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Marco Valeri *Editor*

Knowledge Management and Knowledge Sharing

Business Strategies and an Emerging Theoretical Field

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Business Strategies and an Emerging Theoretical Field

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ISSN 1431-1941 ISSN 2197-716X (electronic)
Contributions to Management Science
ISBN 978-3-031-37867-6 ISBN 978-3-031-37868-3 (eBook)
https://doi.org/10.1007/978-3-031-37868-3

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

Management literature has always recognized the important role of knowledge and its management, identifying in it a real intellectual capital and therefore a strategic resource for the company.

The radical changes in the economic and social reference context, which took place because of globalization and the progressive and rapid technological evolution, have had important consequences on the market, canceling the physical and geographical boundaries and ensuring immediate communication and circulation of information without any physical obstacles. The level of competition has considerably increased, causing a parallel increase in the quantity and differentiation of the offer which has been accompanied by the creation of more informed and aware customers.

The creation and gradual development of the concepts of learning organization and of knowledge management is based on the belief that the degree of competitiveness on the market of an organization is determined by its ability to produce knowledge continuously. This statement derives from a conception of knowledge considered as the activation and production of continuous and permanent processes of adaptation to disturbances and changes in the external context, in order to improve production skills and productive results. The fundamental tool to ensure the success of a company therefore becomes its striving for innovation, which can only be achieved through the creation of knowledge.

Knowledge management can be defined as a continuous and constantly increasing process to gather, organize, and manage knowledge, in order to make it available and ensure its effective circulation. To guarantee that knowledge is available, it is necessary to invest in its transformation and transfer, which thus change from an individual and *tacit* plan to an express and collective one. The starting point is therefore the possession of knowledge, but the real strategic resource has to be identified in its mobilization within the organization's members.

The characteristics of knowledge management mainly concern the collection and selection of information, together with the adoption of incentives for the acquisition and exchange of knowledge. This information context can only be ensured through

the implementation of organizational and technological solutions in order to increase the level of cooperation within the system that is beginning to be conceived as a network of internal and external relations, which cannot be imposed or rigidly standardized.

The creation, accumulation, and sharing of knowledge become the core of the company's functioning, and they have in common the fact that they cannot be imposed, but they are realized only if voluntary forms of cooperation are guaranteed.

In the vision adopted by knowledge management systems, therefore, knowledge must first of all be learnt, thus becoming part of the company's heritage through its preservation and memorization. The knowledge thus acquired can be used as a real resource by the company, which can reveal its potential only if properly managed and with a guarantee of its circulation.

In particular, the correct management of information and knowledge becomes an essential condition for the achievement of the business objectives. The simple possession of information is not sufficient to ensure its value, which instead depends on the ability of the subject who acquires it to use it: a capacity that derives mainly from his experience.

The mere access to information does not ensure itself the ability to transform information into knowledge and, therefore, into competitive benefits and advantages. In order that this transformation can take place, it is necessary for the recipients of the information to develop their skills and ability to decode these different stimuli, to translate immaterial knowledge into real and effective actions.

In knowledge management systems, knowledge therefore has the role of a further and new source of competitive advantages for the company, with its own characteristics, especially concerning the potential to transfer it without high costs.

Knowledge management therefore becomes a real business objective, since the company aims at making all the information it owns accessible to all its employees and collaborators, quickly and efficiently, reducing the time required to search for specific data and increasing the level of knowledge of the company as a whole by individual employees. This type of organizational and managerial approach has developed quite recently and many organizations have undertaken a process of revision of their corporate structure based on the enhancement and best management of knowledge.

New technologies, first of all Internet, offer companies a real competitive advantage only if used in a careful and optimal way, with proper training of its users. However, this must be accompanied by an increase in informal relations, to encourage the creation of opportunities for exchange and contact and, consequently, an increase in information flows both within the company and toward the outside.

The main objective of knowledge management is, in short, the maximization of the value of the company's intellectual assets, to which the guarantee of its constant updating is related. To achieve these objectives, the organization must be able to manage knowledge optimally, adopting an approach inspired by structural, technological, and operational innovation and aimed at developing skills and abilities. Through the development and implementation of these skills, the company is able to

increase its competitiveness by optimizing processes, reducing time to market, and, in general, orienting its business in a flexible way in relation to the expected results.

With this scenario, the call for book chapters aims to offer an historical excursus that explores the evolution of knowledge management from Taylorism to nowadays. By looking into the scientific management history, it is possible to find studies that offer a different point of view on this topic. As far as we know there are few researches that explore historical roots and empirical scenarios of the relevance of knowledge and digitalization management. The scope is to investigate the historical root of such interaction and how it evolved over time. Scholars are invited to offer qualitative and quantitative papers even though previous works on the management history literature are based on theory building approaches. We stress the fact that all interpretations need facts behind them to be justified and generalized.

The book *Knowledge Management and Knowledge Sharing: Business Strategies and Emerging Theoretical Field* is the result of reflections involving research studies of different nationalities. The book contains 11 chapters written by 37 authors located in 12 different countries and affiliated with 19 different universities.

This book aims to provide a comprehensive collection of chapters including new insights into traditional paradigms, approaches, and methods, as well as more recent innovative studies in knowledge management. The scope is to investigate the historical root of such interaction and how it evolved over time.

The book is structured into two parts. The first part focuses on *knowledge management strategies for innovation management*. This part collects chapters that analyze the ability of an organization to recognize the value of new external information and knowledge, assimilate, and apply them, and this ability is critical in determining innovative output. In this sense, the essence of knowledge management is to provide a framework for management in their attempt to develop and enhance their organizational capability to innovate. The second part focuses on *innovation performance: case studies*. This part collects case studies that analyze the knowledge sharing process and its impact on innovation capability and innovation performance of the firms. Knowledge sharing and innovation are two important and interrelated subjects that need to be further explored to understand their dynamics and implications. Knowledge sharing has implications for innovation capability and innovation performance of the firms. Innovation capability also affects innovation performance of the firms.

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Contents

Part I
Knowledge Management Strategies for Innovation Management

Evolution of Research in Knowledge Management and Competitive Advantage

Manisha Paliwal, Ramkrishna Dikkatwar, Nishita Chatradhi, and Marco Valeri

Abstract The importance of knowledge has been felt throughout the history of the human race. Knowledge management is the systematic process that seeks to gain an understanding of how knowledge is created and managed, in order to study and analyze the processes involved by a firm to enhance its knowledge-related effectiveness and gain guaranteed returns from its stock of knowledge assets, kept in a state of currency through constant renewal and updating. Companies can gain a competitive advantage by attracting and maintaining personnel with a knack for acquiring and retaining knowledge and a skill for enhancing, refining, and fine-tuning their knowledge assets. Research shows knowledge management as a strategy for gaining a competitive advantage through innovation. Thus, this chapter aims to understand the crucial role of knowledge management in adopting innovation for success in achieving a competitive advantage for organization. Additionally, to show an overview of Knowledge Management and Competitive Advantage (KM-CA) linkage trends, through a bibliometric analysis and science mapping. The study adopts a bibliometric and systematic literature analysis. By employing this method, this study identifies research clusters of significant interest parallel with the objectives in a bias-free manner. In addition to fulfilling its original purpose, the chapter also culminates the research trajectory curves of recent nature in this area wherein the discovery of future research prospects was made in the clusters. Prior literature reviews have disclosed that a combination of the strategies has created results of higher accuracy. In order to follow the guidelines of the systematic review, the authors have established the eligibility criteria in terms of inclusion criteria and exclusion criteria for this present study. The global literature about "Knowledge

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_1

Management and Competitive Advantage" published from 1979 to 2021 was searched in the Scopus database. The search terms applied to identify the closest matching publication included "Knowledge Management" and "Competitive Advantage" in keywords tagged with the document. The findings show that KM-CA research should increase as most of the industries are becoming knowledge intensive and the adoption of industry 4.0 tools had equipped firms to leverage knowledge. Going forward, the key is to study the role of new-age technology in shaping the relationship between KM and CA. More conceptual studies are needed in the areas of "Knowledge-based view" and open innovation as both themes were influencing others in KM-CA literature. This also paves the way for studies exploring KM-CA relationships from a sustainable angle. Currently, there is no prolific organization or researcher in KM-CA. Furthermore, the importance of knowledge has become distinct as a company's economic and production level is increasingly dependent on its human capital, and intellectual capital. Furthermore, knowledge has been defined as a strategic asset, which is a collection of capabilities and resources that are difficult to replicate and commercialize due to scarcity. Organizations that give knowledge management the proper respect it deserves are sure to reap good rewards from their efforts for ensuring its proper management as knowing is half the battle.

Keywords Knowledge management · Competitive advantage · Bibliometric study · Knowledge management systems · and innovation

1 Background

Our world is expanding at an unimaginable rate, and in order to keep up, nations and communities must quickly grasp how the world works, how to interact with it, and how to update their science and knowledge (Baskerville & Dulipovici, 2006). Knowledge management has become a buzzword in the management discipline last decades. However, this was discussed in the field of Human resources management until then (Gordon & Grant, 2005). It has been predicted that knowledge will overtake capital, raw materials, and machinery to become the industry's most significant component of production (Drucker 2001). It could be stated that the generally accepted sources of monetary might have ceased to remain a critical factor in the assessment matrices for measuring the success or failure of companies (Nasimi et al., 2013). If a business seeks to set up and establish a strong foundation that can afford it for a very long time, the firm's existing stock of knowledge resources will be essential as an intangible asset that can bolster its fundamental competency in the markets it is operating in (Chión et al., 2020).

1.1 Knowledge Management

The term "knowledge" is used as a reference for any recorded data or information in written, pictorial, audio, video, or computer/electronic code and any other Intellectual Property that is considered by the organization as a resource having a tangible value (Antonelli et al., 2013). The process by which this knowledge is created, updated, or renewed and is circulated within the levels of the organization is known as "Knowledge Management" (Sherif, 2006). Knowledge consists of written down, printed, or recorded information (audio, video, technical data, etc.) and other intellectual property that is considered by the organization to have a strategic or tactical advantage to them and involves cooperation and collaboration within the organizational levels for achievement of the intended goals (Awad, 2007).

Knowledge management is the systematic process that seeks to gain an understanding of how knowledge is created and managed, in order to study and analyze the processes involved by a firm to enhance its knowledge-related effectiveness and gain guaranteed returns from its stock of knowledge assets, kept in a state of currency through constant renewal and updating (Wiig, 1997, 1). It is possible to render the process of knowledge management in a smooth, efficient way by the method of incorporation of organizational and technological solutions for enhancement of the level of cooperation with the system, which can be formulated as an interconnected web of internal and external relations which cannot be forced upon or standardized to a substantial, rigid nature (Antonelli, 2017; Lazzeretti et al., 2019; Valeri & Baggio, 2020a, 2020b, 2020c). In order to gain excellent results, the persons or entities who have been designated with the responsibility for the management of knowledge need to have the ability and capability to understand the knowledge resources that are in their possession so that they can use them in the correct way, via their expertise in the subject matter of the knowledge resource gained from years of experience in the field (Valeri, 2016; Innocenti & Lazzeretti, 2019; Antonelli, 2015; Baggio and Valeri, 2020). Knowledge management seeks to enable the company to maximize the value of the sum total of all information, Intellectual Property Assets (Patents, Copyrights, Technical Knowhow, Trade Secrets, etc.), and all other relevant knowledge resources via constant renewal and augmentation so that it will remain relevant and valuable for years ahead (Simon (1976). Connection between a company's business objectives and knowledge management has to be stated in concrete terms for enabling the company to manage its knowledge resources in an optimum and effective way as it is a crucial requirement for the company, if it wishes to stay competitive and flexible in its markets and business domain so that it can gain from the market Savage (1990). For knowledge to grow, it has to be shared and circulated among the employees, collaborators, and other stakeholders of the firm as they can add their own stock of knowledge, increasing the value of the collective horde, leading to "on-demand" access to the required information for ensuring competitive effectiveness (Janis & Mann, 1977). Companies are currently revising their corporate structures to be more congruent

with the specific needs of knowledge management, in order to gain the best output from it (Cameron & Quinn, 2011).

1.2 Evolution of Knowledge Management

The importance of knowledge has been felt throughout the history of the human race. Almost every kingdom and empire had been built on the bricks of knowledge, knowledge that was held sacred within the ruling class who used it to justify their reign and place on the top. Empires have been replaced with companies and corporations but this attitude has not changed much (Cleveland, 1985). Companies that have monetized their knowledge resources are in a position to catalyze innovation which is the fuel that keeps the corporate world running. Knowledge is the only resource that grows when it is shared and companies who keep their stock of knowledge resources fresh and up to date can outpace their competitors in the market and reach the finish line first (Böhme & Stehr, 1986).

One of the prominent thinkers of Management theory, Mr. Peter Drucker has stated that 'knowledge, is a something which was first seen as something to be applied, which was visualized as a resource and as a utility in the years ahead' (Drucker, 1993, 53-54). The process by which knowledge was applied, for example, fundamental knowledge of levers and simple machines was the key to the development of the purpose to build machinery and mechanisms that caused the industrial revolution to happen (Drucker, 1993, 53-54). The effects of industrial revolution caused many paradigm-shifting changes to occur which resulted in a gargantuan scale increase in productivity, also known as the productivity evolution (Drucker, 1993, 63). The years following the great wars (World War 1 and 2) had an effect on knowledge itself which was expressed as "management revolution" as the various theories and models of management propounded by thinkers such as Taylor, Fayol, and Mayo for enhancing the productivity of the non-worker personnel (Drucker, 1993, 53–54). Being that knowledge was the keystone for these changes, it was soon visualized as a resource of value similar to gold, crude oil, steel, and coal as the very future of companies depends on it (Drucker, 2017).

For knowledge to be created, humans had to evolve first and human memory was the key for the transmission of data from generation to generation. The development of printing technology in China and Europe took this further and what first started with written clay tablets from Sumeria later evolved into hundreds of printed books in Alexandria (Jashapara, 2004). It is to be noted that in today's date, interest in knowledge management is on the decline due to rising levels of dissatisfaction being reported in a survey on this topic by the Bain & Company Global Surveys from 1995 to 2014 (Bain, 2010). There is a need for making knowledge management more popular with the current generation as within it lies the keys to the future (Fig. 1).

- **1975:** Chaparral Steel adopts knowledge-focused management without heavy IT use for technical and market leadership.
- **1980:** Digital Equipment Corp. installs the first large-scale knowledge-based system (XCON).
- **1981:** Applied Artificial Intelligence Centre founded by Arthur D. Uttle for practical knowledge-based systems.
- **1983:** USAA develops a Knowledge-Based System (KBS) to transfer expert knowledge.
- **1985:** Concept of "Management of Knowledge" introduced in European conference.
- **1987:** First KM book published in Europe ("Managing Knowhow").
- **1989:** CEOs recognize knowledge as vital but struggle with management.
- **1989**: Sloan Management Review publishes first KM-related article.
- **1989**: Consulting firms integrate KM into strategies.
- **1990:** First book on learning organizations in Europe.
- **1990:** First KM-related books in the U.S.
- **1991**: First Japanese KM book published in the U.S.
- **1991:** Fortune and Harvard Business Review feature KM articles.
- **1993:** Important KM articles published in Europe.
- **1993:** First book dedicated to KM published ("Knowledge Management Foundations").
- **1994:** International Knowledge Management Network expands to include the Internet and conducts Dutch company survey.
- **1994:** KM conferences with European participants and at Université de Technologie de Compiegne.
- **1994:** Consulting firms offer KM services, Knowledge Management Network and FAST Company magazine founded.
- **1995:** European ESPRIT program includes KM-related projects.
- **1995:** APQC and Arthur Andersen hold "Knowledge Imperatives Symposium" and other KM events.
- **1995:** APQC initiates multi-client KM Consortium Benchmarking Study.
- **1996:** Multiple global KM conferences and seminars held.
- **1996:** Many consulting organizations offer KM services.
- **1995:** European Knowledge Management Association established.

Fig. 1 The historic development of Knowledge Management in the last few decades. Source: Wiig, 1997

1.3 Competitive Advantage from Knowledge Management

Some researchers contemplate knowledge management as a strategy for gaining a competitive advantage through innovation (Hamel & Prahalad, 1994). Thus, Forcadell and Guadamillas (2002) defined knowledge management as the organization and change of systems, simple instruments, and devices that contribute to the oversight of knowledge, in a broad sense, in each region and level in the organization that prompts a change in products and work routines. Companies can gain a competitive advantage by attracting, developing, and maintaining personnel who have shown a knack for acquiring and retaining knowledge and a skill for enhancing,

refining, and fine-tuning the sum total of their knowledge assets (Demarest (1996). Managerial personnel in congruence with the above will be able to transform the company into an entity that has the willingness, the ability, and the capability to gain an edge in the market through the aegis of knowledge (Ichijo & Kohlbacher, 2007; Silvi & Cuganesan, 2006). Knowledge, if it is to be useful has to be kept in a state of currency by constant and ongoing efforts to maintain its usefulness. Knowledge once created has to be protected from theft as it will enable the company to keep its competitive edge in the market (Cepeda-Carrion, 2011; Corrado et al., 2014). The strategy should revolve around acquisition and maintenance of knowledge in a state of constant usefulness, enabling the company to use it for gaining a competitive advantage and has to be included in the core competencies of the company (Ichijo & Nonaka, 2006).

A good example for enabling and maintenance of competitive advantage by means of knowledge management can be cited of Apple Computers Inc. Ltd. (Yoffie and Kim (2010). Apple has made a name for itself as a purveyor of quality products in the personal computing, tablet, smartphone, app-space, smartphone OS, and music player device markets. Apple follows a four-phase strategy for knowledge management, in order to gain and maintain its competitive advantage in the markets it is operating in (Yoffie and Kim (2010). In Phase 01, Evaluation and assessment of the physical, digital, and knowledge infrastructure is done for ensuring better alignment of the infrastructure with Apple's operational and business strategy (Apple Inc., 2020). In Phase 2, The Knowledge management system architecture framework is designed and developed by means of knowledge audit, Knowledge management Design teams, and Knowledge management Blueprint and is deployed in Phase 3 and is further evaluated and assessed whether it has met the stated objectives in Phase 4 (Apple Inc., 2020).

An organization that has taken the time to develop and deploy an efficient knowledge management system gains the competitive edge as it can get the necessary decision-making information within seconds and can avoid astronomical costs associated with delays (Hult, 1998. Knowledge management systems create a sort of permanent, "group mind" for storing the memories and records of the organization and are contributed by the present and former employees, which is used to hone the company's competitive edge by ensuring knowledge currency and relevancy (Teece, 2004).

Effective management of knowledge ensures competitive advantage by ensuring more informed decision-making. Information generated from Big Data analysis enables creation of knowledge profiles about the customers, enabling more relevant and personalized solutions for them and maintenance of its position in the market for the company, particularly those in the software development, IT, and SAAS sectors (Inkpen & Tsang, 2005). Companies gain a competitive advantage by using the knowledge management systems to bolster their core competencies, necessary for efficient business operations. A clear picture of the customer/market situations and scenarios is painted using the stored knowledge, enabling the employees to visualize a "skeleton," which they later fill in the gaps using the knowledge resources on hand leading to better productivity and efficiency (Sanchez & Heene, 1997).

For an organization to guarantee operational competitiveness, an environment of collaboration and trust has to be created as a community, within whose members trust each other can ensure more effective and efficient sharing and recording of knowledge (Bramwell & Lane, 2000). For trust to be created, a good knowledge management system has to be created that delivers the required knowledge resource on demand. Creation of this trust ensures belief which can create a sense of empathy, ensuring more efficient sharing and currency of knowledge resources of the company (Halme, 2001). Companies can ensure competitive efficiency by creation of more satisfied employees through means of effective knowledge management systems that provide the necessary information on demand and within time, enabling time and resources to be saved, enabling decisions to be taken within time and on time, catalyzing better efficiency of operations. Further, satisfied employees can contribute more knowledge, increasing the existing stock of knowledge, and giving the desired competitive edge to the company (Popa et al., 2018).

According to Wickramasinghe, 2003, Knowledge Management (KM) is a critical component in addressing key challenges in organizations such as the need to innovate and compete. A competitive advantage is the ability to generate more profit than the industry average (Tripathy et al., 2021). There are numerous ways to develop a sustainable competitive advantage, including economies of scale, access to resources, size (Porter, 1985; Ghemawat, 1986), and even chance. Using knowledge management can support the organization's activities while also increasing the value of the organization's resources, making it more difficult for competitors to imitate (Barney, 1986). Therefore, this indicates that there is a need for knowledge management to be practiced effectively. Thus, this chapter aims to achieve the following objectives:

1. To understand the crucial role of knowledge management in adopting innovation for success in achieving competitive advantage of organization.
2. To show an overview of Knowledge Management and Competitive Advantage (KM-CA) linkage trends, through a bibliometric analysis.

2 Research Methodology

The study adopts a bibliometric and systematic literature analysis in congruence with the objectives. Through bibliometric analysis, it is possible to identify research clusters in quantity and objectivity. However, it is challenging to describe the most recent developments or the gap in terms of the research clusters In order to address this issue, the authors employ a combination of bibliometric analysis and systematic review techniques. This approach enables them to examine research papers that are related to the identified clusters.

By employing this method, this study identifies research clusters of significant interest parallel with the objectives in a bias-free manner. In addition to fulfilling its original purpose, the chapter also culminates the research trajectory curves of recent

Table 1 Criterions for extracting documents with Keywords "Knowledge Management and Competitive Advantage"

	Inclusion criterion	Exclusion criterion
Source	Scopus	Other databases apart from Scopus
Time	From 1998 to 2022	Any papers published in 2023
Subject area	Business, Management and Accounting; Social Sciences; Economics, Econometrics & Finance, and Multidisciplinary	Any subjects apart from Inclusive Criteria
Document type	Articles and conference paper	Book chapter, book, review paper
Language	English	Published in other than English languages
Source type	Journals and conference proceedings	Documents published book, book series, and trade journal
Publication stage	Published	In press

Source: Authors' compilation

nature in this area wherein the discovery of future research prospects was made in the clusters. Prior literature reviews have disclosed that a combination of the strategies has created results of higher accuracy. In order to follow the guidelines of the systematic review, the authors have established the eligibility criteria in terms of inclusion criteria and exclusion criteria for this present study.

In this context, the bibliometric methodology comprises the application of quantitative techniques (e.g., keyword analysis) on bibliometric data (e.g., units of publication and publication year and citation) (Pritchard, 1969). The global literature about "*Knowledge Management and Competitive Advantage*" published from 1979 to 2021 were searched in the Scopus database. The search terms applied to identify the closest matching publication included "Knowledge Management" and "Competitive Advantage" in keywords tagged with the document. The criterions used for extracting documents are enlisted in Table 1.

The information for the documents that meet the requirements in terms of year of publication, language, journal, title, author, keywords, document type, abstract, and counts of citations which were exported into CSV format. The date of the retrieval was December 15th, 2022. VOSviewer (version 1.6.10) was used to analyze the bibliometric data.

This software combines visualization and clustering techniques, allowing the completion of various analyses such as bibliographic coupling (Kessler, 1963), co-citation (Small, 1973), and keyword co-occurrence. Co-occurrence of keywords, also known as a co-occurrence network, refers to a group of keywords that co-occur in at least two different articles over time with the goal of analyzing the most used keywords in the documents (Li et al., 2017).

Aside from descriptive analyses, our network analyses include bibliographic couplings, co-citations, and co-occurrences. VOSviewer graphically depicts the

Table 2 Characteristics of publication

Characteristics of publication		Number of publications
Document type	Article	320
	Conference paper	315
Subject area	Business, Management and Accounting	519
	Social Sciences	169
	Economics, Econometrics and Finance	30
	Psychology	23
	Multi-disciplinary	9

Source: Authors' compilation

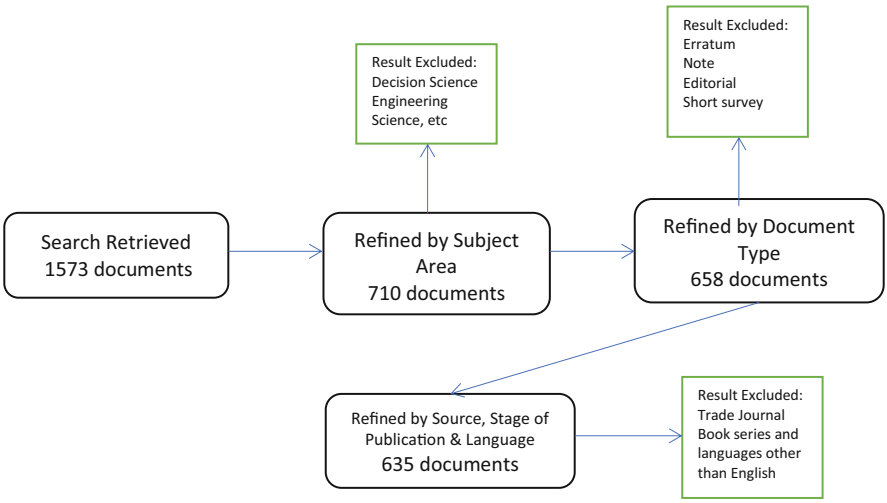

Fig. 2 Flowchart of included publications on KM-CA. Source: Authors' compilation

nodal network using two standardized weights, such as the number and total strength of the links (van Eck & Waltman, 2018).

We accessed bibliographic data used in this study from the Scopus database, the largest multidisciplinary database of peer-reviewed literature in social science research (Mongeon & Paul-Hus, 2016; Gaviria-Marin et al., 2018). Scopus reveals 379 documents published with keywords "Knowledge Management" and "Competitive Advantage" (KM-CA) as a keyword from 1998 to 2022. In the end 635 documents were considered for analysis. The description of these 635 documents is offered in Table 2.

The flow chart of included publications is presented in Fig. 2.

3 Findings and Discussion

In the following section, we present the characterization of the sample of articles chosen for this investigation. Next, we present the analysis of the bibliographic coupling results depicting the conceptual structure of the articles included by us in this study, enabling us to establish a set of dominant themes for our research.

It is evident from Fig. 3 that the pace of KM-CA research had substantially increased from 2003 onward. During 2007–2011 a large number of studies were published. After 2011, the number of studies per year remained range bound and has taken a notable dip in the year 2022. The decline in 2022 needs to be studied in the future as one should not generalize based on the numbers based on a period of 1 year. The KM-CA research should increase as most industries are becoming knowledge intensive and the adoption of industry 4.0 tools had equipped firms to leverage knowledge. Going forward, the key is to study the role of new-age technology in shaping the relationship between KM and CA.

3.1 Cooccurrence Analysis: Keywords

The authors sought to gain an overview of the primary lines of research, and therefore resorted to the usage of the method of keyword co-occurrence analysis for the process of uncovering key topics within the knowledge base. A threshold value of 5 co-occurrences per keyword yielded a total of 57 keywords out of a pool of 1539, with a resolution of 1.0. The overall co-occurrences pertain to six clusters and four major themes, as shown in Table 3 (Fig. 4).

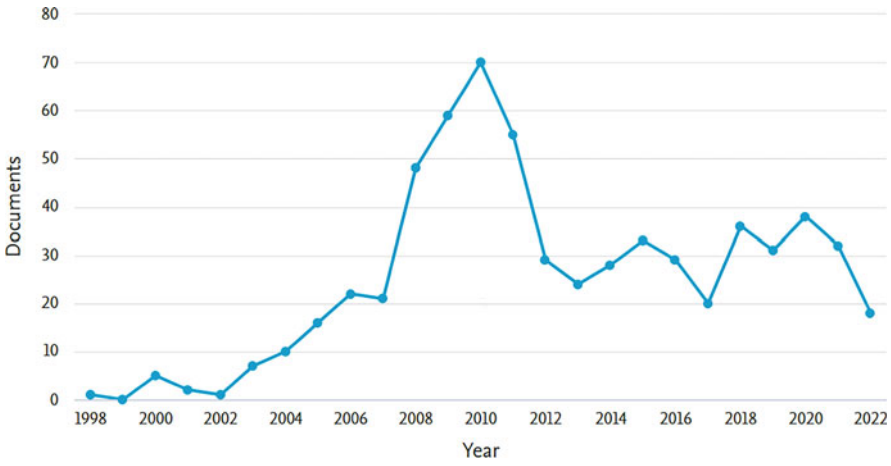

Fig. 3 Year-wise number of documents published on KM-CA linkage. Source: Authors' compilation

Table 3 Cluster-based co-occurrence of authors keywords

Cluster number	Color	Name of cluster	Number of keywords	Average pub. year	Major keywords based on total strength link and normalized average citation
1	Red	KBV, RBV, and Knowledge Transfer	17	2014–15	Resource-Based View, Knowledge Based View, Knowledge Transfer, Sustainable Competitive Advantage
2	Green	KM and Organizational Performance from Customer's Perspective	9	2013–14	Knowledge Management, Organizational Performance
3	Blue	Knowledge sharing and creation in special contexts such as New Product Development, SMEs, Supply Chain	8	2013–14	New Product Development, Knowledge Sharing, Supply chain, SME
4	Yellow	Organizational Learning & Strategy	7	2011–12	Organizational Learning, Organizational Culture, Strategy, Tacit Knowledge
5	Purple	Intangible Assets and Performance	4	2016	Intellectual Capital, Performance
6	Light Blue	KMS & IT and dynamic capabilities or strategy	4	2013–14	Information Technology, Dynamic Capabilities

Source: Authors' compilation

3.2 Cluster Analysis

Cluster 1 (Red Color) major theme is on *knowledge transfer and resource based and knowledge-based view of organization* while studying competitive advantage and majority of research occurred during 2014–15. Table 8 in this study demonstrates that the knowledge-based view and open innovation have received the highest number of citations from researchers.

Cluster 2. (Green Color) shows *KM and Organizational Performance from Customer's perspective*. Largely in 2013–14, KM-CA linkage was studied through the organizational Performance from the Customer's perspective in Table 9. Interestingly this cluster had not made much impact on other researchers. KM-CA Literature has been developed rapidly after the year 2008.

Cluster 3. (Blue Color) shows *Knowledge sharing and creation in special contexts such as NPD, SMEs* proper knowledge-sharing strategies can assist a business in surviving in the industry. Table 10 shows to do so, an business should identify what knowledge it has and compare it to its counterparts in the specific industry to close the knowledge gap. Furthermore, one of the knowledge management system (KMS) factors that support organizational competencies is an information

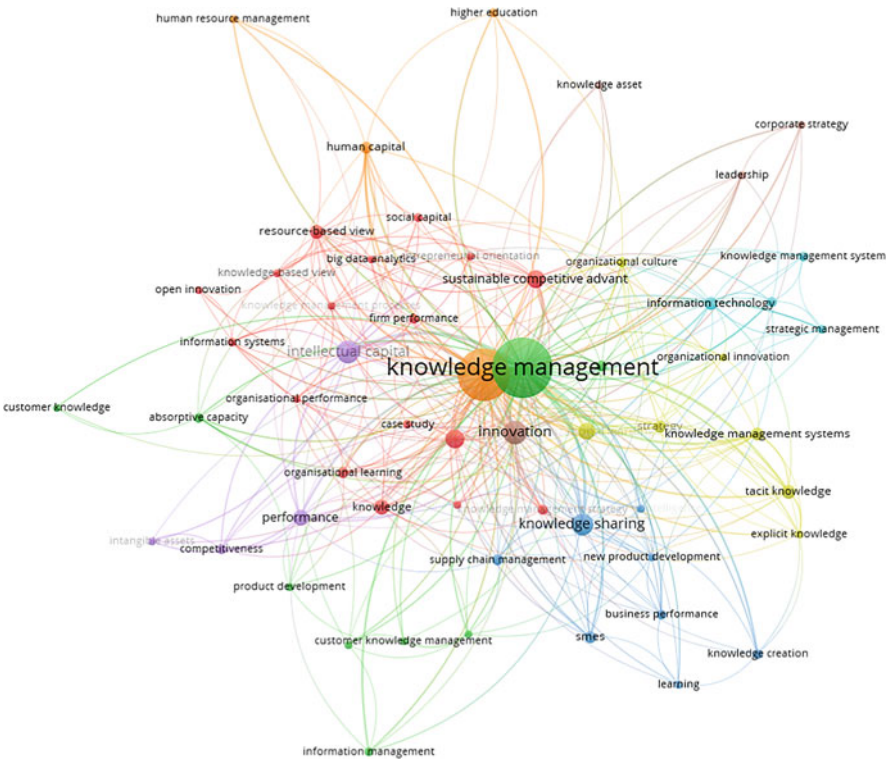

Fig. 4 Authors' keyword co-occurrence. Source: Authors' compilation

system. Overall, knowledge management strategies and their application can assist organizations in gaining a competitive advantage.

Cluster 4. (Yellow Color) *Organizational Learning* in Table 11 focuses on the process of knowledge acquisition, while Knowledge Management focuses on the content of knowledge that an organization acquires, creates, processes, and eventually uses. According to Easterby-Smith and Lyles (2003), knowledge management initiatives pay off by assisting the organization in embedding knowledge into organizational processes so that it can continuously improve its practices and behaviors and pursue the achievement of its goals by motivating the creation, dissemination, and application of knowledge. According to this viewpoint, organizational learning is one of the most important ways for an organization to improve its knowledge utilization over time.

The analysis in Tables 4 and 5 clearly reveals that the research was initially about managing knowledge, especially the tacit in nature and later the focus moved from recognizing knowledge as an asset and then how to transfer, share, and seek learning from it. Later after 2013, the focus was on strategic aspects and about organizational performance through competitive intelligence and entrepreneurial orientation.

Table 4 Period-wise progression of themes

	2017–2020	2013–2016	2009–2012	Before 2009
Based on impact	Big Data Analytics, Competitive Intelligence, entrepreneurial orientation	Knowledge-based view, dynamic capabilities	Information technology, knowledge as asset	Knowledge creation, tacit knowledge
Based on Volume (Occurrences)	Organizational performance	Intellectual capital, innovation, knowledge sharing	Organizational learning, knowledge transfer	Tacit knowledge, knowledge management system

Source: Authors' compilation

Table 5 Progression of themes impacted on KM-CA literature

Theme / Impactful keywords (average publication years)	Stage of KM-CA literature development
Recognition of Knowledge as an Asset (2011)	Awakening about KM as an antecedent to CA
Information Technology and Systems (2013)	Search for tools to harness knowledge (Resources)
Dynamic Capabilities (2014) Open Innovation, New Product Development (2016) Organizational Culture, Knowledge Based View (2016–17)	Soft side (Organizational capabilities)
Big Data Analytics (2021)	New frontiers

Source: Authors' compilation

Some scholars, such as Halme (2001) and Barney (1986), have proposed that knowledge can be generated through various disciplines and that organizations with this area to produce special knowledge can gain a competitive advantage. According to their study, they have also investigated the role of knowledge as a tool for survival in a competitive market.

3.3 Country-Wise Citation Analysis

It has been observed from the map in many regions few countries are actively involved in research collaborations in the field of KM-CA research, e.g., India and Malaysia in Asia, the United States in North America while the United Kingdom in Europe are actively seeking collaboration in this field. The regional leadership in collaboration has not emerged in South America while South Africa has been

Table 6 Top countries based on volume, impact, and collaboration

Based on number of papers	Based on number of collaborations	Based on collaboration strength	Based on average normalized citations[a]	Based on total citations received
United States	Taiwan	United States	Switzerland	United States
China	United States	Taiwan	Denmark	Taiwan
Malaysia	United Kingdom	United Kingdom	Finland	United Kingdom
Taiwan	India	India	Germany	Spain
United Kingdom	Malaysia	Malaysia	Pakistan	China

Source: Authors' compilation
[a]Countries with minimum of 5 documents

actively collaborating with other countries to drive KM-CA research further (Fig. 5 and Table 6).

It has been observed that KM-CA research is either emanating from developed countries like the United States and the United Kingdom or emerging economies like India, Malaysia, China, and Taiwan. Largely, the European countries like Denmark, Finland, Switzerland, and Germany had created a larger impact based on their average normalized citation. The United States and Taiwan have formed a lot of country collaboration to perform KM-CA research. But it is also seen that new countries such as Lithuania, Morocco, Magnolia, Cyprus, and Paraguay were also started KM-CA research indicating the expansion of geographical spread beyond Asia and North America.

3.4 Journal-Wise Citation Analysis

It is quite obvious the journals devoted to KM or KM systems such as *Journal of Knowledge Management, Vine Journal of Information and Knowledge Management Systems, International Journal of Technology Management* and are publishing studied on KM-CA largely. Even a few strategy journals like "Strategic Direction" have published eight studies. Going forward strategy focus journals should also offer focus or even come out with special issues to offer outlet for research on KM-CA. It is encouraging to note that in recent times, academic journals such as the Journal of Cleaner Production, Sustainability (Switzerland), Technology in Society, and Technological Forecasting and Social Change have been publishing research on the topic of KM-CA. This is evident from the publications listed in (Table 7).

It is also observed that a lot of journals like the *International Journal of Technology Management*, *Decision Support Systems* have published work on KM-CA studies but in the recent past these outlets are not publishing much work. It is notable to study further why a journal like the *Journal of Knowledge Management* had considerably slowed down the publishing KM-CA studies in the recent past.

Table 7 Top five sources for KM-CA Linkage Research based on the number of documents

Name of the source	Number of doc	Citations	Average publication year	Average citations
Journal of Knowledge Management	15	1088	2009.40	72.53
Vine Journal of Information and Knowledge Management Systems	14	141	2019.79	10.07
International Journal of Technology Management	12	175	2007.58	14.58
Sustainability (Switzerland)	9	120	2019.44	13.33
Strategic Direction	8	0	2015.75	0.00

Source: Authors' compilation

Table 8 Cluster 1 KBV, RBV, and Knowledge transfer (Red Color)

Author keyword	Number of links	Total strength link	Occurrences	Avg. pub. year	Avg. citations
Big Data Analytics	9	16	6	2021.17	22.33
Business Strategy	6	10	6	2013.67	20.00
Case Study	6	6	7	2010.71	10.57
Entrepreneurial Orientation	7	8	6	2020.67	16.00
Firm Performance	10	12	8	2014.38	40.00
Information Systems	9	16	7	2012.57	51.57
Knowledge	15	25	18	2012.22	4.67
Knowledge Management Processes	12	14	5	2017.00	31.60
Knowledge Management Strategy	11	16	9	2013.11	11.22
Knowledge Transfer	18	35	30	2011.93	23.00
Knowledge-Based View	13	21	6	2016.00	76.50
Open Innovation	4	6	6	2014.83	70.67
Organizational Learning	10	15	10	2011.10	10.80
Organizational Performance	7	12	5	2014.80	9.40
Resource-Based View	15	36	16	2013.25	30.50
Social Capital	10	13	7	2015.43	3.00
Sustainable Competitive Advantage	21	46	28	2015.61	9.75

Organizations benefit from knowledge management in a variety of ways, including improvements in business quality, redesigned data, increased productivity, changing the adequacy of choice changes, increased capacity to offer explanations to client needs, increased reaction to alternative organizational needs, and the ability to anticipate changes and make adjustments quickly (Claro et al., 2006). As a result, knowledge management is one of the organization's competitive advantages and innovation elements in strengthening the organization to achieve important goals.

Table 9 Cluster 2 KM and organizational performance from customer's perspective (Green Color)

Author keyword	Number of links	Total strength link	Occurrences	Avg. pub. year	Avg. norm. citations
Absorptive Capacity	10	19	9	2011.89	0.95
Business Intelligence	8	12	5	2013.40	0.90
Customer Knowledge	3	5	6	2009.17	0.81
Customer Knowledge Management	6	10	6	2015.33	0.52
Customer Relationship Management	9	15	5	2016.20	0.22
Information Management	6	15	7	2014.43	0.62
Knowledge Management	55	436	299	2012.46	1.07
Organizational Performance	14	22	10	2017.10	1.11
Product Development	7	9	5	2012.80	1.62

Table 10 Cluster 3 Knowledge sharing and creation in special contexts such as NPD and SMEs (Blue Color)

Author keyword	Number of links	Total strength link	Occurrences	Avg. pub. year	Avg. norm. citations
Business Performance	10	15	9	2013.22	0.52
Competitive Intelligence	9	18	6	2017.00	2.11
Knowledge Creation	8	16	8	2008.75	1.11
Knowledge Sharing	21	48	38	2013.63	1.45
Learning	7	10	5	2015.00	1.20
New Product Development	10	12	6	2015.17	5.43
SMEs	10	24	13	2014.23	0.32
Supply Chain Management	13	17	10	2012.80	2.12

4 Conclusion and Implications

The study conducted indicates that the relationship between knowledge management and competitive advantage is extremely positive. This chapter emphasizes knowledge management as a key principle to achieving competitive advantage. In other words, organizations can gain a sustainable competitive advantage by understanding how to manage their resources to maximize their value. Furthermore, some of the reasons to consider knowledge management include competition, customer focus,

Table 11 Cluster 4 Organizational learning (Yellow Color)

Author keyword	Number of links	Total strength link	Occurrences	Avg. pub. year	Avg. norm. citations
Explicit Knowledge	9	19	5	2005.60	1.21
Knowledge Management Systems	10	26	15	2007.40	0.67
Organizational Culture	15	23	8	2015.38	2.84
Organizational Innovation	8	10	5	2015.00	1.38
Organizational Learning	19	40	25	2012.52	1.12
Strategy	15	26	13	2013.85	0.36
Tacit Knowledge	13	37	17	2008.71	1.00

the challenge of a mobile employee, and the global imperative. However, it is essential to note that KM-CA research should increase as most industries are becoming knowledge intensive and adoption of industry 4.0 tools had equipped firms to leverage knowledge. Going forward, the key is to study the role of new-age technology in shaping the relationship between KM and CA. More conceptual studies are needed in the areas of "Knowledge based view" and open innovation as both themes were influencing others in KM-CA literature. Prominent countries like the United States, the United Kingdom, and India should form a forum to collaborate with the countries from Africa and South America in the areas of KM-CA. Such a forum would make KM-CA research a global phenomenon. Being KM-CA studies largely published by journals focusing KM, but going forward strategy-focused journals should also publish or even may come out with special issues to offer an outlet for research on KM-CA. Rather journals focusing on society and social change are publishing KM-CA studies. This also paves the way for studies exploring KM-CA relationships from a sustainable angle. Currently, there is no prolific organization or a researcher in KM-CA. Bibliographic coupling indicates that content of KM-CA studies resembles each geographic region while there is a difference that has been observed between the regions. Going forward more exchanges amongst multiple regions would enrich KM-CA research. Business has become more competitive and cutthroat today. The market is a jungle where the rules of Darwin's theory of evolution apply. A company, if it wishes to survive and thrive, must ensure that its core competencies are strong. Companies' core competencies have become stronger as a result of knowledge management practices. As a result, competitive advantage has become more sustainable. Furthermore, the importance of knowledge has become distinct as a company's economic and production level is increasingly dependent on its human capital, and intellectual capital. Furthermore, knowledge has been defined as a strategic asset, which is a collection of capabilities and resources that are difficult to replicate and commercialize due to scarcity. Core strength is ensured by means of knowledge, that is the sum total of all

information and data resources that the company is using for ensuring its operational effectiveness. Right and relevant knowledge is worth on par with gold today as the right knowledge ensures right decisions are taken on time. In spite of its worth, companies are not that interested in management of knowledge, which may explain why the few companies who do, stay relevant and on the top in the market. Organizations that give knowledge management the proper respect it deserves are sure to reap good rewards from their efforts for ensuring its proper management as knowing is half the battle.

Appendix

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Formalizing Knowledge Management in KIBS

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Abstract Knowledge is crucial for organizational development, particularly within the knowledge-based view of organizations, where it's considered the most valuable strategic resource. Effective knowledge management and continuous learning are essential for innovation in products, services, and processes. Knowledge transfer, both tacit and codified, requires proper tools. Therefore, understanding and designing effective strategies for knowledge management might determine competitive advantage and lead to organizational development. This study examines knowledge management in the Romanian Knowledge-Intensive Business Services (KIBS) sector, known for innovation and high performance. Qualitative research, including 16 in-depth interviews with four Bucharest-based companies, reveals a mixed approach: informal methods coexist with somewhat formal practices led by managers. These companies tend to be unconscious adopters of knowledge management, perceiving it as a blend of formal and informal processes that support flexibility, creativity, and organizational innovation. Benefits considered include data access, knowledge sharing, better decision-making, and increased effectiveness. Overall, knowledge management plays a pivotal role in the success of the investigated KIBS organizations.

Keywords Strategic development · Knowledge-based view · Knowledge-Intensive Business Services · Organizational performance · Dynamic networks

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_2

1 Introduction

Knowledge is essential for the strategic development of all organizations (Paoloni et al., 2020; Valeri, 2021). The knowledge-based view of organizations considers knowledge as the most important strategic resource, that can generate competitive advantage by creating and sustaining organizational capabilities that are rare, valuable, and cannot be easily imitated and substituted (Grant, 1996; Bratianu, 2022). Knowledge is an intangible resource that leads to value creation (Bratianu & Orzea, 2010; Nielsen, 2019) and more effective decision-making (Bratianu et al., 2020). Therefore, aiming to develop their knowledge, companies should consider its proper and effective management and continuous organizational learning, leveraged in the innovation of products or services, as well as processes. Knowledge transfer between individual and organizational stakeholders is vital and encompasses both tacit and codified knowledge (Grant, 1996). In this context, the need for an effective set of tools is self-evident. The lack of formalized knowledge management can lead to ineffective use of resources, misallocation, and missed opportunities (Lev, 2004). Several studies suggest that formal adoption and implementation of knowledge management could lead to enhanced organizational performance, directly or induced through various mechanisms, such as developing competitive advantage, creating dynamic networks, enhancing organizational resources, and others (see, for instance, several studies by Bratianu, 2022; Kianto et al., 2014; Kumar et al., 2022; Valmohammadi & Ahmadi, 2015).

Having this in mind, the present chapter discusses how knowledge management (KM) is formalized, focusing on the Romanian Knowledge-Intensive Business Services (KIBS) sector. KIBS companies are high-performing and innovation-forward businesses, covering technical, professional, and creative services (Miles et al., 1995). Therefore, effective knowledge management is crucial for such organizations. The present study relies on qualitative research based on data acquired from 16 in-depth interviews, representing a sample of four respected companies based in Bucharest. The chapter starts with a brief literature review showing how knowledge management is approached in KIBS, followed by a description of the methodology used during the investigation, then an analysis of the findings, and concluding remarks.

2 Knowledge Management in KIBS

"The Cinderella sector," as interrogatively referred to by Miles et al. in their 1995 report to the European Commission, the knowledge-intensive service industries that, at the time appeared to be slowly developing, have meanwhile been acknowledged as drivers of knowledge intensity and innovation promoters for their clients as well. They are an engine for economic growth (Desmarchelier et al., 2013) and play an essential role in combating the COVID-19 pandemic and its aftermath (Miles et al.,

2021). KIBS' role was deemed of competitive importance for other businesses, transferring professional knowledge and diffusing technological innovation. The KIBS concept in the literature covers several elements, namely professional business services that include specialized knowledge seen as either labor qualification or conditions applicable to the transactions between the service provider and service beneficiary, involving elaborated intellectual operations that rely primarily on human capital (Muller & Doloreux, 2008). The KIBS companies are very diverse, but the most often used typology divides them into Professional KIBS (p-KIBS) and Technological KIBS (t-KIBS).

The prominence of KIBS during the last decades could be explained by the accelerated development of a market for (technological) knowledge supported by the new information technology and the need for technological cooperation to enjoy the benefits of the returns but to avoid paying the transaction costs of expensive R&D (Antonelli, 1999). This development trend has also been documented in the case of the Romanian KIBS sector (Cătoiu et al., 2016; Busu & Busu, 2017; Zeldea, 2019), which became an important employer and contributor to economic development. Some gaps are registered within the sector with p-KIBS being more numerous and competitive compared with t-KIBS, as well as regional discrepancies—Bucharest, the country's capital, being the strongest and most competitive sector.

Acquiring and administering knowledge in KIBS is connected to four main strategies: active, passive, internal oriented, and external oriented (Zieba et al., 2017). The effectiveness of knowledge management in KIBS depends on human resources and their attitudes toward knowledge (Zieba, 2014). KIBS can follow two main strategies for managing knowledge, according to Hansen et al. (1999): they use either codification (people-to-documents) or personalization (person-to-person) strategies. When choosing the adequate strategy, KIBS have first to elucidate three issues concerning the type of products they offer, standardized vs customized; the maturity or innovativeness of their products; and the preeminence of explicit or tacit knowledge they employ to solve the clients' problems. The authors propose that KIBS offering customized, innovative products, relying on tacit knowledge should implement the person-to-person knowledge management strategy.

A cluster analysis of knowledge management approaches in SMEs in several European countries, conducted by Alexandru et al. (2020), resulted in a propensity for knowledge management practices such as using digital tools for capturing and storing knowledge, sharing knowledge, or using communities of practice. Companies were split into three clusters: conscious adopters, unconscious adopters, and marginal adopters. However, no significant general distinction could be made between clusters based on KIBS company sector, size, or age, thus indicating that other characteristics may be responsible for the managerial decisions to implement knowledge management. The study confirmed previous investigations (e.g., Bolisani et al., 2014), which posited that no clear-cut distinctions could be made between the cognitive features of t- and p-KIBS and there is heterogeneity even within the same sector.

While the studies concerning KIBS do not amass an extensive body of literature, the extant research shows that the smaller the KIBS, the less formal their knowledge

management processes tend to be. Zieba et al. (2016) investigated knowledge management in small KIBS and concluded that they mostly benefit from an emergent, non-planned approach to managing knowledge. Teirlinck and Spithoven (2013) found out during an empiric investigation, that formalized research and development management, for example, is not a common occurrence in small KIBS. When this happens, it tends to be correlated with the company's innovativeness and the external opportunities, especially for internationalized firms, that have a strategic approach to knowledge management (see also Doloreux & Laperrière, 2014), including in companies involved in research partnerships. Furthermore, KIBS companies can now take advantage of the digitalization process to enhance their performance (Ribeiro-Navarrete et al., 2021).

Tuominen and Martinsuo (2019) looked deeper into the formalization of knowledge in KIBS through codified process templates (containing rules, models, tools, etc.) and the role played by the employees' agency. While knowledge codification can increase transparency and shared meaning, formalization can also be perceived by staff as impeding their agency and work flexibility. It has been posited that knowledge formalization is supported by employees when is associated with value-creation processes. Moreover, successfully formalizing knowledge depends on the KIBS industry specificities (e.g., technical fields vs creative ones), the company size, the involvement of staff and their competencies and skills, the level of centralization or autonomy, but also on each team's culture, especially in large firms or geographically dispersed KIBS.

An interesting perspective is brought by the literature on management standardization and centralized knowledge management systems. According to Wright et al. (2012), while many advocate against formalization and standardization because they are seen as hampering creativity, despite increasing performance through structure and simplification, management innovation (e.g., organizational culture, process efficiency improvement, process redesign, and change management) is conducive to incremental or exploitative innovation. In essence, managerial best practices that become widespread, despite being initially radically innovative, end up becoming common practice, and thus, standards, reinforced by external consultants or internal thresholds in big companies. These findings have been confirmed also by Musolesi and Huiban (2010), who empirically established that external R&D impacts process innovation in KIBS, while internal R&D affects product innovation by leveraging in-house formalized knowledge and technology advancement.

In the same vein, Brivot (2011) revealed, following a longitudinal empirical study inside a large law consultancy in Paris, that a centralized knowledge management system, instead of strongly enforcing bureaucracy, as may be expected, led to unanticipated developments in a work environment where professionals have long-established autonomy and discretion in respect of knowledge creation, sharing, and use. Though no administrative control was applied to ensure compliance with designated procedures, in time, the lawyers' community required to access the common organizational knowledge base self-regulated the quality and outcome of their work following the best models offered by peers and senior staff while avoiding duplication of extant knowledge. Moreover, equal access to knowledge resources

benefitted newcomers and people with less extensive social networks, that previously could only reach that knowledge through informal exchanges, when available. Nevertheless, among the drawbacks were some employees' feeling that not everybody contributed equally to the knowledge development process but also some other staff's tendency to "territorialize" knowledge by trying to claim ownership of knowledge developed by practice groups formed of highly specialized practitioners.

Following a similar line of thought, Bettiol et al. (2012) asserted that the standardization brought by knowledge codification can be counterbalanced in creative KIBS, e.g., the design and communication sector. Even in this industry, which relies more on symbolic knowledge, associated with expression and emotion (Pina & Tether, 2016; Strambach, 2008), vs analytical knowledge in R&D-oriented sectors, which is more abstract, or synthetic knowledge in technical industrial sectors, which is more pragmatic (Asheim & Coenen, 2005; Strambach, 2008), a middle ground for knowledge management can be reached. Some KIBS could find a median point between formalization and personalization, that allows them to codify knowledge to a certain extent (operating principles, division of cognitive work, decision-making process, etc.) while leaving room for customized approaches (through socialization and interactions) to the creative projects' output (Bettiol et al., 2012).

3 Research Methodology

The aim of the investigation is the mapping of the formal framework of knowledge management in Romanian KIBS. Since this topic has not been previously considered consistently in the literature, and it is also considered to be sensitive, we have opted for qualitative research, as this is in line with many of the studies previously referred to in the literature review. Individual interviews allow a safe space for exploration (Brinkmann, 2018).

The companies considered have proved resilience and competitiveness in the Romanian market. They have more than 30 employees, being relatively consistent organizations in their specific context. They are all based in Bucharest, which is the most dynamic and performative region when considering this specific sector (Busu & Busu, 2017). The four investigated companies cover different types of technical and professional KIBS: a PR and digital marketing agency offering creative services as well, a marketing counseling business, a technology company, and an advertising agency. The interviewed persons have key positions in the organizations, therefore, reflecting a consistent image of the knowledge management practices. Table 1 presents the structure of the sample.

The PR and Digital Marketing Agency has an experience of 10 years in the market and 35 employees by the end of 2021. The firm aims to offer clients customized services ranging from the management of Social Media accounts, graphic and web design, and SEO optimization, to online ads campaigns, PR and influencer marketing strategies, corporate workshops, and training courses.

Table 1 The profile of the interviewees

Interviewees	Organization	Job positions	Work experience
C.B.	Digital Marketing Agency	General Manager and co-founder	10 years with the company
V.D.	Digital Marketing Agency	Executive Manager and co-founder	10 years with the company
R.F.	Digital Marketing Agency	Social Media Manager	4 years with the company
C.S.	Digital Marketing Agency	COO	4 years with the company
E.H.	Marketing Consultancy	CEO	14 years in the company
A.H.	Marketing Consultancy	Human Resources Manager	6 years in the company
C.D.	Marketing Consultancy	PM leader	4 years in the company
M.P.	Marketing Consultancy	Performance coach	1 year in the company
D.N.	Advertising Agency	Managing director	16 of which 16 years in the company
M.T.	Advertising Agency	New business director	10 of which a few months in the company
L.I.	Advertising Agency	Creative director	17 of which 5 years in the company
R.D.	Advertising Agency	Strategic planner	4 years in the company
L.S.	Technology Company	CEO	15 of which 5 years in the company
M.H.	Technology Company	Co-COO	7 of which 3 years in the company
A.B.	Technology Company	Co-COO	8 of which 6 years in the company
M.I.	Technology Company	CFO	16 of which 7 years in the company

The Advertising Agency has a presence of nearly 17 years in the Romanian market with little over 30 employees at the end of 2021. The general management approach is focused on ensuring that the business knowledge within the organization is up to date with relevant field novelties.

The Technology Company was founded in 2015 by a Romanian entrepreneur and has registered accelerated growth since then: every year, the company grew by 40%, ending 2022 with over 250 employees. The organization is perceived as one of the fastest-growing companies in Romania and it has a global portfolio of customers for which they deliver product and software engineering. The general management approach is focused on creating a culture of high performance and values, with a people-centric focus and innovative organizational culture to stay competitive.

Founded in 2008, the Marketing Counselling Business is made up of 41 employees who strive to accelerate business growth for their clients using digital technology and a standardized process flow customized for each client based on their needs. This way the team can build a bridge that connects their clients' current

capabilities to their future potential. The general management approach is focused on going above and beyond for clients by providing excellent services and ensuring customer satisfaction through quality service and good customer care.

As the research started unfolding during the COVID-19 pandemic, given the associated restrictions, all interviews were organized and took place on online platforms with audio-video functions. The interviews were conducted during June and July 2022. Each interview took approximately 1 hour to complete. The collected data was transcribed afterward and analyzed by theme, using qualitative research methods.

The number of companies included in the sample is not high, but their diversity and the number of interviewees for each organization generate a detailed picture of each company and allow in-depth discussions on various aspects investigated.

4 Analysis of Findings

Several aspects were investigated concerning the formalization of knowledge management in the company: the perceived benefits of KM, the ownership and organizational relations; the processes and practices concerning knowledge acquisition; knowledge documentation and storage; and knowledge sharing. All these aspects would lead to effective management and usage of knowledge, contributing to more efficient processes and better outcomes, especially for companies where knowledge is an important resource as is the case of KIBS.

4.1 Perceived Benefits of KM

When asked what the benefits of KM activities and practices are from their point of view, the respondents of the Advertising Agency indicated that KM enables different members of the same organization to have common references and to achieve and integrate a unified set of information. According to L.I., "Through KM you ensure that the services' standards, which are imposed by the global market, are met by a company." Additionally, R.D. specifically mentions that the KM benefits are "maximum." From their point of view, "it is not enough to gather data, rather to comprehend, analyze and use data" as they represent an enterprise that should always enable data and information into their services and deliverables.

In the Marketing Counselling Business, the benefits of KM are supporting employee growth and development, according to M.P.: "First of all, by investing in the development of employees, the company practically increases both its productivity and efficiency. We make sure that those who join the team are supported by a mentor." Also, better and faster decision-making, according to A.H: "I think it helps a lot to have the knowledge management and to know exactly what worked in the past and what can be updated on the innovation side." Improving business

processes, according to C.D.: "It helps us to structure the way of working, to create procedures, to share them with our team, and to put them into practice to succeed in delivering the objectives we have within the projects to our clients." And better communication, according to E.H.: "First of all, we ensure an easier onboarding and save time and resources by the way we transmit the information to the team, secondly we are increasing the level of competency to our team."

Looking at the KM benefits for the Technology Company, the most significant positive advantage was related to the great help it implies on the scaling and accelerated growth the organization is going through. KM is perceived as a true asset in the organization, as A.B. states: "We look at all processes as a living organism, with perseverance and flexibility; if you have a persistent team, then you will always find creative ideas while staying true to the common goal. We don't like to do a thing just because that is the supposed way it needs to be done, we like to innovate." Other benefits that come hand in hand with the scaling process and how KM improves accelerated growth were mentioned by all interviewees: scalability, predictability, and consistency. Moreover, it has been acknowledged that KM brings a lot of clarity and structure to the organization. Lastly, M.I. mentioned that KM helps the organization to have a more data-driven approach, which supports the company to make informed decisions based on a huge volume of data and analysis: "Data helps you take the right decisions today that will help you on the mid- and long-term strategy."

In the PR and Digital Marketing Company, partners support a less formal implementation of knowledge management, as it seems more suitable for a small firm. While there are some procedures formalized in internal documents accessible to anybody in the organization, that help staff members to accomplish their tasks, the company adopted the person-to-person approach, which avoids excessive codification and relies on tacit knowledge to find customized solutions for their clients' needs. With this aim, the company encourages the continuous development of staff competencies and skills. One of the greatest benefits of KM is perceived to be efficiency, ensured by the access to operational information provided to new staff, which results in fast integration and assists employees in becoming productive quickly. This has proved of particular importance during the COVID-19 pandemic when the company had to quickly hire new staff as the switch to online working by clients offered opportunities for business growth. Other advantages are organizational growth and client retention. According to C.S., the company's COO, KM allows acquiring knowledge through formal and informal channels.

The interview revealed a wide set of benefits for strategic knowledge management in KIBS. They could be divided into organizational and individual benefits (with impact at the employee level). These benefits are both tactical and strategic. Also, they are related both to the inner environment of KIBS and to their external operations and relationships. Therefore, KM is recognized as relevant both for the effectiveness and efficiency of KIBS organizations.

4.2 KM Ownership and Organizational Relations

In the Advertising Agency, the ownership of KM activities seems to be understood relatively differently from one member to another. For example, according to the founder and owner, the setup is straightforward: "Each division or department manager assumes KM responsibilities within their teams." Complementary, when needed, the company turns to external consultants to enhance the internal organizational knowledge, establishing relevant KM relationships both inside and outside the enterprise. Similarly, the creative director agrees. Nevertheless, according to the new business director, "there are several persons responsible," while the strategic planner indicated that "each one is responsible in their field, and per project, someone is designated as a lead." What this might indicate is that there might not be a unique person responsible as we acquire insights from more members of the organization. Regarding the responsibility for identifying knowledge gaps, the responses revealed two layers of responsibilities: one represented by the board of directors and another by the operational members. For example, D.N. mentioned that the management board is the team in charge of identifying certain knowledge gaps—we can see these as strategic knowledge gaps. Complementary, R.D., mentioned that the project manager is responsible for identifying and closing gaps during campaign development—we can see these as operational knowledge gaps. When it comes to addressing the gaps, all respondents from the Advertising Agency agree that all team members can contribute to closing knowledge gaps, from leaders to junior employees who are being delegated related tasks, through project managers or specialized colleagues in specific fields of advertising, such as Social Media.

In the Marketing Counselling Business, the owner of KM activities is the senior management team who has the right to hoard or share the knowledge that they have. "The entire management team is responsible for knowledge activities in the company. There is not just one responsible person, however, we are undergoing a restructuring process because we have increased our team." Each individual has their knowledge and expertise which they are protective of as there are no clear mechanisms to encourage them to share knowledge. A.H.: "Yes, we utilize the standard measures of security." Everyone is responsible for knowledge protection, there is no particular person to do this job.

Intellectual property rights have been enforced by the company to ensure that the information and knowledge they hold does not spread to competitors. Therefore, the company has its employees sign discloser agreements that prevent them from sharing key information on operating procedures, ingredients of elements, and organizational structure, culture, and working operations. E.H.: "I honestly did not put much emphasis on this aspect, because they take the information, but we ask ourselves what they do next with the information. However, we do not give access to the client's database, also we are signing a confidentiality contract. We save the knowledge in places where only employees have access." M.P.: "All employees sign a non-disclosure agreement (NDA). We use the most powerful servers in the world. We have responsible people for knowledge protection." C.D. adds: "It is important

because theoretical and technical knowledge are part of the essence and competence of the company, and personal and financial data are part of the security and legislation and we must comply with rules and regulations. We have written and unwritten procedures about what information we can share externally. Project managers are responsible for knowledge protection, and then the technical representatives and each team member is subject to a confidentiality agreement. We are facing challenges when we are asked to share confidential information and we are addressing it directly by communicating what information we can share and by signing NDA with various partners and employees. At the same time, the level of access to information differs, depending on the seniority level of the employee."

The interviewees from the PR and Digital Marketing Agency revealed that the heads of departments are responsible for organizing the KM processes for their units, while the associates steer the organizational strategies but all employees are expected to get involved in knowledge production, storing, and sharing. Though there is no documented KM strategy in the firm, R.F. stressed that they aim at "continuously developing knowledge at the staff level and following networking opportunities, to expand our reach and our client base." Knowledge security is also a concern in this company, which determined some formalized measures. R.F. explains: "The heads of departments are responsible for knowledge protection inside their department. We have faced some challenges in the past because employees could access work information from their personal accounts and, after their departure, we could not access or control it. In consequence, we restricted access to such information from accounts administered by the company, that could be deactivated when staff left the company."

Being a flat organization, the Technology Company has an organizational structure that is based on fewer hierarchies and more collaboration and cooperation. This might partially explain the less formal approach to KM. Knowledge is mainly managed informally through technical leaders and project managers: L.S.: "Yes, we managed technical abilities through Technical Leaders"; M.H.: "It's a combination between formal and informal. I feel that areas such as business administration, finance, and how we maintain certain elements for people and culture are managed, but some elements are intentionally not managed because we want them to come from the people, not from the management, to offer the people room for creativity and innovation"; A.B.: "I think the technical leader and the project manager make a great team and fill in for each other: one covers the hard skills, and the other the soft ones"; M.I.: "I think knowledge is assessed and we have a strong desire to continuously innovate."

4.3 Formalization of Knowledge Acquisition

For the Advertising Agency, knowledge acquisition is continuous. This approach is supported by the nature of the field of activity, the fast-paced environment, and the competitiveness and dynamism of the industry. The need for knowledge acquisition

can appear as an urgency during a developing project, or more systematically when ideas start to repeat themselves. Regardless of the situation, the organization formalized its knowledge acquisition processes with the help of external partners, access to databases, subscriptions to relevant publications, industry events, internal training, consultancy, industry studies, perception studies, and retail audit studies.

To achieve great success, the Marketing Counselling Business acquires knowledge from external sources such as customers, suppliers, competitors, and partners. M.P.: "Since we are connected to the external and international environment, we must be aware of new appearances and practices, all clients want faster, better, and more and we have to face these challenges." C.D.: "This can be seen in every interaction with clients, based on their requirements and the level of details discussed."

In the PR and Digital Marketing Firm, the identification of knowledge gaps and knowledge acquisition is a task primarily for the heads of departments, as underlined by R.F., for example, since the managers are responsible for the work in specific areas, they have in-depth knowledge about the operations and can contribute to the company's strategic decisions, including concerning KM. The company develops knowledge internally, e.g., inside expert groups but also acquires it from external sources.

Knowledge creation seems to be the most important aspect sought by the Technology Company. All respondents mentioned the promotion of nonlinear thinking within the company, in the sense of looking for new and better ways to do the work. As L.S. stated, "You start looking for new knowledge when what you used in the past is no longer serving your purpose and desire for innovation." A specific element inherent in the company's organizational culture is to innovate constantly. The organization employs Proof of Concepts, namely the employees test the idea on a smaller group of people in a pre-defined context before deciding if they want to scale it or not. Because the company does not want to lose any opportunity, they act fast and try innovative approaches or processes—one relevant example being the usage of OKR methodology in strategy definition and implementation. To sum it up, M.H. points out that "We always look for knowledge that helps us make the decision fast." In terms of external sources to acquire and find out new knowledge, there were mentioned various forms: input from former employees, competition, national and international press, or coaching.

4.4 Formal Knowledge Documentation and Storage

In the Advertising Agency, knowledge is stored on a server, which is split into different sections aimed to segregate the public access files from the creative department's restricted files and others. As the main reasons for formally documenting and storing knowledge, the respondents indicated: time efficiency, the need to revisit older work due to client requests or to integrate existing knowledge into new projects. This is why the team members are following the rule

ensuring to synchronize their work into the shared server. From this perspective, all team members are responsible for storing and documenting professional activity and deliverables following the standard structure. Additionally, the department manager is responsible for ensuring that the rule is followed and the documentation standards are met by their teams. Along similar lines, the rest of the respondents agreed that there are more persons responsible at different moments.

The PR and Digital Marketing Firm is involved to a limited extent in knowledge codification. Several work procedures are formalized and shared within various departments. Otherwise, the company documents and stores case studies, presentations, and research reports. To this end, the agency uses digital tools and platforms to ensure knowledge retention, like Microsoft Word, Google Docs, and Google Drive. The documents concerning work procedures are prepared by the heads of departments. In other cases, they are written by specialists who transfer their knowledge to replacement colleagues for a shorter or longer time. Furthermore, employees working on specific client accounts online transfer their knowledge to other/new colleagues when they leave that account. The receiver gets a detailed history of everything relevant that happened on the account.

In the case of the Technology Company, all interviewees agreed that it is essential for the company to store knowledge, but this takes place in a rather informal manner even if it is considered extremely important to "have a clear understanding of how things changed and evolved over the years" (M.I.). A.B. highlights the positive impact it has on the new joiners for the onboarding process. Concerning the tools and instruments which are being used, the company employs Confluence, QMS, and Sharepoint. The ones responsible for storing knowledge are the process owners, from technical leaders for technical documentation to the project manager and management team.

4.5 Formal Framework of Knowledge Sharing

As knowledge sharing is instrumental for the Advertising Company, there are multiple means of communication in place, which, according to the respondents are used on an ongoing basis: e-mails, training, meetings, coach sessions, templates, brainstorming sessions, and briefs.

At Marketing Counselling Business, knowledge documentation including user guides, manuals, processes, and tools are stored on shared drives. C.D.: "Yes, we have a team drive to which all colleagues have access; also the information about the projects we work on is archived. That become sources of information for other similar projects." Complete and effective documentation supports training, communication, and user assistance. It is a good way to demonstrate knowledge sharing and allows users to learn about all elements of a KM program.

Knowledge sharing inside the PR and Digital Marketing Firm takes place mostly informally. Operational knowledge is exchanged in interactions between employees or with department heads, while the latter transfer strategic knowledge with the

partners or across departments. The agency also shares knowledge with external stakeholders, either on contractual bases or to attract new clients. C.S. pointed out that exchanges with potential clients are not mere financial offers but contain ideas, strategies, and tactics propositions that could be employed to reach marketing or PR objectives. On the other hand, contractual customers receive presentations and reports. Apart from that, the company shares knowledge, free of charge, with partners, e.g., in CSR projects or academic seminars to offer insights from their work. The company organizes also paid courses and training for interested third parties.

The tool of choice for exchanging knowledge among the company members is Slack. It ensures real-time access to information for all interested stakeholders. Additionally, knowledge can be shared through any other digital platform or application, e.g., Facebook, Instagram, LinkedIn, TikTok, and Twitter, given the company's field of work. As C.B., the CEO, highlighted, informal knowledge sharing proved very effective so far and it is encouraged by the firm. However, knowledge concerning client accounts, especially more sensitive information, is shared through authorized email accounts administered by the company. It ensures confidentiality and data security but also knowledge retention if account managers leave the company. This practice has been adopted following lessons learned when the firm encountered knowledge loss because of employee departure.

For the Technology Company, knowledge sharing was the area all four interviewees were the most excited about. Even though the company does not possess a clear strategy for knowledge sharing, there are a lot of instruments, tools, and processes in place to ensure knowledge dynamics transformations. This can be noticed in the benefits that (M.H.) mentioned when talking about the importance of knowledge sharing "We use several methods as it is very crucial. An important element is the monthly meeting with all people where we bring relevant input for the respective month about projects and business, and we share information from all knowledge categories; we also have various specific methods, such as <<meet our projects>> in which our colleagues can present specific details about the implementation of a certain project. Also, we have different communities that facilitate access to info, PM, BA, and QA at the team level." The knowledge-sharing process takes place both within the same teams, "very naturally" (M.I.), and cross teams, when the company still tries to find the right instruments to facilitate it, as "it's a very qualitative process, not quantitative" (A.B.).

5 Conclusion

The interviews showed a mixed perspective, between somewhat formal approaches coordinated by managers and informal encouragement. Consistent with other findings in the literature referring to small organizations (Zieba et al., 2016; Teirlinck & Spithoven, 2013), most KM processes are supported informally although the strategic value of KM is generally recognized. The investigated companies might be

considered unconscious adopters of KM practices, even if their profile does not perfectly fit the clustering developed by Alexandru et al. (2020). Still, KM is a consistent concern and organizations display a tactical and pragmatic approach in this domain. This might be linked with the perception that most benefits of KM are operative, such as access to data, sharing of knowledge, helping employees cooperate, fast integration of new employees, etc. Still, more consistent advantages such as better and faster decision-making and increased effectiveness are also appreciated. Another aspect consistent with previous findings (Tuominen & Martinsuo, 2019) is that KM tends to be seen as a mixture of formal and informal approaches, assumed voluntarily, to ensure more flexibility, creativity, and supporting organizational innovation, which is crucial in KIBS.

Even if various procedures are in place and sometimes KM proficiency is considered, as mentioned, KM is approached largely informally and organically, especially inside teams. Some organizations are concerned with effective cooperation on a larger scale, across the organization, making pressure to assume more formal approaches to KM. Knowledge sharing and cooperation with stakeholders is also encouraged, through a combination of formal and informal mechanisms. All companies seem to embrace an organizational culture supporting knowledge sharing both inside, but also outside the firm. Also, special attention is given to knowledge-sharing challenges.

In terms of KM processes, knowledge sharing is highly supported as mentioned, but the importance of the other components, such as knowledge creation and acquisition, knowledge storage, and knowledge utilization are recognized. Special attention is given to risks related to knowledge, such as knowledge security or handling by new employees, therefore, these aspects are more formalized than others. The interviews also revealed that even if we talk about flexible and flat organizations, where team cooperation is very important, managers and team leaders are key persons in KM processes. Knowledge acquisition considers a wide variety of resources, including external ones, with clients having a special place; digital resources are widespread. Knowledge creation is also encouraged. Knowledge storage is facilitated by a wide palette of applications. Even if all are involved in the process, managers have high responsibilities. Concerns related to data security are seriously approached.

The findings are relevant to identifying organizational risks and barriers to KM, but also aspects that stimulate it, as well as effective approaches to managing knowledge considering the specific context of the Romanian market. The small number of organizations, all placed in Bucharest, makes it difficult an extrapolation to all Romanian KIBS. Since Bucharest is a dynamic hub of more effective KIBS compared to other regions, and the organizations in the sample are models of good practices, we could assume that in other Romanian KIBS, the degree of formalization and attention given to KM are lower. Since the interviewed companies have recognized the high value of KM, as well as the need for a deeper understanding of it and more strategic approaches, we recommend awareness and training programs in the field of KM.

Acknowledgments The authors greatly acknowledge the financial support from the European Union's Erasmus+ Program under Project Reference: 2021-1-EE01-KA220-VET-000032944. The authors further greatly acknowledge the efforts of the other partners in this project as otherwise this chapter would not have been possible.

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Assessing the Origins, Evolution, and Prospects of the Literature on Knowledge Management: A Bibliometric Analysis

Virginia Navajas-Romero, José Hernández-Ascanio, Nuria Ceular-Villamandos, and Lorena Caridad López del Río

Abstract The current moment, from a multidimensional point of view (political, economic, social, organizational, etc.), is characterized by the wide extension and intensity of phenomena that are projected as scenarios of uncertainty while at the same time imposing the need to adopt strategies and practices of adaptation to these same scenarios. Among these adaptive strategies and practices, companies have developed different models of labor innovation, but those in which "knowledge management" appears as a significant element are particularly relevant, as it is seen as a resource with a first-rate capacity for mediation with the environment. Moreover, the models based on this component have allowed a clearer understanding of how issues such as the configuration of the company's human capital (condensed into the different skills, knowledge, and abilities of the workforce) are articulated with the achievement of the company's different objectives. Likewise, it is possible to clearly identify how innovation and knowledge management are a factor in the development of human capital that ends up redounding in the achievements of the organization to which they are linked. The purpose of this study is to provide a corpus that, by way of a cartography of the scientific production on the subject, allows the academic community to orient itself in this object of study. In relation to this purpose, the main objective of this paper is to carry out a systematic review of the literature in order to articulate the theoretical discussion with an inductive approach to the limits of the conceptual structure of knowledge management. To this end, this chapter presents as a strategy a bibliometric analysis of the object of study, making use of the Web of Science database to carry it out. This analysis is based on the following analytical components: (i) a quantitative analysis of the

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_3

scientific production in the subject from a diachronic perspective as well as the impact of this production (based on a citation criterion); (ii) a cartographic delimitation of the areas of production in this subject based on quantitative criteria; (iii) the identification of production poles in this field based on the visibility of reference authors as well as (iv) the most productive journals on Knowledge Management and recent studies on this subject; (v) a characterization of the semantic field related to the object of study; (vi) a discussion of the evaluation of studies citing Knowledge Management; and finally, (vii) the delimitation of trends in this field. This bibliometric analysis was carried out on the basis of 12,512 studies published in Web of Science (WoS), from 1974 to 2022. To do this, we used the Biblioshiny package of RStudio tools and the VOSviewer program to explore the major research topics and the past in this field using evaluative, relational, and econometric literature data visualization techniques. This result reflects that knowledge management has reached an advanced level of complexity. This is reflected in the current polyhedron content, which acts as a conceptual umbrella. In addition, we demonstrate that econometric literature analysis is a relevant and useful method for scholars and practitioners involved in scholarly debates over knowledge in this field. The findings are both important and timely given the current global economic, political, and social climate. Through a comprehensive review of the literature, this study highlights the need for further research and development in this area. We also identified certain gaps in the literature that could be addressed in future studies.

Keywords Knowledge management · Human capital · Organizational culture · Bibliometric analysis

1 Introduction

Reflection on Knowledge Management is among the most prolific research interests of recent decades, being the management-related areas that have partially stimulated this attention. This could be partly explained due to the fact that strategic management has become almost dominant in this field of study by recognizing that Knowledge Management is of special interest because of its importance and potential for development. Nevertheless, it is necessary to highlight that it is a field subject to constant criticism and tensions—as it is a field under construction, there are still certain deficits in the consolidation of its theoretical background.

Bibliometric studies can be employed to measure the extent and nature of research on a given topic, track and analyze trends in the field, and identify gaps in the literature. Additionally, bibliometric studies can be used to identify the key authors and institutions in the field, the countries and languages in which research is conducted, the extent of collaboration among researchers, and the sources of funding for research. Finally, bibliometric studies can be used to identify and analyze emerging topics in the field and to evaluate the impact of research in terms of citations, downloads, and other metrics. The use of bibliometric studies for studying a concept such as organizational and managerial processes and procedures has

several advantages. First, such studies can provide a comprehensive overview of the literature in the field, which can be used to identify gaps in the literature, highlight the most important authors and institutions, and identify the most important topics. Second, such studies can provide an understanding of the evolution of the concept and its current state. Finally, bibliometric studies can provide insights into the sources of funding, the extent of collaboration, and the impact of research in the field (Ge & Campopiano, 2021). The identification of the semantic field linked to an object of study, the recognition of the main authors (whether in the form of individual or collective subjects, as well as the preferred communication and dissemination devices) and the understanding of their interaction trends are an effective way to contribute to the generation of a corpus. This, within the field of Knowledge Management, facilitates the construction of a frame of reference to guide future researchers and can also contribute to strengthening and unifying this research area.

Despite the great popularity and interest that Knowledge Management has generated, there have been few attempts to build a framework in the field of Knowledge Management. Recently, there have been several proposals in this direction (Nasrallah et al., 2022; Farooq, 2022; Ferreira et al., 2022; Centobelli et al., 2022; Valeri, 2021), but it is not possible to identify a methodological consensus to compare and/or unify results. The most frequently used methodology involves establishing co-citation or bibliographic coupling indicators, an approach more oriented toward detecting intertextual links between academic publications based on scholars' referencing behavior. In addition to this approach, we find that authors document, to a limited extent, the analysis of joint citations.

This paper will generate a resource that can guide researchers interested in this field of study, as well as allow for a better understanding of Knowledge Management. To achieve this objective, the main references will be identified, considering both discipline and authorship, for the period with the largest documentary production in this field (1974–2022), identifying the main themes and trying to elucidate which approach best describes the evolution of Knowledge Management. Moreover, this study also aims at making visible the emerging areas from which future Knowledge Management research could be consolidated. To this end, this paper develops a literature analysis of existing knowledge management research. This analysis allows us to determine the volume of publications and citations in this field, the scholarly communication resources with the greatest projections, the most influential authors and works with the greatest impact, and the relevant semantic areas increase.

As an expected outcome, this paper could serve as an update and identification of new trends in this field of study for new researchers who seek to familiarize themselves with the literature on Knowledge Management.

2 Framework

The attention to Knowledge Management as an area of interest is not new (Serenko, 2013), although irregular development over time can be identified. Some experiences can be traced back to the 1970s, and their objective was to make a more or less systematic analysis of the implications of knowledge in organization development (Serenko, 2013), but it was not really until the late 1990s when it became a focal point.

This new centrality will in part have much to do with two fundamental issues: (i) the consolidation of an economic model that progressively recognizes knowledge as an essential asset to be taken into account and which needs to be managed effectively and efficiently (Serenko & Bontis, 2013) and (ii) the consolidation of an increasingly technologized society in which technostructures have become determinants and conditioning factors in the creation, development, management, and distribution of knowledge (Kumar & Mohindra, 2015).

In this way, Knowledge Management becomes a node where different disciplines converge, especially from a strategic and capacity-building approach (Ribière & Walter, 2013). This approach is easy to understand since, at this initial stage, both public and private entities recognize knowledge as a systemic and complex process, with the singularity of providing competitive advantages to organizations that make good use of it.

A superficial analysis of how the field of Knowledge Management has been shaped over time reveals an ongoing tension about the explanatory roots of the phenomenon. As Serenko (2013) states, the analysis of Knowledge Management is polarized around two dimensions: the social construction dimension (whether individual or collective) or the technological dimension.

This tension seems to be inherent in the construction of the field of study of Knowledge Management and will result in the identification of different perspectives for its development and study.

Authors like Tzortzaki and Mihiotis (2014) consider that the structure of the field was defined in four moments. The first stage would conclude in the mid-1990s, and its main feature would be the analysis of how knowledge brings competitive advantages to organizations. The second stage would pay more attention to the analysis of the processes from which knowledge and innovation management can be described. In the development of the third stage, the social implications of knowledge and its recognition as a social practice would be emphasized. Finally, in the fourth stage, the field is segmented around two main focuses of interest: (i) the subjective—individual and the (ii) objective—social aspects that determine the production and development of knowledge in organizations.

Finally, in this diachronic perspective of the formation of Knowledge Management as an object of study, we should take into account the proposal by Ma and Yu (2010), who suggest that it is only possible to organize the development in this field around two large periods. On the one hand, it is identified the period from 1998 to 2002, whose content would be epistemological; on the other hand, it is the period

from 2003 to 2007, which would focus on the technical and procedural aspects of Knowledge Management and innovation in organizations.

Regardless of the affinity toward one or the other of the stages presented above, in both of them, we see that there is a certain convergence in identifying the coexistence of three main approaches in the configuration of Knowledge Management systems and models (Davenport & Prusak, 2001; Wiig, 1997; Alavi & Leidner, 1999). The first approach focuses on the properties of access, production, and circulation of knowledge. The main peculiarity is that there is no clear distinction between the container, the content, and the subject manager/beneficiary of it. This is an approach particularly focused on the technical-structural aspects of the phenomenon. The second approach pays greater attention to the institutional aspects of the phenomenon, such as organizational culture—both in its individual and collective dimensions—so that resources can be used to intervene effectively. The third approach is a more technological approach, so that the focus is on the technical components of the phenomenon.

After outlining the main trends identified in the previous reviews, we now proceed to describe the methodology on which we will update the results.

3 Methodology

Quantitative literature analysis is used to measure the impact of scholarly literature, assess the performance of research institutions, and identify emerging issues and trends in the field. It can also be used to compare the performance of competing journals and authors, and to assess the contributions of different countries and regions to a particular body of knowledge. Quantitative literature analysis can also be used to assess the performance of research teams and organizations and identify the most influential authors, institutions, and countries in a particular field. By understanding the research landscape, econometric literature analysis helps inform policy decisions, funding, and research priorities (Daim et al., 2006, Bouyssou & Marchant, 2011). Analysis and interpretation of results. Data collection is typically done by searching bibliographic databases such as PubMed, Web of Science, or Scopus. Data analysis includes the use of quantitative methods such as: B. Descriptive Statistics and Applications of Such Literature Measures. B. Citations, influencers, and h-index. Interpreting the results requires careful consideration of the context and understanding of their implications for the field of study (Durieux & Gevenois, 2010; Rueda et al., 2007).

This type of analysis also provides useful insights into the relationships between authors, institutions, and journals, and helps to identify research trends and topics of interest. It can also be used to identify potential collaborators and to assess the relative importance of certain topics within a particular field (Duque-Oliva et al., 2006).

Compared to traditional literature surveys, this type of analysis is a widely used and validated methodology (De Bakker et al., 2005). It helps you explore, organize,

and analyze large amounts of data and find non-obvious data. Patterns that contribute to research progress and scientific progress (Ding et al., 2001; Van Raan, 2005; Daim et al., 2006).

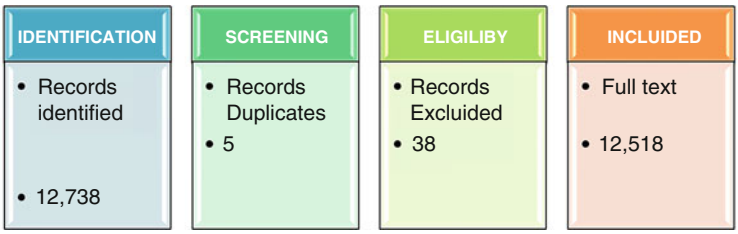
Through bibliometric analysis, researchers will be able to access and expand their knowledge regarding key indicators such as the volume of publications, the distribution and geographical concentration of publications, the academic communication resources with the greatest projection, as well as the most prolific authors and those with the greatest popularity among the community interested in this field of study. Other emerging approaches in the field of altmetrics should be added to classical bibliometric analyses, as this allows a better understanding of issues such as visibility, impact, and dissemination in the production of knowledge. In addition, there are other indicators of influence such as the h-index (Hirsch, 2005), which measures the cumulative impact of a researcher's publications, and the g-index (Merigó et al., 2015), which measures the productivity and impact of the researcher's most cited papers. According to Podsakoff et al. (2008), the number of studies that measures productivity and the number of citations is a good indicator for assessing a researcher's influence.

This study is based on the database Web of Science (WOS), Arts & Humanities Citation Index (A&HCI), or Science Citation Index Expanded (SCI-EXPANDED) by Thomson Reuters, as it is recognized and endorsed as the main resource for scientific documentation on the predefined object of study (Albort-Morant & Ribeiro-Soriano, 2016).

The second step was to establish the search strategy, for which the PRISMA recommendations were followed, as this is one of the most established practices in conducting systematic reviews and meta-analyses (Moher et al., 2009). One of our interests was to describe the semantic field associated with the object of study. After noting the high level of heterogeneity and fragmentation in the literature on the subject, a thematic approach was chosen as a review strategy (Crane & Glozer, 2016). For this purpose, the primary keyword was "Knowledge Management." Using Bibliometrix software, which provides automated analysis, 12,738 documents were identified including this reference in any of the following fields: title, keywords, or abstract. The research team, using a practice of triangulation and a rubric with inclusion/exclusion indicators, proceeded to review the corpus. Finally, 38 documents were discarded, and 12,512 documents were finally accepted for further analysis.

An inductive approach was applied to the resulting corpus in order to establish the glossary associated with the semantic field of the object of study. Human coders were used to evaluate the glossary, and 6 thematic clusters were identified. The glossary was sent to three researchers, who verified the categorization. Each word remains in the glossary if at least two of the three coders vote to include it (Humphreys & Wang, 2018). The three researchers accepted the categorization and validated the glossary.

The associated keywords were then grouped according to their frequency within homogeneous categories. In addition, the main authors were identified: Nick Bontis,



Source: Own elaboration

Fig. 1 Prisma. Source: Own elaboration

Alexander Serenko and Marco Del Giudice, and links were established among the authors and the semantic field indicated above.

For this study, we have used the Bibliometrix package, an RStudio tool used for further visualization and analysis of maps in the literature database (Aria & Cuccurullo, 2017).

Cadavid-Higuita et al. (2012) defined three types of indicators: quantitative, qualitative, and structural. The first metric measures productivity based on the number of publications, the second measures publication impact and includes citations. In addition, structural indicators measure existing connections between works and their authors. This study considered the first two types of indicators to determine which publications in the dynamic competence area were the most recognized. This analysis was conducted via access to the WOS database on June 8, 2022, and analyzes scientific research for the period 1974–2022 (Fig. 1).

4 Results

4.1 Volume of Publications

A total of 12,512 articles published in JCR journals were analyzed, with a growth rate of 13.23% and an average number of citations of 24.77. The number of authors who have worked on this topic is 24,789, being 2.8 the average number of authors per article. Moreover, 2427 articles have a single author.

The topic of Knowledge Management first appeared in academic research in 1974. Table 1 presents the number of publications about Knowledge Management. The results show a detailed description of the literature review.

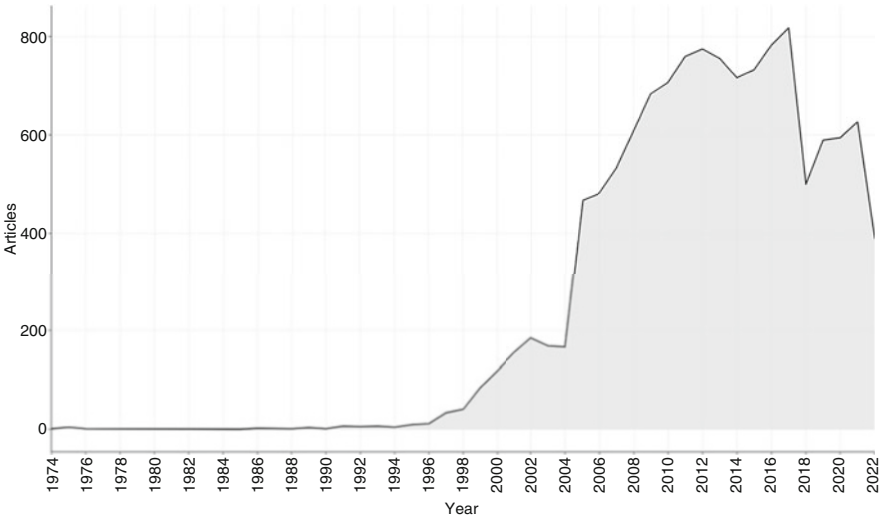
Annual scientific achievements are used to judge the state of knowledge management. Figure 2 shows the spectrogram of the reference data range used from 1974 to 2022. As can be observed, there has been a relatively steady increase in scientific production on the topic of knowledge management.

The highest peak was registered in 1994 with 7 citations, followed by 1996 with 6.8 citations. Since 2020, the number of publications has experienced a slight

Table 1 Detailed information

Description	Results
Main information about data	
Documents	12,512
Annual growth rate %	13.23
Document average age	9.49
Average citations per doc	24.77
References	344,189
Document contents	
Keywords plus (ID)	6807
Author's keywords (DE)	21,595
Authors	
Authors	24,789
Authors of single-authored docs	2017
Authors collaboration	
Single-authored docs	2427
Co-authors per doc	2.85
International co-authorships %	24.49

Source: Own elaboration

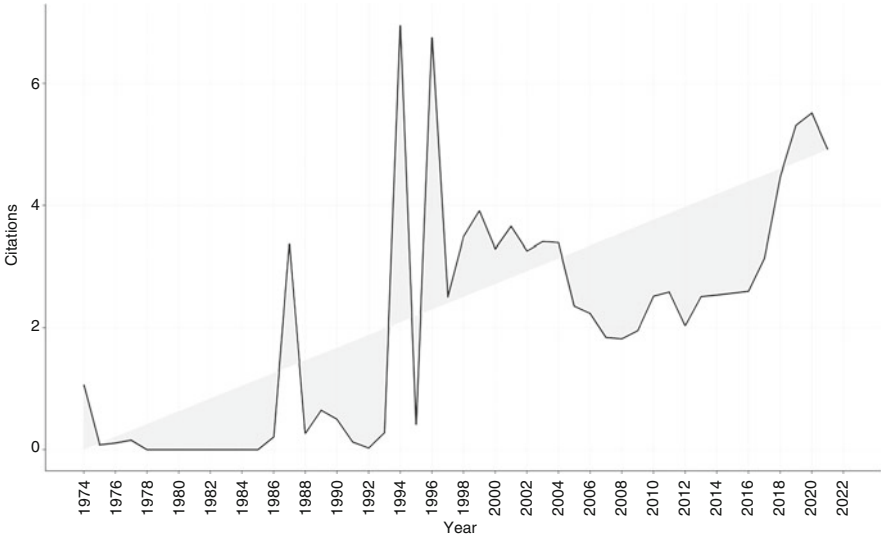


Source: Own elaboration

Fig. 2 Annual scientific production. Source: Own elaboration

decrease, which may suggest that, although the number of publications is still considerable, the topic may be entering a phase of maturity.

The number of citations has been increasing over the years. The years with the highest number of citations were 2012 (774 citations) and 2017 (817 citations), which indicate that the most widely used references about the concept of Knowledge



Source: Own elaboration

Fig. 3 Average number of citations per year. Source: Own elaboration

Management are within the last decade. From 2018 onwards, there has been a new growth, but less important than in previous years (Fig. 3).

4.2 Academic Communication Resources with a Wider Projection

In order to identify the main source of journals on Knowledge Management, one can use the Web of Science Core Collection, which is an online database of indexed journals. By searching for articles related to Knowledge Management in the database, one can determine the scientific journals that have published research on the topic. Additionally, the database provides a citation report for each journal, which can be used to further explore the topic. The citation report provides information on the citation counts, impact factor, and the number of times an article has been cited by other articles. Moreover, the database can also provide information on the number of authors and the countries associated with each journal (Table 2).

In this analysis, the publisher with more papers on Knowledge Management is Emerald Group Publishing, followed by Elsevier and Taylor and Francis. This indicates that these journals can be important sources for reviewing relevant and most recent literature. The *Journal of Knowledge Management* stands out in both articles and citations.

Table 2 Journals

More articles		More citations	
Sources	Articles	Sources	Articles
Journal of Knowledge Management	643	Strategic Manage Journal	13,414
Knowledge Management Research & Practice	332	Organ Science	11,753
Expert Systems with Applications	217	Journal Knowledge Management	9606
Sustainability	211	MIS Quarterly	9144
Journal of Information & Knowledge Management	210	Academy Management Review	7702
International Journal of Knowledge Management	183	Academy of Manage Journal	6879
Journal of Business Research	127	Journal of Knowledge Management	6453
International Journal of Information Management	126	Harvard Business Review	5560
International Journal of Technology Management	126	Manage Science	5348
Journal of Intellectual Capital	116	Knowledge Management	4883
Industrial Management & Data Systems	110	Administrative Science Quarterly	4861
Knowledge and Process Management	109	Journal Business Research	4518
Decision Support Systems	99	California Management Review	4301
Learning Organization	95	Research Policy	4217
Kybernetes	92	Expert Systems Application	4189
Management Decision	88	Journal Manage Inform System	4128
Information & Management	76	Journal Management Studies	3927
International Journal of Innovation and Learning	72	Journal Management	3669
International Journal of Production Research	70	Journal Intellectual Capital	3341
Business Process Management Journal	68	International Journal Information Management	3209

Source: Own elaboration

4.3 Most Prolific and Most Cited Authors

Numerous authors from diverse backgrounds have conducted research on Knowledge Management In this section, we show the authors with the highest impact in this field by analyzing descriptors such as the number of published papers (NP), the total number of citations per published paper (TC), and the h-index. The most prolific author on this subject is Nick Bontis, with 25 published papers, followed by Alexander Serenko with 20 published papers. Moreover, the author with the highest number of citations and the most citations per published paper is Bontis with 1847, followed by Marco Del Giudice with 1701. Over the years, Bontis has

Table 3 The 20 most relevant authors

Author	h_index	TC	NP	PY_start
Bontis N	25	1847	41	2000
Serenko A	20	1434	30	2006
Del Giudice M	18	1701	25	2014
Kianto A	18	1607	24	2008
Ferraris A	15	1110	19	2017
Soto-Acosta P	14	1055	16	2007
Cegarra-Navarro JG	13	603	22	2006
Chen YM	13	495	25	1998
De Pablos PO	13	466	16	2004
Lin BS	13	547	17	2002
Yang J	13	550	20	2002
Desouza KC	12	542	15	2003
Petruzzelli AM	12	488	12	2017
Bresciani S	11	785	11	2017
Carayannis EG	11	804	13	1998
Cerchione R	11	366	12	2015
Chen YJ	11	300	21	2004
Durst S	11	435	20	2011
Esposito E	11	387	12	2014
Gao J	11	471	15	2005

Source: Own elaboration

conducted research that has contributed significantly to the development of new theories (Table 3).

4.4 The Most Cited Studies on Knowledge Management

Although the most productive authors in this field are N. Bontis, A. Serenko, M. Del Giudice, A. Kianto, and A. Ferraris, the bibliometric analysis shows that the most cited works (in this case those occupying the top five positions in the ranking of global citations) do not correspond to these authors, as can be seen in Table 4. Moreover, it can be seen that the most cited works correspond to the time frame when the main foundations of Knowledge Management were established.

4.5 Related Semantic Field

Rank centrality (degree of interaction of the research topic with other research topics) and rank density (internal strength of the research topics) are important analyses for establishing the semantic field of a given subject. The semantic field

Table 4 Most cited works globally and locally

Document	Year	Global citations	LC/GC ratio (%)	Normalized global citations
Hansen, M. T., Nohria, N., & Tierney, T. (2013). What's your strategy for managing knowledge? In *The knowledge management yearbook 2000–2001* (pp. 55–69). Routledge.	1999	1864	36.59	20.74
Davenport, T. H., De Long, D. W., & Beers, M. C. (1998). Successful knowledge management projects. *MIT Sloan management review*, *39*(2), 43.	1998	1285	41.71	15.38
Zack, M. H. (1999). Developing a knowledge strategy. *California management review*, *41*(3), 125–145.	1999	913	35.49	10.16
Wasko, M. M., & Faraj, S. (2005). Why should I share? Examining social capital and knowledge contribution in electronic networks of practice. *MIS quarterly*, 35–57.	2005	2452	12.15	61.22
Kankanhalli, A., Tan, B. C., & Wei, K. K. (2005). Contributing knowledge to electronic knowledge repositories: An empirical investigation. *MIS quarterly*, 113–143.	2005	1499	19.01	37.42
De Long, D. W., & Fahey, L. (2000). Diagnosing cultural barriers to knowledge management. *Academy of Management Perspectives*, *14*(4), 113–127.	2000	902	29.16	12.48
Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management science*, *49*(4), 571–582.	2003	1129	22.59	17.44
Earl, M. (2001). Knowledge management strategies: Toward a taxonomy. *Journal of management information systems*, *18*(1), 215–233.	2001	551	41.02	7.18
Wang, S., & Noe, R. A. (2010). Knowledge sharing: A review and directions for future research. *Human resource management review*, *20*(2), 115–131.	2010	1311	16.70	43.38
McDermott, R. (1999). Why information technology inspired but cannot deliver knowledge management. *California management review*, *41*(4), 103–117.	1999	454	45.59	5.05
Varun Grover, T. H. D. (2001). General perspectives on knowledge management: Fostering a research agenda. *Journal of management information systems*, *18*(1), 5–21.	2001	449	40.98	5.85
Wong, K. Y. (2005). Critical success factors for implementing knowledge management in small and medium enterprises. *Industrial management & data systems*, *105*(3), 261–279.	2005	472	37.29	11.78

(continued)

Table 4 (continued)

Document	Year	Global citations	LC/GC ratio (%)	Normalized global citations
Hedlund, G. (1994). A model of knowledge management and the N-form corporation. *Strategic management journal*, *15*(S2), 73–90.	1994	773	22.25	3.97
Zack, M., McKeen, J., & Singh, S. (2009). Knowledge management and organizational performance: An exploratory analysis. *Journal of knowledge management*.	2009	345	48.12	13.61
Markus, L. M. (2001). Toward a theory of knowledge reuse: Types of knowledge reuse situations and factors in reuse success. *Journal of management information systems*, *18*(1), 57–93.	2001	492	33.54	6.41
Chen, C. J., & Huang, J. W. (2009). Strategic human resource practices and innovation performance—The mediating role of knowledge management capacity. *Journal of business research*, *62*(1), 104–114.	2009	712	22.75	28.09
Lee, K. C., Lee, S., & Kang, I. W. (2005). KMPI: Measuring knowledge management performance. *Information & management*, *42*(3), 469–482.	2005	297	50.84	7.42
Kulkarni, U. R., Ravindran, S., & Freeze, R. (2006). A knowledge management success model: Theoretical development and empirical validation. *Journal of management information systems*, *23*(3), 309–347.	2006	363	41.32	10.14
Choi, B., & Lee, H. (2003). An empirical investigation of KM styles and their effect on corporate performance. *Information & Management*, *40*(5), 403–417.	2003	344	42.73	5.31
Tanriverdi, H. (2005). Information technology relatedness, knowledge management capability, and performance of multibusiness firms. *MIS quarterly*, 311–334.	2005	443	32.51	11.06

Source: Own elaboration

used in Knowledge Management is organized into six main groups, namely: culture, design, firms, framework, information, intellectual capital, knowledge managemer, knowledge sharing, management, networks, organization, system, technology (Cluster 1); antecedents, capabilities, capability, firm performance, impact, integration, knowledge management, mediating role, organizational performance (Cluster 2); absorptive capacity, creation, firm, innovation, knowledge creation, knowledge transfer, organizational knowledge, performance, strategy, tacit knowledge (Cluster 3); competitive advantage, dynamic capabilities, information technology, knowledge managemer, knowledge management system, organizations, perspective, project management (Cluster 4); critical success factors, information technology,

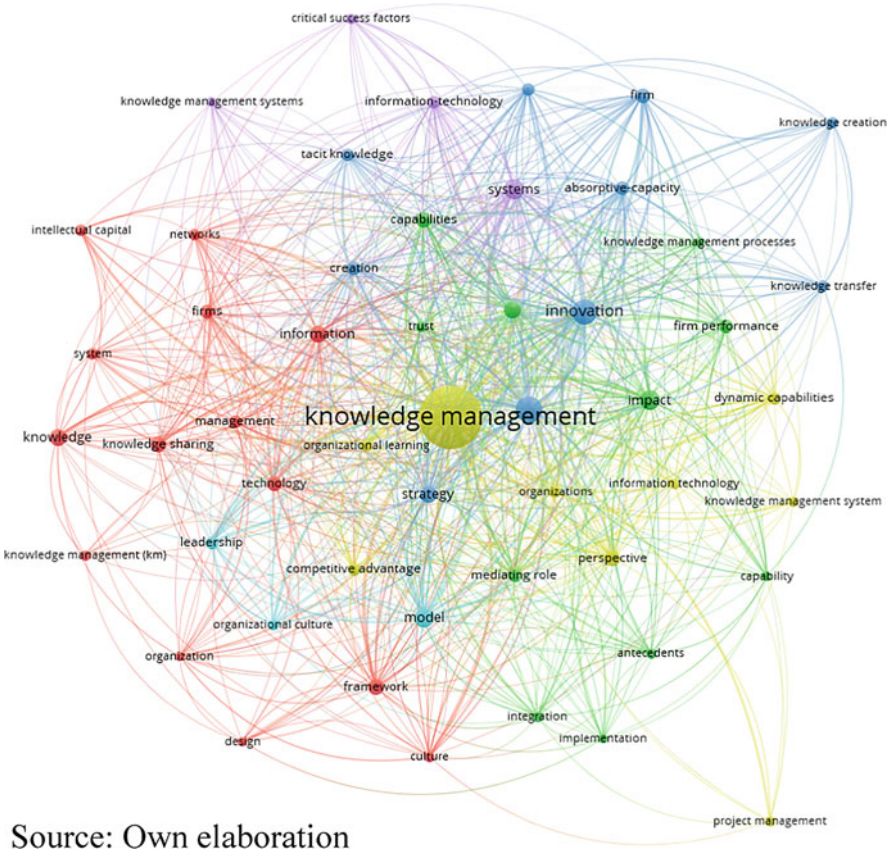


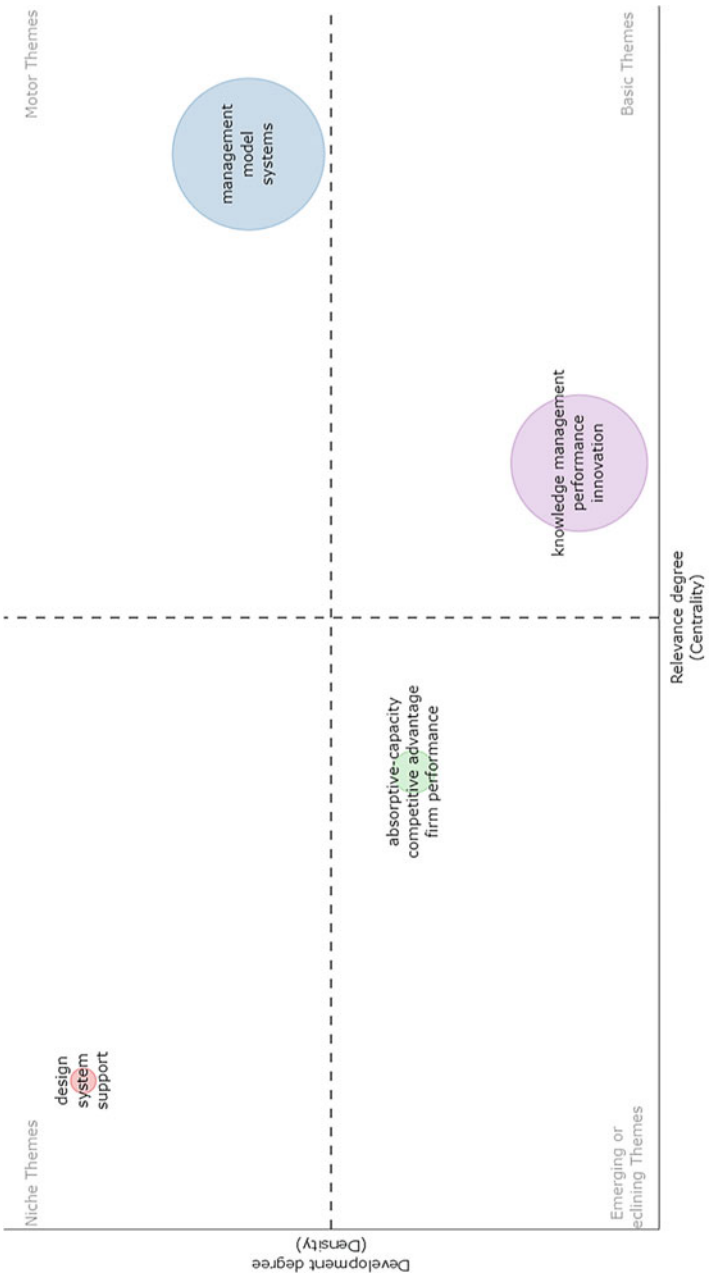
Fig. 4 Cluster of keywords. Source: Own elaboration

knowledge managemer, systems (Cluster 5); and leadership, model, organizational culture (Cluster 6) (Fig. 4).

Deepening in the semantic field we can observe different themes within Knowledge Management. The design of support systems is a peripheral theme, performance capacity is an emerging theme, and innovation in Knowledge Management is a transversal theme (Fig. 5).

5 Discussion

Our analysis provides an overview of existing scientific research in the field of knowledge management from 1974 to 2022, related to publications retrieved from the Web of Science (WOS) database. It is possible to affirm that *managing knowledge* is a field that is increasingly under construction. However, managing



Source: Own elaboration

Fig. 5 Cluster of themes. Source: Own elaboration

knowledge has developed unevenly over time and its development has taken place without the support of schools or theoretical-methodological currents, which has hindered its consolidation.

When crossing the different descriptors used in this analysis, we realize that production and impact do not necessarily coincide as far as authors and scientific communication structures are concerned. A clear case is that the most popular scientific article on the topic (*"What's your strategy for managing knowledge?* Why should I share? Examining social capital and knowledge contribution in electronic networks of practice," by Wasko & Faraj, 2005) was not published by authors with the highest impact nor hosted in the most prolific journals.

In this line, it can be observed that the journal with more research on this topic is the *Journal of Knowledge Management* (643 papers), followed by *Knowledge Management Research and Practice* (332 papers) and *Expert Systems with Applications* (217 papers). However, these journals do not systematically host the publications with the highest impact or written by the most influential authors (e.g., Bontis with 41 papers).

These findings suggest that there is a certain incapacity to generate a harmonious and integrated field of study in terms of authorship, structures of scientific communication, and impact on the community interested in this field, which may also be related to the fact that this field of study is being shaped around a fragile object of interest.

Furthermore, this study highlights the three most cited studies on this topic. The first paper is "Why should I share? Examining social capital and knowledge contribution in electronic networks of practice," developed by, the second one is "What's your strategy for managing knowledge? developed by Hansen et al. (1999) with 2452 quotations. The third paper is "Knowledge sharing: A review and directions for future research" by Wang and Noe (2010), with 1311 quotations. Finally, the fourth paper is "Contributing knowledge to electronic knowledge repositories: An empirical investigation," developed by Kankanhalli et al. (2005), with 1499 quotations.

6 Conclusion and Limitations

These publications show the main tensions in this field of study and how research interests have varied over time, which allows the identification of a series of stages. The first stage lasted until the early 1990s and was mainly concerned with managerial and technocentric processes, which sought to identify, codify, and store employees' knowledge. This first stage is a moment of proto-development in which the construction of the field of Knowledge Management is accompanied by an unusual production of structures (forums, research centers, dissemination platforms, etc.) that allow for an intense and accelerated development of the subject area (Grant et al., 2011) as well as an almost permanent contact with other social arenas, especially business (Alajmi & Alhaji, 2018). However, the main characteristic of this stage is that practically all research of this stage was carried out behind the back of

the academic world, an issue that was to continue until nearly the end of the twentieth century (Serenko & Bontis, 2013).

The second stage covers the last decade of the twentieth century and focuses on the value of human capital, the different mechanisms of knowledge transformation (from tacit to explicit), the organizational resources of the so-called intellectual capital, as well as neo-institutional elements such as organizational culture and leadership in relation to Knowledge Management. At this stage, the production of concepts that will later have a long trajectory in the field of study will be particularly important. Clear examples are "intellectual capital" (Nonaka & Takeuchi, 1995; Davenport & Prusak, 1998) or "knowledge assets" (Boisot,1999), as well as the legitimization of these terms through the endorsement of influential institutions such as the OECD by incorporating them into their acquis or the emergence of powerful dissemination mechanisms such as the *Journal of Knowledge Management*, launched in 1997, or the *Journal of Information & Knowledge Management*, launched in 2002 (Alajmi & Alhaji, 2018).

The third stage has developed to the present day and pays more attention to processes related to learning or the production of new ideas. At the same time, at this stage there is a growing interest in the evaluation of impacts related to knowledge management, both from a micro and macro perspective, and its implications for the generation of value in organizations and territories. This is the stage when there is a production marked especially by an interest in questions with a clear neo-institutionalist orientation, such as the relationship between knowledge management and organizational culture, objectives, or participation in networks by the protagonist entities.

In parallel, but much later, there is also a certain interest in carrying out systematizations to validate practices, methods, and technologies related to Knowledge Management.

The fourth stage, contemporary to the present time, focuses on an epistemological revision of knowledge, especially from the paradigm of complexity, and how to make it more understandable in an increasingly diverse society.

This study has some limitations. First, many Knowledge Management publications may appear in journals that are not indexed and therefore not available in the WOS database. Second, citations often measure the impact of an article in quantitative terms, although this does not always correlate with the actual quality of the work. The fact that an author is important or relevant may encourage others to cite that author without gaining critical and significant insight (Albort-Morant & Ribeiro-Soriano, 2016). Third, the results provide a complete picture, these results may change over time, especially for new releases that have not grown significantly. After all, research is done in a specific specialization: business administration, public administration, and economics. Researchers should therefore be careful about generalizing their conclusions.

The implications for future research are clear. Since the first research was published, there has been a trend to examine the role of knowledge management in improving organizational performance. However, recent work has focused on more topical issues of human resources, environment, marketing, technology, the

role of entrepreneurship, and the management of multinational corporations (Zhao et al., 2022; Lei et al., 2021; Wahab et al., 2021). Other articles discuss the complementarity between knowledge management and supply chain management.

Finally, it is important to note that bibliometric studies are not only used to measure the impact of research but can also be used to identify blind spots in the literature and to provide a comprehensive overview of the state of the art of a field. In this way, the results of bibliometric studies can help to inform research agendas and guide future research.

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Historical Root of Knowledge Management: A Bibliographic Review

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Abstract The aim of this chapter is to analyse the historical root of knowledge management from 1930 to 2020 through a systematic review of the international academic literature. The research work consisted of a systematic review that involved the analysis of articles that presented both theoretical and empirical research results. The research was performed from 1930 to 2020 on the Web of Science databases. We conclude that despite the environmental awareness and knowledge that exists about this concept, it has not yet reached a sufficiently comprehensive level to apply it. Therefore, it is necessary to introduce certain variables such as the generation and use of information as well as the formation of human capital in this regard. A compilation of recent works was made to identify how knowledge management affects the enterprises that currently face serious problems in this domain, aggravated by the COVID-19 pandemic, and to generate a contribution to the state of the art and the subject knowledge gaps in the subject. The major limitation of this paper is the lack of access to the content of articles located in databases such as Web of Science.

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_4

Keywords Knowledge management · History · Human capital · Bibliographic review

1 Introduction

For Ting (2017), the fierce competition between companies for customers has generated various challenges for these companies, loss of customers being one of the most significant challenges for the administrators of such organisations. Another problem that has repercussions on the previous challenge is how to face the continuous changes in the market trends. Knowledge Management (KM) has become a primary key for creating value for the customer (Ipe, 2003; Hooff & Huysman, 2009), and this has led to the consideration of knowledge as a strategic source of competitiveness. For organisations to implement and make full use of knowledge management, they must have a clear understanding of how it is formed, disseminated and applied within companies. Carrion et al. (2016) stated that it is insufficient for organisations to maintain themselves competitively with only valuable resources, but that they must know how to manage them effectively.

Since its inception, the discipline of knowledge management has undergone a significant evolution, starting out strong at first and presenting a solid development later. After World War II, some companies began to develop a series of strategies to improve their production based on learning from experience (Pérez, 2016). These strategies have their maximum theoretical expression in the work of the economist, Kenneth Arrow, in 1962, and some authors (Prusak, 2001; Senge, 1990) have seen in these strategies a clear intellectual background of the knowledge management movement (Pérez, 2016; Valeri, 2021).

For Villasana et al. (2021), since its inception, knowledge management has always been the most interesting field for academics and professionals and is seen as a hope for improvement within the organisation. However, one of the challenges of knowledge management is how to manage it from the process of creation, exchange, combination and application of knowledge to clarify and enhance the organisational process.

Some individuals believe that knowledge management is indispensable due to increasing globalisation, the speed of information and knowledge, the dynamics of innovation in products and processes as well as the environmental changes caused by market competition (Greiner et al., 2007). Knowledge management is dedicated to helping companies become faster, more efficient and innovative than their peers and competitors. In addition, the field deals with the interaction between the organisation and the environment as well as the response capacity and actions of the organisation (Macharzina, 1999; Greiner et al., 2007). Among the basic elements of an organisation, knowledge is considered an important resource that aids in value creation (Barney, 1991; Greiner et al., 2007; Valeri & Baggio, 2022).

Villasana et al. (2021) pointed out that knowledge management has made a great contribution to the creation of competitive advantages in knowledge-based organisations. The creation, exchange, combination and application of information is not

only related to teaching and learning but also addresses the organisation through management systems to better operate and respond to internal and external needs, thus improving the efficiency of processes and services.

These same authors pointed out that the importance of knowledge management highlights that globalisation is a challenge to test organisational knowledge. The use of technical tools is essential for the normal functioning of an organisation; however, the main challenge remains how to transform talent into the organisation's knowledge heritage. In order to optimise the process of decision-making, operation, strategy execution and goal realisation such that the knowledge in people's minds can be transformed from implicit to explicit and make applicable in their respective organisations.

2 Literature Review

Cayeux (1964), Toffler (1999), Valdes (2002) and Huntington (2001) agree in stating that the history of humanity is made up of three great cycles, which are a kind of curves in time with a beginning and one end. The first period, known as the agricultural age, was extensively long—lasting more than 10,000 years—and had few discoveries. The second stage, known as the industrial age, was five times shorter than its predecessor; nevertheless, countless discoveries were made in this era that radically changed the life of humanity.

In the first two periods, events occurred somewhat slowly in such a way that man had enough time to get used to the changes that each discovery or advancement gave him. The third stage began in the 1980s, and with globalisation, the information and knowledge society arrived. This new era is characterised by high volatility in the environment, uncertainty, and constant changes in the markets as well as voracious competitiveness in addition to having an impressive number of discoveries that radically changed the way of living of individuals (Huntington, 2001).

In this regard, Yeung et al. (2000) comment that with the installation of globalisation, the era of information and knowledge began, which generated great changes in the environment, and for this reason, it was necessary to forge other types of organisations that can respond to a changing and volatile environment. The changes registered from this new era are so profound that they modified the way of conceiving life in society, as Toffler (1999) points out. Today's environment is complex and unpredictable, which forces companies to develop strategies that allow them to face the adversities and challenges that the environment imposes on them and survive despite this (Khunsoonthornkit & Panjakajornsak, 2018).

Gómez Romero (2008) argues that the use of knowledge as the new source of wealth production completely modified the structure of society and, consequently, of organisations, from which the importance of studying and deepening the issue of knowledge management can be deduced. Organisationally—as Nakash and Bouhnik (2021), Drucker (1994) and Toffler (1999) maintain—knowledge is an important principle of power, and whoever manages to generate it in the best way will have an

excellent opportunity to remain and succeed in a globalised society. The foregoing makes sense when one reflects on what was mentioned by Wu and Chen (2014) and Edmonson (2010) when they argued that knowledge management should be one of the core strategies of organisations, since organisational knowledge will facilitate the generation of processes, innovative manufacturing and commercial processes that will result in better organisational performance and better competitiveness.

Apparently, knowledge management is a relatively new concept; however, knowledge as such is as old as the appearance of the human being on the globe. Nonaka and Takeuchi (2000) argue that the only being capable of learning is the human being, and he learns when he apprehends—that is, when he captures knowledge of the environment and incorporates it into his personal experience—and if this allows him to perform the actions he desires in a better way, then it becomes knowledge that will improve his actions. Knowledge gives human beings the ability to act and elucidate information from the environment to forge new knowledge, thereby solving a particular problem (Rubier Valdés, 2019).

Beginning from the principle that the human being is the only one capable of generating knowledge (Nonaka, 1991), and that knowledge originates in the minds of human beings, in a complementary way, organisational knowledge is produced when its members share beliefs and interact to work. Overall, as Rubier Valdés (2019) states, the foregoing allows us to infer that learning, when shared among the members of an organisation, necessarily generates new knowledge, which, if properly worked upon, can constitute the detonation of competitive advantage (Ali et al., 2020).

All organisations generate organisational knowledge to a greater or lesser extent, whether they are aware of it. What is important is that they know how they generate it, and that they reflect on what and how they can use it, from which the importance of organisational knowledge management—according to Milla Calderon et al. (2018)—is nothing more than converting environmental data into information and then into knowledge that doubtless improves the quantity and quality of what is offered and/or occurs.

To better understand knowledge management, how knowledge is generated and its implications in the life of organisations, theorists have sought to express it through models, among which the most representative is the one proposed by Nonaka and Takeuchi (1995)—known as the spiral of organisational knowledge—in which they explain that there are three types of knowledge in organisations: the tacit (which is found in each and every one of the individuals, but which is difficult to express and/or represent), explicit (which occurs when tactical knowledge is shared and socialised with the community), and cultural knowledge (occurs when members of an organisation share knowledge on a daily basis to solve problems and improve organisational performance).

Andersen (1999) presents an interesting consulting model that he calls KMAT, which is a tool that diagnoses organisational knowledge management from the areas of leadership, culture, technology, and process measurement. The purpose of this proposal is that the management of the organisation can conceive, and outline strategies based on knowledge that is generated in the organisation. Tejedor and

Aguirre (1998) present the KPMG Consulting Knowledge Management Model that seeks, among other things, to increase creativity, improve innovation capacity and help companies generate a competitive advantage and increase the production of all knowledge.

Blanco et al. (2017) are more visionary. They present knowledge management in Industry 4.0 and anticipate the metamorphosis of technologies and how organisations will migrate to big data in the short term, the development of robotics, simulation as well as the horizontal and vertical integration of its systems, the care of cybersecurity and augmented reality, all in a bid to achieve an assertive response to the increasingly volatile demands of a demanding environment.

Yeung et al. (2000) present the model of learning organisations based on three foundations. The first to be named generate ideas with impact, depending on one of the four learning styles (experimenter used by innovative organisations. The acquisition of competencies typical of companies that, based on what they have experienced, are going to modifying reference marks or benchmarking used by entities that seek to imitate the leader in their area of work to avoid wear and tear and complications Continuous improvements, based as its name says on improving little by little what is known, to avoid failures.). The second foundation is to generalise ideas with impact. They recognise that one of the deepest problems of organisations lies in deficient organisational communication, which ends up being an endemic evil that prevents organisational knowledge from spreading freely throughout the organisation, and inhibiting such knowledge is culturalised (Nonaka & Takeuchi, 1995).

The third foundation consists of identifying learning disabilities based on the principle that all organisations generate organisational knowledge, but that there are barriers or learning disabilities that prevent knowledge from being generated and/or generalised, that disabilities are a kind of silent disease that afflicts and damage all organisations and that they are difficult to identify (Gómez-Osorio & Gómez-Romero, 2018). For this, Yeung et al. (2000) identify seven disabilities that are somewhat like those presented by Senge (1990), and the first four disabilities (blindness, naivety, homogeneity, close coupling) prevent the generation of knowledge, while the remaining three (paralysis, learning of superstitions and poor dissemination) prevent the generalisation of knowledge.

Upon reaching this moment, it must be recognised that only knowledge management recognises the human being as the most important part of its administrative theory. In addition to giving knowledge management the value that other approaches denied it under the pretext of competitiveness from its inception, Penrose (1959) and Barney (1991) recognised and based the capacities of the human being on the generation of knowledge. Today, it is known that the knowledge of an organisation is in its procedures—in the rules—however, above all, this knowledge resides in the human being who generates and applies it to solve problems (Villasana et al., 2021).

In such a way that knowledge management was the most important component for achieving success in an organisation and its permanence in the labour markets (Ting & Colin, 2017), it should be considered that getting organisational learning to be generated is not easy, since there are countless organisations that do not achieve it due to challenges with coordination between workers (Martínez Aragón & Aguilar

Morales, 2022). Conversely, Zhu et al. (2018) believe that an organisation's organisational performance will improve to the extent that knowledge generation is achieved, giving adequate dividends and returns, since organisational knowledge is intimately linked to the creativity and innovation of an organisation (Lee & Choi, 2003).

Wittke (2020) comments that without a doubt, knowledge has now become the most important intangible asset for the competitiveness and sustainable development of organisations, and that an organisation without a culture of knowledge will undoubtedly fail, since the generation of organisational knowledge will be difficult. In addition to everything discussed so far, it is worth noting the role played by leaders and the influence they exert on their subordinates in generating organisational knowledge. If the leader has a vision and understands the importance of organisational knowledge and its importance in the fulfilment of organisational objectives, the organisation will better achieve its objectives and be better positioned in the mind of the consumer (Ponce Telles & Gómez Romero, 2022).

3 Methodology

The study method used in this chapter is the narrative method, which reveals the current state of the literature on the historical roots of KM in the context of companies. Transfield et al. (2003) point out that the definition of the research question will drive the review process. A literature review aims to impartially transmit current knowledge on a subject and summarise what has been researched in the state of the art to offer the reader updated, accurate and complete information. This leads to a better understanding and a complete vision of the topic addressed, in addition to helping to identify gaps in the literature (Green et al., 2006; Pautasso, 2019).

The orientation used to conduct a literature review depends on the research question. A systematic review of the literature is appropriate when a precise answer is needed, rather than a general approach, while a narrative approach is more appropriate when what is sought is the current state of the art on a specific topic (Grant & Booth, 2009).

In the case of this bibliographical review, the narrative orientation was applied to fulfil the main objective of the study, since this approach allows for analysis, summary and express transmission of the state of the historical roots of KM in companies. It combines the different elements that lead to a broader perspective of the subject (Slavin, 1998; Pautasso, 2019).

Drafting and formalising a protocol increases the objectivity of the information review process by offering a detailed description of the procedure developed to pose the research question, study sample, information obtained and exclusion criteria (Transfield et al., 2003). Table 1 indicates the protocol developed for this research.

To have a global vision of the historical origin of KM in the context of companies, the Web of Science (WOS) database was used as a search engine to examine the

Table 1 Narrative literature review protocol

Phase	Description
1	Definition of the purpose of the literature review
2	Identification of the elements of the investigation
	Definition of the source of information
	Definition of keywords and search terms
	Definition of the research period
3	Search and refinement
	Search Engine: Web of Science (WOS)
	Search by topic
	Use of specific keywords
	Selection of all years in the review period
4	Selection criteria
	Establishment of inclusion and exclusion criteria
5	Evaluation
	Review of title and abstract of articles
	Complete analysis

Source: Rodríguez et al. (2022)

articles. Subsequently, the articles defined by the following words were selected: 'Knowledge Management' + 'Historical Roots', 'Knowledge Management' + 'Companies', 'Knowledge Exchange', 'Knowledge Transfer', 'Knowledge Creation' + 'Intellectual Capital' + 'Organisations', 'Organisational Culture', 'Social Capital', leaving without limitations the quality of the magazine, considering the novelty of the topic to be dealt with.

Based on the research protocol, the inclusion criteria are that the articles are found only in the commercial filter. A narrative review, such as that by Green et al. (2006), involves a detailed evaluation of the literature, which motivates readers to reflect and leads to a full understanding of a particular phenomenon (Duke & Bennet, 2010). A total of 1434 sample documents were obtained. To achieve the objective, an in-depth content analysis was carried out on a final sample of 1133 documents, and the review period was from 1930 to 2020.

4 Results

Based on the systematic review carried out, it was identified that since 1934, there has been information on publications on topics related to KM, according to Akbar and Mokhtarpour (2016). These authors point out that in 1934, Joseph Schumpeter emphasised the importance of the economic development cycle and how it is affected by internal and external factors. According to Akbar and Mokhtarpour (2016), Schumpeter pointed out that innovation under a risk approach generated growth and, at the same time, allowed the development of a system in various sectors of society. For Schumpeter, the most important factor in a company was innovation.

For Akbar and Mokhtarpour (2016), in 1949, another important author of the origin of KM is presented—the philosopher Gilbert Ryle—who in his work, 'The concept of the mental', affirmed that thought and other attributions of mental states are a special type of action and could be described just like the behaviour of other aspects of the body, without the need for a mysterious entity hidden within it. The main purpose of Ryle's work was to reform the state of knowledge that was previously marked in the minds of human beings.

For these same authors, Akbar and Mokhtarpour (2016), 1974 is another important year in the development of KM because in this year, Friedrich Hayek, who won the Nobel Prize in Economics, recognised that the knowledge that is needed in companies is neither consolidated nor centralised, and that the economic system is explained by individual actions that in his opinion are rational. His work is summarised in the term *spontaneous order*, and it is based on the simple principle that all individuals have a role in society and that exercising it freely results in the creation of wealth. In this spontaneous order, the people involved in the hundreds of thousands of production processes in the world may sometimes not be aware of what they are creating, although they still collaborate freely to do it without the need for a centralised order. The knowledge of the human being is finite and, in many cases, very limited: no person can know and understand all the social processes that occur spontaneously in the world and that have consequences in their daily lives.

Jasimuddin (2006) mentions Peter Drucker, Laurence Prusak and Chris Argyris as the main proponents of KM in companies. For this author, in 1980, the concepts of knowledge engineering, knowledge-based systems, and computer-based ontologies were created, which were the precursors of the term KM.

For Edwards et al. (2009), in the 1980s in the United States of North America, various companies considered some of the most important in that country were investigating how to concentrate the knowledge of their human capital. It was at that time that Karl Wiig applied the term KM to a group for the first time. These same authors mention that at the end of the 1980s, multiple advisory and business consulting firms incorporated KM into their catalogue of professional services.

Knowledge management was consolidated in organisations in the 1990s, and since then, the concept has been developing in companies and senior managers are becoming convinced that it should be made known within companies as it is generated. The top management of organisations incorporates into their language KM issues related to the fact that knowledge is the most important asset in a company, or that it is a generator of competitive advantages. The terms knowledge workers and knowledge empowerment have become commonplace in companies. In this same decade, conferences on KM were offered all over the world (Farfán & Garzón, 2006).

In the twenty-first century, it has been mentioned that a knowledge-based economy requires a strong investment in human resources and highly developed technology, so that the said knowledge can be processed and transmitted. Knowledge comes from the people who make up the organisation; hence, human capital is the key to KM. Thus, a central element of knowledge societies is the ability to identify, produce, treat, transform, disseminate and use information with a view to create and

Table 2 Language of publications related to knowledge management from 1930 to 2020

Language	Records	Percentage
English	984	87
Spanish	108	10
Portuguese	24	2
Catalan	2	1
German	2	
Indonesian	2	
Rumanian	2	
Bosnia	1	
Croatia	1	
French	1	
Italian	1	
Polish	1	
Russian	1	
Swedish	1	
Turkish	1	
Ukrainian	1	
Total	1133	100

Source: Own elaboration

apply the knowledge necessary for human development and to contribute to the fulfilment of institutional objectives. In addition, the incorporation of knowledge management contributes to transforming information and knowledge into an asset for management in public administration, to which elements such as innovation, creativity, learning, productivity and work are added and shared. Knowledge constitutes one of the key intangible assets for institutions. However, the mere possession of knowledge, however, valuable it may be, is not a guarantee. Thus, it is necessary to efficiently manage knowledge, which implies the development of different activities and attitudes that promote the identification, generation, transformation, conservation and application of knowledge (Public Function Secretary, 2018).

There were 1133 KM research-related publications in 16 languages. The main languages included English (87%), Spanish (10%), Portuguese (2%) and others with the 1% in total (Catalan, German, Indonesian, Romanian and so on), see Table 2. Data analysis revealed that English was the dominant language in KM research.

Table 3 indicates the number of product publications beginning in 1930 until 2020. The decade from 2010 to 2020 is that in which the largest number of products related to KM are published.

In the period with the highest number of publications on the subject, 2020 was the year with the highest number of published products (see Table 4). Of the 669 products, 135 were issued in 2020.

The main categories in which the publications were made from 1930 to 2020 in web of science are those of the business area, computer science and clinical medicine (see Table 5).

Table 3 Number of publications for the period analysed from 1930 to 2020

Period	Records	Percentage
1930–1970	3	0
1970–1980	14	1
1980–1990	43	4
1990–2000	105	9
2000–2010	298	26
2010–2020	669	59
Total	1133	100

Source: Own elaboration

Table 4 Number of publications in the decade from 2011 to 2020

Year	Records	Percentage
2011	42	6
2012	46	7
2013	52	8
2014	56	8
2015	60	9
2016	64	10
2017	64	10
2018	72	11
2019	78	12
2020	135	20
Total	669	100

Source: Own elaboration

Table 5 Main categories in which the publications were made from 1930 to 2020

Categories	Records	Percentage
Economics & Business	639	56
Computer Science	216	19
Clinical Medicine	165	15
Education	82	7
Others	31	4
Total	1133	100

Source: Own elaboration

Of the 639 publications in the economics and business area, 426 come from 10 journals (see Table 6).

Of the reviewed publications, fifty (50) percent of the 1133 publications come from England (321) and the United States (250), while the rest (562) come from 64 different countries. Of the 1133 published studies, 561 were quantitative, 372 qualitative and 200 mixed. Of the 1133 products, 23% were produced by one author, 27% by two authors, 33% by three authors and the complement by four or more.

Table 6 10 Top journals in the area of economics and business

Journal	Records	Percentage
International Journal of Knowledge Management	85	20
International Journal of Knowledge Management Studies	77	18
Knowledge and Process Management	55	13
Management & Marketing-Challenges for the Knowledge Society	47	11
Journal of Innovation & Knowledge	43	10
Academy of Management Annals	30	7
Academy of Management Discoveries	30	7
Academy of Management Journal	26	6
Academy of Management Learning & Education	21	5
Academy of Management Perspectives	13	3
Total	426	100

Source: Own elaboration

5 Conclusions

The main detonators in the appearance of knowledge management (KM) as a discipline include globalisation, the generation of information and communication technologies and the vision of the organisation centred on knowledge. Managing knowledge means making the company learn every day and that—thanks to this learning—it is more competitive, produces better results, and is more efficient and effective; therefore, it has a greater competitive advantage.

As can be seen in the development of this work, the topic of KM has its historical roots from 1930, although the term as it is known today was formalised in the 1990s. This concept boomed from the year 2000, and from then, the publications began to be made in greater numbers, with the year 2020 being the year that contributed the most publications in the period from 1930 to 2020. England and the United States are the countries with the greatest number of publications, which coincides with the fact that the English language is mostly used in published products. The articles include the type of product most used by authors, and the area of economics and business has the greatest contribution to the topic of KM. The main journal with publications is the *International Journal of Knowledge Management*.

It is important to mention that KM currently implies the coordinated integration of human capital and information and communication technologies in organisations. In current times, it is one of the main factors in the generation of competitive advantages in companies, hence the importance of continuing to carry out studies and publications that allow us to delve into this important topic, especially in this post-pandemic era in which so much economic imbalance has been generated in the various economic sectors of the world.

Information technologies play an important role in KM, since they constitute a useful tool for storing, sharing and utilising knowledge with the aim of improving the quality of compliance and development of an organisation's mission. Furthermore, the culture which the employees belonging to an organisation possess should

not be left out, since it is key to the success to be achieved. KM is a key success factor for organisations of the twenty-first century. Therefore, driven by the strategic objectives of generating, sharing and innovating, KM practitioners use tools that allow for the extraction and application of an organisation's intangible resources.

The knowledge that peoples possess is of great value because it is considered an intangible asset in this era of knowledge and information. This knowledge becomes the capital of all organisations from which growth and greater productivity can be promoted. Therefore, it is important that an organisation takes advantage of such knowledge if they hope to maximise the potential for work and training of human resources, such as intellectual property, trademarks and contractual rights.

The industrial society has been replaced by the knowledge society. Not recognising this premise denies the reality of daily life.

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Fostering Organizational Image: the direct roles of Big Data Analytics, Radical Innovation, and Incremental Innovation Capabilities

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Abstract The aim of this chapter is to identify the impact of big data analytics, radical innovation capabilities, and incremental innovation capabilities on the organizational image of the Jordanian tourism sector, for this study's purposes, 305 questionnaires were analyzed. Convergent validity and discriminant validity tests were performed through Structural equation modelling in the Smart-PLS program. Data reliability was confirmed. A bootstrapping procedure was used to analyze the data. Empirical results showed accepted all hypotheses, the relationship between BDA, RIC, IIC and OI were positive and statistically significant. The predictive power is acceptable, meanwhile the regression model is efficient. This study has important implications for leaders in the Jordanian tourism sector in general, as the study highlights the importance of BDA, RIC, and IIC to enhance the organizational image.

Keywords Big data analytics capabilities · Radical innovation capabilities · Incremental innovation capabilities · Organizational image

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_5

1 Introduction

Data is arguably the most salient resource in the contemporary business setting. The overarching lucidity for this affirmation is that it can be analyzed to generate insights that achieve business objectives like efficiency, reduced operational costs, augmented customer experience, and increased sales. Nevertheless, unstructured data, which is epitomized by large amounts of data in different formats, presents an analysis challenge, yet it holds a huge potential for revolutionizing business operations. Big data analytics offers a suitable platform to address this challenge. It involves sophisticated complex applications with components like predictive models, statistical algorithms, and what-if techniques driven by analytic systems. Extant literature on the subject signposts that both radical and incremental innovation are largely responsible for a firm's competitive advantage against its rivals (Arnold & Palmatier, 2011; Valeri, 2021). This study is of paramount significance as it will help firms understand how they can focus their efforts on big data analytics to attain favorable business outcomes. The primary objective of this study is to ascertain the effect of big data analytics, radical and incremental innovation on organizational image.

2 Theoretical Framework and Hypothesis Development

Big data analytics capability (BDAC) is demarcated as the aptitude of a business to successfully deploy technology and skill to obtain, store, and analyze data geared to the generation of insight. On the other hand, organizational image denotes an individual's general perceptions regarding a company. Different stakeholders often have varying images of a similar company, contingent on their interactions and expectations (Beck et al., 2016). It is imperative for businesses to ensure that this image is good since having a bad one is very costly to change. BDAC is important for several reasons. First of all, it enables better decisions regarding all aspects of operations and marketing. For instance, it allows a company to get a comprehensive picture of its clients and can thus focus its adverts and promotions on the targeted audience without wasting much time and resources marketing to the wrong audience. Second, it augments the agility of a business (Coccia, 2017). Since the data obtained and analyzed is enormous, businesses can identify areas of improvement that other companies have not yet discovered. Subsequently, the firm will provide the client with appropriate solutions to solve their problems. Third, BDAC improves customer experience, resulting in a higher customer retention rate (Ferraris et al., 2018; Valeri & Baggio, 2022). Last but not least, BDAC improves the efficiency of a firm as it allows it to accentuate vital operations and embrace effective models.

2.1 Relationship between BDAC and Organizational Image

BDAC and organizational image have a mutually dependent relationship. This means that one affects the other and vice versa. As aforementioned, the organizational image entails what stakeholders and the public think of a business. When this image is good, people are comfortable engaging in business. Our brains are structured in a manner that likes to take shortcuts while processing information. Once a business creates the right organizational image, most clients will not even think before purchasing the item or service as they know they are getting the best value (Gupta & George, 2016). For instance, if clients are cognizant that they will receive fast, efficient service from the customer representatives of a particular company, they will seek the services from there. BDAC helps a company maintain a remarkable customer experience, thereby sustaining its organizational image. This is the same scenario with marketing. The target audience of a particular company may prefer specific platforms other than television and social media. Big data allows the company to know which specific platform their target audience is using, which could be video games and proceed to use product placement which will enable it to reach more audiences that need their products or services (Watson, 2014).

From the discussion in the literature in the above we proposed this hypothesis:

H_1: efficient BDAC enables an organization to attain and maintain a good organizational image

2.2 Relationship between BDAC, RIC (Radical Innovation Capabilities), and IIC (Incremental Innovation Capabilities)

Innovation denotes a novel approach, idea, or product. Ideally, it introduces a new efficient way of doing something that results in an enhanced product. Radical innovation refers to an innovation that rescinds or displaces a current model (Hariri et al., 2019). This innovation is exemplified by Netflix. When the company entered the market, it had a business model of mailing DVDs to clients. Radical innovation resulted in a new model whereby clients could access all the movies via the company's online platform. On the other hand, incremental innovation refers to a series of trivial improvements to current products or services that enable a firm to differentiate itself from its rivals (Kambatla et al., 2014). An illustration of this type of innovation is the changes introduced by phone companies such as Apple and Samsung when they release newer versions of current products.

BDAC has a positive effect on both radical and incremental innovation capabilities. The underlying rationale for this occurrence is grounded on the resource-based view theory, which suggests that a firm's aptitude to innovate depends on the firm's resources (LaValle et al., 2011).

Since big data leads to increased efficiency, it reduces the time taken to accomplish tasks. As a result, the firm saves a significant amount of time that can be used in the research process. Further, BDAC reduces operational costs, thereby enabling a firm to obtain increased revenues. Time and financial resources are vital in the research process, which ultimately leads to the invention of new features and products through incremental innovation or the introduction of new models through radical innovation (Mikalef et al., 2018).

One of the most salient risk factors for innovation is the lack of equilibrium between optimization and disruption. There are instances where incremental innovation should be preferred over radical and vice versa. Selecting the wrong type of innovation is largely caused by insufficient analytics and can be costly (Vassakis et al., 2018). BDAC addresses this challenge by allowing a firm to have adequate insight into the type of innovation that a firm should embrace.

From the discussion in the literature in the above we proposed this hypothesis:

H_2: BDAC has a positive impact on RIC and IIC

2.3 The relationship between RIC, IIC, and Organizational Image

Both types of innovation help foster an organization's image. The underlying rationale for this is that they increase a firm's brand awareness, thereby allowing it to obtain loyal clients. Once clients are aware that a firm produces high-quality products or services, they will practice repeat-purchasing behavior, which is highly vital for business success (Ohlhorst, 2012). Besides, RIC and IIC augment the agility of a firm. We live in a world where new trends come up every day, and clients have an increased desire for convenience. When a business addresses this concern by clients, their brand loyalty increases, and subsequently, they have a positive image of the firm.

In addition, radical and incremental innovation introduces changes that motivate the staff to stay with the company and not look for other challenging opportunities elsewhere (Wan et al., 2015). As a result, the company experiences a low employee turnover which is beneficial in the long run. Usually, competent and skilled employees are poached by other businesses as their productivity is high (Souto, 2015). Thus, when a company maintains its current employees, its organizational image is boosted as clients develop relationships with the business through the employees. Hence, this relationship is compromised when they are changed frequently, especially when the new ones do not get along well with the existing clients. Furthermore, motivated workers are the best source of innovative ideas (Sartore-Baldwin & Walker, 2011). This is because they interact with the clients more frequently than the management. Thus, they have ideas that are sourced from clients' opinions and complaints that can be exploited by the business to improve the current processes and products.

The consistent analysis of market trends is the aspect that triggers both types of innovation. This analytics enables a firm to obtain insight from all the stakeholders including clients, employees, and suppliers (Sheng & Chien, 2016). Moreover, it allows the business to know what the competitors are doing and thus keep up with the competition.

From the discussion in the literature in the above we proposed this hypothesis:

H_3: RIC and IIC have a directly proportional relationship with the organizational image.

3 Methodology

In this study, the quantitative approach was relied on in the process of data collection and analysis in order to know the impact of the capabilities of big data analytics and the radical and incremental innovative capabilities on the organizational image in the Jordanian tourism sector, where a random sample was used in the process of data collection, as 305 questionnaires were used in the analysis process.

3.1 Study Population and Sample

The study population included the Jordanian tourism sector, as the Jordanian tourism sector is considered one of the most influential economic sectors in the Jordanian gross national product (Al-Khatib & Valeri, 2022). The study sample consisted of workers in this field, as 305 questionnaires were collected through this sector and the table summarizes (1) Demographic and functional characteristics of the study sample members (Table 1).

4 Data Analysis Results

This study aims to know the direct effects that enhance the organizational image in the Jordanian tourism sector.

This methodology depends on the bootstrapping technique in the estimation process. First, the Measurement model is used to verify validity and reliability, and then the Structural Model is used to test the hypotheses (Hair et al., 2014).

Table 1 Distribution of sample members

Characteristics	Category	No.	%
Gender	Males	192	63%
	Females	113	37%
Age	Less than 30 years	98	32.1%
	30–40 years	90	29.5%
	41–50 years	89	29.2%
	51 years and above	29	9.2%
Education	Diploma and less	41	13.4%
	Bachelor	170	55.7%
	Master	57	18.7%
	PhD	37	12.1%
Job position	Manager	44	14.4%
	Administrative employee	83	27.2%
	Employee	178	58.4%
Total		305	100%

4.1 The Measurement Model

The Measurement model was confirmed by calculating the average variance extracted AVE and factor loadings values, as the AVE values should be greater than 0.50 and the FL values greater than 0.70. It is clear from Table 2 that these measures are validated for statistically acceptable values.

Reliability was checked by calculating Cronbach's alpha and composite reliability CR values, as the values should be greater than 0.70. Table 2 shows the achievement of these values.

Also, before performing the hypothesis test, it is necessary to check the Discriminant validity of the study variables, as the (Fornell and Larcker, 1981) test was used to verify this, as the square root of AVE must be greater than all other correlation coefficients.

Table 3 shows the fulfillment of these criteria in the study variables.

4.2 The Structural Model

The three hypotheses of the study were tested through a bootstrapping procedure using 5000 times (Hair et al., 2014), as this technique was considered a nonparametric statistical technique that gives new results in exploratory studies.

The predictive power of the model was acceptable and high, as the value of R2 reached (0.768) for OI, (0.517) for RIC, and (0.534) for IIC.

All hypotheses were supported as all direct relationships had a positive and statistically significant effect as the relationship of BDA with OI was ($\beta = 0.362$, $t = 6.281$, p-value $= 0.000$), the effect as the relationship of BDA with RIC was ($\beta = 0.719$, $t = 21.701$, p-value $= 0.000$), the effect as the relationship of BDA with

Table 2 Validity and reliability

Construct	Item	Factor loading	AVE	Composite reliability	Cronbach alpha
Big data analytics capabilities	BDA1	0.883	0.725	0.940	0.924
	BDA2	0.896			
	BDA3	0.855			
	BDA4	0.891			
	BDA5	0.853			
	BDA6	0.766			
Radical innovation capabilities	RIC1	0.743	0.700	0.921	0.892
	RIC2	0.817			
	RIC3	0.880			
	RIC4	0.885			
	RIC5	0.849			
Incremental innovation capabilities	IIC1	0.827	0.694	0.901	0.853
	IIC2	0.838			
	IIC3	0.860			
	IIC4	0.806			
Organizational image	OI1	0.749	0.660	0.931	0.914
	OI2	0.780			
	OI3	0.822			
	OI4	0.818			
	OI5	0.879			
	OI6	0.793			
	OI7	0.883			

Table 3. Discriminant validity

No.	Construct	1	2	3	4
1	BDA	**0.852**			
2	IIC	0.730	**0.833**		
3	RIC	0.811	0.781	**0.812**	
4	OI	0.719	0.620	0.746	**0.836**

IIC was ($\beta = 0.731$, $t = 20.934$, p-value $= 0.000$, and the effect of RIC on OI was positive ($\beta = 0.269$, $t = 4.572$), p-value $= 0.000$), and the third hypothesis that studies the effect of IIC on OI ($\beta = 0.348$, $t = 7.274$, p-value $= 0.000$) is also supported as shown in Table 4.

Fig. 1 shows the beta values of the study variables.

Table 4. Results of direct relationships

Path	Beta value	Std. Error	t-Statistic	*P*-Value	Result
BDAC⇒OI	0.362	0.058	6.281	0.000	Support
BDAC⇒ RIC	0.719	0.033	21.701	0.000	Support
BDAC⇒ IIC	0.731	0.035	20.934	0.000	Support
RIC ⇒ OI	0.269	0.062	4.355	0.000	Support
IIC ⇒ OI	0.350	0.047	7.379	0.000	Support

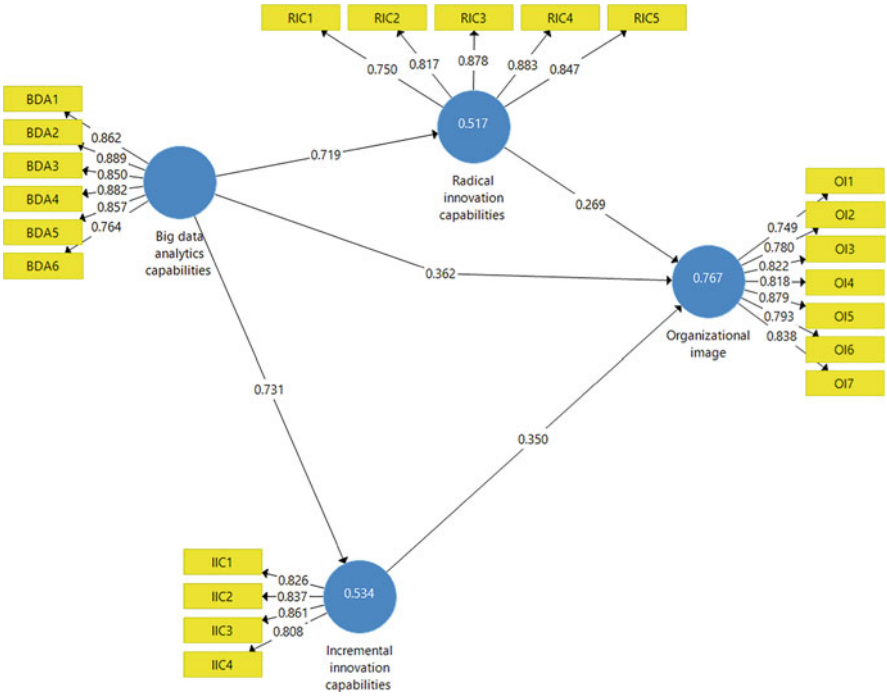

Fig. 1 SEM results

5 Discussion

This study aimed to identify the direct effects of each of the big data analytics capabilities, radical innovation capabilities, and incremental innovation capabilities on the organizational image in the Jordanian tourism sector.

The study reached a variety of results, the most important of which were:

1. The big data analytics capabilities had a positive, strong, and statistically significant impact on the organizational image, as big data analytics play a role in improving the image of the external and internal organization through the use of big data collected through customers or employees to come up with new

information that improves business efficiency in order to achieve competitive advantages (Al-Khatib, 2022a, 2022b). Also, these analyses work to enhance the organizations' knowledge of the market and thus improve the organization's image through more targeted advertisements to specific segments in the market. This improves the organization's ability to create customer satisfaction and thus improves the organizational image.

2. The results of the study confirmed a positive and strong impact of BDA on RIC and IIC, where big data analyses promote innovations by accessing new knowledge, information, and insights that did not exist previously that can generate new ideas that help enhance the level of innovation in these companies (Al-Khatib, 2022a, 2022b).
3. The study found that radical innovation capabilities and incremental innovation capabilities have a positive impact on the organizational image of the Jordanian tourism sector (Al-khatib and Al-ghanem, 2022). In addition, innovation, and in particular service innovation, makes workers more productive and thus enhances organizational activities, which enhances the improvement of the organization's image in front of its customers (Al-Khatib & Valeri, 2022).

6 Conclusion

6.1 Theoretical Implications

This study contributed to many theoretical implications, as it is considered one of the few studies that focus on the Jordanian tourism sector, which is considered one of the most important economic sectors in Jordan, in addition to being one of the most important tourism sectors in the Middle East.

This study also had an important contribution to understanding how big data analytics interact with innovation in enhancing the organizational image in this sector, thus bridging the research gap in the innovation literature in this regard.

6.2 Practical Implications

This study contributes to a set of recommendations and practical implications that may be useful to decision makers in the Jordanian tourism sector, as the results of the study concluded that there is an impact of big data analytics capabilities on the organizational image, as it is possible for managers of this sector to invest more money in building Infrastructure capable of exploiting big data to enhance the organizational image. This study also recommends the importance of training workers in this field on the latest applications related to big data analytics in order to enhance the reputation of the organization and improve its organizational capabilities, which works to improve its organizational image.

Second: The results of the study confirmed the existence of a statistically significant effect of radical innovation capabilities and incremental innovation capabilities on enhancing the organizational image in the Jordanian tourism sector, as innovation can work to provide new products and services that enhance the organization's competitive position, leading to achieving new competitive advantages. Therefore, the study recommends the importance of introducing new products to improve the company's reputation in front of its customers, and the study also recommends the need to exploit the innovations offered by organizations in making the organization more responsive to the requirements and needs of customers, which leads to strengthening the organizational image of these organizations in front of their customers.

6.3 Limitations

Although this study has reached an important set of results, it is like any scientific study, not without some limits. First: The study included the tourism sector without studying the sub-sectors in this sector such as hotels or restaurants, and therefore the results cannot be widely generalized. Second: The data was collected through the questionnaire, and other methods such as qualitative analysis and interviews were neglected, so it may be useful in the future to conduct qualitative studies through interviews. Third: The study was conducted in Jordan, which is within the Arab region. Therefore, this study calls for conducting surveys on different contexts and cultures. Fourth: This study calls for future studies focusing on new variables such as sustainability, green innovation, and the Internet of Things.

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Part II
Innovation Performance: Case Studies

Place Knowledge Management in Promoting Gastronomic Tourism and Regional Development: A Case Study Applied to the Lampreia Festival in Portugal

José Miguel Fernandes, Bruno Barbosa Sousa, and Ricardo Correia

Abstract In recent years, the management of the territory as a brand through the use of marketing tools hitherto used by companies has been gaining prominence. The importance of tourism as a driving force and driver of national, regional, and/or local economies is notorious. In view of the relevance of tourism, namely gastronomic tourism (in the dissemination and promotion of so many regions), the present chapter is strongly focused on this tourism segment. We consider adjusted, to perceive how the affectivity of the residents toward the local gastronomy, will be or are not determining factors in the valorization of the territories. In this study, it will be sought to understand the role of the local population (in particular, the population living in the municipality of Penafiel, i.e., Lamprey Festival) in the dynamization of this type of tourist. It is also sought to assess the degree of affectivity of the residents to the local gastronomy, in particular, with one of the delicacies present in the territory, the lamprey (i.e., perspective of tourism and hospitality). Research of a qualitative nature was carried out, namely through semistructured interviews and a focus group. The results show that the role of the residents is preponderant with regard to the success of gastronomic tourism in the territory in a logic of regional development. Specifically, the results seem to show a strong affectivity on the part of the residents, being that it can be used in the field of marketing of places and territorial communication. From an interdisciplinary perspective, the present study

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_6

presents inputs for marketing (of places), for tourism, and for local development (e.g., tourism or gastronomic events). In the end, some limitations of the study are presented and the next lines of research are outlined.

Keywords Gastronomic tourism · Local development · Festival · Destination branding

1 Introduction

Gastronomic tourism has assumed a preponderant role in many tourist destinations. Portugal is an excellent example, considering the diversity and gastronomic quality that it shows from the north to the south of the country. In this study, it is intended, therefore, to better understand the impact of tourism (gastronomy) in specific contexts (e.g., Lamprey Festival) and the role of residents in the development, growth, and promotion of these cultural events (e.g., Penafiel). As mentioned by Milheiro et al. (2018), with regard to impacts, the economic ones are more often positive, while the environmental ones are more associated with negative than positive consequences for the population, such as the degradation of the landscape, the garbage, pollution, among others. Given this evidence, it is very important to better understand the phenomenon of tourism as one of the main levers of economies. Hence the elaboration and development of this work, not only understanding tourism, but above all, one of the niches of tourism, such as gastronomic tourism in this case. According to Viveiros et al. (2018), in the case of gastronomy, people are willing to pay more for the added value offered by a gastronomic experience. In turn, it is thus a gateway to local culture, creativity, and landscapes. It is difficult, if not impossible, to approach tourism without considering its enogastronomic aspect (sometimes as the hallmark of a tourist destination). The role of gastronomic events will be, throughout this study, object of analysis and understanding. In this investigation, we will focus on the event "Festival da Lampreia" (i.e., context of study), understanding its reasons, foundation, evolution, objectives, and role of the residents (in terms of effectivity and symbolic and functional identity). It is intended, in parallel, to understand how the resident contributes to the promotional and economic leverage of the region. Events are very important for destinations because they attract more visitors, boost the local economy and can act as an engine for tourism development in that destination (Heliodoro, 2018; Valeri, 2022a). The aim is to understand the level of connection that Penafidelenses have with this gastronomic product, the lamprey, making it imperative to understand how they identify with the event, and how the degree of affection shown with this gastronomic product, if decisive evidence for the enhancement of the territory in the promotion of local gastronomic tourism.

2 Theoretical Background: Attachment Theory

The Feeling of Place is reflected in the relationship between people and places, in their multidimensional perception and in the emotional and symbolic values transmitted by places (Stefanovic, 1998). Therefore, in this symbiosis of feeling and place, man can transform places, but above all, he influences and lets himself be influenced by the geographic context in which he is inserted. For Proshansky (1978), the identity of place is a complex and multidimensional construction that comprises the dimensions of the self that define the individual's personal identity in relation to the physical environment, through a complex pattern of conscious and unconscious ideas, beliefs, preferences, feelings, values, goals, behavioral tendencies, and skills. Place attachment is the emotional connection that a given individual develops with a given place, being the result of experiences, relationships, and memories. It seems to us that, given this, there is not only an emotional link with geographical places, in the sense of belonging, as places may very well be able to shape our personality, tastes, and above all they can transform our perception of the world (Valeri, 2022b).

The place where we grew up is always equipped with something that history carries to the present day, which we usually call "our culture" and "our traditions." An interesting feature of the relationship between people and places is precisely the construction of meanings and senses that enable a transformation of spaces into places. It will be considered a place, only when we recognize it as ours, when the physical space starts to have an affective importance for us. While locations are encouraged to diversify their industries and target markets, each location has its own specific characteristics. These specificities can still be an important factor in your strategy as they can be used as your key factor in its recognition. It is in this particularity, the uniqueness of tourist destinations, that operators face the greatest challenges, proposing them to be able to offer a different tourist offer from the rest. In view of the development of the tourism sector, many stakeholders see the tourist place as a result of the constructive dynamics of the tourist destination (d'Orey, 2015).

3 Lamprey Festival in Penafiel (Portugal)

Penafiel is a Portuguese city in the Porto district, North region, and Tâmega sub-region, with about 15,711 inhabitants (2011 Census). Also, according to the Census (2011), it is the seat of a municipality with an area of 212.24 km^2 and 72,265 inhabitants subdivided into 28 parishes. The municipality is limited to the north by the municipality of Lousada, northeast by Amarante, east by Marco de Canaveses, south by Castelo de Paiva, and west by Gondomar and Paredes. In the following figure, we can identify the geographic location of the Municipality of Penafiel, on the map of mainland Portugal. It is especially in spring that Penafiel stands out for its intangible religious heritage, with singular and unique celebrations in the country

such as the Corpus Christi festivities, animating the urban center with the children's procession of Carneirinho, Cavalhada and the recovered craft balls, and, on Maundy Thursday, the celebration of Endoenças, lighting the night with thousands of candles at the mouth of the Tâmega (e.g., Festas do Corpo de Deus; Procession of Endoenças (Entre-os-Rios); Feast of Our Lady of Health (Bustelo); Pilgrimage of São Simão (Urró)). It is impossible to remain indifferent to the rich gastronomy of Penafiel, influenced by the religious and agricultural calendar that marks the seasons throughout the year. In addition to the great quality of its Vinho Verde wines, exported from here all over the world under the prestigious Quinta da Aveleda brand (e.g., Vinho Verde; Lampreia with rice or Bordaleza; Roasted lamb and lamb with oven rice; Bazulaque; Tortas de São Martinho; Love Cookies; Dry Soup; Oak Bark Melon).

Lampreys are aquatic beings, vertebrates without a jaw belonging to the Petromyzontiformes family (Renaud, 2011). The European river lamprey, *Lampetra fluviatilis* and the European Ribeiro lamprey, *Lampetra planeri*, Bloch (1784) apud Ferreira et al. (2013), are considered highly threatened in Portugal. This species is very commercially exploited, mainly in countries such as Spain, France and, particularly, in the central and northern regions of Portugal, where it is considered a great gastronomic specialty, due to its commercial value, reaching a unit price of up to 45–50 € (Almeida et al., 2000). The sea lamprey, to spawn, begins its migration through Portuguese rivers in mid-December, with the peak of migration occurring between February and April. Spawning takes place between May and June, depending on weather conditions (Almeida et al., 2000). In the following figure, and according to Ventura (2014), we present the lamprey life cycle.

The Lamprey Festival (FL) is a gastronomic event, organized by the CMP, aiming to promote one of the most renowned delicacies in the region. The lamprey has a very important historical significance in the municipality of Penafiel, for many years the exodus of people has been known to move me to the municipality of Penafiel, namely between January and April, to eat the lamprey. Taking advantage of this evidence, the CMP has promoted since 2008 the FL. This festival, which takes place in the southern part of the municipality of Penafiel, more precisely in Entre-os-Rios, between the River Douro and the River Tâmega, in the riverside area of the municipality. Alongside the FL, there is the Lamprey Route, which consists of a group of restaurants that adhere to this program, also with the support of the CMP, aiming to promote the cuisine of Penafiel, obviously associated with lamprey. The Lamprey Route occurs for a longer period of time, usually more than a month, and always coincides with the FL date.

When we visit the website of the municipality of Penafiel (2018), we come across the following text in the Visit Penafiel tab, where about gastronomy they say that no one is indifferent to Penafiel cuisine, which can be enjoyed at all times of the year, in any of the restaurants throughout the county. Lampreia (and Shad) continue to be highlighted, delicacies celebrated through the Lamprey Route, promoted by the Municipality every year in its time, especially made in the form of rice (in Entre-os-Rios) and Bordalesa.

They also mention that the lamb roasted in the oven and the Portuguese stew are worth noting and, in the sweets, the love cakes, the pies from S. Martinho, the Sopa

Seca and the Pão-de-Ló from Rio de Mills. Naturally, green wine is also king on the table in Penafidel, even if this council were not the most responsible for its production and export.

4 Preliminary Results

During this investigation, the importance of tourism in the local economic dynamics is evident. The creation and realization of events are valuable tools available to agents and stakeholders to vitalize, dynamize, promote, leverage, and enhance resources (natural or otherwise) in the surrounding territory. Politicians have the audacity and dexterity to be able to create and foster synergies in the territory they administer. Knowing how to do this, colliding the interests of the population with the interests of the territory, may not be easy, but knowing how to interpret the feelings of the population means having humility and sensitivity. The way they do it will be decisive for the success of event management.

The approach to tourism has had several implications for our society, including raising several questions that the author of this study was not indifferent to. The interest in this area has been refined from the moment that the researcher assumes functions in an autarchy in the municipality of Penafiel. The city of Penafiel has always shown a unique vivacity, and local politicians have been working on these opportunities to develop tourist attractions in the county. The number of events that have been created in Penafiel is clearly evident, and they involve various aspects, from taking advantage of the territory's exogenous resources, to creating unique events that can help to leverage economic synergies and increase the number of visitors to the region, county. Specifically, the lamprey festival was addressed, as a distinctive element of gastronomic nature and the territory's brand image.

Several questions were raised around its potential and competitive advantage in the territory. One of the main conclusions to be retained from this investigation is related to the intention of local mayors, in relation to what they intend with the realization of this event and their sui generis delicacy that sponsors and sets the tone for this festival, the lamprey. Upon identifying the opportunity, the Municipality takes advantage of a very specific delicacy and tries to work on its potential, opening it to a wider audience. In this way, there is the concern of politicians with responsibility in Penafiel, namely municipal responsibilities, in trying to promote this delicacy, with centuries-old traditions in the territory, namely in the south of the Penafiel county in the Entre-os-Rios area.

In the eyes of local mayors, the lamprey festival is of tremendous importance, it promotes the territory supported by the delicacy, but above all it gives residents the opportunity to enjoy a tasting menu for just 10 euros. This action, and with some investment from the Penafiel City Council, takes place with a desire to leverage the territory, in an area of the municipality with immense tourist potential. In the Entre-os-Rios area, many tour operators work today, given its great landscape potential, but not only that. Giving visibility to the territories, boosting local tourism and

promoting one of the oldest gastronomic products in the region, are the motto of the agents in Penafiel with the realization of the lamprey festival. They hope that the scope of these actions will encourage local economic synergies, boosting the economy in the municipality of Penafiel. Regarding the identity and affection for the lamprey and the lamprey festival, and from the analysis of the focus group, the biggest surprises for the author of this study emerge, the people of Penafidelenses do not nurture empathy with the festival or with the lamprey, even though they recognize the lamprey as being a local gastronomic product. They go even further, as considering an elite event, and for a very restricted group of people. This paradox, between the position of the Municipality of Penafiel and its officials, with the intention of bringing the delicacy closer to the population, ends up not having an effect on the people of Penafiel. Perhaps we will be talking about a lack of communication and promotional marketing of the event. Gorada that is the intention of the mayors, to believe in their positions and in the statements of the participants in the focus group. Even with the weight, the absence of identity and affection for the lamprey festival for the focus group, they ended up recognizing the lamprey's connection to the restricted Penafiel riverside area, in Entre-os-Rios. The only uniformity between the purpose of the Penafiel City Council and the participants in the focus group is the recognition of the economic return of the lamprey festival, as well as of all the promotional actions carried out by the municipality of Penafiel. They, the focus group, are even able throughout the debate to exemplify situations of return and economic impact of the lamprey festival in the region.

5 Final Considerations

So, more succinctly, and by answering the 3 questions raised for the purpose of this study, our three main conclusions emerge:

(i) The realization of the lamprey festival is very important for the region, both in the eyes of local authorities and in the eyes of the population, as well as any event that dynamizes the territory. The mayors list the promotion and visibility of Penafiel, the population highlights the dynamism of the council.

(ii) The economic impacts are truly recognized, both in the intention of local politicians, municipal agents, and by the population. Knowing that the economic impacts are reflected at the level of the local economy, and here we are closer to the riverside area of Entre-os-Rios, where the lamprey festival takes place. They are able to enumerate economic development factors, such as the increase in sales of the small fishing operator and lamprey trader, such as the increase in the volume of sales in restaurants, and the level of employment, at least during the weekend. Festival, several people are recruited to work on the lamprey festival.

(iii) When we mention the theme of affectivity, there is a strong lack of identity for the population, when the theme is the lamprey festival. Despite recognizing that

there may be identity and affection for people living in the Penafiel riverside area. Here, in our understanding, there are some conditions that may well contribute to the subtraction of this affectivity by the generality of the municipality's population. The fact that the lamprey is a very specific gastronomic product, with a very distinctive appearance and palate, the fact that the price is uninviting and the poor or ineffective communication produced by the local agents, promoters of the lamprey festival, make it on the part of the Penafidelenses, there is a clear distance and lack of identity with the event. So, more succinctly, and by answering the 3 questions raised for the purpose of this study, our three main conclusions emerge:

(a) The realization of the lamprey festival is very important for the region, both in the eyes of local authorities and in the eyes of the population, as well as any event that dynamizes the territory. The mayors list the promotion and visibility of Penafiel, the population highlights the dynamism of the council.
(b) The economic impacts are truly recognized, both in the intention of local politicians, municipal agents, and by the population. Knowing that the economic impacts are reflected at the level of the local economy, and here we are closer to the riverside area of Entre-os-Rios, where the lamprey festival takes place. They are able to enumerate economic development factors, such as the increase in sales of the small fishing operator and lamprey trader, such as the increase in the volume of sales in restaurants, and the level of employment, at least during the weekend. Festival, several people are recruited to work on the lamprey festival.
(c) When we mention the theme of affectivity, there is a strong lack of identity for the population, when the theme is the lamprey festival. Despite recognizing that there may be identity and affection for people living in the Penafiel riverside area. Here, in our understanding, there are some conditions that may well contribute to the subtraction of this affectivity by the generality of the municipality's population. The fact that the lamprey is a very specific gastronomic product, with a very distinctive appearance and palate, the fact that the price is uninviting and the poor or ineffective communication produced by the local agents, promoters of the lamprey festival, makes it on the part of the Penafidelenses, there is a clear distance and lack of identity with the event.

In short, the study seems to highlight the importance of gastronomic tourism (e.g., lamprey festival) as a differentiating element of a territory (i.e., impact on the level of communication of destination brands), but also denotes the role of affectivity (i.e., attachment) on the part community (i.e., residents) and the feeling of belonging to the event and the delicacy. In this sense, and in a marketing logic applied to places, this study is assumed as a good tool to help all those who directly or indirectly work on marketing applied to tourism. The sense of belonging and hospitality on the part of residents are strongly important in the successful growth and enhancement of

tourist spaces. In this sense, this study adds contributions to marketing, tourism, and local development.

With regard to limitations, it is of course important to mention that the present investigation focused solely on a municipality (i.e., Penafiel) and a gastronomic event (i.e., Lamprey Festival), which is why we cannot generalize the results obtained. On the other hand, the present investigation was strongly conducted with a qualitative nature (i.e., interviews and focus group), which naturally increases the subjectivity of the obtained results. Thus, and in order to present lines of investigation for the future, it will be pertinent in future works to resort to the administration of surveys by questionnaire (i.e., quantitative study) to be applied to tourists and visitors to the lamprey festival. In this sense, some results obtained in this investigation can be confronted and reinforced. It is also important to point out that, for future work, it would be pertinent to seek a greater generalization of results, namely by replicating the study in different municipalities in the country and with different gastronomic events (e.g., francesinha festival, chocolate fair, among others). Merely suggestive, it is hoped that in the future the mayors of Penafiel will be able to supply the great shortage detected with this study, the lack of affection and involvement of the population of Penafiel with the realization of the lamprey festival. Here, we consider and weigh the factors of lamprey being a difficult dish, even a delicacy for very specific palates, and being an expensive food, despite CMP's efforts to provide a more accessible tasting menu. There are evident communication and dissemination failures in the dissemination of FL, even if we restrict it to a very specific area of the municipality of Penafiel, such as the riverside area of Entre-os-Rios. The Penafidel population does not feel an integral part, and even considers itself marginalized. We believe that this event, as it took place in one of the areas of Penafiel with the greatest tourist potential and beauty, had much more to gain from the involvement of everyone. Creating the feeling of belonging with the lamprey festival, together with Penafidelenses, will be the challenge we leave to local mayors. It would be interesting in the future, and from an internal perspective of the lamprey festival itself, to ascertain the real impacts of this festival on the operators. Understand with them, what evolution they have denoted since it took place, as well as expectations and suggestions for growth.

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Application of Knowledge Management in Tourism and Hospitality Industry: A Sustainable Approach

Santus Kumar Deb, Bapon Chandra Kuri, and Shohel Md Nafi

Abstract The aim of this chapter is to better understand about how the stakeholders of tourism supply chain management can establish sustainable knowledge acquiring and sharing effectively and efficiently. The lacking of single information may debilitate the whole supply chain management. The social, economic, environmental, technological, and political changes spike the importance of knowledge management to adapt to current issues and challenges. Even, tourist behavior is now switching because of technological advancements which make it possible to bring information to their doorstep with a single click of browsing. As tourism and hospitality industry maintains the web of supply chain management to ensure the overall well-being of the tourist, community, govt, and business. In the case of developing tourism products, it is mandatory to gather appropriate information from both explored and unexplored sources to create a sustainable chain with the help of tourism knowledge management (KM). This study will bridge the gap among all stakeholders of the tourism industry by acquiring, storing, and sharing knowledge when it is necessary. This study figured out how tourism supply chain management can adapt and survive with the pace of global changes. The role of the government and organization is to ensure the security of information as a crucial part of knowledge management. This supply chain must be interconnected with some guidelines and principles of knowledge management. This is a qualitative study where all data will be collected from both primary and secondary sources. Experts' opinion from the tourism and hospitality industry has given their doctrine that have triggered the point, of how knowledge management can contribute to the overall supply chain management of this industry. The study attempts to find how

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_7

stakeholders of the tourism and hospitality industry can be supplemented with sustainable knowledge management through the production, distribution, and use of information. Human resources, Information Technology, business management, organizational behavior, tourist behavior, and psychology are considered as the measuring factors to run this analysis. None of the studies can be found to explore the role of knowledge management in the supply chain of the tourism and hospitality industry which is the novelty of the study. This chapter has presented the linkage among the stakeholders of tourism and hospitality industry through the Knowledge Management system. That is why expert opinions and secondary sources are used to extract a better outcome.

Keywords Economic · Technology · Supply Chain Management · Environment · Knowledge Management (KM)

1 Introduction

Today's tourism and hospitality industry is evolving quickly, and the competitive landscape is no longer stable (Janes & Wisnom, 2011). The existence and success of the tourism industry depend on its capacity to adjust to the changing business environment through effective decision-making and appropriate utilization of staff skills and knowledge (Fratu, 2011). Recent developments show how knowledge is now recognized as a crucial competitive asset for the hospitality and tourism sector. However, the hospitality and tourism sectors have been hesitant to implement KM strategies (Valeri & Baggio, 2022). Due to the intense rivalry in the rapidly growing travel and tourism industry, businesses must now provide levels of customer service that go above and beyond all previous norms to win over potential customers and travelers (Shamim et al., 2019). Over the past 10 years, the number of customers making online reservations has sharply increased along with competition, necessitating the development of ways to handle these rising demands (Avdimiotis, 2019). These knowledge components assist a national tourist organization in better positioning itself in the market and marketing various goods and services to its customers. According to Cillo et al. (2019) stated that the concept of knowledge management also includes the management of customer connections and experiences. People choose not to utilize travel agencies to arrange their eagerly anticipated vacations because they can access a wide variety of businesses and travel possibilities online. However, the solution to handling these evergrowing expectations is knowledge management software, which allows the customer to self-serve and provides the agent with instant access to a massive library of precise information (Yiu & Law, 2014).

The tourist sector relies heavily on knowledge. The hospitality sector, like any other organization, suffers from an obvious information overflow that makes it challenging for tourists to choose the ideal vacation package among those offered by several travel agencies at comparable costs (Pyo & Bouncken, 2003). There are numerous goods and services, sources of knowledge, and business partners. The

independence of choice and the availability of multiple partners are both significant benefits for travelers and tourism service suppliers. But evaluation is a process that both travelers and travel stakeholders must complete. The purpose of this study is to better understand how the stakeholders of tourism supply chain management can establish sustainable knowledge acquiring and sharing effectively and efficiently. This study will also figure out how tourism supply chain management can adapt and survive with the pace of global changes.

2 Literature Review

Since the 1990s, social, economic, and technical changes have fueled the study and practice of knowledge management. Tourism has been reluctant to implement this strategy due to a lack of alignment between researchers and the tourism industry. Ritsri and Meeprom (2020) demonstrated a relationship between knowledge management practice and the accuracy and fairness of accounting data as well as the quality of financial statements and the satisfaction of users of financial statements. According to Zaragoza-Sáez et al. (2020), corporate social responsibility and strategic knowledge management operate as mediators, laying the foundations for developing the principles that will allow intangible capital to impact hotel profitability significantly. Horng et al. (2020) highlighted the links between knowledge application and entrepreneurial propensity, the roles of entrepreneurial content, love for learning, and entrepreneurship promotion. But none of the studies did not explore the role of knowledge management in the supply chain of the tourism and hospitality industry.

This chapter has presented how knowledge management can build a sustainable relationship among all stakeholders of the tourism and hospitality industry. According to Ghasemi et al. (2021) emphasized "knowledge management-oriented innovation" items were utilized to quantitatively examine new goods or services associated with active hospitals in Iran's medical tourism industry. The study found that knowledge management domains—such as time, expenses, and quality management, play a crucial role in operational success. However, in this book chapter, we designed tourist buying behavior in pre-trip, trip, and post-trip stages that can help to purchase the tourism package. In this sense, this process can save time and cost. On the other hand, Entrepreneurs' expertise in knowledge management varies according to the organization's people, processes, technology, organizational structure, and culture (Valeri, 2021). The tourism business owners' demographic traits had an additional impact. Businesses now require additional knowledge management education as well as changes to existing tourism development plans and initiatives (Kharel et al., 2022). In support of this statement, our chapter depicted that skill-, theoretical-, practical-, market-, and networked-based knowledge can be supplemented issues in designing and planning tourism supply chain management.

Ochoa-Jiménez et al. (2021) discovered a strong and direct connection between knowledge management and sustainability as well as a direct, significant, and

favorable association between knowledge management and innovation. Organizations can focus on knowledge management, which will result in innovation. and, in turn, make them stand out by attaining sustainability, with the potential to create both sustainable innovation and competitive advantage. According to our book chapter, we illustrated how T2T, T2C, C2C, S2T, and T2S can contribute to the knowledge enhancement process by sharing knowledge among the stakeholders of the tourism and hospitality industry through direct and technological innovation. However, Kaldeen (2019) stated that the most significant enablers for KM in Sri Lanka's tourist sector have been recognized as organizational infrastructure, management leadership and support, organizational culture, motivational aids, team building and knowledge variety, and utilization of the Internet and information technology. Employee churn, knowledge losses, failure to identify the variables of enhancing KM, the deployment of incorrect KM techniques, an excessive focus on IT, and pressure to comply were, sequentially, the most significant stumbling blocks for KM in Sri Lanka's tourism industry. The chapter presented a model or web for sustainable knowledge management (SKM) in the tourism and hospitality industry. This model uses the bottom-up approach and adds several environmental, technological, economic, and sociocultural factors to draw an ultimate conclusion on how explicit and tacit knowledge is communicated and stored to achieve the 17 sustainable development goals.

3 Methodology

The aspiration of this study is to gain a better understanding of the sustainable knowledge acquisition and sharing practices that the tourist supply chain management stakeholders can build. This is a qualitative study where all data were collected from both primary and secondary sources. Experts' opinion from the tourism and hospitality industry will give their doctrine that will trigger the point, of how knowledge management can contribute to the overall supply chain management of the tourism and hospitality industry. Secondary sources such as journal articles, related literature, website, and different published works were used to acquire the data and get a clear depiction of Knowledge Management with emotional intelligence for Tourism and Hospitality sector (Deb et al., 2023). Boslaugh (2007) and Clark (2013) characterized secondary data as information that was gathered by someone else without the author being involved as well as secondary data being used to solve brand-new issues with some limitations (Vartanian, 2010).

4 Why Is Knowledge Important in the Tourism Industry?

Knowledge management makes the tourism and hospitality industry get notifications about potential glitches in customer service, carefully watch trends, and distribute comments across numerous platforms. In the hotel sector, efficient knowledge management may empower the service personnel to go above and beyond for customers, deliver the level of service and experience they expect, and give your business a competitive edge.

5 Destination Management and Implication of Knowledge

The market knowledge and tourist influx matrix is the key to evaluating the overall performance of knowledge management (Table 1).

(a) *High market knowledge, high tourist influx:* High destination knowledge facilitates the tourist inflow in a particular destination. Mainly, it articulately disseminates information among prospective tourists. Especially, tourism marketing and promotion play a significant role in conveying information through social media and word of mouth.
(b) *Specific market knowledge and specific tourist inflow*: This is a niche market segment. Especially, tourists with specific knowledge about a particular spot will drive to visit the destination. Basically, adventure tourists are part of this segment.
(c) *Low market knowledge, high tourist inflow:* This segment depicted that low market knowledge sometimes generates a high tourist influx. A new destination with proper safety and good communication may thrive the tourist to explore the destination.
(d) *High market knowledge, low tourist influx:* In this case, a destination full of resources invites tourists to visit. Rather, the destination may be affected by war, and terrorism brings a possible threat to tourists. So, tourists have all sorts of information and are interested in visiting. But the above-mentioned external factors may create impediments.
(e) *Low market knowledge, low tourist influx:* Tourists do not have any idea about the destination. Therefore, they do not show their zeal to travel to an unknown destination. The explorers and drifters are the participants of this segment. Their

Table 1 Market knowledge and tourist influx matrix (Source: Authors)

	Market knowledge	
Tourist influx	High market knowledge High tourist influx	Low market knowledge Low tourist influx
	High market knowledge Low tourist influx	Specific market knowledge Specific tourist influx

job is to demystify the puzzle of the destination. Their knowledge will contribute to identifying unexplored tourism resources.

However, the high market knowledge will minimize the information gap, thus will help them to understand the basic prospects and experiences that they will receive at the destination. Even, social media will play an active dimension in spreading basic information to potential tourists, so disseminating information should not be restricted from the national authority when it comes to the tourism and hospitality industry.

6 The Use of Knowledge on the Supply Side of the Tourism and Hospitality Industry

The purpose of knowledge management is to give staff members quick access to current and specialized information. This is crucial in the tourism and hospitality industry in particular because a business' success depends on how well it treats its tourists (Table 2).

However, the ultimate goal of knowledge sharing among all stakeholders of the tourism and hospitality industry is to maximize tourist satisfaction levels. Knowledge management works as a medium to minimize the gap between guests and hosts. This gap is again filled by adding additional service quality of tourism products and personalized service in the hospitality industry.

7 The Use of Knowledge in the Demand Side of the Tourism and Hospitality Industry, and Tourist Decision Process

Travelers' networks at home and abroad are now successfully connected through the spread of cell phones and online empowerment. ICT and the Internet are frequently used by travelers to speed up and optimize their search for tour-related details and itinerary preparation, to evaluate costs and the standards of tourism goods and services at the point of interest (Xiao, 2006). Designing a distinctive, personalized experience is made possible by the use of augmented and virtual reality, mobile apps supported by universal connectivity via wireless internet or 3/4G network, destination smart cards, and wearables (Table 3).

Potential tourists evaluate the tourism package by comparing the costs and quality of available services. On the other hand, technology has facilitated a more rapid flow of information, made commercial transactions immediately, decreased the cost of travel, and allowed potential tourists to spend their time more productively. However, the Internet offers travelers information that is based on opinions (assessments, preferences, and recommendations of popular tourist spots). Direct contact with

Table 2 Use of knowledge in the supply side of the tourism and hospitality industry (Source: Authors)

Objects	Knowledge-sharing tools and resources	Share knowledge	Storing knowledge
Human resources	Training Demonstration Presentation Skilled employee (practical and theoretical)	Training session Employee autobiography about his experiences in the hospitality industry Demonstration (cooking, serving, marketing)	Hard copy and soft copy: Book, journal, hard drive, manual
E-service	Training Demonstration Presentation E-service tools (software, website, news fed), E-service destination)	Keeping in touch with service personnel and tourist that how the hospitality industry embraces new websites and online services can save both time and cost for each stakeholder. So, new knowledge about this e-service requires appropriate training for service personnel and customers	Hard copy and soft copy: Book, journal, hard drive, manual
Hotel industry	Gathering updated knowledge and sharing, experts from the front office, housekeeping	Knowledge sharing through demonstration about check-in, check-out, reservation process, gathering, and sharing up-to-date skills required to serve as front office personnel. Purchasing world-standard online software to make easier access to information for all. Introduce the housekeeping personnel to newly generated tools and chemicals used in the housekeeping department. Hire knowledgeable staff who is experienced in this field. Food and beverage production process	Book, PDF, journal, notes, video, written documents, YouTube video, audio-visual blog, etc.
Food and beverage service	Expert chefs from the world-class hotel, traditional food service, and	Initiating a world-class service style for the customers. Introduce and share new knowledge of	Book, PDF, journal, notes, video, written documents, Youtube

(continued)

Table 2 (continued)

Objects	Knowledge-sharing tools and resources	Share knowledge	Storing knowledge
	ethnic community people	food and beverage items with the service personnel and the guests. Show the demonstrations about the culture-based food and beverage production process	video, audio-visual blog, etc.
Food and beverage production		International five-star hotel always tries to invent new equipment that can reduce production time and cost. So, new knowledge about food and beverage production brings a new dimension to the hospitality industry. Keeping up-to-date information and knowledge makes it possible	Video, written documents, YouTube viedeo, audio-visual blog, etc.
Transportation sector	Experts from the rail, road, water, and aviation industry	Introducing E-payment rules and regulations, e-passports, and government online information portals about tourism destinations. Knowledge of principles and methods for moving people or goods by air, rail, sea, or road, including the relative costs and benefits. Sharing the experiences	E-module, video, GDS, written documents, YouTube video, audio-visual blog, etc.
The sustainability pillars and knowledge management			
Culture, heritage, and society	Store and share their culture, heritage, and tradition through documentation, printing, publishing, and telecasting. This knowledge will inspire tourists to visit and explore their lifestyle, language, and marriage ceremony.		
Economic	Using TSA to know the contribution of the tourism and hospitality industry. Overviewing the UNWTO and WTTC report to predict the income.		
Environmental	Community and environment are interrelated. Most community people depend on environmental resources to get a natural healing process for their disease. Writing and documenting the indigenous knowledge, how the ethnic community people survive by using the natural resources, and how they preserve and conserve them. Using the case study, survey and ethnographic research may assist to gather deeper knowledge about indigenous people.		
Political	Government rules and regulations should be documented in a congenial format that the prospective tourist can easily understand. The information can be spread through country diplomacy, print, and electric media. The country's political background and ideology have a greater impact on tourist buying behavior.		

Table 3 Use of knowledge in the demand side of the Tourism and Hospitality Industry, and tourist decision process (Source: Kotler et al., 2018)

		Sources of information	Knowledge sharing
Pre-trip	***Need recognition***	The consumer identifies an unmet need that has to be supplied as the first stage in the purchasing process. The basic need for tourist motivation is to visit a destination for relaxation, entertainment, or other purposes.	Documentary, videos, word of mouth
	Information search	Tourist search for related information from various sources. They search for the safety security, accommodation, and transportation facility of the destination.	Friends and family, blog, international ranking, webpage
	Evaluation of alternatives	Compare the destination value based on their uniqueness and value. Tourists want memorable experiences. They eagerly search for alternatives that provide maximum value at a congenial price.	Journal, blogs, friends and family, destination bureau
Trip	***Purchase behavior***	This is the actual moment of truth when the tourist visit destination. They compare the expected service and actual service. In this stage, they experienced both positive and negative images of the service quality.	Memory, experience, photos, videos, live documentation
Post-trip	***Post-purchase***	Tourists get back from the travel and recall their experiences with the whole package. They come to the final judgment about their service. They provide feedback to the suppliers.	Feedback status, online survey, SMS, e-mail, etc.

tourists usually results in a personalized service that can persuade tourists to buy the tour package.

8 Types of Knowledge for the Hospitality Industry

Tourism products can be improved by having a better understanding of what the tourist wants and needs. Therefore, knowledge can assist in generating consumer capital and contributing to the development of customer intimacy and connections is information sharing. On the other hand, employees are regarded as knowledge workers. Making an organization where employees can grow and maximize their talents is a key component of effective knowledge management. It offers a setting where employees can learn and exchange with their coworkers, partners, and tourists while also making work enjoyable.

(a) *Skill-based knowledge:* Skill-based knowledge introduces how practical, conversational, technological skills, and personalized service can create loyal

bonding between host and guest. For example, handling guest complaints and providing service effectively and efficiently.

(b) *Theoretical knowledge:* Theoretical knowledge connects the historical background and current knowledge by analyzing books, journals, documents, case studies, and written documented research. It helps to understand deep thinking and how to adapt to current changes. For example, when the tourism and hospitality industry faces a crisis moment. For instance, in the COVID-19 situation, the tourism and hospitality industry faced inexorable miseries. This industry introduces new strategies to adapt to the current crisis by analyzing the previous history when the SARS virus spread in 1920 and 2006.

(c) *Experienced-based knowledge*: The core understanding of this kind of knowledge is the realization of one another's knowledge, choices, shortcomings, and professional goals. For example, a hotel manager who is experienced in this sector for 20 years. His expertise can contribute to creating new entrepreneurs in the tourism and hospitality industry.

(d) *Tourist-related knowledge:* However, understanding tourists is crucial to the tourism sector since its products and services are designed with its customers in mind. The socio-demographics, preferences, expectations, culture, and so on are some examples. Age, income, education, social status, kind of profession, geographic location, and household size are just a few examples of demographic data that could be used to learn more about visitors. Psychographic data should also be considered. People's lives and behaviors are covered, such as their preferred vacation destinations, their interests, their values, and how they act. Therefore, preparing a segmented demographic profile contribute added value to the knowledge management system.

(e) *Tourism suppliers-related knowledge:* Tourism suppliers (accommodation, transportation, food and beverage, attractions, local travel agencies, hotel chains, tourism consultancy firms, event management firms, caterers, etc.) nowadays communicate with each other to optimize their service and generate maximum revenue. For example, in the COVID-19 situation, the whole supply chain of the tourism and hospitality industry has been debilitated. How hospitality industry adapt to that situation? The hotel industry turned into a temporary quarantine center. The food and beverage industry initiated online food orders and delivery. The transportation industry carries medical staff, perishable goods, patients and emergency supplies, etc.

(f) *Tourism market-related knowledge:* For every organization, understanding the market (size, population, culture, habits, etc.) is crucial. The offered items and services will need to alter and adjusted properly since the operating markets may differ greatly from the core market. The tourism market is now changing with the pace of time, like, people are now searching for unique experiences (virtual tourism, augmented tourism, satellite tourism, etc.

(g) *Network-related knowledge:* Relationships with other stakeholders are crucial, especially in the tourism and leisure industries. These knowledge components assist a national tourist organization in better positioning itself in the market and marketing various goods and services to its tourists. In the hotel sector, efficient

knowledge management may empower your workers to go above and beyond for customers, deliver the level of service and experience they expect, and give your business a competitive edge. Destination development is concerned with improving the supply side of tourism by offering enticing experiences, high-quality facilities, and exceptional services to encourage repeat travel.

(h) *Government rules and regulations knowledge:* All stakeholders of the tourism and hospitality industry must address their country's rules and regulations toward the tourist. If the tourist knows the country's political background and its current rules and regulations, then their tourist decision-making behavior will be quite easy. For example, Qatar initially put restrictions on consuming alcoholic beverages in the world cup 2022. This information and knowledge will aware the tourist about their code of conduct in Qatar. As Qatar always introduces halal tourism for prospective tourists.

(i) *Technological-based knowledge:* The tourism and hospitality industry perceives itself as a virtual sector that largely uses the Internet to promote travel destinations in international markets. The three main areas are operational excellence, market intelligence, and electronic marketing. This industry seeks to add value for its members, by encouraging information and management knowledge exchange and increasing awareness of the role of national tourism organizations.

However, gap identification is the most critical job for the tourism and hospitality industry. Most, importantly, this gap can be minimized by getting feedback from the tourists and opinions from experts in the related field. Research-based knowledge can provide a better outcome for industry success. Like, case studies, surveys, interviews, and observation are the major tools to track the gap and fill the gap with related value.

9 The Effective Supply Chain Management Tool for Knowledge Management

The creation and application of new knowledge are essential for the competitiveness of both tourism destinations and businesses since it fuels innovation and product development (Cooper, 2015). Destinations constantly adjust to changing circumstances by producing and utilizing information, such as the safety and security measures required in response to the September 11 attacks on the United States (Huddy et al., 2002). However, supply chain management technology can help tourists and service providers have better communication (Table 4).

However, external, internal, and word-of-mouth messaging are just as important in attracting and keeping repeat visitors as the marketing of tourist locations, which is done through a variety of communication channels, including print, social media sites, and television (Cai, 2012). A sustainable knowledge management model is presented in this chapter that connects these communication components to the phenomena of repeat travel buying behavior.

Table 4 The effective supply chain management tool for Knowledge Management (Source: Authors)

Supplier (locals community people, hotels, transportation, destination)	Producer (tour operator)	Distributor (travel agency)	Tourist
Identification of new resources and development of the infrastructural process (website, news)	Create new products and services by identifying tourist needs wants and demands (Facebook, Twitter, direct interview)	Communicating with tourists (direct, mail, call).	Tourists analyze the package by getting feedback from internal (friends, family, and relatives) and external (Facebook, Twitter) sources.
Update their webpage with new knowledge and information (Google map, settelite zoning, GDS, software)	Add new information related to the services. For example, virtual tourism augmented tourism, and e-tourism in a pandemic situation	Use the updated mode of communication and technology. (job rotation, staff training.	Using updated communication tools.
Initiating an updated module for the hotel, transportation, food, and beverage staff	Taking expert opinions, analyzing the news portal, books, articles	Creating expert profiles, and agency profiles.	Suppliers' profile creation for the tourist buying process.
Tasked-based knowledge	Experts from the related fields of the tourism and hospitality industry	Creating updated itinerary.	Analyzing the package
Guest-related knowledge	Demographic profile creation	Online profiling.	Communicating with suppliers through the mail and direct communication.
Market-related knowledge	Report on tourism market growth and share	Gathering information through research and market survey.	Tourists documented the current market trend and growth.
Network-related knowledge	Analyzing and mapping the destination's supply chain system	Communicating with other suppliers worldwide, knowledge management software, GDS.	Studying the various supply chain network channel to whom tour packages can be purchased.

10 The Knowledge Communication Process

However, we are accustomed to (B2B, B2C) terms, when we deal with product-related supply chain management. In this section, a new pattern of supply chain tools is used to determine the knowledge gathering and sharing process among all stakeholders of the tourism and hospitality industry (Table 5).

(a) *Tourist to Tourist (T to T)knowledge sharing:* Nowadays, tourists have social media accounts on Facebook, Twitter, WhatsApp, etc. They uploaded their experiences and video blog to get feedback from their friends. They provide various suggestions about the tourist destination. They will develop a close bond with one another through social media or direct communication in tourist spots. Thus, creating a tourist to tourist knowledge-sharing process.

(b) *Community to Community (C to C)knowledge sharing:* In this scenario, all people of the Christian, Muslim, Hindu, Buddhist, and ethnic communities will create a marketing hub, assisting the neighborhood in attracting more visitors. One community will support another community by sharing its culture, tradition, and heritage. For example, when tourist visits to see the lifestyle of the "Manipuri community" in Bangladesh, the leader of that community must suggest the tourist visit "Khasiya Polli" of another community.

(c) *Tourist to Community (T to C) knowledge sharing:* Tourists can acquire information through Facebook, Twitter, or direct conversations with members of the host community. In this scenario, the tourist's Facebook friends must reside in a specific nation or community. He posts on Facebook something along the lines of, "I will go to Cox Bazar," in Bangladesh. The community people who live in Cox's Bazar (the host) might respond.

(d) *Community to Tourist (C to T) knowledge sharing:* The host always extends a warm welcome to the visitor since they see them as a peace messenger and economic multiplier. To optimize visitor satisfaction and experiences, they exhibit both their cultural artifacts and natural heritage in this situation. They will play the role of narrator and purposefully describe the tradition and culture in an evolved manner.

Table 5 Knowledge communication process (Source: Authors)

Supply chain terms in the tourism and hospitality industry	Knowledge sharing
T2T	Tourist to tourist
C2C	Community to community
T2C	Tourist to community
C2T	Community to tourist
S2S	Suppliers to suppliers
S2T	Suppliers to tourist
T2S	Tourist to suppliers
S2C	Suppliers to community
C2S	Community to suppliers.

(e) *Suppliers to Suppliers (S to S) knowledge sharing:* All of the suppliers of the hospitality sector commonly use marketing tactics to support other suppliers. Local hotels will host food festivals by showcasing their regional cuisine, while foreign hotels will join and present their culinary offerings.
(f) *Suppliers to Tourist(S to T) knowledge sharing:* The hospitality business will commonly make direct contact, through travel agencies, tour operators, printing media, social media, or their website with potential guests. In this instance, they present the key details about the location as well as unique services or incentives to entice travelers.
(g) *Tourist to Suppliers (T to S) knowledge sharing:* Before traveling to a place, tourists research the available accommodations, modes of transportation, foods and beverages, and other amenities. They get the data from the internet site and other sources like Facebook, Twitter, friends and family, print media, travel agents, or direct interactions with the hospitality sector.
(h) *Suppliers to Community (S to C) knowledge sharing:* The suppliers of the tourism and hospitality industry must empower and engage the community people to deal with tourism-related services. This process helps to boost the economic well-being of the community people.
(i) *Community to Suppliers (C to S) knowledge sharing:* Local community people may be the ultimate source of providing raw materials (agro-based products) to the suppliers which can reduce the cost and time. Eventually, tourist will have their products and services on time.

11 The Model/Web for Sustainable Knowledge Management in Tourism and Hospitality Industry

The tourism and hospitality industries have become increasingly globalized, which has increased the demand for knowledge management. As a result of globalization, the tourism industry must employ knowledge management as a strategy to build sustainability and improve consumer services.

The illustrated model has delineated SKM process in tourism and hospitality industry (Fig. 1). It followed the bottom-up approach, where the community people take the lead to preserve and conserve the indigenous knowledge regarding environment, culture, norms, values, and lifestyle. This model gave them the maximum priority in the case of designing the KM pattern for the tourism and hospitality industry. However, their expertise and knowledge should be compiled in terms of both practical and theoretical perspectives. The business stakeholders and government will act as middle persons whose job is to link up the tourists and community people through effective Knowledge management. The overall sustainability of environmental, technological, political, and economic produces different perspectives of knowledge theories. For example, theoretical knowledge, skill-based knowledge, experienced based knowledge, tourist based knowledge, technological based knowledge can be found in both tacit and explicit form which is similar with Deb

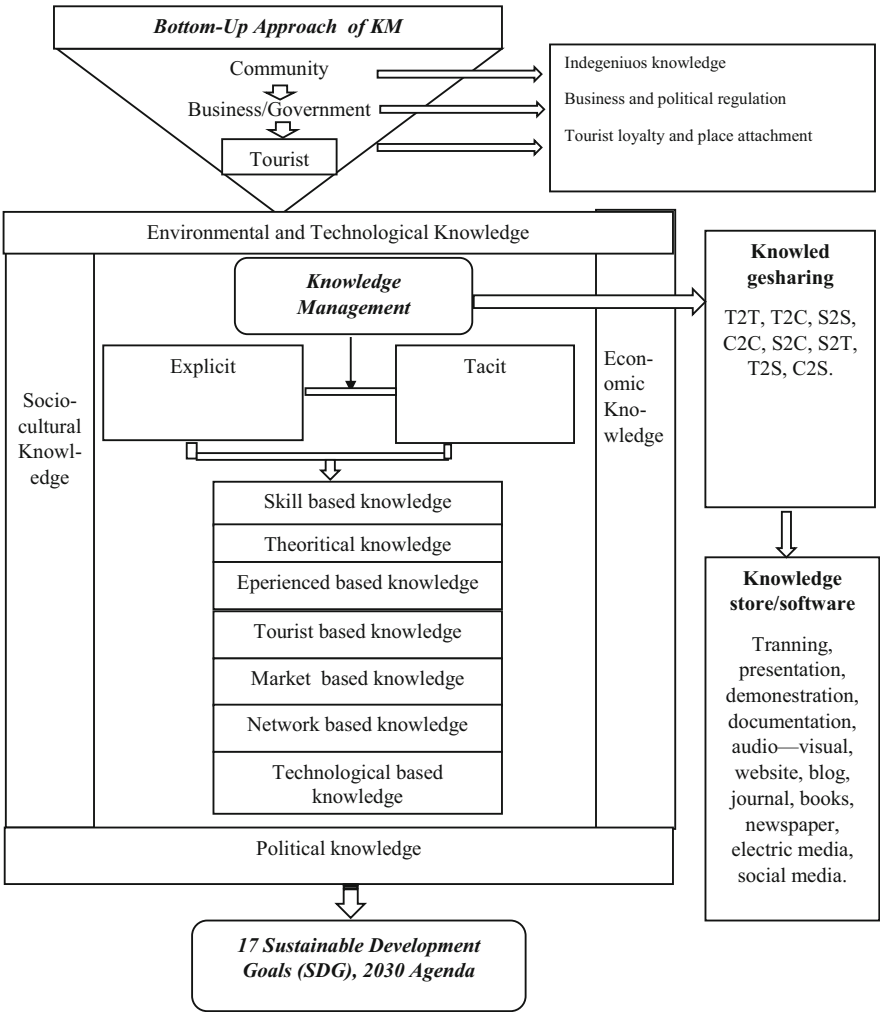

Fig. 1 The Model/Web for sustainable knowledge management in Tourism and Hospitality Industry (Source: Authors)

et al. (2023). As mentioned earlier, theoretical knowledge provides a deeper and more conceptual understanding of a particular theme. On the other hand, practical knowledge will stong the foundation level for enhancing the practical experiences through training, demonstrations, and direct contact with the guest. Moreover, experienced related knowledge (industry expert), tourist-related knowledge (needs, wants, demand, demographic pattern), market-related knowledge(tourism demand, tourism supply, trends), political knowledge (law, political ideology of the ruling government, history, current status, tourism ranking of the country), technological (tools, software, social media) have magnificent contribution in managing, storing,

and disseminating the knowledge among all the stakeholders in tourism and hospitality industry. This knowledge must be kept in the form of hardcopy (books, journals, written documentation) and soft copy (video, audio, storing in the Pendrive, company website, youtube, presentation, web blog) for future reference. This knowledge can be shared through presentation, demonstration, training, and publishing worldwide. In the last portion, this model adopted 17 sustainable goals, agenda 2030. The main objective of tourism is to bring peace worldwide. If we examine every 17 goals, we see each goal is directly connected with the objectives of the tourism and hospitality industry (Deb & Ahmed, 2022). Therefore, if our proposed model is adopted in the KM strategy, then overall sustainability will be ensured.

12 The Theoretical and Practical Implication of Knowledge in Tourism and Hospitality

As the tourism and hospitality sector is a knowledge-based segment. Everyone may understand the facts clearly with the combination of theory and practical practice. The theoretical implication of knowledge will be confined to books, journals, and articles and e-resources (Deb, 2021). The practical implication, on the other hand, creates direct communication with suppliers and tourists. The competencies of practical implications propagate industry income and tourists get memorable experiences with emotional involvement (Deb et al., 2023). The mixing of this knowledge will enrich the human overall competencies in the tourism and hospitality industry.

13 Conclusion

The tourism and hospitality industry is a knowledge-based as well as intangible import and export industry. Therefore, The ability of the tourist and hospitality sectors to adapt to emerging economic, social, political, environmental, and technical issues is essential to their growth and development. This chapter has focused on various sections to unite the entire tourism and hospitality industry under the umbrella of the knowledge management system. Tourist buying behavior, the effective knowledge management tool, knowledge used in the hospitality industry, knowledge communication process, and sustainable KM model have been presented to ensure the overall sustainability of supply chain management.

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Exploring the Role of Organizational Learning and Knowledge Management in the Acceleration of Current Small Business's Digital Transformation

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Abstract At present, humanity experiences a vertiginous period of multiple transitions, with strong repercussions on the sustainable development of our contemporary societies and business fabric. Indeed, local small and medium-sized enterprises (SMEs) particularly strive to ride the wave of digital transformation by strategically reorienting inner resources toward the optimization of their latent intellectual capital. In this line, drawn on the examination of five (5) industrial SMEs located in the region of the Basque Country (Spain), this chapter explores the role of organizational learning and knowledge management in the acceleration of their current digital transformation processes, identifying certain fundamentals of the enterprise knowledge and learning management theory, while aiming at advising research-based strategies and purposeful organizational measures to forward digital transformation in SMEs. The lessons learned from this territorial case analysis encapsulate promising implications for public/private organizations, SMEs directors/managers, and multilevel policy makers pursuing continual advancement of sustainable competitiveness of their territories.

Keywords Digital transition, · Knowledge management · Organizational learning · Digital transformation · Small business

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_8

1 Introduction

At present, humanity experiences a vertiginous period of multiple transitions, of changes in environmental, social, and economic domains, with strong repercussions on the sustainable development of our contemporary societies.

These radical reorientations in context are persistently demanding the emergence of new skills and abilities, those that may accelerate our capacity to adapt to changes, to gain flexibility and resilience in turbulent times, regardless of the realm in which people and organizations thrive and interact, or the type of transition being addressed or undertaken, namely energy, sustainable, or digital transition.

Regarding the latter, the challenge societies and local business fabrics have to deal with in light of present digital transformation is putting to the test territorial competitiveness, spurring their own pursuit of more enduring advantages through the internal trial of fresh value-creation formula as means of product/service differentiation.

Indeed, local small and medium-sized enterprises (SMEs) particularly strive to ride the wave of digital transformation by strategically reorienting inner resources toward the optimization of their latent intellectual capital.

In this line, drawn on the examination of five (5) industrial SMEs located in the region of the Basque Country (Spain), through a territorial case study and the analysis of a collection of variables from the digital transformation process theory—economic activity, participation in the value chain, size, innovation level, internationalization scope, organizational structure, and digital/technological management model—this chapter explores the role of organizational learning and knowledge management in the acceleration of current digital transformation of companies, trying to identify connections between these variables and certain fundamentals of enterprise knowledge and learning management theory—the integration/coordination of knowledge organizational resources, the organizational development of competences, the knowledge management system, the internal knowledge circulation and transmission approach, etc.—while aiming at advising research-based strategies and purposeful organizational measures to forward digital transformation in SMEs.

From a theoretical perspective, this work contributes to the enterprise knowledge management theory related to the identification and recognition of underlying organizational constituents in empirical scenarios (e.g., shared features, transitional implementation processes, and logics/goals behind technology change strategy) that might potentially boost digital transformation processes in SMEs, with potential applicability in other branches of activities, economic sectors, or types of organizations (e.g., public or non-profit).

From an utilitarian approach, the lessons learned from this territorial case analysis encapsulate promising implications not only for public/private organizations and SMEs directors/managers, but also for multilevel policy makers who pursue the continual advancement of inclusiveness and sustainability in the competitiveness of their territories.

1.1 Keys to the Digital Transformation of SMEs in the Basque Country

The analysis of these industrial cases sheds light, in greater depth, on how the digital transformation process is taking place in Basque SMEs, glimpsing what features different companies share, what processes they have been developing and even identifying certain logic and dynamics that underlie their change processes while achieving different goals and objects in their different strategies, when not reorienting them or giving them a better shape.

Likewise, through this work, it is possible to obtain extended and served sharable learning, as a reference for other SMEs. The knowledge generated, as well, could be used to foster public policies related to this challenge, key to the territorial business competitiveness of SMEs.

2 Theoretical Background

In the digital knowledge society 4.0, the creation of unique and differential value that guarantees competitiveness for companies is supported by the result of the distinctive interaction that each organization makes between multiple and innumerable competencies developed entirely by its set of competences and capacities, based on its singular resources of information and knowledge, from a dynamic process of continuous and adaptive learning.

In this sense, today, the importance of comprehensive knowledge management and learning transferability in industrial organizations resides in developing inner skills for the digital transformation of a company that generates new and better processes aimed at the transition of industrial organizations to a new evolutionary stage, known as Industry 4.0 or Fourth Industrial Revolution.

In this management process of changes, several key dimensions are involved related to the digital transformation processes of SMEs and their own business fabrics, determinants of the ecosystem generated in any territory—and consequently, game changers for its competitiveness—which, throughout this chapter, we will elucidate in the five (5) cases of industrial companies here analyzed, corresponding to a very specific territory of Spain, the Basque Country.

In this vein, the theory of the knowledge-based firm postulates that the greatest source of competitiveness lies in the ability to apply knowledge and not necessarily in the ability to create new knowledge per se (Grant, 1996). Likewise, the integration of knowledge is fundamental for the development of new organizational capacities, since they are conceived as sets of integrated resources (Teece et al., 1997; Winter, 2003).

On the other hand, in the analysis of the digital transformation process, authors such as Teece et al. (1997), Eisenhardt and Martin (2000), Yoo et al. (2012), and

Bharadwaj et al. (2013) claim that the success of the process is conditioned to the development of the well-known dynamic capacities.

2.1 Digital Leadership and Corporate Strategy

The digital transformation process in organizational environments with great volatility, uncertainty, complexity, and ambiguity—VUCA approach—makes it necessary for new business leaders to adapt their leadership styles to the needs generated in the new transitional eras (Petry, 2016), having to respond to changes, according to Buhse (2014) and Petry (2014) with at least five characteristics of the digital leadership—the NOPA principles approach—which are: to be more interconnected, open, participatory, and agile.

2.2 People Management

Leadership is not effective if it is not aligned with an adequate knowledge management policy and a learning transfer strategy in the organization. For this reason, although knowledge and learning are key in the processes of digital transformation in Industry 4.0, the role of human resources as a pillar in the process of change—which allows to value the necessary skills to satisfy the needs of organizations based on the combination of knowledge and lessons learned—with their attitudes, aptitudes, and abilities, leads to consider people as the basis of the management of such transformation, positioning human management as the true core of knowledge and learning management systems in organizational (Lendzion, 2015; Valeri, 2021).

Thus, for knowledge and learning management programs to be effective, it is necessary to start up, develop and control the human teams involved at all organizational levels of the company. This practice requires significant efforts from the field of human resources and the redesign of the organizational structure, as Staniewski (2008) points out.

Thus, in the case of larger companies, the so-called knowledge intermediaries can be incorporated, whose function is to transfer knowledge and accumulated learning to the rest of the people involved (Staniewski, 2008), guarantee the effectiveness of recruitment systems and selection, capable of satisfying the needs that digital transformation entails. For this, it will be essential that the job analysis process is clearly defined and agreed with the technical managers of each organizational unit.

2.3 Digital Culture

Organizational culture is defined as a complex entity of values, beliefs, behavior norms, meanings, and practices shared by the people within a work environment, which is determined based on the relationship of three conceptual levels: those of the artifacts, the visible elements of the culture, the beliefs and values adopted, and the underlying basic assumptions (Robbin, 2004).

In the company's digital transformation process, the relationship between the organizational strategy to be implemented and the organizational culture is an essential factor, which can facilitate or hinder the implementation process.

For this reason, this variable has been the subject of numerous research studies, where the authors evaluate the impact of culture on the effectiveness of each of the phases of knowledge management and organizational learning (De Long & Fahey, 2000).

In this regard, Gupta and Govindarajan (2000) consider that a participatory culture, where the exchange of ideas is promoted, happens to be crucial to activate knowledge management and learning initiatives, in such a way that they allow the acquisition of new experiences and lessons based on the creation and combination of its generation process, exchange, exploitation, and use.

Additionally, a step further can be taken by linking the organizational culture, from a holistic perspective, with knowledge management processes, drawn on the relationship with organizational performance as a control mechanism for the process of implementing the digital transformation (Al Saifi, 2015).

2.4 Organization Size and Workforce

In the literature here analyzed, it has been determined that the size of organizations turns out to be an important and moderating factor in the relationship between the exchange of knowledge and innovation management in the digital transformation processes of companies (Černe et al., 2013). Likewise, it seems that the aging of the workforce is decisive in the level of organizational performance, making necessary to redesign new formulas to transform its own expertise, and integrate it into the process of exploitation and management of organizational knowledge and learning (Park & Kim, 2014).

Finally, it is necessary to take into account the moderating role of organizational structures, key in company culture, as well as their effect on knowledge management for digital transformation (Ahmad et al., 2014).

3 Methodology

This research has been conducted through qualitative analysis using the case method. The selection of the companies interviewed has been made taking into account various criteria, such as its location (Basque Country, Spain), activity and value chain to which the SME contributes to, its size, its level of innovation and internationalization, among others. Indeed, throughout the process, other variables have been identified, such as the organizational structure and the digital and technological management model, for instance. The companies have been anonymized in this study to protect their internal management processes.

The field study was carried out, using in-depth semi-structured interviews, in an 18-month timeframe (during 2020 and 2021), which included, though, the first phases of the COVID pandemic and later stages. The semi-structured interview technique, through the use of open questions, made possible the identification of different paths throughout the research process enriched by a loaded exploratory and descriptive nature, underscoring dissimilar stages of digital transformation among the companies analyzed.

The interviews were addressed to the general management personnel, namely managers or the person with the greatest responsibility in the company. In some of the cases, the specific traits of the digital context have been fulfilled with the vision of other employees with current and/or past responsibilities in relevant areas of the managerial function.

4 Case Study

4.1 Case # 1: Toward a Smart Factory in the Market of Welded Steel Tubes

This company was founded in 1997 and belongs to a leading business group in the territory. Dedicated to the manufacture of precision welded steel tubes, it dedicates its market efforts to a diversified portfolio of sectors, highlighting the automotive and storage ones, plus an extensive mix that complements its commercial portfolio. Internationally, this firm has a presence in more than 20 countries, both in Europe and in Africa, constituting the majority of its destination market. Its offer includes more than 3000 references, which implies a great logistical and operational complexity in terms of cataloging, demanding annual updates, depending above all on the latest orders.

Its digital and technological strategy is fundamentally based on compliance with its own annual management plan. However, there are strategic axes that are being executed through projects and that are not precisely present explicitly within the aforementioned plan or its digital transformation strategy, such as the implementation of various functional modules of *Enterprise Resource Planning* (ERP) or the

conceptualization and design of surveillance of the company's central systems and services.

In general terms, its digital transformation as a company starts from the integration of technology to improve processes at the level of business management, manufacturing, and finished product management. For example, the management of the ERP system makes the provision of support to administrative and management processes possible, which is complemented by a business intelligence system that feeds on information generated within the management processes and that is capable of developing dashboards for functions related to decision-making in areas such as management, production, programming, quality, systems, administration, maintenance, billing, budgets, sales, orders, and R + D + I.

The information that is exploited is directly linked to its production performance, special manufacturing, internal claims or rejections, order execution, price and raw material policies and management, etc.

4.2 Toward a Smart Factory

For its pre-sale stage, the company also relies, digitally speaking, on *Customer Relationship Management* (CRM) technology, facilitating bilateral communication and information between the commercial department and the company's management. Its functions can be optimized thanks to the standardized nature of production, requiring less engineering, and custom design activities.

Its design and engineering area has a team of eight professionals, responsible for the design and improvement of product manufacturing. Among its functions are the feasibility studies of orders or the analysis of their technical viability. The team meets weekly to assess and monitor the strategy aimed at developing higher value products.

Within the production system, tasks such as fabrication, welding, and cutting are not yet digitized. Likewise, other tasks, in which they are not particularly specialized, are carried out through a network of collaborating companies in the territory. In this sense, the need to systematize and homogenize the collection of data from all participatory units in a collaborative way, whether they are their own or external, has been identified, as well as the urgent assessment of investments in cutting lines and the incorporation of systems that enable it to analyze productivity variables more thoroughly.

4.3 Technological Departments: Information Technologies and R + D + I Strategy

Its ICT department is responsible for managing ERP technology, as well as plant computing, which is provided by an external technology partner. For its part, the activities of the R + D + I department focus on the product and production processes, carrying out, among other things, simulation projects, in collaboration with local universities, in the field of materials evaluation and welding process, while promoting the generation of new knowledge through the analysis of the variables that can affect the efficiency and productivity of the process. It should be noted that the company's Management Committee plays an essential role in leading the execution of these initiatives.

4.4 Relationship with Customers

In the digital field, the company has a corporate website that allows reasonable interaction between the client and the commercial department. This tool is developed and managed jointly with two other companies of the business group belonging to stages of the value chain close to the client. Its role is dynamic and active in the process of digitizing customer relationships. Likewise, an e-commerce strategy is being recently implemented with the collaboration of professional digital channels.

4.5 Digital Governance from the Perspective of the Business Group

Digital issues in this company are governed with coherence and autonomy from the general direction and the responsible areas. Thus, the technology department implements varied digital issues transversally for all the companies in the group. Likewise, the office platform, the figure of the *Chief Information Security Officer* (CISO) and the incorporation of certain digital infrastructures are defined at the level of the entire group in order to reduce the total cost of ownership (TCO) and transactions between the different business units, especially from their IT departments.

In 2021, a new *chief information officer* (CIO) joins the group, increasing the level of coordination, which does not become formalized in specific procedures, but through frequent contact and coordination meetings for certain matters of transversal scope.

On the other hand, the need to establish a technological roadmap has been identified, as well as the definition of some indicators for its achievement; among them, some key indicators of the digital component of the business. On this basis, in terms of ERP systems, compared to other companies in the group, there is a much

greater deployment and breadth of their exploitation; such task has been strengthened based on the learning obtained from the simplest digital deployments carried out in the other group companies. Complementary, a project has started to select a new business intelligence tool that might respond to the growing analytical needs.

Regarding analytical quality management, the *Material Resource Planning* (MRP) software currently utilized is truly key to its control and achievement of goals. On the other hand, production management is carried out fundamentally against order and inventory in the warehouse. Thus, based on the market history, manufacturing planning takes into account the variation in demand, as well as the requirements that exist in terms of order fulfillment. In this regard, the company has automated warehouses with cutting-edge mobility technologies (MAG).

Finally, from the R + D + I department, the priorities have led to work in two directions: to continue deepening the management of knowledge in certain industrial processes and to advance in the measurement of such processes in the production plant, machineries, and production lines.

4.6 Case # 2: Intelligent Multimodal Transport Making the Most of the Port of Bilbao

This company offers a comprehensive point-to-point transport service anywhere in the world, operating mainly from the port of Bilbao, Basque Country (Spain). Its provision of services has specialized mainly in integral multimodal transport by road, rail, sea, and air. In addition to working on the mobility of goods, its business model allows it to provide storage services, guaranteeing the responsible management of international freight transport. The security, speed, and economic efficiency of each phase in the logistics chain are an integral part of its competitive advantage, while it is currently adapting its strategy to start a new phase of business growth.

The start of its economic activity was in 2012. Today, it has a team of 62 people with a vast expertise in exports and logistics, as well as a remarkable knowledge of the daily circuit of activities performed in the Port of Bilbao: transport, consignee, freight forwarding, and general logistics. Its greatest experience comes from the historical provision of its services to small and traditional companies in the territory and, to a lesser extent, from its own advanced management, innovation, and digitization models. Each service order this company carries out is worked on as a custom-defined transport project that includes specific documentation, and explicit permits and certificates.

4.7 New Management Direction and Strategy

Its new Chief Executive Officer (CEO) is largely focusing his/her efforts on promoting greater cohesion and integration between the different lines of business and capabilities, seeking to generate synergies that promote the creation and perception of value by and for customers. As a top-level executive, he/she is backed by more than 20 years of experience in multinationals.

Indeed, the present competitive strategy of this company is fundamentally based on differentiation through the added value provided to its customers, thanks to technological and digital transformation oriented toward an enriched value proposition via comprehensive and reliable end-to-end customer services.

This strategy also seeks to improve efficiency in terms of response times in key administrative areas such as billing and collection processes, incorporating new technology-based functionalities, and digital integrations supported by a corporate *Enterprise Resource Planning* (ERP) software.

Unfortunately, this process of reflection and strategic planning was interrupted by the COVID crisis at its earliest stages. Thus, during 2020, the strategic response was to adapt to the new market demands (e.g., health and minimum levels of activity), forcing it to respond to new operational and sustainability needs that were even more pronounced due to the consequences caused by Brexit in commercial and bureaucratic administrative matters.

4.8 Digital Strategy

The current digital planning adequately responds to the new corporate strategy based on two main focuses: the search for improvement in the customer experience and the increase in the efficiency of corporate processes. Additionally, digital planning is designed to promote the identification, adaptation, and generation of new business models, recognizing the difficulty of currently addressing this type of innovation due to the global socioeconomic situation and the company's present degree of digital maturity.

The development of new products/services is intended to be initially tested with clients who are open to it, trustworthy for the exploitation and evaluation of new solutions. Once testing has begun, it becomes essential to identify new customer needs and potential responses to them. However, COVID is affecting the internal integration process of the business and strategic reflection at all levels, limiting the depth of this approach.

On the other hand, the general management keeps a close eye on coordinating all the company's strategic initiatives, including those that bear technological components or are linked to digital ones. These initiatives are clearly oriented toward strategic repositioning; that is, to more added value and customer orientation, with a strong component of operational efficiency.

In order to accelerate digital changes, this company collaborates at the territorial level with various tech organizations and groups, representing a key member for different business and sector associations from which it receives technological trends and strategic information.

This company has a technological partner with whom it carries out most of the digital developments on its information systems. This partner is an utter ally that, in addition to responding to the technological needs of the corporate platform in terms of ERP, is also updated concerning technological innovations in the sector, identifying opportunities on arena. Such technological surveillance is undertaken mainly through this external partner, which, among other digital capabilities, provides the ERP and technological developments and integrations incorporated into this platform. This technological partner is not a generalist, but rather a specialist in the transport and logistics sector, helping to incorporate elements linked to the company's digital mindset, as well as specific training on certain technologies.

Regarding the average age of the company's workforce, this happens to be low, which (according to the interviewee's opinion) seems to facilitate the adoption of technology in workplace, as well as the identification of possible improvements in the way of carrying out certain procedures.

Additionally, this company participates, along with many other organizations, in projects promoted by territorial business associations with the support of the Provincial Council of Bizkaia, exploring and building new forms of teamwork, while seeking to create new habits in companies, develop leadership in the teams, and share a joint vision of the development of skills and abilities, among others.

4.9 Costumers and Markets

The new business strategy has placed the accent on customer orientation. Thus, for example, it proposes initiatives for the development of an extranet from which the client can obtain information about the contracted services, as well as their execution in real time. This approximation, from management and information, implies the coordination with other departments and a greater degree of integration with both internal and external information systems, as well as the agents with which the company collaborates in the implementation of this development, for instance, collaborative shipping companies.

As part of this sectoral collaboration, information is shared at different levels among the participants, concerning subjects such as fleet management, geolocation, routes, tachographs, shipments and entries, and merchandise stocks. It seeks to generate new interactions, information, knowledge, learning, and traffic of interest to its customers, contributing to their satisfaction. To this end, a project is being developed, made up of different key territorial actors whose intention is to reproduce conversations in which the client transfers functional needs to the company.

This tool makes possible the identification of technological needs among consumers and their prioritization. Therefore, to proceed with its execution, it is

necessary to coordinate with technology areas for the subsequent construction, adjustment, or integration in the extranet and corporate ERP platform. The administrative and management operations of those responsible for the company's accounts are the ones that have been digitized and integrated the most, seeking the improvement and efficiency of processes by reducing inefficiencies.

Likewise, in the digital field, the corporate website is in the process of being improved within the digital strategy, in such a way that it will allow the achievement of marketing objectives aimed at business development. The idea, in general terms, is to make this tool a key means in the learning process of the knowledge of its final customers and b2b ones, recognizing characteristics such as business size, sectors, or inner capacities, as well as the appropriate profiles for projects related to digital innovations. Some of the keys to this type of project lie in the choice of an expert technological partner, as well as the internal management of expectations and results, minimizing the potential risks that depend on the innovative culture of the company.

In addition, in managing the relationship with customers and stakeholders, the company carries out marketing actions by preparing and distributing a newsletter with relevant information on the sector. However, this initiative has not been as satisfactory as expected, having recently to turn toward a communication model through a corporate blog in which various experts from both the company itself and external experts—with remarkable relevance and prestige in the sector—collaborate with each other.

4.10 Digitization of Management Processes

Before the arrival of the current general management, a digitization process had already begun in the company, setting off the implementation of various platforms for different functionalities and internal processes. In spite of this, the fragmentation of information and the added complexity of the processes required, in this new managerial stage, a greater capacity for integrating information and knowledge. Thus, with the subsequent investment in an evolution of the ERP, this pending task has been carried out in recent dates.

This internal process has required significant efforts, not only for the technological investment accomplished but also the organizational changes implemented since it has led to a slower speed of adaptation than expected mainly due to the culture and business baggage in digital terms: from truck transport to evolution in a modular way, to the integration of data with different company processes, such as accounting, intermodal traffic, export-import management, and vehicle workshop storage. Thus, this company has passed from being oriented toward integration just of the billing process to integrating and supporting all business processes.

Given that the digital transformation also implies an organizational evolution, the current digitalization process has been accompanied by the development of

personnel and teams through continuous training for the acquisition of the necessary digital skills.

In quality management, projects have been carried out for the completion of incident management, although there are still certain limitations, mainly due to the lack of time and prioritization, the existence of some habits or preestablished practices, and the need to incorporate a new digital mentality. For its realization, a pilot project is being carried out using an incident management model based on a client's file, which includes all the services provided, while involving different participating departments.

In addition, from the top direction, in digital terms, the cost management has been improved, fulfilling a greater control of the activity and margins, increasing the level of information—which allows this company to better know its customers and make sound decisions throughout its organization levels—and greatly streamlining processes due to: the integration of information systems, greater communication and interdepartmental interaction, and the notable reduction of activity based on isolated departmental silos.

Likewise, improvements are being performed based on digital systems; for example, the management and control of warehouses or the monitoring of transport fleets. Currently, their possible extensions to other areas are being evaluated, above all because clients have evolved into a more aware target segment with the need of having an integrated vision of their relationship. They are, thus, more demanding and requesting new features in services that can have their digital implantation through current or even new instruments.

For its part, the transport unit is developing a pilot project, shared with other territorial organizations, which seeks to improve fleet management, providing information that allows the company to take higher quality decision-making, such as its own track and trace systems. Some specific clients require their own systems to be used, which is why information management based on simple and compatible solutions is a must, while knowing how the operation is carried out in an effective, efficient, and transparent manner.

Finally, the digitization of delivery notes and documentation required for the mobility of orders has internally shortened billing and collection periods, positively and directly influencing the financial dimension of the business. As a component of the aforementioned territorial project, it seeks to reduce the risks derived from individualized information management and aims to increase trust and organizational transparency in companies, both between people and departments, with the ultimate goal of reinforcing the vision of customer orientation. The territorial system of open work and shared source has been promoting more interaction and new solutions between the different teams.

4.11 Leading Transformation, Empowerment, and Organizational Agility

The digital transformation, intensified with the new general direction, has also led to the development of organizational skills linked to the flexibility and adaptability of the organization, thus contributing to the construction of a broader process within the framework of the company's strategic reorientation.

The vision and experience of the CEO in other economic sectors, with multiple and diverse management approaches, have represented the seed on which to adapt the culture and organizational dynamics. Thus, from this predominant position of organizational leadership, this direction seeks to generate "creators" of solutions who may maximize the added value present in the services provided, promoting a genuine culture of experimentation and innovation that gives optimal results to both clients and the company itself.

Likewise, the size of the company makes it possible for senior management to be directly present in many of the transformation activities, which allows it to identify, prioritize, and channel opportunities and development needs that are often accompanied by technological developments of different scopes; such as the case of the territorial project for the improvement of quality or fleet management.

Other initiatives, such as the incorporation of people trained in computer engineering, have improved the analytical-technological capacity of the technological developments that are carried out hand in hand with the territorial technological partner. Likewise, the significant number of employees with digital native profile is considered a contributing factor in proposing new lines of work or opportunities to take advantage of the potential of certain digital technologies. A collateral effect of this context has been a greater specialization of work and support for the decision of the general management, redirecting the digital demands of the company departments that have new dialogue with a clear technological profile.

Although it is true that the average age of the workforce is quite low, the same is not a fact for administrative or office jobs, compared to those at the logistics or transport operation level.

Through participation in territorial projects, new interpersonal skills or soft competences are developed in the organization, such as teamwork, valuing leaders, and managing in changing or uncertain environments. This collaborative project count on the support of various experts and people from different areas of business function, while knowledge and learning acquired ranges from the suggestion of changes at the physical level in plants, such as the layout of people or workspaces in offices, to promoting greater interaction between departments and people. Their implementations have promoted the establishment of new organizational habits and progress at the level of transparency, resulting in an improvement in organizational trust.

4.12 Transforming the Value Chain with Technology

The market position of this company is based on providing a high-value service at each point of the logistics chain to a global client portfolio, with some processes already being digitized, such as the communication platform for the exchange of transport documentation. In the field of transport and logistics, coordination is enormously complex due to the high number of stakeholders involved, which is why agents and suppliers have moved to create an electronic customer-managed relationship (eCMR) platform.

Hand in hand with the sector and territorial technology centers, some pilot tests are being carried out with other technologies such as blockchain for assurance and traceability processes. However, the proliferation of vertical and horizontal solutions and the lack of a commonly accepted standard makes it difficult to adopt a common solution.

On the other hand, concerning storage, the automation of the operation turns certainly complex when it comes to non-palletizable materials. However, digital technologies are used for the design of storage locations. Likewise—in terms of plant management, electronic invoicing, documentation, stock control, and the level of consignment—the intelligent automation of administrative tasks, such as notifications, and information shipments are already a reality, the next step being deepening into the incorporation of artificial intelligence.

These projects, for the modernization and updating of technologies that allow the improvement and efficiency of the processes, contribute to changing the profile of the client manager toward services with greater added value, while more mechanical tasks can be developed through digital technologies.

4.13 Cases # 3: Digitization for Servitization at the Core of Worldwide Leading Labs

This company, founded in 1978, is dedicated to the design, manufacture, and installation of comprehensive solutions for laboratories. Its clients belong to sectors such as the pharmaceutical, chemical, food, universities, or research centers. Its international presence is very prominent in Europe, the United States, Africa, and the Middle East; highlighting its participation in the market thanks to a high segment position that demands top-quality materials and a high standard level of service in laboratory furniture with maximum benefits. The equipment offered is highly sophisticated, as well as its equipment for research into advanced materials. For this reason, its clients value aspects such as safety, energy savings, or the conditions for sustainability.

Its commercial management is carried out through the realization of laboratory projects that include layout design, such as installation, to the procurement of equipment. It is actually a world-leading manufacturer of technical furniture.

Its activity began by providing solutions for school and laboratory facilities. In 2000, innovation led this company toward a modular system of intelligent equipment, expanding the attributes with greater ergonomics and efficiency features. In 2016, the design of layouts for laboratories was added to the company's offer, initiating integration processes with the client's processes. This business approach enables plausible integrations with systems that are used in disciplines such as construction, architecture, and civil engineering, requiring an effort for automation since it could affect profitability analysis and therefore the feasibility of its realization.

4.14 Digitization at Two Levels

The services provided to its clients are worked on projects. For this reason, there are two types of projects: standard and special projects, depending on the level of customization that customers require. The vast majority of them are turnkey projects. Finished product stocks, thus, are not managed.

These projects cover varied activities ranging from a commercial stage, with a strong technical component, to the design and calculation of the facilities. For this, linked to the production process, there is a "product configurator" that simplifies the design stage. This tool increases efficiency and reduces production and delivery times. Given the relevance of this configurator, a pilot project is currently being carried out to explore new needs and opportunities to generate greater value for clients.

Similarly, the company provides a *Lab Planning* service that integrates a prior analysis of the present and future needs of the laboratories, as well as an interpretation or adaptation to the facilities and a functional analysis of the prior layout design.

In assembly tasks, digitalization has not achieved significant improvements. However, quality in the assembly and expertise of the professionals are some of its attributes of differentiation and positioning with clients, which is why, at the moment, it is not a subject of special attention in terms of digitization.

4.15 Strategy and Vigilance

The strategic management of this company is based on a 4-year plan, the most recent corresponding to the 2020–2023 period, which sets out 10 strategic objectives for the organization. Under the umbrella of this planning, digitalization is considered a completely transversal line of action and summarized in its digitization plan, which integrates a handful of individual digital actions. Indeed, this plan bears its own balanced scorecard and its corresponding *Key Performance Indicators* (KPIs), as well as its follow-up and monitoring process.

On the other hand, this company counts on its own monitoring team, having a mechanism for technological surveillance and competitive intelligence in its sector. Its research laboratories are interconnected through a digital platform capable of receiving and sending information.

Likewise, in order to understand the digital changes that directly affect its customers and the sector itself, this company becomes part of the *Equipment, Furniture*, *and Design Basque Cluster*, and is an active member in the conferences and sessions that are organized in the territory related to digital transformation, especially through its line of action in innovation and technology.

Since its inception, technological and digital updating has been a constant for this company. At its beginning, it was mainly seeking to maintain the competitive level of the company in the market and among its competitors. On the other hand, for some years now, new digital functionalities have been appearing, becoming barriers to entry in certain markets.

4.16 Digital Governance

The company works by processes and organizes its departments and teams in relation to these processes. Thus, its IT team is integrated into the general services department, along with the human resource and finance teams.

This IT team is responsible for the connectivity infrastructure, corporate equipment, and systems. Its functionalities have provided the company a highly reliable digital network infrastructure, with services based on *Cloud* technologies. They are also responsible for the management of the ERP, providing support to the managerial functions in aspects as relevant as the automatic preparation of corporate reports. In support operations, among those that are not core, IT teams collaborate with specialized third parties that embrace specific technological expertise.

As of 2020, this company has set out a digital strategy with a double objective: gain efficiency and reduce the effort to keep technology updated. In this sense, the evolution and multiplicity of basic technology systems and platforms make it difficult to keep up to date and imply an investment that is inadequate given the current business model. Secondly, this reduction in effort allows the company to focus on the management of other activities related to the new customer-oriented digital services, combining this refocusing approach with previous experience of collaboration with external providers, while committing to continue reinforcing extended digital capabilities based on the knowledge and expertise of specific partners in the territory.

Finally, the innovation department works on the basis of a product-level scope, more recently focusing on servitization-oriented market opportunities.

4.17 Digitization for Servitization

In addition to laboratory equipment, this company develops a client portfolio that includes four types of services: verification, maintenance, training, and technical assistance service (SAT). Verification and maintenance services, in turn, are offered at three levels: economy, advance, and premium; all these according to the standard costumers request for their labs.

Each type of service is associated with a digital proposal and a different level of digitization, for which maintenance and technical support, and digital technologies offer multiple potentialities for each of them. That is the case of the IoTLab, an intelligent digital tool that allows companies to control the state of the laboratory in terms of efficiency, security, and operating status remotely.

The functionality of this tool acts as a management system for interconnected laboratories from different devices, generating knowledge and learning on the consumption of certain services or the presence of particles in laboratories. This feature is highly relevant in terms of safety and energy efficiency linked to those activities carried out in laboratories, which are highly appreciated by customers.

Factors such as the reduction in the cost of gadgets, digital trends in the sector, and the evolution of the industry in relation to the sensorization of equipment have also contributed to this costumer's appreciation. This own development, conducted in collaboration with other partners and territorial scientific agents, allows businesses to monitor in real time a facility anywhere in the world. Thanks to this tool, this company has been able to relaunch the next generation of intelligent laboratory furniture. To do this, the R&D department has been encouraged to acquire skills related to telecommunications and electronics.

4.18 At the Right Pace

This company has been using technological systems in its processes for years, relying on Computer-Aided Design and Manufacturing (CAD/CAM) systems for the design and construction processes piloted by its technical office, utilizing machinery with a remarkable degree of automation.

Likewise, it has an ERP that integrates all the administrative functions of the business, seeking a higher level of integration with the manufacturing processes. Its digital strategy has passed from having fragmented and independent applications—which made having a complete vision of business information certainly complex—to the implementation of shared perspective technology, where the relevance of updated, consistent, and non-fragmented information turns vital for company's purposes.

It should be noted that, thanks to the support of the general management, this process has been promoted smoothly by the IT team, leading and coordinating the ERP implementation process through project teams for each of the defined processes

in the company. Both IT and process personnel comprised these teams, combining and harmonizing the business vision with the technological one.

These multilevel collaboration actions within the organization have allowed it to feed the scorecards (KPIs) that monitor the development and compliance in accordance with the strategic plan, also having its own *Document Management System* technology for the management of its equipment documentation.

Likewise, one of the company's strategic lines of digitization is carrying out a project that pursues the connectivity of 4.0 manufacturing machines, both for the management of machining centers or *Computer Numerical Control* (CNC), the cutting machineries, and the advanced machining or *Nesting*. This process also includes the integration of new equipment with the broad administrative management of the organization through its ERP.

Another of the digital projects is aimed at a higher level of vertical integration in the pre-sale phase of the process, integrating itself with other corporate systems in collaborative and joint management. Likewise, there has been a greater digital interaction with customers at the documentary, economic, and technical aspects, including certain elements of design and planning.

On the other hand, it should be noted that automation in plant manufacturing processes is still difficult to apply and implement, particularly in activities related to facility management. Here, automation turns complex, which questions the profitability of the investments to be made for such technological digital transformation.

It is observable, therefore, how in the current strategic plan, digital transformation is more than present in its processes, integrating the customer's perspective during remote installation and assembly, the growth of the portfolio of products and services, and the development of high-performance products.

In the near future, the company plans to promote projects that optimize the connectivity of manufacturing 4.0 and of those connected machineries that accelerate a higher level of integration of internal processes, while intensifying engineering and design with CAD/CAM technologies and their potential highest levels of automation (CNC, Nesting, or intelligent storage). That will help prioritize those aspects that will bring more value to customers and company's managerial functions.

Regarding the digital relationship with customers, changes are expected to be accomplished on the corporate website. For this reason, this business is executing a pilot b2b marketing project, while professionalizing its presence in social networks, without this currently being its focus of action. Likewise, some small approximations to the digital management of customer relations are being carried out based on CRM models; however, these have not been exempt from some difficulties for b2b models.

The IoT Lab, carried out at the initiative of the Management Committee, will further strengthen user safety and energy efficiency, two of the utter brand's attributes. This pilot project has been brought to the market and is offered within the *Premium* service level, operating just for a limited number of clients.

4.19 Cases # 4: Drilling the Market Diversifying Smartly

This industrial company is over 60 years old. After many changes and transformations, it currently has a team of 50 people specialized in the industrial drilling sector.

In its beginnings, the main focus of its management was producing in order to meet a very high demand. Between the years 1994 and 2000, the massive entry of Asian competitors into the market and the substitution by more complex and versatile machinery produced noticeable effects in the market demand for this company's services. The industrial drill sector begins to suffer a price competition process. Industrial drills acquire, as tools, less central character in relation to other components and systems in which they were integrated. On top of that, Asian competitors begin to develop their products based primarily on two main attributes: lower quality at a lower price.

The company here studied, since its inception, has been characterized by a clear market positioning of the drills, faithfully betting on quality, offering premium products that guaranteed high levels of durability—useful lives beyond 40 years—compared to that Asian manufacturer offered. From 2012 to 2014, it was decided to maintain the drill business with the same quality brand positioning, but with a diversification and specialization strategy, this time betting on the manufacture of special machines.

4.20 Diversification and Incorporation of Digital Technology

This specialized machinery, with a very high guaranteed productivity, used in very diverse sectors, was not general purpose machines, but for very specific operations. An example of this was the transfer machines; in this regard, the complexity and sophistication of their development required not only mechanical capacities, but electrical and electronic ones, as well as design and engineering activities.

4.21 New Management Direction, New Business Times

In the second decade of the current century, there was a managerial change in the company's direction assuming the highest responsibilities within the board of directors and in the operation of the business. Indeed, the composition of the board of directors is reformulated, but this time including independent executives from companies in which they hold senior management responsibilities. The new board decides on a new form of management that includes the incorporation of a new manager with a more commercial vision of the business while continuing to leverage technical and production development internally. In this context, a fresh but known OM (operations manager) executive is appointed to carry out these functions.

The professional assigned to this responsibility has a historical role in the company, as well as extensive territorial knowledge of processes and products, which gives him great leadership, playing a key role and one of maximum trust at all organizational levels.

This operations manager was joining in 2019 as the first non-family company's manager but with deep knowledge of the industrial field and technical consulting in the sector. His addition to the company's project brings with it a strategic vision of technology as a lever for growth, which translates, over the months, into the implementation of projects with external expert partners, plus the incorporation of professionals with an intense digital mentality. With this, this director sought to increase company's own digital capabilities, key to the development of new products and/or services, but from a digital perspective.

4.22 2020–2025 Strategy and the Impact of COVID-19

The 2020–2025 strategic period had just begun when COVID-19 burst onto the territorial and international scene affecting daily business activity and some relevant projects. The pandemic has had a significant impact on the economic activity of this company, representing a huge commercial drop that has been gradually diminishing until now, time in which the company has compensated for the adverse situation.

To understand the market of this company, it is necessary to mention that industrial drills are intermediate products in the most complex production and transformation systems in the industry. Clients, though, to a large extent, are engineering, procurement, and construction firms (EPCs), engineering companies themselves, and not so much the end customer who receives the service.

However, the technology currently applied to industrial drilling by the company here study allows it to be very competitive, while it offers new business opportunities that offset the results in the drilling line, despite certain doubts regarding the investment that translates into a certain slowdown in the contracting of turnkey projects.

Likewise, the diversification that has begun, given the breadth of its technology, is opening up new opportunities for leverage based on digitization in processes, glimpsing new promising lines of income. The 2020–2025 strategy contains different lines linked to operational efficiency, channel diversification, and the development of business prospects based on the servitization of its products.

Thus, a catalog of services has been defined with notable market response, which includes maintenance services, thus identifying commercial areas where greater added value can be generated for the customers, including new technology.

To this end, some pilot projects have been launched to facilitate closer contact with users. These projects propose a first experimental development in digital key to connect with the end user of the products, thus seeking to improve engagement and loyalty through the development of a specific and segmented value proposition, the development of Apps and online digital links, in collaboration with companies and

technological centers of the territory pertaining to the Basque Network of Science, Technology and Innovation (RVCTI).

Similarly, a catalog of services has been defined for operations and maintenance firms (O&M) using different tools and technological components. One such component is an *gauge interceptor* that checks the quality of the threads. This innovative development started from the identification of a need in key sectors, such as the automotive industry where it has been validated effectively. The innovation consists in the automation of the check, thus contributing to the reduction of non-quality costs, as well as to the improvement of the traceability of products. When it comes to systemic digital integration, it is currently in the early stages of developing a platform with a technological local partner, but the innovation itself is today fully operational.

4.23 From Digitization in Management to Comprehensive Digital Transformation

The company studied here has incorporated technology into its management processes for decades. Digitization, in turn, has come in parallel to the evolution of the company, proving essential to make the leap from developing products to developing projects, hence incorporating previous engineering phases that significantly add additional value for customers. Thus, at the corporate level, an *Enterprise Resource Planning* (ERP) software was implemented some years ago, contributing to the integration of the processes of the different management units; later incorporating, on this same support, a package for project management.

Currently, the technical office uses commercial software for engineering and design. The technological and digital integration have subsequently occurred when a computer solution was implemented between the technical office and the production office. In this regard, for this company, manufacturing continues to have many manual components given the complexity of its operations, while some steps are taken to generate a CAD/CAM-based technological structure for monitoring its plant activities. It is considered that the incorporation of technology is very complex and arduous due to the type of activities carried out by the company, making the profitability of digital investments doubtful for this line.

On the other hand, the company continues to move in the direction of incorporating sensor technology and connectivity capabilities into its products and services to allow its users to operate them as intelligent products. Likewise, progress is being made in the exploration of new features based on market needs and opportunities where connectivity to know the operating status of equipment and solutions plays a salient role in improving preventive maintenance, reducing risks, and associated costs.

The digital transformation this company is undergoing is being experienced largely in a collaborative way; for instance, the internal design of the integration

and intelligence in the products has been opened up to other technological agents in the territory to collaborate in making new developments. By this means, some technology centers contribute with their learnings and knowledge to the collaborative platform based on their own specializations and capacities, in line with the practice of open innovation. They also collaborate with other engineering companies and private firms both for the development of R&D activities aimed at improving and innovating in products, and for the sophistication of business models through sensors and development of innovative services.

Finally, a fundamental forthcoming strategic step for this company will be to grow through digital channels, focusing the generation of value on the digital marketing that may complement traditional one and sales, thus generating interest in professional social networks through fresh brand content with customer reference cases.

4.24 Case # 5: Digitization and Value Generation in a Committed Cooperative

Founded in 1993, and with a current workforce of 104 people, this company is dedicated to the industrial foundry specializing in nodular iron products, whose uses are mainly for the truck, rail, and wind power markets; as well as automotive, agricultural, and valves ones, among others, but to a lesser extent.

Its manufacturing is focused on the elaboration of very specific metallic parts for complex sub-assemblies of traction systems, brakes, moving parts, manifolds, and valves, among others. Its productions are short and medium series.

In 2008, after some years of difficulties, they carried out a study on the diagnosis of the business situation. As a result, the report throws up a comprehensive proposal to revive it, proposing the incorporation of a chief executive officer (CEO). Unfortunately, this recovery plan suddenly overlapped with the global financial and economic crisis, which led to the loss of 50% of the business volume for this company between the years 2008 and 2009. Added to this drop in billing, there were structural elements that had been causing the deteriorating situation, among which it is worth noting the inefficient use of resources, both human and material, and that includes financial ones.

The effects of the crisis made it necessary to rethink the management and collective effort of the organization in a more direct and reactive way, jointly committing to set an equal "survival wage" for all workers, regardless of their responsibility in the company. Finally, in 2010, it was possible for this business to obtain a positive economic result.

4.25 Fitting Digitization into the Strategy

Since 2011, the management model of this company has been based on annual management plans that allow the CEO to run the company with a relatively lower degree of uncertainty, reducing potential frustration in the business. However, some parts of its internal operation did have specific longer-term plans, such as the commercial plan (3–5 years) or the investment plan (3–5 years).

Currently, the 2021 annual plan includes varied aspects of "social investment," which relates to the dignity of the production process, focusing on workers and their workplace conditions and environments, where gases are produced with special materials in high-temperature environments, involving risks to some extent. This social investment will set up a new molding line, which will be intense mainly in mechanical engineering tasks.

4.26 Digitization in the Value Generation Sequence

The company's sales management is based on a direct relationship with clients to whom it has been working for many years. This is reflected in its solid portfolio of clients in various sectors. The orders are offered under the format of arranged projects, including the definition and construction of part models, the manufacture of cores that are integrated into moulds, the construction of specific moulds, the type of fusion carried out, etc. Additionally, heat and surface treatments, and machining are offered. Projects include geometric design, chemical composition, and mechanical properties.

To do this, the company relies on a digital plan that develops a part simulation system. Simulation is vital, because in the casting process, there are innumerable physical and chemical conditions that definitively interact. This R&D activity, based on trial and error, continues to play an important role in the development of solutions, and is therefore a key source of knowledge for the company.

4.27 Transformation Versus Technology

For this company, the digital transformation is approached from a double perspective: the management of the basic digital infrastructure—informatics and telecommunications, which includes the maintenance of the ERP and other corporate management systems or additional technological development—and the digitization of production or industrial processes of the company, with a clear orientation toward the efficiency of the plant.

This digital transformation is currently carried out through specific project initiatives in collaboration with varied technological partners in the territory. In this sense,

diverse projects have been developed by local technology centers specializing in metallurgy. With this, the aim is to centralize the data of the production plant, trying to eliminate informational fragmentation—existence of many individual systems that do not allow business function to gather an overall vision of the company's comprehensive performance. This implies both integrating the collection of process information and offering different perspectives that may be relevant to multiple departments of the organization, such as the commercial, financial, production, raw materials, and environmental ones. The quality of the plant information is key to making sound decisions in all these departments.

The system used is based on a platform that allows predictive detection of an incident in production, proposing, and recommending corrective actions for the manufacturing process. In that way, knowledge of data related to the process in real-time facilitates assessments and corrections in central processes.

In addition, quality has proven to be a key variable for the productivity and profitability of its foundry activity. For this reason, different milestones throughout the production process are designed to offer fundamental information on the final quality, making it necessary to take advantage of the know-how developed over the years, which has progressively evolved through experimentation. The results of this project are recorded and managed digitally to make it transferable in terms of knowledge and learning.

The collaboration of technological partners focuses, among other tasks, on developing digitalization processes that predict results based on the raw material used in each experiment. In this sense, the technological R&D that is currently carried out from the company's technical office, has proved its importance in such a way that at least 20% of the company's activity is R&D, which generates new knowledge and learning for the involved areas of the organization.

Finally, the commercial department carries out its ordinary activity digitally, using digital technologies for teleworking under certain conditions or the management of service incidents, work systems that imply interaction with other teams.

4.28 Digitization Beyond Efficiency

This company considers the digital transformation of its organization from a broader perspective than the mere optimization of processes. This proactivity is explained, first of all, by its cooperative nature, since a good part of its staff are partner workers.

On the other hand, the type of activity in the production facility poses a new space where digitization can cover the foregoing "social investment" of the company. In this sense, a project is being designed that will include augmented reality technologies as an assistant in the activities of the operators. This project is being developed in collaboration with other territorial technology partners.

Other actions implemented are intended to improve the empowerment of people, especially operators. In this company, plant managers fulfill a double function:

ensure production compliance and perform a training function for these professionals, transferring knowledge and learning acquired.

The digital transformation in the company is certainly linked to its occupational safety (e.g., a load of weights and exposure to gases and other materials). For this reason, an initiative has been launched seeking to improve and ensure the health conditions of employees through the utilization of exoskeleton technology, biometric bracelets, devices to monitor air quality, etc. This project is being carried out with some territorial technology centers and certain companies in the industry with which it shares this interest.

4.29 Organizing the Digital Transformation

Its intelligent productive plant program is under the responsibility of the manager and the director of the maintenance area. Management direction, for example, drives the development of technological surveillance.

Finally, it should be noted that this company maintains an active presence in various forums, summits, and meetings to reflex on foundry. On top of that, it also participates in international projects for the introduction of 3D printing technologies applied to its industry in order to respond to the potential future needs of its clients.

5 Findings

In all of these cases, the differentiating element seems to be people as the primary factor in the knowledge development process, so the head role of the leader in the change process, the culture developed, and the management of people in an integrated way facilitate the improvement of the competitive conditions of companies.

In this analysis of the experience of digital transformation of SMEs in the Basque Country and their links to knowledge management and organizational learning, from a perspective rooted in the development of processes and products, the different strategies adopted by Basque companies are highlighted, which serve as a reflection for the analysis of the different models that have been generated in their change processes and their learning logic.

For this, a set of stages have been systematized that begins with the acquisition and capture of knowledge, continue with the assembly, exchange, and integration, and end with the leverage and exploitation of new knowledge acquired (Alavi and Leidner, 2001; Teece, 1998; O'Dell and Grayson, 1998).

In this line, among these companies, a common pattern is observed in the previously established system, that one before the process of digital transformation. Thus, in some cases, an explicit and formal key knowledge record has been materialized to reinforce the acquired knowledge management process, which allows it to be shared as a source of information for maintaining competitive

advantage, clearly identifying a responsible for the direction of this stage in projects of diverse nature.

This fact serves as practical learning in a multitude of actions as it is related to technical, technological, process, and marketing knowledge. The developments of the intranets of the companies analyzed are clear examples of the maintenance of technological surveillance and consequently competitive intelligence.

Here, firms not only compete for their ability to exploit their existing organizational resources and capitals but also do so for their ability to renew and develop their organizational capabilities (Teece et al., 1997). For this reason, in the companies analyzed, and in order to develop innovation in the change process, they try to guarantee that workers have a higher level of skills and competencies necessary for their jobs. Thus, greater importance is attached to the training policy aimed at updating corporate and technical knowledge in order to maintain a competitive advantage.

On the other hand, the technical and technological skills linked to inner development and industry 4.0 implementation allow these companies to establish new learning formulas by interacting with their customers through win-win models. Likewise, virtual experiences provide these firms with digital skills that are developed and available to be transmitted later in the organization.

In relation to the soft or interpersonal skills used or generated in the companies studied —such as teamwork, management in changing environments, and leadership—they have proven to be especially relevant in knowledge management and organizational learning forged in its own internal processes of digital transformation.

Indeed, to promote digital transformation, a change in management style is necessary in such a way that it can combine efficiently the ability to carry out effective leadership through open behavior (Li, 2010), accelerating effective commercial execution, as well as business adaptation to the market, since this is progressively becoming more agile (Gibson & Birkinshaw, 2004).

Hence, the process of adaptation and renewal of the leaders in Basque companies has been analyzed as responsible for managing knowledge in a process of change toward digitalization and integration. The materialization of these managerial measures have spurred the development of new business models, contributing to the competitiveness of the organization and the harmonious interaction between the different functional areas that may be found in salient company immerged in a technological environment and continuous innovation.

The incorporation of leaders to strengthen new business projects through the redesign of corporate strategies is presented as a cardinal factor in the management process for digital transformation. That is the case of all the companies here analyzed, where a change in the direction of the company is observed as a common element of a decisive turning point.

The inclusion of a new CEO with internal origin, who in some cases can count on the support of external key agents, is usually accompanied by a different formation of the management team that assumes maximum responsibility for advancing the mission of promoting a renewed strategic repositioning based on in the digital

transformation, while promoting a process of reopening to unexplored markets and products that is reflected in the design of a fresh organizational strategy.

6 Conclusion

As observed in the cases, in general terms, this remodeled strategy is linked to the development of new products or the optimization of those existing ones, pursuing a new strategic position while improving the company's competitiveness through the development of its value chain. In addition, the leadership capacity in the transformation process, based on his previous experience, is commonly accepted, which gives him maximum confidence in the organization.

The cases analyzed have also shown how, given the need to adapt to digital transformation, it is necessary to carry out a redesign of the organizational structure leading to favoring the active participation of employees in the knowledge management and learning transfer process, acquired, and accumulated in the organization (Staniewski, 2008).

Likewise, the cases have shown the urgency of reducing the hierarchical levels to structures with fewer layers, where communication can ascend, descend, and move horizontally more fluidly. In medium-sized companies, like the ones here analyzed, it is naturally easier to implement a flexible structure design that might provide the organization with greater efficiency in the knowledge management and organizational learning process.

On the other hand, these Basque companies have relied on measures to attract and select personnel that has been fundamental in the process of digital transformation and knowledge and learning transfer. Indeed, organizations need to reformulate the designs of the necessary professional profiles, considered specific for the positions where the main management of this transformation falls.

Furthermore, the cases help us infer the strategic value of training through continuous learning in the organizational field, which must be dynamic, proactive, flexible, and with the purpose of creating and maintaining knowledge management as the necessary and differentiating value Industry 4.0 furbishes. The importance attached to the cases of these aspects is reflected in the implementation of modalities such as mentoring or coaching to support innovation based on the transmission of experience and lessons learned from one to another.

Regarding the control function of effectiveness and efficiency at the level of staff performance, as generators of value in knowledge management and learning processes in digital transformations, the cases have shown the need to implement operation evaluation systems that might allow managers to measure and analyze the impact and involvement of employees in the processes.

On the other hand, in the analysis of the cases of the Basque SMEs, trust in the CEO—now the leader in the transformation process—recognized by all the members of the organization, has been critical.

On top of that, in their role as leaders, they have fostered a culture based on experimentation and innovation that translates into the incorporation of values and codes of conduct aligned with the management of information, knowledge, and collaborative learning.

For these companies, digital culture is now pivotal in the effective implementation of new strategies as it is shared by all the members of the organization, shaping, thus, their own image and digital identity that allows them to maintain the competitive advantage achieved during this process until taking the next technological and organizational leap.

Linked to the participatory leadership and culture of these companies is their average size, as well as the low-middle age of their workers. These particularities have enabled the companies, on one hand, to participate directly in a significant number of knowledge and learning management activities; and on the other, to implement a digital mentality that is adopted in most of the jobs in the company's organizational structure.

Finally, their new ways of organizing work, so that the organizational support can positively respond to the new strategies of change and transformation, seem prepared for the redesign of the organizational structures to undertake, looking for a change in the process dynamics as a common element, while creating new, more resilient, and flexible organizational routines in which various departments are actively involved. Thus, workspaces are configured as open and connected spaces that boost the interaction between people, departments, and machines to be optimized like never before to generate knowledge and promote organizational learning.

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Safety and Security Knowledge Management

Barbara Pavlakovič Farrell

Abstract The chapter presents the field of employee safety and security, its historical progress and the current state of prevention actions and training based on case studies of employees in industrial tourism. Employee safety and security refer to the physical aspect (appropriate working conditions and organisational processes, physical attacks on employees), psychological safety and security, and providing workers' rights. Different subjects and objects can endanger employees; however, they can handle challenging conditions if adequately equipped with safety and security knowledge. From a sample of 17 organisations from the UK, Austria, Slovenia and Croatia, we will present actions taken to ensure employee safety and security within industrial tourism and list possible training to acquire and strengthen safety and security knowledge.

Keywords Safety and security · Knowledge management · Employee training · Industrial tourism

1 Introduction

HR management as an organisational function responsible for attracting, recruiting, developing, rewarding and retaining talents that determine the success of an organisation (Phillips & Gully, 2014; Wilton, 2016) has become an important strategic aspect of organisational management. However, recent theories showed that we could go beyond HR management. Modern organisations value human capital, which is presented as knowledge, skills and attitudes—KAS (Bhattacharya & Cohen, 2017; Nyaupane et al., 2021). Since employees need a wide range of KAS, there is a need for human capital management, which includes comprehensive education, training and development of employees and their skills. All these

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_9

activities enhance the productivity and effectiveness of the organisation and provide healthier working conditions (Güdük & Uca, 2019).

One particular field of KAS is knowledge about safety and security. Safety and security can be divided into the physical aspect, which ranges from appropriate working conditions and organisational processes (protective clothes and equipment, friendly working days and hours, healthy environment, safe technology and similar) to physical attacks on employees. Another aspect is psychological safety and security, where employees can be endangered by different subjects and objects. These can include other employees (co-workers, management), customers, technology and work processes. However, employees can handle challenging conditions if adequately equipped with safety and security knowledge. This knowledge can be included in the soft skills list and described as problem solving and creative thinking skills (Elshaer & Marzouk, 2020). Furthermore, employers also consider conflict management skills essential and highly valued (Andersen, 2020).

The chapter will highlight significant turning points as the first acknowledgement of employee safety and security rights, the implementation of safety and security into laws and the establishment of HR departments (Brown, 2014; BCF Group Limited, 2022). We will also present the development of organised safety and security knowledge training, which is legally required in some countries. Safety and security knowledge training received slightly more attention during the pandemic (Chi et al., 2020), although other situations are yet to be explored. Therefore, as a case study, we will present employee safety and security in industrial tourism. Nevertheless, first, let us focus on the theoretical background of the safety and security concept.

2 Safety and Security

First, we shall look into the basic concept of safety and security. "Security is often seen as protection against a person or thing that seeks to do another harm. Safety is often defined as protecting people against the unintended consequences of an involuntary nature" (Tarlow, 2014, p. 12). Hence, providing security means actively protecting people or things against potential deliberate and intended threats, while providing safety means ensuring minimal harmful effects from unintended consequences on people or things (Agarwal, Page and Mawby, 2021). As we can see, English has two words explaining various aspects of the concept. Meanwhile, some languages have only one word for both concepts combined. This is the case in Spanish (la seguridad), German (die Sicherheit), Slovenian (varnost), Icelandic (öryggi) and some other languages.

The importance of safety and security was recognised by Maslow (1943), who presented the safety and security needs in his theory of human motivation, where they are placed on the second level. As Maslow states, higher needs can be reached if we fulfil lower-level needs; hence safety and security are vital for greater self-development. Besides, if we do not satisfy these basic needs, we may face fear, which restricts us from functioning effectively (Furedi, 2007). Safety and security is

also vital motivator when deciding on which destination to visit (Beirman, 2021), as it is one of the elements when deciding upon getting a new job position.

Safety and security are also fundamental to a healthy workplace, besides the health and well-being of all workers (WHO, 2010). Nevertheless, many different agents can endanger employee safety and security. First, they can derive from the natural or man-made environment. They can be summarised into four groups: natural disasters, social and political unrest, health crisis and technological disasters (Podbregar & Pavlakovič, 2016). On the other hand, threats can be regarded as physical (accidents, exposure to violent personal attacks and property/valuables crime, abuse, hostile body conditions) or psychological (threatening, assault, mobbing, endangering well-being and mental health, overload of work, jeopardising social security) (Beirman, 2018). Ngo and Nicely (2022) highlight harassment, which can happen in the workplace and affect the behaviour and feelings of the employees. Based on various sources, there are different healthy workplace influences: safety in the physical work environment (e.g., machinery and chemicals), psychosocial environment (e.g., time pressure and harassment); personal health resources (e.g., poor diet and lack of breaks); and organisational involvement (e.g., supporting health care and implementing policies) (WHO, 2010; De Cieri & Lazarova, 2021).

Safety and security in working environments have unique features, especially regarding employee safety and security. Crisis does not only endanger organisations but also their workers and their families who depend on their earnings (Elshaer & Marzouk, 2020). The next chapter will present the historical root of employee safety and security management and the significant turning points of its development.

2.1 History of Providing Employee Safety and Security

Working conditions are an important issue for employees as well as for employers. Some sources state that working risks were already considered in ancient Egypt and the middle ages; however, the awareness of the problem arose from the time of the industrial revolution (seventeenth century) (Vakselj, 2001; Strban, 2012). For example, the first warnings and recommendations on mine working were already written in 1300 and discussed further in the sixteenth century by Paracelsus (Batič et al., 2002). Nevertheless, in the early days of industrialisation, employers had free hands and were not obliged to any legalisation. Through time, countries introduced decrees on mine working conditions, child labour and workers' rights. In the UK, there were legal proposals to appoint inspectors in the mines as early as 1872 or to establish safety committees in the iron and steel industries in 1927 (Dawson et al., 1988). The inspections committee inspected safe labour conditions from 1841 in France, 1883 in the Habsburg monarchy and 1912 in Italy (Vakselj, 2001).

Safety and security management was long considered a part of the collective agreement between employers and workers, which was better arranged if there were trade unions.

Unions as workers' associations whose purpose is maintaining and improving the working conditions were developed on the grounds of trade guilds. However, the origins of modern trade unions go back to eighteenth-century Britain (Durrenberger & Reichart, 2010). Unions were also connected and held international conferences on which they appealed to respect workers' rights and provide safe working conditions (Jouhaux, 1951). Throughout history, trade unions attempted to improve protection against injury or ill health at work (they proposed financial compensation for the risk of injury, the creation of the protective legalisation and its effective enforcement, and the development of consultative bodies at the plant level) (Dawson et al., 1988).

Nowadays, countries have laws and acts to protect general employees' rights, health, safety and security. For example, one of the first acts on safety and health was approved in Massachusetts, USA, in 1877; the law required safety precautions, such as guards for belts, shafts and gears and adequate fire exits (Brown, 2014).

There was a lack of regulatory labour legislation in the UK until the 1960s, as they had only general working laws, and most legal enactments depended on collective bargaining (Dawson et al., 1988). However, from the 1960s on, acts on strikes, unfair industrial practices, workers' rights and protection were introduced. Through the years, different acts were passed to reduce the incidence of death, injury and disease arising from employment. The laws encouraged improved safety standards and stimulated self-regulation within minimum statutory requirements. One of the important turning points of the UK 1974 Health and Safety at Work Act was the awareness that the responsibility for safety lies on employers, senior management and employees since they, too, must act responsibly (Dawson et al., 1988). Another turning point was the creation of enforcing body, The National Industrial Relations Court (in 1971), and later the formulation of The Safety Representatives and Safety Committee Regulations (in 1977), which appointed safety representatives/committees as agents of trade unions and investigators of potential work hazards (Dawson et al., 1988).

As an example of Slovenia, when the country gained its independence in 1991, workers' rights were addressed in the county constitution, highlighting the rights of social and health security, safe working conditions and union representatives (Bubnov-Škoberne, 2001). There were also other laws designated directly to the area; for example "Zakon o varnosti in zdravju pri delu" (Occupational Safety and Health Act), "Zakon o delovnih razmerjih" (Labour Relations Act) and "Zakon o inšpekciji dela" (Labour Inspection Act).

Worldwide general employees' rights, safety and security are protected by many laws and international documents (Strban, 2012). We can highlight the Universal Declaration of Human Rights by the United Nations, which was accepted on 10 December 1948—it constitutes the right to work in a healthful work environment, to receive equal pay and to have workers' representatives (Elshaer & Marzouk, 2020). The document was the base of the formulation of the International Bill of Human Rights, which was completed in 1966 and legally bound countries to provide healthy and safe working conditions, equal rights for all employees and social security. Within the European Union, other documents refer to the topic. First is

the European Social Charter (revised in 1996), a Council of Europe treaty that guarantees fundamental social and economic rights related to employment, working conditions, housing, health, education, social protection and welfare (Council of Europe, 2022). Another document is the European Code of Social Security, which defines European social security norms and establishes minimum levels of protection (in areas such as pensions, unemployment and invalidity benefits and medical care). There are also different European directives referring to the area; for example Directives 77/576/EGS and 78/610/EGS, followed by Council Directive 89/391/EEC from 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work. Each EU member country is invited to develop its own work safety legalisation further; moreover, employers are invited to design the Code of working ethics in which the subject is appropriately addressed.

Even before the mentioned documents, the International Labour Organization (ILO) was founded in 1919 (Vodovnik, 2009). Among other things, it promotes workers' safety and security within conventions, protocols and recommendations that are proposed to worldwide counties (related to the protection against harmful materials, situations, pollution and ensuring workers' rights). One of the essential conventions is the Occupational Safety and Health Convention (No. 155), which sets the fundamental principles of safety and health at work and relates to all occupations in all industries, including the public sector (ILO, 2017a).

One of the crucial milestones of twentieth century employee safety and security is the development of human resources departments. First, as personnel management and later as human resources management (HRM), it appeared in the early 1900s. HRM focuses on different issues; for example business management and strategy, workforce planning and employment, human resource development, compensation and benefits, employee and labour relations and risk management (Vinodan & Meera, 2019). One of its primary roles is training workers and derived from factories that operated between the II World Wars and needed a new working force equipped with skills and knowledge (Werner, 2014). Nevertheless, not only working skills and professional knowledge are needed in the working process. If employees should be safe while working, they also need knowledge about safety and security; therefore, HR departments need to organise and provide appropriate training and development opportunities.

2.2 Employees' Safety and Security Management

Employee safety and security can be observed from different angles: technical safety and security; health protection; labour assurance and social security (Vakselj, 2001; Vodovnik, 2009; Strban, 2012). Regarding technical safety and security, employees must be aware of various sources of danger. They can be endangered by natural causes, accidents, technical faults or higher force, people from outside the working environment (organised crime, suppliers, customers) or people from inside (management, other employees). Health protection refers to providing a healthy working

environment (without pollution or endangering workers' health) and promoting health at work. Labour assurance protects the rights to work, to organise in unions and to have employees' representatives. Lastly, social security addresses pensions and medical insurance.

There are numerous possibilities for providing a safe and secure working environment (Vakselj, 2001; Strban, 2012). Employers must first evaluate the working conditions and improve them if there is an issue. Next, a risk assessment should be performed to calculate the probability of unsafe events (Clifton, 2021). The usage of non-harmful materials and processes should be implemented wherever possible. Safety and security protocols should be applied for everyday occasions and exceptional cases of fire, natural disaster, violence, mobbing and technical issues. Besides, workers' rights and salaries should be secured and respected. Secondly, employers should inform and educate employees about new technologies, working conditions, risks and possible illnesses that may derive from the work process. Also, regular medical check-ups are advised for all workers. Moreover, employers must ensure protective clothing, physical barriers between employees and the source of danger, security staff and technical protection to prevent possible accidents (Clifton, 2021). If the dangerous event still happens, the employer should provide the workers with immediate help and health support. Last but not least, all these processes must be led following laws and the Code of Ethics.

When it comes to a critical situation, an employee has to defend oneself on all fronts (physical, mental, legal and media). Therefore, the organisations should also gather a security team consisting of a crisis manager, medical/public health specialist, a legal person, a specialist in physical and human security and a marketer/public relations specialist (Tarlow, 2014; Elshaer & Marzouk, 2020). If a team is not possible, an internal safety and security specialist or outsourced expert is recommended, who can help ensure and promote safety and security in the organisation (Strban, 2012). Ways of promoting safety and security are a newsletter (e-mail or newspaper provides safety tips and suggestions, highlights safety topic of the month, uses quizzes and games, promotes safety training and posts photos of safety hazards), safety wall (bulletin board highlights the most important safety and security issues), a website about safety and security, phone hotline and personal communication (Clifton, 2021).

However, it is not all in the hands of the employers. A legal obligation of employees is to handle technology, machinery, chemical elements, transport and other production tools safely while using personal protection equipment (for example, helmet, goggles, gloves and protective vests) (Strban, 2012). Additionally, employees must act responsibly and not abuse drugs, alcohol and other dangerous substances at work. Care for the safety and health of other workers is also required from employees (Bubnov-Škoberne, 2001). However, employee safety behaviour (following safety procedures and improving workplace safety) is more noticeable when workers are motivated by inspirational leader communication and support on safety behaviour in everyday working processes or safety training (Fruhen et al., 2022).

If both sides—employers and employees—follow safety and security guidelines, the organisation can build a security culture within its own organisational culture. Security culture is an ongoing system of ensuring a qualitative, healthy and safe working environment, which is supported, implemented and constantly improved by all employees and management (Batič et al., 2002; Han et al., 2019). It should encompass the values, beliefs and behaviour of the organisation members to protect security (Phillips & Gully, 2014; da Veiga & Martins, 2017). Safety culture is reflected in a safety climate, which emphasises the employees' perception of the importance of a safe demeanour in occupational activities (Zohar, 2010; Gray et al., 2023).

It should be in the interest of both workers and employers that the security culture is respected (Bubnov-Škoberne, 2001; Clifton, 2021). Workers want to be active and healthy after retirement or ready for their next professional challenge. Furthermore, employers need healthy workers to be more productive and generate further profit. In addition, due to the provision of greater security, costs can be reduced (insurance premiums and compensations, repairs, searches for replacement employees), the ethical dimension of the company is proven, work efficiency increases, as well as the motivation, morale and loyalty of employees (Phillips & Gully, 2014; Bratton & Gold, 2017). Security culture is closely connected to organisational resilience, which represents an organisation's ability to respond quickly and innovate to crises, followed by fast recovery and adaptation to new circumstances (Prayag, 2019). An essential part of organisational resilience is employee resilience; therefore, responsive workers know how to react in unpredictable situations. If the organisation can build employee resilience, it needs capable workers, who utilise resources to adapt and succeed when facing ordinary and challenging situations (Kuntz et al., 2016). On the other hand, employees perceive a safe and secure working environment as one of the elements of organisational resilience; therefore, the whole loop can be closed (Nyaupane et al., 2021). The next chapter will discuss acquiring safety and security knowledge.

2.3 Safety and Security Training

Organisations can ensure more excellent safety and security by providing support mechanisms (e.g. policies, actions, safety up-dates and training opportunities), customise policies and practices to individual working positions, and connecting and collaborating within- or outside-sector by sharing information, training opportunities and experience (Fee et al., 2019). Promoting a solid safety culture during critical eras and encouraging safe practices is vital (Gray et al., 2023).

One of the fundamental means of providing safety and security at the workplace is educating employees in the field. In some countries, employers are legally obliged to deliver training and education about safe work and a healthy job environment. For example, in Slovenia, all employees must attend a safety and security at work course ("Varstvo pri delu") (Act on Safety and Health at Work, n.d.. Besides that, Slovenian

Act on Safety and Health at Work introduces the importance of education among its fundamental principles. It states that learning about health and safety should be a part of the formal education system at universities and professional schools and a part of the introduction to work processes (Strban, 2012).

Widespread knowledge is the fundamental base for human resources development. It encompasses formal education, introduction to work processes, job shadowing and transfer of knowledge between employees, regular and occasional training, courses and knowledge refreshment (Možina et al., 2002; Elshaer & Marzouk, 2020). Introduction to the work process is the first opportunity to equip new employees with safety procedures guidelines and acquaint them with security culture (Možina et al., 2002; Strban, 2012). They should learn about dangerous situations at the workplace, security measures and crisis protocols, their response in dangerous situations, usage of protective clothes and equipment, rights and representatives, data of personnel responsible for first aid and evacuation, communication channels and all written and unwritten rules that apply in the organisation. Information about safe working conditions should be up to date and in writing, while training should be customised to a specific place of work (regarding content and frequency).

However, employers should not forget that appropriate training is also needed when workers change their working position, when new technology is introduced or when new working equipment is available. Nevertheless, knowledge should be regularly renewed even if conditions do not differ. Besides, safety education and training should be accustomed to different worker subgroups and their demographic factors since Han et al. (2019) showed that mid-career professionals tend to underestimate the severity of safety hazards. Therefore, their safety education should be reinforced.

Developing knowledge and training is the responsibility of HRM. Therefore, organisations can have internal training coordinators, who develop training programmes, coordinate the schedule and keep a record of the attendees (Clifton, 2021). They can also deliver general safety and security training or search for external educators. Moreover, special training should be organised for the employees responsible for the first reaction in a crisis. Security guards and workers, responsible for first aid or extinguishing the fire should have special training performed by certified educators from reputable organisations (Clifton, 2021). Training should be conducted yearly (Elshaer & Marzouk, 2020). HRM should also gather safety and security knowledge in security manuals. An organisation can have general manuals with instructions for the first response after the dangerous event and training manuals that provide detailed information about protocols and steps of individual security policy (Clifton, 2021).

Modern legislation states that upgrading knowledge is a worker's right and duty due to ILO conventions instructing countries to develop their legislation in the field (Možina et al., 2002; Vodovnik, 2009). Therefore, management should develop an annual training plan for workers, where they predict the most important fields that need to be improved with further education. Besides, organisations should provide funds to cover training costs and enable the workers to be absent from the working process during training as it is written in the Paid Educational Leave Convention,

no. 140 (ILO, 2017b). Different countries have adopted these conventions into their legislation; moreover, they developed public associations for implementing permanent education at work (e.g. French National Agency for Adult Vocational Training; German Federal Institute for Vocational Education and Training, Irish Education and Training Boards Ireland and Lithuanian Qualifications and Vocational Education and Training Development Centre) (European Commission, n.d.). There are more examples of different institutions that ensure the development of lifelong learning systems through which the needs of the economy are met with the skills and knowledge of the employees.

3 Case Study: Employees in Industrial Tourism

The next chapter will demonstrate the theoretical safety and security concepts in real-life situations. The tourism industry is especially endangered since employees can be threatened by natural, man-made, external (e.g. tourists) and internal (e.g. co-workers) risks which make the tourism working environment uncertain and sensitive to security and healthy issues (Elshaer & Marzouk, 2020; Monaco, 2022). Moreover, the safety and security of tourism workers are quite often overlooked since the safety and security of tourists take the prime spot.

A distinctive tourism example is industrial tourism, a type of tourism that offers visits to functional or abandoned production sites or services (Otgaar et al., 2016). Visitors can experience product tasting, viewing the production process, interactive engagement through applications, and historical insight into the company. There, safety and security can be divided into protecting intellectual property and know-how, visitor safety, product hygiene and employee safety (Pavlakovič, 2022). Employees facing industrial tourism perform tours and offer visitor support as well as production or service workers. Therefore, both should be acquainted with safety risks from tourists as almost intruders to their familiar working environment. Safety and security information should be delivered at the introduction to work, while other needed skills should also be nurtured during employment at all positions (Pavlakovič & Jereb, 2020).

As a case study, we present 17 European organisations that performed industrial tourism tours in the pre-COVID-19 time. Currently, some abandoned welcoming tourists due to strict COVID-19 health regulations and safety concerns, while others reopened with new safety and security measures introduced. This chapter presents actions taken to ensure employee safety and security within industrial tourism and list training options to acquire and strengthen safety and security knowledge.

United Kingdom

Examined organisations were Mondelez United Kingdom (Cadbury world—chocolate production), Fiskars Group (World of Wedgwood—porcelain production) and BMW Group (Visit Mini Plant Oxford—car production) (Table 1).

Table 1 Employee safety in industrial tourism—United Kingdom case study

Organisation	Employee safety measures	Safety training	Situation after COVID-19
Mondelez United Kingdom (Cadbury World)	Health and Safety supervisor; employee rotation.	Training about how to use equipment; handling with visitors.	Reopened after approx. 4 months after closure, following law requirements (currently, no strict measures apply).
Fiskars Group (World of Wedgwood)	Physical barriers (fence, gallery); Tour guide supervising tourists; security announcements.	Experiences from former workplace.	Reopened after approx. 4 months after closure, following law requirements (currently, no strict measures apply).
BMW Group (Visit Mini plant Oxford)	Smaller groups; Tour guide supervising tourists; physical distance.	Training about how to communicate.	Reopened after approx. 2 years after closure.

Austria
Examined organisations were Zotter Schokoladen Manufaktur GmbH (chocolate production), Vulcano Schinkenmanufaktur GmbH & Co KG (dry meat production), Manufaktur Gölles GmbH (liqueur and vinegar production), Swarovski Group (Swarovski Kristallwelten—jewellery production) and Flughafen Wien AG (airport) (Table 2).

Slovenia
Examined organisations were Revoz d. d. (car production), Pivovarna Laško Union d. o. o. (brewery Laško and brewery Union), Droga Kolinska, Živilska industrija d. d. (paté production) and Nuklearna elektrarna Krško (power plant) (Table 3).

Croatia
Examined organisations were Međunarodna zračna luka Zagreb d. d. (airport), Rimac Automobili d. o. o. (car production), Hrvatski sabor (parliament) and Atlantic Cedevita d. o. o. prehrambena industrija (soft drinks production) (Table 4).

4 Recommendations for Developing Safety and Security Knowledge Management

As presented in this chapter, there are various employee safety measures possible. As we presented through the historical development of the field, safety and security have become more and more critical for the working process effectiveness and productivity as well as for the well-being of the employees. Therefore, efficient safety and security management is necessary for each organisation. Fig. 1 resumes several recommendations that lead towards developing a more solid security culture.

Table 2 Employee safety in industrial tourism—Austria case study

Organisation	Employee safety measures	Safety training	Situation after COVID-19
Zotter Schokoladen Manufaktur GmbH	Physical barriers (glass wall); physical distance.	Exchange of employees' experiences.	Reopened after approx. 3 months after closure, following law requirements (currently, no strict measures apply).
Vulcano Schinkenmanufaktur GmbH & Co KG	No contact with production workers; the help of other tourism workers.	How to deal with stress; safety training.	Reopened after approx. 3 months after closure, following law requirements (currently, no strict measures apply).
Manufaktur Gölles GmbH	No contact with production workers; video surveillance; trained employees for handling with drunk people.	Exchange of Employees' Experiences.	Reopened after approx. 3 months after closure, following law requirements (currently, no strict measures apply).
Swarovski Group (Swarovski Kristallwelten)	No contact with production workers; security guards.	Introduction to work training; mentoring.	Reopened after approx. 4 months after closure, following law requirements (currently, no strict measures apply).
Flughafen Wien AG	Technical surveillance (cameras, X-ray); security guards and police.	Introduction to work training; customised training.	Reopened after approx. 4 months after closure, following law requirements (currently, no strict measures apply).

First, employers must follow the laws and ensure workers' rights. That includes technical and health safety while securing a safe and healthy work environment (technology, material, processes) and appropriate safety equipment (helmets, goggles, reflective vests and other clothing). Furthermore, employees must be entitled to labour assurance and social security.

Second, employers should promote workplace safety and security to ensure a safe organisational culture. Most importantly, they should be role models for employees, behave safely and be security conscious. Next, safety and security issues could be highlighted in newsletters, bulletin boards, organisations' websites and during annual appraisals or other personal communication.

Lastly, workplace customised training is one of the most important measures in providing safety and security. While new employees are being introduced to work, they must undergo comprehensive and thorough training about the safe ways to use technology and materials and how to prevent incidents and respond to them. Part of the training should also be a presentation of their rights, representatives, contacts in need and general security culture. Another important group of employees are people responsible for the first reaction in the crisis. They are entitled to special training organised by external specialists. Safety and security training should become regular

Table 3 Employee safety in industrial tourism—Slovenia case study

Organisation	Employee safety measures	Safety training	Situation after COVID-19
Revoz d. d.	Tour guide supervising tourists; physical distance.	Manual	Reopened after approx. 2 years after closure.
Pivovarna Laško Union d. o. o. (Union)	Physical distance; restriction of entrance for drunk people.	Mentoring and job shadowing; training about handling with visitors.	Reopened after approx. 3 months after closure, following law requirements (currently, no strict measures apply).
Pivovarna Laško Union d. o. o. (Laško)	Tour guide supervising tourists; physical distance.	Manuals; training for a local tourist guide.	Reopened after approx. 1 year after closure. Now, Visitors are more welcome in the town brewery museum.
Droga Kolinska, Živilska industrija d. d.	Tour guide Supervising tourists.	Visits to good practice examples abroad.	Tours were cancelled. Now, they offer 360° video on their website.
Nuklearna elektrarna Krško	Tour guide supervising tourists; technical surveillance (cameras, X-ray); security guards.	Job shadowing; introduction to work training.	Reopened after approx. 2 years after closure.

Table 4 Employee safety in industrial tourism—Croatia case study

Organisation	Employee safety measures	Safety training	Situation after COVID-19
Međunarodna zračna luka Zagreb d. d.	Tour guide supervising tourists; technical surveillance (cameras, X-ray); security guards and police.	Manuals; job shadowing; training about handling with visitors; exchange of employees' experiences.	Tours were cancelled.
Rimac Automobili d. o. o.	Tour guide supervising tourists.	Exchange of employees' experiences; visits to good practice examples abroad; training about how to communicate.	Reopened after approx. 2 years after closure.
Hrvatski sabor	Tour guide supervising tourists; technical surveillance (cameras, x-ray); security guards.	Mentoring; encouraging enrolment in formal education programmes.	Reopened after approx. 2 years after closure.
Atlantic Cedevita d. o. o. prehrambena industrija	Tour guide supervising tourists; technical surveillance (cameras); security guards; help from other tourism workers.	Visits to good practice examples abroad.	Tours were cancelled.

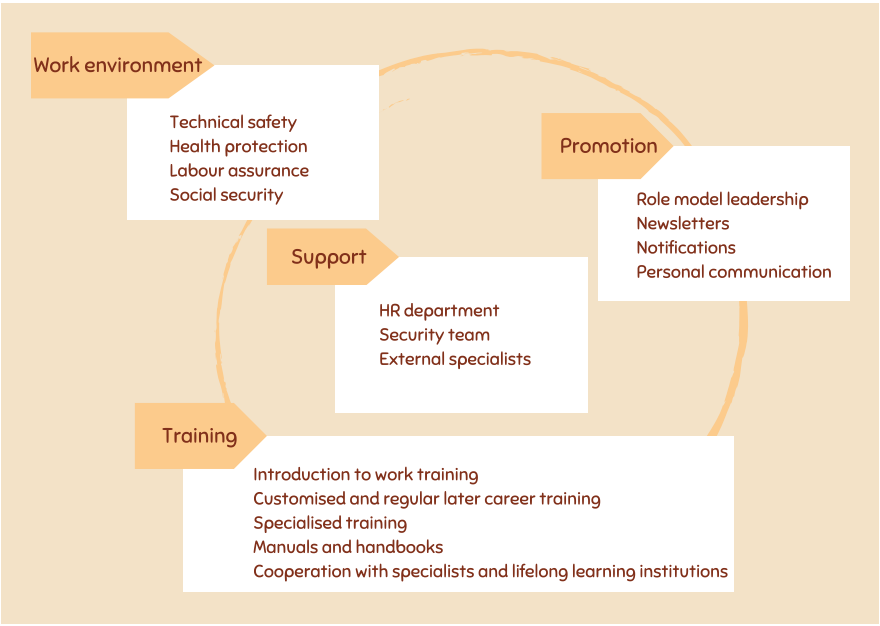

Fig. 1 Safety and security knowledge management

even for employees in their later careers since renewing knowledge and updating it is necessary for ever-changing safety and security circumstances. Besides, organisations can prepare manuals and handbooks for initial training or be used later during work. Also, cooperation with specialised institutions for developing lifelong learning to gain professional skills and knowledge are encouraged.

All in all, the listed measures should be taken care of by the HRM department, where they organise training and support the development of a safety culture. Moreover, organisations can also design a security team that helps employees in times of crisis and gives support in different areas. Another possibility is outsourcing external specialists.

Ensuring safety and security in an organisation is thus a lifelong process that includes all employees—from management and middle management to workers. As presented within case studies, there are various ways of protecting employee safety and security, as well as different types of training customised to individual workplaces. Along with the recommendations listed above, we hope that organisations will adopt safety and security behaviour, protect their employees, improve their safety culture and be prepared for an ever-changing world where known and yet unknown risks may appear.

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A Multidimensional Model for Implementing Knowledge Management in an Enterprise to Increase Employee Motivation and Enterprise's Competitiveness

Maja Rožman and Tjaša Štrukelj

Abstract The purpose of the chapter is to develop a multidimensional model to requisitely holistic identify aspects necessary for the successful implementation of knowledge management in an enterprise, which leads to increased employee motivation and enterprise competitiveness in today's turbulent environment. Namely, social changes require from owners and top managers changed governance and strategic management of the enterprise, which is more focused on the implementation of knowledge management. Researched determined multidimensional aspects for successful implementation of knowledge management in an enterprise are therefore (1) developing knowledge culture, (2) knowledge leadership, (3) building the knowledge team, and (4) knowledge employees' competencies. The main survey involved randomly selected 513 Slovenian enterprises. From each enterprise, owner or top manager participated in our research (online survey questionnaire). Structural equation modelling was used for statistical data analysis. Quantitative research, therefore, includes exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and determining the strength of the interplay of connections between the studied constructs. The results show that developing a knowledge culture, knowledge leadership, building a knowledge team, and knowledge of employees' competencies have a positive effect on the implementation of knowledge management. Further, implementation of knowledge management has a positive effect on employee motivation and an enterprise's competitiveness. Therefore, we suggest to owners and top managers of enterprises to direct the governance and strategic management to enterprise knowledge management. In the long run, this raises both the satisfaction of the enterprise's employees as well as its competitive advantage. This chapter highlights the important multidimensional aspects of successful implementation of knowledge management in an enterprise to increase employee motivation and enterprise competitiveness. Also, our results will contribute to the proper implementation of knowledge management in enterprises and give owners or top

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_10

managers a broad insight into the various aspects that need to be considered in their business governance and strategic management to increase the motivation of their employees and enterprise's competitive advantage in today's rapidly changing business environment. The limitation of the research is reflected in viewpoints of owners/top managers in Slovenian enterprises. Also, our research is limited to seven constructs: developing knowledge culture, knowledge leadership, building the knowledge team, knowledge employees' competencies, implementation of knowledge management, employee motivation, and enterprise's competitiveness. The findings of the research indicate a new combination of selected aspects that significantly affect employee satisfaction and enterprise competitiveness. Nevertheless, a major limitation of the research is that we did not investigate the further impact of employee satisfaction and enterprise competitiveness on enterprise performance. We propose to explore this in the future.

Keywords Knowledge management · Owners · Top managers · Leadership · Organizational culture · Employee motivation · Enterprise's competitiveness · Competitive advantages · Structural equation modelling

1 Introduction

The worldwide economy has shifted from an industrial manufacturing/product-oriented economy to one based on knowledge and services, where the commodity is information or knowledge (Rofiaty, 2019). Effective intellectual capital management is a critical issue facing enterprises in today's global and information-driven economy (Yee et al., 2019). Knowledge management is not really about managing knowledge but rather managing and creating an organizational culture that facilitates and encourages the sharing, appropriate utilization, and creation of knowledge that enables an enterprise's strategic competitive advantage (see, e.g., Lin et al., 2009; Rofiaty, 2019; Walczak, 2005). Enterprises that want to thrive in the twenty-first century need to learn more effectively than competing enterprises (Kucharska, 2021). They will have to improve their ways of acquiring knowledge constantly. Only in this way they will be able to compete with aggressive countries entering the market with products with low wages, even with high salaries (Irum & Pandey, 2020). The central issue in enterprises in the coming years will be knowledge management. The biggest challenge will be the enterprise's willingness to enable its employees to learn and progress and its maturity in creating and maintaining the mechanisms and opportunities that enable it (Manik et al., 2022). The enterprise should allow for openness and a willingness to share information, knowledge, and creativity and create a competitive work environment and a culture that encourages learning. Another motivation for examining the knowledge management methodology at an enterprise is the effect of organizational culture on new strategic initiatives (Aramburu et al., 2015). With the continuing globalization of the economy, enterprises are facing increasing pressure to effectively manage their intellectual capital (Kucharska & Bedford, 2020). Enterprises that attempt to introduce a knowledge

management initiative without having a managerial support structure will soon find that the investment in knowledge management does not produce any perceived benefits (Amoozad Mahdiraji et al., 2021; Yee et al., 2019). Gold et al. (2001) state that enterprises' organizational structure is an important factor in leveraging technology. More specifically, organizational structures must be flexible to encourage knowledge sharing and collaboration across traditional enterprise's boundaries to promote knowledge creation. According to Yee et al. (2019), knowledge management is the systematic management of an enterprise's knowledge assets to create value and meet tactical and strategic requirements. It consists of the processes, strategies, and systems that sustain and enhance knowledge creation, storage, and sharing (Manik et al., 2022; Rofiaty, 2019; Yee et al., 2019). There is a staggering increase in the price tag for data, and it is expected to grow further. It is evident that big data will alter how business is done in the very near future (Yee et al., 2019). Furthermore, data collection and analysis can allow enterprises to make better and more strategic decisions (Koohang et al., 2017). Hence, the collection, storage, and transformation of information into knowledge are the key prerequisites to data analytics (Amoozad Mahdiraji et al., 2021).

In the era of a knowledge economy, knowledge is the strategic resource for an enterprise (Wang & Chang, 2007), and knowledge management is the critical factor for an enterprise to improve core competences (Anjaria, 2020). As a new management pattern, knowledge management can make employees fully use capability and creativity and diffuse knowledge effectively to establish the strongest innovation capability, competitive capability, and anti-risk capability (Lin et al., 2009). A knowledge management strategy is a comprehensive plan outlining how an enterprise will manage information, data, and knowledge to enhance productivity and efficiency (Amoozad Mahdiraji et al., 2021). Successful knowledge management strategies align closely with departmental and enterprise-wide objectives and keep the knowledge management team focused on their business priorities and needs (Bhatti et al., 2020). Enterprises that invest in a knowledge management strategy enable their teams to leverage shared knowledge and make informed decisions that impact innovation, revenue, and retention (Kucharska, 2021). Knowledge management is a system of established processes for collecting and sharing knowledge and skills within an enterprise (Leone & Schiavone, 2019). Proper knowledge management in enterprises ensures that all employees have access to the information they need to perform at their best and grow their skills. It also makes it easier to onboard new hires and transfer projects to other individuals or teams (see e.g., Amiri et al., 2020; Jad et al., 2017; Sadeghi & Rad, 2018; Stylianou & Savva, 2016). Among IT enterprises, there is a common misconception that knowledge management is simply ensuring that information is added to the repository correctly (Safari & Azadehdel, 2015). However, the primary focus of knowledge management is ensuring that all of the available information is stored and managed in a way that makes it easy for employees to find and utilize it when needed, and team members themselves will be able to add information to the knowledge base (Berraies & Chouiref, 2022). This goes beyond just repository management and knowledge retention; it means building interdepartmental communication and encouraging employees to share their

knowledge with others (Fischer et al., 2021). Also, employees want to work in a supportive environment where they are given all of the tools they need to succeed and are encouraged to grow and develop new ideas. This is why knowledge management is valuable in enterprises of all sizes (Henttonen et al., 2016; Muhammed & Zaim, 2020).

According to Abdalla et al. (2022), knowledge management remains one of the top issues affecting enterprise's success and has become even more essential with the COVID-19 pandemic's scattering of staff among homes and work sites. However, only 9% of business leaders feel ready to address it (Abdalla et al., 2022; Yin et al., 2020). Knowledge transfer has become even more essential as COVID-19 has scattered staff among homes and different work sites. But traditional views of how to handle knowledge no longer apply (Behme & Becker, 2021). Some leaders have not yet recognized that. They have a false sense of security, believing that technology will enable knowledge to be transferred, with platforms and tools helping dispersed teams stay connected (Sahibzada et al., 2020). But Deloitte's European Workforce Survey research (Behme & Becker, 2021) has shown that technology alone will not be enough to harvest the value of knowledge management, and workforces have made it clear that they expect more from their employers. According to Irum and Pandey (2020), for future success, enterprises should shift their focus from knowledge capture to knowledge creation and transfer and champion a knowledge-sharing culture as vehemently as they champion tools and platforms. According to the results of the Deloitte European Workforce Survey (Behme & Becker, 2021), enterprises that prioritize knowledge transfer are perceived by employees as more competitive with respect to revenue growth and client satisfaction. Employees see them as more innovative and more attractive for employment. The time is ripe for business leaders to create a fluid flow of knowledge in their enterprises (Manik et al., 2022), beginning from enterprise's vision and business policy and thus strategies that are consistent with the baselines set by the enterprise's owners. To help employees share knowledge and information in fluid ways, the implementation of technology alone is not enough (Kucharska, 2021). Enterprise's vision, business policy, and strategies are needed to enable and motivate employees in this exchange (Fischer et al., 2021; Štrukelj et al., 2020, 2021). These reinforce the need for enterprises and their teams to rethink how they share data and make available knowledge (Muhammed & Zaim, 2020). In some cases, this calls for a new working environment that will supercharge the value of knowledge and turn it into a key enabler (Abdalla et al., 2022). Knowledge management implementation or improvement requires a multifaceted approach and there is no one-size-fits-all process for setting up a knowledge management program (Atapattu & Huybers, 2021; Sahibzada et al., 2020; Zhao & Detlor, 2021). It requires detailed planning and preparation, effective strategies, goal setting, and careful selection of knowledge managers (Yee et al., 2019). Implementing effective knowledge management requires proactive strategies and incorporating multiple new processes (Shen et al., 2021). Enterprises have to uncover the existing knowledge available to them, understand how to spread this information to produce additional value, and plan what this looks like in action (Boamah et al., 2022). According to Penc-Pietrzak

(2014), Mohamad and Mat Zin (2019), an enterprise's competitiveness is very important in the field of management, particularly in strategic management. An increase in an enterprise's competitive potential as well as obtaining and maintaining a competitive advantage in the long term leads to an increase in an enterprise's profitability, increases a market share, provides a better satisfaction of clients' needs, and an improvement of an enterprise's image in the environment (Bloodgood, 2019). The leaders must know the mechanisms of competition and the rules of market game in the sectors in which the enterprise operates and must manage them in a way that will increase an enterprise's competitiveness (Penc-Pietrzak, 2014). They should formulate a strategy allowing an enterprise to survive in the market and develop when the competition is strengthened (Bhardwaj, 2020). Thus, Ghayth (2020) emphasizes that knowledge management is vital to enterprise's strategies to increase competitiveness.

Still, enterprises are not sufficiently aware of the right way to implement knowledge management in their business. Owners and top managers of enterprises are too often unaware of the need to implement knowledge management in the enterprise and therefore the owners do not include it in the vision and business policy of the enterprise, and top managers are not in the enterprise's strategy. They also often do not know the important multidimensional aspects that contribute to the successful implementation of knowledge management in the enterprise; we presented them through the prism of the studied constructs and explained them in detail in the chapter on literature review.

The purpose of the chapter is to develop multidimensional aspects that are important for the successful implementation of knowledge management in an enterprise, which leads to increased employee motivation and enterprise's competitiveness in today's turbulent environment. These multidimensional aspects for successful implementation of knowledge management in an enterprise are (1) developing a knowledge culture, (2) knowledge leadership, (3) building the knowledge team, and (4) knowledge of employees' competencies. This results in greater employee motivation and enterprise's competitiveness. Our results will contribute to the proper implementation of knowledge management and give leaders and managers a broad insight into the various aspects that need to be considered in their business to increase the competitive advantage and motivation of their employees in today's rapidly changing business environment.

In the literature review (Sect. 2), we explain the hypotheses development, first how implementation of knowledge management in the enterprise influences enterprise's employee motivation and competitiveness through competitive advantages (Sect. 2.1), then we research implementation of knowledge management in the enterprise through developing knowledge culture (Sect. 2.2), new way of leadership style—knowledge leadership (Sect. 2.3), building the knowledge team (Sect. 2.4), and knowledge employees competencies development (Sect. 2.5). Then we explain methodology (Sect. 3), i.e., we explain data and sample, research instrument, and statistical analysis. In the Sect. 4 we present results and in the Sect. 5 we present discussion. Section 6 brings conclusion.

2 Literature Review

2.1 Implementation of Knowledge Management in the Enterprise

Knowledge management is any process (either formal policy or informal personal methods) that facilitates the capture, distribution, creation, and application of knowledge for decision-making (Li et al., 2022). This decision-making may be at the basic realization process of day-to-day operations performed by an employee or at every level of decision-making: operational level (of first-line managers), tactical level (of middle managers), or at a strategic level of developing enterprise's strategy by top managers (upper-level management) (Bhardwaj, 2020; Štrukelj et al., 2020). Mohamad and Mat Zin (2019) emphasize that knowledge management's value is organizing knowledge to enable people and the enterprise itself to act as effectively as possible. Boamah et al. (2022) argue that knowledge management is valuable to help enterprises use what they already know, work smarter and more quickly, gain competitive advantages, and accelerate their performance. Furthermore, knowledge management involves capturing the knowledge, wisdom, and added value experiences of individuals within an enterprise, making it easy to find again and, in so doing, preserving it as an enterprise's asset (Shen et al., 2021; Zhao & Detlor, 2021). Knowledge management involves collecting valuable knowledge and then storing, categorizing, and organizing this knowledge with the aim of making it promptly available to those people and systems that need it (Zhang et al., 2020). Such valuable knowledge is primarily in the possession of the experienced employees but may also be found in systems, databases, file cabinets, and other available sources (Imam & Zaheer, 2021). In order to enterprises transform into knowledge enterprises, it is necessary to put together coordinated efforts which will be directed toward a number of business areas (Abdalla et al., 2022). These efforts involve aligning the enterprise's organizational structure, the system processes, and the availability of technology and skills with the enterprise's specific goal to become a knowledge enterprise and its broader executive goals and direction (Stylianou & Savva, 2016). Moreover, effective knowledge management is not just a part of a strategy, it is a culture. A culture that helps enterprises streamline their processes and support their employees (Kucharska, 2021). Knowledge management can help businesses (1) speed up onboarding, reducing project entry time from weeks to days (Sahibzada et al., 2020), (2) make meetings more effective and eliminate wasted time (Yin et al., 2020), (3) develop training courses for both new hires and for teaching new skills and methods (Muhammed & Zaim, 2020), (4) establish instructions and detail processes for employees, (5) create instructions for clients (Fischer et al., 2021), (6) document the work of each department or team, and (7) facilitate cross-departmental collaboration and communication (Henttonen et al., 2016). Thus, knowledge management is key to gaining core competitive ability (Wang & Xiao, 2009).

Also, knowledge management increases employee motivation (Atapattu & Huybers, 2021), because when employees have easy access to information and knowledge they are able to do their jobs efficiently, they feel supported, motivated, and empowered (Atapattu & Huybers, 2021; Balde et al., 2018). Knowledge sharing among the employees creates new knowledge for the enterprise and helps it to improve its products and services (Safari & Azadehdel, 2015). Thus, knowledge sharing gives employees the convenience feeling and motivation to interact and be free among their co-workers within the enterprise, this will create a quiet challenge among the employees by motivating them to deepen their research in their field of work, which will result in the employees to come up with various new ideas that can be established to improve the enterprise's productivity (Usman & Musa, 2012). According to Manik et al. (2022), knowledge management is important because it boosts the efficiency of an enterprise's decision-making ability. By ensuring all employees have access to the overall expertise held within the enterprise, a smarter workforce is built that is more able to make quick, informed decisions, benefiting the entire enterprise (Amoozad Mahdiraji et al., 2021; Manik et al., 2022). Furthermore, knowledge management allows innovation to grow within the enterprise, customers benefit from increased access to best practices, and reduced employee turnover (Bhatti et al., 2020). Making knowledge management a significant part of an enterprise's leadership approach produces a more streamlined workforce with faster onboarding and well-informed staff that provide a better experience for customers (Yee et al., 2019). Knowledge management is a critical tool for any enterprise that wants to increase its bottom line and market share (Rofiaty, 2019). Thus, we propose the following two hypotheses:

H1: Implementation of knowledge management in the enterprise has a positive effect on the enterprise's competitiveness.

H2: Implementation of knowledge management in the enterprise has a positive effect on employee motivation.

2.2 Developing Knowledge Culture in the Enterprise

Organizational culture is an important factor influencing knowledge management processes in enterprises (Prystupa-Rządca, 2017). Organizational culture facilitates the creation and distribution of knowledge (Aramburu et al., 2015). Learning enterprise facilitate the learning process of all employees, continuously transforming themselves. Therefore, a desire to possess knowledge is a motivation for learning. Given that learning always changes the perception of things, leaders should support an organizational culture focused on knowledge, learning, and innovativeness at the individual and enterprise's levels and facilitating the flow of constant transformation of tacit knowledge into explicit knowledge (Kucharska, 2021). This is easier to achieve through owners' demand expressed in the enterprise's vision and business policy and through the top managers' demand incorporating it into the competitive

advantages and business strategies (Štrukelj et al., 2020), via appropriate enterprise culture, i.e., knowledge culture. Oliver and Kandadi (2006) suggest that enterprises should exactly know their culture before launching a knowledge initiative. Several other authors support this notion and advocate that organizational culture should be the focal point of knowledge management programs (Islam et al., 2015; Kucharska, 2021; Prystupa-Rządca, 2017; Stylianou & Savva, 2016). Islam et al. (2015) defined knowledge culture as one that has the conditions to support the flow of knowledge across the enterprise. Kucharska (2021) argues that a learning enterprise must capture, share, and use knowledge so its members can work together to change the way the enterprise responds to challenges. Learning must take place and be supported in teams and larger groups, where individuals can mutually create new knowledge (Prystupa-Rządca, 2017). Kucharska and Bedford (2020) noted the significant effect of knowledge culture on learning. Achieving a knowledge culture requires managerial focus in three areas: preparing the enterprise, managing knowledge assets, and leveraging knowledge for competitive advantage. Thus, Kucharska and Bedford (2020) summarize that preparing the enterprise is the first step in developing a knowledge culture and often involves changing the culture of the enterprise, changing the way employees work and interact. Furthermore, an enterprise's knowledge culture can shape employees' positive attitudes toward (tacit and explicit) knowledge that supports the smooth flow of all knowledge processes (see, e.g., Kucharska & Bedford, 2020; Leone & Schiavone, 2019). However, some enterprises have proved more successful than others have, in their knowledge management efforts, often citing their inherent culture as the central aspect behind their success (Oliver & Kandadi, 2006). According to Tennakoon et al. (2022), there is a strong link between organizational culture and knowledge management. Cultural context is necessary to adequately analyze and apply knowledge (De Angelis, 2016). According to Halisah et al. (2021), Wei and Miraglia (2017), organizational culture influences behaviors central to knowledge management, i.e., (1) culture shapes assumptions about what knowledge is and, hence, which knowledge is worth managing; (2) culture mediates relationships between individual and organizational knowledge; (3) culture creates the context for social interaction that ultimately determines how effective an enterprise can be at creating, sharing, and applying knowledge and to what extent it manages the processes. Yi (2019), Prystupa-Rządca (2017), Stylianou and Savva (2016) summarize that organizational culture regulates two important areas from the perspective of knowledge management: readiness to collaborate and trust between employees. Knowledge sharing requires human interaction, an exchange of ideas, and openness. Thus, the following hypothesis is proposed:

H3: Developing a knowledge culture in the enterprise has a positive effect on the implementation of knowledge management in the enterprise.

2.3 New Way of Leadership Style: Knowledge Leadership

Today's complex business environment calls for a new approach to leadership (Yin et al., 2020). This approach must focus on co-creating meaningful value with and for all stakeholders, expanding beyond shareholders to include customers, employees, partners, and our broader society (Goswami & Agrawal, 2022). Leaders play a critical role in the success or failure of their enterprises (Goswami & Agrawal, 2021). Leaders can be effective in implementing changes, building their enterprise's capabilities, and improving its performance, or the opposite, they could be ineffective (Amiri et al., 2020). The impact of leadership on business and enterprise governance and management has been recognized as a significant factor that could make a difference in enterprise's performance (Imam & Zaheer, 2021). A suitable leadership style positively impacts implementation knowledge management in enterprises (Islam & Asad, 2021). According to Maheshwari and Yadav (2019), leadership and enterprise development are all parts of one process for enhancing the capacity of enterprises, and people, to improve their performance. According to Amiri et al. (2020), leadership has several roles in developing an enterprise's capabilities and implementing strategic changes. Leadership enables executive teams to collaborate effectively to drive change and execute strategy, develop processes (Maheshwari & Yadav, 2019), skills, mindsets (Allio, 2019), and tools to navigate change together, ignite innovation across the enterprise (Longenecker & Insch, 2018), manage talent, and create the right culture (Al-Ghazali, 2020). Regarding knowledge leadership, evidence was found that knowledge-oriented leadership has a positive effect on knowledge management (Donate & De Pablo, 2015; Jad et al., 2017; Sadeghi & Rad, 2018), and it also has a positive effect on knowledge creation and application (Safari & Azadehdel, 2015). Leaders deal with rapid changes brought about by new technologies, globalization, politics (Yi, 2019), and environmental concerns, transforming the basic values, beliefs, and attitudes of followers to build the enterprise's capacity for positive change (Amiri et al., 2020). Leaders have a significant position of influence within their enterprises (Maheshwari & Yadav, 2019). Knowledge leadership has increasingly been recognized as an essential element for enterprises to enhance the implementation of knowledge management (Yanga et al., 2014). Also, knowledge management has been promoted as a means to enhance enterprise's performance (Koohang et al., 2017). When enterprises are viewed as learning systems, the leader's role can provide leadership in the learning process (Kragt & Guenter, 2018). The roles of leaders in a learning enterprise have been specified as being coaches, facilitators, teachers, leaders of learning, and developers (Allio, 2019). In contrast to knowledge management, knowledge leadership refers to the constant development and innovation of information resources, individual skills, and knowledge and learning networks (Berraies & Chouiref, 2022; Fischer et al., 2021). Knowledge leadership is defined as a process whereby an individual supports other group members in learning processes needed to attain the group or enterprise's goals (Yin et al., 2020). Moreover, knowledge leadership may help develop mechanisms for

accountability and control and customer knowledge sharing (Goswami & Agrawal, 2021). In addition, effective knowledge leadership may support efficient customer knowledge integration, sharing, and management (Imam & Zaheer, 2021). A knowledge leader is a catalyst for a knowledge-sharing culture, owner of the infrastructure specifications that facilitate customer knowledge transfer and storage, and a maintainer of the closed-loop learning system (Berraies, 2020; Steinerowska-Streb & Wziątek-Staśko, 2020). Thus, we proposed the hypothesis:

H4: Knowledge leadership has a positive effect on the implementation of knowledge management in the enterprise.

2.4 Building the Knowledge Team in the Enterprise

The need to effectively manage both enterprise's knowledge and teams presents both opportunity and challenge for the contemporary enterprise (Rofiaty, 2019). In the area of knowledge management, the challenges range from creating and sustaining a knowledge management infrastructure to effective employment of tools and systems and navigation of organizational culture (Anjaria, 2020). Related to enterprise's teams and work groups, the challenges include team leadership, developing and implementing shared vision and goals, identifying ways to achieve maximum productivity, and managing conflict (see, e.g., Berraies & Chouiref, 2022; Zhang et al., 2020). Each team member has a different thinking style which determines how he or she assesses situations, processes knowledge, and analyses outcomes (Yao et al., 2021). He or she also has different perspectives, informed by educational backgrounds, experiences, expertise, and internal values (Zhang & Wang, 2021). The key to harnessing team diversity to foster innovation is sharing the knowledge, perspectives, expertise, and information of individual members within the team. Continuous knowledge sharing as a process supports mutual learning among team members (Min et al., 2021). Teams that promote knowledge sharing internally and externally tend to produce new ideas and facilitate activities that support innovation. New ideas need to be converted into tangible process improvements, outputs, and products (Jiang et al., 2016). Teams need to decide which ideas to implement and how (Boamah et al., 2022). Diverse teams have more expertise and wider perspectives, enabling informed decision-making and encouraging critical feedback. The team can then form a consensus on how new products, services, and practices will be implemented (Zhang et al., 2020). Teams with a shared perception that change and creativity should be actively encouraged are more likely to share new ideas, especially when this is supported by team leadership and enterprise's practices (Imam & Zaheer, 2021). Building psychological safety within the team develops the confidence of individual members and improves internal team processes around knowledge exchange (Balde´ et al., 2018). Teams where excellence is a core value and members are encouraged to collaborate on implementation to achieve excellent team performance are more successful in implementing new ideas (Zhao & Detlor, 2021).

Some facets of a team climate, namely trust (Balde et al., 2018; Zhao & Detlor, 2021), cohesion (Imam & Zaheer, 2021; Zhang et al., 2020; Zhao & Detlor, 2021), and innovativeness (Min et al., 2021) were identified as drivers of positive behaviors of team members such as knowledge sharing (Xue et al., 2011). Team members who feel that their teammates are trustworthy, are more likely to build good social relationships, and exhibit positive attitudes and behaviors when interacting with them. Trust-based work relationships foster team members' cooperation and commitment (Balde et al., 2018). A climate of trust is a key factor at the team level because of the high degree of interdependence required to complete collective team tasks (Koohang et al., 2017). Team cohesion refers to feelings of belongingness, attachment, sense of integration, and interdependence felt by team members toward the team (Imam & Zaheer, 2021). It materializes a force that determines how teammates are close to each other, leading to synergistic interactions and actions and fewer conflicts (Imam & Zaheer, 2021; Xue et al., 2011). Team innovativeness refers to the degree to which team members are encouraged to introduce new and improved ways of doing things and are rewarded within the team (Berraies & Chouiref, 2022). As working under changing conditions becomes an everyday task for enterprises and teams become the main unit for managing this change, a team innovativeness climate characterized by tolerance of failure, risk-taking, and free flows of information becomes of vital importance (Min et al., 2021). The following hypothesis is thus proposed:

H5: Building the knowledge team has a positive effect on the implementation of knowledge management in the enterprise.

2.5 Importance of Knowledge of Employees

Enterprises operate in a knowledge era in which their competitiveness relies on their effectiveness in managing knowledge (Fischer et al., 2021; Henttonen et al., 2016; Muhammed & Zaim, 2020; Yin et al., 2020). Enterprises must create a supportive organizational climate to motivate employees to share their knowledge (Sahibzada et al., 2020). Furthermore, enterprises need engaged employees who are dedicated, energetic, and absorbed in their work (Kim & Park, 2017), as participation in knowledge management activities is an extra-role behavior and assumes a voluntary action of employees (Xue et al., 2011). Work engagement has been identified as a psychological state that reflects employees' willingness to devote resources to perform their tasks and interact with their colleagues (Fait et al., 2021). Many studies have confirmed the contribution of work engagement at the individual level to knowledge creation, sharing, and use at the individual and organizational levels (Acharya & Jena, 2016; Atapattu & Huybers, 2021). Modern enterprises emphasize quality customer service and continuous product improvements that bring knowledge workers closer to customers (Fischer et al., 2021). Good communication skills enable knowledge employees to work closely with other workers in

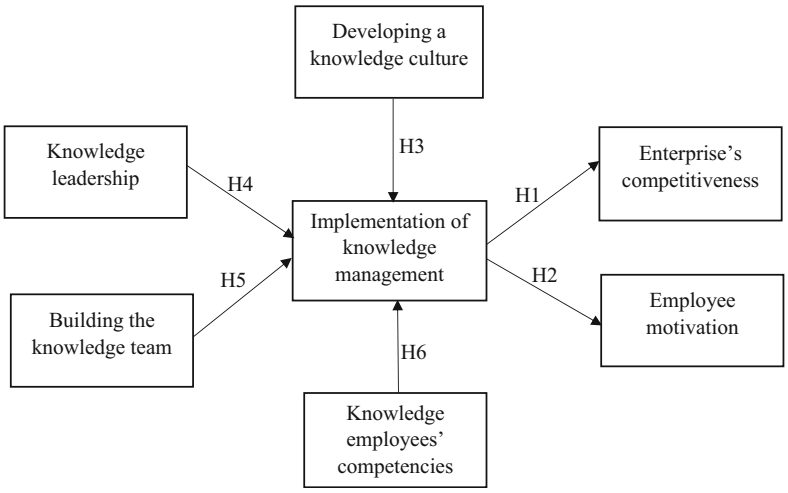

Fig. 1 A multidimensional model of knowledge management implementation to increase enterprise's competitiveness and employee motivation

decision-making, goal setting, and brainstorming sessions (Al-Ghazali, 2020). The demand for qualified employees to perform specialized roles presents challenges and opportunities. One of the challenges is hiring and retaining knowledgeable employees (Amiri et al., 2020). With a looming shortage of knowledgeable employees, employers are forced to look for more effective ways of hiring the best talents and retaining them for a long period of time (Wei & Miraglia, 2017). Knowledge employees play an important role in driving success in any enterprise. Their specific skills and knowledge are extremely valuable as knowledge employees often drive innovation in the workplace (Nezafati et al., 2021). Knowledge employees would be the most valuable assets of a twenty-first-century enterprise because of their high level of productivity, different mindset, and creativity (Kucharska & Bedford, 2020). Thus, we propose the hypothesis:

H6: Knowledge employees' competencies have a positive effect on the implementation of knowledge management in the enterprise.

In Fig. 1, we present a multidimensional model of knowledge management implementation to increase enterprise's competitiveness and employee motivation in enterprises.

3 Methodology

3.1 Data and Sample

The main survey involved randomly selected 513 Slovenian enterprises. From each enterprise, the owner or manager participated in our research. The biggest share of enterprises presents large enterprises (50.3%). Medium-sized enterprises comprised 38.2%, and small enterprises comprised 11.5%. Regarding gender, 63.7% male and 36.3% female respondents participated in the study. According to the standard classification of enterprises activities, owners or managers were from manufacturing (20.8%), wholesale and retail trade, repair of motor, vehicles, and motorcycles (19.1%), financial and insurance activities (14.8%), information and communication activities (13.5%), real estate activities (10.1%), professional, scientific and technical activities (9.2%), administrative and support service activities (7.6%), and human health and social work activities (4.9%).

3.2 Research Instrument

As a research instrument, we used a questionnaire, which included questions of a closed type. On a 5-point Likert-type scale, the respondents indicated their agreement with the listed statements, where 1 = strongly disagree, and 5 = completely agree. Items for construct *Developing a knowledge culture* were adopted from Yener et al. (2017), items for construct *Knowledge leadership* and construct *Building the knowledge team* were adopted from Yanga et al. (2014), items for construct *Knowledge employee's competencies* were adopted from Maloney (2018), items for construct *Implementation of knowledge management* were adopted from Obaide (2004), items for construct *Enterprise's competitiveness* were adopted from Mikalef and Gupta (2021), and items for construct *Employee motivation* were adopted from Amar (2004), Islam and Ismail (2008). All items are presented in the Appendix.

3.3 Statistical Analysis

The structural equation modelling was used for statistical data analysis. First, we wanted to establish if the use of an exploratory factor analysis is reasonable based on the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO ≥ 0.5) (Kaiser, 1974) and Bartlett's test of sphericity ($p < 0.05$). Based on the results of exploratory factor analysis, we checked communalities whether their values are higher than 0.40 (Costello & Osborne, 2005). Also, we checked the reliability of the research measurement within the scope of inner consistency with Cronbach's alpha coefficient (Chronbach, 1951, pp. 297–334). Second, as part of the validity, we examined

average variance extracted (AVE) and composite reliability (CR) coefficients, keeping in mind the criteria AVE > 0.5, CR > 0.7, and the criterion CR $>$ AVE (Kock, 2019). To check for multi-collinearity, we used VIF (variance inflation factors), considering the criterion VIF < 5.0 (Hair et al., 2010). The quality of the structural model was measured by the R-squared and adjusted R-squared coefficients, reflecting the percentage of explained variance of latent variables in the structural model and the Stone-Geisser Q-squared coefficient. Thus, we examined the predictability value of the structural model. Acceptable predictive validity in connection with an endogenous latent variable is suggested as being $Q^2 > 0$ (Kock, 2019). We also used the criterion of quality indicators listed in Table 2 (Model fit and quality indicators) to test the model. To test the hypotheses, we used the path coefficient associated with a causal link in the model (γ) and the Cohen effect indicator (f^2), with 0.02, 0.15, and 0.35 indicating small, medium, and large effect sizes, respectively (Kock, 2019).

4 Results

The results in Table 1 (Exploratory factor analysis research results) indicate that the values of the measure of sampling adequacy and the results of Bartlett's test of sphericity for each construct suggest that the use of exploratory factor analysis is warranted. The values of communalities for all seven constructs are higher than 0.40; therefore, we did not eliminate any measured variable. Also, all factor loadings are higher than 0.70 and significant at the 0.001 level. All measurement scales have demonstrated high reliability (all have Cronbach's alpha >0.80). In addition to the results in Table 1, the total variance explained for *developing a knowledge culture* is 70.6%, for *knowledge leadership* is 83.4%, for *building the knowledge team* is 80.2%, for *knowledge employee's competencies* is 73.6%, for *implementation of knowledge management* is 81.3%, for *enterprise's competitiveness* is 85.8%, and for *employee motivation* is 84.9%.

In the following, Table 2 shows key quality assessment indicators of the research model.

Table 2 shows that the indicators APC, ARS, and AARS are statistically significant ($p < 0.001$), and the indicators AVIF and AFVIF are lower than 5.0 and are suitable. Indicator GoF shows the power of the underlying conceptual model (Kock, 2019), and the result of indicator GoF shows that the model is highly appropriate (GoF is 0.536). The values of indicators SPR, RSCR, SSR, and NLBCD are higher than the minimum prescribed values and are suitable. Table 3 presents indicators of the quality of the structural model.

Table 3 indicates that the values of the latent variables R^2, adjusted R^2, and Q^2 coefficients are greater than zero. The Composite reliabilities (CR) for all seven constructs are greater than 0.7. Also, values of average variance extracted (AVE) for all constructs are greater than 0.5. All CR values were higher than AVE values, therefore, we confirmed the convergent validity for all the constructs. The VIF

Table 1 Exploratory factor analysis research results

Construct	Item	Communalities	Loadings	Cronbach's Alpha
Developing a knowledge culture	DKC1	0.609	0.776	0.927
	DKC2	0.731	0.860	
	DKC3	0.648	0.805	
	DKC4	0.759	0.872	
	DKC5	0.750	0.868	
	DKC6	0.712	0.854	
	DKC7	0.683	0.841	
	DKC8	0.612	0.782	
	DKC9	0.763	0.874	
KMO = 0.927; Bartlett's test of Sphericity: Approx. Chi-Square = 3775.012, df = 36, $p < 0.001$ Cumulative percentage of explained variance: 70.602%				
Knowledge leadership	KL1	0.876	0.937	0.943
	KL2	0.887	0.941	
	KL3	0.890	0.943	
	KL4	0.873	0.934	
	KL5	0.768	0.878	
	KL6	0.869	0.932	
	KL7	0.805	0.897	
	KL8	0.766	0.875	
	KL9	0.865	0.930	
	KL10	0.772	0.880	
KMO = 0.935; Bartlett's test of Sphericity: Approx. Chi-Square = 7321.659, df = 45, $p < 0.001$ Cumulative percentage of explained variance: 83.426%				
Building the knowledge team	BKT1	0.861	0.927	0.918
	BKT2	0.786	0.892	
	BKT3	0.837	0.911	
	BKT4	0.854	0.920	
	BKT5	0.860	0.926	
	BKT6	0.863	0.929	
KMO = 0.906; Bartlett's test of Sphericity: Approx. Chi-Square = 3005.121, df = 15, $p < 0.001$ Cumulative percentage of explained variance: 80.248%				
Knowledge of employee's competencies	KEC1	0.835	0.914	0.936
	KEC2	0.691	0.831	
	KEC3	0.780	0.883	
	KEC4	0.763	0.873	
	KEC5	0.749	0.866	
	KEC6	0.824	0.909	
	KEC7	0.654	0.811	
	KEC8	0.676	0.822	
	KEC9	0.831	0.912	
	KEC10	0.786	0.887	
	KEC11	0.623	0.796	

(continued)

Table 1 (continued)

Construct	Item	Communalities	Loadings	Cronbach's Alpha
	KEC12	0.797	0.896	
	KEC13	0.821	0.907	
KMO = 0.956; Bartlett's test of Sphericity: Approx. Chi-Square = 7159.719, df = 78, $p < 0.001$ Cumulative percentage of explained variance: 73.624%				
Implementation of knowledge management	IKM1	0.880	0.938	0.965
	IKM2	0.876	0.936	
	IKM3	0.851	0.922	
	IKM4	0.836	0.914	
	IKM5	0.830	0.911	
	IKM6	0.841	0.916	
	IKM7	0.858	0.926	
	IKM8	0.845	0.918	
	IKM9	0.871	0.931	
	IKM10	0.855	0.925	
KMO = 0.959; Bartlett's test of Sphericity: Approx. Chi-Square = 6252.438, df = 45, $p < 0.001$ Cumulative percentage of explained variance: 81.281%				
Enterprise's competitiveness	EC1	0.825	0.909	0.894
	EC2	0.847	0.921	
	EC3	0.866	0.930	
	EC4	0.851	0.923	
	EC5	0.856	0.925	
	EC6	0.864	0.929	
	EC7	0.820	0.894	
KMO = 0.908; Bartlett's test of Sphericity: Approx. Chi-Square = 3340.395, df = 21, $p < 0.001$ Cumulative percentage of explained variance: 85.791%				
Employee motivation	EM1	0.886	0.941	0.967
	EM2	0.874	0.935	
	EM3	0.836	0.905	
	EM4	0.842	0.914	
	EM5	0.872	0.931	
	EM6	0.863	0.929	
	EM7	0.851	0.921	
	EM8	0.855	0.925	
	EM9	0.847	0.918	
KMO = 0.947; Bartlett's test of Sphericity: Approx. Chi-Square = 6518.477, df = 36, $p < 0.001$ Cumulative percentage of explained variance: 84.920%				

values ranged between 1.473 and 2.458 (VIF < 5.0), providing confidence that the structural model results were not affected by collinearity. The results of SEM and structural coefficients of links of the basic structural model are presented in Table 4. Figure 2 presents the conceptual model with the values of path coefficients.

Table 2 Model fit and quality indicators

Quality indicators	The criterion of quality indicators	Calculated values of indicators of model
Average path coefficient (APC)	$p < 0.05$	0.219, $p < 0.001$
Average R-squared (ARS)	$p < 0.05$	0.523, $p < 0.001$
Average adjusted R-squared (AARS)	$p < 0.05$	0.520, $p < 0.001$
Average block variance inflation factor (AVIF)	AVIF <5.0	2.734
Average full collinearity VIF (AFVIF)	AFVIF <5.0	2.128
Goodness-of-fit (GoF)	GoF ≥ 0.1 (low) GoF ≥ 0.25 (medium) GoF ≥ 0.36 (high)	0.536
Simpson's paradox ratio (SPR)	SPR ≥ 0.7	1.000
R-squared contribution ratio (RSCR)	RSCR ≥0.9	1.000
Statistical suppression ratio (SSR)	SSR ≥ 0.7	1.000
Nonlinear causality direction ratio (NLBCD)	NLBCD ≥0.7	0.897

Table 3 Indicators of quality of the structural model

Constructs	CR	AVE		Adj. R^2	Q^2	VIF
Developing a knowledge culture	0.961	0.784	(−)	(−)	(−)	2.236
Knowledge leadership	0.946	0.838	(−)	(−)	(−)	1.687
Building the knowledge team	0.927	0.718	(−)	(−)	(−)	1.842
Knowledge employees' competencies	0.975	0.861	(−)	(−)	(−)	2.348
Implementation of knowledge management	0.938	0.779	0.548	0.550	0.368	1.473
Enterprise's competitiveness	0.952	0.823	0.527	0.526	0.375	2.057
Employee motivation	0.986	0.876	0.561	0.562	0.384	2.458

Note: (−) Values cannot be calculated because the construct is a baseline

The results in Table 4 and Fig. 2 show that developing a knowledge culture has a positive effect on the implementation of knowledge management (DKC → IKM = 0.628, $p < 0.001$) as well as knowledge leadership has a positive effect on the implementation of knowledge management (KL → IKM = 0.649, $p < 0.001$). In addition, building the knowledge team has a positive effect on the implementation of knowledge management (BKT → IKM = 0.587, $p < 0.001$). Also, knowledge of employees' competencies have a positive effect on the implementation of knowledge management (KEC → IKM = 0.569, $p < 0.001$). Further, implementation of knowledge management has a positive effect on an enterprise's competitiveness (IKM → EC = 0.685, $p < 0.01$) as well as implementation of knowledge management has a positive effect on employee motivation (IKM → EM = 0.672, $p < 0.01$). The effect sizes show whether the effects indicated

Table 4 Standardized path coefficients for the proposed model

Hypothesized path	Path coefficient (γ)	Sig.	Effect size (f^2)	Standard error	Link direction	Shape of link
DKC → IKM	0.628	$p < 0.001$	0.436	0.031	Positive	Nonlinear
KL → IKM	0.649	$p < 0.001$	0.442	0.032		
BKT → IKT	0.587	$p < 0.001$	0.473	0.030		
KEC → IKM	0.569	$p < 0.001$	0.384	0.030		
IKM → EC	0.685	$p < 0.001$	0.486	0.030		
IKM → EM	0.672	$p < 0.001$	0.429	0.031		

Note: *DKC* Developing a knowledge culture, *KL* Knowledge leadership, *BKT* Building the knowledge team, *KEC* Knowledge employees' competencies, *IKM* Implementation of knowledge management, *EC* Enterprise's competitiveness, *EM* Employee motivation

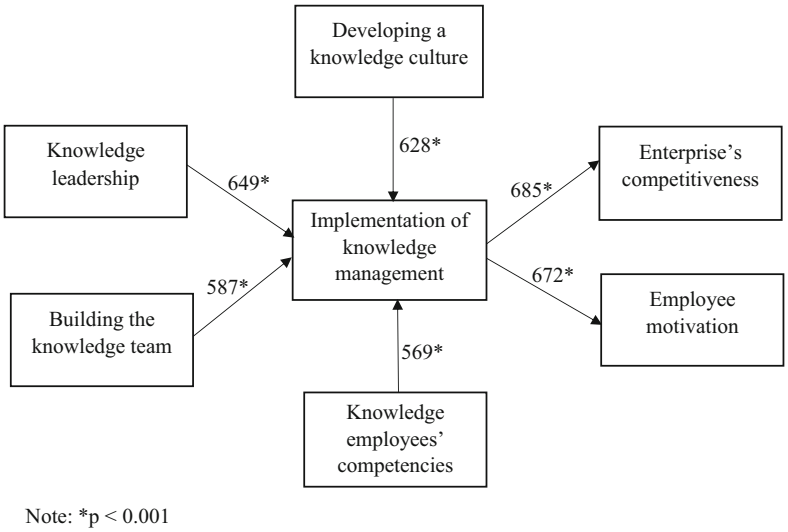

Fig. 2 The conceptual model with the values of path coefficients. Note: $*p < 0.001$

by path coefficients are small, medium, or large. The values usually recommended are 0.02, 0.15, and 0.35. Values below 0.02 suggest effects that are too weak to be considered relevant from a practical point of view (Kock, 2019). The value of Cohen's coefficient for all seven constructs show that the effect of latent predictive variables is of high strength. Based on the results, we confirmed hypotheses H1–H6.

5 Discussion

In today's turbulent environment, effective knowledge management is important for the success and competitiveness of an enterprise. It should be integrated into all business activities in the enterprise and linked to the strategic plans. The links between the knowledge assets and the core business processes are people, processes, infrastructure, and technologies that enable the application of knowledge assets to benefit the enterprise; they enable knowledge assets to be utilized to maximum benefit (Kucharska, 2021). According to Bhatti et al. (2020), the knowledge strategy may be seen as a long-term plan to manage knowledge for competitive advantage. The knowledge strategy results from the knowledge of employees' awareness of, and response to, virtually imperceptible trends emerging within the marketplace (see, e.g., Amoozad Mahdiraji et al., 2021; Yee et al., 2019). The knowledge strategy should be aligned with the business strategy and support core business processes and key strategic decisions (Irum & Pandey, 2020). It is self-evident that, for the knowledge strategy to have business value, it must support the enterprise's core business processes that are employed to attain specific business objectives (Manik et al., 2022). Enterprises gain the most from knowledge management when they map their knowledge activities to sharply defined strategic goals (Leone & Schiavone, 2019). Four basic business goals that lend themselves to improvement through knowledge management are innovation, responsiveness, productivity, and competency (see, e.g., Nezafati et al., 2021; Kokt, 2020; Tennakoon et al., 2022).

Based on the results in Table 4 and Fig. 2, we found that developing a knowledge culture has a positive effect on implementing knowledge management in the enterprise (confirmation of hypothesis H3). Table 1 shows that the most important role in developing a knowledge culture is an appropriate organizational culture, which helps establish common values, opinions, and beliefs. Also, second important role in developing a knowledge culture in an enterprise is a shared vision of what enterprise will be like in the future, followed by clearly defined policies of the enterprise and using technology in any part of the business. The fifth important role is that employees fully understand the goals of the enterprise, followed by the enterprise's management providing information to employees in a timely manner. According to Koohang et al. (2017), organizational culture is the ideology that shapes our thinking, behavior, and perception of our business environment. The culture establishes a set of guidelines for how we all work together in an enterprise (Anjaria, 2020). Sometimes enterprises resist changes rather than embrace them, and that is why cultural shifts are so challenging. In the context of knowledge sharing, organizational culture is the engine that propels knowledge through the enterprise (see, e.g., Amoozad Mahdiraji et al., 2021; Bhatti et al., 2020). Kucharska (2021) emphasizes that all enterprises have cultures. These are the rules and values that set the standards for their members or employees and guide their behavior (Islam et al., 2015). In a knowledge-sharing culture, a collaboration between employees is routine. The work environment is positive, and teammates are expected to help each other out (Kucharska & Bedford, 2020). Employees are encouraged to get to know

one another by working collaboratively and having opportunities to interact casually during the workday. In this environment where open communication is encouraged, knowledge is shared horizontally between team members as well as vertically between executives and employees (Prystupa-Rządca, 2017). Also, knowledge flows between departments within the enterprise and other industry competitors. Modern technology advancements make it easy for people to collaborate and exchange information. Sharing knowledge within an enterprise not only impacts on individuals but also in teams and the enterprise with higher engagement, motivation, and team building. Creating a knowledge culture in the enterprise allows for higher growth for everyone, enabling everyone to gain new skills and share their expertise, leading to greater employee satisfaction and motivation. Knowledge sharing is an important component of any enterprise's strategy. Thus, Wei and Miraglia (2017) argue that while knowledge sharing is particularly relevant to scaling enterprise because of the requirement for rapid transfer of knowledge to new employees, it is highly beneficial to stable enterprises that are looking to get the most out of their employees through more autonomous work (Yi, 2019). Without a culture of knowledge sharing, there is an erosion of time and productivity. In scaling enterprises, a lack of fluid knowledge transfer can be particularly painful as new employees try to navigate the onboarding process without reliable documentation (Nezafati et al., 2021).

Based on the results in Table 4 and Fig. 2, we found that knowledge leadership has a positive effect on the implementation of knowledge management in the enterprise (confirmation of the hypothesis H4). Table 1 shows that the most important role in knowledge leadership is that the leader is actively engaged in removing enterprise's impediments at all levels. The second important role is that the leader demonstrates excellent knowledge leadership skills, followed by always trying to gain new knowledge to set an example for others. The fourth important role is that the leader is a role model for continuous improvement within the enterprise, and the fifth, the leader transcends hierarchy to foster collaboration. Also, for knowledge leadership, the leader must motivate and support individuals in bringing their whole selves to work and create conditions that encourage team engagement. According to Koohang et al. (2017), leadership may be described as one of the four key enablers of an effective knowledge management program. Furthermore, good leadership is attributed to four essential properties: (1) management of enterprise's knowledge is recognized as being central to the enterprise's strategy (Kragt & Guenter, 2018), (2) the enterprise grasps the potential of its knowledge resource and develops strategies for marketing it, (3) the enterprise uses knowledge and learning to support existing core competencies and to create new ones, (4) individuals are appointed, evaluated, and rewarded based on their contribution to developing enterprise's knowledge (Amiri et al., 2020; Kucharska, 2021). Moreover, knowledge leadership drives the process of knowledge management, orchestrating the efforts of all the knowledge employees and keeping the issue constantly though unobtrusively in the corporate eye (Maheshwari & Yadav, 2019). This is a critical factor in the effective management of knowledge. Without strong leadership, any management process fails to reach its full potential, and knowledge management is no different. As the

shape of the knowledge economy becomes more obvious, so the need for systematic practices that capture and disseminate enterprise's knowledge that can be used for competitive advantage will increase. Also, Longenecker and Insch (2018) also emphasize that knowledge management will not come about spontaneously and will neither thrive without sustained human intervention. Leadership is vital in this regard. Knowledge leadership posits enterprise's knowledge management as a core strategy that helps achieve corporate strategic goals (Al-Ghazali, 2020; Longenecker & Insch, 2018; Muhammed & Zaim, 2020). Knowledge must support the purpose of an enterprise in such a way that every operational level is enriched by the enterprise of its knowledge requirements and its products. In this way, the rich tapestry that is corporate knowledge is crafted and made into capital that can assist in the development of business advantage. Knowledge management requires a knowledge champion with the vision to motivate people within enterprises to engage in knowledge-sharing practices. Interpersonal and communication skills are particularly important knowledge management skills, as are emotional maturity, enthusiasm, and the ability to create internal and external networks.

Results in Table 4 and Fig. 2 show that building the knowledge team has a positive effect on the implementation of knowledge management in the enterprise (confirmation of the hypothesis H5). Table 1 shows that the most important role in building the knowledge team is that all team members achieve their goals equally effectively, followed by that the statement that team members produce many valuable ideas (services/products), and third, all team members work equally creatively and enthusiastically to find ideas and solve problems. The important fifth role in building the knowledge team is that team members solve problems independently and also that the team members coordinate the work themselves. Thus, in an increasingly competitive business environment, enterprises must develop capabilities that will provide them with a sustainable competitive advantage. Yin et al. (2020) noted that these capabilities must be unique such that other enterprises cannot copy or imitate them. The degree to which an enterprise creates new products, services, and processes better and faster than its competitors is dependent on knowledge-sharing practices (Sahibzada et al., 2020). Knowledge sharing enables enterprises to develop skills and competencies, increase value and sustain their competitive advantage. Knowledge embodies intangible assets, routines, and creative processes that are difficult to imitate and is an enterprise's most valuable resource. Accordingly, one source of competitive advantage for an enterprise is the capability of teams to produce superior results based on the knowledge that is embedded in the interactions among team members. Imam and Zaheer (2021) state that team knowledge sharing has led to enhanced performance. By engaging in the knowledge-sharing process, teams create a new unique knowledge resource that competitors cannot easily imitate. Knowledge sharing leads to superior team performance and is a source of competitive advantage for enterprises (Zhang et al., 2020; Yao et al., 2021). Literature indicates that there are a variety of factors that influence knowledge sharing in teams. Some of the factors include personality traits, communication styles, trust, interpersonal attitudes, leadership, diversity of expertise, and team size. Two factors that the literature has examined extensively on multiple

dimensions are trust and leadership. Research has found that leadership and trust have a positive direct impact on team knowledge sharing (see, e.g., Min et al., 2021; Xue et al., 2011; Zhang & Wang, 2021). Trust is an important ingredient to successfully creating, sharing, and applying knowledge in teams. Trust in teams becomes important when a team process, like knowledge sharing, requires interdependence, information sharing, and collaboration (Balde et al., 2018). Leadership can be thought of as a relationship between the leader and those being led that can motivate a team or enterprise. A leader is able to influence individuals to accomplish a group or enterprise's goal (Jiang et al., 2016). A team leader, then, can have a large amount of influence on a team. The traditional task of the leader is to focus and coordinate the diverse viewpoints found on a team in order to achieve a common goal (Berraies & Chouiref, 2022). In addition, team leaders also serve as models by openly sharing information, trusting others, stepping into another's shoes, and providing constructive feedback. Knowledge sharing does not happen automatically in a team, and the team's leader has an important role to play in making it come about. Knowledge sharing is critical to enterprise success. It enhances team performance and provides an enterprise with a sustainable competitive advantage. Team leaders play an important role in helping to facilitate knowledge sharing within teams by fostering an open, trusting environment, leading by example, setting expectations, facilitating opportunities for team members to share ideas, and recognizing the contributions of individual team members.

Results in Table 4 and Fig. 2 show that knowledge employees' competencies have a positive effect on the implementation of knowledge management in the enterprise (confirmation of the hypothesis H6). Table 1 shows that the most important role in the knowledge of employees' competencies is that an employee must have a positive attitude to changes, the importance of employee's innovation and creativity followed by the statement that an employee must be able to use a systematic and analytical approach in the enterprise. Also, the important role in knowledge employees' competencies is that an employee must be able to establish informal relationships to achieve goals, an employee must be able to develop cooperation at all levels of the enterprise, an employee must provide accurate and consistent information and instructions, an employee must be able to assume responsibilities and risks, an employee must be able to solve various problems, and that an employee must be able to make decisions. According to Kokt (2020), working in the new economy or the new world of work poses some significant changes compared to how things were done in previous generations. The most prominent of these are the digitalization and virtualization of the workplace, as well as a tendency for decentralization, delegation, and the implementation of work teams (Henttonen et al., 2016). These developments imply a workforce that is able, committed, and flexible in adapting to the new challenges enterprises face. As the world of work continues to evolve it is imperative for employees to recognize the importance of continuously developing their competencies. There is a growing demand for highly qualified and competent employees, called knowledge workers, in the modern economy known as the knowledge economy. Knowledge workers are characterized by creativity, tolerance for diversity, and openness to changes and

challenges. Furthermore, as technology advances and workplace strategies evolve, there comes a need for professionals to align with these changes in terms of knowledge and skills. One of the best ways to enhance knowledge and skills is through training. Providing employees with relevant and consistent training can help improve performance and efficiency in the workplace. Thus, training is important because it represents a good opportunity for employees to grow their knowledge base and improve their job skills to become more effective in the workplace. Implementing training programs in the workplace will help employees feel like the enterprise is invested in them. By continuing to teach employees new skills and abilities, they will not just become better employees, but they will feel like more productive members of the enterprise. This will improve their workplace capabilities.

Based on the results in Table 4 and Fig. 2, we found that implementation of knowledge management in the enterprise has a positive effect on the enterprise's competitiveness (confirmation of the hypothesis H1) as well as that the implementation of knowledge management in the enterprise has a positive effect on employee motivation (confirmation of the hypothesis H2). Table 1 shows that the most important role in implementation of knowledge management in the enterprise is that the enterprise provides knowledge employees with adequate training to do their work well, and that the enterprise lets knowledge employees feel empowered to make decisions that impact their work. The third important role in the implementation of knowledge management in the enterprise is that working in an enterprise is based on fast learning, decision-making, and action cycles. This is followed by the statement that the enterprise is constantly monitoring changes in its business environments and looking for feedback from business partners in various ways and that the enterprise strives to ensure that existing products or services are based on new digital technologies that will meet the changing requirements of business partners.

Also, Table 1 shows that the most important role in employee motivation is that enterprise emphasizes the motivation of employees, strives to ensure that each employee is especially motivated in the performance of his/her work (individual approach to the employee), that enterprise enables their employees to attend education, training, that employees have the possibility of career development, and also that enterprise provides autonomy at work to its employees.

Results in Table 1 show that the most important role in an enterprise's competitiveness is that an enterprise successfully achieved its business goals, compared to its key competitors, the enterprise is more innovative, more profitable, and growing faster. Also, the important role in enterprise's competitiveness is that enterprise business units and/or functional units (e.g., marketing, R&D, and sales) are closely intertwined and support each other, thereby improving enterprise's competitiveness and that enterprise is better than its competitors at anticipating future customer needs when it comes to product development. Today, enterprises have been concerned about quick changes in working environment and this issue caused competition to be increased among enterprises. Thus, knowledge is the most important strategic tool for improving and maintaining performance and enterprise's competitiveness. Knowledge has become an essential part of every successful enterprise. This forces

enterprises to put more effort into managing knowledge in a new, systematic, and effective way to accomplish their goals. Enterprises must be able to identify the need for introducing technology and process to contribute to facilitating knowledge sharing within the enterprise. According to Anjaria (2020), the primary business challenge of the twenty-first century is the transition from an industrial to a knowledge economy. Knowledge management is a critical component of such a transition's success. In an industrial setting, effective knowledge management enables enterprises to collect, share and use knowledge systematically across internal departments and between customers. Amoozad Mahdiraji et al. (2021), Manik et al. (2022), and Kucharska (2021) assert that knowledge management requires businesses to invest time and money, the enterprise's two most valuable resources. The value placed on knowledge sharing between customers has increased, and managers now view knowledge sharing with their customers as a source of creativity. The phenomenon enables managers to make more informed decisions that contribute to long-term sustainability. Building a knowledge management system allows the practice of identifying, creating, communicating, socializing, measuring, and improving internal knowledge to support strategic objectives, which also leads to higher employee motivation (Balde et al., 2018; Yee et al., 2019). An enterprise is able to respond quickly to market trends and demands without having to wait for the lead time or to negotiate with a third party for the ideal data (Leone & Schiavone, 2019). Having a knowledge management system enables an enterprise to use strategic know-how effectively for competitive advantage in the global knowledge economy (Amiri et al., 2020; Halisah et al., 2021; Tennakoon et al., 2022). Additionally, an enterprise can capitalize on knowledge flows generated through systematic approaches to managing know-how, best practices, and standard operating procedures (Al-Ghazali, 2020; Mikalef & Gupta, 2021). Thus, knowledge management can promote competitive advantage through sharing of best practices, developing skills among employees, motivating employees to be more innovative, addressing communication gaps among different departments, adopting products/services to customer requirements, enhancing productivity, improving revenue, and fast-tracking better decision-making (Ghayth, 2020).

6 Conclusion

In today's rapidly evolving world, enterprises must seek out innovative tools in order to adapt and thrive. The transformed business landscape necessitates that enterprises establish new objectives, aligning them with society's evolving demands for sustainable, long-term development. By embracing these societal requirements, such as prioritizing employee well-being and environmental stewardship, enterprises can effectively motivate their workforce and gain a competitive edge. Knowledge management emerges as a valuable instrument to help enterprises meet these goals. To successfully implement knowledge management, enterprises must consider the long-term vision of their owners and the medium-term objectives of their

top managers. These knowledge management requirements should be integrated into the enterprise's vision, business policies, and strategies. By aligning with these strategic orientations, enterprises can effectively implement knowledge management and reap its benefits. Research suggests that the implementation of knowledge management positively impacts both employee satisfaction and the enterprise's competitive advantage. Therefore, it is crucial for enterprises to understand the factors that influence the development of knowledge management implementation. Managing knowledge within enterprises is a vital yet challenging task due to the vast complexity and diversity of information possessed by employees at any given time. To foster continuous learning and development, enterprises need to effectively manage their existing knowledge base while actively seeking new knowledge. By doing so, they can enhance their existing knowledge and stay ahead in their respective industries. Enterprises that adopt distinctive practices for knowledge creation, transfer, and retention gain motivated employees and a competitive edge over their counterparts. The introduction of knowledge management within an enterprise serves two significant purposes. Firstly, it fosters employee motivation, leading to increased efficiency and a willingness to accomplish more within shorter timeframes. Secondly, it enhances the enterprise's competitive advantage. Studies indicate that enterprises prioritizing the development of employee knowledge outperform their industry competitors. Given these findings, it becomes crucial for enterprise owners and top management to recognize the importance of implementing knowledge management within their organization. By doing so, they can cultivate a motivated workforce and gain a sustainable competitive advantage. Therefore, it is important that the owners and top management of the enterprises are aware of the need to implement knowledge management in the enterprise. This research paper sheds light on the multidimensional aspects crucial for the successful implementation of knowledge management within an enterprise. The primary objectives are to enhance employee motivation and boost the enterprise's competitiveness in today's dynamic business environment. The findings presented in this study aim to facilitate the practical implementation of knowledge management, providing owners and top managers with comprehensive insights into the key factors that should be considered in their business development and daily operational practices. This knowledge will enable them to effectively increase employee motivation and gain a competitive advantage. The limitation of the research is reflected in research sample, which consists of owners/managers in Slovenian enterprises. Also, in our research, we limited to seven constructs: (1) developing a knowledge culture, (2) knowledge leadership, (3) building the knowledge team, (4) knowledge employees' competencies, (5) implementation of knowledge management, (6) employee motivation, and (7) enterprise's competitiveness. Therefore, for further research, we propose analyzing also other constructs, for example, different training programs, appropriate working conditions, work engagement, and employee well-being. Also, possibilities for further research include studies relating to the examination of implementation of knowledge management in other countries and comparing differences between the constructs in different countries.

Appendix

Appendix 1 Items for researched constructs

Construct	Item
Develop knowledge culture	DKC1: The enterprise's culture is very responsive and changes easily.
	DKC2: We used technology in any part of our business.
	DKC3: There is a high level of agreement about how we do things in the enterprise.
	DKC4: There is a shared vision of what enterprise will be like in the future.
	DKC5: Policies of the enterprise are clearly defined.
	DKC6: Employees fully understand the goals of our enterprise.
	DKC7: The enterprise's management provides information to employees in a timely manner.
	DKC8: Employees are familiar with all the services/products we offer/produce in our enterprise.
	DKC9: The enterprise has an appropriate organizational culture, which helps to establish common values, opinions, and beliefs.
Knowledge leadership	KL1: The leader always tried to gain new knowledge to set an example for others.
	KL2: The leader demonstrated excellent knowledge leadership skills.
	KL3: The leader is actively engaged in removing organizational impediments at all levels.
	KL4: The leader is a role model for continuous improvement within the enterprise.
	KL5: The leader's actions demonstrate that he cares about personal and group well-being.
	KL6: The leader transcends hierarchy to foster collaboration.
	KL7: The leader creates conditions that encourage team engagement.
	KL8: The leader encourages and supports the celebration of progress and offers proper recognition.
	KL9: The leader motivates and supports individuals in bringing their whole selves to work.
	KL10: The leader built an environment of trust.
Building the knowledge team	BKT1: The team members produce many valuable ideas (services/products).
	BKT2: The team members work without a leader.
	BKT3: The team members coordinate the work themselves.
	BKT4: Team members solve problems independently.
	BKT5: All team members work equally creatively and enthusiastically to find ideas and solve problems.
	BKT6: All team members achieve their goals equally and effectively.

(continued)

Construct	Item
Knowledge of employee's competencies	KEC1: An employee must have a positive attitude to change.
	KEC2: An employee must have managerial skills.
	KEC3: An employee must be able to assume responsibilities and risks.
	KEC4: An employee must be able to solve various problems.
	KEC5: An employee must be able to make decisions.
	KEC6: An employee must be able to use a systematic and analytical approach in the enterprise.
	KEC7: An employee must be able to make good decisions even under pressure.
	KEC8: An employee must be able to see a problem comprehensively.
	KEC9: Employee's innovation and creativity are important.
	KEC10: An employee must provide accurate and consistent information and instructions.
	KEC11: An employee must delegate wisely and effectively.
	KEC12: An employee must be able to develop cooperation at all levels of the enterprise.
	KEC13: An employee must be able to establish informal relationships to achieve goals.
Implementation of knowledge management	IKM1: The enterprise provides knowledgeable employees with adequate training to do their work well.
	IKM2: The enterprise lets knowledge employees feel empowered to make decisions that impact their work.
	IKM3: High-performance employees have access to training aimed at developing potential.
	IKM4: The enterprise rewards top-performing employees.
	IKM5: The enterprise recognizes good work and celebrates success using periodic employee evaluations.
	IKM6: The enterprise strives to make adjustments to changes in the shortest possible time.
	IKM7: The enterprise is constantly monitoring changes in its business environments and looking for feedback from business partners in various ways.
	IKM8: The enterprise is dominated by an organization based on a network of small, high-performance teams with a high degree of autonomy.
	IKM9: Working in an enterprise is based on fast learning, decision-making, and action cycles.
	IKM10: The enterprise strives to ensure that existing products or services are based on new digital technologies that will meet the changing requirements of business partners.
Enterprise's competitiveness	EC1: We are better than our competitors at anticipating future customer needs when it comes to product development.
	EC2: Our business units and/or functional units (e.g., marketing, R&D, and sales) are closely intertwined and support each other, thereby improving our competitiveness.

(continued)

Construct	Item
	EC3: We successfully achieved the business goals of the enterprise.
	EC4: Compared to our key competitors, our enterprise is growing faster.
	EC5: Compared to our key competitors, our enterprise is more profitable.
	EC6: Compared to our key competitors, our enterprise is more innovative.
	EC7: Compared to our major competitors, our capabilities and resources complement each other extremely well.
Employee motivation	EM1: In the enterprise, we emphasize the motivation of employees.
	EM2: We strive to ensure that each employee is especially motivated in the performance of his work (individual approach to the employee).
	EM3: We provide our employees with appropriate pay for success.
	EM4: An employee receives a praise or recognition for achieving successful results.
	EM5: We enable our employees to attend education and training.
	EM6: Employees have the possibility of career development.
	EM7: We provide flexible working hours to our employees.
	EM8: We provide autonomy at work to our employees.
	EM9: In the enterprise, good relationships prevail.

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Repatriate's Knowledge Transfer: Antecedents of Knowledge Transfer, Transfer Process, Knowledge Absorption, and Consequences

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Abstract The present study aims to analyze the knowledge transfer of repatriates in organizations, a topic that has gained significance over the past decade. Due to its complexity, a systematic literature review was conducted to explore various aspects of this theme. To contribute to the academic literature, the authors developed a comprehensive framework for the process of knowledge transfer. The objective was to enhance understanding and identify the antecedents, consequences, as well as the processes of transfer, absorption, and diffusion of knowledge. The findings indicate that knowledge transfer often falls short of optimal practices, which impacts overall efficiency. Consequently, this study is relevant for organizations seeking to improve their knowledge transfer practices, as well as for researchers aiming to gain a deeper understanding of this subject matter.

Keywords Competitive advantage · Knowledge transfer · Knowledge absorption · Repatriates · Systematic literature review

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M. Valeri (ed.), *Knowledge Management and Knowledge Sharing*, Contributions to Management Science, https://doi.org/10.1007/978-3-031-37868-3_11

1 Introduction

The globalization process has evolved over time, forcing large and small businesses to adapt to the dynamism of the international competitive environment (Dicken, 2011; Ribau et al., 2015). This evolutionary journey has led to the development of several different assumptions, frameworks, and theories that explore the relationship between increasing business globalization and the subsequent rise in international competition among businesses.

The expatriation of mobile employees, managers, and executives was (and still is) an essential strategy employed by firms, normally multinationals, to align their business processes to the requirements of destination countries (Shaffer et al., 1999; Wang, 2002), to overcome the lack of qualified and skilled expatriates of foreign markets and to facilitate the transfer knowledge from the headquarters to foreign affiliates (Bonache et al., 2018; Shaffer et al., 1999; Tahir, 2018; Wang, 2002).

Technically, expatriation refers to the temporary residence in a foreign country, alone with the expatriate's family, to address challenges, to transfer knowledge, to implement new projects, or to complement knowledge gaps in the destination country (Morence et al., 2021). Normally, the expatriation process concludes with the repatriation of the individual to the home country and organization (Chiang et al., 2018).

While expatriation entails the temporary stay of employees abroad for a period exceeding 1 year (Howe-Walsh & Torka, 2017), repatriation refers to the process through which managers or employees return to the organizations they originally worked for in their home country. Repatriation occurs after the completion of a business assignment abroad (Lazarova & Caliguri, 2001).

While the expatriation process can encompass several stages, depending on the complexity of international assignments, repatriation was originally viewed as another stage within the expatriation process (Knocke & Schuster, 2017; Rodrigues et al., 2021). However, repatriates play an important role as the international knowledge gained during the international assignment can be capitalized as relational/social capital allowing them to implement important international knowledge transfers and business expansion strategies. Moreover, they possess important insights into the diverse international cultural contexts and markets they have been involved with, offering their employing companies knowledge-based competitive advantages by facilitating knowledge transfer between international branches of the organization (Knocke & Schuster, 2017).

Knowledge encompasses a vast body of data, information, ideas, and experiences that influence behavior and decisions. Knowledge is a strategic resource that should be exploited in order to result in competitive advantages for organizations (Gonzalez & Chakraborty, 2014). The acquisition of skills and competencies through international assignments could be a vehicle to achieve valuable knowledge and competencies that contribute to the company's success, enhancing its competition in the global economy (Stevens et al., 2006). Knowledge transfer between the parent and

subsidiaries could be a valuable resource, especially in the transfer of core competencies, as being geographically dispersed there will be relevant knowledge that will be developed.

During an expatriation mission, knowledge transfer from the parent company to the subsidiary is expected to take place. When the expatriation mission is over, expatriates return to their home country, and to the parent company, and are now considered repatriates (Chiang et al., 2018). There is an understanding that the knowledge that comes from the reverse process, from the subsidiary to the headquarters, could also be used as a competitive advantage since there is the assimilation of international knowledge, skills, capabilities, or even experience (Chiang et al., 2018).

Nevertheless, there are limitations to the repatriation process, both due to the differences between the destination and origin organizations (Hurn, 2007). For example, Burmeister et al. (2018) highlight that repatriates face active and passive resistance when attempting to share their knowledge. Similarly, the parent company may offer resistance in accepting knowledge coming from subsidiaries as it considers it inferior, since the subsidiary is more specialized and locally restricted (Bucher et al., 2022; Burmeister et al., 2018).

Knowledge transfer is an increasingly important issue for companies to gain a competitive advantage and to stand out from their competitors (Jayasingam et al., 2021). Repatriation is a valuable resource for this process. Individuals who embrace international assignments abroad gain new experiences and new knowledge that can be very useful for organizations. Repatriates can play an important role as part of a social global network of the company, since they may speed up the transfer of knowledge from subsidiaries and affiliates to the parent company, and vice versa. Moreover, the repatriation process represents an important research avenue, since the stay of an employee in an organization depends on the success of the repatriation process. Furthermore, repatriation issues often present more challenges, are more subtle, and are widely underestimated compared to those experienced during expatriation (Knocke & Schuster, 2017).

Multinationals can be understood as global knowledge-based systems, where knowledge flows from headquarters to subsidiaries, as well as among subsidiaries, as they create, exploit, transfer, and protect internal knowledge (Nielsen & Michailova, 2007; Omerzel & Gulev, 2011). To enhance their market competitiveness, multinationals must leverage knowledge generated across the organization (Argote & Ingram, 2000) and manage this knowledge to adapt it to local specificities (Laszlo & Laszlo, 2002). Clearly, knowledge transfer plays a key role in gaining a competitive advantage.

Argote and Ingram (2000) describe knowledge transfer as the process by which one business unit is influenced by the experience of another business unit, based on the knowledge or performance of the recipient. Since knowledge is intrinsically linked to particular contextual problems, multinationals need to manage different actors and units (Ambos & Ambos, 2009). Classical studies have analyzed the important role of internal knowledge management transfers (intra-MNC knowledge transfers) that can be split up into several management transfer types (Grant, 1996;

Kogut & Zander, 1992, 1993; Castro et al., 2021; Castro & Moreira, 2023): vertical knowledge transfers (VKT), i.e., from HQs to subsidiaries and vice versa, and horizontal knowledge transfers (HKT), i.e., across peer subsidiaries. Moreover, although there are several studies in the literature on knowledge transfer, most of them focus on expatriation and not on the repatriation process. Thus, in order to complement the knowledge about repatriate's knowledge transfers, this chapter aims to answer the following questions: What is the significance of repatriate's knowledge for companies? How can organizations motivate repatriates to transfer knowledge? What are the inherent obstacles in this process?

In order to answer these objectives, this chapter conducts a systematic literature review (SLR) on knowledge transfer from repatriates to their parent companies. The main focus is to analyze the knowledge transfer process during repatriation, specifically from the foreign country back to the home organization. It is important to emphasize that throughout the chapter several terms are used for the same concept. Terms such as "home," "parent company," "headquarters," "home organization," "home firm," and "home organization" all denote the company in the home country that sends an employee as an expatriate and subsequently receives them as a repatriate. Conversely, the terms "branches," "subsidiaries," "host firm," "affiliates," and "host organization" refer to the company in the destination country that hosted the expatriate for a certain period of time. Finally, the main themes analyzed emerged from the analyzed articles and were grouped in four main strands, that constitute the framework of analysis: antecedents of knowledge transfer, repatriate's knowledge transfer, knowledge absorption capacity, and consequences of knowledge transfer.

After this introduction, the chapter is composed of four additional sections. Section 2 outlines the methods employed to implement the SLR. Section 3 describes the results of the research. Section 4 presents the results obtained, divided into four subtopics: antecedents of knowledge transfer, the repatriate's knowledge transfer process, the capacity for knowledge absorption, and the consequences of knowledge transfer. After the presentation of these topics, Section 5 presents the conclusion.

2 Research Method

This chapter follows the SLR procedures proposed by Denyer and Tranfield (2009), aiming to provide a replicable and scientific process that captures the essence of the topic under analysis. Denyer and Tranfield (2009) outline the following steps: defining the research question, locating relevant studies, selecting and evaluating studies, analyzing and synthesizing, and presenting the results. Once defined the research question, as presented in the introduction, the Scopus database was utilized to search for journal papers, as they have the highest reputation in the academic field and contain validated knowledge, normally through double-blind review processes (Tahai & Meyer, 1999). Secondly, to capture as much content as possible in order to

Table 1 Search procedure implemented in the Scopus database

Search	Terms and means used in the search
Search (TITLE-ABS-KEY)	"Repatriation" OR "Repatriat*" AND "Know*"
Inclusion criteria	Type of documents: *Articles* e *Reviews* Types of publication: *Journals* Area of Study: *Business, Management and Accounting* Language: English
Results	76 articles Without restrictions: 535 articles

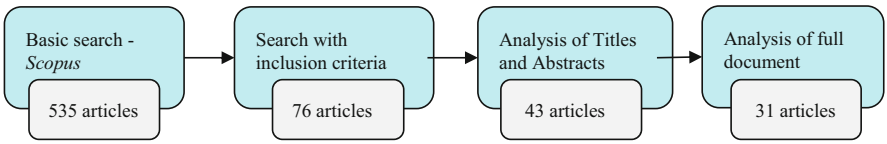

Fig. 1 Article's process selection

identify and collect different perspectives, no restriction was placed on a particular set of academic journals in the field (Jones et al., 2011).

To obtain a selection of articles that fit the purpose of the study, a search was conducted using keywords and specific search criteria. The search did not impose any time limitations on publication dates and was conducted on carried out 22, 2022. Table 1 shows the search data.

For this search, the terms "Repatriation" or "Repatriat*" were used to encompass both the repatriation process and the repatriates. The term "Know*" was employed to capture knowledge related to the repatriation process. Since there are several variants of the word know, we used the asterisk so that words like knowing, knowledge, know-how, know-who, among other derivatives, could be included. No additional keywords were applied since the selection of articles already provided an acceptable basis for analysis.

After selecting the set of documents, they were exported to an Excel file, and their titles and abstracts were analyzed individually by each of the authors of this document to understand and identify which articles were in accordance with the theme. A color-coded method was employed to decide what articles to include: green for articles requiring in-depth analysis, yellow for articles requiring further discussion, and red for articles that did not align with the objectives. After this selection, a meeting was conducted to discuss the authors' choices. As a result, 26 articles were approved, 32 excluded, and 17 remained in doubt.

After this phase, a more in-depth search was conducted, involving a speed reading of the articles in doubt. At the end of the selection process, 31 articles were approved for inclusion. The article selection process is illustrated in Fig. 1.

The selected documents served as the foundation for understanding the themes explored in the literature, enabling the segmentation and grouping of topics in the results discussion. The question-problem addressed in this paper was to "understand

the process of repatriation's knowledge transfer, from the repatriate's return to the absorption of knowledge by the parent company, highlighting the consequences of the process."

Drawing from Weed (2008) and Mota et al. (2021), it was possible to combine content and thematic analysis to capture the explanatory value of the analyzed articles. As a result, a table was created categorizing each of the 31 papers according to their main topics. Based on these topics, the main themes analyzed were grouped into four themes that underpinned the framework of analysis: antecedents of knowledge transfer, repatriate's knowledge transfer, knowledge absorption capacity, and consequences of knowledge transfer. Within the latter topic, two main subtopics emerged: competitive advantage for the home organization *and* Repatriates *Turnover*. Figure 2 presents the general framework for analyzing the underlying themes explored in this paper.

3 Results

Based on the selected articles for this analysis, it can be concluded that most of the articles are very recent, most of them being published from 2012 onwards. About one-third of the analyzed articles were published within the last 5 years, as shown in Fig. 3.

The articles were published in 18 different outlets. The journals with the highest number of published articles are *The International Journal of Human Resource Management* and the *Journal of Global Mobility*, as can be seen in Table 2, with six and five articles each. Moreover, Table 2 also shows that over 60% of the articles pertaining to repatriation are published in the top six journals that focus on this subject.

This search yielded a total of 31 articles, with 65% of them being empirical studies ($n = 20$), which are further categorized into interviews and questionnaires, while 35% are conceptual studies ($n = 11$). They have 996 total global citations (TGCs) and 128 total local citations (TLCs). TGC represents the number of times an article has been cited based on the overall computation of the SCOPUS database. TLC denotes the number of times each selected article has been cited by the remaining articles within the selected literature (Alon et al., 2018). Among the selected articles, Lazarova and Tarique (2005) and Mäkelä and Brewster (2009) emerge as the two most cited documents. If we took into account the TGC per year, Reiche (2012) would also stand out. However, Lazarova and Tarique (2005), Oddou et al. (2013) and Burmeister et al. (2015) stand out among the 31 manuscripts analyzed in terms of TLC scores (Table 3).

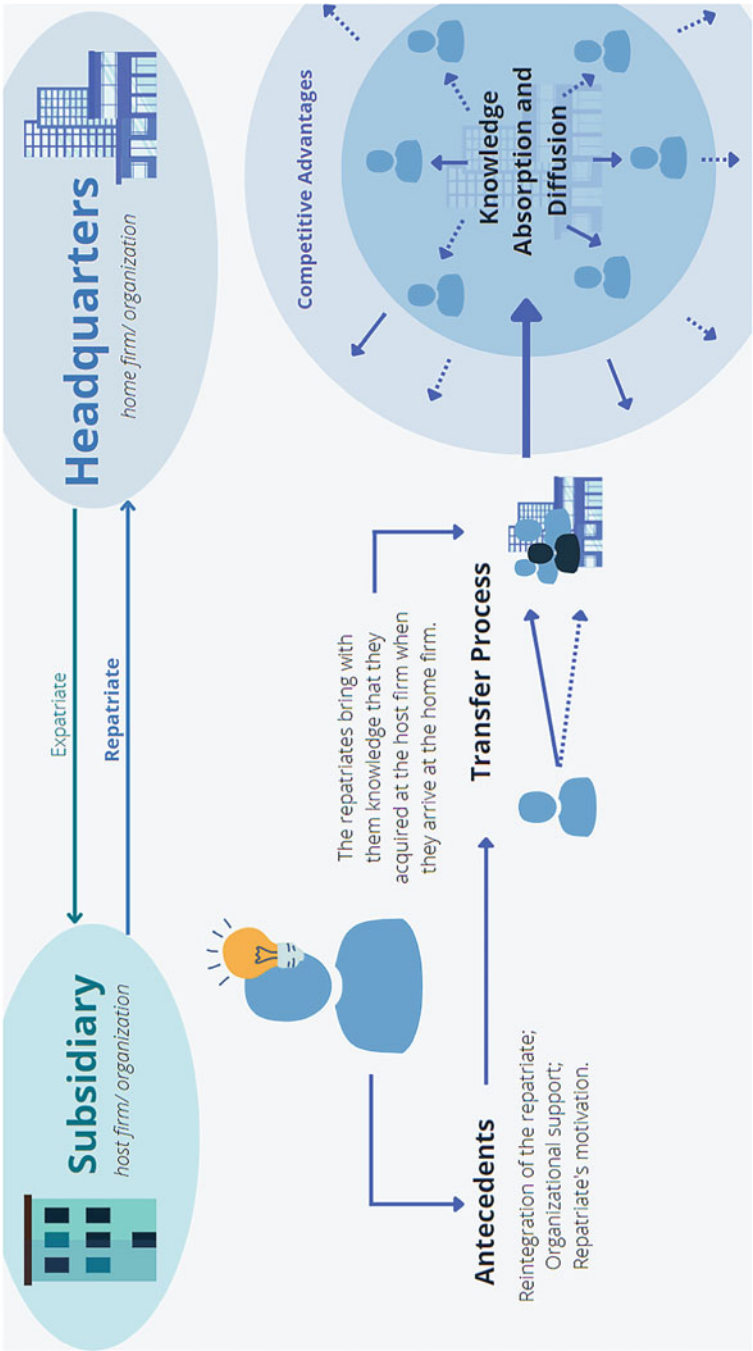

Fig. 2 Framework of analysis

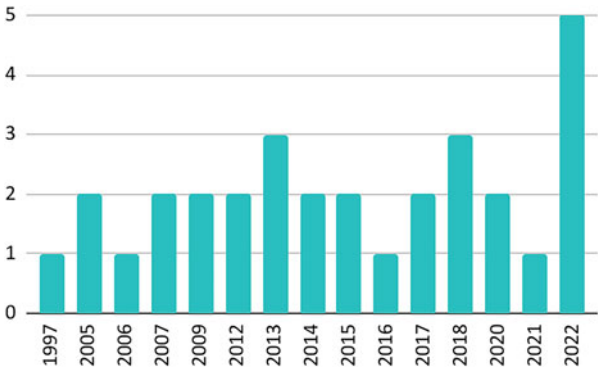

Fig. 3 Evolution of published articles over time

Table 2 Main outlets of the articles analyzed

Journal name	No. of articles published	Percentage of total articles
International Journal of Human Resource Management	6	19.35
Journal of Global Mobility	5	35.48
Journal of Knowledge Management	3	45.16
Journal of Management Studies	2	51.61
Journal of World Business	2	58.06
Journal of Business Research	2	64.52

4 Discussion of Results

4.1 Antecedents of Knowledge Transfer

Repatriate's knowledge transfer can be influenced by several factors, one of which is the repatriate's reintegration into the parent company. Generally, repatriates who are well received upon their return exhibit a willingness to transfer the knowledge acquired during their expatriation period (Peltokorpi et al., 2022; Shao et al., 2022). Conversely, some repatriates encounter difficulties with their reintegration due to reverse culture shock (Chiang et al., 2018).

Upon leaving their home country, expatriates are forced to adapt to the culture and practices of other nations and organizations. When they return as repatriates, they undergo a similar situation and often experience challenges in readjusting to their home country's culture and even the organization itself (Hao & Liu, 2017; Nery-Kjerfve & McLean, 2012). This reverse cultural shock is particularly intense for employees from culturally homogeneous backgrounds, who have had to undergo drastic changes abroad and need to make substantial adaptations to their previous routines (Nery-Kjerfve & McLean, 2012). Furthermore, unsuccessful reintegration can result from companies failing to assign repatriates positions that match their

Table 3 Number of citations of the articles analyzed

Author	Title	Journal	TGC	TLC
Lazarova and Tarique (2005)	Knowledge transfer upon repatriation	*Journal of World Business*	154	16
Mäkelä and Brewster (2009)	Interunit interaction contexts, interpersonal social capital, and the differing levels of knowledge sharing	*Human Resource Management*	128	6
Reiche (2012)	Knowledge benefits of social capital upon repatriation: A longitudinal study of international assignees	*Journal of Management Studies*	90	9
Crocitto et al. (2005)	Global mentoring as a means of career development and knowledge creation: A learning-based framework and agenda for future research	*Career Development International*	70	2
Huang et al. (2013)	Knowledge governance mechanisms and repatriate's knowledge sharing: The mediating roles of motivation and opportunity	*Journal of Knowledge Management*	65	9
Vidal et al. (2007)	Antecedents of repatriates' job satisfaction and its influence on turnover intentions: Evidence from Spanish repatriated managers	*Journal of Business Research*	60	5
Stevens et al. (2006)	HR factors affecting repatriate job satisfaction and job attachment for Japanese managers	*International Journal of Human Resource Management*	44	1
Oddou et al. (2013)	Repatriates as a source of competitive advantage. How to manage knowledge transfer	*Organizational Dynamics*	39	11
Nery-Kjerfve and McLean (2012)	Repatriation of expatriate employees, knowledge transfer, and organizational learning: What do we know?	*European Journal of Training and Development*	35	7
Crowne (2009)	Enhancing knowledge transfer during and after international assignments	*Journal of Knowledge Management*	33	6
Chiang et al. (2018)	Repatriation: What do we know and where do we go from here	*International Journal of Human Resource Management*	31	7
Peltonen (1997)	Facing the rankings from the past: A tournament perspective on repatriate career mobility	*International Journal of Human Resource Management*	30	3
Burmeister et al. (2015)	The micro-processes during repatriate knowledge transfer: The repatriates' perspective	*Journal of Knowledge Management*	29	11
Gonzalez and Chakraborty (2014)	Expatriate knowledge utilization and MNE performance: A multilevel framework	*Human Resource Management Review*	28	5
Froese et al. (2021)	Best of both worlds: How embeddedness fit in the host unit and the headquarters improve repatriate knowledge transfer	*Journal of International Business Studies*	23	2

(continued)

Table 3 (continued)

Author	Title	Journal	TGC	TLC
Burmeister and Deller (2016)	A practical perspective on repatriate knowledge transfer: The influence of organizational support practices	*Journal of Global Mobility*	22	9
Burmeister et al. (2018)	Repatriate knowledge transfer: Antecedents and boundary conditions of a dyadic process	*Journal of World Business*	21	6
Vidal et al. (2018)	Repatriates and reverse knowledge transfer in MNCs	*International Journal of Human Resource Management*	20	4
Hurn (2007)	Pre-departure training for international business managers	*Industrial and Commercial Training*	13	0
Howe-Walsh and Torka (2017)	Repatriation and (perceived) organisational support (POS): The role of and interaction between repatriation supporters	*Journal of Global Mobility*	12	3
Valk et al. (2013)	International assignment and repatriation experiences of Indian international assignees in the Netherlands	*International Journal of Organizational Analysis*	12	2
Amir et al. (2020)	Informal repatriate knowledge transfer: a qualitative analysis of Malaysian corporate executives	*Journal of Global Mobility*	8	2
Barakat and Moussa (2014)	Variables influencing expatriate learning and organizational learning	*Competitiveness Review*	8	1
Valk et al. (2015)	Warm welcome or rude awakening? Repatriation experiences of Indian and Dutch international assignees and intention to leave the organisation	*Journal of Indian Business Research*	7	1
Hao and Liu (2017)	The impact of Australian accounting education on repatriates' career development	*Australian Accounting Review*	6	0
Bucher et al. (2022)	The influence of empowering leadership on repatriate knowledge transfer: Understanding mechanisms and boundary conditions	*International Journal of Human Resource Management*	5	0
Jayasingam et al. (2021)	Knowledge sharing behaviour of overqualified repatriates	*Journal of Global Mobility*	2	0
Peltokorpi et al. (2022)	Reverse knowledge flows: How and when do preparation and reintegration facilitate repatriate knowledge transfer?	*Journal of Management Studies*	1	0
Shao et al. (2022)	Knowledge transfer of Chinese self-initiated repatriates: Exploring the returnee and company perspectives	*Journal of Business Research*	0	0
Cave et al. (2022)	Examining antecedents of repatriates' job engagement and its influence on turnover intention	*International Journal of Human Resource Management*	0	0
			0	0

(continued)

Table 3 (continued)

Author	Title	Journal	TGC	TLC
Oleškevičiūtė et al. (2022)	The international transfer of individual career capital: Exploring and developing a model of the underlying factors	*Journal of Global Mobility*		

acquired experiences abroad, leading to a lack of motivation among repatriates (Vidal et al., 2007).

These factors can cause repatriates to not feel satisfied with their work (Nery-Kjerfve & McLean, 2012) and, in turn, leaving the company without transferring the knowledge gained abroad (Chiang et al., 2018). Additionally, some repatriate characteristics, such as cultural intelligence, relationship-building abilities, or even past expatriation experiences, can influence the knowledge transfer process (Oleškevičiūtė et al., 2022).

Repatriates' expectations also serve as a possible antecedent to the outcome of repatriation (Chiang et al., 2018). In many cases, repatriates hold higher expectations than those that the organization perceived for them, often leading to disappointment, particularly in terms of career progression (Peltonen, 1997). Thus, it is crucial for multinationals to assist repatriates in developing realistic expectations both during their expatriation and at the time of repatriation (Chiang et al., 2018).

Crocitto et al. (2005) propose three aspects that repatriates should address during the repatriation process:

1. Assessing the knowledge acquired in the host country.
2. Equipping the host country's employees with the appropriate skills to continue the work tasks initiated by the repatriate.
3. Communicate with the parent organization to evaluate career opportunities after repatriation.

This third point is particularly relevant in the knowledge transfer process because the greater the importance repatriates attach to their career opportunities, the higher their commitment to the organization, increasing the likelihood of transfer knowledge (Chiang et al., 2018; Oddou et al., 2009). Repatriates may initially introduce knowledge indirectly through social interactions with co-workers and, when they deem it appropriate, carry out directly the knowledge transfer (Amir et al., 2020).

It is possible to argue that organizational support plays a vital role both during expatriation and repatriation. If expatriates feel supported by their supervisors outside their home country, reintegration upon their return is more likely to be smoother due to the establishment of trust-based relationships (Valk et al., 2013). Managers should carefully plan and evaluate strategies aimed at retaining expatriates (Stevens et al., 2006). In this respect, the development of human resources support-based policies to support repatriates' adaptation is crucial (Howe-Walsh & Torka, 2017). Moreover, a clear differentiation between repatriates and regular staff is recommended based on the specific situation the repatriates are (Shao et al., 2022). For instance, some companies offer their employees a repatriation training program,

to facilitate smoother reintegration, demonstrating organizational care for their employees (Hurn, 2007).

4.2 Repatriate's Knowledge Transfer

Repatriate's knowledge transfer can become a very important element for companies. Home country employees are left with a better understanding of foreign business experiences, cultures, and markets, which allows multinationals to enjoy a strategic resource that is difficult for competitors to copy (Bucher et al., 2022; Crowne, 2009).

During international assignments, expatriates are tasked with transferring knowledge from headquarters to subsidiaries abroad (Edström & Galbraith, 1977; Froese et al., 2021). At the same time, during the process, expatriates acquire different types of knowledge, important for the parent company, such as market-specific knowledge, personal skills, work-related management skills, networking skills, and general management skills (Fink & Meierewert, 2005; Vidal et al., 2018). With the former, expatriates learn brand new things about the foreign country's business and the cultural differences between the host and the home country (Vidal et al., 2018). Personal skills are related to the individual's personality and may coincide with self-confidence, tolerance, and flexibility. Work-related skills, on the other hand, focus on technical knowledge and professional skills that repatriates must transfer to their colleagues (Vidal et al., 2018). Networking skills are also very important because expatriates, during their international assignments, create long-term relationships with international contacts that may be very useful for the organization. Finally, general management skills allow repatriates to understand more clearly the worldwide business structure of the organization.

All of this knowledge is a valuable source for companies, but also for the employees themselves who experience significant personal growth (Oddou et al., 2013; Vidal et al., 2018). This growth can be a lever for repatriates to improve their skills and capabilities to disseminate the acquired knowledge (Vidal et al., 2018).

For this knowledge to be put to good use, it is mandatory that the knowledge and skills of repatriates and the characteristics of the job at the parent company are compatible (Froese et al., 2021). Furthermore, the higher frequency of communication with the parent company during the expatriation process the more easily repatriates transfer their knowledge (Froese et al., 2021). Aligned with this idea, it is also important to emphasize that for knowledge to be truly transferred there must be a fit between the repatriate's willingness to transfer knowledge and the organization's receptiveness to that knowledge (Lazarova & Tarique, 2005). Repatriates must have knowledge that is valuable to the company and be motivated and willing to share their experiences. This motivation may come from the repatriates' assessment of the costs and the benefits they have with this process, and therefore their decisions are based on expected rewards such as increased power, respect, reputation, and the opportunity cost of the time and effort spent (Gonzalez & Chakraborty, 2014). On

the other hand, organizations must have the right tools to absorb knowledge and create the right incentives for repatriates to accept this process (Lazarova & Tarique, 2005).

It is further added that the decision-making style of company managers is a possible obstacle to be taken into account in the transfer of knowledge by repatriates. Managers must recognize international experiences in order to help the repatriate share their skills and know how to use them correctly (Oddou et al., 2013). Moreover, the knowledge acquired by expatriates may not be exploited due to the its tacit nature (Nery-Kjerfve & McLean, 2012). As such, repatriates need programs and experiences that enable them to apply that knowledge to the new environment (Nery-Kjerfve & McLean, 2012). Organizing social activities allows for the building of stronger relationships between repatriates and co-workers and leads to a better working environment, which positively influences the repatriates' decision to transfer their knowledge (Huang et al., 2013).

Amir et al. (2020) suggest some steps that companies should follow to obtain positive results in knowledge transfer by repatriates. One of them is to pay attention not only to expatriation, but also to repatriation, as mentioned before, so that the international mission offers good results for both the repatriate and the organization. In other words, expatriation and repatriation should be seen as an integrated cycle consisting of three phases—before expatriation, during expatriation, and after repatriation (Burmeister & Deller, 2016). Alongside this, there should be regular debriefings during the expatriation process, so that expatriates know the changes of the parent company and are not surprised at the time of repatriation (Amir et al., 2020).

Burmeister et al. (2015) propose a model of repatriate's knowledge transfer process, consisting of four phases: assessment, initiation, execution, and evaluation. The first phase involves analyzing the aspects that influence the decision to transfer or receive knowledge. In the second phase, the drivers that precede the actual transfer of knowledge are identified. The third phase is characterized by the actual knowledge flow between the repatriates and the recipients. Finally, the fourth phase focuses on the results of the actual knowledge transfer. Throughout this model, the activities of the three players in the knowledge transfer process—repatriates, recipients and supervisors—are identified.

It should be noted that it is common for repatriates to take the initiative to share knowledge rather than for other employees to seek out this information (Oddou et al., 2013). This willingness of repatriates is related to four facts: the right knowledge, the right time, the right attitude, and the right work context (Oddou et al., 2013). This means that repatriates must be able to show how their knowledge relates to the problems the organization is trying to solve, so that employees understand the context of the knowledge they are receiving (Oddou et al., 2013). Furthermore, it is important that the repatriate is able to use the knowledge at the appropriate time, given the company's situation (Oddou et al., 2013). In the period of this knowledge sharing, it is crucial that repatriates have the right attitude, such as having patience, persistence, and the ability to influence others (Oddou et al., 2013).

Finally, it is important to emphasize that this whole process becomes easier when the repatriate is in the right position to exploit their skills.

4.3 Knowledge Absorption Capacity

Knowledge transfer is a complex process that takes place within a social environment, as noted earlier. When sharing knowledge, absorptive capacity of individuals and organizations is key because in the internalization and flow of knowledge (Burmeister et al., 2018; Moreira, 2009). In this sense, not all knowledge transferred will necessarily be absorbed. Knowledge absorptive capacity refers to the ability to incorporate knowledge into everyday routines, practices, and processes, essentially "knowing how to learn" (Gonzalez & Chakraborty, 2014).

Trust among workers may serve as a mediator in this knowledge absorption process. There are several risks associated with knowledge transfer, which can be mitigated if there is trust among workers (Bucher et al., 2022). If repatriates do not feel welcomed within the group, they may lack the confidence to share their knowledge.

From the perspective of employees, they must perceive and recognize the value, uniqueness, and complementarity of the knowledge being transferred. Moreover, employees need to be interested in the knowledge being shared, which motivates them to invest time in understanding the international knowledge brought by the repatriate (Burmeister et al., 2018). Trust-based knowledge sharing trust between both parties enhances the likelihood of absorption and effective application of that knowledge (Bucher et al., 2022).

Repatriates' knowledge originates from a different country, market, culture, or reality, making it challenging for the organization as a whole and its employees in particular to perceive and absorb it (Bucher et al., 2022). Sometimes, knowledge may not be absorbed within the originating company due to the so-called "not-invented-here" syndrome, i.e., the perception of outside knowledge as less relevant (Gonzalez & Chakraborty, 2014). Another factor that can be understood as an impediment to the absorption of knowledge is that the problems faced by the destination organization may differ from those at the home firm, resulting in a mismatch in the knowledge internalized.

Organizations can act as facilitators in disseminating and internalizing repatriates' knowledge through human resources techniques involving training and communication (Shao et al., 2022). However, it is first necessary to perceive knowledge transfer as a pedagogical process influenced by both the repatriate, as the bearer of information, who should have the ability to communicate it, and the workers, as learners, who most understand and assimilate the information (Burmeister et al., 2018).

Leaders play a prominent role in facilitating knowledge absorption by acting as mediators between the repatriate and the workers, fostering an environment conducive to knowledge transfer (Bucher et al., 2022). Moreover, leaders need to have

capabilities to provide social resources that stimulate and leverage relationships (Bucher et al., 2022).

In short, it is essential to highlight that repatriates acquire various skills and capabilities in their assignments, and that for the organization to benefit from them, it is crucial to establish an organizational climate and structure that enable the sharing of knowledge ensuring effective knowledge absorption among stakeholders (Gonzalez & Chakraborty, 2014).

4.4 Consequences of Knowledge Transfer

The success of both the repatriation and the knowledge transfer process can be evaluated from two perspectives: at the individual level, in this case, the repatriate, and at the organizational level (Chiang et al., 2018). In general, when knowledge is transferred by the repatriate and absorbed by the home firm, this results in positive factors for both parties, whereas when this process is interrupted, at whatever stage, fewer positive consequences are highlighted, such as the potential loss of competitive advantages and increased turnover intentions (Valk et al., 2015; Vidal et al., 2007).

4.4.1 Competitive Advantage for the Home Organization

The repatriate's knowledge transfer to the organization not only facilitates the development and creation of new knowledge (Chiang et al., 2018) but also serves as a basis for proposing improvements to current organizational practices (Reiche, 2012). Moreover, organizations contribute to greater success in international growth by creating and disseminating knowledge within them, just as they promote faster adjustment to changing conditions (Vidal et al., 2007). The combination of various knowledge sources is vital for organizations to differentiate themselves and achieve their goals (Vidal et al., 2007). It is important to note that repatriates, having carried out activities in different geographical regions, acquire knowledge that can be valuable for the parent company, as it provides insights into various aspects of international markets (Nery-Kjerfve & McLean, 2012). All these factors contribute to the organization's competitive advantage.

Headquarters should develop policies that embrace repatriate's knowledge transfer, such as launching knowledge platforms, creating communities of practice, promoting dialogue and socialization tactics among repatriates, top executives, colleagues, among others (Cave et al., 2022; Reiche, 2012; Valk et al., 2015). It should be noted that the greatest advantage of repatriates lies in their ability to gain an overview of organizational and business behavior (Peltonen, 1997), and organizations should view repatriation as a basic opportunity to renew their skills (Nery-Kjerfve & McLean, 2012).

Knowledge transfer and absorption are dynamic processes. Repatriates establish connections and build social capital during their assignments in the host firm, which enables them to access knowledge and information (Mäkelä & Brewster, 2009; Reiche, 2012). Therefore, they may continue to have access to developments in the host organization, which can impact their activities in the home organization. Moreover, if repatriates feel organizational support, they are more likely to transfer the newly gained knowledge. Conversely, if repatriates do not feel this support, they are more likely to leave the multinational, and the knowledge hitherto absorbed by the company may become obsolete and outdated. However, the long-term effects of repatriates on the organization and the duration of their role as knowledge pipelines are not extensively explored (Chiang et al., 2018). What is certain is that if repatriates feel recognized and valued by the headquarters, they are likely to continue to develop connections with the host firms, contributing to a more sustained competitive advantage over time and space.

4.4.2 Repatriates *Turnover*

Job engagement, which refers to the level of enthusiasm and dedication an employee feels toward their work, has a strong influence on turnover intentions, including those of repatriates (Cave et al., 2022). The repatriate's knowledge transfer can be a source of competitive advantage for the company; however, if repatriates leave the company, this knowledge transfer process is disrupted, and their decision is closely linked to their perception and expectations they have of the home organization (Nery-Kjerfve & McLean, 2012). Factors such as recognition for their international experience, level of involvement, team orientation, and utilization of their knowledge (Cave et al., 2022) contribute to their decision. Often, many returnees feel undervalued after their repatriation and end up leaving their home firms (Cave et al., 2022). It is worth noting that about 20%–50% of returnees leave the companies they worked for within a year after returning from their international assignments (Nery-Kjerfve & McLean, 2012; Tyler, 2006; Yeaton & Hall, 2008).

Repatriates are aware that they have acquired valuable knowledge and developed an international network during their assignments, which they would not have gained had they stayed at the company's headquarters. When they return to the home firm, they expect their career to progress, both objectively through promotions and salary increases, and subjectively through the achievement of corporate goals, particularly in terms of recognition for the knowledge and skills they acquired during the expatriation period (Chiang et al., 2018).

Upon returning to their home firms, repatriates may find themselves in positions that do not fully utilize their skills and experience, often due to a lack of post-repatriation career planning. This mismatch can lead to decreased performance and a sense of reduced commitment to the organization (Nery-Kjerfve & McLean, 2012). They may also be placed in roles that do not align with or leverage the experience gained at the host firm (Cave et al., 2022). However, it should be noted that repatriates may also be assigned to other divisions that better match their knowledge

or even undertake new international assignments, which can reduce their turnover intentions (Gonzalez & Chakraborty, 2014).

It is important to highlight that the transfer and absorption of knowledge may not be perceived solely due to the lack of pro-repatriation policies developed within the headquarters but also because the recipients resist accepting the new knowledge. The persistence factor plays a relevant role, as repatriates may continue to try to transfer the knowledge, or to adopt a more selective approach where they have been successful, or ultimately give up transferring that knowledge (Burmeister et al., 2015). Rewards and recognition granted to repatriates can motivate them to share the knowledge acquired during their international assignments (Burmeister & Deller, 2016). Still, repatriates are more satisfied when they perceive that their knowledge transfer was successful and effectively applied in a new context, rather than relying solely on monetary rewards (Burmeister et al., 2015).

In an empirical study conducted between Indian and Dutch home firms (with host firms located in the Netherlands and India, respectively), it was evident that Indian companies show greater receptivity and appreciation of the knowledge acquired by repatriates vis-à-vis Dutch firms. Thus, the Indian home firms acquired technical and cultural knowledge, which allowed them to enhance team projects performance, improve the labor market and foster conditions for lower turnover. They strategically develop their knowledge, strengthening the connection between the home organization and the international clients/hosts, thus contributing to a greater global competitive advantage. Such companies that demonstrate this responsiveness become more integrated into the global economy (Valk et al., 2015). In addition, as some of the perceived knowledge is tacit, it difficult to imitate (Oddou et al., 2013). Differently, Dutch home firms did not facilitate knowledge transfer, nor did they value it, leading to repatriates experiencing frustration and disillusionment, ultimately leaving the organization (Valk et al., 2015).

Often, parent companies are not as receptive to the knowledge potential acquired from subsidiaries and prioritize knowledge transferred to host firms. As previously referred, this becomes a source of frustration for repatriates and a significant precursor to turnover (Stahl et al., 2009; Gonzalez & Chakraborty, 2014).

5 Conclusions

Repatriation plays a crucial role in the development of knowledge-based competences within global organizations. Although extensive literature has been developed on this topic, it has gained particular momentum in the last decade. The knowledge transfer process can be influenced by several antecedents, among which the repatriates' reintegration into the parent company stands out very prominently. To circumvent this challenge, companies must devise support and welcoming strategies so that repatriates feel satisfied with their work and, in turn, are motivated to transfer the knowledge acquired during their expatriation period.

Knowledge transfer is a complex process, usually initiated by repatriates. Therefore, it is crucial to integrate them into an appropriate work context aligned with their expatriation experience, enabling them to share relevant knowledge at the right time, with the right attitude. However, it should be noted that the knowledge that is transferred by repatriates is not always absorbed by employees or the parent company for several reasons, as above referred. Given the benefits related with this process, measures should be implemented to ensure that this knowledge is, in fact, shared within the company, enabling the company to successfully explore knowledge-based competitive advantages.

In fact, if properly implemented, the repatriation process can be an important competitive advantage, as the knowledge acquired by repatriates, and subsequently transferred and absorbed by the parent company, is an asset for strategic decision-making. Repatriates can also be the link between subsidiaries and the home organization. However, for repatriates to be willing to share knowledge, home firms must recognize their value and stablish structural mechanisms for knowledge sharing, in order to avoid partial or total losses in case repatriates decide to leave the organization.

Based on the TGC scores vis-à-vis the TLC scores, repatriation knowledge transfer is far from being consolidated, as indicated by the scattered themes analyzed. Moreover, recent articles are closely aligned with the core themes addressed in the selected articles. However, it is possible to claim that the exploration of repatriates' horizontal knowledge transfer to other sister units within the multinational firms is still an open avenue for future research.

This study presents some limitations that can be further explored in future complementary studies. In this paper, no distinction is made between the various types of inherent knowledge, as it is analyzed as a whole. We know, however, that there are types of knowledge that are more easily transmitted and replicated than others, while some are difficult to imitate. Furthermore, the duration of the repatriate's stay in the host organization may have impacts for the quality, quantity, and manner in which the knowledge is transmitted to the parent company, which is well beyond the scope of this study. The possible measurement of costs associated with pro-transfer of knowledge organizational policies is also not examined. Furthermore, existing literature does not address in detail how the absorption of knowledge transferred by repatriates is carried out and evaluated, or what strategies can be used to optimize and stimulate this process. In this sense, future studies should be conducted on this topic.

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