# MAPPING THE IMPACT OF THE INTELLECTUAL CAPITAL ON THE AGILITY AND PERFORMANCE OF AN ORGANIZATION: A BIBLIOMETRIC STUDY

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## **Abstract:**

Research Background: In a changing environment, it is very important for the organizations to understand that the intellectual capital represents an asset for the organization, as it can impact its agility and performance. While previous research has explored the relationship between intellectual capital, agility, and performance, there is a need for a comprehensive understanding of the knowledge landscape and for the research trends when it comes to this topic. Thus, a bibliometric analysis offers a systematic and quantitative approach to map the intellectual structure, identify influential studies, and uncover emerging themes and gaps in the literature. Purpose of the article: The purpose of this research is to present a bibliometric analysis of the literature focusing on the impact of the intellectual capital in the organizational agility and performance.

*Methods:* The methodology employed in this study is centered around a bibliometric analysis conducted using the specialized software VOSviewer. This analysis visually represents nine semantic clusters that depict the co-citation relationships among various concepts related to the search terms utilized, such as "intellectual capital," "performance," and "agility." The study utilized papers published in Scopus-indexed journals as the database.

Findings and value added: The research paper's outcomes consist of graphical representations of the semantic clusters associated with the aforementioned search terms, alongside tables presenting content analysis of these clusters and other relevant publication data (e.g., top 10 countries contributing to the topic and document types retrieved). The findings unequivocally establish a significant correlation between innovation, intellectual capital, knowledge management, performance, and agility. This research makes a notable contribution as the first bibliometric analysis exploring the interrelation of intellectual capital, performance, and agility, as evidenced by the papers retrieved from the Scopus database.

**Keywords:** Intellectual capital; Performance; Agility; Bibliometric study.

JEL Classification: J24; M12; O34.

## 1. Introduction

Over time, globalization and advancing technology have created a competitive business environment that compels companies to constantly innovate and market new products or services. This dynamic has presented various challenges and opportunities for organizations (Stratone, 2021; Farzaneh et al., 2022; Papíková and Papík, 2022). A significant recent challenge was the COVID-19 pandemic, which the World Health Organization officially recognized as a global public health emergency on January 30, 2020. This crisis serves as an example of how organizations have leveraged their intellectual capital to address the situation, adapt to virtual work models, foster new knowledge, and overcome the difficulties brought about by the pandemic (Kański et al., 2022; Stratone et al., 2022; Vătămănescu et al., 2022a).

As the information society has evolved, businesses have increasingly invested in intangible assets, often referred to as intellectual capital, rather than relying solely on physical (tangible) assets, which had traditionally constituted the majority of their operational investments (Vătămănescu et al., 2015, 2016a; Dinu et al., 2023). Intellectual capital, also known as organizational knowledge, plays a crucial role in driving economic growth and enabling organizations of all types and sizes to maintain and enhance their competitive advantage (Sutrisno, 2021). Consequently, the value of intangible assets in enhancing organizational performance and agility has been consistently emphasized in the digital economy (Niwash et al., 2022).

Based on these considerations, the purpose of this paper is to conduct a literature review that examines three key concepts—intellectual capital, performance, and agility. Additionally, the paper aims to perform a bibliometric analysis to highlight researchers' focus on this subject and their exploration of the relationship between intellectual capital, organizational performance, and agility. Finally, the paper will present the research findings and limitations.

### 1.1. Literature review

All the knowledge resources a company has at its disposal and can use for a variety of reasons are collectively referred to as intellectual capital (Cristea and Dinu, 2022). The intellectual capital was conceptualized by Dave Ulrich (1998) as being a multiplicative function of abilities and commitment. Until 1980's, some of the theories (Nicolaisen et al., 1991; Bergquist, 2017) focused on the external environment of an organization "as a basis for understanding the competitive advantage" (Radjenovic and Krstic, 2017, p. 14). Even though the concept of intellectual capital was formulated in the 1990s, it was defined generally, as something that represents "the combined intangible assets of a company" (Martinidis et al., 2021, p. 2). According to Ulrich (1998), intellectual capital is one of the main values of an organization and the characteristics of this concept are distinguished by a high degree of complementarity and they all are affecting the performance of an organization, no matter is we refer to small and medium-sized enterprises (SMEs), multi-national companies, nongovernmental organizations, or public institutions. According to Lekić, et al. (2021, p. 3), "intellectual capital can be seen as the holistic ability of a company to coordinate, organize and use its own available knowledge in order to create future values", thus, to survive on the ongoing changing market and to be able to face all challenges.

In the literature, intellectual capital is divided into human capital, structural capital and relational capital (Brătianu, 2018; Vătămănescu et al., 2017, 2019; Vale et al., 2022). The term "human capital" refers to the human element of an organization, specifically the combination of abilities, knowledge, and expertise that defines an individual's character (Boeske and Murray, 2022; Vătămănescu et al., 2022b, 2022c). It also symbolizes the value of knowledge and talent

present in the individuals who make up the organization, including abilities, knowledge, talents, competences, attitudes, intellectual agility, and creativity (Sutrisno, 2021). Ali et al. (2021, p.3) mentions that human capital represents an important "component of innovation performance, as employees' experience, knowledge, and skills are necessary for the existing fast-paced and changing business environment".

On the other hand, the knowledge that remains in the company after personnel leave is referred to as structural capital and includes operational procedures, policies and strategies, processes, routines, organizational charts, and manuals (Ozgun et al., 2022). More exactly, structural capital refers to the non-human knowledge in the organization (such as: hardware, software, databases, organizational structures, patents, trademarks, and everything else that is related to the capabilities of organizations that promote worker productivity) and it is also associated with the effort put forth in establishing organizational structures and systems that enable employees to function at their peak intellectual and organizational potential (Widiartanto et al., 2020).

Relational capital, also known as the network of connections or relationships that an organization possesses, along with the loyalty and satisfaction of its stakeholders, is a significant aspect (Kalkan et al., 2014; Păduraru et al., 2016; Todericiu, 2021). This form of capital is characterized by the interpersonal bonds shared among customers, suppliers, stakeholders, and government officials, which are built on trust, commitment, and respect (Pedro et al., 2018). According to Radonić et al. (2021), an organization with a robust infrastructure can deliver exceptional service even in the face of uncertainties such as economic crises, global pandemics, or lockdowns. Additionally, relational capital emphasizes the significance of an organization's relationships with its customers, suppliers, and the broader society, while also measuring the loyalty of these entities towards the organization (Szelagowski, 2019). The ability to cultivate enduring relationships with external parties is a crucial component of relational capital, as it adds significant value to the company. Conversely, the failure to maintain relationships with key actors in the external environment can lead to detrimental consequences for the business (Widiartanto et al., 2020).

This raises the question of whether intangible resources can be viewed as strategic resources in the current environment and whether a particular arrangement of these resources could result in a strategy that provides a company with the necessary competitive advantage in terms of agility and performance. Yet one thing is certain: for small and medium-sized businesses, investing in a company's intangible assets is less expensive than investing in its concrete assets and this is one of the reasons why intellectual capital has gained attention in recent years (Tran et al. 2021).

It is important to highlight the correlation between intellectual capital and an organization's performance and agility (Calli and Calli, 2021; Williams and Anyim, 2021; Lekić et al., 2022). The pursuit of performance is now intertwined with an organization's ability to generate outcomes and advantages stemming from creative processes (Faisol et al., 2021), which have become increasingly challenging in the twenty-first century (Slimene et al., 2022). According to Xu and Liu (2020), a company's competitiveness is determined by its ability to access crucial and distinctive resources. Therefore, enterprises must recognize, protect, and enhance their intellectual capital resources to maintain their market position and achieve improved performance (Sotto-Acosta et al., 2016; Vătămănescu et al., 2016b). When evaluating a firm's performance, Kalkan et al. (2014) suggest employing various methods, including financial performance indicators such as return on investment and profitability, product performance indicators such as uniqueness and reliability, and market performance indicators such as customer satisfaction and market share.

Slimene et al. (2022) assert that organizational agility techniques lead to improved innovation performance. Conversely, Yauch (2011) supports the notion that agility itself is an outcome of performance. As mentioned earlier, organizations and businesses are currently grappling with escalating levels of stable and unpredictable competition (Asfahani, 2021), driven by technological advancements, evolving market dynamics, and changing customer demands. In this context, agility is regarded as a means of effectively responding to organizational changes (Shami and Nastiezaie, 2019). As emphasized by Munteanu et al. (2020), an organization becomes agile when it can swiftly and easily adapt to challenges and seize new opportunities, contingent upon the availability of a skilled, knowledgeable, and competent workforce. Hence, personnel should be considered as a hidden asset that adds value to the organization.

Even while the concept of agility has gained widespread recognition, it remains an extremely challenging construct to quantify. As a result, numerous measurement strategies have been proposed in recent years (Dove, 1995; Gill and Henderson-Sellers, 2006; Yauch, 2011; Akkaya, 2020). According to Dove (1995), an organization's agility should be assessed using the following metrics: cost, time, robustness, and scope. Yauch (2011) recommended analyzing environmental turbulence, organizational success, and agility as a performance outcome (which integrates the previous two) in order to determine whether an organization is agile. On the other hand, Akkaya et al. (2020) concur that considering the leadership style is the best way to examine agility. Nevertheless, the ideal approach has not yet been discovered.

In conclusion, in order for organizations to thrive in a constantly evolving environment, they must develop the ability to adapt and improve their performance (Phonthanukitithaworn et al., 2023). Achieving this can be facilitated through a deeper comprehension of intellectual capital (Bhattacharjee and Akter, 2022). The aforementioned factors highlight the motivation behind conducting a bibliometric analysis on the three key elements previously defined (intellectual capital, performance, and agility). This analysis aims to uncover the semantic connections and relationships among these concepts and ideas.

# 2. Methodology

A bibliometric analysis of the literature focusing on the role of the intellectual capital in the organizational agility and performance was performed using VOSviewer, a specialized software. As the only technique that uses the actual content of the writings to create a similarity measure, the co-occurrence investigation procedure accounts for the majority of the research. This procedure finds connections and links among concepts and notions that co-occurred in document titles, keywords, and abstracts.

The data retrieval is based on Scopus core collection, which is one of the world's leading information, analytical and scientific citation search platform and which provided access to abstracts of scientific articles from more than 22.400 international scientific journals published by more than 5000 international publishers. (E-nformation, n.d). The retrieval was performed on 21st of January 2023, when we have searched the main and core article expressions: "intellectual capital", "performance" and "agility".

Table 1 illustrates data retrieved from Scopus, reflecting the research labels, the first year of appearance of the expression on Scopus, the total number of publications to date on Scopus and the weight of 2022 publications with the selected theme within all years on Scopus. 2022 was chose as a representative year, due to the fact that the research is made at the beginning of the year 2023. Moreover, the data retrieved was limited to subject areas such as "Business, Management and Accouting" and "Social Sciences".

Thus, "intellectual capital", as a research expression, was first captured by Scopus in 1965 and appeared in 40.434 publications since the day the retrieved was performed; year 2022 represented 7,09% (4997 publications) of the total Intellectual Capital-related publications. The "performance" search on Scopus returned 1.822.099 results, being firstly captured in 1886 and had in 2022 a 9,38% (170980 publications) share of total related publications. "Agility" was first introduced on Scopus in 1961, appeared in 24.284 publications since the day the retrieved was performed and had in 2022 a 19,09% (4633 publications) share of the total related publications. When it comes to searching all the expressions together ("intellectual capital", "performance" and "agility"), they first appeared on Scopus in 2000 and up to the day the retrieved was performed the expressions appeared in 1737 publications together, out of which 31,08% in 2022 (540 publications).

Table 1: Main concepts frequencies and weight on Scopus

| Research Labels            | The first Year of<br>Appearance on Scopus | Total Number of<br>Publications to Date on<br>Scopus | Weight of 2022 Publications with the Selected Theme within all years – on Scopus |
|----------------------------|---|--|--|
| "intellectual capital"     | 1965                                      | 40,434   | 7,09%  |
| "performance"              | 1886                                      | 1,822,099  | 9,38%  |
| "agility"                  | 1961                                      | 24,284   | 19,09%   |
| "intellectual capital" AND |   |  |  |
| "performance" AND          | 2000                                      | 1,737  | 31,08%   |
| "agility"                  |   |  |  |

Source: authors` own research

As it can be observed in Table 1, the three expressions ("intellectual capital", "performance" and "agility") were firstly used together starting with 2000. In the next tables, the focus will be only on the mentioned expressions, this being the topic of interest of this research paper. The literature format for the search was defined as "all type". The most frequent document type is article (1423 articles, representing 81,92% of the total number of publications), followed by book chapters (100, 5,75%), reviews (81, 4,66%), books (68, 3,91%), conference papers (61, 3,51%) and other publications, such as: notes, conference reviews and editorials (4, 0,23%).

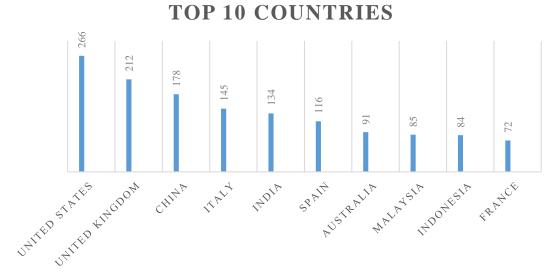
Table 2: Types of retrieved documents for "intellectual capital", "performance" and "agility" on Scopus

| Type of Document                            | Frequency | Share in total |  |
|---|-----------|----------------|--|
| Article                                     | 1423      | 81,92%         |  |
| Book Chapter                                | 100       | 5,75%          |  |
| Review                                      | 81        | 4,66%          |  |
| Book  | 68        | 3,91%          |  |
| Conference Paper                            | 61        | 3,51%          |  |
| Other (Note, Conference Review & Editorial) | 4         | 0,23%          |  |

Source: authors` own research

In terms of literature origins, as stated in Figure 1, the leading analyzed publications came from United States (266 articles, representing 15,31% of the total number of publications), followed by United Kingdom (212 articles, representing 12,20% of the total number of publications) and China (178 articles, representing 10,24% of the total number of publications). These countries are followed then by Italy (145 publications), India (134 publications), Spain (116 publications), Australia (91 publications), Malaysia (85 publications), Indonesia (84 publications) and France (72 publications). Moreover, it should be underlined that the study has a global approach that relies on the published specialized literature from 59 countries.

Figure 1: Top 10 "intellectual capital", "performance" and "agility" - related publications by Countryentt



Source: authors' own research

As already mentioned, the most relevant research areas are "Business, Management and Accounting" (1492 publications) and "Social Sciences" (459 publications) and the main language is English (1721 publications, representing 99,07% of the total number of publications with the selected theme on Scopus since the day the data was retrieved). The most influential authors for the three expressions searched are: Demetris Vrontis, Alkis Thrassou and Sheshadri Chatterjee and the top 5 journals include: Sustainability (77, representing 4,43% of the total number of publications), Journal of Knowledge Management (57, representing 3,28% of the total number of publications), Journal of Business Research (45, representing 2,59% of the total number of publications), Technological Forecasting and Social Change (39, representing 2,24% of the total number of publications) and Business Process Management Journal (21, representing 1,20% of the total number of publications).

A summary of the research protocol is introduced in the below table (Table 3):

Table 3: Research protocol and characteristics and types of "intellectual capital", "performance" and "agility" research sample

| Research Protocol                  | Description/Explanation   |
|------------------------------------|---|
| Search expressions                 | "intellectual capital", "performance" and "agility".  |
| Search database                    | Scopus.   |
| Search fields                      | All fields.   |
| Type of publications               | All types of publications indexed in the Scopus database.                                   |
| Subject areas                      | "Business, Management and Accounting" and "Social Sciences", up until 21st of January 2023. |
| Timespan                           | 2000-2023.  |
| Language                           | All languages.  |
| Software for bibliometric research | VOSviewer.  |

Source: authors' own research

The 1737 documents were exported as a CSV Excel format, including information such as: citation information, bibliographical information, abstract & keywords, funding details, other information, then the bibliometric software VOSviewer was used to process the systematic literature review and then to both analyze and visualize the co-occurrence of keywords by generating a map embedded on the already mentioned bibliographic data.

# 3. Results and Discussions

The first aspect that was taken into consideration when the analysis was made was to perform a co-citation analysis on the most important sources that were co-cited by the articles retrieved from the Scopus database. In this way, a synopsis of the most prominent co-cited sources is presented in both Table 4 and Figure 2 and it illustrates the most 15 cited Journals. Here, we can observe that among the most 5 cited Journals included: Strategic Management Journal (with 5134 Citations and 752218 total link strength), Academy of Management Review (with 2521 Citations and 451136 total link strength), Academy of Management Journal (with 2692 Citations and 418046 total link strength), Harvard Business Review (with 1800 Citations and 382919 total link strength) and Organization Science (with 2353 Citations and 359516 total link strength)

Table 4: Prominent co-cited sources

| Source                                       | Citations | Total Link Strength |
|--|-----------|---------------------|
| Strategic Management Journal                 | 5134      | 752218              |
| Academy of Management Review                 | 2521      | 451136              |
| Academy of Management Journal                | 2692      | 418046              |
| Harvard Business Review                      | 1800      | 382919              |
| Organization Science                         | 2353      | 359516              |
| Journal of Management                        | 2052      | 306199              |
| Journal of Business Research                 | 2761      | 302775              |
| Administrative Science Quarterly             | 1239      | 246388              |
| Journal of Knowledge Management              | 2706      | 242459              |
| Mis Quarterly                                | 2048      | 235682              |
| Journal of International Business<br>Studies | 886       | 224600              |
| Journal of applied psychology                | 1016      | 211918              |
| Journal of Operations Management             | 2083      | 207262              |
| Journal of Management Studies                | 1299      | 204314              |
| Industrial Marketing Management              | 1370      | 178678              |

Source: authors` own research

Source: authors` own research

Figure 2: Prominent co-cited sources and their clusters – by VosViewer

handbook of research on human



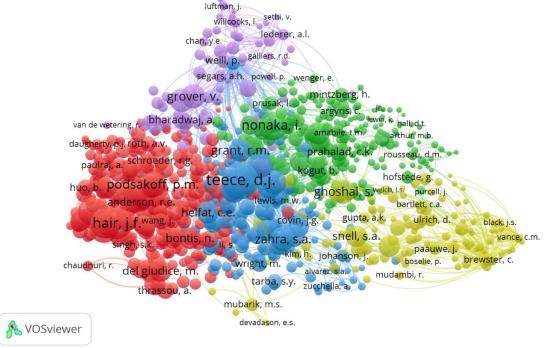
As we wanted to expand our research, a look was also taken to the most cited authors of the sources retrieved from the used database and in this way, a synopsis of the most 15 prominent co-cited authors is illustrated in Table 5 and Figure 3. As observed, among the 5 most cited authors we can mention: Teece, D.J. (with 1133 Citations and 135029 total link strength), Nonaka, I. (with 662 Citations and 76295 total link strength), Tushman, M.L. (with 499 Citations and 72125 total link strength), Ghoshal, S. (with 480 Citations and 71138 total link strength), Zahra, S.A. (with 485 Citations and 69183 total link strength), Eisenhardt, K.M. (with 538 Citations and 68857 total link strength), Porter, M.E. (with 432 Citations and 66441 total link strength), Hair, J.F. (with 827 Citations and 59206 total link strength), Hitt, M.A. (with 406 Citations and 58608 total link strength) and Brewster, C. (with 147 Citations and 56902 total link strength).

Table 5: Prominent co-cited authors

| Author           | Citations | Total Link Strength |
|------------------|-----------|---------------------|
| Teece, D.J.      | 1133      | 135029              |
| Nonaka, I.       | 662       | 76295               |
| Tushman, M.L.    | 499       | 72125               |
| Ghoshal, S.      | 480       | 71138               |
| Zahra, S.A.      | 485       | 69183               |
| Eisenhardt, K.M. | 538       | 68857               |
| Porter, M.E.     | 432       | 66441               |
| Hair, J.F.       | 827       | 59206               |
| Hitt, M.A.       | 406       | 58608               |
| Brewster, C.     | 147       | 56902               |
| Ringle, C.M.     | 733       | 56449               |
| Grover, V.       | 492       | 56444               |
| March, J.G.      | 344       | 55970               |
| Volberda, H.W.   | 380       | 55937               |
| Kodama, M.       | 166       | 54255               |

Source: authors' own research

Figure 3: Prominent co-cited authors and their clusters – by VosViewer



Source: authors' own research

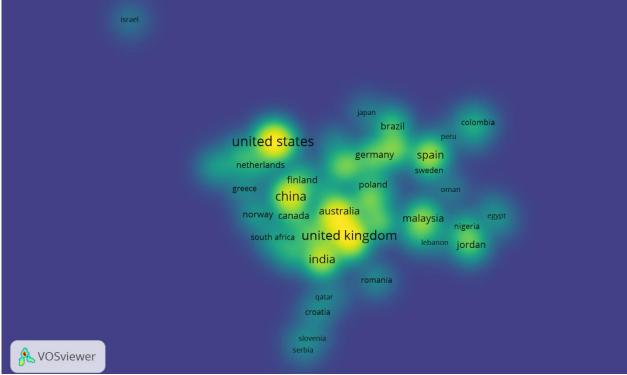
In table 6 and Figure 4 we can observe that the most co-cited authors come from United States (with 266 documents, 16897 citations and 1339 total link strength), United Kingdom (with 212 documents, 4771 citations and 764 total link strength), Italy (with 145 documents, 3040 citations and 634 total link strength), China (with 178 documents, 2915 citations and 600 total link strength), France (with 72 documents, 1761 citations and 398 total link strength), Spain (with 116 documents, 2727 citations and 374 total link strength), India (with 134 documents, 1849 citations and 361 total link strength), Pakistan (with 66 documents, 826 citations and 259 total link strength), Australia (with 91 documents, 1242 citations and 220 total link strength) and Taiwan (with 53 documents, 1791 citations and 207 total link strength). We can observe that authors for all around the world are interested in finding the connection between the intellectual capital, performance and agility.

Table 6: Countries of the co-cited authors

| Country        | Documents | Citations | Total Link Strength |
|----------------|-----------|-----------|---------------------|
| United States  | 266       | 16897     | 1339                |
| United Kingdom | 212       | 4771      | 764                 |
| Italy          | 145       | 3040      | 634                 |
| China          | 178       | 2915      | 600                 |
| France         | 72        | 1761      | 398                 |
| Spain          | 116       | 2727      | 374                 |
| India          | 134       | 1849      | 361                 |
| Pakistan       | 66        | 826       | 259                 |
| Australia      | 91        | 1242      | 220                 |
| Taiwan         | 53        | 1791      | 207                 |

Source: authors' own research

Figure 4: Countries of the co-cited authors – by VosViewer



Source: authors` own research

This paper's center of attention is seeing how many papers were published with the focus on the three expressions "intellectual capital", "performance" and "agility". As observed in table 7, a number of 1737 publications that mention the above expressions were found; among them,

a total of 5751 keywords were found, out of which 409 meet the threshold for a minimum number of occurrences of a keyword of 5, accounting for 7,11%. The value of the information is shown by the size of the nodes and words in the following picture. The magnitude of the node frequency and the word frequency are inversely correlated with the weight. A shorter path frequently indicates a stronger connection because the distance between two nodes is directly proportional to the quality of the link between them. When two keywords are connected by a line, it means that they have previously appeared together. Thus, the more times the two keywords have appeared together, the thicker the line.

Table 7: Searched expressions meet the threshold

| Searched Expressions                                | Results in Scopus | Number of Keywords<br>(VOSviewer) | Keywords Meeting the<br>Threshold for a Minimum<br>Number of Occurrences of<br>a Keyword of 5 |
|---|-------------------|-----------------------------------|---|
| "intellectual capital", "performance" and "agility" | 1737              | 5751                              | 409   |

Source: authors' own research

The software VOSviewer is used to create the network visualizations. The graph's nodes and words are sized according to how much weight they have. The weight increases as the node and word frequencies increase. The nodes with the same colors are collected into a cluster, and the colors indicate how closely two keywords are related to one another. The separation between two nodes reveals how strong their connection is. The line's length explains the relationship between the two words, and the line's thickness emphasizes the degree of their co-occurrence. VOSviewer portrays the keywords of "intellectual capital", "performance" and "agility"-related publications into nine clusters.

Table 8 is emphasizing the 9 clusters together with their most important key words according to the links, total link strength and occurrence, as it was also underlined in Figure 5.

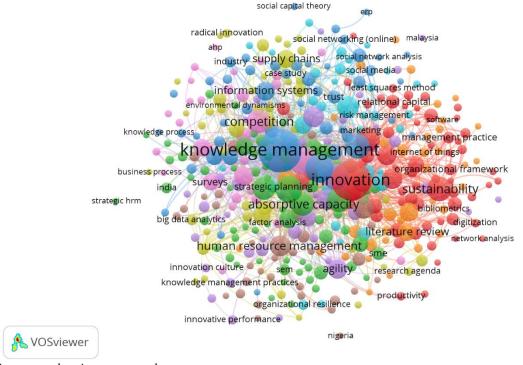
Table 8: The 9 clusters and their most relevant items – by VOSviewer

| Cluster     | Key words                          | Links | Total Link Strength | Occurrence |
|-------------|------------------------------------|-------|---------------------|------------|
|             | innovation                         | 291   | 853                 | 169        |
|             | sustainability                     | 174   | 392                 | 64         |
| Cluster 1   | small and medium-sized enterprises | 122   | 207                 | 26         |
|             | competitiveness                    | 83    | 113                 | 21         |
|             | relational capital                 | 68    | 101                 | 21         |
|             | business model                     | 47    | 64                  | 17         |
| C1          | intellectual capital               | 153   | 258                 | 76         |
| Cluster 2   | firm performance                   | 137   | 226                 | 59         |
|             | knowledge management               | 313   | 1048                | 197        |
| CI          | social capital                     | 140   | 242                 | 66         |
| Cluster 3   | organizational learning            | 90    | 137                 | 32         |
|             | dynamic capabilities               | 193   | 370                 | 85         |
| Cl          | supply chain                       | 135   | 273                 | 35         |
| Cluster 4   | data analytics                     | 121   | 209                 | 23         |
|             | agility                            | 107   | 164                 | 41         |
|             | performance                        | 174   | 315                 | 71         |
| Clarata n F | decision-making                    | 148   | 244                 | 34n        |
| Cluster 5   | organizational culture             | 59    | 83                  | 20         |
|             | knowledge sharing                  | 95    | 159                 | 48         |
|             | learning                           | 57    | 72                  | 16         |
|             | information technology             | 161   | 290                 | 50         |
| Cluster 6   | strategy                           | 46    | 57                  | 21         |
|             | risk management                    | 43    | 49                  | 11         |
|             | digital transformation             | 110   | 174                 | 38         |
| Cluster 7   | corporate social responsibility    | 64    | 85                  | 16         |

| Cluster   | Key words                    | Links | Total Link Strength | Occurrence |
|-----------|------------------------------|-------|---------------------|------------|
|           | digital economy              | 30    | 33                  | 5          |
|           | entrepreneurship             | 57    | 66                  | 19         |
|           | human resource<br>management | 158   | 255                 | 47         |
| Cluster 8 | business value               | 31    | 32                  | 6          |
|           | information management       | 96    | 145                 | 21         |
|           | artificial intelligence      | 85    | 113                 | 18         |
|           | competitive advantage        | 201   | 433                 | 84         |
| Cluster 9 | competition                  | 203   | 480                 | 57         |
|           | green innovation             | 26    | 27                  | 6          |

Source: authors' own research

Figure 5: Keyword's co-occurrence matrix-related publications – by VOSviewer



Source: authors` own research

As observed above, the green cluster (Figure 5, cluster 2, center, 63 items) is focuses on "intellectual capital" and the "firm performance", while the dark blue cluster (Figure 5, cluster 3, center-left up, 50 items) has its focus on "knowledge management", "social capital", "organizational learning" and "dynamic capabilities".

The yellow cluster (Figure 5, cluster 4, up and center-down, 45 items) emphasizes on "supply chain" and "data analytics", while the violet cluster (Figure 5, cluster 5, down-right, 40 items) regroups "agility" with "performance", "decision-making", "organizational culture", "knowledge sharing" and "learning".

The light blue cluster (Figure 5, cluster 6, up-right, 39 items) regroups "information technology" with "strategy" and "risk management", while the orange cluster (Figure 5, cluster 7, right, 37 items) regroups "digital transformation" with "corporate social responsibility", "digital economy" and "entrepreneurship".

Last but not least, the brown cluster (Figure 5, cluster 8, center-down, 35 items) combines "human resource management" with "business values", "information management" and "artificial intelligence", while the pink cluster (Figure 5, cluster 9, left, 34 items) focuses on "competitive advantage", "competition" and "green innovation".

Figure 6 displays the density visualization of the already analyzed keywords ("intellectual capital", "performance" and "agility"). As observed, within the density visualization each point has a colour that is ranging from blue to green to yellow and that indicated the density of the items at that point. The closer a point's tint is to yellow, the more neighbors it has and the heavier those neighbors' items are; on the other hand, the closer a point's tint is to blue, the fewer and lighter the items nearby are, and the smaller the number of things around a point. (Jan van Eck & Waltman, 2019)

social capital theory radical innovation social networking (online) malaysia industry Supply chains social network analysis social media case study information systems trust least squares method environmental dynamisms risk management software competition marketing management practice knowledge management internet of things organizational framework india surveys strategic planning innovation sustainability absorptive capacity bibliometrics big data analytics factor analysis literature review network analysis digitization human resource management sme innovation culture agility research agenda knowledge management practices productivity organizational resilience innovative performance VOSviewer

Figure 6: Keywords' Density Visualization – by VosViewer

Source: authors` own research

The red cluster (Figure 5, cluster 1, mid-right, 66 items) focused on "innovation"; the below table (Table 9) exposes the first cluster, in red colour, in order to acknowledge the structure and the relevant information, as it was provided by the VOSviewer software.

Table 9: Cluster 1: most relevant 11 items by VOSviewer

| Links      | Total link strength   | Occurrence   |
|------------|---|--|
| 291        | 853   | 169  |
| 174; 170   | 392; 304;   | 64; 41   |
| 168        | 331   | 61   |
| 122        | 207   | 26   |
| 119        | 225   | 41   |
| 104; 111   | 158; 158  | 45; 20   |
| 106        | 159   | 33   |
|            |   |  |
| 95; 63; 47 | 153; 85; 64   | 23; 12; 17   |
|            |   |  |
| 85; 67; 46 | 123; 91; 60   | 19; 16; 9  |
| 83         | 113   | 21   |
| 68         | 101   | 21   |
|            | 291<br>174; 170<br>168<br>122<br>119<br>104; 111<br>106<br>95; 63; 47<br>85; 67; 46<br>83 | 291 853<br>174; 170 392; 304;<br>168 331<br>122 207<br>119 225<br>104; 111 158; 158<br>106 159<br>95; 63; 47 153; 85; 64<br>85; 67; 46 123; 91; 60<br>83 113 |

Source: authors' own research

## 4. Conclusions

This paper has two-main objectives: (1) to search the literature in order to understand the role of the intellectual capital in the organizational agility and performance and (2) to perform a bibliometric analysis in order to underline the focus of the researchers on this topic and how they have explored the connection between intellectual capital, the performance of the organizations and the organizational agility.

As observed, the three concepts analysed ("intellectual capital", "performance" and "agility") are interconnected and represent a topic of interest for the nowadays research, especially due to the fact that when it comes to organizations (no matter their type or size), they are focusing now on the intangible resources and got to the conclusion that people are a better investment. The contribution of the present paper comes from the fact that it is the first one reviewing the literature that is dedicated to intellectual capital and its role in the organizational agility and performance. Moreover, the bibliometrical analysis is presenting the distribution of papers on the types of the retrieved documents (articles, book chapters, reviews, books, conference papers, notes, conference reviews and editorials) and the top 10 countries that published these documents. The graphical illustrations are offering a better view of the clusters constructed within the semantic ecosystems of the concepts "intellectual capital", "performance" and "agility".

The main limitation of this research paper comes from using only Scopus as a database and further research should include Web of Science and Google Scholar in order to enlarge the area of publishing papers in international conferences, books and proceedings of conferences.

Shortly, this article undertook an extensive bibliometric analysis to investigate the role of intellectual capital in organizational agility and performance. The results of this study illuminate the interconnectedness and significance of intellectual capital, performance, and agility in organizational contexts. The analysis of relevant literature revealed that intellectual capital plays a crucial role in enabling organizations to adapt to dynamic environments, improve their performance, and gain a competitive edge. The study emphasized the diverse dimensions of intellectual capital, such as human capital, structural capital, and relational capital, and their respective contributions to organizational agility and performance. Moreover, the analysis unveiled the semantic connections and associations among these concepts, offering valuable insights into the research landscape pertaining to intellectual capital and its influence on organizational outcomes. The findings of this bibliometric analysis establish a solid groundwork for future research endeavors and provide practical implications for organizations aiming to harness intellectual capital to enhance their agility and overall performance.

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