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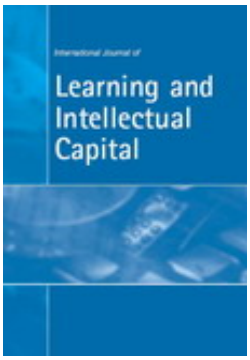

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Intellectual capital and competitive advantage: a structured literature review

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Abstract: The purpose of the present study is to review and critique the intellectual capital (IC) literature in context of competitive advantage (CA) and outline the future of relevant research agendas in this field. Research articles from the Scopus and Web of Science (WOS) databases, ranging from 2000 to 2022 are categorised and analysed through bibliometric and content/thematic analysis in a structured literature review (SLR). The findings indicate an increased attention among scholars and academicians due to tremendous importance and recognition of IC as source of CA. The results of co-citation and bibliographic-coupling analyses suggest that further attention should be devoted to IC practices. The study is constructive in evaluating the scientific production on this subject and identifying major contributions. Furthermore, the information provided is useful for researchers and practitioners studying IC as competency of CA and can underline the directions of future research.

Keywords: intellectual capital; competitive advantage; structured literature review; co-citation analysis; bibliographic coupling analysis.

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1 Introduction

Intellectual capital (IC) has been at the forefront of a wide range of research for academicians and practitioners in the field of business, management, and economics from last two decades (Dumay and Garanina, 2013). It is vital to identify the key drivers of organisational IC, ways to manage and deploy it, and the expected consequences from its exploitation (Brooking et al., 1998). The rise of 'knowledge-based economy' (Dean and Kretschmer, 2007) or 'post capitalist society' (Drucker, 1993) has underscored the strategic importance of IC for organisational survival (Marr and Spender, 2004) and its role as a key driver of financial prosperity and sustainability in both national and international realms. Additionally, the market premium of knowledge firms lies in the ability to leverage and manage their IC to capture the tacit knowledge created and convert it into explicit knowledge (Paoloni et al., 2020). IC, which exerts significant impact on financial performance, is not only a way to augment organisational competitiveness (Chen, 2008; Jardón and Martos, 2012; Chahal and Bakshi, 2014; Rehman et al., 2022) but also a survival kit in current fast-paced and dynamic economic environment. This perspective aligns with Na et al. (2019), who argue that valuable, rare, and irreplaceable resources of organisations are prone to reify long-term competitiveness.

Unlike financial and physical assets, the nature of IC is abstract; consequently, creating, measuring, leveraging, and maintaining it compels it to be one of the main and most difficult-to-imitate sources of organisational competitive advantage (CA) and growth. As IC is a dynamic system that continuously evolves, it is necessary to reshape the way organisations manage information, knowledge, and learning processes. Therefore, measuring and reporting IC is no longer an option but a necessity facing all organisations alike. The emerging roles of IC in different areas, such as sustainable growth, CA, and integrated reporting (Edvinsson et al., 2021) open up new research possibilities. All in all, such relevant research possibilities drive attention to literature review in the international scenario. This study offers a complementary interpretation of the association between IC and CA by analysing the theoretical foundations of such association. From an organisational vantage view, IC is acknowledged as a key determinant in fostering organisational innovative capabilities (Subramaniam and Youndt, 2005; Dost et al., 2016; Niwash et al., 2022) and competitiveness (Kamukama et al., 2011; Xu and Wang, 2018; Khan et al., 2019; Vo and Tran, 2023). Thus, it is asserted that IC needs to be directed towards perceiving, capturing, and seizing novel opportunities to sustain a competitive edge. Furthermore, strategic management studies have focused on the decisive role of IC and the ways of its exploitation to possess dynamic capabilities. In this respect, there seems to be an urge for current research, as IC is an important enabler for organisational CA.

The pursuit of CA is arguably a central theme in the academic field of strategic management (Hoskisson et al., 1999), and IC is a set of attributes that permits organisations to outperform their competitors or the industry. An organisation exploits opportunities and confronts incessant challenges in its quest for value creation. IC, as organisation's overarching or superordinate capability, effectively addresses the challenges and opportunities to realise its mission and vision (Rastogi, 2003). It occurs when firms implement value-creating strategies not simultaneously being implemented by the current or potential competitors (Barney, 1991). In the literature, the antecedents of competitiveness shifted from a tangible to an intangible perspective. Ma (2004) explained CA as a condition of positional superiority. Accordingly, firms cannot obtain CA if the strategic resources are evenly distributed across industry. Thus, firms must focus on resource heterogeneity and immobility. There are three key theories that underpin the study of CA, namely:

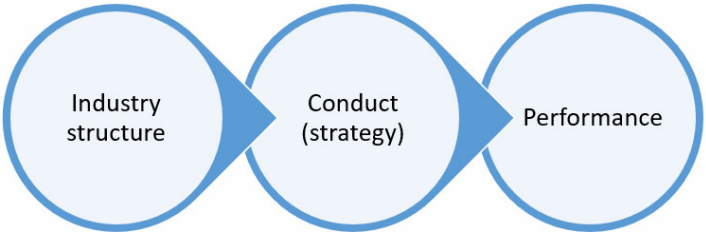
1 market-based view (MBV)

2 resource-based view (RBV)

3 knowledge-based view (KBV).

According to MBV, industrial factors and external market orientations are the major determinants of organisational performance (Porter, 1980). The industrial organisation paradigm argues that a firm's performance in the marketplace critically depends on the characteristics of industrial environment. It determines the conduct of the firms, whose joint conduct then determines the industry's performance. This is expressed as structure-conduct-performance (SCP) trilogy. The SCP paradigm, also known as MBV, attributes distinctive performance to the structural nature of the industry and argues that CA derives from the economic structure within industries, and strategic group behaviour is the primary source. The literature claims that the focus of studies since 1980s has shifted from the industrial structure paradigm (MBV) to the organisational internal structure (RBV).

Figure 1 Structure-conduct-performance (SCP) trilogy (see online version for colours)

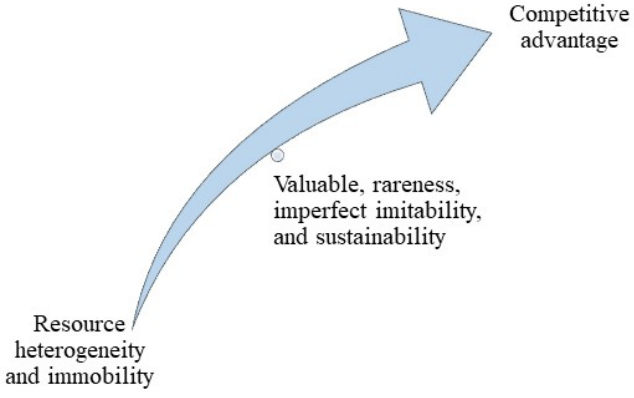


Source: Peterson (1980)

The theorists of RBV (Barney, 1991; Grant, 1991; Peteraf, 1993) posit that organisational strategic resources, particularly intangible ones, are the cornerstones of CA. Penrose (1959) advocated that organisation's resources are more important than structure of the industry, though the term 'resource-based view' was propounded later by Wernerfelt (1984). The theory resets on two aspects in analysing the resources of CA. First, the strategic resources determine the firm's performance, and second, these resources must be perfectly idiosyncratic and immobile, thus making heterogeneity long lasting. Barney

(1991) further demystifies that the firm obtains CA when competitors have ceased efforts to duplicate a unique configuration of the resources. Important features of the RBV include organisational internal interactions by resources resulting in higher business performance and cooperation mechanisms with other organisations to acquire lacking resources (Prahalad and Hamel, 1990).

Figure 2 RBV – heterogeneity and immobility of resources and CA (see online version for colours)



Source: Barney (1991)

An emerging research stream, resource orchestration theory (ROT), extends the understanding of RBV by explicitly addressing the role of managers' actions to effectively structure, bundle, and leverage firm resources (Sirmon et al., 2011; Asiaei et al., 2020). The notion of 'resource mobilisation' lies at the heart of ROT, where mobilised resources are integrated to ensure greater alignment, coordination, and direction. Hence, the challenge in implementing ROT lies in understanding the ways in which managers can structure and mobilise resources to trigger organisational performance.

Foss and Knudsen (2003) criticise RBV based on the concern to conceptualise, identify, and measure intangible resources, which are abstract in nature. Reed et al. (2006) advance the theory and propose a pragmatic resolution to these concerns, which emerges as a mid-range theory: an intellectual capital-based view (ICV) of firms. As a mid-range theory, ICV provides a higher potential for empirical testing than RBV, representing specific aspects more narrowly linked to CA (Martín-de-Castro et al., 2011). Thus, ICV is considered as complementary to a more widely understood knowledge-based view (Grant, 1996), attempting to access knowledge assets for superior performance. This theoretical-pragmatic approach is a specialisation of RBV and arose from practitioners in the 1990s.

The KBV of the firm is an extension of the RBV, accepted to be adequate for the present economic context (Mathews, 2003). The RBV of the firm is further extended by introducing the concept of the knowledge process, where organisations that can develop new capabilities and opportunities in a dynamic learning path are able to sustain CA (Eisenhardt and Martin, 2000). As the KBV considers that firms are heterogeneous entities loaded with knowledge (Hoskisson et al., 1999), most of the researchers advocating the RBV regard knowledge as a generic resource for its special characteristics

of a competitive resource. Prahalad and Hamel (1990) argue that in the information age, knowledge, intellectual assets and competencies are the main drivers of superior competitive performance. Organisations with innovative knowledge can introduce innovative products or services, potentially providing a competitive position. The RBV approach is claimed to be very descriptive (Foss and Knudsen, 2003) and criticised for the lack of prescriptive models. Therefore, it may be assumed that the KBV approach welcomes the development of prescriptive models. However, literature lacks theoretical development in this particular field of research.

Even though IC, as a strategic intangible source, has been intensively addressed, the nexus between CA facets and various components of IC has received less attention. The comprehension of IC models, processes, procedures, and tools supporting CA discloses further investigation areas. To the best of our knowledge, a structured literature review (SLR) related to the articles about the contribution of IC to sustain CA is lacking. This motivates the need for the present study, which aims to fill the gap and trigger future analyses and development in this field. Additionally, the manuscript attempts to disclose existing scientific roots of the IC-CA literature and spot current thematic trends and relevant emerging trajectories. Accordingly, this article conducts an SLR to analyse the studies surrounding IC as a strategic asset for sustaining CA, in search of promising research gaps. A preliminary protocol is defined to document the procedure undertaken in developing the literature review. As research questions provide to develop new approaches and insights (Hart, 1998), the study is based on two central and essential research questions:

RQ1 What are the major themes that have been developed within IC as competency for CA in the Scopus and WOS databases?

RQ2 What is the focus and critique of research in this field?

The article is further classified into three sections. In Section 2, the methodology illustrates how the authors select the articles for analysis, develop, and apply the analytical framework. Section 3 presents the research findings – insights and critiques to answer the research questions through descriptive and thematic analysis. Practical implications and conclusion are discussed in the final section.

2 Material and methodology

The SLR approach originated in the 1990s and was initially applied in the field of medicine. However, it has since been used to investigate interdisciplinary fields such as supply chain management and human capital accounting (Guthrie et al., 2012), integrated reporting (Dumay et al., 2016), knowledge management in SMEs (Massaro et al., 2016), and blockchain (Frizzo-Barker et al., 2020). It is a standardised, transparent, rigorous, and replicable approach to develop knowledge by mapping the evolution of major research themes, trends, and paths, as well as to identify potential future research areas. According to Massaro et al. (2016), conducting an SLR "can help experienced scholars develop new and interesting research paths by accessing and analyzing a considerable volume of scholarly work". Additionally, it can contribute to developing research paths and questions by providing a foundation for further investigation. Interestingly, the SLR seems to furnish an alternative to traditional literature review process to capture more

defensible and replicable results. This approach provides a modern point of view on literature review evolution since it includes all the indexed articles in the databases. Moreover, in the SLR process, authors use an explicit algorithm, as opposed to a heuristic, to conduct a search and perform critical appraisal of the literature employing a transparent and reproducible procedure (Tranfield et al., 2003). The scientific rigueur of SLR is paramount for a quality review. In this paper, the three-stage procedure of Tranfield et al. (2003) is followed, which includes: planning the review, conducting the review (i.e., execution), and finally reporting and dissemination. In planning, the general and specific objectives of conducting a review are explained. Further, the databases are selected, and search criteria are established. In the execution step, the search and selection of the articles that best adapt to the research objectives and hypothesis are performed. Finally, in reporting, the synthesis and analysis of the results are presented in accordance with the investigation objectives.

2.1 Planning the review

The initial stages of SLR may be an iterative process of defining, classifying, and refining (Clarke and Oxman, 2001). Planning consists of identifying the need for a review, preparing a proposal for the review, and developing a review protocol. The general objective is to understand the literature evolution and detect the most important articles and authors that conducted studies on the topic. Specifically, the authors focus the studies on IC in the context of CA to observe the changing trend of competitiveness.

Articles for the present study have been collected using Elsevier's Scopus database and Clarivate Analytics' (previously the Intellectual Property and Science Business of Thomson Reuters) Web of Science (WOS) database. The inclusion of the Scopus and WOS databases in the search strategy revolves around the fact which entails that search must be implemented in multiple databases. Both databases have rich academic prestige and are among the biggest scientific databases.

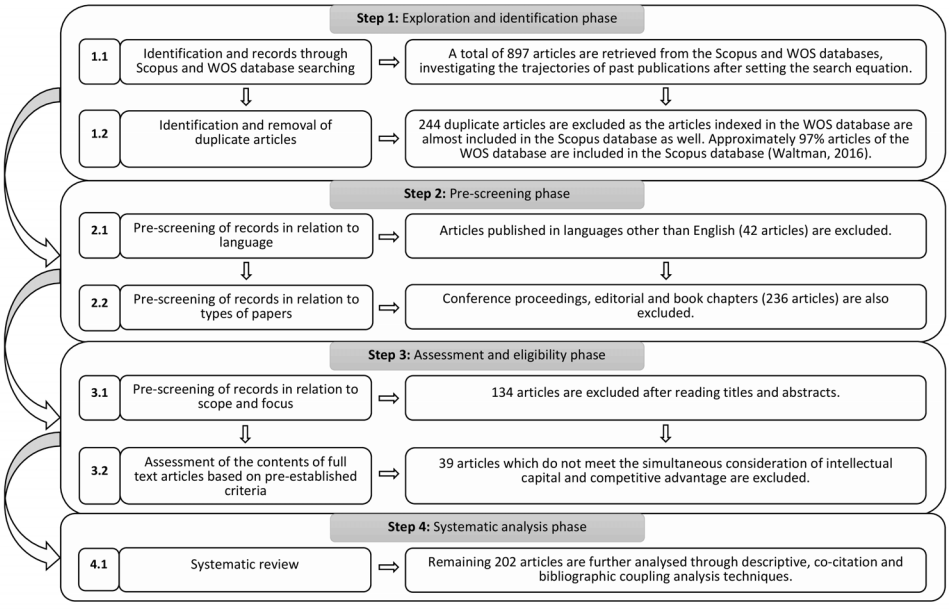
2.2 Conducting a review, i.e., execution

The second step, conducting a review, includes the identification of research, selection of studies, quality assessment, data extraction and monitoring progress, followed by data synthesis. A comprehensive and unbiased search is the key feature of SLR and exposes studies to rigorous methodological scrutiny. To retrieve the most relevant articles, a bibliometric analysis has been conducted. The Boolean operator 'AND' is applied to include articles which linked the keywords, though it narrows down the parameters of exploration, confining it to more specific demarcation. The goal is to combine the search variables and retrieve results where both terms occurred.

The search string used for extracting relevant articles is first identified by querying a set of keywords. Taking into consideration the criteria established in Section 2.1, the search strategy allows for variations of terms spelling when searching titles, abstracts and/or keywords: *intellectual capital* and *competitive advantage* with a timespan from 2000 to 2022. This unbiased way of searching for articles is comprehensive as well as reproducible. The focus is on IC literature tendencies in achieving CA to identify literature gaps, support further research, and deliver an inventory of articles concerning the specific research area.

The initial search in both databases produced 897 articles, including duplicates. To obtain a more suitable set of articles, the authors defined some inclusion and exclusion criteria. Articles from the initial pool are analysed with respect to the following criteria:

Figure 3 Selection criteria



Source: Authors' compilation.

The selection criteria are classified in four parts, i.e.,

1 exploration and identification phase

2 pre-screening phase

3 assessment and eligibility phase

4 systematic analysis phase.

In the first part, i.e., exploration and identification phase, the authors set the search string to investigate the trajectories of past publications and identify and remove duplicate articles as two databases (Scopus and WOS) are considered in the study. In the next part, i.e., pre-screening phase, conference papers, editorials, book chapters, and articles published in languages other than English are removed. In the third part, i.e., assessment and eligibility phase, articles that do not meet the simultaneous consideration of IC and CA are excluded after reading the articles. Finally, the authors selected 202 articles and analysed these through descriptive, co-citation, and bibliographic-coupling analysis techniques.

2.3 Reporting and dissemination

A quality SLR makes it easy for practitioners to understand the research by synthesising extensive published articles. In business, management and accounting research, a two-stage report may be produced, i.e., descriptive analysis and thematic analysis. Descriptive analysis is achieved using categorical sets of extraction forms, whereas thematic analysis focuses on the extent to which consensus is shared across themes.

The reports obtained from these databases are elaborated to represent the information required to study literature related to IC and CA. Defining a framework of analysis is an essential step to analyse the state of the art of literature and to develop an SLR. From previous SLR studies, the list of leading prospective nodes is taken. The analysis of 202 articles is conducted using and comparing two citation-based strategies: co-citation analysis and bibliographic coupling analysis (Crupi et al., 2020; Skute et al., 2019). Co-citation analysis examines the interactions among articles cited by the same study (Van and Waltman, 2017) and is preferable to unfold the state-of-the-art literature and emerging trajectories (Skute et al., 2019). The relationship between studies that cite the same articles is explored using bibliographic coupling. The visualisation of similarities (VOS) technique is applied in accordance with the dedicated algorithm of VOS-viewer, and the changing scenario of CA, from industrial factors to knowledge assets, with key emerging themes and research questions, is identified.

3 Research findings: insights and critique

This section presents the results obtained from descriptive and thematic analysis and provides commentary to answer the research questions: RQ1 and RQ2. Accordingly, it is organised into two parts: descriptive analysis and thematic analysis.

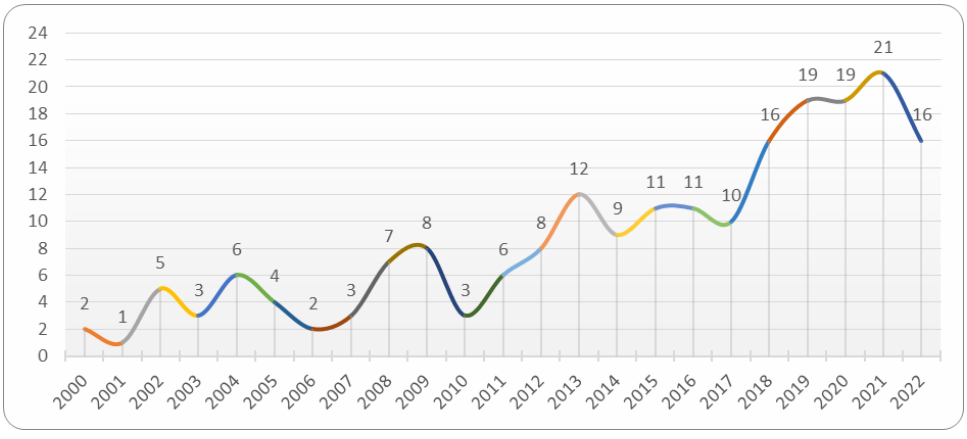
3.1 Descriptive analysis

Following the coding framework, this section includes the following categories of nodes: general information, articles by evolution, geographic distribution, journals, articles, authors, and subject areas. Figures 4 to 9 and Table 1, resulting from SLR, present the evidence and provide a comprehensive analysis of the trends characterising the advancement of the debate that IC spurs CA.

3.1.1 Evolution of research

Exploring the selected databases and considering the keywords discussed above in the search string, the authors obtained 202 documents (post exclusion practice) distributed from 2000 to 2022. The trend of articles developed over the timeframe is depicted in Figure 4. As noted, at the intersection of IC and CA, there is an exponentially growing interest by academicians and scholars in investigating the research topic.

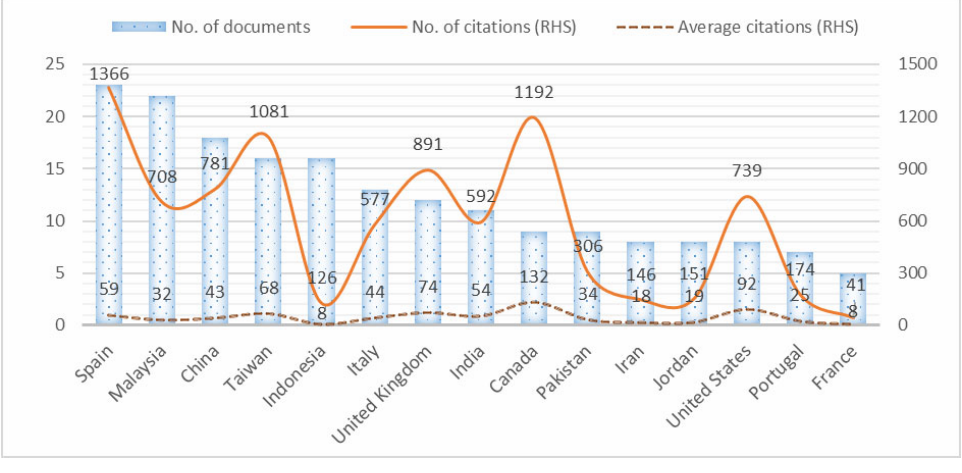
Figure 4 Distribution of articles over the timeframe (2000–2022) (see online version for colours)



Note: A total of 202 documents in the Scopus and WOS databases from 2000 to 2022.

The drastic increase, from 2018 onwards, in topic research depicts the recent interest in the literature for IC as competency for CA, and a tendency of successive increase in indexed articles can be observed. Out of 202 articles, 45% have been published in the last 5 years (2018–2022), which depicts the emerging scenario of IC-CA literature.

Figure 5 Origin of the research articles (see online version for colours)



Note: Based on the information retrieved from Scopus and WOS databases, this figure includes the top 15 countries regarding number of documents, along with total and average citations.

3.1.2 Geographic distribution

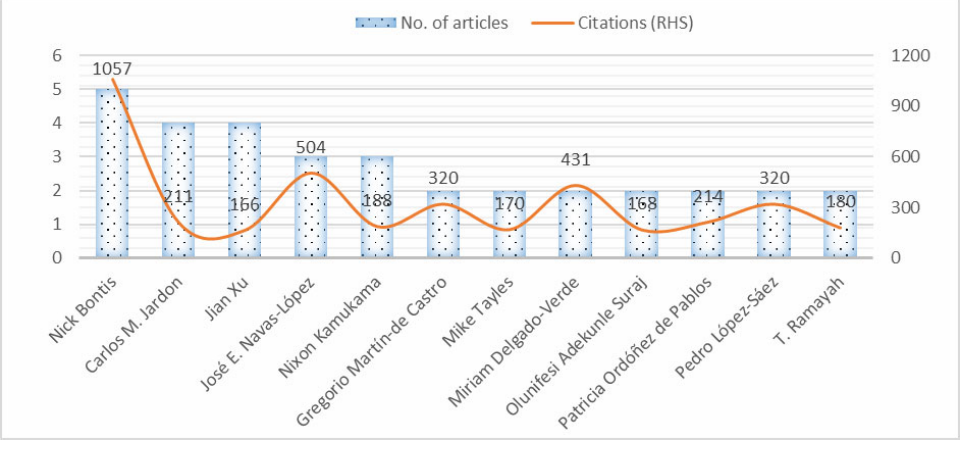
The relevance of this distribution lies in the fact that societal and cultural differences among countries affect the social capital; thus, IC differs geographically (Hofstede et al., 2010). Figure 5 shows the distribution of articles across countries. Out of 202 articles, 149 articles are from the top ten countries, covering 73.76% of the sample. The results of

the analysis of the articles revealed that Spain is the leading country with 11.39% of publications, followed by Malaysia (10.89%), China (8.91%), Taiwan (7.92%), and Indonesia (7.92%). The rest of the countries have a comparative smaller participation, i.e., 15 or fewer articles. Although the publication of articles is low in some countries, Figure 5 allows to derive the nucleus of interest at the global level.

3.1.3 Most influential authors

Figure 6 shows the list of the top 12 authors who have the highest publications and citations, considering Scopus Citation Overview. Nick Bontis has the highest number of publications, followed by Carlos M. Jardon and Jian Xu.

Figure 6 Most influential authors (see online version for colours)

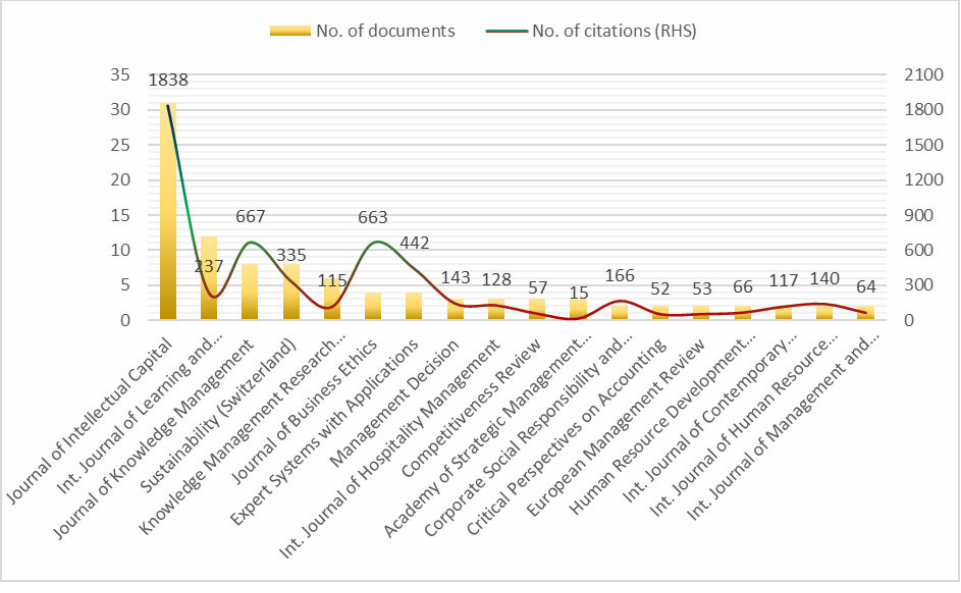


Source: Authors' calculation based on data extracted from Scopus and WOS databases (2000–2022)

3.1.4 Most recognised journals

Figure 7 presents the most recognised journals where the analysed articles have been published. These journals published 99 articles (49.01%) out of the sample and cover 57.33% of the citations (5,298 out of 9,242). The most frequently used journal for IC and CA is the *Journal of Intellectual Capital* (31 articles), followed by *International Journal of Learning and Intellectual Capital* (12 articles), *Journal of Knowledge Management* (eight articles) and *Sustainability* (eight articles). Other journals with concentration for the given topic include *Knowledge Management Research and Practice* (six articles), *Journal of Business Ethics* (four articles) and *Expert Systems with Applications* (four articles). For new researchers, this summary can serve as a useful guide to detect potential areas of research and the journals in which this topic is frequently published.

Figure 7 Most recognised journals (see online version for colours)



Source: Authors' calculation based on data extracted from Scopus and WOS databases (2000–2022)

The trends characterising the number of citations received in the literature demonstrate the impact and relevance of publications. Figure 7 also provides evidence of the number of citations for these journals. The analysis shows the quality of articles in terms of number of citations received. With reference to the citation trend, *Journal of Intellectual Capital*, *Journal of Knowledge Management* and *Journal of Business Ethics* have the highest specialisation in terms of IC, capturing greater interest from scholars and researchers.

3.1.5 Most cited articles along with distribution of citations

Table 1 presents the most cited articles with their references. Besides, it shows the publication year and total citations (TC) received in literature. The years since publication (YSP) are also considered to contemplate the citation per year (CPY) in each case. Analysis of the results reveals that there is no positive relationship between the publication year and the number of citations received. For example, the most cited articles include one from Egbu (2004) and another one from Beattie and Smith (2013), with 9 years of difference between their publications but share almost the same number of citations received.

Table 1 Most cited articles

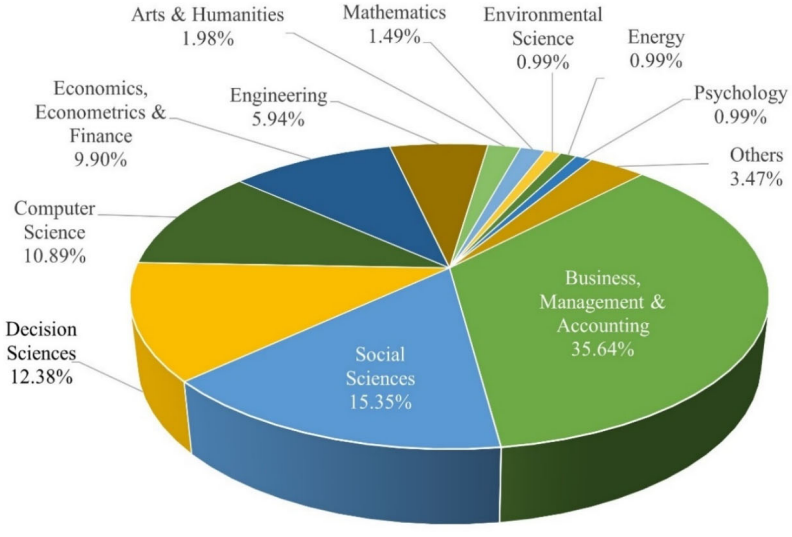
Author(s)	*Article (year)*	*Journal*	*TC*	*YSP*	*CPY*
Bontis, N.	Assessing knowledge assets: a review of the models used to measure intellectual capital (2001)	*International Journal of Management Reviews*	866	22	39.4
Chen, Y.S.	The positive effect of green intellectual capital on competitive advantages of firms (2008)	*Journal of Business Ethics*	360	15	24.0
Maditinos, D. et al.	The impact of intellectual capital on firms' market value and financial performance (2011)	*Journal of Intellectual Capital*	313	12	26.1
Meso, P. and Smith, R.	A resource-based view of organizational knowledge management systems (2000)	*Journal of Knowledge Management*	258	23	11.2
Martín-de-Castro, G. et al.	Towards 'an intellectual capital-based view of the firm': origins and nature (2011)	*Journal of Business Ethics*	247	12	20.6
Hayton, J.C.	Competing in the new economy: the effect of intellectual capital on corporate entrepreneurship in high-technology new ventures (2005)	*R&D Management*	217	18	12.1
Egbu, C.O.	Managing knowledge and intellectual capital for improved organizational innovations in the construction industry: an examination of critical success factors (2004)	*Engineering, Construction and Architectural Management*	209	19	11.0
Beattie, V. and Smith, S.J.	Value creation and business models: refocusing the intellectual capital debate (2013)	*British Accounting Review*	203	10	20.3
Calabrese, A. et al.	Using fuzzy AHP to manage intellectual capital assets: an application to the ICT service industry (2013)	*Expert Systems with Applications*	199	10	19.9
Martín-de-Castro, G. et al.	The moderating role of innovation culture in the relationship between knowledge assets and product innovation (2013)	*Technological Forecasting and Social Change*	184	10	18.4

Source: Authors' calculation based on data extracted from Scopus and WOS databases (2000–2022)

3.1.6 Subject-area-wise classification

Figure 8 displays that most of the studies are conducted around business, management and accounting, and social sciences, covering 41% of the articles. However, the topic is emerging in other areas, particularly in decision science, computer science, arts and humanities, environmental science, and energy, etc.

Figure 8 Subject-area-wise classification (see online version for colours)



Source: Authors' calculation based on Scopus and WOS databases

Figure 9 Word cloud of keywords (see online version for colours)

Source: Authors' compilation, using R software

3.1.7 Word cloud

A word cloud is a technique for visual representation to analyse the emerging versus declining topics in the terms of the frequency of keywords, allowing the analysis of a very large amount of text without losing focus on small amount of the material in considerable depth. The more frequent words within the text being analysed are represented with larger characters in the generated image. Keywords are used by researchers to signal the important themes in their articles. In the study, word cloud is interpreted with certain caveats as it often fails to group words with similar meanings, for example, 'public sector' and 'public organisations'. A dictionary of terminologies is created by aggregating such related words based on their centrality.

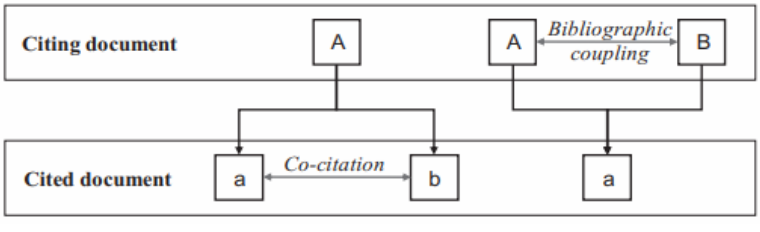
3.2 Thematic analysis

Thematic analysis is a qualitative research method used to identify and analyse patterns, themes, and recurring ideas within a dataset, such as interview transcripts, documents, or texts. It involves systematically organising and interpreting data to uncover underlying themes and gain insights into the research topic. In the present study, citation-based analysis and bibliographic coupling analysis have been employed.

3.2.1 Citation-based analysis

There are three main citation-based approaches namely co-citation analysis, bibliographic coupling, and direct citation, each with different histories. Both the co-citation analysis (Small, 1973) and bibliographic coupling analysis (Kessler, 1963) trace their roots back several decades, making them adequate for disclosing the literature path from its origins. Co-citation analysis was adopted as the *de facto* standard in the 1970s and has enjoyed that preferred position ever since. However, the recent resurgence in the use of bibliographic coupling is challenging the historical preference for co-citation analysis (Jarneving, 2005), as it is more suitable for displaying state-of-the-art literature and emerging trajectories (Skute et al., 2019). Direct citation, also called inter-citation, includes the direct interaction between two documents. It has not been as widely used due to the need to use very long-term windows to obtain a sufficient linking signal for clustering. In this study, the authors employed co-citation and bibliographic coupling analyses. The articles have been analysed using VOSviewer, a tool for visualising and constructing bibliometric networks in clusters, conducting co-citation analysis – which considers cited articles, and bibliographic coupling - which considers citing articles.

Figure 10 Co-citation and bibliographic coupling

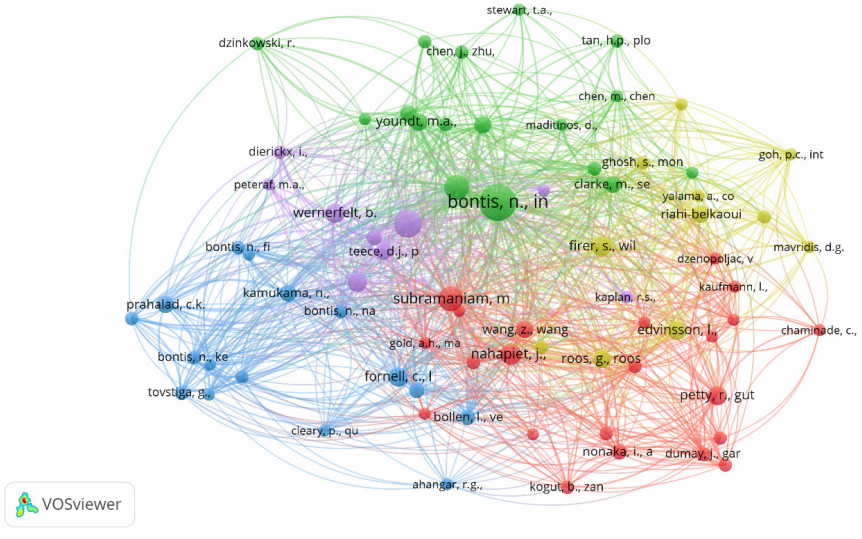


Source: Vogel and Güttel (2013)

3.2.1.1 Co-citation analysis

Co-citation analysis is defined as the frequency with which two documents of earlier literature are cited together, and co-citation strength as the number of identical citing items (Small, 1973). As frequently together-cited papers display the notion of subject similarity and represent the co-occurrence of key concepts, methods, approaches, or experiments in a particular research field, the co-citation pattern can be used to map out in detail the relationship between these key ideas. The clusters of co-cited articles provide a new way to study the specialty structure of literature. Another application of co-citation analysis is that it provides a tool for monitoring the development of research fields and assessing the degree of interrelationship among specialties. Figure 11 displays the results of co-citation analysis of the contribution of IC to sustain CA using VOS technique. The results are structured into five main interconnected thematic clusters based on likelihood of being cited together, with distinctive labels resulting from cited references. The clusters can be identified by different colours. Articles incorporated in one cluster display a higher probability of being jointly cited with another article. Furthermore, each article displays a specific weight based on the number of total citations received and the link strength of the article.

Figure 11 Results of co-citation analysis (see online version for colours)



Note: Purple – cluster 1; blue – cluster 2; green – cluster 3; yellow – cluster 4; red – cluster 5.

3.2.1.1.1 Cluster 1 [purple]: IC as source for CA

CA is dependent not, as traditionally assumed, on increasingly easy-to-imitate resources such as natural resources or economies of scale, but in accordance with the RBV, valuable, exclusive, and difficult-to-replicate resources lead to attainment of sustainable competitiveness (Barney, 1991; Peteraf, 1993) and, in turn, to maintain above-average business performance. Stewart (1997) referred to these rare resources as 'invisible assets' which is IC in real sense. Similarly, Spender (1996) acknowledged that CA arises out of

scarce, intangible, and firm-specific assets. Kamukama et al. (2011), Mubarik and Bontis (2022) and Rehman et al. (2022) claimed IC as a fundamental determinant of competitiveness and growth. IC reflects a knowledge resource controlled by the organisations, including implicit knowledge embedded in the organisation, as well as explicit knowledge that can be structured (Braunerhjelm et al., 2018).

Table 2 Highly linked articles of cluster 1 (purple) in the co-citation analysis

Author(s)	*Title*	*Year*	*Journal*
Wernerfelt, B.	A resource-based view of the firm	1984	*Strategic Management Journal*
Dierickx and Cool	Asset stock accumulation and sustainability of competitive advantage	1989	*Management Science*
Peteraf, M.A.	The cornerstones of competitive advantage: a resource-based view	1993	*Strategic Management Journal*
Teece et al.	Dynamic capabilities and strategic management	1997	*Strategic Management Journal*
Marr et al.	The dynamics of value creation: mapping your intellectual performance drivers	2004	*Journal of Intellectual Capital*

Source: Author's compilation

The extant literature affirms that CA and growth are largely influenced by various IC dimensions, for example, human capital (Fenech et al., 2019; Villanueva-Flores et al., 2023), structural capital (Zangoueinezhad and Moshabaki, 2009), and social capital (Zardini et al., 2015; Donate et al., 2016). Studies belonging to this cluster describe the importance of IC and its elements towards CA in the current turbulent economic environment. Knowledge and consequentially, innovation are considered climacteric elements for any organisation to enjoy CA (Shafiee, 2022). In this context, using the lenses of different theories of CA, the stream of literature explores the characteristics and dimensions of IC intended as an organisational strategic resource. However, empirical research is far from enough to investigate the practical role of IC to gain and sustain CA.

3.2.1.1.2 Cluster 2 [blue]: interplay among IC, innovative capabilities, and CA

Innovation is viewed as a critical source of CA and perceived to be a prerequisite for organisational success and survival. Studies grouped in the fourth cluster suggest IC as an antecedent of innovative capabilities development. As innovation is an indispensable determinant of organisational growth and competitiveness (Chahal and Bakshi, 2014; Trevlopoulos et al., 2021), ceaseless innovative improvement regarding materials, processes, methods, and technologies is required to avoid stagnation and inertia construction. The separate and interrelated impact of IC on the generation and adoption of innovation is critical, as innovation leads organisations to CA (Kamya et al., 2011). Innovation generation requires the creation and application of new knowledge, which contributes by creating opportunities, and the acquisition of new knowledge is the direct outcome of human and social capital. On the other hand, adoption of innovation relies on the replication of existing knowledge, which assists organisations to overcome deficiencies and performance gaps and exploit new opportunities.

Table 3 Highly linked articles of cluster 2 (blue) in the co-citation analysis

Author(s)	*Title*	*Year*	*Journal*
Bontis et al.	Intellectual capital and business performance in Malaysian industries	2000	*Journal of Intellectual Capital*
Tovstiga and Tulugurova	Intellectual capital practices: a four-region comparative study	2009	*Journal of Intellectual Capital*
Kamukama et al.	Competitive advantage: mediator of intellectual capital and performance	2011	*Journal of Intellectual Capital*
Yaseen et al.	The impact of intellectual capital on the competitive advantage: applied study in Jordanian telecommunication companies	2016	*Computers in Human Behavior*
Cleary and Quinn	Intellectual capital and business performance: an exploratory study of the impact of cloud-based accounting and finance infrastructure	2016	*Journal of Intellectual Capital*

Source: Author's compilation.

Dost et al. (2016) suggested that the survival of an organisation depends on its capability to innovate and learn, which is derived from IC in terms of competencies, organisational intelligence, and customer services. Furthermore, the IC and innovation linkage is addressed in the cluster by Duodu and Rowlinson (2019), exploring linear and quadratic effects of IC dimensions on strategic exploratory and exploitative innovation. The post hoc analysis concluded that social and organisational capitals have a significant effect on innovation. Gibson and Birkinshaw (2004) argued that both exploratory innovation processes (to enhance long-term development) and exploitative innovations (to provide short-term benefits) can be pursued simultaneously, while Gupta et al. (2006) suggested a trade-off between the two.

3.2.1.1.3 Cluster 3 [green]: accounting tools for IC and measuring organisational competitiveness

Traditionally, organisational IC has been thought of as a form of 'unaccounted capital', described as the knowledge-based equity that assists organisations to attain a competitive edge. IC, one of the crucial competitive resources of abstract nature, is challenging to measure (Bontis, 2001), and articles belonging to this cluster focused on 'counting the uncountable' issues. To address this, numerous measurement methods have been devised, each with its own limitations. Some methods treat manpower as other financial variables of the balance sheet, whereas others draw on an imprecise framework, not considering the entire cohort of interplay among IC components. In fact, the major challenge for scholars and academicians is to set an inclusive framework to disclose the true measurement of IC, considering both organisations' and markets' perspectives (Crupi et al., 2020).

Table 4 Highly linked articles of cluster 3 (green) in the co-citation analysis

Author(s)	*Title*	*Year*	*Journal*
Dzinkowski, R.	The measurement and management of intellectual capital: an introduction	2000	*Management Accounting*
Bontis, N.	Assessing knowledge assets: a review of the models used to measure intellectual capital	2001	*International Journal of Management Reviews*
Chen et al.	Measuring intellectual capital: a new model and empirical study	2004	*Journal of Intellectual Capital*
Youndt et al.	Intellectual capital profiles: an examination of investments and returns	2004	*Journal of Management Studies*
Clarke et al.	Intellectual capital and firm performance in Australia	2011	*Journal of Intellectual Capital*

Source: Author's compilation

The existence of IFR 138 indicates the acceptance of IC's significance by the international business community. The conceptualisation of IC as an incubator of business competitiveness has led the literature to theoretical development, drawing, describing, modifying, and extending the sub-dimensions of IC. Studies grouped in this cluster provided empirical evidence to better understand how specific IC components relate to and contribute to CA by value creation, applying different IC dimensions (Bontis et al., 2018) across industries and geographical boundaries.

3.2.1.1.4 Cluster 4 [yellow]: evolution of IC concepts and classification

Various factors such as globalisation, upgraded technologies, changing customers' preferences, relatively free capital and innovations are constantly reshaping the ways to encounter increased competition and highlighting the importance of IC. A plausible reason for the mismatch between book value and market value is the existence of IC. Studies grouped in this cluster dealt with the analysis of IC issues, such as definitions, classifications, configuration, recognition, and effects on financial performance. There are numerous generic definitions of IC, creating problems of plurality with no consensus over a single definition. Congruent to definition, its classification also lacks harmony among theorists. Sveiby (1997) first twined a classification of IC as human capital, structural capital, and customer capital which was modified and extended later by Bontis (2001) who deputised customer capital for relational capital. Another classification of IC consists of internal capital, which refers to organisational innovation capabilities, technological infrastructure, processes, management philosophy, and research and development activities (Guthrie et al., 2006), and external capital consisting of business partnering and alliances, distribution channels, customers, suppliers, shareholders, and market value (Johanson et al., 2006).

Table 5 Highly linked articles of cluster-4 (yellow) in the co-citation analysis

Author(s)	*Title*	*Year*	*Journal*
Edvinsson, I.	Developing intellectual capital at Skandia	1997	*Long Range Planning*
Firer and Williams	Intellectual capital and traditional measures of corporate performance	2003	*Journal of Intellectual Capital*
Riahi-Belkaoui, A.	Intellectual capital and firm performance of us multinational firms: a study of the resource-based and stakeholder views	2003	*Journal of Intellectual Capital*
Goh, P.C.	Intellectual capital performance of commercial banks in Malaysia	2005	*Journal of Intellectual Capital*
Ghosh and Mondal	Indian software and pharmaceutical sector IC and financial performance	2009	*Journal of Intellectual Capital*

Source: Author's compilation

Table 6 Highly linked articles of cluster-5 (red) in the co-citation analysis

Author(s)	*Title*	*Year*	*Journal*
Nahapiet and Ghoshal	Social capital, intellectual capital, and the organizational advantage	1998	*Academy of Management Review*
Petty and Guthrie	Intellectual capital literature review: measurement, reporting and management	2000	*Journal of Intellectual Capital*
Subramaniam and Youndt	The influence of intellectual capital on the types of innovative capabilities	2005	*Academy of Management Journal*
Dumay and Garanina	Intellectual capital research: a critical examination of the third stage	2013	*Journal of Intellectual Capital*
Wang et al.	Knowledge sharing, intellectual capital and firm performance	2014	*Management Decision*

Source: Author's compilation

3.2.1.1.5 Cluster 5 [red]: IC disclosure and reporting to enhance CA

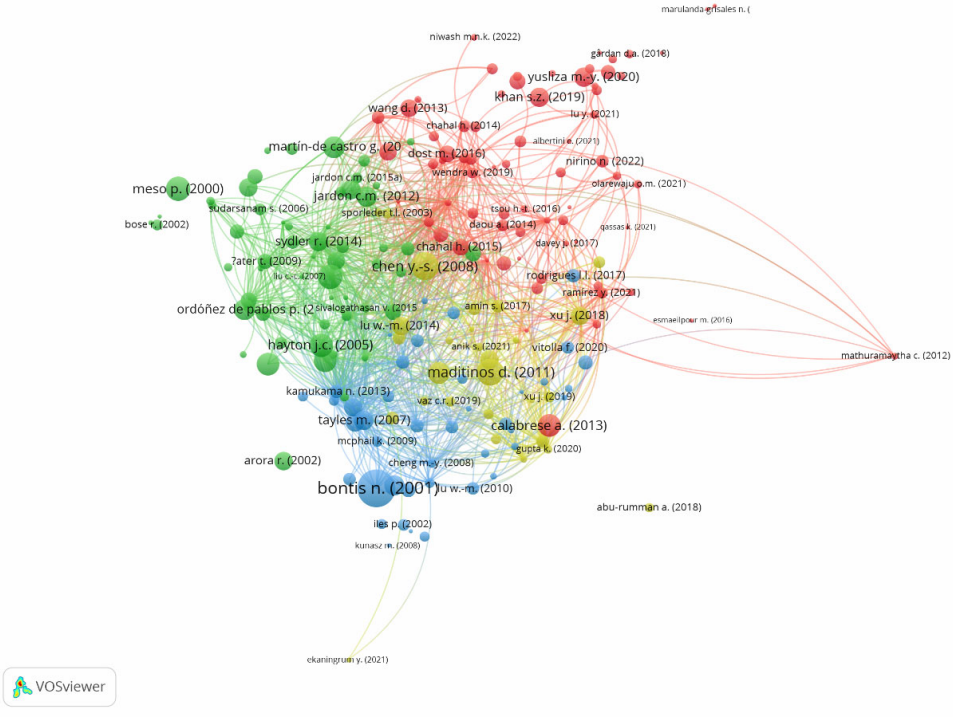
This cluster attempts to report the findings in relation to IC disclosure (ICD) and reporting to enhance CA. In traditional accounting practices, organisations used to measure and assess physical assets only, but the literature experienced a rapid turnaround, offering several frameworks for disclosure and intellectual capital reporting (ICR). An initial attempt was made by Brooking et al. (1998) to predict the potential of IC. The established literature examined various determinants of voluntary disclosure (Hossain et al., 1995), mandatory disclosure (Owusu-Ansah, 1998), and the combination of both (Inchausti, 1997). The findings suggested firm size (Bozzolan et al., 2003), types of industry and audit firms (Whiting and Woodcock, 2011), board independence and leverage (White et al., 2007), listing status (Williams, 2001), ownership concentration (Bukh et al., 2005), and firm age (Yau et al., 2009) are among major factors influencing ICD. The analysis of literature depicts a lack of innovations in ICD and a coherent theoretical framework (Kordi et al., 2023). Though the administrative department promotes the necessity of a standardised reporting format for scientific outcomes, the

professionals' question the viability of such a report (Habersam et al., 2013). Nevertheless, emerging innovations in integrating reporting (IR), stakeholder engagement, and disclosure in ecosystems open up possibilities for further research.

3.2.1.2 Bibliographic coupling analysis

Bibliographic coupling occurs when two articles refer to a common third article in their bibliographies. This association indicates the existence of the probability that the two articles treat a related subject matter. It is one of the earliest citation analysis methods for article similarity computation, which is a retrospective similarity measure, i.e., the information used to establish the similarity relationship between two documents is static; consequently, bibliographic coupling strength cannot change over time. Bibliographic coupling can be useful in a wide variety of fields since it helps scholars find related research, as bibliographic coupling is able to partition the literature into valid, related sub-groups (Kessler, 1963). Figure 12 displays the results of bibliographic-coupling analysis of the contribution of IC to sustain CA using VOS technique. The results are structured in five main thematic interconnected clusters, which can be identified by different colours, based on the likelihood of being commonly cited, with distinctive labels resulting from cited references.

Figure 12 Results of bibliographic-coupling analysis (see online version for colours)



Note: Blue – cluster 1; Yellow – cluster 2; Green – cluster 3; Red – cluster 4.

3.2.1.2.1 Cluster 1 [blue]: investing in IC to improve profitability, productivity, and value creation

The core argument of this cluster is to display the impact of IC, either positive or negative, on organisational profitability, productivity, and value creation. The literature has mixed results regarding the influence of IC on organisational performance. However, mixed outcomes may be a cause of different measurement tools of IC, as discussed earlier. Dumay et al., (2016) argued that the issue doesn't lie in managerial ignorance regarding IC and its importance but in the lack of uniform and comprehensive measurement and reporting frameworks for assessment and disclosure of IC. For example, Ricceri and Guthrie (2009) reviewed 36 IC frameworks classified into stock approach (establishing the financial value of intangibles) and flow approach (contextualising knowledge resources). Further, the epistemology of IC is a multi-dimensional asset, which makes the measurement challenging, and the frameworks divide the phenomenon into different elements (human, structural, and social capital) and further propose the indicators for each element.

Table 7 Highly linked articles of bibliographic-coupling analysis (cluster-blue)

Author(s)	*Title*	*Year*	*Journal*
Bontis, N.	Assessing knowledge assets: a review of the models used to measure intellectual capital	2001	*International Journal of Management Reviews*
Tayles et al.	Intellectual capital, management accounting practices and corporate performance: perceptions of managers	2007	*Accounting, Auditing & Accountability Journal*
Tan et al.	The evolving research on intellectual capital	2008	*Journal of Intellectual Capital*
Kamukama et al.	Competitive advantage: mediator of intellectual capital and performance	2011	*Journal of Intellectual Capital*
Boj et al.	An ANP-multi-criteria-based methodology to link intangible assets and organizational performance in a balanced scorecard context	2014	*Decision Support Systems*

Source: Author's compilation.

3.2.1.2.2 Cluster 2 [yellow]: human capital as a strategic resource

The anthropomorphisation of any organisation is a complicated conceptual leap and yet, there is a need to integrate the auspicious areas to uncover its hidden meaning. HC theorists (Barney, 1991; Lepak and Snell, 1999) considered HC an analogy to conventional capital and framed neoclassical capital theory for the analysis of HC components. Kamya et al., (2011) identified that knowledge resources (expertise and reputation of human capital) contribute significantly to organisational success. An influx of HC can augment organisational knowledge (Madsen et al., 2003), which is a crucial component of an organisation's ability to sustain CA. Shafiee et al. (2023) reported the importance of HC in the export orientation and competitiveness of knowledge-intensive firms.

In this context, the central focus of the cluster has been to explore the key dimensions of human capital and analyse it from a psychological to an economical perspective. In the fields of business and management, scholars focused on micro-level (individual and organisational behaviour and psychology) as well as macro-level (organisational strategy, policies, and practices) aspects. From a practical viewpoint, the micro-level aspect identifies and appreciates the characteristics of HC, such as knowledge, skills, and other abilities. Organisational processes and psychological traits of HC influence each other and enhance the organisational ability to exploit existing HC (Ployhart and Moliterno, 2011) and eventually build CA and superior performance.

Table 8 Highly linked articles of bibliographic-coupling analysis (cluster-yellow)

Author(s)	*Title*	*Year*	*Journal*
Chen, Y.S.	The positive effect of green intellectual capital on competitive advantages of firms	2008	*Journal of Business Ethics*
Maditinos et al.	The impact of intellectual capital on firms' market value and financial performance	2011	*Journal of Intellectual Capital*
Mondal and Ghosh	Intellectual capital and financial performance of Indian banks	2012	*Journal of Intellectual Capital*
Xu and Wang	Intellectual capital, financial performance and companies' sustainable growth: Evidence from the Korean manufacturing industry	2018	*Sustainability*
Bontis et al.	Intellectual capital in Serbia's hotel industry	2015	*International Journal of Contemporary Hospitality Management*

Source: Author's compilation

3.2.1.2.3 Cluster 3 [green]: IC – a knowledge-based perspective

Specific types, magnitude, and the abstract nature of organisational strategic resources determine profitability, productivity, and value creation. Accordingly, knowledge is perceived as a critical source to compete within an industry. Further, knowledge assets that contribute towards sustainable CA are referred to as IC or intangible or invisible assets (Subramaniam and Youndt, 2005; Curado et al., 2011; Rehman et al., 2022). Knowledge management extracts, processes, and disseminates vital information to make it useful, which can be shared and reused by the organisation to encounter fierce competition. Studies grouped in this cluster support the KBV that strategic knowledge assets, reflected in IC, tend to be the key drivers of comparative profitability and CA. Within this vein, Torres et al. (2018) identified the knowledge and IC dimensions representing the knowledge management construct of CA.

The studies in this cluster discussed the two key concepts: IC and knowledge management. The IC literature emphasised invisible resources which contribute to value creation in terms of human and organisational (structure and relational) capital, whereas the knowledge management literature concentrated on the mechanisms to control and manage such resources. In this sense, knowledge management leverages IC in the urge for sustainable CA.

Table 9 Highly linked articles of bibliographic-coupling analysis (cluster-green)

Author(s)	*Title*	*Year*	*Journal*
Meso and Smith	A resource-based view of organizational knowledge management systems	2000	*Journal of Knowledge Management*
Martín-de-Castro et al.	Towards 'an intellectual capital-based view of the firm': origins and nature	2011	*Journal of Business Ethics*
Hayton, J.C.	Competing in the new economy: the effect of intellectual capital on corporate entrepreneurship in high-technology new ventures	2005	*R&D Management*
Egbu, C.O.	Managing knowledge and intellectual capital for improved organizational innovations in the construction industry: an examination of critical success factors	2004	*Engineering, Construction and Architectural Management*
Martín-de-Castro et al.	The moderating role of innovation culture in the relationship between knowledge assets and product innovation	2013	*Technological Forecasting and Social Change*

Source: Author's compilation

Table 10 Highly linked articles of bibliographic-coupling analysis (cluster-red)

Author(s)	*Title*	*Year*	*Journal*
Calabrese et al.	Using fuzzy AHP to manage intellectual capital assets: an application to the ICT service industry	2013	*Expert Systems with Applications*
Yusliza et al.	A structural model of the impact of green intellectual capital on sustainable performance	2020	*Journal of Cleaner Production*
Khan et al.	Investment in intangible resources and capabilities spurs sustainable competitive advantage and firm performance	2019	*Corporate Social Responsibility and Environmental Management*
Wang and Chen	Does intellectual capital matter? High-performance work systems and bilateral innovative capabilities	2013	*International Journal of Manpower*
Chahal and Bakshi	Examining intellectual capital and competitive advantage relationship: role of innovation and organizational learning	2015	*International Journal of Bank Marketing*

Source: Author's compilation

3.2.1.2.4 Cluster 4 [red]: impact of green IC on sustainable performance

This cluster addresses the impact of IC on environmental management or green innovation to attain a competitive position in the industry under the trends of popular

environmentalism consciousness and international environmental conventions (Chen, 2008). The literature explores that these environmental trends drive organisations to carry out green IC. Initially, these trends were considered as obstacles to development, but further studies found the correct evaluation and proposed a novel concept – green IC. Based on the RBV and ICV, Malik et al. (2020) investigated the impact of green human resource management and green IC on sustainability. Further, Yusliza et al. (2020) and Ali et al. (2021) unfold the contribution of green IC to mitigate environmental destruction and achieve sustainable development. The studies in the cluster report the contribution of IC to environmental issues.

4 Discussion and implications

The analysis of selected articles expresses the interest of scholars in identifying the key drivers of CA, growth potential, and organisational survival in the global competitive business environment. The results of co-citation analysis and bibliographic coupling analysis identify the theoretical building blocks of IC and CA. Initially, the key concern for scholars resides in defining IC and its relevant components and their inter-relationships. Then, the concern shifts to determine a measurement model capable of assigning the correct financial value to the firm's IC and its contribution towards CA. As the conflicting findings highlight, there is no consensus over any models to measure IC as knowledge is a multi-dimensional asset. Hence, various models are propounded by scholars to measure IC, but none can be considered as a dimension-free process model for calculating IC. The detailed analysis of literature favours a minimalistic, objective, pecuniary, and comprehensive framework for IC measurement and raises the following issues:

1 recognising the heterogeneity of IC

2 challenge for measurement as IC has temporal and dynamic nature

3 performative measure rather than self-accounting and tailoring

4 ways to address the 'dark side' of IC.

As earlier discussed, IC is increasingly recognised as a strategic determinant for sustainable CA (Kamukama et al., 2011; Xu and Wang, 2018; Khan et al., 2019; Vo and Tran, 2023), but there is little understanding of how IC influence CA. Further, Martín-de-Castro et al. (2011) documented organisational IC as the fourth factor of production, which can be labelled as *an intellectual capital-based view of the firm competition*. Though the phenomenon of IC and CA has been immensely researched and debated in the management literature, there is a lack of empirical evidence of a systematic and causal relationship between the two. Prior literature supports the notion that firms' ability to create and share knowledge reinforces the innovative capabilities and eventually sustainable CA (Subramaniam and Youndt, 2005). As the IC-CA relationship has gained consistency in recent years, the theoretical foundations of such studies have diversified. In turn, aspects like green IC, innovation, sustainable growth, and the knowledge-based perspective of IC have gradually become the new theoretical pillars recalled by scholars.

As the search string is based on two large databases, the results that the KBV provides a theoretical grounding to generate CA can reasonably be generalised. Here, it is important to recall the initial motive of the study, which was to check the role of IC in changing trend of competitiveness. The descriptive and thematic analysis assisted in answering the research questions, and the results of analysis concluded that in the knowledge economy era, CA of enterprises shifted from visible sources to invisible ones (Kamya et al., 2011) and IC becomes a dominant source of value creation (Curado et al., 2011; Rehman et al., 2022).

One of the implications of the study is that some geographical areas are comparatively less investigated, i.e., research is asymmetrically distributed. The detailed analysis of literature provides that within continents, some countries are comparatively less analysed. Furthermore, unorganised sectors such as agriculture and environment are not deeply investigated. The reason may be linked to the availability of funds and databases in such sectors and locations. In any case, such geographical areas and sectors open several new research opportunities. It is also apparent from the analysis of the results that the emerging topics should be developed, while results of comparatively mature topics should be summarised. Furthermore, research originates predominantly from developed countries, a trend that remained unchanged over time. Interestingly, it is evident from the literature review that a few countries like Malaysia and India, despite being emerging economies, secure their positions among the top countries to explore the research area.

The prevalent idea that emerges from the analysis of co-citation and bibliographic coupling clusters is not only that IC plays a critical and pivotal role for sustainable CA, but also that organisational policies and practices strongly affect the way in which IC will impact firms' performance, growth, and survival. Based on these considerations, possible research paths may be suggested. The evidence from existing literature seems to confirm that IC, being the source of CA, further needs to be explored scientifically and statistically. The research fraternity should devote particular attention to ways to manage IC practically to let its potential be fully explored. The future of IC is likely to lie in the recognition of components of knowledge embedded in its various dimensions and CA, as well as new forms of IC. Furthermore, it could be highly beneficial for policymakers to delve into the specification of IC and CA linkage.

5 Conclusions and limitations

The review of IC and CA literature conducted using quantitative bibliographic analysis helped to identify the theoretical foundations and major areas of this research field that have attracted the attention of academicians and scholars over the past two decades. According to the KBV, IC has been recognised as a vital resource for organisational competitiveness during the last decade of the 20th century whereas in the first two decades of the 21st century, theoretical underpinning of IC and its elements have been connected to other research areas in different disciplines, among which those related to CA. This study documents the process by spotting the main research pillars and their evolution over time.

The results of SLR reveal that scholars are keen to explore the association between IC, organisational performance, and its impact on CA. To address the issue, academicians and scholars have grounded their research on theoretical development. IC research is

gaining the attention of scholars from environmental science and energy. Post-measurement and reporting of IC, the primary focus is on the part of the application, adoption and implications of organisational IC in management practices. The new area that needs to be explored is how IC can be used to manage external environments, especially stakeholders, in the knowledge economy.

The present study provides a comprehensive review of the articles addressing IC and its elements regarding sustaining CA. This offers insights into the evolution of research in this field that can pave the way for future research efforts. Content analysis encouraged finding new avenues of promising future research. The strategic role of IC in gaining and sustaining CA is highlighted in the literature, though more focus is required to have better understanding of the association between the two.

Despite the described findings, this research has certain limitations that need to be considered carefully. These can be identified in the nature of articles included and excluded. The authors focused only on the Scopus and WOS databases, and there remains a risk of missing some meaningful and relevant articles not included in these databases or published in different formats such as reports. Second, the use of distinct synonyms words of IC across the world warrants rethinking what research to include in future review(s), and accordingly, the IC definition may need to be broadened (Cuozzo et al., 2017). There are likely to be many more articles that conducted similar studies using different terms in different contexts. Finally, bibliometric clustering analysis provides more emphasis on highly cited articles, whereas the emerging trends in recent publications may not be included. Despite these limitations, as argued by Massaro et al. (2016), SLR "is not the end of the road, but the beginning of new journeys", we hope this study contributes to identifying gaps in the debate and providing pathways for promising future research areas.

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