KNOWLEDGE SHARING IN BUSINESS AND COMPETITIVE INTELLIGENCE: A BIBLIOMETRIC ANALYSIS

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Abstract: *Over the past years, business intelligence and competitive intelligence practices achieved a significant importance in organizations, due to their capability of providing the necessary knowledge for the decision-makers, providing a significant advantage against market competitors or internal and external threats and vulnerabilities. Also, business intelligence and competitive intelligence have been under researcher's scope, the literature in those domains being continuously updated with new findings. Also, knowledge sharing is a process that helps organizations increase their employees understanding and expertise in certain fields, being highly recognized by both practitioners and researchers for its importance and efficiency. Therefore, the purpose of this research is to analyze the state of the literature in business intelligence and competitive intelligence, in correlation with knowledge sharing concept, in order to identify the connections between these domains. Also, this article aims to present an analysis that could provide a better understanding about the research interest in integrating knowledge sharing in business intelligence and competitive intelligence practices. In order to achieve the proposed objective, this research performs a bibliometric analysis using VOSViewer, a specialized software designed for creating visualizing maps that present networks between specific items. The information used for conducting this research was retrieved from Web of Science core collection and Scopus, world's largest index databases.*

Keywords: competitive intelligence, business intelligence, knowledge sharing, bibliometric analysis.

JEL classification: D83.

1. Introduction

Intelligence represents an important intangible asset, obtained through data gathering activities and complex analytic processes, having the main objective of obtaining necessary information and knowledge for enhancing the decision-making process (Johnson, 2010). As Kent (1949) and Spender (1996) considered, intelligence is more than knowledge, but depends on it. This complex and resourceful domain was developed by researchers from business field in two main directions: business intelligence and competitive intelligence (Krizan, 1999). The result of either business intelligence or competitive intelligence is considered to be a driving force for obtaining and maintaining a competitive advantage in a certain field, from a strategic perspective (Bratianu and Murakawa, 2004; Fleisher, 2001; Jourdan et al., 2008; McGonagle, 2016; Porter, 1985; Rajnoha et al., 2016; Søilen, 2017).
Another intangible asset that is indispensable for achieving competitive advantage is knowledge that is created, acquired, shared and exploited within an organization (Bratianu, 2007, 2022; Nonaka, 1994; Porter, 1985; Spender, 1996; Zack, 1999). Therefore, this study

[*] Cite as:
Budeanu, N.AS., 2024. Knowledge Sharing in Business and Competitive Intelligence: a Bibliometric Analysis. *Oradea Journal of Business and Economics*, 9(2), pp.71-82. http://doi.org/10.47535/1991ojbe197.

tries to understand the connections between business intelligence and competitive intelligence, on one hand, and knowledge sharing concept, on the other hand, by analyzing the existing literature and identifying the common points of interest between these research fields, using the specialized software VOSViewer (Van Eck and Waltman, 2020).
This research starts with a short introduction and literature review that conceptualize the purpose and motivation of this approach. After this, the study continues with the methodology presentation, followed by results and conclusions.

2. Literature review

According to Skyrius (2021, p.10), "business intelligence may be defined as the organizational practice that encompasses a coherent set of people, informing processes and conventions of using a comprehensive technology platform to satisfy business information needs that range from medium to high complexity".
Also, Watson and Wixom (2010, p. 96-97) stated that "business intelligence consists of business users and applications accessing data from the data warehouse to perform enterprise reporting, online analytical processing, querying, and predictive analytics".
Nevertheless, business intelligence has an important role in the strategic decision-making process by transforming non-relevant data and weak signs, gathered from inside the organization and using advanced analytic tools, into valuable information (Botos and Radu, 2017; Rouibah and Ould-ali, 2002). The main attribute of business intelligence is its orientation exclusively on the activities that take place inside the boundaries of the organization, such as value chain or interdepartmental activities (Alnoukaria and Hanano, 2017; Ivan, 2016).
Unlike business intelligence, competitive intelligence is oriented on producing valuable information about the external environment of the organization. According to Fleisher (2001, p.4), "competitive intelligence is the process by which organizations gather actionable information about competitors and the competitive environment and, ideally, apply it to their decision-making and planning processes in order to improve their performance." Martins (2001) saw competitive intelligence as a mandatory asset that could provide knowledge about possible future outcomes in a certain industry.
Therefore, competitive intelligence target specific objectives in the external environment, such as strengths and weaknesses of other business competitors that could be exploited (Botos and Radu, 2017; Bratianu, 2002), or opportunities and threats that could affect the organization (Alnoukaria and Hanano, 2017). McGonagle (2016) drew attention to the ethical and legal framework in which competitive intelligence must act in order to obtain the information that is needed about the competitive environment. Therefore, competitive intelligence is an ethical and legal activity, unlike business espionage which is condemned by law (Fleisher, 2001; Ivan, 2016).
As it was presented before, intelligence depends on knowledge (Kent, 1949; Spender, 1996). Business intelligence and competitive intelligence processes rely on the specific rational knowledge, emotional knowledge and spiritual knowledge that the organization and its employees possess. This triad of knowledge, as well as the knowledge dynamics model that implies rational knowledge, emotional knowledge and spiritual knowledge, were presented by Bratianu and Bejinaru (2019a, 2019b). Therefore, according to the theory of knowledge fields, rational knowledge represents the knowledge that could be expressed using symbolic or natural language, emotional knowledge refers to emotions and feelings and spiritual knowledge is composed by our meanings and values.
One process that affects the knowledge dynamics is knowledge sharing. This complex process includes the transfer of information, experience and knowledge between certain entities, either individuals or groups, without wanting, seeking or demanding any form of compensation (Bratianu and Bolisani, 2018; Massingham, 2020; Nonaka and Takeuchi,

1995). Knowledge sharing is greatly influenced by the organizational culture, which represents the spiritual knowledge of the organization. Based on the organizational culture, employees tend to be more competitive or cooperative, and, therefore, to be willing to share their knowledge or to try and hide it (Bratianu, 2022; Massingham, 2020; Nonaka and Takeuchi, 1995).

3. Methodology

This study tries to determine the state of the literature concerning the implications of knowledge sharing in business intelligence and competitive intelligence, based on a bibiliometric analysis conducted using the specialized software VOSViewer (Van Eck and Waltman, 2020). Therefore, this article has two main research questions:

- Are there any studies that encompass the knowledge sharing practices in business intelligence and competitive intelligence?
- What are the common points that connect knowledge sharing to business intelligence and competitive intelligence?

In order to respond to the proposed research questions, as well as to achieve its designated objective, this research will use data retrieved in 04 June 2024, from the world's leading literature databases, respectively Web of Science core collection and Scopus. The expressions used for searching throughout the mentioned databases were "business intelligence – knowledge sharing" and "competitive intelligence – knowledge sharing". The search engine for both Web of Science core collection and Scopus was used with "All fields" requirement, as well as all the time frame and all languages criteria. The results are presented in Table 1 and Table 2.

Table 1: Search results for "business intelligence – knowledge sharing"

	Web of Science core collection	**Scopus**
Total number of publications	51	2861
First year of publication	2005	1991
Document type	Article – 28 Proceeding paper – 23	Article – 1778 Conference paper – 523 Book chapter – 272 Book – 124 Others - 164
Subject area (leading 4 subject areas; one publication can have several subject areas)	Computer Science Information Systems – 13 Business – 12 Management – 11	Computer Science – 1402 Business, Management and Accounting – 1389 Social Sciences – 717 Decision Sciences- 559
Language	English – 51	English – 2821 Others – 40
Country	Australia – 13 USA – 11 China – 10 Germany - 4 Others - 13	USA – 435 China – 325 Australia – 219 India – 201 Others – 1681
Leading authors	Chang, E. – 6 Dillon, T – 4 Hai, D – 3	Kasemsap, K – 54 Chang, E. – 31 Wongthongtham, P. – 19

	Web of Science core collection	Scopus
	Hussain, F.K. – 3 Others – 35	Dillon, T. – 17 Others – 2740

Source: Author's analysis /processing based on own data

As it could be seen, Scopus database includes a significantly larger number of publications than Web of Science core collection. However, by analyzing the information presented in Table 1 it can be observed a resemblance in "Document type", "Subject area" and "Language" fields, as follows: both databases are mostly dominated by articles from Computer Sciences, Management and Business domains, written in English.

Table 2: Search results for "competitive intelligence – knowledge sharing"

	Web of Science core collection	Scopus
Total number of publications	19	1068
First year of publication	2003	1991
Document type	Article – 12 Proceeding paper – 5 Book chapter – 2	Article – 754 Conference paper – 136 Book chapter – 98 Book – 37 Others – 43
Subject Area (leading 4 subject areas; one publication can have several subject areas)	Business – 11 Management – 10 Economics – 3 Information science - 3	Business, management and accounting – 650 Computer science – 331 Social sciences – 284 Decision sciences – 188
Language	English - 19	English – 1039 Others - 29
Country	USA – 4 Australia – 3 Brazil – 2 France – 2 Others – 8	USA – 193 China – 129 United Kingdom – 89 India – 67 Others - 590
Leading authors	Capatina, A. – 2 Cekuls, A. – 2 De Almeida, F.C. – 1 Riccio, E.L. – 1 Others - 13	Tuan, L.T. – 17 Kasemsap, K – 14 Rothberg, H.N. – 14 Erickson, G.S. – 12 Others - 1011

Source: Author's analysis /processing based on own data

Just like for the previous search expression, Scopus database holds a considerably larger number of publications than Web of Science core collection. The resemblance identified for "business intelligence – knowledge sharing" expression could also be seen for "competitive intelligence – knowledge sharing" keywords, with article as the main document type, Business, Management and Computer Science as the leading subject areas and English as the dominant language.

After retrieving the databases needed for this study, the data was analyzed using the co-occurrence investigation procedure offered by VOSViewer (Van Eck and Waltman, 2020), in order to identify and visualize the similarities and connections between certain fields of interest, keywords and areas of research.

4. Results and discussions

The first database analyzed using VOSViewer was the one retrieved from Web of Science core collection for the expression "business intelligence – knowledge sharing", that contains a total number of 51 publications. From this database, VOSViewer identified a total number of 273 keywords, while 17 met the minimum threshold of 3 occurrences (Table 3). Those keywords were placed in 4 clusters, having a number of 75 links and total link strength of 119 (Figure 1).

Table 3: Keywords for Web of Science core collection "business intelligence – knowledge sharing" database

keyword	occurrences	total link strength	keyword	occurrences	total link strength
absorptive-capacity	3	12	innovation	3	7
analytics	3	11	knowledge	3	8
big data analytics	3	7	knowledge management	4	9
business intelligence	18	40	knowledge sharing	14	28
collaboration	3	7	management	9	26
firm performance	3	13	model	3	13
framework	3	7	performance	5	4
impact	6	24	strategy	3	15
supply chain	3	7			

Source: Author's analysis /processing based on own data

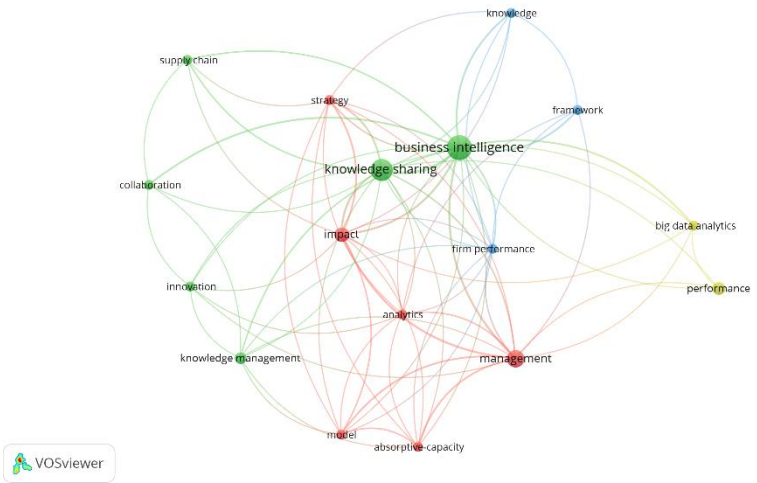

Figure 1: Co-occurrence map for "business intelligence – knowledge sharing" – Web of Science core collection

Source: Author's analysis /processing based on own data

The map generated by the specialized software is governed by "business intelligence" and "knowledge sharing" keywords, that are placed in the green cluster, in the center of the map, and connected through a link strength of 7, the highest in this case. This proves the fact that

these two fields are correlated and were the subject of research in the past, but the publications that cover this area are not varied. Nevertheless, this map shows some relevant common points of connection between “business intelligence” and “knowledge sharing”, both being linked with “management” (link strength 4, respectively 2), “strategy” (link strength 2, respectively 3) or “knowledge management” (link strength 2, respectively 1).
The second database for “business intelligence – knowledge sharing” expression was retrieved from Scopus and is formed by 2861 publications. Given the complexity of the database, VOSViewer found a total number of 11544 keywords. In order to enhance the relevance of this study and to obtain a clear and readable visualization map, the minimum number of occurrences was set to 21, with 131 keywords meeting the criteria. The first 20 keywords with the most occurrences are presented in Table 4. VOSViewer arranged those keywords in 6 clusters, being generated 4323 links with total link strength of 13188 (Figure 2).

Table 4: Keywords for Scopus “business intelligence – knowledge sharing” database

keyword	occurrences	total link strength	keyword	occurrences	total link strength
artificial intelligence	121	195	information management	146	315
big data	161	251	information systems	217	415
business intelligence	143	301	information use	113	252
competition	125	254	innovation	137	118
competitive intelligence	111	279	knowledge based systems	105	243
data analytics	86	168	knowledge management	536	755
data mining	95	190	knowledge sharing	132	245
decision making	190	407	knowledge-sharing	114	317
decision support systems	83	227	ontology	131	165
information analysis	100	254	social networking (online)	104	123

Source: Author’s analysis /processing based on own data

In this case, the most important keyword is “knowledge management”, placed in the blue cluster alongside both “knowledge sharing” and “knowledge-sharing” keywords that refer to the same concept. Both knowledge sharing constructs are linked with “business intelligence” (link strength 8), proving that the concepts are connected in the literature. Nevertheless, both knowledge sharing keywords, as well as “business intelligence”, are connected to similar keywords like “knowledge management” (link strength 90, 71 and 40) or “decision making” (link strength 16, 5 and 28). It is important to note that even if this analysis is oriented towards business intelligence, the keyword “competitive intelligence” is placed in the yellow cluster, connected to “business intelligence” (link strength 55), demonstrating the strong correlation

between the concepts. Also, “competitive intelligence” is connected to both knowledge sharing keywords (link strength 9), foreseeing the next phase of this research.

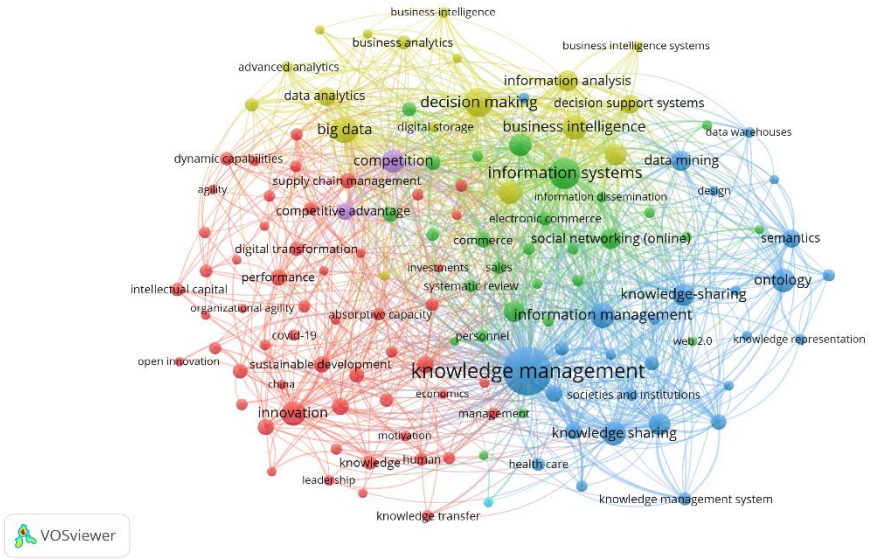

Figure 2: Co-occurrence map for “business intelligence – knowledge sharing” – Scopus
Source: Author’s analysis /processing based on own data

Going further to “competitive intelligence – knowledge sharing” expression, this study analyses the database retrieved from Web of Science core collection, formed by 19 publications. Out of 103 keywords, only 7 met the minimum threshold of 3 occurrences (Table 5), forming 2 clusters with 20 links and total link strength of 52 (Figure 3).

Table 5: Keywords for Web of Science core collection “competitive intelligence – knowledge sharing” database

keyword	occurrences	total link strength	keyword	occurrences	total link strength
competitive intelligence	10	22	management	5	11
impact	4	13	organizational culture	5	15
knowledge management	4	11	performance	8	14
knowledge sharing	6	18			

Source: Author’s analysis /processing based on own data

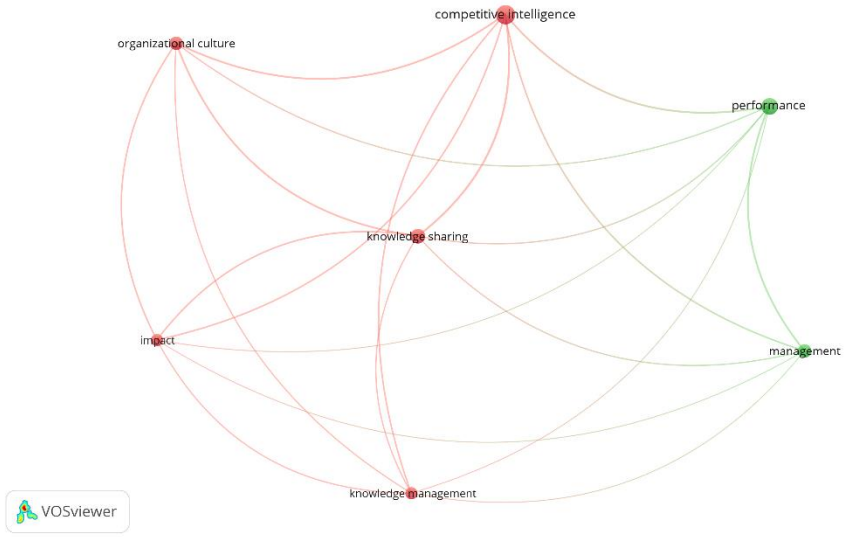

Figure 3: Co-occurrence map for "competitive intelligence – knowledge sharing" – Web of Science core collection
Source: Author's analysis /processing based on own data

By briefly analyzing Figure 3 it can be concluded that "competitive intelligence" and "knowledge sharing" are connected (link strength 5) and also linked to keywords like "knowledge management" (link strength 3, respectively 2) and "management" (link strength 3, respectively 2). This proves that, despite the relatively low number of publications indexed in Web of Science core collection for the searching expression, competitive intelligence and knowledge sharing are connected and have similar connections with other keyword.
The last database analyzed during this research is the one retrieved from Scopus for the expression "competitive intelligence – knowledge sharing", that contains 1068 publications. Out of these, VOSViewer determined 4416 keywords, and, using the same minimum number of occurrences as for "business intelligence – knowledge sharing" database, respectively 21, 32 keywords met the criteria (Table 6). VOSViewer placed the 32 keywords in 5 clusters, with 373 links and total link strength of 2035 (Figure 4).

Table 6: Keywords for Scopus "competitive intelligence – knowledge sharing" database

keyword	occurrences	total link strength	keyword	occurrences	total link strength
big data	40	79	knowledge acquisition	22	83
business intelligence	74	216	knowledge based systems	32	117
competition	77	250	knowledge management	237	546
competitive advantage	40	132	knowledge sharing	102	206
competitive intelligence	186	487	knowledge-sharing	45	156
decision making	61	196	motivation	24	52

keyword	occurrences	total link strength	keyword	occurrences	total link strength
design/ methodology/ approach	27	88	ontology	23	55
human resource management	26	90	organizational performance	29	66
industrial management	22	70	performance	23	36
information analysis	33	128	social media	45	82
information management	31	98	social networking (online)	25	65
information systems	42	127	societies and institutions	31	101
information technology	34	101	strategic planning	22	75
Innovation	71	116	surveys	30	96
intellectual capital	31	45	sustainable development	28	54
knowledge	31	48	vietnam	21	9

Source: Author's analysis /processing based on own data

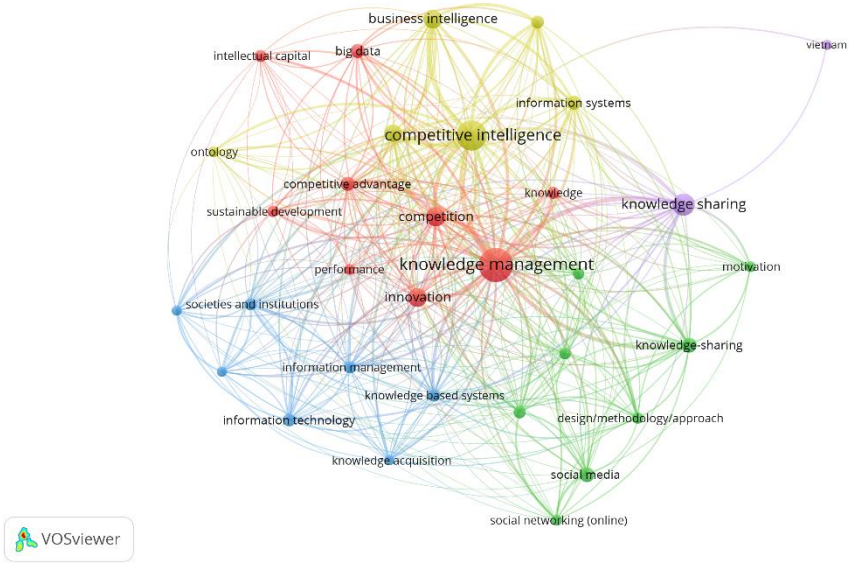

Figure 4: Co-occurrence map for "competitive intelligence – knowledge sharing" – Scopus
Source: Author's analysis /processing based on own data

In this map, "knowledge management" and "competitive intelligence" are both placed in the center of the map, in the red and yellow clusters. The two keywords are connected with the highest link strength, respectively 65. Just like in the 'business intelligence – knowledge sharing" co-occurrence map generated for the Scopus database, presented in Figure 2,

there are 2 keywords for knowledge sharing concept: “knowledge sharing” and “knowledge-sharing”. Both keywords are connected to “knowledge management” (link strength 45 and 37) and “competitive intelligence” (link strength 19 and 12). The strong correlation between “competitive intelligence” and “business intelligence” is proved again by the presence of the latter in this map, the two concepts being connected with a link strength of 55. Also, “business intelligence is connected with “knowledge management” (link strength 26) and both knowledge sharing keywords (link strength 5 and 3).

5. Conclusions

The bibliometric analysis conducted in this study tried to prove that, in the literature indexed in Web of Science core collection and Scopus, business intelligence, competitive intelligence and knowledge sharing are connected and were researched together. Nevertheless, this research identified the common areas of research for business intelligence and competitive intelligence, on one hand, and knowledge sharing, on the other hand, such as management, knowledge management and decision-making.

Also, based especially on the databases from Web of Science core collection, it can be stated that the connection between business intelligence/competitive intelligence and knowledge sharing has been researched for a while, but the state of the literature is still premature.

Therefore, understanding the correlation between business intelligence and competitive intelligence, using a knowledge-based framework and from a knowledge sharing point of view, should help both researchers and practitioners in analyzing and implementing these specific domains. This should be seen as the theoretical and practical utility of this paper, which aimed at closing a research gap between business intelligence, competitive intelligence and knowledge sharing.

By responding to the research questions formulated in this study naturally comes another direction for further research, such as the connections between knowledge sharing and other type of intelligence, respectively national security intelligence.

The fact that this study was based exclusively on the literature indexed in Web of Science core collection and Scopus and did not cover the publications from Google Scholar or the one that are not indexed in none of those represents the main limitation of this research. Another limitation represents the way VOSViewer is used by every researcher, accordingly with his general view and research objectives. Therefore, by setting the minimum number of occurrences to different values, VOSViewer generates different results, including or excluding relevant keywords. This limitation could be overcome by implementing different values for the minimum number of occurrences and analyzing the changes that occur in the maps generated by the specialized software, representing a possible research direction for future work.

References

Alnoukaria, M. and Hanano, A., 2017. Integration of business intelligence with corporate strategic management. *Journal of Intelligence Studies in Business*, 7 (2), pp. 5-16. https://doi.org/10.37380/jisib.v7i2.235

Botos, H.M. and Radu, G., 2017. Business counterintelligence practices. *Romanian Intelligence Studies Review*, 17-18, 165-175.

Bratianu, C., 2002. *Management strategic*. Craiova: Editura Universitaria Craiova.

Bratianu, C., 2007. An integrated perspective on the organizational intellectual capital. *Review of Management and Economical Engineering*, 6(5), 107-112.

Bratianu, C., 2022. *Knowledge strategies,* Cambridge University Press. https://doi.org/10.1017/9781108864237

Bratianu, C. and Murakawa, H., 2004. Strategic thinking. *Transactions of JWRI*, 33(1), 79-89.
Bratianu, C. and Bolisani E., 2018. *Emergent knowledge strategies. Strategic thinking in knowledge management*, Springer. https://doi.org/10.1007/978-3-319-60657-6
Bratianu, C. and Bejinaru, R., 2019a. The theory of knowledge fields: A thermodynamic approach. *Systems*, 7(2), pp. 20. https://doi.org/10.3390/systems7020020
Bratianu, C. and Bejinaru, R., 2019b. Knowledge dynamics: a thermodynamic approach. *Kybernetes,* 49(1), pp. 6-21. https://doi.org/10.1108/K-02-2019-0122
Fleisher, C.S. (2001). An introduction to the management and practice of Competitive Intelligence (CI). In P. Fleisher, C.S. and Blenkhorn, D.L. (Ed.), *Managing frontiers in competitive intelligence*. New York: Quorum Books, pp. 3-18. https://doi.org/10.5040/9798400682186
Ivan, L., 2016. Characteristics of information analysis in/for business environment. *Romanian Intelligence Studies Review*, 15, pp. 133-142.
Johnson, L.K., 2010. National Security Intelligence. In L.K. Johnson (Ed.), *The Oxford handbook of national security intelligence.* Oxford: Oxford University Press, pp. 3-33. https://doi.org/10.1093/oxfordhb/9780195375886.003.0001
Jourdan, Z., Rainer, R.K. and Marshall, T.E., 2008. Business intelligence: An analysis of the literature. *Information Systems Management*, 25 (2), pp. 121-131. https://doi.org/10.1080/10580530801941512
Kent, S., 1949. *Strategic intelligence for American world policy,* Princeton: Princeton University Press.
Krizan, L., 1999. *Intelligence Essentials for Everyone*, Joint Military Intelligence College. https://doi.org/10.21236/ADA476579
Massingham, P., 2020. *Knowledge management: Theory in practice,* Los Angeles: SAGE.
McGonagle, J., 2016. Competitive intelligence. In P. Oleson (Ed.), *AFIO's Guide to the Study of Intelligence*. Association of Former Intelligence Officers, pp. 371-381.
Nonaka, I., 1994. A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), pp. 14–37. https://doi.org/10.1287/orsc.5.1.14
Nonaka, I., and Takeuchi, H., 1995. *The knowledge-creating company: How Japanese companies create the dynamics of innovation*, New York: Oxford University Press. https://doi.org/10.1093/oso/9780195092691.001.0001
Porter, M., 1985. *Competitive advantage: Creating and sustaining superior performance*. New York: Free Press.
Rajnoha, R., Štefko, R., Merková, M. and Dobrovič, J., 2016. Business intelligence as a key information and knowledge tool for strategic business performance management. *E+M Ekonomie a Management*, 19 (1), pp. 183-203. https://doi.org/10.15240/tul/001/2016-1-013
Rouibah, K., and Ould-ali, S., 2002. PUZZLE: A concept and prototype for linking business intelligence to business strategy. Journal of Strategic Information Systems, 11(2), pp. 133–152. https://doi.org/10.1016/S0963-8687(02)00005-7
Skyrius, R., 2021. *Business intelligence: A comprehensive approach to information needs. Technologies and culture*. Cham: Springer. https://doi.org/10.1007/978-3-030-67032-0
Søilen, K.S., 2017. Why care about competitive intelligence and market intelligence? The case of Ericsson and the Swedish Cellulose Company. *Journal of Intelligence Studies in Business*, 7 (2), pp. 27-39. https://doi.org/10.37380/jisib.v7i2.237
Spender, J. C., 1996. Making knowledge the basis of a dynamic theory of the firm. *Strategic Management Journal*, 17, Special Issue, pp. 45–62. https://doi.org/10.1002/smj.4250171106
Van Eck, N.J. and Waltman, L., 2020. *VOSviewer Manual*, Universiteit Leiden.
Watson, H., and Wixom, B., 2007. The current state of business intelligence. *Computer*, 40(9), pp. 96–99. https://doi.org/10.1109/MC.2007.331

Zack, M. , 1999. Developing a knowledge strategy. *California Management Review*, 41(3), pp. 125–145. https://doi.org/10.2307/41166000

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