Knowledge Management for Improved Digital Transformation in Insurance Companies: Systematic Review and Perspectives

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Abstract: Knowledge Management (KM) plays a pivotal role in contemporary businesses, facilitating the identification, management, and utilization of existing knowledge for organizational benefit. This article underscores the indispensability of effective KM processes in the insurance industry, which is undergoing profound digital transformation. Through a systematic review utilizing the PRISMA framework, we meta-analyzed 85 high-quality scientific papers sourced from prominent databases spanning 2008 to 2022. Our examination centers on the diverse implementation processes of KM worldwide, emphasizing the integration of information technologies to enhance data collection, analysis, processing, and distribution within insurance companies. The objective of this review is twofold: to devise efficient methods for implementing KM systems in the insurance sector and to delineate practical research directions in this domain.

Keywords: insurance; knowledge management; innovation management; digital transformation; information system; systems engineering; PRISMA

1. Introduction

In this era of digital transformation, companies face the imperative task of efficiently processing and utilizing the vast amount of information they generate and receive. The global economy, driven by intense competition, demands constant innovation as product lifecycles shorten and companies’ survival hinges on their ability to adapt rapidly. Managing innovation, facilitated by effective management techniques and systems, fosters an environment conducive to tangible advancements. Achieving this necessitates the effective mobilization of knowledge both within and outside the organization.

However, modern work paradigms such as telecommuting and geographical dispersion, coupled with the complexities of the labor market characterized by economic downsizing and transient employee–employer relationships, pose challenges in creating, sharing, and retaining knowledge within businesses. In response, some companies have embarked on implementing knowledge management (KM) policies.

KM can be defined as the systematic and organized actions a company undertakes to extract greater value from its existing knowledge [1]. Initially focused on document management, KM evolved in the 1980s and 1990s, notably in the United States, with advancements in training and the emergence of the Knowledge Manager role [2]. The advent of the web and the Internet in the 2000s revolutionized data processing within internal and external documents. Legislative measures, such as the Planning for Employment and Skills (GPEC) law enacted on 18 January 2005, made KM mandatory for companies. Nevertheless, KM often takes a backseat in business transformation projects due to its perceived complexity and resource-intensive nature [3].

Moreover, media and technology solution providers promote an optimistic vision of a data-driven future. This oversimplified perspective leads companies, including insurance
firms, to disproportionately invest in data acquisition and storage solutions, overlooking the importance of human-centric approaches in deriving meaning from data. The success of a KM project hinges on various factors, including administrative, organizational, human, technological, and procedural aspects.

The insurance industry faces its own set of KM challenges, notably concerning employee turnover and the loss of valuable knowledge. High costs associated with hiring, training, and productivity losses underscore the importance of knowledge retention. Collecting and managing knowledge within insurance companies is essential, encompassing proprietary information, confidential data, and invaluable insights. Ethical dilemmas arise when insurance agents switch employers while attempting to retain clients from their former workplace. Recruiting, training, and retaining insurance personnel pose significant challenges for companies worldwide. Customer knowledge is equally vital, directly influencing insurance productivity and profitability. Understanding customer needs and preferences is crucial for market share and profitability.

In this article, we will outline the fundamentals of knowledge management and its significance in the insurance domain. We will present the systematic review protocol and methodology, analyze the general findings, and assess the impact of technical advancements on the insurance industry vis-à-vis organizational dynamics. In fact, the focus on organizational and technological dimensions of knowledge management (KM) in this study is driven first of all by the context of the study within the Moroccan insurance sector. We have two primary considerations: the heightened sensitivity surrounding data security and the resistance to change within Moroccan insurance companies.

These factors necessitate a thorough examination of organizational strategies to manage data sensitivity and change management, alongside the integration of advanced technological infrastructure to support KM processes. While we recognize the importance of social dimensions, such as employee engagement and knowledge sharing behaviors, our initial focus on organizational and technological aspects aims to address the most immediate and critical challenges faced by the industry.

Drawing from successful experiences across various countries, we will explore the implementation scenarios of KM in insurance companies to enhance profitability. Additionally, we will discuss common implementation challenges and propose new research avenues in this field.

2. Driving Innovation: The Digital Transformation Landscape in the Insurance Industry

Recent advancements in digital technologies have catalyzed significant transformations within the insurance industry, reshaping traditional business models and operational processes. Studies by [4] have highlighted the pervasive impact of digitalization on various aspects of insurance operations, ranging from underwriting and claims processing to customer engagement and risk management.

The adoption of artificial intelligence (AI) and machine learning (ML) algorithms has revolutionized risk assessment and pricing strategies, enabling insurers to analyze vast volumes of data and derive actionable insights for enhanced decision-making [5,6]. Furthermore, blockchain technology has emerged as a disruptive force, offering immutable data records and smart contract capabilities to streamline insurance transactions and mitigate fraud risks [7,8].

In addition to technological innovations, the rise of insurtech startups has intensified competition within the insurance market, prompting incumbent insurers to embrace digital transformation initiatives to remain competitive [9]. Digitalization efforts have spurred the development of innovative insurance products and services, such as usage-based insurance (UBI) and peer-to-peer (P2P) insurance platforms, catering to evolving consumer preferences and demands [10,11].

Regulatory frameworks and consumer expectations continue to drive digitalization agendas across the insurance sector, with regulatory authorities mandating compliance with data protection regulations and promoting transparency in insurance practices (European
In summary, digitalization has become a cornerstone of strategic imperatives for insurers worldwide, enabling them to adapt to dynamic market conditions, mitigate risks, and capitalize on emerging opportunities in the digital age. The convergence of technological innovation, regulatory changes, and shifting consumer behaviors continues to shape the trajectory of digitalization within the insurance industry, underscoring the importance of proactive adaptation and continuous innovation for sustainable growth and competitiveness.

3. Knowledge Management for Insurance Companies

In the business realm, a significant amount of knowledge, skills, and expertise often remain undiscovered and thus inaccessible. It is unfortunate to repeatedly encounter the same challenges without realizing that solutions have been found in the past or that an employee possesses the necessary expertise. Knowledge management (KM) aims to address this by identifying and consolidating both static and dynamic knowledge to facilitate access [14]. Knowledge can be defined as structured information focused on a specific subject and validated through rules or experience.

The practical application of KM is largely influenced by the work of Nonaka and Takeuchi [15]. They distinguish between tacit knowledge, which resides within individuals and is challenging to articulate, and explicit knowledge, which is formalized and transmitted through reusable documents. According to their framework, knowledge is exchanged through four main flows:

• Socialization: Involves the transmission of tacit knowledge through experiences such as verbal exchanges, observation, imitation, and practice.

• Externalization: Entails converting tacit knowledge into explicit form, such as concepts, models, or hypotheses, often through activities like writing a presentation or reaching a consensus on problem-solving.

• Internalization: Involves the assimilation of explicit knowledge for use in different or specific contexts, which can occur through activities like reading documents or participating in team meetings.

• Combination: Refers to the amalgamation of explicit knowledge from various sources to create new explicit knowledge, exemplified by actions like disseminating a pivot table or drafting a meeting report.

Nonaka and Takeuchi’s model, depicted in Figure 1, illustrates how innovation in manufacturing processes can be facilitated by converting certain tacit knowledge into explicit knowledge. However, attempting to systematically formalize all knowledge can be highly inefficient. Not all knowledge is intended for reuse, and tacit knowledge holds particular value when shared and applied (bearing in mind that skills or know-how are challenging to formalize). As a result, two main approaches have emerged: capitalization [16] and collaboration [17]. Both approaches prioritize the sharing and exchange of tacit knowledge.

Capitalization operates on the premise that knowledge is a valuable asset that, when leveraged, enhances a company’s business value. It focuses on preserving the knowledge acquired and possessed by employees through their daily activities, particularly know-how and feedback. This process is often referred to as “capitalization on” knowledge. Essentially, the objective is to gather, format, and make accessible the knowledge necessary for the company’s effective functioning.

Here is the revised text with improvements in grammar, sentence structure, vocabulary, and clarity.
Various methods exist for leveraging critical business knowledge (such as REX, CYGMA, CommonKads, MASK, MOKA, CBR, etc.), which can be categorized into two groups [18]: modeling methods and experience feedback capitalization methods. Modeling methods aim to map out knowledge, while experience feedback capitalization methods involve critically evaluating past approaches and project executions to identify roles, processes, and actions, thereby mitigating the risk of repeating errors or dysfunctions in the future.

Collaboration emerges as one of the most effective means of enhancing information exchange, leveraging direct communication. Direct exchange is a natural process through which individuals share knowledge, create new insights, and learn. Establishing a collaborative environment among employees requires fostering communities of practice [19], wherein professionals come together to exchange information and experiences related to specific subjects or activities. Within these communities, members collaborate to solve problems or develop common practices. Participation in such communities is entirely voluntary, distinguishing them from other organizational structures like project teams or business units.

According to [20], innovation heavily relies on tacit knowledge, wherein general knowledge is transformed into specific knowledge to generate new products, services, or processes. Moreover, ref. [21] further emphasizes that knowledge is a prerequisite for innovation and, more broadly, for a company’s competitiveness. As businesses evolve, people increasingly serve as competitive differentiators, making strategic decisions, generating new ideas, and possessing creativity—a domain where machines have yet to fully match human capabilities. Collective intelligence refers to a group’s ability to converge individual intelligences toward common goals through interactions and synergy creation [22].

Insurance companies are keenly interested in collective intelligence as it enables the pooling of diverse expertise to solve technical and organizational challenges. This mindset aligns well with KM, which aims to facilitate knowledge emergence and sharing for business purposes, making it an integral component of innovation management. Additionally, each organization approaches digitalization differently, with various implications for knowledge management. The insurance sector has experienced several waves of digital revolutions, resulting in mergers, branch closures, and workforce reductions [23].

In this literature review, we address several research questions:

- How does KM influence the operations and performance of insurance companies?
- What impact does KM have on the relationship between insurance companies and their customers?
- What processes are necessary to leverage KM effectively?
• What is the relationship between deploying a knowledge management system in insurance and managing innovation for successful digital transformation?

To answer these questions, we employed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [24]. In the following section, we outline the methodology and protocol used, as well as other PRISMA attributes.

4. Methodology

This literature review analyzes high-quality, peer-reviewed papers following PRISMA guidelines [24]. In fact, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) methodology is employed to ensure the rigor and transparency of the literature review process in this study. PRISMA provides a structured and systematic approach for identifying, selecting, and synthesizing relevant research, which is crucial for producing reliable and replicable results. The literature selection and screening process of PRISMA is as follows.

Identification: A comprehensive search of multiple academic databases (such as PubMed, Scopus, and Web of Science) was conducted to identify relevant articles. Keywords related to knowledge management (KM), the insurance sector, and various dimensions of KM were used to ensure broad coverage.

Screening: The initial search results were screened based on titles and abstracts. Articles that did not meet the inclusion criteria (e.g., relevance to KM in the insurance sector, peer-reviewed, published in English) were excluded. Duplicates were also removed at this stage.

Eligibility: The full texts of the remaining articles were retrieved and assessed for eligibility. This step involved a detailed evaluation to ensure that the studies were relevant and of high quality. Criteria for eligibility included the focus on KM practices, technological and organizational dimensions, and empirical data from the insurance sector.

Inclusion: Articles that met all the criteria were included in the final review. The included studies were then systematically analyzed to extract relevant data, such as the impact of KM on operations and performance, the relationship between KM and customer interactions, and the processes necessary for effective KM implementation.

To explicit the methodology we presented Identification of studies via databases and registers in Figure 2.

By adhering to the PRISMA guidelines, we ensured that the literature review was comprehensive, unbiased, and methodologically sound. This rigorous approach enhances the credibility of our findings and provides a robust foundation for drawing conclusions and making recommendations.

We targeted articles with titles containing the keywords “Knowledge management” AND “insurance”, published in English with the status of peer-reviewed or accepted. The articles could be original research articles, conference papers, or book chapters. Information sources included IEEE Xplore (IEEE, Piscataway, NJ, USA), Scopus (Elsevier, Amsterdam, The Netherlands), Web of Science (Clarivate Analytics, Philadelphia, PA, USA), Taylor & Francis (Taylor & Francis Group, Abingdon, UK), and Google Scholar (Google, Mountain View, CA, USA), covering the period from 2008 to 2022. Study selection involved screening by a single researcher based on predetermined criteria, initially downloading abstracts and subsequently retrieving full texts. All types of studies (quantitative, qualitative, exploratory, empirical, descriptive, mixed methods) were included.

The resulting selection was as follows:
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Figure 2. Identification of studies via databases and registers.

As a summary (see Figure 3), we initially selected 116 papers and after PRISMA identification and screening we kept 85 papers and we detailed in Figure 4 the number of papers selected per year. There 85 papers have been categorized by geographical zones to provide an overview of the specificities of each insurance market and the knowledge management processes adopted.

Figure 3. Number of articles in scope.
In fact, considering publications per country or region is important for several reasons:

- **Cultural and Regulatory Differences**: Different countries and regions have unique cultural norms, regulatory environments, and business practices that influence knowledge management (KM) strategies and practices in the insurance industry. By analyzing publications per country or region, researchers can identify trends, challenges, and best practices that are specific to each context.

- **Tailored Solutions**: Understanding the context-specific challenges and opportunities in different countries or regions allows for the development of tailored KM solutions. What works well in one country may not be as effective in another due to varying cultural norms, legal frameworks, or market dynamics.

- **Comparative Analysis**: Analyzing publications per country or region enables researchers to conduct comparative studies, which can yield valuable insights into the relative effectiveness of different KM approaches. By comparing practices across countries or regions, researchers can identify factors that contribute to success or failure and extract lessons that can inform future KM initiatives.

- **Global Perspective**: Studying publications from diverse countries or regions provides a more comprehensive and global perspective on KM in the insurance industry. This broader view helps researchers identify emerging trends, innovative practices, and universal challenges that transcend geographical boundaries.

Overall, considering publications per country or region enhances the depth and richness of research on knowledge management in the insurance industry by accounting for the diversity of contexts and experiences worldwide.

Additionally, information on insurance lines of business, methodologies, techniques, survey responses, and recommendations obtained have been highlighted. This approach aims to gauge the organizational and technological impact of KM in various insurance companies.

Initially, we developed a two-dimensional framework for the KM function: organizational and technological. We examined a range of experiences from different corners of the world, focusing on the utilization of KM in the insurance sector. The objective is twofold: to compile a list of implementation recommendations and to initiate a discussion on a generic process for establishing a successful knowledge management system within insurance companies.

### 5. Results

Due to stringent regulatory frameworks, the need for extensive risk portfolio creation, and the time investment required to establish customer trust, the insurance industry has historically remained relatively insulated from digital disruptions. However, it represents a fertile ground for knowledge accumulation and a rich workspace. Therefore, the pressing
question arises: how can knowledge management (KM) be leveraged to capitalize on insurance knowledge? To address this query, we delineate two dimensions: the organizational and technological aspects.

5.1. Organizational Level

The insurance sector encompasses a spectrum of services aimed at providing coverage for various aspects of individuals’ lives, ranging from life and health insurance to property and automotive coverage. The impact of knowledge management within insurance companies, like any other business, revolves around implementing a system that centralizes knowledge around individuals, in addition to incorporating technology—a process that poses inherent challenges [25]. Achieving this entails a long-term commitment. The advantages and limitations discussed earlier underscore that while KM can stimulate innovation, it may also impede the creation process. Thus, striking a balance is imperative. For KM to be effective, it must prioritize aspects that hold value for employees in their work. Overambitious initiatives risk being too abstract, while overly modest efforts may fail to foster collaboration. Although KM yields rewards in the medium to long term, it demands initial investments in financial, temporal, and human resources. Implementing such a project necessitates not only a change in management but also unwavering support from top-level executives. In organizations with a hierarchical structure, visible leadership commitment is vital. This commitment can manifest in the transparent recognition of experts and senior employees or instituting rewards for KM activities, such as valuing projects that facilitate feedback dissemination. However, effective knowledge management can only commence when employees are willing to share their knowledge. Trust among employees and in the hierarchy, coupled with motivation to share, are pivotal factors influencing knowledge sharing [26]. Sponsoring initiatives across various organizational tiers and fostering regular, transparent communication can help cultivate a climate of trust. Moreover, providing support and training for users is crucial to developing KM competencies and maximizing participation. However, managing the human aspect of KM in insurance companies requires the most time and attention. Employees require time to grasp KM concepts, master tools and practices, and capitalize on knowledge effectively. Additionally, ref. [27] found that establishing communication practices among managers to facilitate knowledge sharing, along with gauging managers’ perceptions of KM and designing scales to assess the efficacy of KM learning programs, is vital. The hierarchical structure of insurance companies must also align with KM implementation.

5.2. Technological Level

Technologies aiding knowledge management, known as Knowledge Management Technologies, are akin to information technologies but focus on managing knowledge instead of processing data. These technologies, integral to KM systems, encompass various tools.

Artificial Intelligence (AI) systems play a pivotal role in knowledge acquisition, utilizing machine learning to collect, process, and apply knowledge to tasks and enhance decision-making. In digital enterprises, AI enhances knowledge delivery by optimizing dissemination to those in need [28]. AI also augments knowledge distribution. In the insurance domain, data science and AI have significant ramifications for ‘data-driven’ insurance markets, akin to the transformative impact of algorithmic trading on capital markets [29]. Technologies such as Big Data, AI analytics, the Internet of Things, and Blockchain facilitate market automation and risk analysis. New AI algorithms mimic diverse aspects of human learning, reasoning, and insurance knowledge management [30]. Data mining aids in claim volume estimation, identifying optimal rate plans, and forecasting profitable consumers [31]. Cluster analysis aids in customer acquisition and retention, while fraud detection prevents improper claim payments.

Various other technologies facilitate knowledge management and sharing, including case-based reasoning systems, electronic discussion groups, simulations, databases, and
decision support systems [32]. Enterprise Resource Planning (ERP) systems promote knowledge management and sharing through standardized processes and terminologies. Video conferencing, information repositories, wikis, blogs, and lessons learned systems also aid KM in the Web 2.0 era [33].

5.3. Detailed Results

5.3.1. Impact of Knowledge Management in the Insurance Industry

Knowledge management (KM) projects have demonstrated efficiency and positive impacts on business processes across various industries, particularly in Information Technology (IT) and Research and Development (R&D). Similarly, KM initiatives have led to tangible business improvements and measurable outcomes within the insurance sector [34]. However, the effects of KM implementation in the insurance business vary across different countries, influencing HR processes, employee attitudes, customer management, innovation, and the validation and implementation of new business cases. Notably, knowledge loss resulting from personnel turnover presents a significant challenge, with the costs of recruitment, lost productivity, and training replacements amounting to millions of dollars. Preserving the company’s accumulated know-how over the years is a key objective of insurance knowledge management, enabling companies to differentiate themselves from competitors. Additionally, safeguarding trade secrets, confidential information, and valuable insights within the insurance workforce is paramount. Recruiting, selecting, training, and managing insurance agents, underwriters, and claims managers pose significant challenges for insurance companies globally. An ethical concern arises when employees leave their employers to join competing insurance companies while attempting to retain former clients [35].

5.3.2. Global Evaluation of KM in the Insurance Industry

This section evaluates studies and implementation experiences of KM in the insurance industry across different regions, including Asia, America, Europe, Africa, and Australia. The distribution of KM research works by geographical area in the insurance field is essential due to the unique characteristics of each market, including cultural shifts and regulatory changes. KM, as the capitalization of human know-how, is primarily implemented or evaluated based on technological and organizational dimensions. Our study, based on the PRISMA request described earlier, focuses on insurance KM experiences in various countries, including the United States, Germany, Hong Kong, Italy, Kenya, India, Iran, Norway, Taiwan, Indonesia, China, Jordan, Australia, Turkey, Korea, Iraq, and Piraeus, as illustrated in Figure 5.

![Number of papers per country](image-url)
Let us review the recommendations obtained through studies carried out on insurance companies regarding knowledge management from both technological and organizational perspectives, continent by continent

6. Asia

6.1. India

According to [36], in the Indian insurance industry, employees are primarily tasked with collecting, storing, and updating data and information in electronic databases. However, the prioritization of discovering and capturing new knowledge is lacking [37]. There is a lack of a knowledge-sharing culture in relevant areas, even though there are many experts (mainly in the public sector) [38]. Knowledge tends to be shared through direct communication rather than through specific information and communication channels (in the private sector). Additionally, high-performance working systems have been introduced to ensure that employees understand their work, are motivated to share it, and effectively communicate about it. Systematic planning in Indian insurance companies focuses on how organizational routines affect three knowledge management procedures: knowledge capture, sharing, and application.

Regarding the organizational dimension, KM implementation in Indian insurance aims to:

- Ensure knowledge alignment with business objectives;
- Define efficient business roadmaps;
- Study KM implementation at various sub-organizations;
- Evaluate the initiative in terms of its business impact: knowledge submission, retrieval, application, and reuse.

Concerning the technological dimension, Indian KM systems in insurance companies are primarily based on Knowledge Bridges to:

- Create logical segmentation of files into centralized folders;
- Manage project versions;
- Implement a tag-based search feature;
- Provide role-based secure access;
- Store metadata and comments (wikis, blogs, discussion threads, calendar, and links).

They also recommend the use of KM platforms modeled after popular social media platforms, where users can share messages, photos, videos, and invite colleagues to collaborate on projects and tasks.

6.2. Iran

For Iranian insurance companies, considerable attention is given to insurance knowledge management across various aspects. Our literature review identified a significant number of recent publications focusing on the impact of KM on innovation and new product development [39] (non-exhaustive list).

Regarding the organizational dimension, decision-making opportunities are provided to promote and update employees’ skills. Conversation groups are established to foster idea generation for service innovation, and successful experiences are continuously recorded, updated, and reviewed. Employees actively engage in knowledge-based activities and utilize knowledge in their daily tasks. One of the challenges faced by the insurance industry in Iran is value chain identification [40]. Several factors influence KM implementation in Iranian insurance companies, including human resource characteristics, managerial attitudes, knowledge-sharing strategies, organizational structure and relationships, organizational culture and atmosphere, organizational rewards (economic and socio-psychological motivations), and organizational strategy [41]. Critical success factors suitable for KM implementation primarily revolve around administrative, organizational, digital, and human resources.
In terms of the technological dimension, the most crucial KM practices for e-insurance include knowledge organization, knowledge storage security, knowledge-sharing intention, and knowledge applications, although these practices are not extensively used and implemented in Iranian insurance companies [42]. Many studies conducted in the same context [43,44] emphasize recommendations such as enabling everyone to access knowledge resources and creating appropriate platforms for acquiring, documenting employee experiences, and facilitating knowledge exchange and sharing. Additionally, the use of suitable search engines, KM expert systems, and Enterprise Resource Planning is recommended for enhancing e-insurance systems. Moreover, there is a growing emphasis on integrating customer commercial knowledge into insurance digital KM solutions [45]. Furthermore, studies have highlighted the meaningful relationship between knowledge creation, acquisition, transmission, application, and preservation, which significantly impact competitive advantage in insurance [46]. Knowledge creation remains a pivotal technological focus, supported by the utilization of KM conceptual models and KM roadmaps [47].

6.3. Taiwan

According to [48], the knowledge embedded within insurance organizations in Taiwan, when deployed into operations and services, positively influences business activity. Knowledge management (KM) enhances insurance job performance, leading to improved service, time savings, and increased productivity. Effective knowledge management and performance contribute to solidifying competitive advantages for organizations.

Regarding the organizational dimension, the adoption of KM requires a detailed model that encompasses external factors, perceptions, attitudes, KM practices, and perceived performance [49]. Intellectual capital emerges as a critical factor in insurance KM implementation in Taiwan, encompassing relational, human, and structural capital to enhance knowledge-based performance [50]. Employees’ innovation and their working attitudes significantly impact knowledge management activities, particularly in driving a knowledge-based economy in Taiwan [51].

In terms of the technological dimension, the significance of hardware, software infrastructure, and computer background is highlighted [52]. These elements facilitate information provision, address questions related to insurance products, and enable the collection and utilization of knowledge for customer satisfaction and loyalty. Additionally, integrated information systems, data updating mechanisms, data and system security measures, as well as collaboration and communication tools, emerge as key technological KM practices to adopt.

6.4. Indonesia, Malaysia and Thailand

In the Indonesian, Malaysian, and Thai insurance contexts, knowledge management is considered a key component with a significant impact on sustainable competitiveness, closely linked to organizational performance, organizational culture, and the use of Information Technologies [53].

Regarding the organizational dimension, conceptual models of knowledge management should be developed within insurance companies before implementing and adopting KM practices. Conducting causal relationship analyses between knowledge management and internal organizational variables, as well as competitive intensity, is imperative [54].

In terms of the technological dimension, IT Governance plays a crucial role. Providing digital opportunities that prioritize flexibility, effectiveness, and the acceleration of automation processes in insurance routine activities aids in transforming traditional business insurance into Insurance Technology [55]. Emphasizing user experience and implementing customer relationship management systems based on empathy for brokers, underwriters, and customers adds considerable value to the insurance knowledge management system.
6.5. China and Hong Kong

In both China and Hong Kong, integrating the existing insurance policy information into the insurance knowledge management system can assist stakeholders in their daily tasks. Furthermore, it facilitates knowledge innovation and sharing both within and outside the company, thereby enhancing competitive advantages [56]. Regarding the organizational dimension, the Intellectual Capital (IC) of Chinese insurance companies exhibits a strong linkage to knowledge management and influences financial performance as well [57].

In terms of the technological dimension, the utilization of smart contracts and Blockchain technology in the insurance sector has multifaceted effects on knowledge. These technologies impact areas such as fraud prevention, policy management, underwriting, claims administration, and new trends. Additionally, automation, transparency, and efficiency in claims administration offer numerous advantages for the successful implementation of an insurance knowledge management system [58].

6.6. Turkey

In Turkey, similar to many countries, research in knowledge management (KM) is conducted extensively, although not specifically focused on the insurance sector. This explains the number of articles included in our study and the recommendations cited concerning the insurance business.

Regarding the organizational level, Turkish service firms have demonstrated the ability to orchestrate KM activities by combining various drivers and strategies. Tacit knowledge management has been found to fully mediate the effects of leader behaviors on the job performance of branch employees [59]. Selecting the appropriate KM strategy is crucial for achieving results and aligning with innovation and business goals.

In terms of the technological dimension, adopting codification as a document-centered KM strategy (focused on explicit knowledge) with an emphasis on technological solutions for knowledge delivery proves beneficial in the Turkish services market. However, this approach should be supplemented with personalization as a people-centered KM strategy (emphasizing tacit knowledge) to enrich the KM practices further.

6.7. Arab Countries

In Arab countries, the emphasis on people, process, and technology is crucial for the successful implementation of knowledge management (KM) in insurance companies.

At the organizational level, research indicates that Jordanian insurance companies should design appropriate organizational structures and leverage knowledge for increased productivity, survival, and success [60]. KM plays a significant role in enhancing Strategic Competence, particularly in areas such as Shared Vision, Cooperation, Empowerment, and Innovation within insurance companies. Furthermore, effective information and knowledge management contribute to the operational efficiency of Iraqi insurance companies, with the growth of expertise being closely linked to corporate performance [61].

Regarding the technological dimension, investing in Information Technology is essential for developing the necessary infrastructure to support the acquisition, management, and transfer of both tacit and explicit knowledge. However, technological investment alone may not suffice to realize the full benefits of KM. It is imperative to provide a technological framework for KM capabilities, particularly in the insurance sector, to understand customer processes and enhance customer acquisition [62]. Researchers in Jordan recommend the utilization of WEB 2.0 applications such as wikis, blogs, and social applications in various stages of the KM process, including acquisition, creation, transfer, storage retrieval, and application [63].
7. Europe
7.1. Norway and Germany

According to our PRISMA process, knowledge management, specifically in the insurance business, is of greater interest to European insurance companies than researchers. Currently, KM is a topic of interest for almost all European companies across various fields.

In Norwegian insurance companies, the digital transformation, including mobile banking solutions, self-service options, contact-less payments, and home-based banking, has significantly altered both customer and worker behaviors within these industries. KM plays a pivotal role in facilitating this change, fostering knowledge management and learning within the company, and promoting effective collaboration among employees [64].

Regarding the technological dimension, insurance companies are actively engaged in digital agendas, with digital transformation positively correlated to business performance and contributing to financial success. Business Intelligence tools have also contributed to sustained growth in turnover and market share, positively impacting the strategy development process and strategic knowledge management efforts.

At the organizational level, European insurance companies are particularly focused on identifying trends and developments that could potentially impact the internal and external environment. This includes areas such as value creation, customer relationships, business model evolution, and enhancements to business processes [65].

7.2. France and Greece

The impact of knowledge management on the strategic plans of insurance organizations has also garnered interest from researchers at the University of Piraeus in Greece. Regarding the organizational dimension, research conducted by [66] suggests that organizational progress is significantly influenced by knowledge management practices. Utilizing information sources and human resources effectively through knowledge management can enhance an organization’s competitiveness. Moreover, poor knowledge management practices can have a detrimental effect on the strategic planning of insurance companies in Piraeus.

On the technological front, the development and implementation of effective knowledge management systems, methods, and practices through IT software and infrastructure have been shown to not only enhance human resources but also increase productivity [67]. In addition, French insurance companies have found success in using the balanced scorecard as a knowledge management tool, particularly when integrated with IT solutions to establish correlations between key performance indicators. Support from CEOs and other top managers has been crucial for the successful adoption of such practices [68].

8. America (USA)

In business contexts more than research, knowledge management systems in US insurance companies assist businesses in developing a more knowledgeable and collaborative staff. They consider the insurance sector as a dynamic workplace where teamwork, collaboration, and customer experience all contribute to long-term success [69]. For example, by removing dozens of information and content silos and consolidating all enterprise knowledge and guidance, a top five US P&C insurance provider is rapidly transforming Customer Experience (CX).

As for the technological dimension, new technologies, namely IoT-based technologies, act as a knowledge creation mediator in enhancing business performance and leading to broader social good [70]. According to authors, the IoT capabilities are very beneficial for KM systems by increasing KM processes and creativity through collecting, analyzing, processing, and distributing varied data in real-time.

As for the organizational dimension, knowledge management systems can improve customer experiences, cut expenses, and create more effective insurance teams up-to-date with relevant training, company information, and products or processes changes. In
addition, to be competitive and successful, experience shows that enterprises must create and sustain a balanced intellectual capital portfolio.

9. Africa

9.1. South Africa

In South African insurance companies, it is crucial that knowledge management (KM) is not approached in an ad hoc or isolated manner. Instead, it should be seamlessly integrated into the broader management activities of the enterprise and closely linked to the strategic plan [71].

On the organizational front, the significance of KM is widely recognized, with acknowledgment that it can serve as a source of long-term competitive advantage for the company. To ensure effective implementation, recommendations include designating a senior manager responsible for overseeing KM efforts, conducting thorough analyses of insurance knowledge, communicating the KM approach to all team members, emphasizing its importance, and garnering their support. Additionally, providing staff training on efficient KM practices and system use, fostering a culture of knowledge exchange, and encouraging employees to explore new ideas are essential organizational strategies.

From a technological perspective, the infrastructure, IT management practices, and accessibility of data, information, and knowledge within the enterprise play crucial roles in facilitating KM initiatives in insurance companies. IT platforms are particularly vital as enablers, enhancing the efficiency and productivity of knowledge sharing efforts [72].

9.2. Nigeria

According to [73], the Nigerian insurance industry faces significant challenges due to high competition and the need for innovation to keep pace with technological advancements. However, innovation efforts are hindered by limited knowledge exchange within the industry, ineffective application of knowledge, insufficient control mechanisms over operational procedures, and minimal knowledge acquisition.

On the organizational front, Nigerian insurance organizations are urged to leverage both internal and external sources to enhance their innovation capabilities by improving their ability to acquire, share, and manage knowledge effectively.

Regarding the technological dimension, organizations should recognize the crucial role of information technology in boosting their innovativeness. Investing in IT infrastructure and leveraging technological solutions can help facilitate knowledge management processes and drive innovation within the Nigerian insurance sector.

10. Australia

Australian insurance companies place significant emphasis on understanding the importance of knowledge for their business operations. They prioritize structuring and organizing knowledge by validating business cases and implementing KM projects, particularly within banking, compliance management, and treasury organizations.

On the organizational front, Australian KM standards such as AS5037, 2003, delineate drivers as strategic levers through which organizations achieve their desired outcomes. Australian insurance firms focus on expediting the generation of proposal documents by leveraging existing domain-specific knowledge, lessons learned, and best practice repositories from financial institutions and government treasury organizations.

Regarding the technological dimension, digital knowledge content analytics and KM codification play vital roles in Australian insurance companies. These technologies facilitate smoother onboarding processes for new hires by allowing them to be guided by their peers via IT platforms. Additionally, analytics software helps identify recent and relevant knowledge material more efficiently, ensuring that critical details are not overlooked, even if they may not directly relate to the new hire’s role.
11. Discussion

It is evident from the studies and works evaluated in this review that recommendations for knowledge management (KM) projects in insurance companies vary depending on factors such as the company’s maturity, management approach, and regulatory environment. Both the organizational and technological dimensions play crucial roles in the success of KM initiatives.

On the organizational front, the impact of country-specific regulations, the size of the insurance company, its business lines, and management approaches are significant. KM enables greater competitiveness and influences strategic planning. Additionally, customer involvement is crucial, as it enhances the customer experience and fosters loyalty to the insurance company. Conversely, effective knowledge management promotes employee motivation, team synergy, and innovation in insurance services, ultimately improving corporate performance.

Human capital and performance are consistently highlighted as key parameters for successful knowledge management in insurance across various countries. However, the maturity of KM implementation varies among countries, with some exhibiting high maturity levels, while others are medium or less mature. Additionally, the lack of information due to the confidential nature of insurance company processes poses challenges for researchers and practitioners alike.

Influence of KM on Operations and Performance

Effective knowledge management (KM) practices play a pivotal role in shaping the operations and performance of insurance companies. For example, in India, insurance firms have implemented robust KM frameworks to streamline underwriting processes and optimize risk management strategies based on insights gathered from past experiences. Similarly, Norwegian insurers have leveraged KM to enhance digital transformation initiatives, leading to improved customer service and operational efficiency. These examples illustrate how KM fosters a culture of continuous improvement and innovation within insurance organizations, ultimately driving better operational outcomes and performance.

To validate the findings, provide contextualization, highlight relevance, and enhance transparency in the research process, let us answer the research questions we addressed before.

Impact of KM on Customer Relationships

The integration of KM into insurance operations has a profound impact on the relationship between insurers and their customers. For instance, insurance companies in South Africa have utilized KM systems to gain deeper insights into customer preferences and behaviors, enabling them to offer personalized products and services that enhance customer satisfaction and loyalty. Likewise, insurers in the USA have leveraged KM to expedite claims processing and provide proactive risk management solutions, thereby strengthening customer relationships. These examples highlight how KM enables insurers to tailor their offerings to meet the unique needs of individual customers, ultimately enhancing overall customer experience.

Processes for Leveraging KM Effectively

Leveraging knowledge management effectively within insurance companies requires the implementation of robust processes and strategies. For example, insurance firms in Taiwan have fostered a knowledge-sharing culture and provided comprehensive training to employees to ensure the successful implementation of KM initiatives. Similarly, Iranian insurers have invested in technology infrastructure that supports knowledge management practices, such as collaborative platforms and data analytics tools. These examples demonstrate how effective KM processes and technology infrastructure are essential for enhancing the efficiency and effectiveness of KM practices within insurance organizations.

Relationship between KM and Innovation for Digital Transformation

The deployment of knowledge management systems in insurance is closely linked to managing innovation for successful digital transformation. For instance, insurance companies in China have embraced AI-driven analytics and machine learning algorithms to extract actionable insights from data, leading to more accurate risk assessments and
personalized customer experiences. Similarly, insurers in Australia have leveraged digital knowledge content analytics to drive innovation and enhance customer service. These examples illustrate how KM empowers insurers to adapt to changing market dynamics, embrace emerging technologies, and deliver innovative products and services to customers, ultimately driving digital transformation.

In Table 1 we summarize the key insurance KM characteristics per country.

<table>
<thead>
<tr>
<th>Country</th>
<th>KM Capture</th>
<th>KM Modeling</th>
<th>KM Implementation</th>
<th>Domain</th>
<th>Focus</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iran</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>e-insurance</td>
<td>Customer</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Yes</td>
<td></td>
<td></td>
<td>life insurance</td>
<td>Enterprise</td>
</tr>
<tr>
<td>Indonesia, Malaysia &amp; Thailand</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td></td>
<td>Customer</td>
</tr>
<tr>
<td>China &amp; Hong Kong</td>
<td>Yes</td>
<td></td>
<td></td>
<td>fraud/policy</td>
<td>Enterprise</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>management/UW/claims</td>
<td></td>
</tr>
<tr>
<td>Turkey</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arab countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Norway &amp; Germany</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Customer &amp; Enterprise</td>
</tr>
<tr>
<td>France &amp; Greece</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Enterprise</td>
</tr>
<tr>
<td>USA</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td>Customer &amp; Enterprise</td>
</tr>
<tr>
<td>South Africa</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nigeria</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Australia</td>
<td>Yes</td>
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</tr>
</tbody>
</table>

After presenting the main differences and similarities between the findings in Table 2, we can say that organizational recommendations for KM Implementation in Insurance are as following:

- Facilitate knowledge recording and sharing within teams, fostering a culture of experimentation and innovation;
- Ensure managerial involvement in KM initiatives, aligning organizational and knowledge strategies;
- Strategically align knowledge management with business objectives, maintaining a balanced intellectual capital portfolio.

Technological Recommendations for KM Implementation in Insurance:

- Design a robust technological framework for KM, investing in effective digital KM infrastructure;
- Utilize question/answer systems, wikis, blogs, and social apps for enhanced customer and employee engagement;
- Incorporate emerging technologies such as IoT, AI, and BI into the KM system structure for improved efficiency and effectiveness;
- Prioritize data update, security, and sharing practices as essential components of e-insurance KM;
- Implement IT governance best practices to manage KM media effectively and maximize results.
Table 2. Main differences and similarities between the findings from the different countries.

<table>
<thead>
<tr>
<th>Continent</th>
<th>Country</th>
<th>Infrastructure</th>
<th>KM</th>
<th>Technology</th>
<th>Transparency &amp; Collaboration</th>
<th>Strategy</th>
<th>IT Investment &amp; Governance</th>
<th>Digital Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>India</td>
<td></td>
<td>✔</td>
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<tr>
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<td>Taiwan</td>
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<td>✔</td>
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</tr>
<tr>
<td></td>
<td>Indonesia, Malaysia,</td>
<td></td>
<td>✔</td>
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<tr>
<td></td>
<td>Thailand</td>
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<td>✔</td>
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</tr>
<tr>
<td></td>
<td>China, Hong Kong</td>
<td></td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
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<tr>
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<td>Turkey</td>
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<tr>
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<td>Jordan, Iraq</td>
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<td>✔</td>
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<tr>
<td>Countries</td>
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<td>✔</td>
<td></td>
<td>✔</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>France, Greece</td>
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<td>✔</td>
<td></td>
<td>✔</td>
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<tr>
<td>America</td>
<td>USA</td>
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<td>✔</td>
<td></td>
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<td>✔</td>
<td></td>
</tr>
<tr>
<td>Africa</td>
<td>South Africa</td>
<td></td>
<td>✔</td>
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<td></td>
<td>Nigeria</td>
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</tbody>
</table>

Key Research Questions for KM in Insurance:

- What are the technological and organizational challenges specific to e-insurance KM?
- How can personalized customer expectations be effectively matched with insurance company knowledge in the digital era?
- What strategies can sustain balanced corporate performance and business growth through KM in the insurance context?
- How can the digital transformation from traditional insurance to e-insurance be effectively managed from a knowledge management perspective?
- What are the optimal technological choices for developing an effective insurance KM system?

12. Conclusions and Perspectives

In conclusion, our literature review highlights the crucial role of knowledge management (KM) in enhancing insurance operations, customer relations, and innovation. By analyzing 85 articles using the PRISMA methodology and drawing examples from various countries, we illustrate how KM processes intersect with organizational and technological dimensions to drive organizational learning and adaptation. Emphasizing the importance of aligning knowledge with business objectives and fostering a knowledge-sharing culture, our findings provide actionable recommendations for insurers worldwide. Additionally, we underscore the significance of leveraging KM for successful digital transformation and innovation.

In future research we will explore the social/people dimension of KM further to enhance organizational effectiveness. We will also develop a suitable KM framework for Moroccan insurance companies in which we will consider specific local variables such as the regulatory environment, organizational culture, technological infrastructure, and human resources. Drawing from international experiences, such as India’s use of Knowledge Bridges, China’s application of Blockchain technology, and Australia’s digital analytics, can offer valuable insights. Additionally, organizational practices from Iran, Norway, Germany, Turkey, and Arab countries highlight the importance of integrating KM into strategic planning, fostering a culture of knowledge sharing, and leveraging advanced technological solutions. By combining these global best practices with a thorough understanding of
the Moroccan context, a robust KM framework can be developed that drives innovation, enhances customer relations, and improves overall organizational performance. We will also focus on further exploring these local variables and continuously refining the KM framework to ensure it meets the evolving needs of the Moroccan insurance sector.

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**Conflicts of Interest:** The authors declare no conflicts of interest.

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