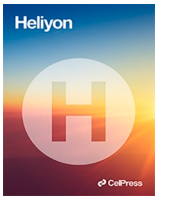
Heliyon 9 (2023) e22293

Contents lists available at ScienceDirect

Heliyon

journal homepage: www.cell.com/heliyon



A systematic review on the roles of knowledge management in public sectors: Synthesis and way forwards

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ARTICLE INFO

Keywords:
ystematic review
knowledge management
PRISMA
Managing knowledge
Public sector

ABSTRACT

The main objective of this study is to examine and synthesise the role of knowledge management in the public sector. The study applied the systematic review technique of Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) to evaluate the role of knowledge management in the public sector using 33 selected web of science core collection journal articles. The study acknowledged that different theories have been applied by the scholars using different research methodologies. The articles published in the stated year show progressive increment, and the authors used different research methods to undertake a study on KM in the public sector. In this review, three research themes in KM research have been identified. Knowledge management for organisational improvement, KM for citizens' satisfaction, and KM for collaborative innovation management are the main research themes identified in this systematic review.

1. Introduction

Knowledge management (KM) is a process of acquiring, exchanging, renewing, and handling data, materials, and knowledge within an organization for productivity, efficiency, cost reduction to be realized and improved performance to be attained [1,2]. KM is handling properly the processes such as knowledge identification, creation, sharing, transfer, acquisition and utilization in the organizations. It also enables organizations to achieve their overall goals strategically [3]. KM research has gotten attention in different field of studies such as business, management, sociology, information management, organizational theory, public administration and management of human resources [4]. Prior studies on KM relied on private and business organizations, and, through time, the importance of knowledge management for public sector become recognized by different researchers and institutions around the globe [5]. It became a center of policy-making and management of public service organizations [6].

Public sector is a service provider organization, agency, or unit at the federal, state and local level of the country. It includes agencies, public utilities, cooperatives, military departments, police department and others that strive to provide quality services for citizens [7]. The routine activities of public organizations are attached by policies, guidelines, procedures and rules [8]. Additionally, the central government, non-governmental organizations, the armed forces, and state-owned companies are categorized under public sector [9]. Public sector organizations work in different specializations, i.e., agriculture, engineering and pure sciences, construction, livestock, and medical. Public organizations are looking for new ways to use digital technologies to increase the efficiency of their internal processes and improve their interactions with clients, whether citizens or businesses [10,11]. Public organizations are faced by

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https://doi.org/10.1016/j.heliyon.2023.e22293
Received 11 May 2023; Received in revised form 6 November 2023; Accepted 9 November 2023
Available online 15 November 2023

challenges like social problems that arise from lack of resources (physical resources, knowledge resources and other resources to manage) and provide quality service to their clients [12]. Organizations have been exposed to a dynamic environment and the shift in global economic pressure, while serving the public with new and/or better services under limited budgets. Public sector organizations are criticized for being too bureaucratic, too stable, stagnant, staff resistance, rigid organizational structures, the lack of shared innovation goals and conservative [13,14]. Organizations should address social, economic, and ecological concerns, particularly in the public sector [15]. Public sector resilience in times of crisis has an irreplaceable role [16]. Public sector provides many potential benefits for the community [17]. Recently, transformative impact on the operational excellence of public sector organizations is rather limited. However, dynamic capabilities enable public sector organizations to fulfil policies and provide services [18,19]. In general, public sector workers are less satisfied, and service provision could improve by technologies and enhanced organizational performance are still largely missing [20,21]. Entrepreneurial management and competition are fundamental drivers of public sector transformation [22].

With regard to knowledge management related activities, public sectors are restricted by bureaucratic structures; political, cultural, individual behavior; human resource management functions and the nature of knowledge [23,24]. KM is exposed to ineffectiveness in different organizations by lack of leaders that participate in KM activities, rigid organizational structures, culture, and deficiency of standardized incentive systems [25]. Even though numerous problems are available in the public sector to manage knowledge properly, the importance of KM for the overall improvement of public service provider organizations became irreplaceable. In the public sector, creating knowledge on worker characteristics such as the willingness to add value, improve themselves and adopt a more holistic view of their function within the workplace is crucial in achieving the goals set by the sectors [26,27]. KM is the best managerial tool to digitalize the public service by asset tracking system [28]. It also helps to improve the quality of life and wellness by providing quality service for citizens [8].

The problem related to KM in public sector is relatively under researched when compared with private sector research results. The literature on KM in public administrations is rare and focuses on macro level [29,30]. KM research trend in the public sector shows a gap and is not well researched and unexplored [31,32,33,34]. However, knowledge management plays a significant role in the public sector in terms of various criteria when compared with other sectors such as business and industry.

The first reason why KM is crucial for the public sector is that public sector organizations are linked to the culture of "knowledge hoarding". It means that the public sector leaders deliberately withhold knowledge from others in order to maintain power. Hence, this should be carefully examined by different researchers [35]. The second justification as to why public sectors are unique in KM related activities is that many forms of personal data, from health records to housing register information; legal and personal information; educational history; employment and taxation records; legal records; welfare records and business details are available in public sector organizations [36]. Thirdly, KM in public sectors enhances decision-making, supports public participation in public decision-making, builds societal intellectual capital, and enables to develop a knowledge-capable workforce [8,37]. The forth reason why KM in public sectors is important is that currently public sectors are changing rapidly and showing power paradigms [35]. The fifth justification is, according to Ref. [38], that there is an important concept called "new public management". This concept is aimed at bringing the public sector in line with the private sector, and incorporating private sector market values and demand cycles via cost effectiveness, performance and accountability improvements. The practice of new public management have gotten increasing acceptance by countries around the globe [39,36]. The sixth reason is that public sectors play a unique role in promoting the sharing, creating, integrating, and dissemination of knowledge resources available in their contexts [40]. The last justification as to why KM research in public sector is essential is that public sectors exhibit greater environments of control than the private sector but have also greater external influence involving government, exchequer and societal accountability within adequate infrastructure [18,43]. This article is vital in exploring the importance of knowledge management in the public sector. The knowledge that is available in the public organizations is not explored by scholars for expanding and improving the public services for citizens. Hence, this review will provide new insights on how KM is vital for the public organizations in all aspects.

In general, from the above justifications, based on the available studies and literatures, we use systematic literature approaches to explore the available literature by identifying prominent theories; geographic distribution of published articles; and essential research area, and to know, the outcomes of KM application in public sectors, and finally, to forward future research directions in KM at public sectors.

2. Methodology

For the purpose of this article, we applied a Preferred Reporting Items for Systematic Review and Meta-Analysis (PRISMA) technique to analyze the role of knowledge management in public sectors. It enables to analyze the published articles, examine the research findings in a complete manner and suggest possible way forwards [14].

2.1. Data management

Web of Science (WoS) core collection was chosen for our sampling from 2010 to 2022. The key word was selected after reaching an agreement to search articles from the database. The key word was classified in two categories. The first category was "knowledge management". In this search category, we generated 7307 articles. The second search category was "Public Sectors*" OR "Public Utilities" OR "Public Institutions*" OR "Public Agents" OR "Public Services*" OR "Public Authority" OR "Public Administrators*" OR "Public Managers" OR "Public Workers*" OR "Public Employees*". From this, we were able to generate 8674 articles. By combining the two results (#1 AND #2), we have got 43 articles for this analysis.

2.2. Data Screening and exclusion

After generating the articles by preparing a table to check the quality and other related factors, we excluded some articles. For details, see Fig. 1.

3. Findings

3.1. Paper distribution in year

Knowledge management started to get due attention by scholars in recent years. Research institutions and scholars have tried to conduct researches on KM in different settings. It is clear that KM researches in public sectors are limited. Though, for the purpose of this article, we searched articles from web of science core collection by combining key words of KM and public sector related words, the number of articles shows an increase trend through time. Fig. 2, result confirms that in the year 2022, 8 articles were published and in 2020 also 5 articles were published with the focus on KM in public sectors.

3.2. Geographical distribution of papers

The published articles across countries has difference from country to country. From the total 33 articles Asian and European authors published more articles than authors from other continents (Table 1). There is also a combination of authors across countries to publish articles related to knowledge management in public sectors. This enables the authors to share experience and have good linkage between institutions.

3.3. Paper distribution based on methodologies applied

Methodology is a guideline for authors to know in detail about KM in public sectors. The sources that are considered in this article are authors who adopted the following five methodologies: quantitative [1,4–6,8,10,13,14,22,27,41,51,57,60,61,74], qualitative method [9,22,25,26,28–30,35,47,56,69], qualitative content analysis [3,19,39] complex street network analysis [66] and experimental method [26]. In the KM research, the methodologies are varied to explore the role of KM in public sectors (Table 2).

3.4. Paper distribution based on theories applied

Theories enabled the authors to understand the context and show a direction regarding how to explore new insights about the

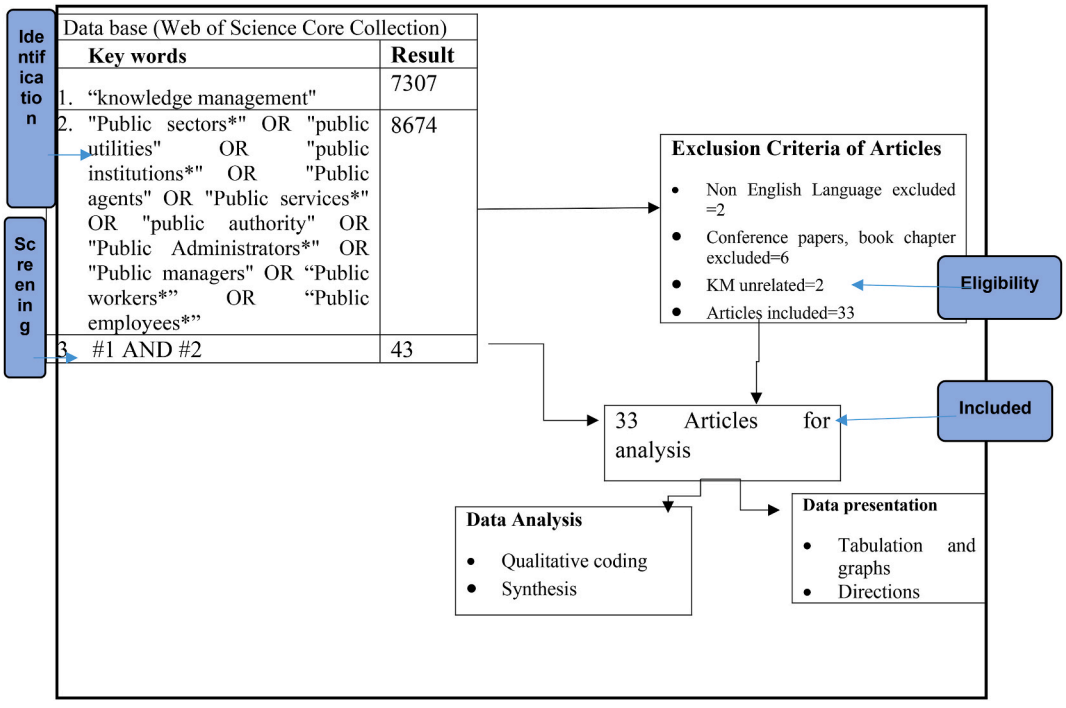

Fig. 1. PRISMA flow diagram for selection of studies.
Source: Authors compilation (2023)

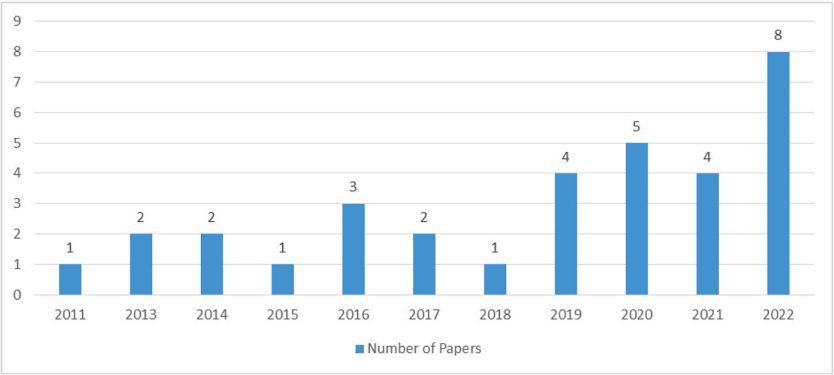

Fig. 2. Number of articles.
Source: WoS core collection (2010–2022)

Table 1
Paper distribution across geography.

S/N	Continent	Number of Articles	Authors
1	Asia	11	[41,42,29,43,44,26,45,32,33,46,38]
2	Australia	2	[47,48]
3	Europe	16	[49,50,51,52,53,53,54,55,56,57,58,59,60,61,62,63].
4	North America	2	[64,12]
5	South America	2	[65,66]
	Total	33	

Source: WoS core collection (2010–2022)

Table 2
Paper distribution based on Methodologies applied.

Methodology	Number of articles
Complex street network analysis	1
Qualitative Content Analysis	3
Experimental	1
Mixed	1
qualitative	11
Quantitative	16
Total	**33**

Source: WoS core collection (2010–2022)

specific topic that is investigated. Scholars use different theories that may fit with their interest in context. In KM research in public sectors, the authors use different theories that are not used by authors frequently in KM and public sector researches. Authors try to investigate at individual and organizational level through theories such as cognitive theory of trust, knowledge and resource-based theory, behavioral theory, institutional theory, complexity theory, theory of planned behavior, job-to-be done theory, unified theory of acceptance and use of technology (UTAUT), two-sided market theory, complex network theory, technology and demand pull model and fuzzy set theory (Table 3). Authors also used two and more theories simultaneously.

3.5. Knowledge management researches in public sectors; synthesis of the concepts

Recently, KM in public sectors is being investigated by scholars at different levels of organizations providing services for citizens or customers. After extracting research articles from web of science core collection by preparing the evaluative criteria, we recorded each paper's concepts, methodologies, organizations, theories, and other issues discussed in the article by using MS word processor (see Table 5, supplementary data). After summarizing all the 33 articles, we found the outcomes of each paper (Table 4) and classified the outcomes by themes of the research. The research themes are categorized in to three and discussed as follow.

3.6. KM for organizational improvement as a research stream

In the globalization period, organizations' development and improvement have continued fundamentally. The change of the organizations happens through time by utilizing different advanced technologies [16]. Public organizations have their processes,

Table 3
Articles distribution based on theories.

S/n	Theory	Authors (Citations	Industry/sector	Description of the theory
[41].	Cognitive theory of trust	[44]	Organizations	This theory enables to explore how trust is important to people to use the technology in the public sectors organizations.
[40].	Knowledge-based theory	[45,32,33, 67]	Groups and Organizations	Managing knowledge in the public sectors has great value for competitive advantages. A successful management of knowledge, which is acknowledged as the most basic strategic resource of the firms. This theory is important for leader how to management the knowledge in the organization.
[42].	Resource-based view (RBV) theory	[53,12,46]	Groups and organizations	This theory promote how to manage rare and difficult to imitate resources for organization improvements in the public sectors and assist how to make a decision within the sectors
[29].	Behavioral theory	[26]	Individuals	This theory helps to understand the workers behavior how to fit with the expected outcomes and how to share knowledge within the group.
[49].	Institutionalist theory	[53]	Organizations	The theory emphasize that the legitimacy and structure of the public organizations. Proposed how political economy of public services contribute for citizens.
[65].	Complexity theory	[48]	Organization	This theory elaborates how complex adaptive system supports knowledge creation in results from the co-existence and co-evolution of both top-down and bottom-up processes.
[7].	Theory of Planned Behavior	[51]	Organization	This theory important to collect individuals' attitudes, perceptions and beliefs towards online information for communication of the organizations.
[50].	Job-to-be done theory	[52]	Groups and organizations	Job to be done theory helps to evaluate a core job mapping, which entails breaking down a job that customers want done into discrete steps in the public sectors and other organizations.
[64].	Unified theory of acceptance and use of technology (UTAUT)	[29,68]	Organization	This theory enables to predict the performance of public sectors by adopting knowledge based utilizations of technology in different public sectors
[51].	Two-sided market theory	[57]	Organization	Tow sided market theory enables to create dynamic links between imagery and very specific information to respond to end-user requirement and create high added value such as the social value for a whole community through the transfer of innovation and efficiency in the implementation of public policy.
[69].	Complex network theory	[66]	Group and organization	This theory enables to analyze the co-existence and co-evolution of both top-down and bottom-up processes. These co-evolutionary processes involved the combination and recombination of four complexity constructs, which they called 'adaptive tension', 'enabling leadership', 'enhanced cooperation' and 'boundary spanning'. Complex network analysis can be used to evaluate critical infrastructures like street networks, revealing patterns of flow distribution, path redundancy, efficiency and robustness in public transportation.
[4].	Technology and demand pull model	[60]	Organization	The theory helps to understand how innovation and market demand as key factors in company innovation behavior of workers in the organizations.
[43].	Fuzzy set theory	[38]	Individual	This theory important to characterize by a membership function which assigns to each object a membership degree ranging between 0 and 1. This theory essential for decision making by analyzing the available materials in database or in the organization.

Source: WoS core collection (2010–2022)

practices and implementation improved by doing tasks based on knowledge. Knowledge management processes are essential to improve the performance and process of the organizations. Knowledge infrastructure such as information technology enable these organizations to simplify the complexity of the project operations. Public organizations can be successful by applying digital transformation. It enables citizens to engaged and push economic growth. The improvement of an organization and KM complement each other in public sectors [42,49]. Public organization improvement can be revealed through value creation, would empower public service delivery and make the sectors smarter [44]. Public sector organization improvement can be evaluated based on how they crafted startegies specially on how to create, share, transfer and retain knowledge. The knowledge management strategy is essential to manage knowledges in the organiztion, then to enhance the performance of the public sectors [13,29,61].

3.7. Knowledge management for citizens' satisfaction

This stream is the second research stream that is categorized in this article (Table 4). Public sectors strive to provide quality service for citizens by providing quality services for their customers. KM plays a significant role in providing quality services for citizens by improving the public sector service provision system [10,22,74]. In public sectors, workers should be well informed to provide services without exculding citizens in need. Knowledge based activities are vital to avoid exclusion during service provisions [56].

Table 4
Outcome of KM in public sectors.

Category	Outcome themes	Case area (Industry, Sector and organization)	Outcome explanations
Organizational Improvement	Managing the complexity of IT projects	Private and public sectors.	Academics and practitioners in simplifying the complexity of projects and helping to achieve a project's objectives [42].
	Success of digital transformation	Ministry of Environment	KM important to digitalize public sectors. Digitizing public services is, at the moment, an essential necessity for numerous governments around the world. An improved government through digitization will not only have a growing effect on businesses, but it will also be able to intensify citizen engagement and push for economic growth. It has an association with knowledge management process too [49].
	Public value created	Public organizations	KM can be an input to create a value for public sectors. Public value creation of empowered public services and also contribute to academic research literature and are practically helpful for policymakers for designing [44].
	Knowledge management strategies	Water department	KM embraces to develop or craft KM strategies in the public organizations. Utilizing the available data base system is a pillar to develop that fit the organization structure [13,29,61].
	KM process and work performance improvement	Organizations	Knowledge management process such as knowledge production, sharing, consumption, diffusion shows improvement. Experts, managers are more proactive in sharing their knowledge, particularly those with the personality traits of conscientiousness and openness. Trust is urgently needed for enhancing Knowledge transfer effectiveness under time pressure, time pressure reduces trust-building too [1,8,22,23,26,47,56,57]
Citizens satisfaction	Awareness raising	Consultancy enterprise	KM based activities and strategies used were adequate and essential to the successful inclusion and participation of the employees. An official website was created in order to communicate with different audiences, to disseminate scientific knowledge, and to contribute to consolidate the image of the study within society [6,30,60].
	Quality information	University	Quality information avoiding knowledge hiding, which, in turn, fosters defensive reasoning, in a vicious circle, which can negatively affect decision-making and also cause distrust in public institutions. Timeliness, relevance and accuracy of information as well as the source expertise were highly significant antecedents that were affecting attitudes toward communications [51,53].
	Services satisfaction	Individual	KM based services in public sectors increase satisfactions of clients especially in the health centers [38].
	Avoid social exclusion.	Groups and organization	Knowledge based activities better to perform for internal and external stakeholders to avoid social exclusions during crises in the public [56].
Collaborative innovation and management	Collaborative public management	Public sector organizations	Experience-based approaches to identifying and sharing knowledge on Public Private Partnerships are preferred to transfer learning. Collaborative public management helps to add and management knowledge in the organization properly [9,41].
	Innovation	Primary industries Research, Development and Extension	Knowledge management capacity transforms into innovation, and as a result, organization performance would increases [27,69]
	Smart cities development	Smart city	The digital industry also important when supported by knowledge related infrastructures [52].
	Higher connectivity	Public transport	In public transportation service when there is high connectivity explored a possible source of vulnerability in transportation system. Every aspect of the network has some influence in resilience, depending on the characteristics of the disruptive process. And global system performance measure may not reflect individual trips performance in terms of traveled distance and travel time [66].

3.8. Knowledge management for the collaborative innovation management

This is the third research stream that was identified in this article after reviewing the overall articles. KM has a contribution to the innovativeness of the public organizations, resulting in the improved performance of those organizations [27,69]. Collaborative management and knowledge management have direct relationship in the public sector environment. Collaborative management enables to manage multiple activities including knowledge management in the public organizations [9,41]. Similarly, knowledge-based infrastructure enbales to build smart city. Industries, smart factories and other organizations are combined with the concept of smart city by the help of knowledge infrastructures [52].

4. Discussions

In this article, the published articles are analyzed based on geographical distribution, publications by year and more importantly,

the theories used by the authors are examined in the knowledge management researches in public sectors. Authors have tested theories based on their study context. In KM research, resource-based view and knowledge-based view theories have been tested by different authors and authors have forwarded their findings [22,27,35,41,57,61]. Uncommon theories were also used by the authors in KM research from public sectors settings. The complexity theory, job-to-be done theory, unified theory of acceptance and use of technology, two-sided market theory, complex network theory, technology and demand pull model, fuzzy set theory [4,19,30,47,55,74] and institutional theories, Cognitive and behavioral theories were applied by the authors (Table 3). The practitioners examined contemporary theories in knowledge management researches in public sectors.

In knowledge management studies at public sectors, the authors tried to investigate KM by applying different methodologies such as quantitative, qualitative (content analysis and grounded theory) mixed, complex street network analysis, and experiment methods utilized (Table 2). The authors also explored the role of knowledge management in public sectors by participating in different units of analysis such as organization workers, managers, customers and examining the overall organization environment by their respective studies.

Furthermore, we identified the outcomes of each author by examining the articles. The number of authors indicate the outcomes of their study for their respective unites of analysis. The outcomes that are identified under this study are managing the complexity of IT projects, success of digital transformation, public value created, knowledge management strategies, KM process and work performance improvement, awareness raising, quality of information, services satisfaction, avoidance of social exclusion, collaborative public management, innovation, smart cities development and higher connectivity (Table 4).Authors also suggested future research directions about knowledge management researches in the public sector, different essential research directions have been identified after reviewing the selected articles (Fig. 3). Future research areas/directions are database management in KM, smart government, infrastructure capability, online dimensions on KM, knowledge retention in public organization, knowledge hybrid management, intellectual capital, digital transformation, quality online information, open innovation collaborations, big data and advanced analytics, knowledge encounter and hiding, and online learning and smart working.

In the prior sections, we discussed the geographical distributions of articles, the research methods applied for, the theories tested by authors, and research directions suggested by scholars. At the very beginning, our intentions was to consider the importance of KM researches in public sectors in this article. Public sector KM research has mainly applied models borrowed from the business sector and has focused primarily on public service organizations or administrative sectors such as the police and education [5]. Knowledge is a valuable intangible resource that must be managed properly for further utilization and achieving competitive advantages. KM, from the strategic management viewpoint, focuses on knowledge as an organizational resource of strategic significance [70]. It is necessary for the public sectors to enhance knowledge-sharing skills, to manage human resource practices effectively and to apply emerging technologies in the service delivery processes [71]. KM in the public sector relies on data production and analysis. Public administrators apply KM for public policy implementations in different sectors such as education, military and civil services [70]. KM in the public sector can be influenced by different factors such as organizational factors, political factors and contextual factors. According to Ref. [72], leadership commitment, organizational structure, internal trust, user training, teamwork, reward and recognition, IT system establishment, bureaucratic organizational hierarchy, accountability to a higher level of government and voluntary participations are contextual factors that may affect the effectiveness of KM in the public sectors. Recently, the emergence of artificial intelligence public administration is riddled with ethical tensions of fairness, transparency, privacy, and human rights. This progress is better to align with knowledge management [18].

5. Conclusions

In this synthesis of knowledge management researches in public sector organizations, practitioners have applied different methodologies and theories to investigate their study from different units of analysis such as individuals, groups and organizations. The old and new theories were also explored by the authors for their research undertakings. After identifying outcomes of the studies, we categorized them into 3 research themes namely, KM for organizational improvement, knowledge management for citizens' satisfaction and knowledge management for the collaborative innovation management.

5.1. Limitations

For the purpose of this article, the articles were sourced from web of science core collection. In this article, databases such as Scopus, PubMed and others have not been reviewed. The other lack of this systematic review is that, it were only articles that are analyzed. Other materials such as books and conferences proceedings are not included in this article.

5.2. Future research Questions/directions

In the public sectors, knowledge-based activities are important to render quality services for citizens. Public organizations are fully resourced with intangible resources. These resources better be investigated in the future by scholars. Based on this article's results and discussion, we suggest that knowledge hiding, and knowledge hoarding in public sector, knowledge-based smart governance in public sectors, and knowledge-based digital transformations in the public organizations can be research directions for interested scholars.

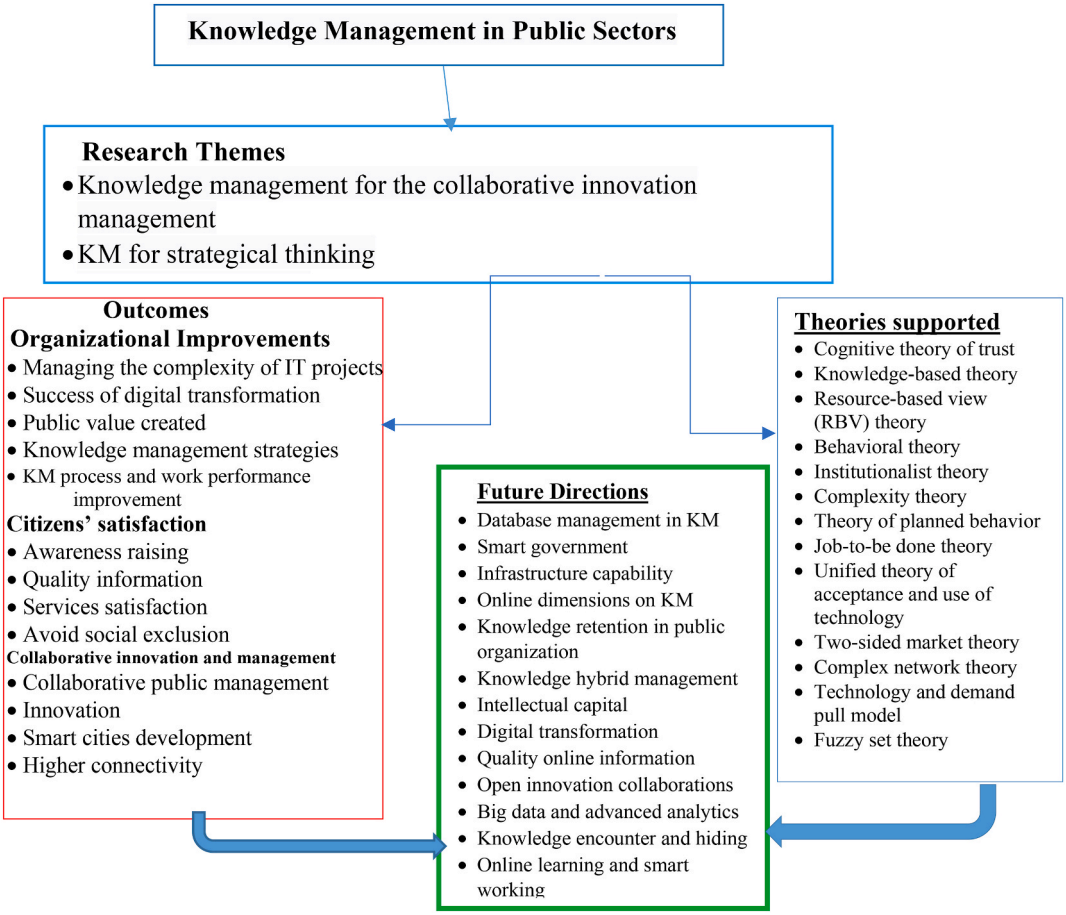

Fig. 3. Framework of the paper.

Funding information

The authors did not received a fund from any organization.

Data availability statement

All used data are included in the manuscript, references and supplementary data.

CRediT authorship contribution statement

Erstu Tarko Kassa: Conceptualization, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. **Jing Ning:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing.

Declaration of competing interest

We declared that this article has no conflict of interest from third party. The article is original and done independently by the authors. All sources utilized in this article have been acknowledged by the authors.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2023.e22293.

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