processes (Crosby et al., 2016). In line with these considerations, blockchain has all the characteristics to enable companies to not only reach economic-financial goals but also sustainability goals (Adams et al., 2018; Nayak & Dhaigude, 2019). Indeed, the ability of blockchain to create new sustainable business models is recognized (Nowiński & Kozma, 2017), although studies in this area are still limited (Massaro et al., 2020).

The three main components of sustainability represented by economic, social and environmental dimensions make up the well-known triple bottom line (Bebbington & Unerman, 2018). In order to contribute to the creation of sustainable industrial value, new technologies, including blockchain, must intervene in the three dimensions of sustainability, which would lead to a transformation of business models and management of business processes(Di Vaio & Varriale, 2020).

Economic benefits are easy to observe, as there are several cases that show that blockchain is useful for increases the wealth of companies (Hughes et al., 2019; Lemieux, 2016; Morkunas et al., 2019). Tracking likely environmental and social situations that could create an environmental, social, safety or health risk is a crucial blockchain characteristic (Adams et al., 2018). For example, a clear chronology of the history of products could allow consumers to evaluate the origin and ethics of the product, and efficient energy systems like Echchain and ElectricChain could help reduce greenhouse gas emissions (Futurethinkers, 2017). By implementing blockchain technology, product authentication that is respectful of the environment can be carried out at any level and in real time, promoting customer loyalty and trust in the company. Environmentally conscious consumers can monitor goods along the entire supply chain, thereby verifying whether the company pursues sustainable practices. Through the implementation of blockchain, all products can be tracked, allowing interested consumers to access not only information relating to the current state of the product but also to the product's history (Provenance, 2015). Each product will be assigned a digital identification (Abeyratne & Monfared, 2016), and the use of smart contracts will allow only network participants to modify information, such as product ownership, value-added services, certifications, quantities, quality, locations, etc. (Abeyratne & Monfared, 2016). Blockchain will uphold the upstream and downstream flows of material and information in a reliable and transparent way, the positive results of which are higher levels of customization, reduced surveillance costs and

holistic management practices to serve the customers (Tian, 2016; Wong et al., 2020).

Despite the advantages of the implementation of distributed technology, major obstacles remain to its adoption, especially in SMEs—obstacles having to do with technology, behaviour and organization (Crosby et al., 2016; Lemieux, 2016; Überbacher et al., 2020; Yli-Huumo et al., 2016).

Instrumental to the application of blockchain technology is solid collaboration along the entire supply chain, achievable with leadership capable of motivating all the partners involved. Organizations must also have a adequate knowledge of technology and its potential and a propensity for investing in innovation (Hastig & Sodhi, 2020).

3. Research questions

The importance of SMEs for the economic and social development of our country makes it interesting to analyse the tools that could help enhance their growth. Digital technologies are currently an important means of consolidating a company's competitive advantage, requiring profound changes to business models (Jovanović et al., 2018; Moeuf et al., 2017) for the obtainment of benefits in costs, quality of products and improved economic, financial and capital performance as a whole (Morkunas et al., 2019; Peake & Marshall, 2017; Raymond, 2005; Songini & Gnan, 2013).

Despite the many advantages, the percentage of SMEs that have embarked on a path of digital transformation is very small (Dawn et al., 2002; Houghton & Winklhofer, 2004; Smallbone et al., 2003). In addition, not implementing courses to increase knowledge of digital innovations (OECD, 2019) strongly limits the adoption rates of such tools (Houghton & Winklhofer, 2004). SMEs are therefore not always able to recognise the benefits of a digital transformation process (Bi & Cochran, 2014; Hastig & Sodhi, 2020).

In line with these theoretical premises, we formulate the following research question:

Rq (1): Do SMEs recognise the benefits of new digital technologies?

Even with the potential difficulties faced by SMEs in the digitalization process, new digital technologies has the ability to transform traditional business models, change business strategies and revolutionize managers' mental paradigms (Hughes et al., 2019; Morkunas et al., 2019). Distributed ledger technology (DLT), which includes blockchain, has all the characteristics that would enable companies to achieve profitability and sustainability goals (Bebbington & Unerman, 2018; Di Vaio & Varriale, 2020), both of which are linked to the balance between economic objectives and the use

of internal, environmental and social resources (Nayak & Dhaigude, 2019). More specifically, sustainability is understood in terms of performance on environmental, social and governance levels.

The environmental sphere includes a company's ability to efficiently use resources in its processes, leading to a reduction in environmental impacts. The social dimension expresses a company's ability to promote ethical values and relationships of trust and collaboration among employees, while also respecting human rights. The last factor, governance, refers to a company's ability to act in the interest of its shareholders through corporate management systems and processes (Buallay, 2019; Drempetic et al., 2019).

Blockchain promotes the integration of the environmental and ethical-social dimensions with the needs of competitive and entrepreneurial development.

Tracking likely environmental and social situations that could create an environmental, social, safety or health risk is a crucial application of blockchain (Adams et al., 2018).

Considering how limited investigations into this topic have been, this study aims to expand upon the literature dealing with blockchain to create a tool for facilitating the creation of sustainable business models in the agri-food sector. We seek to fill the gap highlighted by Massaro et al. (2020) by answering the following research question:

Rq (2): How can blockchain technology support SMEs in achieving sustainable goals?

4. Methodology

To answer our research questions, we used the methodology of the case study (Yin, 2014), a methodology that is recommended for studying phenomena that are still unexplored (Eisenhardt, 1989), such as the impact of new digital technologies on the sustainability of SMEs. This methodology also ensures a high level of understanding of the complex reality examined (Berg, 2004).

We chose a single case study, which we considered one of the most representative cases of the application of blockchain in the wine industry.

Blockchain technology is not yet fully mature, and this case analysis is exploratory, providing preliminary explanations to our research question, and warrants further investigation in subsequent empirical studies.

4.1 Research context

Torrevento, a company based in the Apulia region, was founded in 1400 and meets the requirements of SMEs established by the EU Recommendation 2003/361/EC, which restricts SMEs to those companies employing 50 to 250 employees with a revenues of 10 to 50 million euros and a total assets of 10 to 43 million euros. Torrevento is one of the largest companies in the regional wine scene: it has an annual production of several million bottles, owns 250 hectares of vineyards and manages an additional 200 hectares in different parts of Apulia. The agri-food sector has always been the engine of economic development in Apulia due to excellent and diversified local production , which respects tradition and offers high quality, safe and sustainable products (Assessorato alle Risorse Agroalimentari, 2013). Dairy products, extra virgin olive oil, wine, baked goods and food pastes are among the products typically attributable to the region. Recently, Apulia has promoted the recognition of new districts - among them, the South East Barese food district -, which helps preserve the territory through sustainable local development. As shown by a survey of the Italian wine sector conducted by Mediobanca (April 2020), Apulian wineries recorded an increase in revenues of 7.5% from 2017 to 2018. The simultaneous expansion of investments (ISTAT, 2019) in artificial intelligence, blockchain and the Internet of things (IoT) has also fostered the competitive strengthening of many SMEs in Apulia that, thanks to the traceability of the food supply chain, guarantee the purchase of products fully adherent to the requirements for the 'Made in Italy' label.

Torrevento's vision has always been native vine recovery, expression of the territory and enhanced heritage in order to produce inimitable and competitive products. In keeping with the winemaking tradition, the company has always adopted production policies focused on organic viticulture, which are environmentally friendly. Torrevento is one of the first companies in Apulia to have implemented blockchain for the traceability of its products, so it represents an opportunity to capture the effects of technology on the social, environmental and economic dimensions of sustainability. As early adopters of blockchain, Torrevento management is aware of the challenges to implementing the technology and has already assessed the advantages and disadvantages associated with its adoption.

At the end of 2019 the company has a revenue of 864.638 euros, total assets of about 14.4 million euros and 39 employees.

4.2 Data collection

Semi-structured interviews were conducted with the quality manager of the company Torrevento, who has been engaged for several years in the field of sustainable management of resources in environmental, social and economic terms. These interviews sought to uncover the relationship between blockchain and corporate sustainability. They allowed open answers, lasted about 60 minutes and were conducted through an online platform.

Initially, we developed 9 interview questions based on the theoretical frameworks outlined by Morkunas et al. (2019) and Kamble et al. (2020). We then sorted the interview questions into two macro-areas relating to SMEs' recognition of the benefits associated with new digital technologies and the support provided by blockchain to SMEs in their pursuit of sustainable goals. For data coding, we assigned three researchers to independently and separately code the information obtained from the interviews. The results obtained were subsequently compared to each other to verify their validity using the open-coding method (Strauss & Corbin, 2014). We grouped the raw data that emerged from the interviews into well-defined conceptual subcategories that referred to the main topics explored. In addition, further documents were analysed, including: (i) the last approved annual report, in which strategic lines are outlined; and (ii) some articles published in national newspapers on the trials of blockchain infrastructure conducted by Torrevento. The use of multiple data sources made it possible to triangulate the information and increase the reliability of the results that emerged during the interviews.

4.3 Data analysis

Starting from the theoretical contributions of Morkunas et al. (2019) - which examines business models in light of the development of new technologies -, and the contribution of Kamble (Kamble et al., 2020) - which examines the supply chain objectives of sustainable agriculture-, this study analyses the impact of blockchain on business sustainability. Morkunas' contribution specifically examines business models according to the logic proposed by Osterwalder and Pigneur (2010), i.e. as the logic of value creation, transfer and acquisition (Osterwalder & Pigneur, 2010). This model consists of seven building blocks: target, value proposition, communication, customer relationship, resources, key activities and partnerships.

Kamble et al. (2020) proposed an application framework called agri-food supply chain (AFSC) framework, which is based on four main dimensions: supply chain visibility, supply chain resource integration, sustainable performance and data analysis capabilities or "the ability to use resources to perform analysis tasks, based on the interaction between IT resources and other business resources" (Cosic et al., 2015).

This study focuses on four important aspects of the sustainable business model: i) sustainable performance, in terms of the organization's ability to protect the natural resources available during product production, delivery and consumption; ii) value proposition and business strategy, which must be aligned with the opportunities offered by the blockchain and the challenges to be faced in its implementation; iii) key resources and activities of the new business, as well as the organizational change necessary for the adoption of the technology; and iv) sustainable disclosure.

Specifically, the interviews were divided into four parts that reflected the dimensions identified by the study's framework, and they were designed to answer, in different ways, the research questions outlined.

The following table outlines the interview questions, each of which is sorted under the research question they answer.

The interview questions and analysis of the results presented in the next section follow the aspects described above.

Do SMEs recognise the benefits of new digital technologies?	
1.	What has been your company's path towards sustainability? Did the company start with sustainability goals or have these developed over time?
2.	Before blockchain, what were corporate sustainability policies?
3.	What adjective or noun would you use to define blockchain? And why?
4.	How do you use the blockchain and what is the blockchain model you use?
5.	Does blockchain enable your company to compete more effectively? In what way?
6.	What are the advantages, disadvantages and difficulties encountered in implementing blockchain?
7.	Does your company have the right people, partnerships and resources to encourage blockchain adoption? Was it necessary to set up training courses?
8.	What organizational changes were required for the implementation of the blockchain and how were they managed?
9.	Who promoted the adoption of blockchain technology in your company?
How blockchain technology support SMEs in pursuing sustainable goals?	
1.	How could blockchain affect the national and international wine sector and its sustainability?
2.	Does the company pursue sustainable development objectives?
3.	How has blockchain contributed or does it contribute to the pursuit of sustainable development goals?
4.	How does blockchain technology contribute to making business processes more sustainable?
5.	Has the sustainability of your business model improved with the adoption of blockchain?
6.	Will blockchain enable you to improve your customer services and generate more value for them?
7.	Will the blockchain allow you to monitor the ethicality of your products?
8.	Through which channels does your company communicate your sustainability policies and practices to customers?
9.	Does your company draw up a sustainability report?

5. Results

5.1. Blockchain technology and sustainable performance

Torrevento use blockchain technology, specifically Mystory developed by Det Norske Veritas (DNV). DNV's initiative to undertake this digitization process stems from the need to test blockchain in the agri-food sector, viticulture in particular. Torrevento used Mystory blockchain to trace an extremely niche product: Veritas wine made with an indigenous grape and labelled DOCG Castel del Monte Bombino Nero. The process involves attaching a QR code on the wine bottle after a series of checks by DNV inspectors. Mystory's blockchain protocol provides for control by the DNV inspector not only in the final stage of bottling but also in the initial phase of grape ripening, harvesting and transport—even verifying the traceability of the bins used for transport from the field to the cellars where the drilling and fermentation takes place. At each stage, the inspector acquires the documentation necessary to certify the provenance, history and ethics of the wine present within each bottle. This process reflects one of the main features of blockchain technology, which is to ensure the integrity and veracity of the data embedded in the chain (Adams et al., 2018; Feng et al., 2018; Guo & Liang, 2016). To sum up, DNV applies its own brand (accessible with the QR code attached to each bottle) to test and to ensure the veracity of what the company communicates. In particular, the company recognizes the ability of blockchain technology to improve the three dimensions of sustainability: social, environmental and economic (Bebbington & Unerman, 2018; Di Vaio & Varriale, 2020). In the social dimension, following Adams et al. (2018), Torrevento recognizes the accuracy and punctuality of the distributed technology, thanks to which it is possible to reduce the risk of error and manipulation of information, since products follow an absolutely controlled and tracked path. According to an interviewee: "Only a blockchain technology, with its verified and certified digital database, shareable and above all immutable (not editable) can guarantee the perfect traceability of the supply chain, the absolute clarity and the immediacy of information directly to the consumer. This contributes to a greater guarantee to an increasingly attentive consumer who is deserving of protection. Bringing the results of verification activities directly to the consumer is unprecedented and we believe it is a bold and ethically correct choice to bring to market." Following this description, and in line with prior literature (Abeyratne & Monfared, 2016), blockchain is described by the respondent as a photograph that captures every step of the supply chain with no possibility of modification. In other words, thanks to blockchain technology, the consumer can learn about the history of wine, from the ripening phase of the grapes to bottling.

Within the environmental dimension, sustainability goals are followed

by using exclusively local grapes (production at 0 km), thereby reducing emissions of transport-related pollutants. In addition, Torrevento uses devices that can monitor the use of pesticides and water consumption, thereby reducing waste and dispersal of harmful substances into the air.

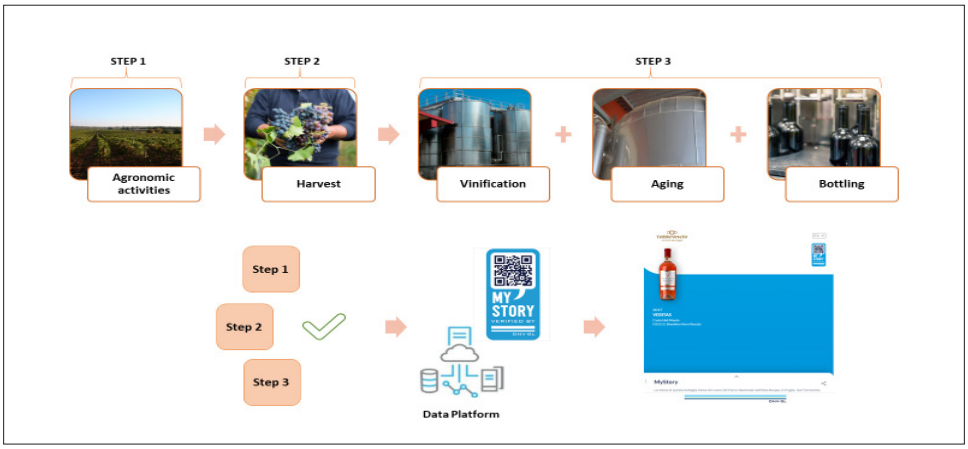
As for the economic dimension, Torrevento is aware that investments in innovation have improved the company's competitiveness. Indeed, as stated by Moeuf et al. (2017), management should interpret these investments not as a cost but as an opportunity to improve their business models, corporate productivity and competitiveness.

First, the implementation of blockchain technology for product traceability, which ensures the transparency of the entire tracking and tracing phase, has promoted the loyalty of pre-existing customers and the acquisition of new customers (Morkunas et al., 2019; Peake & Marshall, 2017; Songini & Gnan, 2013). The attention of more and more consumers to the quality of products, especially food, is what pushed Torrevento to implement blockchain technology, and, thanks to blockchain, the company has seen an increase in demand for its wine.

Second, the company shares the idea that blockchain applications are a valuable tool to enhance and make immediately visible the potential of Italy, Apulia in particular.

The results of this section show that blockchain technology is a tool that can improve corporate sustainability in all its dimensions (social, environmental and economic) (Bebbington & Unerman, 2018; Di Vaio & Varriale, 2020). In particular, by using blockchain, Torrevento has increased its customer loyalty by offering an ethical and environmentally friendly product with a sustainable production path that can be monitored at any time by the consumer. In addition, identification of suppliers closes to production sites who are equally concerned with environmental issues (which reduces transport-related environmental pollution), as well as attention given to the waste of resources, has led to an improvement in the environmental sustainability of the company and of the Apulian region as a whole. The benefits of attracting a greater number of consumers and the improvement of the company's image, which is also due to greater visibility, has also led to an increase in the company's value, consistently with previous studies on the topic (Hughes et al., 2019; Moeuf et al., 2017; Morkunas et al., 2019).

Figure 1 - My Story: the blockchain solution for tracking wine



Source 1 - Authors processing

5.2. Value proposition and business strategy

Ensuring the protection of the environment within which the large area of vineyards is developed has always been the focus of Torrevento's founders. This interest is demonstrated by the numerous certifications obtained (ISO 9001, ISO 14000 and ISO 22000). The path of corporate sustainability, initially oriented almost exclusively to the environmental sphere due to the geographical location in which Torrevento is located, has also inevitably turned to ethics, specifically dealing with the protection of its employees and obtaining the international certification SA8000. The company later decided to take on not only environmental and social issues but also economic ones by adopting the Equalitas standard. This standard, born in 2015, aims to promote the sustainability of agri-food and wine supply chains, sharing at national levels a unique approach to the sustainability of the wine sector. Cantina Torrevento has distinguished itself over the years by rooting its development plan in research, sustainability and quality. The founders have always believed in the potential of innovation to improve production efficiency, stating that "Italy and, in particular, the Apulia region, must invest in technology to continue to excel in an increasingly globalized context and to bring out and know the quality of the Made in Italy brand". Indeed, Torrevento is aware of the instrumentality of distributed technology in improving its visibility in the domestic and international market, further differentiating it from its main competitors (Moeuf et al., 2017; Oyelaran-Oyeyinka & Lal, 2006).

According to the interviewee, " blockchain increases visibility, and being more visible makes the company more attractive and cutting edge than others".

Torrevento also stated that investing in digital technologies requires adequate knowledge of them, as suggested by Hastig et al. (2020). The company's founders believe in this regard that, as with any other form of investment, it is appropriate to study the advantages and disadvantages that would result. Specifically, the interviewee said that before implementing blockchain technology, "the founders did extensive research on the costs and benefits associated with the technology, as well as the organizational changes that may be required."

5.3. Key resources and activities of the new business

Regarding the benefits of implementing blockchain technology, and consistent with Morkunas et al. (2019), the respondent believes that they will only be evident in the medium to long term.

As for the disadvantages and difficulties linked to the technology (Hughes et al., 2019), the company claims that it has not incurred high costs at the operational level, having already had the tools necessary for product traceability. In this regard, the company stated: "It was simply an integration and transfer of verifications on the blockchain platform. We have adopted the blockchain system and integrated it perfectly with what we already do". For this reason, the company did not feel the need to allocate a specific resource to the management of the project, as all employees were already involved in the daily registration of the steps linked to traceability. The company simply took time to train employees who were already tracking and tracing in the purpose and operation of blockchain. Although there have been no changes in the company's organizational or business model, blockchain has been "an additional testing ground for the company to verify and improve its traceability and traceability system."

According to the respondent, the real disadvantage of adopting DLT technology stems from the management of information about the activities of suppliers downstream from the production process, over which it is not always possible to exercise full control. However, for blockchain to work, "it is necessary for the winery to form, inform and convince the various suppliers to assume a greater sense of responsibility, given that they are part of a controlled and tracked supply chain."

The Apulian economy is characterized by the presence of small entrepreneurial businesses, strongly linked to traditions and not open to Innovation. In this context, it is difficult to persuade the entrepreneur about the opportunities provided by new digital technologies. However, as has been stated by earlier literature (Beugelsdijk et al., 2018; Duran et al., 2016), one must consider young entrepreneurs who are more inclined to change and technological innovation.

In summary, the analysis of results presented in this section, reveals an adequate knowledge of the technology and its benefits by the founders of the company, promoters of the implementation of blockchain in the Torrevento company.

Certainly, the founder's orientation towards new technology was one of the main drivers of the process, but a cost-benefit analysis is also important to consider. In fact, the company stated that it has not incurred high costs. The greatest difficulty concerned researching suppliers willing to follow the production standards imposed by blockchain. Torrevento recognises the benefits related to new digital technologies, and precisely this knowledge has favoured the implementation of blockchain.

5.4. Sustainability disclosure

The Equalitas-Sustainable Wine standard promotes the adoption of an internal sustainability management system and the publication of an annual sustainability report, both aimed at ensuring the continuous improvement of business sustainability standards. The Equalitas standard also calls for carbon and water footprint certifications, requiring companies to reveal the consumption and environmental impacts resulting from its production process. In fact, the need to offer guarantees of product quality to increasingly aware and demanding consumers and the willingness to adapt to international regulations for complete traceability of products are among the reasons that Torrevento has undertaken an innovative plan aimed at corporate quality since 2000. To this end, in addition to implementing the standards from a hygienic self-control manual according to the HACCP System, the company has obtained several certifications related to its quality systems. These include DLG TS Process-Wine, BRC Global Standard for Food Safety 2018, ISO 22000 - 2005 for Food Safety, ISO 14001:2015 for Environmental Quality, IFS (International Food Standard) 2018 and ISO 140001:2004 (2019), Equalitas Corporate Sustainability, Product Sustainability Equalitas. Torrevento, adhering to these standards, intends to draw up a summary sustainability budget that covers social, economic and environmental initiatives in order to provide its stakeholders with an exhaustive picture of the production policies that aim to safeguard the environment and protect the local environment and employees.

6. Conclusion and future research lines

The importance of SMEs to the economic and social development of Italy (Prometeia, 2019) encourages investigation of the relationship between blockchain technology and sustainable development, as well as the role played by innovation knowledge in the implementation of a digital transformation process. Our first research question asks whether SMEs recognise the potential benefits of new digital technologies, and the examined company recognises the advantages. The decision to invest in innovation is linked to the culture of the founders, who are aware of the importance of digital technologies for the growth of corporate value. Specifically, the choice to adopt blockchain technology came after a careful cost-benefit analysis.

Among the main obstacles to the implementation of blockchain is the entrepreneur's culture and his or her willingness to invest in new technology (Sharma et al., 1997). This was not an issue for Torrevento, which has always been open to the adoption of technology, establishing itself as one of the most cutting-edge companies in the Apulia wine industry.

Based on our case study, we can confirm that small and medium-sized businesses recognize the benefits of new digital technologies, which was the first research question we set out to answer.

The second research question asks how blockchain technology supports the sustainability goals of SMEs. Our interview revealed that there is perfect synergy between digitalization and sustainability (Buallay, 2019; Drempetic et al., 2019).

More specifically, blockchain technology has improved the company's social, environmental and economic sustainability. The technology has fostered an improvement in the image and reputation of the company and has led to greater visibility, which has increased customer loyalty. In addition, blockchain promotes transparency in corporate sustainability initiatives, serving as an advantage for companies that adopt ESG policies and revealing cases of inadequate implementation of these policies (Moeuf et al., 2017).

The present study contributes to the literature not only by highlighting blockchain as a tool capable of promoting corporate sustainability (Massaro et al., 2020) but also by partially filling other gaps (Queiroz et al., 2019)—identifying, among the barriers associated with the implementation of blockchain technology, the presence of suppliers that are not always conducive to change.

Indeed, the Apulian economic system is characterized by the presence of small businesses that are firmly tied to traditions and not open to innovation, which makes it difficult to manage information about the activities of suppliers downstream of the production process.

In conclusion, as there are cultural obstacles to the adoption of new digital technologies, sustainability-focused SMEs will not be able to consider

the benefits of digitalisation as a support tool for monitoring the company's sustainable goals.

However, many issues remain unexplored (Wang et al., 2019), as the topic of blockchain is recent and thus little known by scholars and practitioners (Queiroz et al., 2019).

In our current socio-economic context, possible future research developments look at new crisis management technology in the agri-food sector.

The massive decline in consumption caused by the Covid-19 pandemic has led to devastating consequences for the economy, especially in the wine sector, which has seen a complete disappearance of wine tourism. In addition to the loss of the in-person sale, costs have increased due to the health prevention measures adopted during harvest and the lower liquidity caused by unsold stocks (Mediobanca, 2020).

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BOOK REVIEW

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S. LEONELLI, F. MASCIARELLI, ENTREPRENEURIAL PERSONALITY AND SMALL BUSINESS MANAGEMENT. IS THERE A NARCISSIST IN EVERY SUCCESSFUL ENTREPRENEUR?, EDWARD ELGAR PUBLISHING, CHELTENHAM: UK, 2020.

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Abstract

Can entrepreneurial personality traits affect small business management and outcomes? If so, how and why? Leonelli and Masciarelli's book answers these questions by offering an engaging, wide-ranging and comprehensive analysis of the phenomenon with a particular focus on entrepreneur narcissism and how it influences the various phases of small business life. Specifically, the authors analyse how "bright" and "dark" sides of entrepreneurial personality traits affect small businesses' entrepreneurial orientation (i.e., innovativeness, risk-taking and proactiveness), innovation outcomes (product/service or process innovations) and financing (by business angels and venture capitalists). They also examine how entrepreneurial personality traits impact serial entrepreneurial behaviour (i.e., the entrepreneur's decision to create value by founding more than one firm). Finally, implications for theory and practices are discussed.

Review

As widely recognised in management science and entrepreneurship research, the entrepreneur is the small business's linchpin, the one who determines its strategies and, thus, viability. Leonelli and Masciarelli build on the assumption that understanding and describing entrepreneurial personality traits is essential to comprehending how small firms create value, explain why entrepreneurs act differently in similar circumstances and why some entrepreneurs are more successful than others.

In the first chapter, the authors begin by reminding the reader of Narcissus from Greek mythology, now so famous that his name is used—even in common parlance—as a synonym for individuals immeasurably in love with themselves. By combining psychological theories with entrepreneurial studies, the authors analyse the concept of narcissism concerning the entrepreneur's personality.

As explained in the book's first pages, "An individual's personality defines the person, and it tends not to change over time" (p. 3). It includes multiple traits, i.e., different characteristics that distinguish "the individual's way of thinking, feeling and behaving" (p. 13). Studies on the subject, well-illustrated in chapter two that provides a valuable literature review on entrepreneur personality, have identified some useful models and concepts to understand the multidimensional aspect of individuals' personalities. Namely, the Big Five model, the locus of control and the Dark Triad are presented and described. The Big Five model defines personality through the measurement of openness to experience (the tendency to be creative and perceptive); conscientiousness (being respectful of the rules and being organised); extraversion (the tendency to be outgoing, active and enthusiastic); agreeableness (being kind, altruistic and trusting); and neuroticism (the tendency to be anxious, fearful and depressed). The locus of control consists of two dimensions: internal locus of control (which measures the extent to which individuals believe their actions generate events) and external locus of control (which refers to the extent to which individuals believe events depend on external factors they cannot control). Finally, the Dark Triad includes narcissism (a sense of grandiosity, pride, egotism and a lack of empathy), Machiavellianism (an individual tendency to be manipulative and achieve goals using any means), and psychopathy (dysfunctional interpersonal behaviours of people who employ charm and manipulative techniques for personal gain).

Moving on to the entrepreneur's personality and referring to evidence from previous research, the authors explain that the entrepreneurial personality is characterised by traits that can be categorised as bright or dark. The former are considered beneficial for individuals and firms. They include openness to experience, conscientiousness, extraversion, agreeable-

ness and internal locus of control. The dark traits are deemed detrimental to individuals and firms. They comprise narcissism, Machiavellianism, psychopathy, neuroticism and external locus of control.

Nevertheless, more recently, scholars have begun to challenge the conventional belief that bright traits are always beneficial and dark traits are always detrimental, thus exploring the potential upsides of dark traits and the potential downsides of bright traits. As the authors highlight, some empirical evidence shows that the effects of different entrepreneurial personality traits on organizations are more complex and often depend on the high or low level by which a trait is expressed.

Leonelli and Masciarelli's book offers a further contribution in this direction by delving into the positive and negative side of entrepreneurial narcissism and analysing if and how they may influence entrepreneurial orientation, innovation, financing and entrepreneurial seriality.

Precisely, "A narcissist is defined as an individual who is arrogant, overconfident and self-important, who sees themselves as superior and deserving of special treatment, who requires admiration, lacks empathy, is authoritarian, tends to exploit others and overestimates his or her abilities" (p. 5).

Regarding entrepreneurial narcissism, both positive and negative aspects may emerge. The positive aspects concern the so-called "productive/constructive narcissist", which are individuals characterised by passion, perseverance and freedom of thought. They act independently and are charismatic leaders, who are resilient, competitive and risk-takers. They are also able to contribute to social growth and change with innovative ideas. From this point of view, narcissism positively impacts business performance. The negative aspects comprise a distorted view of self-worth, a sense of grandiosity and superiority, self-centredness, lack of empathy, arrogance and the exploitation of interpersonal relationships. Narcissists tend to take unnecessary risks and are not attentive to objective signals. They are also touchy and angry, and see others only as a means to satisfy their need for admiration and reinforcement. Consequently, narcissism is detrimental to the firm's performance and relationship with peers and employees.

Starting from this theoretical background and using quantitative and qualitative methods of analysis, the authors present four interesting empirical studies that examine different samples of small-business entrepreneurs.

Chapter three explores how entrepreneur narcissism affects entrepreneurial orientation (EO) in small businesses. EO includes innovativeness, risk-taking and proactiveness and is considered essential for entrepreneurial activity. According to the research aim, two main narcissistic entrepreneur characteristics are considered: the exhibitionist side (related to grandiosity and self-importance) and the manipulative side (concerning the narcissistic sense of entitlement and the willingness to exploit others for personal gain).

The authors develop the following two hypotheses: Hypothesis 1a – The exhibitionist side of entrepreneur narcissism is positively associated with EO; Hypothesis 1b: The manipulative side of entrepreneur narcissism is negatively associated with EO. The hypotheses are tested on a sample of 114 Italian SMEs considering EO as the dependent variable, exhibitionist narcissism and manipulative narcissism as independent variables, and entrepreneur's education and age, firm's age, size and cash flow, industry sector and location as control variables. Results show that both hypotheses are supported. Particularly, exhibitionistic narcissism has a positive effect on EO (high levels of exhibitionism correspond to high levels of EO), and manipulative narcissism has a negative effect on EO (high levels of manipulation correspond to low levels of EO). Moreover, an entrepreneur's age has a significant negative impact on EO (increasing levels of an entrepreneur's age correspond to a decrease in EO).

Chapter four focuses on the relationship between entrepreneurial personality traits and small business innovativeness. The authors develop a research model that includes the ten personality traits related to the Big Five model, the locus of control and the Dark Triad. Ten hypotheses are proposed and tested on a sample of 35 entrepreneurs. The latter were interviewed, and a content analysis was used to construct independent variables (i.e., ten personality traits) from transcribed interviews. The dependent variable, small business innovation, was derived from the Italian patent register. Findings reveal that, concerning the Big Five model, openness to experience and conscientiousness positively impact small business innovation, while neuroticism has a negative impact. Concerning the locus of control, results show a negative relationship between external locus of control and small business innovation. Finally, as regards the Dark Triad, empirical evidence indicates that narcissism positively impacts small business innovation, while psychopathy has a negative impact. No statistically significant relationships were found for the other personality traits.Chapter five explores the relationship between entrepreneur narcissism and small business financing with particular attention to start-ups. Funding processes are crucial for start-ups and external investors, such as business angels and/or institutionalist venture capitalists, who can play a key role. Sometimes, they may ask entrepreneurs to pitch their idea, and how the idea is presented can be crucial to persuade investors and receive financial support. The chapter aims to illustrate how entrepreneurs' way of presenting themselves (i.e., through their personality traits) and their behaviour may influence their chance of being funded. The authors posit that narcissistic entrepreneurs can more easily get business angels' and venture capitalists' investments than their non-narcissistic counterparts. They identify two mechanisms through which narcissism works: the persuasive effect and the commitment effect. The former helps narcissists to gain support and

reassurance from investors. The latter refers to how narcissists work hard to reach their goals. Based on these arguments, the authors assume a positive effect of entrepreneurs' narcissism on external investors and propose two hypotheses: Hypothesis 1 – Entrepreneur narcissism positively influences the number of business angels who invest in the business; Hypothesis 2 – Entrepreneur narcissism positively influences the number of venture capitalists who invest in the business. The empirical research involves a sample of 65 Chinese start-ups. The tested model considers the number of business angels and the number of venture capitalists who invested in the start-up as dependent variables and entrepreneurial narcissism as the independent variable. Results did not support Hypothesis 1, while Hypothesis 2 was confirmed.

Chapter six is devoted to exploring the role of narcissism as an antecedent to entrepreneurial seriality, i.e., the entrepreneur's propensity to found more than one firm. To this end, the authors propose three mechanisms regulating narcissism: 1) achievement effect (i.e., the narcissistic entrepreneur's tendency to pursue their vision whatever the cost); 2) optimism effect (i.e., the optimistic way in which narcissistic entrepreneurs see the future and perceive opportunities); and 3) independence effect (i.e., the narcissistic entrepreneurs' inclination to act independently). Then, the authors propose the following Hypothesis 1: Entrepreneurs' narcissism is positively related to entrepreneurs' seriality. The hypothesis was tested on a sample of 343 small business entrepreneurs from Italy, France, China, the USA and Denmark. Results confirm Hypothesis 1: entrepreneur narcissism positively effects entrepreneur seriality (high levels of narcissism correspond to a high propensity to seriality). In the seventh and last chapter of the book, the authors present the research's main conclusions and theoretical implications. They pay particular attention to implications for practices, considering how their book may support advisors, entrepreneurs, investors and educators.

This book makes an essential contribution to the debate on the role of entrepreneurial personality in small business management. The volume has the merit of providing a wide-ranging overview of the impact that both the bright and dark sides of entrepreneurial personality—with a particular focus on narcissism—may have on the various phases of small business life. It also draws from various research fields such as psychology, entrepreneurship, small business innovation, entrepreneurial finance and strategic management. Last but not least, empirical research was carried out by using both quantitative and qualitative methods and considering different cultural contexts.

In closing, the work of Leonelli and Masciarelli brings the relevance of the entrepreneurial personality into the spotlight. It confirms how crucial it is to comprehend entrepreneurs' behaviours and small business management thoroughly.

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