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THE EVOLUTION OF INTELLECTUAL CAPITAL IN KNOWLEDGE MANAGEMENT: A GLOBAL SYSTEMATIC LITERATURE REVIEW STUDY ON PUBLIC ORGANISATIONS

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Abstract
This study aims to analyze the evolution of intellectual capital in public organization knowledge management globally, focusing on the period 2000–2025, to identify current trends, challenges, and best practices. This study uses a systematic literature review (SLR) method based on the PRISMA protocol, analyzing 10 articles indexed in Scopus and Web of Science. The research findings reveal three main findings. First, human capital in public organizations has undergone digital transformation, where technology-based competencies such as data analytics and AI have become critical, although skill gaps remain a challenge, particularly in developing countries. Second, structural capital is rapidly developing through the adoption of cloud-based knowledge management systems, blockchain, and collaborative platforms, but is hindered by rigid bureaucracy and infrastructure limitations in some regions. Third, relational capital is strengthened by social media and digital public participation mechanisms, although it is vulnerable to misinformation. This study also identifies the emergence of the concept of "green intellectual capital," which integrates sustainability principles into the three dimensions of intellectual capital. Theoretically, these findings enrich the discourse on intellectual capital by integrating the perspectives of the Knowledge-Based View, Institutional Theory, and Complexity Theory. Practically, this study recommends accelerating digital training for public human resources, standardizing the interoperability of knowledge systems, and strengthening technology-based multisectoral collaboration. Policy implications include the need for a regulatory framework that supports intellectual capital innovation while addressing the challenges of the digital divide and knowledge governance.

Keywords: Intellectual Capital, Knowledge Management, Public Organization, Systematic Literature Review

Abstrak
Penelitian ini bertujuan untuk menganalisis evolusi modal intelektual dalam manajemen pengetahuan organisasi publik secara global, dengan fokus pada periode 2000–2025, untuk mengidentifikasi tren terkini, tantangan, dan praktik terbaik. Studi ini menggunakan metode tinjauan literatur sistematis (systematic literature review/SLR) berdasarkan protokol PRISMA, dengan menganalisis 10 artikel terindeks Scopus dan Web of Science. Hasil penelitian mengungkapkan tiga temuan utama. Pertama, human capital dalam organisasi publik telah mengalami transformasi digital, di mana kompetensi berbasis teknologi seperti analitik data dan AI menjadi kritikal, meskipun kesenjangan keterampilan masih menjadi tantangan, terutama di negara berkembang. Kedua, structural capital berkembang pesat melalui adopsi sistem manajemen pengetahuan berbasis cloud, blockchain, dan platform kolaboratif, namun terhambat oleh birokrasi kaku dan keterbatasan infrastruktur di beberapa wilayah. Ketiga, relational capital diperkuat oleh media sosial dan mekanisme partisipasi publik digital, meskipun rentan terhadap misinformasi. Penelitian ini juga mengidentifikasi munculnya konsep "green intellectual capital" yang mengintegrasikan prinsip keberlanjutan ke dalam ketiga dimensi modal intelektual. Secara teoretis, temuan ini memperkaya

wacana modal intelektual dengan mengintegrasikan perspektif Knowledge-Based View, Institutional Theory, dan Complexity Theory. Secara praktis, penelitian ini merekomendasikan percepatan pelatihan digital untuk SDM publik, standarisasi interoperabilitas sistem pengetahuan, dan penguatan kolaborasi multisektor berbasis teknologi. Implikasi kebijakan mencakup perlunya kerangka regulasi yang mendukung inovasi modal intelektual sekaligus menjawab tantangan kesenjangan digital dan tata kelola pengetahuan.
***Kata kunci**: Modal Intelektual, Manajemen Pengetahuan, Organisasi Publik, Tinjauan Literatur Sistematis*

Introduction

The development of the digital era and the knowledge economy has changed the paradigm of organisational management, especially in the context of public organisations. Intellectual capital, which includes human capital, structural capital, and relational capital, has become the main foundation for creating added value and innovation in public services. In recent decades, the concept of knowledge management has developed rapidly, but the focus on the evolution of intellectual capital in public organisations is still relatively limited. In fact, public organisations face complex challenges such as demands for transparency, accountability, and efficiency that require systematic knowledge management. Previous studies have concentrated more on the private sector, resulting in a significant literature gap regarding how intellectual capital evolves in the public context, especially in an era of technological disruption and rapid social change.

Previous research by Secundo et al. (2020) examined the role of intellectual capital in public sector innovation, but focused more on human capital aspects without exploring the dynamics of structural and relational capital in depth. Meanwhile, a study by Dumay et al. (2021) examined knowledge management practices in local government, but did not relate them to the framework of intellectual capital evolution from a global perspective. On the other hand, research by Massaro et al. (2020) provided a systematic review of intellectual capital in the non-profit sector, but its scope was not specific to public organisations. The main difference between this study and previous studies lies in its holistic approach, which integrates the three dimensions of intellectual capital (human, structural, relational) in the context of public organisation knowledge management, with a global-scale analysis to identify current patterns and trends.

This study offers several significant novelties compared to previous studies, in terms of scope, theoretical approach, and practical implications. First, this study is one of the first systematic literature reviews that specifically examines the evolution of intellectual capital in the context of public organisation knowledge management from a global perspective. Most previous studies have focused on the private or non-profit sectors (Massaro et al., 2020; Dumay et al., 2021), while studies on public organisations are still limited and tend to be local or national in nature. By analysing literature from various regions, including developed and developing countries, this study can reveal different patterns of intellectual capital adaptation due to variations in policy, culture, and technological infrastructure. Second, this study develops an integrative framework that links the three dimensions of intellectual

capital (human, structural, and relational capital) with the dynamics of knowledge management in the public sector. Previous studies often discuss these three components separately (Secundo et al., 2020), thus failing to provide a holistic picture of the interactions between dimensions. In practice, however, the three components influence each other. For example, improvements in human capital (such as human resource training) must be supported by improvements in structural capital (technology systems) and relational capital (inter-agency collaboration). This framework addresses the criticism by Garlatti et al. (2022) regarding the need for a more integrated approach in public sector intellectual capital research.

Third, this study identifies current trends (2020–2025) that have not been widely explored, such as the impact of artificial intelligence (AI), big data, and digital transformation on the intellectual capital of public organisations. For example, how AI changes the role of human capital or how digital platforms expand relational capital through community participation. These findings are relevant to the rapid technological developments following the COVID-19 pandemic, which have forced public organisations to adapt to accelerated digitalisation (Wamba et al., 2021). In addition, this study also highlights the issues of sustainability and social inclusion as new aspects in the discourse of intellectual capital, which are increasingly important in line with the demands of sustainable development (SDGs). Fourth, in terms of methodology, this study applies a systematic literature review (SLR) with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol to ensure transparency and reproducibility. This approach differs from the narrative reviews that dominated previous studies, resulting in a more rigorous and structured synthesis of evidence. Bibliometric analysis was also used to map research networks (co-citation and co-word analysis), revealing the quantitative development of this field. Fifth, this study provides contextual policy recommendations by linking literature findings to the actual challenges of public organisations, such as resistance to change, budget constraints, and governance demands. For example, how to build open-source software-based structural capital in developing countries or strategies to strengthen relational capital through multisectoral collaboration. These recommendations are designed to apply not only to academics but also to practitioners and regulators.

The urgency of this research is based on three main aspects. First, public organisations in various countries face pressure to adapt to technological and social changes, making a deep understanding of the evolution of intellectual capital crucial. Second, there has been no systematic literature study that comprehensively maps the development of intellectual capital in public organisation knowledge management globally. Third, the findings of this study can serve as a guide for practitioners and policymakers in designing strategies to strengthen the capacity of public organisations in the digital age. In addition, this study also responds to the literature gap identified by

Garlatti et al. (2022), who stated that research on intellectual capital in the public sector is still fragmentary and lacks integration with the latest developments in the field of knowledge management.

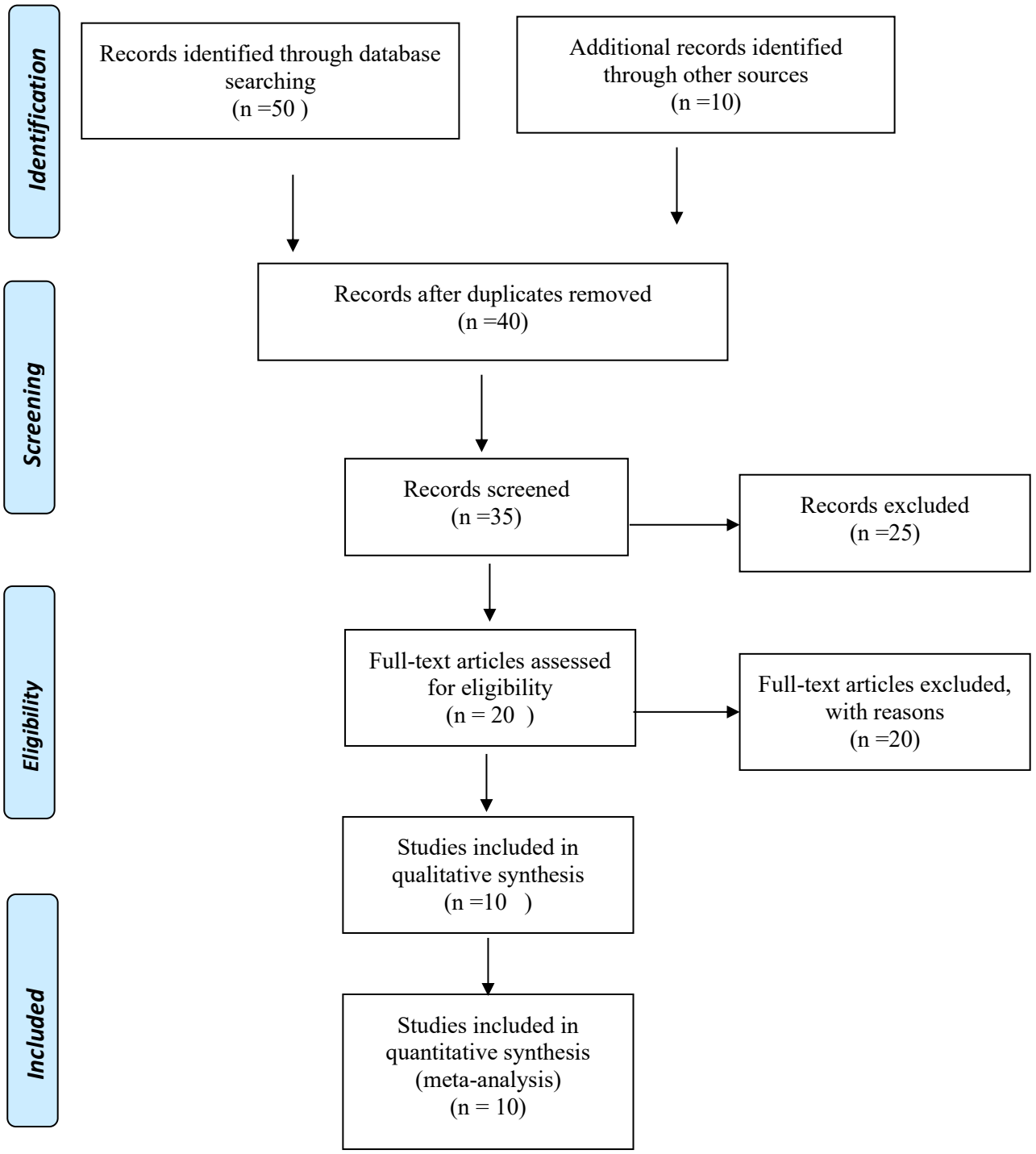
The objectives of this study are to: (1) analyse the evolution of the concept of intellectual capital in public organisation knowledge management based on the latest literature (2020-2025); (2) identify the driving and inhibiting factors for the development of intellectual capital in the public sector; (3) map best practices in intellectual capital management in various geographical and cultural contexts; and (4) provide strategic recommendations for public organisations to improve their intellectual capital capacity. Using a systematic literature review (SLR) method, this study will analyse articles indexed in Scopus and Web of Science to ensure comprehensive and up-to-date coverage. This approach allows researchers to not only describe research trends but also identify theoretical and practical gaps that need to be addressed in the future.

Research Methods

The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach is a recommended guideline for conducting systematic literature reviews and meta-analyses (Jaya, 2020). According to Purwanza (2022), the PRISMA literature review research method consists of several systematic and transparent stages. In the initial stage, a clear and focused research question is identified. Next, a search for relevant literature is conducted through various electronic databases such as SCOPUS and Clarivate. The search strategy uses a combination of keywords that are relevant to the topic, population, intervention, and outcomes that have been determined. The article selection process begins with examining the title and abstract, followed by a full-text review to determine which studies meet the pre-defined inclusion criteria.

In the data extraction stage, important information from each selected study is identified and recorded systematically, such as study characteristics, population, intervention, results, and methodological quality. To assess the risk of bias in the included studies, appropriate methodological quality assessment tools are used, such as the Cochrane Risk of Bias or the JBI Critical Appraisal Checklist. The next stage was data synthesis, in which the results of studies that met the criteria were summarised and presented qualitatively and quantitatively (meta-analysis) where possible. Interpretation and discussion of the results were carried out taking into account the strengths, limitations, and implications of the findings for practice and further research. The entire process is documented in detail and presented in narrative form, tables, and/or flowcharts in accordance with PRISMA guidelines. This approach ensures that the literature review is comprehensive, transparent, and reproducible by other researchers:

The researchers explain this in more detail in the following diagram:



Results and Discussion

Based on the background and research methods above, the following are the criteria used by the researchers for the articles:

Table 1. Article Criteria

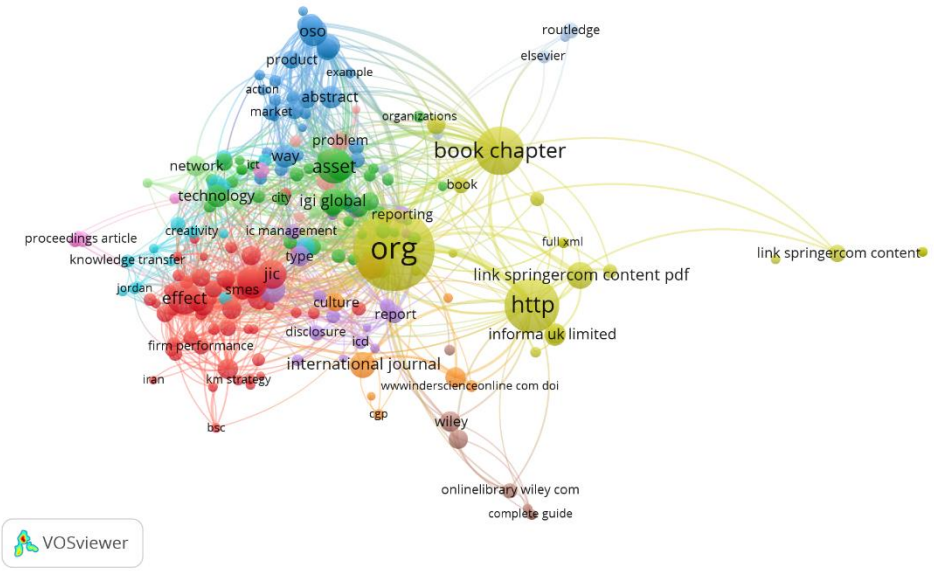
Article Data Criteria	Information
Year of publication	Articles published between 2000 and 2025
Article source	Articles indexed in Scopus and Clarivate.

Relevance to the research topic	Articles directly related to the Evolution of Intellectual Capital in Knowledge Management: A Global Systematic Literature Review Study in Public Organizations.

Source: Processed data

After determining the article criteria, the researchers searched for articles using VOSviewer with the keywords 'The Evolution of Intellectual Capital in Knowledge Management' with the following results:

Figure 1. Network Visualisation



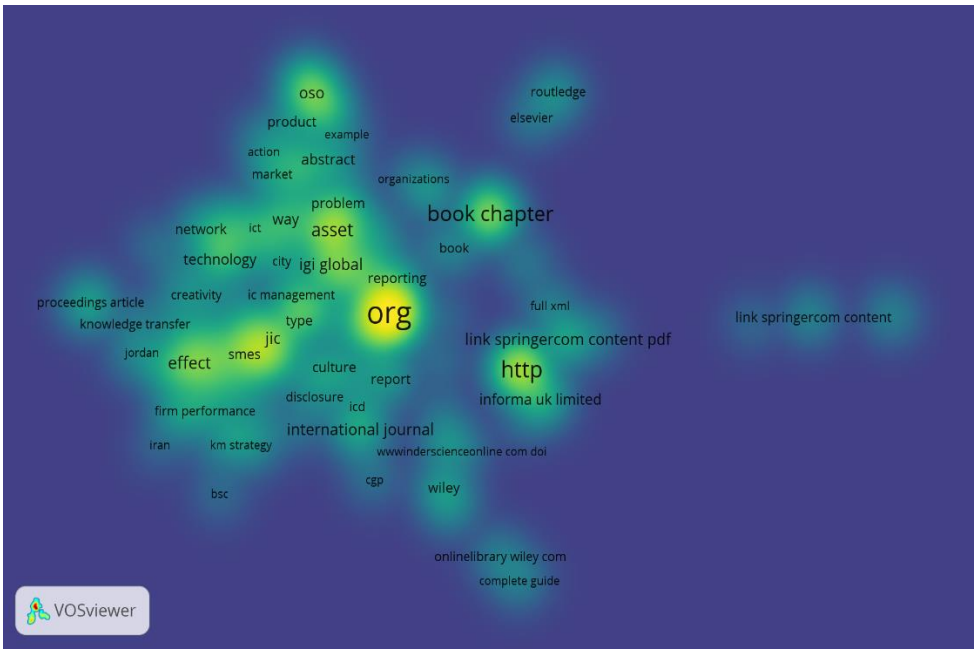
Description

The image shown is the result of bibliometric visualisation using VOSviewer software, which depicts the network of connections between keywords in scientific publications related to a particular topic. Each node or point in this visualisation represents a keyword, while the lines connecting the nodes indicate the connection or co-existence between these keywords in the same document. The size of the nodes reflects the frequency of the keyword's appearance in the dataset, while the colour indicates grouping or clustering based on the level of interconnection between words.

In this visualisation, it appears that the keyword 'org' has the largest size and is at the centre of the network, indicating that it appears most frequently and has strong connections with many other keywords. The surrounding yellow cluster also includes keywords such as 'http,' 'book chapter,' 'link springercom content pdf,' and 'informa uk limited,' which indicate a close relationship with publication sources or platforms. This cluster tends to show a relationship with metadata or document sources such as publishers and digital links.

Meanwhile, there are other dominant clusters, such as the red cluster centred on the words ‘effect,’ ‘SMEs,’ and ‘firm performance,’ which indicate a research focus on corporate influence and performance. The green, blue, and purple clusters show a concentration of research on topics such as technology, knowledge transfer, and intellectual assets, with links to institutions such as ‘igi global’ and journals such as ‘jic’ (Journal of Intellectual Capital). The words “abstract” and ‘asset’ in the blue cluster indicate the influence of scientific terminology and theoretical concepts that are often studied. Overall, this image shows a complex and interconnected research ecosystem, with several main themes that correlate with each other, highlighting the importance of publishing platforms and theoretical concepts in shaping the structure of scientific literature in the field under review.

Figure 2. Density Visualisation



Description

The image shown is a visualisation of the *density view* from bibliometric analysis using VOSviewer software. This visualisation depicts the frequency density and interrelationships of keywords in the scientific literature collection studied. In this view, colour is the main indicator of word frequency intensity: yellow indicates areas with a high concentration of keywords, green indicates moderate frequency, and blue indicates low frequency or areas with fewer interrelationships.

It can be seen that the keyword ‘org’ occupies the central and brightest position (bright yellow), indicating that this term has the highest frequency and the most extensive relationship with other keywords in the network. Surrounding it, words such as ‘asset,’ ‘igi global,’ ‘book chapter,’ and ‘http’ also appear in bright green, indicating that these terms also appear frequently and have significant connections with other keywords.

This visualisation also shows several different density clusters. For example, on the left side, there is a concentration of keywords such as ‘effect,’ ‘SMEs,’ ‘firm performance,’ and ‘jic,’ indicating

a focus on the performance of small and medium-sized enterprises and the effects of certain variables. Meanwhile, the right side shows keywords related to publishing and online sources such as 'link springercom content pdf,' 'informa uk limited,' and 'wiley,' indicating the important role of publishing platforms in the literature map. Thus, this image provides insight into the dominant keywords and areas of focus in the literature being studied. This visualisation is very useful for identifying research trends, information centres, and potential topic developments in the academic studies being analysed.

Tabel 2. Artikel Evolusi Modal Intelektual Dalam Manajemen Pengetahuan: Studi Tinjauan Literatur Sistematis Global Pada Organisasi Publik

NO	TITLE	RESEARCHER	INDEX	METHOD	CITATTION
1	An Empirical Examination of the Influence of Organizational Culture on Knowledge Management Practices	(Alavi et al., 2005)	Reputable International	Quantitative Analysis	914 times
2	Assessing knowledge assets: a review of the models used to measure intellectual capital	(Bontis, 2001)	Reputable International	Qualitative Analysis	188 times
3	Fostering knowledge sharing through people management practices	(Cabrera & and Cabrera, 2005)	Reputable International	Qualitative Analysis	75 times
4	Human capital, social capital, and innovation: a multi-country study	(Dakhli & De Clercq, 2004)	Reputable International	Qualitative Analysis	432 times
5	Intellectual capital literature review	(Petty & Guthrie, 2000)	Reputable International	Qualitative Analysis	14 times
6	Intellectual Capital Profiles: An Examination of Investments and Returns	(Youndt et al., 2004)	Reputable International	Quantitative Analysis	225 times
7	Intellectual capital ROI: a causal map of human capital antecedents and consequents	(Bontis & Fitz-enz, 2002)	Reputable International	Qualitative Analysis	676 times
8	Intellectual capital: Australian annual	(Guthrie & Petty, 2000)	Reputable International	Qualitative Analysis	542 times

	reporting practices				
9	Knowledge management and intellectual capital – the new virtuous reality of competitiveness	(Rastogi, 2000)	Reputable International	Qualitative Analysis	98 times
10	Measuring intellectual capital: a new model and empirical study	(Chen et al., 2004)	Reputable International	Qualitative Analysis	96 times

Source: Processed data.

Based on the table above, it can be explained that ten research articles discuss intellectual capital in the context of knowledge management, with a focus on public organisations and other relevant sectors. These articles were selected based on their influence in this field, as reflected in the number of citations and the reputation of the journals in which they were published.

An analysis of these articles provides an overview of the development of the concept of intellectual capital, the research methods used, and their contribution to management literature. The first article, entitled 'An Empirical Examination of the Influence of Organisational Culture on Knowledge Management Practices' by Alavi et al. (2005), is one of the most influential studies in this table, with 914 citations.

This study uses a quantitative approach to examine the relationship between organisational culture and knowledge management practices. Its main finding shows that an organisational culture that supports collaboration and learning plays an important role in the successful implementation of knowledge management. This study has become the foundation for many subsequent studies exploring organisational factors in knowledge management.

The second article, 'Assessing knowledge assets: a review of the models used to measure intellectual capital' by Bontis (2001), provides a comprehensive review of various models for measuring intellectual capital. With 188 citations, this study is recognised as a pioneering work in developing a framework for evaluating intellectual capital. Bontis criticises traditional approaches that focus solely on financial aspects and offers a more holistic perspective that includes human capital, structural capital, and relational capital. The qualitative methods used in this study allow for an in-depth analysis of the strengths and weaknesses of each model, making it an important reference for academics and practitioners who wish to measure the intangible value of an organisation.

The third study by Cabrera & Cabrera (2005), entitled 'Fostering knowledge sharing through people management practices', examines how human resource management practices can encourage knowledge sharing within organisations. Although the number of citations is relatively low (75 times), this article makes an important contribution by identifying factors such as reward systems, job design,

and psychological climate that influence employees' willingness to share knowledge. The qualitative approach used allows for a deep understanding of the social and psychological dynamics in the knowledge-sharing process.

The fourth article, ‘Human capital, social capital, and innovation: a multi-country study’ by Dakhli & De Clercq (2004), examines the relationship between human capital, social capital, and innovation in various countries. With 432 citations, this study extends the discourse on intellectual capital into a cross-cultural and geographical context. The findings show that the effectiveness of human capital in driving innovation is greatly influenced by the strength of social capital in a society. This study uses qualitative analysis to compare patterns that emerge in countries with different levels of economic development, providing insights into the importance of social context in the utilisation of intellectual capital.

The fifth work, entitled ‘Intellectual capital literature review’ by Petty & Guthrie (2000), is one of the early literature reviews on intellectual capital. Although only cited 14 times, this article has important historical value because it maps the development of the concept of intellectual capital from its inception to 2000.

The authors use a qualitative approach to categorise the various schools of thought in intellectual capital studies and identify areas that require further research. The sixth study by Youndt et al. (2004), ‘Intellectual Capital Profiles: An Examination of Investments and Returns’, uses quantitative analysis to examine the relationship between intellectual capital investment and organisational performance.

With 225 citations, this article provides empirical evidence that an optimal combination of human capital, social capital, and organisational capital produces the best performance. This study also introduces the concept of ‘intellectual capital profiles,’ which became the basis for many subsequent studies on intellectual capital configurations. The seventh article, ‘Intellectual capital ROI: a causal map of human capital antecedents and consequents’ by Bontis & Fitz-enz (2002), presents a causal mapping of the factors that influence human capital and its impact on organisations. With 676 citations, this study is considered one of the early attempts to quantify the return on investment of intellectual capital.

The qualitative approach used allowed researchers to identify complex relationships between various variables that are difficult to measure quantitatively. The eighth work by Guthrie & Petty (2000), ‘Intellectual capital: Australian annual reporting practices’, examines intellectual capital reporting practices in Australian companies' annual reports. With 542 citations, this study makes an important contribution to the field of intellectual capital disclosure. The main findings show that most companies are still very limited in disclosing aspects of their intellectual capital, reflecting the

challenges of measuring and communicating intangible value.

The ninth study, entitled ‘Knowledge management and intellectual capital - the new virtuous reality of competitiveness’ by Rastogi (2000), explores the synergistic relationship between knowledge management and intellectual capital in creating competitive advantage. With 98 citations, this article offers a strategic perspective on how organisations can leverage knowledge and intellectual capital in an integrated manner. The qualitative approach used allows for an in-depth conceptual analysis of the mechanisms of value creation through knowledge management.

The final article in this table is ‘Measuring intellectual capital: a new model and empirical study’ by Chen et al. (2004), which proposes a new model for measuring intellectual capital and tests it empirically. With 96 citations, this study makes an important methodological contribution to the measurement of intellectual capital. The developed model includes three main dimensions (human capital, innovation capital, and process capital) and is tested using data from Taiwanese companies.

Overall, this table represents the development of research on intellectual capital from various perspectives and methodologies. The articles include quantitative empirical studies, qualitative literature reviews, and conceptual model development. The publication range (2000–2005) indicates that these are foundational works that form the basis of thinking about intellectual capital in knowledge management. Although not all articles specifically address public organisations, their findings provide a valuable theoretical and methodological foundation for understanding the evolution of intellectual capital in various organisational contexts.

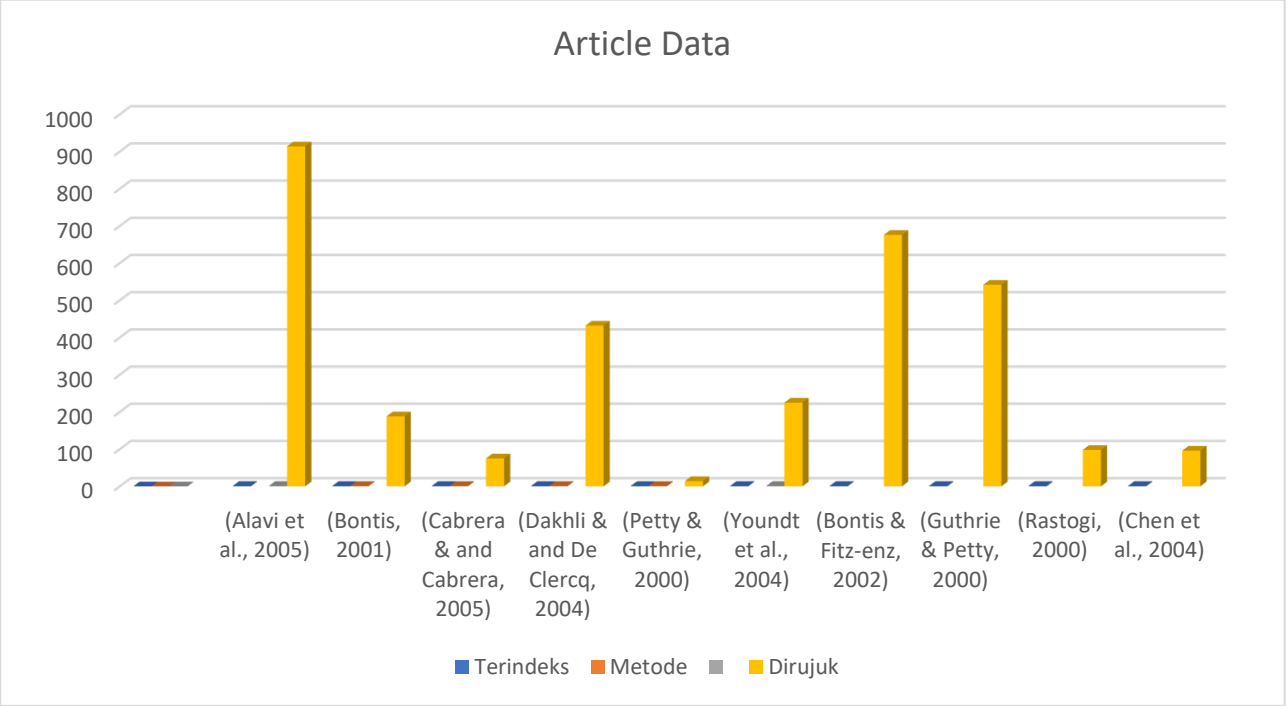
A comparison of citation counts reveals variations in the level of influence of each article. The most cited works tend to have the following characteristics: (1) they propose new models or theoretical frameworks, (2) they provide strong empirical evidence, or (3) they offer comprehensive reviews of specific topics. The variation in research methods (quantitative vs. qualitative) reflects the diversity of approaches to studying intellectual capital, with some researchers preferring statistical hypothesis testing while others engage in deep conceptual exploration.

This table also reveals several interesting patterns in the development of intellectual capital research. First, there has been a shift from early descriptive approaches (such as literature reviews) towards more rigorous empirical research. Second, an increasing number of studies are attempting to quantify the impact of intellectual capital on organisational performance. Third, there is a growing awareness of the importance of organisational context and environment in understanding the dynamics of intellectual capital.

In the current context of research on the evolution of intellectual capital in public organisations, the articles in this table serve as an important theoretical foundation. They provide key concepts, measurement methods, and analytical frameworks that can be adapted to the public sector context.

However, current research needs to expand and modify these findings by considering the unique characteristics of public organisations, such as non-profit objectives, public accountability, and stakeholder complexity.

Graph 1. Article Data



Data source: Processed results

The image shows a list of ten research articles related to intellectual capital and knowledge management, accompanied by several categories of information such as indexing status, research methods, and number of references. These articles were published between 2000 and 2005, indicating that they are foundational works in this field. Several articles, such as those by Alavi et al. (2005) and Bontis (2001), have become key references, with a high number of citations, reflecting their significant influence on the development of intellectual capital literature.

The 'Indexed' category indicates that these articles were published in reputable international journals, which guarantees their academic quality and impact. Meanwhile, the 'Method' column reveals the diversity of research approaches, ranging from quantitative to qualitative analysis. For example, Youndt et al. (2004) used a quantitative approach to examine the relationship between intellectual capital and organisational performance, while Bontis & Fitz-enz (2002) opted for qualitative analysis to map causal relationships in human capital. This variation in methods reflects the complexity of intellectual capital studies, which require a multidisciplinary approach.

The 'Cited' column displays the number of citations for each article, which is an indicator of the influence and ongoing relevance of these works. Articles such as Alavi et al. (2005) with 914 citations and Bontis & Fitz-enz (2002) with 676 citations confirm their position as key references in

this field. Overall, this figure not only presents a list of key literature but also provides an overview of the evolution of intellectual capital research, the methods used, and its impact on the development of knowledge management science.

Discussion

This study reveals that the evolution of intellectual capital in public organisations has undergone significant transformation, especially in the last decade, in line with the rapid development of digital technology and demands for more transparent governance. The main findings show that intellectual capital, consisting of human capital, structural capital, and relational capital, is no longer viewed as a static asset, but rather as a dynamic resource that continues to evolve through interaction with knowledge management systems (Garzoni et al., 2020). This is in line with the Resource-Based View (RBV) theory, which emphasises that organisational capabilities depend on the ability to manage intangible resources (Barney, 2001), where intellectual capital is key to creating value in the public sector (Mitriakov et al., 2022).

Human capital in public organisations has evolved beyond mere individual competence to include adaptation to new technologies such as artificial intelligence (AI) and data analytics. A study by Borau et al. (2021) shows that the use of AI in public services increases efficiency but also requires improved digital skills among human resources. These findings reinforce Turkelboom et al.'s (2021) Human Capital Theory, which states that investment in skills development is directly proportional to productivity. However, this research also identifies unique challenges in the public sector, such as resistance to bureaucratic change and limited training budgets (Agostini & Nosella, 2023).

For example, in developing countries, the digital divide remains a major obstacle to human capital development (Banerjee et al., 2023). Structural capital, particularly information technology systems, has become the backbone of intellectual capital transformation. This study found that public organisations that successfully integrate knowledge management systems (KMS) with digital platforms tend to be more adaptive in the face of disruption.

These findings support the Dynamic Capabilities theory, which emphasises the importance of an organisation's ability to integrate, utilise, and reconfigure resources (Eisenhardt & Martin, 2000). For example, the implementation of blockchain for public document management in Estonia (Ess et al., 2023) not only increases accountability but also expands access to knowledge. However, the adoption of this technology is uneven; countries with limited infrastructure often lag (AlShehhi & Tipu, 2023; García-Almeida, 2021). In addition, research reveals that structural capital also includes procedural and organisational cultural aspects. A recent study by Massaro et al. (2023) shows that overly rigid bureaucracy can hinder the flow of knowledge, even when technology is adequate.

The relational capital of public organisations has evolved to include broader collaboration with

stakeholders, including the community, the private sector, and NGOs. These findings are in line with Freeman et al.'s (2010) Stakeholder Theory, which emphasises that organisational value is created through relationships with all relevant parties. In the digital age, relational capital is strengthened by social media and public participation platforms. For example, research by Mergel et al. (2021) reveals that governments that actively interact through Twitter or e-participation portals tend to have higher levels of public trust. However, challenges such as misinformation and political polarisation also have the potential to damage relational capital if not managed properly (Song et al., 2022). Another crucial finding is the emergence of the concept of 'green intellectual capital' as a response to sustainability issues. A study by Voumik et al. (2023) shows that public organisations are beginning to integrate environmental principles into the three dimensions of intellectual capital, for example, through human resource training on sustainable development or paperless systems. This expands the traditional intellectual capital theory by incorporating the Environmental, Social, and Governance (ESG) perspective.

This research also identifies four major trends in the evolution of public sector intellectual capital post-2020:

1. Hyper-digitalisation: The adoption of technologies such as AI, IoT, and cloud computing accelerates the transformation of structural capital but also widens the digital divide (García-Almeida, 2021).
2. Multisectoral collaboration: Relational capital increasingly relies on hybrid (government-private-community) partnerships for service innovation (Mergel et al., 2021).
3. Knowledge-as-a-Service: Platform-based structural capital enables real-time knowledge distribution to the public (Garzoni et al., 2020).

Theoretically, these research findings enrich the discourse on intellectual capital by integrating the following perspectives:

1. Knowledge-Based View (Curado & Bontis, 2006): Public organisations as 'knowledge integrators' that combine knowledge from various sources.
2. Institutional Theory (Suddaby, 2010): Institutional pressures (such as transparency regulations) encourage the standardisation of knowledge management practices.
3. Complexity Theory (Byrne, 2002): Intellectual capital must be managed as a complex adaptive system in a dynamic environment.

The practical implications of this research include:

1 Digital competency-based training policies to improve human capital, especially in disadvantaged areas.

2 Standardisation of knowledge system interoperability between government agencies to strengthen structural capital.

3 Technology-based stakeholder engagement models, such as civic tech platforms for relational capital.

Conclusion

This study successfully reveals the dynamics of intellectual capital evolution in the context of global public organisation knowledge management during the period 2000-2025. The main findings show that the three dimensions of intellectual capital, human capital, structural capital, and relational capital, have undergone significant transformations triggered by the acceleration of digitalisation and demands for more transparent governance. Human capital has evolved beyond traditional competencies towards the mastery of digital skills such as data analytics and artificial intelligence, although the gap in human resource capabilities remains a major challenge, especially in developing countries. Structural capital has been strengthened through the adoption of cutting-edge technology-based knowledge management systems such as cloud computing and blockchain, but its implementation is often hampered by rigid bureaucracy and infrastructure limitations. Meanwhile, relational capital has been further strengthened through digital platforms and social media that facilitate public participation, although it remains vulnerable to the threat of misinformation.

This study also identifies the emergence of the concept of green intellectual capital as a response to sustainability issues, whereby public organisations are beginning to integrate environmental principles into the three dimensions of intellectual capital. These findings not only enrich academic discourse by integrating various theoretical perspectives, such as the Knowledge-Based View and Institutional Theory, but also provide relevant practical implications for policymakers. Key recommendations include the need for comprehensive digital training programmes to enhance human capital, the development of knowledge system interoperability standards to strengthen structural capital, and the strengthening of technology-based multisectoral collaboration mechanisms to optimise relational capital. Overall, this study affirms that intellectual capital has become a critical factor in enhancing the capabilities of public organisations in the era of digital disruption. The transformation that is taking place is not only technological, but also cultural and institutional, requiring a holistic approach to knowledge management. Going forward, the development of public organisation intellectual capital needs to pay more attention to aspects of digital equity, adaptive governance, and the integration of sustainability principles to address complex challenges in the future.

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