Intellectual capital and business model: a systematic literature review to explore their linkages

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Intellectual capital and business model: a systematic literature review to explore their interconnections

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Abstract

In the last decades, intellectual capital has received great attention by business and management scholars and could seem a mature topic, being arrived at its third wave of studies. However, its intersections with the business model and business model innovation concepts remain an under investigated topic. What is the current state of the art regarding intellectual capital and business model? What links do actually exist between these two topics? What area should be covered by future studies? Based on a systematic literature review, this study answers to these questions by examining 43 peer-reviewed articles searched in the area of business and management. First, a bibliometric analysis was conducted to evaluate what is the current trend of such publications and what are the most relevant articles, authors, Journals, and Countries. Then, a content analysis was performed to aggregate and systematize the results and identify future lines of research. Results show that most of the studies conducted to date are focused on the aspects of value creation and value capture, with a primary focus on investigating the relationship between intellectual capital and firms' performances (e.g., economic, financial, organizational). Thus, despite an increasing literature, in this study several possible future streams are proposed. First, more studies that analyze the business model in a holistic way (i.e., business model configuration) should be proposed. Second, scholars have posed scarce attention to the role that intellectual capital can play to develop new business models (i.e., business model innovation). Third, there is a lack of articles investigating how intellectual capital can lead to decrease rather than create value over time (i.e., value loss). Fourth, due to the sustainable transitions that companies are asked to perform in these years, a promising area to be covered in the next future is the one connected to address the social and environmental aspects of intellectual capital (i.e.,

green intellectual capital). Indeed, to date great part of studies have addressed only the economic issues that are related to intellectual capital.

1. Introduction

Intellectual capital is considered a key intangible asset for firms. However, it cannot be revealed accurately in company's financial statements, but reflects real value of the company and is based on the knowledge owned and used by the company (Nahapiet & Ghoshal, 1998). Intellectual capital has a history as topic and has been proposed as one of the most relevant drivers of growth and key capitals in entrepreneurial development over time (Halberstadt et al., 2019). Overall, studies found a positive significant relationship between financial performance of firms and intellectual value added, intellectual capital efficiency, relational capital efficiency, human capital efficiency, and structural capital efficiency (Salehi et al., 2014). As a consequence, it is well established that intellectual capital affects firm performance positively and provides competitive advantage.

Despite this, there is less studies when it comes to consider intellectual capital and the effect on and the relationship with business model and business model innovation. The concept of business model and business model innovation build on several strategic management theories, such as Transaction Cost Economics (TCE), the resource-based view (RBV) of a firm, Systems Theory (ST), and Strategic Network Theory (SNT) (Amit & Zott, 2001; Morris et al., 2005). Where a business model has been used as a mean to create value in a business (Foss & Saebi, 2018; Franceschelli et al., 2018), business model innovation refers to planned, novel and innovative changes to the fundamental features of the firm's business model and/or the structural design linking these elements (Foss & Saebi, 2018), and also to the way in which the firm collaborates at strategic and operational levels in order to bring products and/or services to the market (Bouwman et al., 2018).

Previously, most literature in the field of business models focused on their structural features and assumed a static relationship among their various elements (Demil & Lecocq, 2010). More recently, however, researchers have underlined the need for a holistic perspective that incorporates innovation in the various elements involved in the value generation and delivery processes (Zott et al., 2011; Massa et al., 2017), since fundamental changes in the relationship between the business model elements can lead to a higher level of business model innovation (Bjorkdahl, 2009).

As aforementioned, the relationship between intellectual capital and business model has been quite neglected by the literature, or at least it leaves room for further research lines. For example, a rich stream of studies in the intellectual capital field, has assessed the impact of intellectual capital on value capture (Bukowitz & Petrash, 1997; Salehi et al. 2014), one fundamental aspect of business model. Despite this, less effort has been directed when it comes to consider the business model through a holistic lens or considering other business model components apart from value capture (Beattie & Smith, 2013). For example, little is known on how firms used the various intellectual capital assets to leverage new forms of value proposition, new target markets or new sources of revenues. This changes represent the core of the business model innovation and are considered as key driver of sustainable competitive advantages in the current era affected by globalized markets (Del Giudice et al., 2019; Santoro et al., 2019).

As a consequence, the aim of this paper is to explore the relationships between intellectual capital and business model. In order to do this, the present research builds on the systematic literature review (SLR) methodology, to trace what we know on this topic and to propose future lines of research based on the found gaps.

The reminder of the paper is structured as follows. The next section describes the main concepts behind this research, namely intellectual capital and business model. Section three explains the research methodology regarding the procedures of the SLR used in this study. Section four shows the research findings while le last section concludes discussing the found gap and proposing future line of research.

2. Theoretical background

Intellectual capital has increasingly captured the attention of scholars and practitioners during the last decades. Intellectual capital research has a quite long history. Three main stages of the intellectual capital stages have been identified in the literature (Guthrie et al., 2012). The first stage was characterized by the use of "grand theories" to highlight the strategic significance of intellectual capital in creating and managing sustainable competitive advantage. The second stage, focused on the impact of intellectual capital on capital markets and value creation processes and on how intellectual capital should be managed in order to create and maintain a sustainable competitive advantage. The third stage regards intellectual capital in practice, focusing on the use of intellectual capital measurements and the interplay between them and intellectual capital mobilization and management (Dumay & Garanina, 2013). Indeed, it emerged that the effects, the outcomes and the drawbacks of measuring and narrating intellectual capital have often been neither realized nor recognized in practice (Guthrie et al., 2012; Dumay, 2013).

In all these stages, intellectual capital has been approached from several theoretical perspectives and angles (Gröjer, 2001; Mouritsen et al., 2001; Giacosa et al., 2017) and this has led to a plethora of proposed concepts, methods, and tools but none of them has gained a general consensus (Mouritsen et al., 2001; Chaminade & Roberts, 2003). For example, the definition of intellectual capital is still widely debated and there is no universally-accepted definition of intellectual capital in the literature. From one perspective, intellectual capital can be viewed as a pool of intangibles resources such as knowledge, information, intellectual property, and experience, that can be used to create value (Stewart, 1997). Some scholars define intellectual capital as the system composed of all of the firm's intangibles (Meritum, 2002), or as the sum of everything everybody in a company knows that gives it a competitive edge (Stewart, 1997), or as a combination of knowledge flows (Mouritsen et al., 2001) or of connections between intangible resources (Chaminade & Roberts, 2003). This definition is in line with Bontis et al. (2000), who argue that intellectual capital is the knowledge of individual employees and organisations that contributes to sustainable competitive advantage. In essence, all information that can be transformed into something of value is intellectual capital (Edvinsson, 2000).

Even if there is a lack of a generally accepted definition of intellectual capital, in terms of classification there is the tendency to adopt the well-known tri-part model based on the identification of human capital, structural capital and relational capital (Guthrie et al., 2012). Human capital is defined as the knowledge, skills and experiences that employees take with them when leaving a company. Human capital encompasses the individual knowledge of an organisation that exists in its employees. Employees generate such capital through their intellectual competence, attitudes and agility. Structural capital is defined as knowledge that will remain within the company (Benevene & Cortini, 2010). The capital is described as what is left to the company when an employee returns home at night (Roos et al., 1997). Structural capital includes organisational routines, procedures, systems, cultures and databases. Some of the structural capital is legally protected and becomes part of the organisation's intellectual property rights, legally owned by the company. One part of structural capital is to build systems such as databases, and all things other than humans. Structural capital is derived from the knowledge within an organisation, including organisational structure, process instructions, strategies, software, hardware and all things that give value to the company higher than the material value. Finally, relational capital regards the source of capital driven by all the relationships of the company with external stakeholders such as customers, suppliers, governments and so on (Roos et al., 2001).

Most intellectual capital studies have focused on intellectual capital disclosure, namely on the informative role of external reporting for the effective functioning of capital markets (Healy & Palepu, 2001). Other studies have explored the relationship between the components of intellectual capital and the creation of economic and financial value (Bayraktaroglu et al., 2019). However, the very concept of value has changed over time, with an emphasis on new needs and demands. Therefore, recent management studies have focused on the "business model" concept to emphasize the "how" a business creates, delivers and captures value. Therefore, it is necessary to understand how intellectual capital helps to create, deliver and capture value, using the business model as a theoretical reference framework. The literature that deals with the relationship between intellectual capital and value by explicitly using the business model concept is very poor at the current state.

3. Methodology

3.1. Research design

The SLR methodology has been used in this study to unveil what we know and what we do not know about the relationship between intellectual capital and business model. SLRs arose in the area of medical science aiming to produce a replicable, scientific and transparent analysis of the literature, but have recently been extended to other areas (Boaz et al., 2002), namely, the scientific area of management (Geraldi et al., 2011). By conducting a SLR, authors are able to combat prejudices and produce more transparency and high quality contribute in the management field (Sirelkhatim et al., 2015). SLR aims to identify all relevant sources of information (qualitative or quantitative) and it has several advantages compared to traditional narrative reviews, as: (a) it enhances the quality of the review procedure and outcomes (b) it allows for reduced bias and errors (Dada, 2018; Tranfield et al., 2003); c) it increases the validity of the process based on the replicability of the steps applied during the review process (Wang & Chugh, 2014); d) it allows for data synthesis and literature mapping of a specific research area (Crossan & Apaydin, 2010; Kauppi et al., 2018; Witell et al., 2016), and; e) often provides to researchers and practitioners with frameworks that integrate extant knowledge (e.g. Crossan & Apaydin, 2010; Dada, 2018). Moreover, SLR is applied in the top management journal in different research fields. Based on the previous reasons, we think that SLR is the most appropriate methodology, because is able to provide high-quality state-of-the-art review on the research focusing on the relationship between intellectual capital and business model, with a specific focus on value capture, value creation and value configuration.

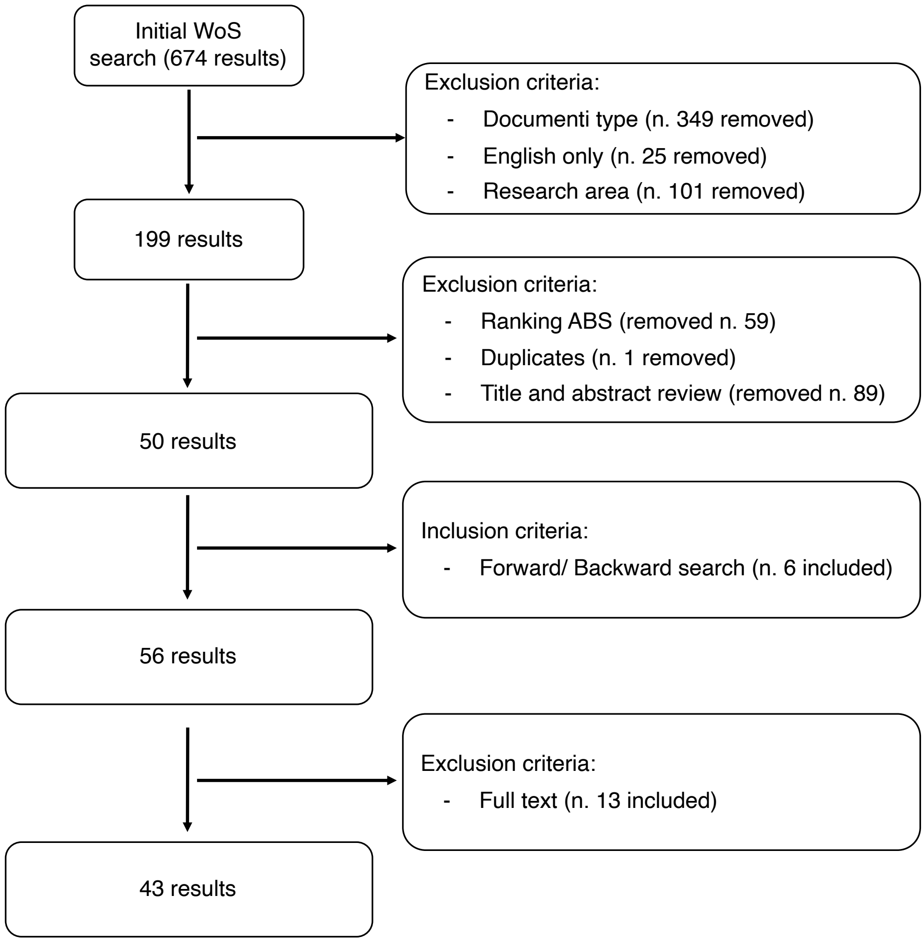
3.2 Question formulation

A successful review is based on clear research questions being developed at the start of the review process (Nguyen et al., 2018). The RQ of this study posits a focus on the relationship between intellectual capital and business model. Following Adams et al. (2016), the research question was formulated through dialogue between the authors and by taking the opinions of academic and industry experts. Based on this process, the research questions were settled as follow:

RQ1: What are the links between IC and BM in the business and management research fields?

RQ2: What are possible future research trends of business and management studies regarding IC and BM?

Fig. 1 Literature search strategy



3.3 Search strategy

The first step of a SLR is to determine what database use for collecting data (Carvalho et al., 2013). For what regards the social science disciplines, the two largest and most used ones by scholars are Web of Science (WoS) from Clarivate Analytics and Scopus from Elsevier. WoS covers around 159 million records (i.e., articles, books, and proceedings) and more than 34.000 journals (Clarivate Analytics, 2020). Scopus includes around 69 million records from more than 35.000 active and inactive titles (i.e., peer-reviewed journals, books, and conference proceedings) (Scopus, 2017). However, around 97% of scientific documents enclosed in the two databases are the same, making them as adequate substitutes (Waltman, 2016). In this study, a search into the WoS Core Collection was conducted since it is recognized the best in terms of quality standards of metadata, leading to less problems in terms of disambiguation issues (i.e., authors' homonyms) (Merigó et al., 2015; Krämer et al., 2017). Moreover, WoS encloses keywords plus, which are automatically generated from documents' references and do not give comparison problems (e.g., if the same keyword has been written in single or plural form). For these reasons, WoS was considered the most reliable database for applying the first evaluation based on bibliometric data to include or exclude articles (Thelwall, 2008; Waltman & Van Eck, 2012).

3.4 Data extraction

Based on the relevant literature related to intellectual capital (Pedro at al., 2018) and business model (Chesbrough, 2010), the initial set string was set as follows:

TS=("intellectual capital" OR "intangible asset" OR "intangible capital" OR "intangible resource*" OR "knowledge resource*") AND TS=("business model*" OR "value capture" OR "captur* value" OR "value creation" OR "creat* value")*

Boolean operators to include alternatives (OR) and combine strings (AND), and wildcards to capture words variations were used to search into documents' topic, which includes title, abstract, author keywords, and keywords plus. Search returned 647 records. Then, inclusion and exclusion criteria were applied as discussed in the following section. Fig. 1 illustrates the applied review process.

3.5 Inclusion and exclusion criteria

In this study, restrictions on year (documents published until 2019), language (English only), and document type (articles, reviews, and letters) were applied (Merigó *et al.*, 2016). First, to include all relevant documents regardless of publication date, no restrictions were set on a specific time span. So, all documents published until 2019 were considered. To do so, a first search was performed in December 2019 and then updated in January 2020. Second, only documents in English were considered due to language limitations of the researchers (Vrontis & Christofi, 2019). Third, documents that did not pass a peer-review process were excluded, considering only documents published in academic journals (Dada, 2018).

Fourth, to answer the research questions of this paper only the results included in the "Management" and "Business" field were considered. In this way, also the bibliometric analysis was conducted excluding comparison problems in comparing the metrics of scholars or journals of different research fields.

Fifth, the sample was restricted to studies in peer-reviewed journals ranked 2, 3, 4 or 4* in the ABS 2018 journals list as including only top-tier academic journals remains a frequently adopted method for identifying scholarly debates and research trends during a systematic literature review of a specific area (Christofi & Vrontis, 2019). After that, only one duplicates article was removed.

Thus, the first review of the above sample of 139 articles consisted mainly of evaluating the titles and abstracts of the articles, and in some cases briefly reviewing the introduction section. In line with Kauppi et al. (2018), the above inclusion and exclusion criteria was applied (see Fig. 1), and the depth and level at which the studies were reviewed increased throughout the review rounds.

Moreover, a manual search through the reference lists of all selected studies was done (Dada, 2018). This further step resulted in retrieving 6 more papers, thus increasing the selected studies to 56. These studies were also reviewed according to the inclusion, exclusion and quality criteria using a title, abstract and full text analysis.

Moreover, a tightened exclusion criterion in the second round of review for the remaining 56 studies was done and, after the full text reading, only papers clearly related to the review topic that makes a significant contribution and provided major insights to existing knowledge for IC and business model relationship was selected.

Indeed, for reducing the limitations of single methods and improve the relevance of the findings, a combination of bibliometric and content analysis has been performed in this study (Carvalho et al., 2013; Takey and Carvalho, 2016).

4. Descriptive analysis of the systematic literature review

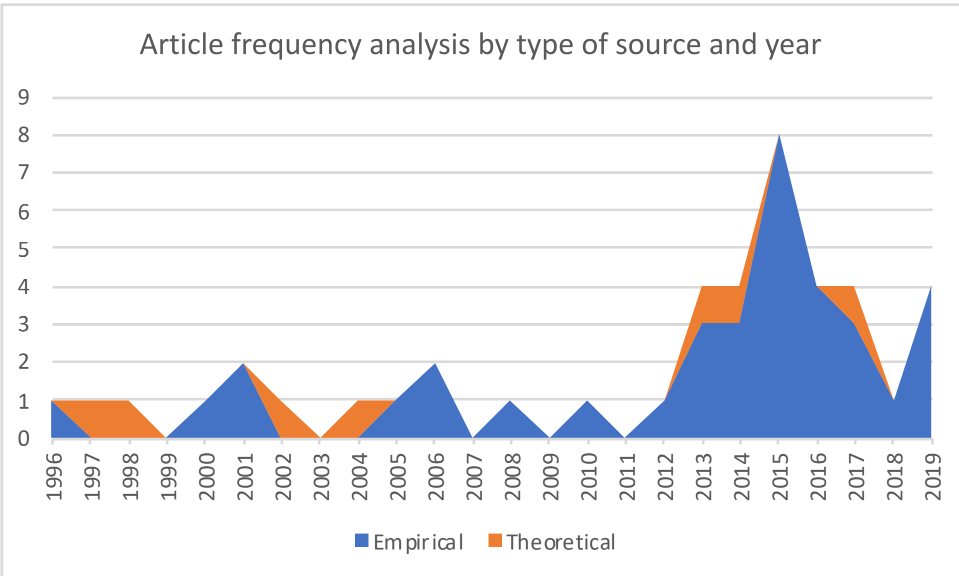
The review of the existing literature yielded various trends related to the research on intellectual capital and business model. In the following section, we provide an overview on the publication outlets from which the data were collected, year of publication, the type of articles published, author's characteristics, an industrial analysis of papers reviewed and methods applied, as a mean to provide a preliminary map of the existing literature and identify possible gaps to be filled by future research.

4.1 Year of publication, type of paper and methods employed

Since the first study in 1996, the number of articles published every year had a steady state trend, until 2010. From 2010 until now there has been a growing trend, with a peak of number of articles in 2015 (n = 8) (Fig. 2). Indeed, the results show that there has been a growing number of studies that explored the relationship between intellectual capital and business model. Moreover, the results show that academic output on the topic has increased exponentially over the past decade (300% increase compared to the first 10 years) and that 50% of the studies was published in the last 5 years, indicating that the reviewed research area is quickly shifting into a "growth" stage. This analysis makes us understand how the line of research has evolved over time, both in new contexts and in new directions, without ever remaining "static". Among the studies taken in consideration for this analysis, there's a huge quantity of empirical papers (85%, n = 36), compared to theoretical one's (about 15%, n = 6).

The sample taken in consideration includes only two literature review. As regards to empirical papers, in terms of the methods employed, quantitative methodologies (e.g., regressions) were used in 42% (n = 15) of the studies, purely qualitative methodologies (e.g., semi-structured interviews) (28%, n=10), whereas mixed qualitative and quantitative methods captured the smallest share 6% (2). Regarding the field maturity, our results suggest that this field seems to be mature. Indeed, the majority was theory building and testing (about 48%, n=20), whilst 4 are solution building and testing studies (about 31%, n=13). This means that the field of research is very well developed, but nevertheless, many gaps are to be filled.

Fig. 2 Article frequency analysis by type of source and year



4.2. Journal outlets and citation impact

The majority of the articles (n=17; 40%) were, as expected, published in the Intellectual Capital Journal (Table 1), the most relevant journal about Intellectual Capital research field. Apart from Journal of Intellectual Capital, European Management Journal and R&D Management Journal are at the second place, with 3 papers each. All the other articles arrive from different field of research, but mostly are in the "General Management, Ethics and Social Responsibility field" according to the ABS classification list. To better understand the impact of publication outlets on the research domain, we examine our sample's number of citations. The top 10 publications based on numbers of citations are: Teece (1998, 1119), Gubbi et al. (2010, 247), Beattie and Smith (2013, 109), Carlucci et al. (2004, 94), Inkinen (2015, 62), Wu et al. (2006, 52), Hermans & Kauranen (2005, 44), Denicolai et al. (2015, 42), FitzPatrick et al. (2013, 41), Qureshi (2006, 40), Helms (2016, 26).

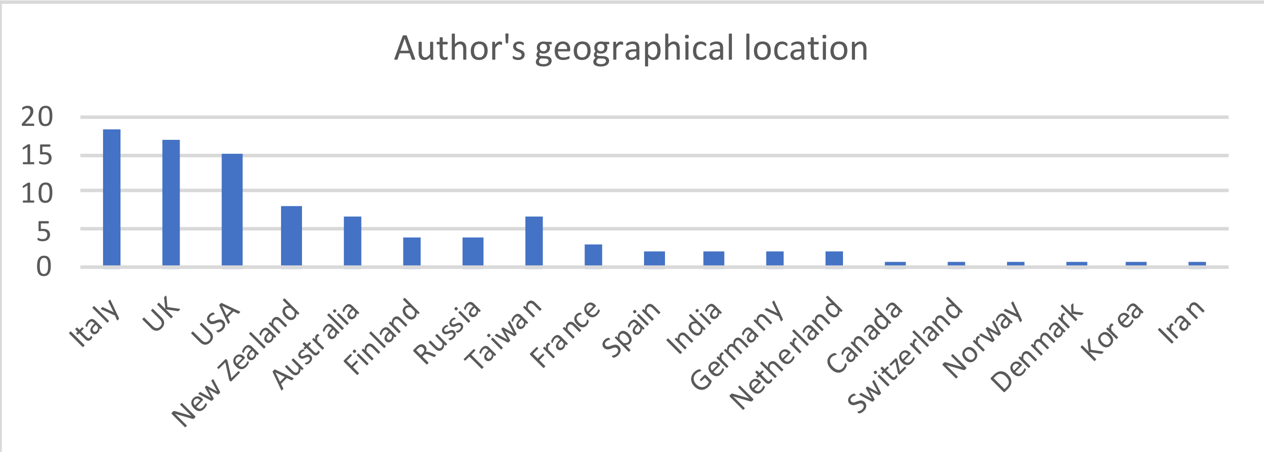
Table 1. Journals included in the sample

Publication outlet	ABS ranking	No. of a articles	Weight (%)
Journal of Intellectual Capital	2	17	40%
European Management Journal	2	3	7%
R & D Management	3	3	7%
Group Decision and Negotiation	2	2	5%
Accounting Auditing & Accountability Journal	3	1	2%
British Accounting Review	3	1	2%
British Journal Of Management	4	1	2%
California Management Review	3	1	2%
Canadian Journal of Administrative Sciences	3	1	2%
Energy Policy	2	1	2%
Industrial Marketing Management	3	1	2%
International Business Review	3	1	2%
International Journal of Contemporary Hospitality Management	3	1	2%
International Journal of Technology Management	2	1	2%
Journal of Accounting Literature	3	1	2%
Journal of Business Research	3	1	2%
Journal of Business-to-business Marketing	2	1	2%
Journal of International Business Studies	4*	1	2%
Long Range Planning	3	1	2%
Omega-International Journal of Management Science	3	1	2%
Research-Technology Management		1	2%
Tourism Management	4	1	2%

4.3. Geographic analysis of authorship origin

Results identify 97 authors from 20 different countries. Based on author's geographical location, it is possible to note that most of the authors comes from Italy, followed by substantial contributions from United Kingdom and USA (Fig. 3).

Fig. 3 Author's geographical location



Moreover, by analysing the regions from which authors' contributions come from, the majority of studies come from Europe (n = 57%), followed by America (n = 16%), New Zealand and Australia (n=15%) and Asia (n=8%). Africa is absent in this stream of research. Based on these findings, there's a call for future line of research from these geographical areas.

5. Content analysis of the systematic literature review

The following sections present the results of the SLR. The results have been divided into two sections. The first concerns studies that explored the relationship between intellectual capital and value capture. The second concerns studies that explored the relationship between intellectual capital and business model as a holistic concept. Although value capture is one of the elements of the business model, we decided to divide the discussion into these two parts to emphasize how the literature is divided between those who consider the concept of business model in a holistic way and those who have simply dealt with value capture as a reference to business performance.

5.1 intellectual capital and value capture

The last two decades were characterized by a shift in the way companies thought about the role played by their intangible assets for gaining greater competitive advantages, understanding that leveraging their tangible resources was no more sufficient for exploiting their full potential. So, scholars have posed greater attention to study the role played by IC in companies' value creation processes (Qureshi, Briggs and Hlupic, 2006; Inkinen, 2015; Nielsen, Lund and Thomsen, 2017). However, as shown in the following sections, most of the articles analysed in this study focused on the value capture process of the business model, exploring the relationship between intellectual capital and increased companies' performances (e.g., Carlucci, Marr and Schiuma, 2004; Massingham and Tam, 2015) or financial value (e.g., Chang, Chen and Lai, 2008). However, some of the studies considered value creation and capture as synonyms. However, in this paper, the value creation and value capture concepts were analysed according to the definition provided by Chesbrough (2006), who was the first author to introduce them. So, value creation refers to the provision of a new product or service in such a way that increased net value will be generated through each stage of a company's activity. Value capture is the ability of a company to retain part of that value. Following these definitions, obtaining greater performances (e.g., business, financial, organisational) deals with capturing value rather than creating it.

After the work from Petrash (1996), who presented the Dow's framework (an American Chemical Company) for managing intangible assets to create higher value for customers, shareholders, and employees, one of the first studies that investigated the relationship between intellectual capital and companies' performances was performed by Bukowitz & Petrash

(1997). Indeed, besides the Dow's framework, in their study the authors analysed also the framework developed by a Swedish company (i.e., the Skandia's framework) for capturing their common paths. The two cases examined by the authors were slightly different, focusing on the strategic management of intellectual assets and on the communication of strategic objectives, but both were aimed at raising the awareness of implementing and managing intangibles. Using these two models as a starting point, the authors were able to propose a roadmap for helping managers in comprehending the importance of their intangible assets within the acquisition of competitive advantages and the whole value capture process, explained in terms of higher stock prices and return on investment (ROI). However, the framework aimed also at spurring companies to look for new ways to create value and identify and seize new market opportunities in the future. So, implicitly, the study posed the basis for linking intellectual capital and business model innovation in the same way digital transformation and new technologies are pushing the actual debate, talking about the development of new information systems for collecting and managing data related to companies' actual and potential customers (Ferraris et al., 2018).

After the work of Bukowitz and Petrash, another seminal work that focused on the particular role played by knowledge assets in leveraging companies' competitive advantages was Teece (1998). Especially, the author stated that "the competitive advantage of companies in today's economy stems not from market position, but from difficult to replicate knowledge assets and the manner in which they are deployed" (Teece, 1998, p. 62). In this regard, some years later Nunamaker et al. (2002) directed their analysis on the creation of value through external knowledge and developed a model for deploying information technology in order to reduce the workload in managing the organisational capital of a company. Also Carlucci et al (2004) reflected on how knowledge management (KM) influences companies' business performances. In this regard, the authors developed a novel framework, the knowledge value chain, which suggested the following conceptual steps: i) KM enables companies to leverage their organizational competencies; ii) these increased competencies imply more effectiveness and efficiency of organizational processes; iii) the company learns how to manage its business processes better, namely improves its value creation capability; iv) also the ability to deliver this increased value to relevant stakeholders results enhanced. In synthesis, they posed the basis for recognizing the relevance of organisational capital in the value creation process. In the same regard, a theoretical work was proposed by Kianto et al. (2014) who reflected on the relations that can occur between static (intellectual capital assets) and dynamic (KM practices) aspects of organizational knowledge. In this regard, they proposed four alternative models on how KM influences a company's performance. First, they found that KM practices can moderate the relationship between intellectual capital assets and performances (e.g., the effect of employees' training on human capital or ICT practices on structural capital). Second, intellectual capital practices can moderate the effect of KM practices on performance (e.g., the effect of innovation culture on human capital and product innovation). Then, KM practices (IC assets) are proposed as a mediator between intellectual capital assets (KM practices) and performance, able to lead to greater results over time dynamically (e.g., when high levels of relational capital are possessed performances would be enhanced from learning how to better manage those relationships or empowering employees which leads to better innovation performance through the effect of human capital). Surprisingly, only one study focused its attention on capturing the role played by KM in the value creation process in the early-stage of the supply value chain (Qureshi et al., 2006), whilst the majority of scholars have investigated this process in later stages.

Over the years, the linkages between performances and intellectual capital were explored by several authors in different contexts and adopting different lenses but mainly focusing on the firm-level. Interestingly, only one study adopted a multi-level approach for analysing the effect of intellectual capital on companies and industry's performances in the context of Russian public companies (Molodchik et al., 2019). So, several studies have addressed the relationship between intellectual and firm performances in the context of advanced economies, such as emphasising the positive role on US firms' performances of international strategic alliances and previous internationalisation experiences (Chang et al., 2008) or investments in business-to-business relationships (Chung et al., 2012). Similarly, greater firms' performances were correlated to international acquisitions also in the case of an emerging economy such as India (Gubbi et al., 2010).

Additionally, sectors characterized by a service-dominant logic have been investigated by scholars. So, for example, some authors highlighted how relationship capital (i.e., networks) results the most important in terms of value capture in the European and American touristic sector (FitzPatrick et al., 2013) or for what regards multi-sided platforms (e.g., Uber, Facebook, Alibaba) operating in China (Zeng et al., 2019).

Other studies have considered intellectual in a more holistic way, taking into consideration the relationship between its three components (relational, human, and structural) and value capture. Hermans & Kauranen (2012) found a positive relationship between those three components of intellectual capital and anticipated future sales (performance). A good combination of these component implies value capture potential and high anticipated future sales. Furthermore, in the study of Inkinen (2015), a systematization of the intellectual capital effect on firm performance is provided. The results show that intellectual capital influences firm performance mainly through interactions, combinations and mediations. Indeed, factors such as organisational capabilities, activities, assets and orientation mediate the relationship between IC firm performance. IC Furthermore, Inkinen (2015) literature review underlines the relationship between intellectual capital and firm's innovation performance. Whilst, in the context of private European portfolio companies subject to a buyout between 1997-2007, Landau & Bock (2013), by studying the role of corporate centre on business units, underlines the importance of intangible assets as a value creating effect on business units. Furthermore, Tseng et al. (2005) analyse the relationships among four constructs of intellectual capital (human, organizational, innovation and relationship), as well as the relationship between intellectual capital and corporate value. From the empirical findings, for Taiwanese manufacturers, a positive relationship exists between intellectual capital and corporate value. To a similar conclusion arrived Wu et al. (2006) analysing Taiwanese design companies, observing that only one third of their sample developed effective management systems, leaving great room for other companies to leverage this opportunity. Moreover, Tseng et al. (2005) finds out a positive relation between organizational capital and performance and that both human capital and organizational capital indirectly and positively influence corporate value, and oppositely both innovation capital and relationship capital directly and positively impact corporate value. Peppard & Rylander (2001a,b), by using a case study, explain how to implement a growth strategy, by leveraging intellectual assets, which leads to a dramatic increase in shareholder value.

In a nutshell, it is possible to infer the most of the studies focused on the relationship between intellectual capital and value capture.

Some articles specifically focused on how the three elements of intellectual affect value capture. Indeed, Andreeva et al. (2016) found that structural and human capitals positively influence organizational performance, while relational capital does not. These results might be explained by the peculiarities of the Russian manufacturing company context, where high relational capital is common and thus it does not provide a unique competitive advantage. Furthermore, Benevene et al. (2017) highlight that human capital was perceived as more relevant than relational capital and structural capital in generating organizational value, in line with the previous literature (Curado, 2008; Kong, 2011; Massingham & Tam, 2015). The study of Benevene et al. (2017) focused on the Italian social enterprise and how intellectual capital creates economic value, but neglected the relationship between intellectual capital and social value, which could be a future line of research in this field. Furthermore, Davey et al. (2017) confirm that intellectual capital assets can provide sustainable competitive advantage and are therefore critical for company success, especially in the service company. The results underline and stress the importance of relational capital in the value-capture process. Whilst, Beattie & Smith (2013), through case studies, found out that human capital is the most important category of intellectual capital. Bini et al. (2016), extending the work of Beattie & Smith (2013), describes how knowledge resources drive value creation, rather than the specific money value ascribed to those resources.

Finally, the work of Rossi et al. (2016), extends and implements a framework that aims at improving the strategic management of organizational intellectual capital assets (ICAs). This framework included eight elements that compose ICAs: Corporate culture and internal relationships (e.g., the set of organizational values and relational dynamics), Intellectual property and technology (e.g., the organization's patents and industrial secrets), knowledge and competence (i.e., knowledge that people within the organization own), processes (e.g., procedures to run projects), relations with customers (e.g., consumers, downstream firms), relations with institutions (e.g., local government, ministries), relations with investors (e.g., shareholders, banks, venture capitalists), relations with partners and suppliers. The study finds out that Knowledge and competence ICA has the highest effect on value capture, followed by processes. In fact, these two factors have the best cost/benefit ratio related to the other 6 ICAs. Of course, this study has a big limitation, because it refers to only one company, in particular a high capital intensity company, it means that this study is not generalizable to all companies.

While IC was a driver for value creation in previous works, some studies have investigated the issue of IC related to value destruction, i.e. how IC leads to value loss. Giuliani (2015), analyze the role played by intellectual capital and intellectual liabilities "in practice" within the value creation processes, by adopting a temporal lens and a managerial perspective. Indeed, it also analyses the “dark side” of the value creation, it means “value destruction”, that it tends to generate negative effects faster than the value creation one, especially with reference to the impacts of IC on financial performance. Cova and Paranque (2019) work focus on interplay between value creation and value capture in a context in which value capture by a company owning an immaterial asset is more and more under threat. The study identifies five assemblages (animation, dormant beneficiary, mismatch, dissidence, and confrontation) which describe different modalities of communal management of the immaterial resource that is the brand. The study underlines the importance of intangibles management as a key element to create value and avoid brand slippage. Indeed, new technologies allow the brand to lose some of the control over the brand (brand slippage). On the other side, in which there is no slippage, the firm controls the interactions with the community and other market players and retains all the value created. It becomes extremely important for companies capturing the exchange value potentially created by these new uses and practices, and thereby to understand the different forms and conditions of value slippage. Brand is an intangible asset, and does not disappear in the act of consumption; on the contrary, its reputation grows and it can be consumed reduced availability to other actors. Through co-creation mechanisms in brand communities, brand users are able to help the evolution on the brand. This capacity to capture value created by the community, that is, to capture use value as exchange value, and to avoid any kind of value slippage, depends on the collaboration between the community and the company.

5.2 intellectual capital and business model (holistic view)

It is clear from the literature that the business model concept has successfully colonized the strategic management literature, acting as a holistic, overarching concept. Key component concepts are resources, competencies, value creation and value delivery, strategy and competitive advantage (Zott et al., 2011). Thus, the business model is a system-wide description of how companies do business and, most importantly, how they create value. Value creation is at the core of companies' purposes and therefore business model has emerged as a key priority for managers and entrepreneurs. Its dynamics have become priority for scholars too. As a holistic concept, the 'connectivity' between the various elements (i.e. the glue) is part of the model itself. In this scenario, what is the role of intellectual capital? What's the logic between business model and intellectual capital? Of course, intellectual capital is a key component for generate competitive advantage and hence create value. It is surprising, therefore, that the intellectual capital literature appears to make little use of the management literature relating to business models. Despite this there a few exceptions. Martin de Castro et al. (2019), by conducting a quantitative review of the existing literature on intellectual capital, identify the four major trends in intellectual capital research; one of this factor is related to the role of intellectual capital in new business models, which extends the classic domain of IC to include both the inside and the outside of the organization (Secundo et al., 2018), and to include new scenarios in business and the economy by addressing its role in emerging businesses (start-ups and entrepreneurship), as well as new business realities and activities such as the Internet of Things or cloud-based management. Additionally, Beattie & Smith (2013) refocused the debate of intellectual capital and concluded that the business model concept offers a powerful overarching concept within which to refocus the intellectual capital debate. The business model concept is holistic and systemic. Indeed, it is a unit of analysis that spans the boundaries of a single firm, while being firm-centric with boundary-spanning value creation activities playing a key role for many firms. The concept effectively subsumes the resource-based, dynamic capability and strategic network views of competitive advantage within the strategic management literature, which in turn subsumes the intellectual capital literature. The business model concept and related perspectives on competitive advantage offer a powerful integrating concept within which to refocus the intellectual capital debate. In this regard, Beattie & Smith

(2013) affirm that intellectual capital assets are implicitly part of business model elements, for example intangible resources, competences and dynamic capabilities are part of business model configuration, which allow to find new sources of revenues, therefore, creating new values. Despite this there are no empirical evidence supporting this proposition.

The hyper competitive environment pushes companies to evolve or rethink completely their business model. New trends (e.g., Digital Transformation, Industry 4.0, Fintech) encourage companies to innovate the business model. In this context, the role of intangible assets became a key element to gain competitive advantage in all sectors. For example, banking systems have experienced significant transformations driven by deregulation, technological change and the globalisation of goods and financial markets. According to this, Chen et al. (2014) developed a model to rethink business model leveraging intangibles. It suggests that existing bank business models should be further developed in a conceptually richer world of intangibles, knowledge and information. In the same vein, Helms (2016) analysed the servitization process of Swiss and Germany utility companies. So, the author investigated how intangibles push companies to innovate their business models from being product-oriented to being less capital-intensive and more service-oriented.

Another area that has received scant attention from scholars to date is related to the so-called green intellectual capital (Chen, 2008), which is related to companies that leverage their intangibles to achieve the sustainability transition. According to the classification proposed by Johnson (1999) and Bontis (2001), green intellectual capital has been distinguished into green human capital, green structural capital, and green relational capital, which all co-participate to build a company's competitive advantage (Chen, 2008). Notably, green human capital is linked to achieving sustainable innovation thanks to the expertise, know-how, commitment, and willingness of a company's employees. Green structural capital pertains to the complex of technologies, culture, and system of beliefs that push a company to modify its strategies and operating plans to be more environmentally friendly. Subsequently, all the practices related to monitor a company's carbon footprint, water consumption rates, GHG emissions, or, more generally, give evidence of all its environmental-related behaviours in the non-financial disclosure are included in the green structural capital. Finally, green relational capital regards the involvement of relevant stakeholders in pursuing the sustainable transition and achieving environmental objectives. That said, whilst some authors have explored how a company's culture focused on helping the environment could lead to obtain higher performances (Linnenluecke and Griffiths, 2010), even specifically designed environmental ones (Yadiati et al., 2019), to the best of authors' knowledge no studies have addressed the relationship between green intellectual capital and business model or business model innovation. Consequently, this could represent a promising future research line for business and management scholars.

6. Discussion, research gaps, future research trends and conclusions

The purpose of this paper was to explore the relationship between intellectual capital and business models. Two research questions have been proposed to investigate the links between intellectual capital and business model, and to explore possible future research trends of business and management studies regarding intellectual capital and business model?

Regarding the first research question, it is possible to underline that, if we consider value capture as a fundamental element of the business model, the literature of its connection with intellectual capital is very rich. Many studies have tried to study and test the impact of the components of intellectual capital on business performance (Inkinen, 2015), namely the ability of the company to capture value.

However, most studies have focused on economic value (Nielsen, Lund and Thomsen, 2017), neglecting social and environmental value. This represents a significant research gap, which allows us to answer the second research question. We currently live in an era in which there is great awareness of sustainability issues. Future studies should study how intellectual capital and its components can contribute to solving social and environmental problems and create value for different stakeholders (Porter & Kramer, 2019), not only for shareholders. For some years now, scholars have been talking about green intellectual capital (Chen, 2008). This stream of literature should focus on creating value, with a focus on the value created for the community, the environment, employees and the territory at large. Studies should focus on the role of knowledge, information and relationships in the development of business models that have a social and environmental impact. Moreover, future studies should go further the "dark side" of IC and value creation, aiming to identify why and how in same case IC assets could lead to a "value destruction".

Returning to the link between intellectual capital and business model, few studies consider the business model through a holistic lens (Beattie & Smith, 2013). Recent history sees many companies able to use their intellectual capital, knowledge, unique skills and dynamic capabilities to change their business model. However, the scientific literature on the subject seems to be very scarce. Studies should focus on companies' ability to create new products and value propositions, enter new markets, create new pricing models, through the use of their intellectual capital. Several high-tech companies are shifting servitization strategies to create to sources of competitive advantage, i.e. strategies that aim to create value no longer through the development and sale of products but services. For example, Daimler used its relational capital and expertise to innovate its service-oriented business model when it developed Car2Go. The service also included a collaboration with Daimler's competitor BMW. In the same way, the Italian company ENI, active in energy production, exploited its intellectual capital to develop the car sharing model called Enjoy, in collaboration with several local and national actors such as Fiat Chrysler Automobiles. These cases underline that the link between intellectual capital and business model is evident, although the literature seems to neglect it.

The paper offers the following main theoretical implications. First, it contributes to the well-established literature on intellectual capital (Nahapiet & Ghoshal, 1998) by shedding light on the current interconnections between intellectual capital and business model. As such, the findings of the SLR suggest that most of the studies on intellectual capital and business model focused on value capture, while studies neglected the business model concept through a holistic lens. Therefore, the study contributes to the intellectual capital literature by identifying several research gaps that should be filled by future studies. Second, the research underlines the key role of intellectual capital assets in driving business model innovation, which are increasingly important in the current hyper-competitive international markets (Beattie & Smith, 2013).

In conclusion, the study has the following limitations. First, SLR considered intellectual capital in a narrow sense. Surely there are studies not considered in our SLR, which analyse the impact of some intellectual capital variables on business models (human capital, know-how, knowledge management). Second, the results highly depend by the decision of investigating into only one database and by the adoption of specific keywords to search into it. However, they were chosen from the relevant literature regarding the topic and to be the most comprehensive as possible. Moreover, the backward and forward analysis enabled the authors to include other relevant literature. Thus, although some potentially relevant article could have been missed, the authors are sure to have considered the most representative publications of the investigated topic. Third, in performing the bibliometric analysis the total number of citations was considered to identify the most influential publication regarding the intersection between IC and business model and business model innovation. In this sense, a temporal bias influenced the evaluation, giving more emphasis to older articles. However, the qualitative nature of the content analysis enabled to mitigate this bias in the development of the article.

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