South African Journal of Information Management
ISSN: (Online) 1560-683X, (Print) 2078-1865

Looking into the future of competitive intelligence as supported by knowledge management

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Dates:
Received: 09 July 2025
Accepted: 15 Sept. 2025
Published: 01 Dec. 2025

How to cite this article:
Mabe, K., Hlatshwayo, O.L., Maputla, R.M. & Masango, M.G.G., 2025, 'Looking into the future of competitive intelligence as supported by knowledge management', *South African Journal of Information Management* 27(1), a2056. https://doi.org/10.4102/sajim.v27i1.2056

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Background: While competitive intelligence (CI) mostly focuses outwardly, knowledge management (KM) is tasked to draw from external and internal knowledge sources to facilitate the knowledge flow inside the organisation towards innovation and competitive advantage. As a result, KM is perceived to be a key support function for the CI function. As such, it may be worthwhile for KM practitioners to understand key CI resources and plans for the future to offer improved support to CI practitioners. This study thus explores the future research agenda of CI.

Objectives: This study aims to map the body of work centred on CI research and to map future research agendas in the CI space.

Method: A bibliometric analysis approach was used to identify the latest studies, key sources, authors, keywords and countries that publish work on CI.

Results: The research identified the main industries where CI research is done, the focus of the studies, research gaps and the prominent research methodologies in the CI field.

Conclusion: Knowledge management practitioners can better support CI practitioners in their functions as they learn where CI is mostly practised and where the field is headed.

Contribution: The authors believe that by fulfilling the research aims, CI and KM practitioners would be able to enhance their CI knowledge, tackle pressing CI research needs and reenergise conversations focusing on CI.

Keywords: competitive intelligence; knowledge management; intelligence; CI-KM; information and knowledge management.

Introduction

The evolution of the market has meant that competition has been higher than ever before. To maintain or grow a market share, competitive intelligence (CI) is integral. According to Victoria (2020), CI is a systematic institutional programme for mining and analysing data on competitor activities and trends in markets to help organisations gain a competitive advantage. The purpose of CI is similar to that of knowledge management (KM) (delivery of knowledge to the right person, at the right time and in the right format) (Ghannay & Mamlouk 2012:24; Taib et al. 2008:31). Ranjan and Foropon (2021:3) stated that the purpose of CI is to collect and interpret information at the time needed to enhance decisions.

Competitive intelligence can be regarded as an extension of KM because the intelligence provided through CI practices contributes to improving an organisation's strategic position (Chawinga & Chipeta 2017:28). When KM practitioners support the CI agenda, they enable organisations to enhance their competitiveness in increasingly dynamic and competitive markets (Ghannay & Mamlouk 2012:23). For example, although the use of CI may be advantageous, the level of information overload poses a challenge for professionals (Chen, Chau & Zeng 2002:1). Knowledge management assists in combating information overload (Klutch Team 2023), a fact that motivated the execution of this study, seeking to improve KM practitioners' understanding of CI. To do so, the authors believed it necessary to lead KM and CI practitioners to authoritative CI sources, in the case of this study, academic authors and publishers of CI research, necessitating the completion of a bibliometric analysis focusing on understanding the future agenda of CI. The study also points to the future direction of CI to catalyse the improvement of the practice and the development of new CI knowledge to be added to the CI body of knowledge (CIBoK).

Note: The manuscript is a contribution to the collection titled 'Embedding Knowledge Management into Business Processes for Operational Excellence', under the expert guidance of guest editors Prof. Martie Alet Mearns, Prof. Vincent Ribière and Prof. Rexwhite Enakrire.

The argument for encouraging KM practitioners to further improve their CI knowledge is supported by technological developments, particularly the prevalence of big data (BD) and artificial intelligence (AI). In the fourth industrial revolution (4IR), where the Internet of Things (IoT) operates, machines including sensors, smartwatches and vehicles generate data (Ahmed et al. 2023:112892), alongside digital outputs from blogs, social media (SM), emails and text messages (Ranjan & Foropon 2021:1–2), as well as smartphones, cameras and tablets (Di, He & Li 2014:659), meaning new sources for CI exist. As such, KM practitioners need to understand how CI has been altered by these technologies to continue offering relevant support to CI units.

Big data has intensified competition across industries (Di et al. 2014:659). Accordingly, to strengthen organisational competitiveness, KM business units must assume a stronger role in this landscape by systematically collecting, structuring and applying environmental data (Yan-Li & He-feng 2016:60). By doing so, KM practitioners would be offering the needed support to perform CI. For example, CI data such as BD enable organisations to refine customer experiences and thereby boost revenue (Ranjan & Foropon 2021:1). Big data analytics (BDA) uses advanced analytics to boost predictive power and information discovery, helping fill key information gaps (Obitade 2019:3) and enabling organisations to forecast future performance and trends (Ahmed et al. 2023:112915), which is a key function of CI. These statements further indicate the synergistic nature of the KM and CI functions.

The above examples happen because the main purpose of performing BDA is to convert raw data into actionable information and knowledge (Rialti et al. 2020:1589), positioning it as a new model for generating intelligence (Shabbir & Gardezi 2020:2). Knowledge emerges from analysing BD through approaches such as machine learning (ML), data mining for extracting insights (Mangat & Saini 2022), statistical techniques for identifying trends (Coursera 2024), natural language processing (NLP) and deep learning, which attempt to mirror human cognition with BD (Holdsworth 2024; Karaboğa, Şehitoğlu & Karaboğa 2022:53). Furthermore, AI has automated KM processes such as creating (Taherdoost & Madanchian 2023:5), indexing and classifying knowledge (Tella, Olaniyi & Dunmade 2021:12), further indicating new opportunities these technologies present to enhance KM support for CI initiatives.

Intelligence enables increased efficiency and drives enhanced effectiveness (Baškarada & Koronios 2013:7). Intelligence synthesises accumulated knowledge to transfer insights across domains. Intelligence operates at the highest level of abstraction (Baškarada & Koronios 2013:7) and requires sound judgement and applied knowledge (Intezari, Pauleen & Taskin 2016:4194). This study aims to create a platform to help KM practitioners identify ways in which they can contribute to CI by understanding future CI needs. Additionally, this study encourages the increased support by KM for CI practices from an operational perspective to propel the utilisation of intelligence.

Research methods and design

By using previously published studies, bibliometric studies are used to ascertain the worldwide research tendencies for a certain topic (Mabe & Bwalya 2023:2). Depending on the search phrase and research area, bibliometric studies are also employed to analyse the bibliographic data of pertinent papers (Khan, Lew & Sinkovics 2022:2). Researchers can evaluate the influence of scientific research by using bibliometric analysis to learn more about the scientific framework of a field (Akhavan et al. 2014:229). This study's objective, which was to map the body of work centred on CI research, is reflected in the application of bibliometrics. Furthermore, the study emphasised understanding the research aims, strategies, leading industries and delineating the future research agenda of CI work. Data were analysed using the Scopus analysis tool, Microsoft Excel and VosViewer version 1.6.20. A key limitation of the study is that there are other business functions KM practitioners could look to enhance support for, but this study focusses only on how improvements can be made to support CI activities. It is thus a research gap to look into the other professions that KM practitioners support for added value in an era where KM processes are automated.

Data source and search strategy

The data collection process was conducted between 18 June 2024 and 24 June 2024 using the Scopus database. The data collection phase aimed to find the top-cited research articles that studied the CI discipline. As such, the search string used was 'competitive intelligence', with the only limitations being that the sources needed to be in English and the words CI had to be present in the article titles. This was done to ensure that the studies analysed had a deep focus on CI. The oldest article in the database was from 1959, highlighting the far-reaching importance of the practice. However, this article was not among the highest cited, possibly because of the belief that the knowledge contained might be outdated, as CI is a constantly evolving practice. Out of the 822 articles, only articles from the last 3 years (2022–2024) were considered for determining the future of CI work.

Bibliometric maps

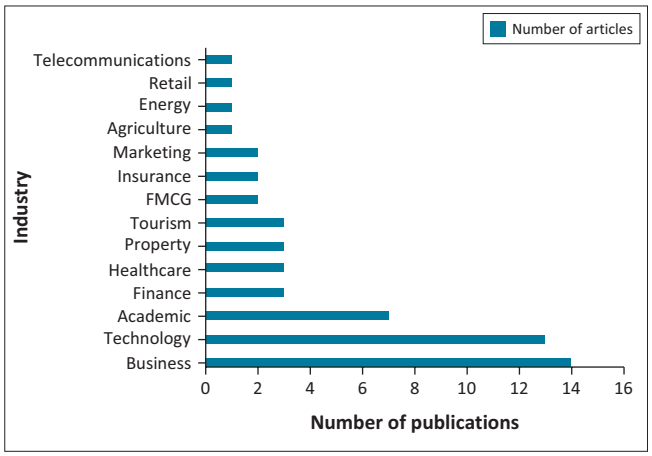
Using a research information system (RIS) file, the bibliographic data of the sources identified were imported into VosViewer to produce the visualisation depicted in Figure 2. This visualisation offers a clear illustration of the most used keywords, which reflect the focus of the CI research, using occurrences and link strength. When the link has a positive numerical value, the strength of the relationship is realised. Higher values are assigned to stronger relationships.

For instance, in terms of co-authorship analysis, the number of publications in which two countries share authorship is indicated by the strength of their association. The strength of a country's co-authorship relationship with other countries is represented by the overall link strength. Additionally, the number of publications where two keywords are jointly

present is indicated by the intensity of the association between the keywords in the co-occurrence analysis.

Analysis of the co-authorship

The authors considered all 92 countries connected to the 1469 authors when analysing co-authorship. The nations were determined to belong to seven continents: North America, Oceania, Asia, Europe, Africa, South America and the Middle East, by examining co-citation relationships between the countries.



FMCG, fast-moving consumer goods.

FIGURE 1: Industries leading in competitive intelligence-related publications.

Analysis of co-occurrence

With the minimum number of occurrences set at five, 54 of the 1575 keywords met the criterion for assessing link strength. Through the use of overlay visualisations, the authors were able to ascertain the frequency, link strength and average number of publications per year. Based on the colour of a keyword, the average publishing year was determined using the scale provided in the VosViewer overlay visualisation. This visualisation informed that the research landscape transformed in 2018, moving SM, BD and BDA into the spotlight as critical driving forces at the very heart of CI investigations.

Related works

The importance of CI cannot be overstated. The practice examines the competitiveness of an organisation, necessitating enterprise-wide involvement rather than limiting it to the marketing department. Every human resource should understand the complexity of the process and should work towards adding effective competitive strategy building and organisational success (Štefániková & Masárová 2013:671). In a time when markets are at capacity, the best way for existing organisations to ensure continuity is to expand their existing market share using practices such as CI.

Globalisation and the rapid advancements in technology have intensified competition, driving firms to adopt new

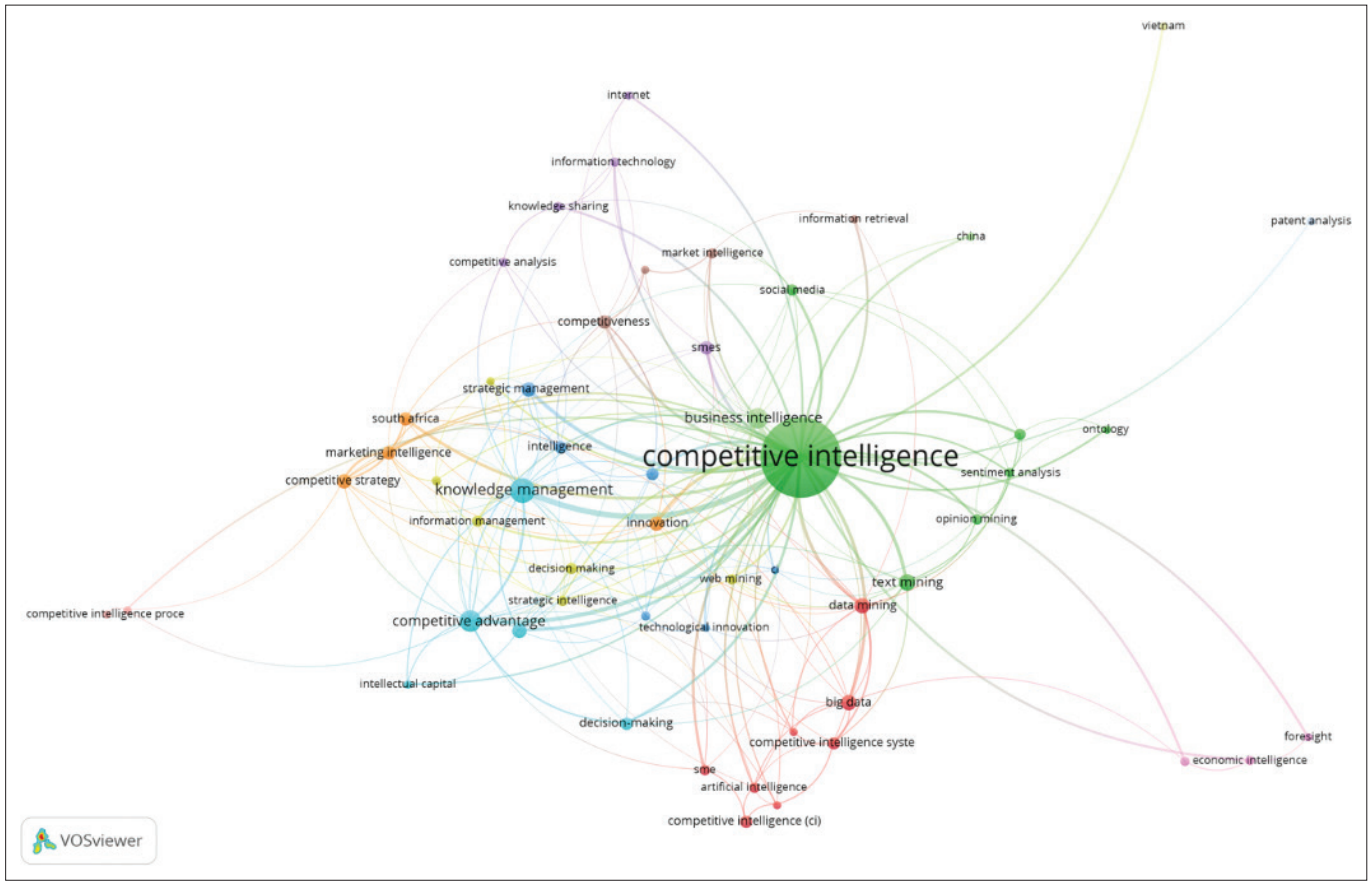


FIGURE 2: Keyword co-occurrence.

technologies should they want to be competitive (Macpherson, Werner & Mey 2022:1; Sackey, Bester & Adams 2017:117). Competitive intelligence and KM are functions that support the competitiveness of organisations through enhancing strategic decision-making. As Ghannay and Mamlouk (2012:23) state, sustained competitive advantage is critically dependent on acquiring knowledge. While KM and CI are often treated as separate disciplines, both are considered essential to the success of businesses across various sectors (Chawinga & Chipeta 2017:27). Taib et al. (2008:31) and Ghannay and Mamlouk (2012) asserted that although KM and CI are distinct disciplines, they are both complementary and synergistic, sharing similar objectives and functions as natural extensions of one another.

There is continued convergence between KM and CI, as the distinctions between the two fields continue to blur. Ghannay and Mamlouk (2012:24) reported that KM and CI are strategic tools that help create a competitive advantage. Erickson and Rothberg (2012:16) added that the improved management of knowledge leads to a competitive advantage. Knowledge management is integral for CI professionals to ensure accuracy and to better guide the various phases of strategy implementation (Shujahat et al. 2017:55).

Information and data are the commonalities that tie KM and CI together. Competitive intelligence collects data to create intelligence and support organisational decisions, while KM systems organise the resultant intelligence, alongside other internal and external sources (Nitse & Parker 2002:396) for ease of access. Johnson (2005:303) mentioned that the technologies that KM brings forth contribute to CI's strategic efficiency and effectiveness. Knowledge management and CI, when combined, deliver targeted information to decision-makers when needed (Ghannay & Mamlouk 2012:31).

The relationship between CI and KM has become a way for organisations to gain a competitive advantage (Johnson 2005:303). The only limitation for CI practitioners has been the ability to access the knowledge. Additionally, Nitse and Parker (2002:396) provided that issues such as information credibility, focus, quantity, shallowness, sharing and timeliness were identified by users of CI regarding the intelligence supplied to them by CI professionals. Additional CI challenges included decision lag, data overload and the lack of necessary organisational values and innovation support.

Knowledge management components can help resolve the above-mentioned issues (Esmaeili, Mousavi & Beyranvand 2015:1862). Hence, there is a need for KM practitioners to support CI work, as KM is fundamentally concerned with the identification, organisation, codification and sharing of an organisation's knowledge assets (Taib et al. 2008:29). Knowledge management can improve compliance, assist with innovation and product exchange, enhance efficiency and develop a conducive organisational culture. Knowledge management delivers the right information to the right people when needed for decisions and can thus assist in maintaining competitiveness (Nitse & Parker 2002:396).

Knowledge management streamlines data from multiple sources by enabling indexing and search capabilities (Nitse & Parker 2002:396). Both disciplines aim to evaluate business decisions, locate and deliver relevant internal and external knowledge and ultimately help decision-makers interpret the knowledge (Ghannay & Mamlouk 2012:31). Oladejo and Osofisan (2011:590) stated that KM enables CI-produced intelligence to be reused and distributed to decision-makers, analysts and project leaders across all intelligence phases.

Knowledge management methods enable effective information use by systematically organising, preserving and sharing existing knowledge (explicit and tacit) while anticipating future needs. This makes KM essential for CI, as both interconnect through information processing (Oladejo & Osofisan 2011:55). Ghannay and Mamlouk (2012:31) argued that an organisation's future hinges on strategically transforming knowledge into actionable CI.

Though KM and CI differ in focus, they share core goals such as managing information overload and enabling targeted analysis, making them complementary forces. According to Chawinga and Chipeta (2017:28), KM focuses on managing internal knowledge processes to ensure that the necessary knowledge for decision-making is readily accessible and efficiently utilised. In contrast, CI emphasises the collection and analysis of data from a wide range of external sources to support strategic decision-making and gain a competitive advantage.

Given their complementary roles – KM focusing internally and CI focusing externally – it can be argued that integrating both approaches within an enterprise can yield greater strategic value and enhance organisational effectiveness. Synergy leads to greater combined effects, which can be seen by linking KM and CI rather than keeping them separate. As the fields have some similarities, they have the potential to complement each other through KM organising and sharing internal knowledge and CI gathering competitor data (Taib et al. 2008:31).

Knowledge management and CI operate on two different levels but will inevitably integrate (Tang & Li 2010:1). The integration and combination of the two functions, referred to as KM-CI, can result in the delivery of relevant intelligence to the most appropriate decision-makers at the most appropriate time, thereby enhancing the decision-making process (Chawinga & Chipeta 2017:28). Given the close relation seen in the literature, it can be argued that KM and CI are natural partners and ought to collaborate (Johnson 2005:304). Both disciplines ultimately aim to ensure that critical insights are delivered to strategic decision-makers in a timely and actionable manner (Taib et al. 2008:29). As highlighted by Taib et al. (2008:31) and Ghannay and Mamlouk (2012:24), it is at this convergence where internal intelligence and external intelligence inform strategic choices that KM and CI meet at a pivotal intersection.

Knowledge management enhances the value of information already available within the organisation, while CI focuses on gathering and interpreting relevant data from the external environment. When integrated, these two functions can produce a competitive advantage. Specifically, KM seeks to optimise internal expertise and knowledge assets, whereas CI filters and analyses external data to understand the complex nature of the competitive landscape and to identify emerging trends (Chawinga & Chipeta 2017:28). Thus, the claim of this study is that KM practitioners should take it upon themselves to understand the future focuses of CI to better contribute to and drive CI for increased business effectiveness.

Ethical considerations

Ethical clearance to conduct this study was obtained from the University of Johannesburg's School of Consumer Intelligence and Information Systems Research Ethics Committee (No. 2024SCiiS092V).

Results and discussions

Publication output and growth of research

Over 65 years, 822 articles on CI have been published. The oldest work was published in 1959, and many other publications have been published almost every year since then. Over the last 65 years, the publication trend has fluctuated, with some up and down years. From 1960 to 1983, there had been no publications relating to CI, while the year with the most publications was 2015, with 53 studies published.

Despite the up–down pattern, publication growth has been consistent, with publications increasing in both up and down years. For example, there were 18 publications in 1995, but only four in 1996. However, there were 26 in 2007 and 31 in 2008. The trend continues, with 38 in 2012 and 51 in 2013; 37 and 53 were released in 2014 and 2015, respectively; and 45 and 27 were released in 2021 and 2022, respectively. In 2023, 37 papers were published, but only 14 were published in 2024 at the time of data collection (between 18 and 24 June 2024). The data revealed that later years have more publications than earlier years; however, there are fluctuations in the number of publications, thus not indicating a consistent growth in CI publications. As a result of the continued fluctuation, it can be expected that 2025 will have more than 14 publications that entail CI.

Because of the widespread relevance of CI across industries, it made sense why the same trend was realised when assessing the industries in which the included studies were conducted. It was found that the work published was focused on 15 industries. In some cases, articles focused on more than one industry. For example, the article by Tajdini (2022) touches on both the business and technology industries as it analyses how technology-driven consumer data impact business outcomes.

The most prevalent industry was the business industry, with 14 articles coming from this industry. The articles focused on innovation, strategic decision-making and organisational performance and development. For example, the study by Wu, Yan and Umair (2023) focused on how CI impacted the ability of small- and medium-sized enterprises (SMEs) to adapt and prosper in competitive business environments. Additionally, Rahma and Mekimah (2023) stated that their study was driven by CI's role in facilitating organisational learning to enhance organisational performance.

Additional prevalent industries were the technology and academic industries, found in 13 and seven articles, respectively. The technology studies mainly focused on creating CI models and systems or enhancing existing models and systems using AI. For example, in the study by Bouktaib and Abdelhadi (2022), the authors proposed including a BD analytics layer in CI systems. On the contrary, the articles that were academic discussed theories and literature surrounding the understanding of the use and application of CI systems and processes.

Other industries included finance, health care, property and tourism with three articles; the fast-moving consumer goods (FMCG), insurance and marketing industries were represented in two articles each and the agriculture, energy, retail and telecommunications industries were seen in one article each. Ultimately, the organisations in these industries used CI to monitor their competitors' moves in the market and to identify threats and opportunities to adapt their strategies, set prices, develop products, target customers, mitigate risks and gain a competitive advantage.

Preferred journals

Analysis revealed that the top 10 most prevalent journals were published by nine distinct publishers (see Table 1). Springer Nature had the most publications with two journals followed by every other publisher with just one each. In terms of the articles relating to CI, the Lecture Notes in Computer Science, which included the subseries Lecture Notes in AI and Lecture Notes in *Bioinformatics* journal, had the most cited article – 'U-net: Convolutional networks for biomedical image segmentation', with 52 358 citations.

According to the CiteScore 2023 report, only one journal (*IEEE Engineering Management Review*) (7.4) had a score of five and above, making it the journal with the highest CiteScore. On the contrary, *Ciencia Da Informacao* had the lowest, scoring 0.1. Hamburger (2020) suggested that a CiteScore indicates the value of a journal. The higher the score, the greater the value. The CiteScore denotes that Scopus views *Ciencia Da Informacao* as the least valuable journal among the top 10 journals. Nevertheless, it is imperative that publishers not only take the CiteScore into account but also consider the journal's capacity to reach the appropriate target audience.

In Table 1, TP refers to total publications, and TC refers to total citations. The total publications refer to those related to CI and not the journal's entire publication history. However, the citations represent the journal's entire citation history. Times cited speak to the number of times the most cited article was referenced.

Table 2 presents the countries that are leading in terms of their total publications (total publications per country [TPC]) focusing on CI. The table also highlights the leading country's most productive academic institution and the institution's total publications (total publications per institution [TPI]). As can be seen, the United States (US) was the leading country with the highest number of publications relating to CI at 149 publications. The University of Pittsburgh was the most productive institution in the US, contributing seven publications. Following the US was China, with 115 total publications, where Wuhan University was the most productive academic institution with nine publications. Although the US was leading in terms of total publications, it was observed that the most productive institution in China outperformed the most productive one in the United States.

When analysing co-authorship between countries, the researchers required countries to have published at least five documents, which reduced the results from 92 to 33 countries. There were 57 total links, and the total link strength was 127. The top three collaborators were the US, China and Brazil, with South Africa coming in fourth place. From 149 articles, the US had 14 links. This finding meant that 9.4% of the articles published in the US were collaborated on with other countries. While China was second in terms of total publications contributed, it had a total of seven links. Therefore, the percentile representation in terms of articles collaborated on was 6.09%. Brazil came in third with total publications contributed and had a total of six links (11.86%). Although South Africa was fourth in terms of total articles contributed, it had seven links, indicating a higher collaboration percentage than the top three countries, with 12.73% of the work being collaborated on. It can also be assumed that authors from China believed less in international collaborative research than the other top three.

Studies on CI were found to be published mostly by authors from institutions not mentioned in the 2025 top 100 institutions on the Webometrics list. Table 3 provides the institutions' global ranking list, where only two institutions were in the top 100. This was perhaps because researchers from top institutions turned their focus to other research areas. However, the

TABLE 2: Leading countries and the leading academic institutions in the country.

Rank	Country	TPC	Most Productive Academic Institution	TPI
1	United States	149	University of Pittsburgh	7
2	China	115	Wuhan University	9
3	Brazil	59	Universidade de São Paulo	9
4	South Africa	55	North West University	17
5	France	53	Université de Tolouse	6
6	Canada	45	University of Ottawa	14
7	Spain	35	Universidad del Pai Vasco	6
8	United Kingdom	29	De Montfort University	7
9	Iran	22	Ferdowsi University of Mashhad	3
10	Morocco	22	Faculté des Sciences et Techniques de Tanger	6
11	Portugal	21	Universidade de Lisboa	9
12	Germany	18	Friedrich Alexander-Universitat Erlangen-Nurnberg	3
13	Czech Republic	16	BRNO University of Technology	7
14	Russian Federation	15	HSE University	9
15	Tunisia	13	Université de Sfax	4

TPC, total publications per country; TPI, total publications per institution.

TABLE 1: Preferred journals.

Journal	TP (%)	TC	CiteScore 2023	The most cited article (reference)	Times cited	Publisher
Journal of Intelligence Studies in Business	227	68	2.0	Competitive intelligence research: An investigation of trends in the literature	51	Halmstad University
Journal of Modern Information	1073	19	0.6	Comparison and Analysis of Research Trend Prediction Models Based on Machine Learning Algorithm - BP Neural Network, Support Vector Machine and LSTM Model |	18	Editorial Board of Journal of Modern Information
Perspectivas Em Ciencia Da Informacao	755	48	0.4	Scientific collaboration: Theoretical and conceptual review | Colaboração científica: Revisão teóricoconceitual	41	Escola de Ciencia da Informacao da UFMG
Lecture Notes In Computer Science Including Subseries Lecture Notes In Artificial Intelligence And Lecture Notes In Bioinformatics	546875	148168	2.6	U-net: Convolutional networks for biomedical image segmentation	52358	Springer Nature
Ciencia Da Informacao	592	7	0.1	Scientificcommunication and the open access movement in scholarly publishing | A comunicação científica e o movimento de acesso livre ao conhecimento	43	Brazilian Institute for Information in Science and Technology
Information Wissenschaft Und Praxis	1421	17	0.2	HistCite™: A software tool for informetric analysis of citation linkage	151	De Gruyter Saur
Business Information Review	1112	132	2.5	Fake news and ideological polarization: Filter bubbles and selective exposure on social media	362	SAGE
Acta Universitatis Agriculturae Et Silviculturae Mendelianae Brunensis	3067	85	1.4	Digital transformation maturity: A systematic review of literature	148	Mendel University of Agriculture and Forestry Brno
Communications In Computer And Information Science	72032	17860	1.1	Scalability evaluation of NSLP algorithm for solving non-stationary linear programming problems on cluster computing systems	1107	Springer Nature
IEEE Engineering Management Review	2367	1102	7.4	The Impact of COVID-19 on Consumers: Preparing for Digital Sales	262	IEEE

TP, total publications; TC, total citations.

finding does not minimise the importance of CI as it is widely practised to deliver a competitive advantage (Victoria 2020).

Leading authors

Table 4 lists the authors who had the most contributions towards the study of CI. The list is made up of the top 15 authors from eight different countries, namely the Czech Republic, the United Kingdom and Latvia, with one author from each. Portugal, Morocco and the US had two authors each. Lastly, South Africa and France had three authors each. The top three authors with the most publications are from Portugal, France and the US. Most publications were from the Universidade Nova de Lisboa in Lisbon, Portugal, by Castelli, M., with 202 publications, 3813 total citations and an h-index of 30 (a metric designed to evaluate both the research output and scholarly impact of an individual researcher or a collective) (MD Anderson Cancer Center 2025). In second place was Dou, H.J.M., affiliated with Aix Marseille Université with 75 total publications, an h-index of 14 and 672 total citations. In third place, from the Debbie and Jerry Ivy College of Business in Ames, US, was Agnihotri, R., who had 73 publications, an h-index of 29 and 3523 total citations. The list is made up of mostly authors from Europe (eight authors) ranked 1, 2, 8, 9, 10, 11, 14 and 15, followed by five authors from Africa ranked 4, 6, 7, 12 and 13 and then two authors from North America ranked 3 and 5. The two authors from North America are both from the US. The suggestion is that CI is mostly valued in Europe and South Africa, and therefore, KM and CI practitioners should make European contacts where CI is concerned to improve their understanding of the practice.

TABLE 3: Authors' institutional global rankings.

No.	Institution	Ranking
1	University of Pittsburgh	44
2	Universidade de Sao Paulo	67
3	Wuhan University	147
4	University of Ottawa	192
5	Universidad del Pais Vasco	349
6	HSE University	420
7	University of Pretoria	431
8	Universidade de Brasilia	496
9	University of Johannesburg	545
10	De Montfort University	704
11	University of South Africa	732
12	Nova Information Management School, Universidade Nova de Lisboa	839
13	Universidade NOVA de Lisboa	881
14	Latvijas Universitate	968
15	BRNO University of Technology, Faculty of Business and Management	1222
16	Universite de Toulouse	1281
17	Mohammed V University in Rabat	1412
18	North West University	1721
19	Ithaca College	1961
20	Marist College	2078
21	Faculté des Sciences et Techniques de Tanger	5978
22	Ecole de Gestion Telfer	Not listed

Author keywords co-occurrence

A total of 1575 author keyword co-occurrences were identified, among which 54 co-occurred at least five times, which was the threshold set for map generation in VosViewer (see Figure 2); 70 keywords co-occurred four times, 124 keywords co-occurred three times and 285 keywords co-occurred two times.

Terminology and concept

Data revealed that the commonly utilised keyword was CI, with 406 occurrences and a link strength of 363. The second and third most used keywords were KM (39 occurrences and the total link strength of 79) and competitive advantage (30 occurrences and the total link strength of 57). The frequency of the keyword occurrences of KM further purports the need for KM practitioners to contribute to CI work as CI practitioners acknowledge KM. Business intelligence and text mining

TABLE 4: Leading authors and their affiliations.

No.	Author	Scopus author ID	Year of first publication	TP	h-index	TC	Current affiliation	City/Country
1	Castelli, M.	36052209100	2010	202	30	3813	Universidade Nova de Lisboa	Lisbon, Portugal
2	Dou, H.J.M	7005674622	1995	75	14	672	Aix Marseille Université	Marseille, France
3	Agnihotri, R.	56845068700	2008	73	29	3523	Debbie and Jerry Ivy College of Business	Ames, United States
4	Benbrahim, H.	8301231000	2000	57	13	473	Ecole Nationale Supérieure d'Informatique et d'Analyse des Systèmes	Rabat, Morocco
5	Prescott, J.E.	7102196859	1995	55	28	4942	Katz Graduate School of Business	Pittsburgh, United States
6	Calof, J.	24309705900	1995	42	16	1722	North West University	Potchefstroom, South Africa
7	Boulourand, Z.	57501487700	2015	42	6	74	Hassan II University of Casablanca	Casablanca, Morocco
8	Dousset, B.	7006195495	2000	28	6	349	Université de Toulouse	Toulouse, France
9	Cekuls, A.	57189390277	2016	22	5	36	Latvijas Universitāte	Riga, Lativa
10	Bisson, C.	35179145000	2009	19	8	109	SKEMA Business School	Lille, France
11	Wright, S.	24482796200	1998	14	11	698	Strategic Partnerships Ltd	United Kingdom
12	Nenzhelele, T.E.	56263617900	2014	13	4	36	University of South Africa	Pretoria, South Africa
13	Sewdass, N.	6508041309	2004	12	5	115	University of South Africa	Pretoria, South Africa
14	Barthes, F.	3697497430	2006	11	4	53	Brno University of Technology	Brno, Czech Republic
15	Madureira, L.	57217176590	2019	6	3	26	Universidade Nova de Lisboa	Lisbon, Portugal

Note: Please see the full reference list of this article Mabe, K., Hlatshwayo, O.L., Maputla, R.M. & Masango, M.G.G., 2025, 'Looking into the future of competitive intelligence as supported by knowledge management', *South African Journal of Information Management* 27(1), a2056. https://doi.org/10.4102/sajim.v27i1.2056, for more information.

TP, total publications; TC, total citations.

rounded up the top five keywords used with 28 and 17 occurrences and total link strengths of 46 and 27, respectively. These keywords also highlighted the topics of interest.

Results from assessing work from the last 3 years

Research focus

The authors analysed a range of research aims drawn from the collected literature. A total of 59 articles were identified from the past 3 years (2022–2024). However, for the sake of this analysis, only 49 articles were considered as 10 were made up of editor's notes, others were duplicates, one could not be accessed, one was a full conference proceedings and another was a corrigendum. The primary focus, accounting for approximately 26.5% of the reviewed articles, centred on CI tools. Within this category, particular attention was given to the integration of AI and ML, with a view to enhance CI capabilities across various industries. These technologies were explored for their potential to automate, refine and strengthen CI processes. Knowledge management practitioners thus need to look into how AI has impacted CI and provide related knowledge to inform CI strategies.

Additional thematic areas included CI processes and skills, as well as strategy development, with each theme represented by 16.33% of the collected articles. An illustrative example is the work by Qian et al. (2024), titled 'Voice of the professional – acquiring CI from large-scale professional-generated contents', which intersects both of these research focuses. This article explored practical methodologies for CI acquisition while concurrently addressing strategic planning. Knowledge management practitioners need to look into how CI processes have been improved and document best practices as a way of supporting the CI agenda.

Furthermore, 14% of the articles concentrated on the theme of CI maturity. A notable contribution within this theme was the study by Madureira, Popovič and Castelli (2023) that considered the use of automation tools in the development of CI. 10.2% of the articles specifically addressed the role of SM and the Internet in the context of CI. These studies sought to clarify the influence of data harvested from digital platforms and assess its analytical value. Within this subject, the topic of BD analytics emerged, featuring prominently in contributions such as the work by Ranjan and Foropon (2021), which investigated how BD can be leveraged for CI purposes.

Strangely, the least represented research focus pertained to decision-making. This was strange given that the main purpose of CI is to drive enhanced decision-making. However, this could have been as a result of the fact that CI is created to impact decision-making and thus can be latently implied in research and not warrant explicit mention. Nonetheless, this theme appeared predominantly in the enterprise- and entrepreneurship-focused literature. For example, the 2022 study by Sadeghiani, Shokouhyar and Ahmadi, titled 'How digital startups use CI to pivot', explored how startups utilise CI to support decision-making in their formative stages, highlighting CI's role in strategic adaptation and entrepreneurial agility. Figure 3 offers an illustration of the research focus results. Knowledge management can support CI deliver products that enhance decision-making by facilitating the identification, organisation, codification and sharing of an organisation's knowledge assets (Taib et al. 2008:29).

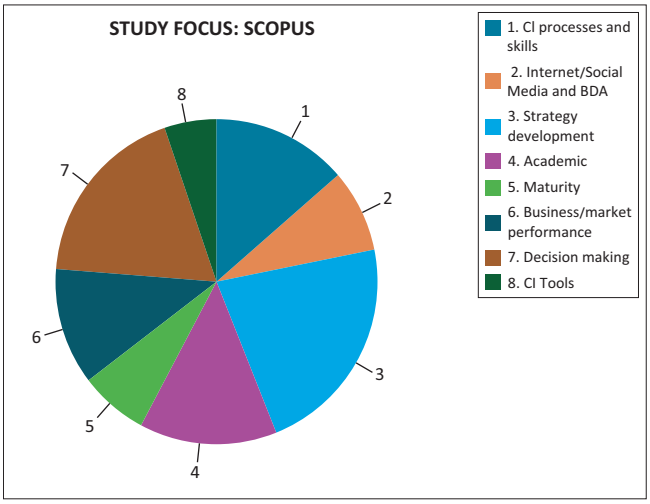
Prevalent research strategies

There are many methodologies employed in producing the articles, with some proving more prevalent than others. The most common research strategy employed was a survey, which was employed in 33% of the articles. Following the use of surveys was model development, which was used in 22% of the studies. Testing these models required the use of secondary data. Secondary data were the most used data type as they were also incorporated in other research methodologies such as systematic literature reviews.

Systematic literature reviews and literature reviews accounted for the last of the majority used, with the strategy being prevalent in 18% of the studies. These systematic literature reviews aimed to analyse existing data and highlight potential gaps in CI knowledge, as can be seen in the work by Maluleka and Chummun (2023). On the other end of the spectrum was the case study strategy used in 8% of the articles. Secondary data analysis, expert research, document review and grounded theory each accounted for 4%. In this instance, secondary data analysis refers to studies that used methods such as web scraping to source data. Experimentation was the least utilised strategy, with only 1% prevalence. The great use of the survey methodology highlights the commitment to primary data acquisition in the studies assessed.

Conclusion

The authors were able to identify articles, important sources, authors, keywords and nations that had published content



CI, competitive intelligence; BDA, Big Data analytics.

FIGURE 3: Key research focuses discovered.

on CI. One database (Scopus) was utilised for data collection, which was one of the study's limitations. As a result, it is possible that using a different database may produce different results. For the most part, the future research agenda from a technological standpoint was seen in authors requiring enhancements to the CI models and systems they had built. These authors pointed out the limitations of their models and suggested what needs to be done in efforts to produce enhanced CI work. For instance, Lin et al. (2023:13) asserted that while their work improved how CI was acquired, their model was based on supervised learning, which goes against the trend of using unsupervised learning for embedding AI into systems. In support, Maluleka and Chummun (2023:193) posited that CI processes need to be enhanced by the application of BD and the use of AI. Studying the contributions made by SM in delivering CI was also emphasised by authors such as Carvalho, Picoto and Busch (2022:176) and Hassani and Mosconi (2022:8).

Nonetheless, Lin et al. (2023:13) also pointed out that supervised learning models are highly dependent on accurate data, whereas unsupervised learning models are not so much, as they can learn from unstructured data sourced from social networks. Bouktaib and Abdelhadi (2022:164) added that they needed to apply deep learning networks to their model to enhance knowledge extraction from data, while Zhang, Zhang and Zhu (2023:233) believed that utilising deep learning would assist with automating model learning features. Lin et al. (2023:13) further criticised their methodology in terms of the data used to test the model as it was limited to structured data and did not test its response to unstructured data.

Continuing with the point on methodology, many of these studies relied on secondary data. While acknowledging that building and testing models require the use of secondary data, studies such as the ones by Maungwa and Laughton (2023) and Maluleka and Chummun (2023) also relied on secondary data, as they used a systematic literature review approach. These studies did not build models but aimed to report findings provided by other researchers. The authors of this study believe this was the case, perhaps because CI is not practised as much as it needs to be or even when it is practised, it is practised informally as pointed out by Nenzhelele in 2014 and 2024 (Nenzhelele 2024:297; Nenzhelele & Pellissier 2014:97). Therefore, there are less opportunities to conduct case studies. Nenzhelele (2024:303) also suggested looking into the reasons why organisations in the property sector do not employ CI experts.

It became overwhelmingly obvious that the studies were more concerned with methodological constraints in making recommendations rather than pointing to new areas of investigation. The other limitations included adding more sample sizes and types and converting studies to use longitudinal time horizons to assess impact. The transfer of study results was also a generic recommendation asserted by some authors.

Oraee (2022:725) provided that academic libraries also have a role to play in CI. Oraee stated that research must be conducted to help determine how academic libraries can assist with information literacy and acquisition to contribute to quality CI processes. These contributions can be attributed to the need to develop an organisational culture that supports CI. Olszak, Bartuś and Sączewska-Piotrowska (2023:1804) highlighted that the effectiveness of CI efforts was weakened by the lack of an organisational culture that purports its implementation and recommended that future studies look into how this challenge can be averted. Chinyavada and Sewdass (2023:69–70) argued that future researchers should look into training and development requirements to improve the execution of CI activities.

Acknowledgements

This article is based on a conference paper originally presented at the Knowledge Management South Africa (KMSA) Conference, themed *Integrating Knowledge Management for Operational Excellence*, held in Franschhoek on 25–27 August 2025. The conference paper, titled 'Looking into the future of competitive intelligence', was subsequently expanded and revised for this journal publication, with permission from the conference organisers.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

K.M., O.L.H., R.M.M. and M.G.G.M. made equal contributions to this work.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

The data that support the findings of this study are available from the corresponding author, K.M., upon reasonable request.

Disclaimer

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