

## **Institutionalization of knowledge management strategies in agricultural research organizations: a systematic review of the international literature**

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### **Abstract**

The contribution that knowledge management (KM) initiatives bring to an organization has been increasingly recognized by both researchers and practitioners in recent years. Despite the growing number of papers and publications, the institutionalization of KM strategies has not been studied enough. Consistent with a “practice turn” emphasis in recent literature, this study examines the body of knowledge on the institutionalization of KM strategies in agricultural research organizations (AROs). A complementary approach combining systematic and hermeneutic literature review methods was used to search, select and analyze the extant literature and the presentation of study results. While different studies recommend linking the analysis of a process to the context at the organizational level, these concepts are not widely used. Similarly, a comparative analysis or a framework to compare similar or different contexts is not easily found. The conclusion is that a process analysis of the institutionalization of KM strategies in research organizations is lacking. As a result, while the literature continues to report that AROs are facing many difficulties this area, it is still not well known how KM strategies are adopted, implemented and entrenched in these organizations.

**Keywords:** agricultural research; knowledge management; strategies; organizational strategies; literature reviews

### **Introduction**

In recent years, knowledge management (KM) has emerged as a significant field for research and practice (Fassehi, 2012; Jami *et al.*, 2018), and many studies show the importance of a KM strategy (Ma & Yu, 2010). This can be described as a framework that provides the building blocks which are needed to reach and improve the KM goals in an organization (Dalkir, 2013).

Drafting and adopting a KM strategy can help an organization establish the necessary KM practices that support its overall organizational goals. Using discourse analysis, an earlier literature review showed that research focusing on the development of KM strategies has intensified over the years (Grant, 2011), but the institutionalization of these strategies is not widely discussed. In organizational studies, institutionalization is defined as a process (Selznick, 2011), and Tolbert and Zucker (1999) describe this process as “habitualization”, “objectification” and “sedimentation”. In similar ways, Hirst (2010) defined institutionalization in terms of adoption, implementation and entrenchment, considering that adoption refers to the formal decision-making process to accept a given practice, implementation is the process of executing this practice, and entrenchment is the process that allows the persistent use and continuous spread of the practice. This study provided a model for explaining the institutionalization of KM practices, showing how theorization through specification and justification affects the formalization of these practices. It asserts that a process analysis and approach is central in understanding the institutionalization of KM practices. This paper follows this approach.

Different studies have shown that KM strategies are not streamlined in Agricultural Research Organizations (AROs) and that they need “re-evaluation, re-strategizing and re-focusing” (Abbas, 2015). Consequently, AROs are not benefiting as much as they could, and their KM initiatives lack the tools needed to support an effective utilization of research knowledge (Bernaoui & Hassoun, 2011; Staiger-Rivas *et al.*, 2014), with no established model to link researchers and practitioners and to manage research outputs. These concerns are consistent with those claims stating that a strategy development process is mainly concerned with social and institutional structures which are remote from practice (Hendry *et al.*, 2010; Peppard *et al.*, 2014), with many authors contending that this approach is difficult to conceptualize and therefore risks losing relevance. Other studies indicate that KM strategy research studies need to include approaches that consider more practical aspects (Serenko *et al.*, 2010; Jakubik, 2011).

Although a KM strategy is critical to the success of KM initiatives in organizations (Jennex, 2002; Choi *et al.*, 2008; Kim *et al.*, 2014; Lee & Lim, 2017), understanding how KM strategies are institutionalized remains limited. There is no literature synopsis that coherently looks at this from a practice and process perspective. This study provides a systematic literature analysis, hoping to reduce this widening gap. Specifically, our interest was to see how the extant literature has examined the institutionalization processes of KM strategies in AROs, and to answer these specific questions:

1. To what extent has the literature addressed the institutionalization of KM strategies?
2. To what extent has the body of knowledge explored factors influencing the institutionalization of KM strategies in AROs from a practice and process perspective?
3. What are the key knowledge gaps in extant literature on institutionalization of KM strategies in AROs with regard to a practice and process perspective?

### **Knowledge management strategies in agricultural research organizations**

Although KM is an interdisciplinary and established field, researchers have not sufficiently focused on the institutionalization of KM strategies in AROs, especially from a process and practice perspective. This is despite the fact that these are knowledge intensive organizations and are constantly facing knowledge-related challenges. Focusing on East Africa, a systematic literature review was carried out to identify the main concepts, the influencing factors and the general gaps in the body of knowledge. The process entailed a rigorous review of the extant literature from a theoretical, conceptual and empirical perspective.

In organizational studies, the focus on processes and practices has been interesting to scholars and practitioners for decades (Selznick, 2011; Tolbert & Zucker, 1999; Hirst, 2010). While the study of organizational processes and practices using an institutional lens or perspective is not new, in the case of AROs in East Africa there is a dearth of studies in this area. There is a lack of studies focusing on how KM strategies have been institutionalized in research organizations, but also a limited exploration of the factors influencing this. Many organizations have turned to KM to address the challenges they face in terms of performance and competitiveness, and the most common initiative is the development of KM strategies. Success is seen to depend on the processes and practices that look beyond the high-level goals that are outlined in the strategy development and execution plans. But while these ideas have been taken up by many AROs, not much has been achieved due to the many different challenges and constraints in the field (Kawtrakul, 2012; Abbas, 2015).

There has been extensive research on KM in different thematic areas, including the development of KM strategies, but the literature also shows that a practice perspective could lead to more scholarly contributions, enhance the academic environment and increase the cross-fertilization of research concepts (Ma & Yu, 2010). Subsequently, the practical integration of KM activities into the decision-making processes in an organization is lacking (Gourlay, 2006). In his analysis of 160 KM frameworks, Heisig (2009) claimed that the consolidation and harmonization of KM research and practice is weak. Other studies contend that the relationship between an

organization's practices and KM is not well understood, and that instituting KM routines, such as procedures and habits, has the potential to create an appropriate context for KM (Sun, 2010). The literature also mentions that KM has been recognized as a strategic asset in organizations and that knowledge will continue to be important in future, but studies like those of Serenko *et al.* (2010) show that it risks losing practical relevance, and the absence of approaches with a practical side is repeatedly found in many KM literature studies. Academic relevance and rigor could be a potential contributor to this situation, but scholars also contend that relevance and rigor can still be maintained when approaches that include practice and process perspectives are applied (Serenko *et al.*, 2010; Jakubik, 2011). A "practice turn" in KM research could thus reveal hidden aspects and dynamics in organizations (Barley *et al.*, 2018).

A review of KM strategies in AROs shows substantial research, covering different subjects and countries (Abbas, 2015). Research shows that KM frameworks and strategies contribute substantially to the realization of agricultural research goals (Hirschheim & Klein, 2012). However, these studies also highlight numerous constraints. For example, a PhD study conducted to assess the application of KM approaches in the agricultural sector in Tanzania identified the need to develop KM strategies which are flexible (Lwoga, 2010).

### **Institutionalization of KM strategies**

Studies like that of Abbas (2015) looked at the importance of KM strategies and practices in agricultural research institutes in Nigeria. However, they do not examine the institutionalization of these strategies in Nigeria or elsewhere. Although, the study highlighted several factors with the potential to influence the formulation of these strategies, there were no explicit reviews and explanations regarding their institutionalization. Another PhD study (Dileepkumar, 2010) identified numerous problems in the management of knowledge as well as lack of studies on KM strategy from projects undertaken in AROs. The study did not examine the institutionalization of KM strategies either from a practice or process perspective.

An institutionalization process can ensure that those activities that facilitate the continuous acquisition and utilization of an organization's knowledge are effectively undertaken (Alers-Tealdi, 2015). Knowledge remains a fundamental strategic resource for enhancing competitiveness, and there is a need to ensure that an organization's knowledge is not lost due to staff attrition. On this ground, the effective institutionalization of a KM strategy is seen as a mandatory condition for organizations to succeed with their KM initiatives (Alers-Tealdi, 2015). Sandhawalia and Dalcher (2011) suggest that organizations lack KM competencies to ensure that KM practices are effectively institutionalized, and not enough studies provide the theoretical and empirical insights needed to enhance the capacities of practitioners. Having sufficient insights

and in-depth research on the institutionalization of KM strategies will ensure that organizations are able to manage and leverage on their knowledge and maximize the returns from the organizations' intellectual capital. A clearer understanding could boost their efficiency and decision-making abilities, and ensures employees access the required knowledge or expertise, leading to a well-informed workforce.

The literature further mentions that examining KM strategies from a specific organizational dimension can provide insights to inform practice (Kushwaha & Rao, 2015). Studies contend that the concept of practice has been used without theoretical justification and lacks empirical cases (Lounsbury & Crumley, 2007). However, Hirst (2010) asserts that this concept is vital for understanding an institutionalization process, and allows a research endeavor to focus on what is taking place. In organizational studies, the concept of practice is often linked to adoption, implementation and entrenchment (institutionalization) of a new idea or innovation such as a KM strategy (Martin *et al.*, 2003; Hirst, 2010). Drawing from institutionalization literature, it is clear that the concepts of practice and process are interrelated in the sense that when a practice is accepted, it has the potential of being institutionalized to become a full-fledged process. It then follows that a specific practice such as a KM strategy has a chance to progress towards adoption, implementation and entrenchment in an organization.

At the same time, the literature asserts that theories or theoretical models or frameworks can help explain the interrelationship between practices, processes and outcomes (Lounsbury & Crumley, 2007; Hirst, 2010). This is because scholars view "practice" from a process perspective. To advance the discussion regarding the institutionalization of KM strategies, the framework described by Hirst (2010) provides a clearer view, taking the organizational practices and outcomes into account. This study uses this framework for defining the concepts and explaining the logical relationship between the concepts and the context.

While the framework expanded the understanding of practice and process concepts as well as their interrelationship, it did not analyze the extent to which studies have conceptualized these concepts. Similarly, the framework can be used to analyze the complexities affecting organizations, such as the factors influencing institutionalization, but it does not provide an exhaustive account of how the extant literature has explored these concepts from a context perspective. Although it recommends that new studies should test and explain the framework following an empirical analysis with different organizational cases, it is important to understand the key gaps regarding the practice and process perspectives.

## Methodology

Literature review methods have seen a rapid development in all academic disciplines, but this has received mixed reactions and they are still criticized for lacking standard procedures (Boell & Cecez-Kecmanovic, 2014; Tate *et al.*, 2015; Paré *et al.*, 2016; Schultze, 2015; Schryen *et al.*, 2017; Cram, 2019). An effective literature review is meant to help gain a better understanding of previous research studies on a topic. In this regard, a good literature review study must demonstrate the contribution of new knowledge to the overall body of knowledge in the field. While differences exist in terms of philosophical stances and methodological approaches, the role and significance of a literature review is well recognized and undisputed (Webster & Watson, 2002; Bandara *et al.*, 2011; Rowe, 2014; Laghrabli *et al.*, 2015; Schultze, 2015; Vom *et al.*, 2015; Wagner *et al.*, 2016; Schryen *et al.*, 2017; Cram, 2019).

Although scholars discussing literature review methods have not agreed on one particular method, a combination of methods and approaches can provide scholarly richness (Schultze, 2015; Geeling *et al.*, 2016). Adopting relevant principles from different methods is seen as complementary and not competing. The guiding principle is that a method must be consistent with the purpose, genre and scope of the study (Schultze, 2015; Templier & Paré, 2018; Cram, 2019). Similarly, the design and the method chosen must be well documented and explained. Like any other research endeavor, a literature review research must be designed and rigorously conducted, following methodologically accepted practices and techniques (Paré *et al.*, 2016).

Considering the ontological, epistemological or ideological differences and theoretical standpoints, this study adopts a complementary approach by applying principles from the systematic and hermeneutic review methods. The systematic method provides clear steps that explicitly guide the review process, making it reproducible and defensible. On the other hand, the hermeneutics method provides additional guidelines for the critical analysis and interpretation of the findings, helping identify gaps in the extant literature (Schryen *et al.*, 2017). This is one of the research questions this study seeks to answer.

As stressed by Booth *et al.*, (2016), a clear literature review plan is established through the articulation of purpose, research questions and scope. This enhances the credibility of the data collection and findings. The systematic part follows the guide by Okoli and Schabram (2010). In this study, an initial search and selection of all papers and articles meeting the defined search criteria is conducted covering the main databases (Scopus, Web of Science and Google Scholar). Library catalogs and relevant websites are subsequently searched. The period, region and language are not specified as a preliminary literature background search revealed that there are

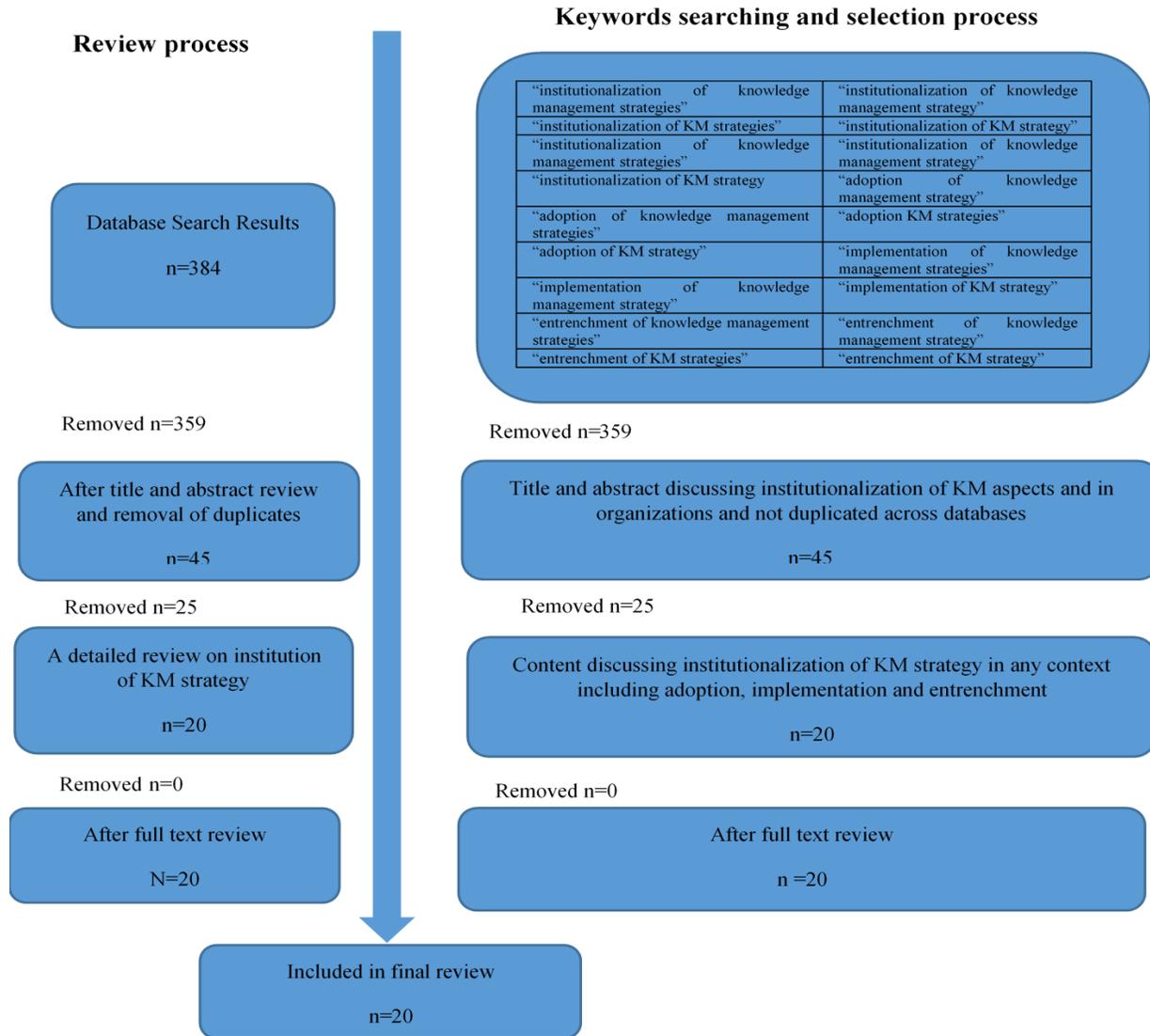
limited studies on the subject. This allows for a comprehensive search of papers and articles available in online databases. The process involved searching for all articles and papers containing the key words listed in Table 1 in the Appendix.

The search on Scopus and Web of Science covered a total of 114 academic journals, 15 books, 12 conference proceedings, 3 magazines and 1 trade publication. As for a practical screening and quality appraisal, a refined search was conducted as well as an initial reading of all abstracts. Subsequently, a thorough examination of the papers and articles helped ensure appropriateness and relevance. To achieve consistency in terms of purpose and scope, all those articles and papers that did not discuss the subject were excluded – following the literature review guidelines (Schultze, 2015; Templier & Paré, 2018; Cram, 2019). This process helped select articles and papers with an explicit focus on the subject.

All the papers meeting the set criteria were selected for data extraction and a coding scheme was used to generate relevant content to answer the research questions. Both quantitative and qualitative methods were applied for analyzing the data, using quantitative descriptive statistics and content analysis. In addition, both a backward and forward review was conducted using citations to identify papers for inclusion. Using hermeneutic approach, critical examination and argumentation principles were applied to enrich the writing of the review results. The results of the initial search are shown in Tables 1 and 2.

### **Analysis of papers and articles**

An initial keyword search generated a total of 384 papers. After a thorough review of the titles and abstracts and the removal of all duplicates, a total of 45 were considered for a next phase. A detailed reading and review of the articles eliminated 25 that focused on other aspects of an institutionalization process but not on that of a KM strategy. While some of the articles discussed these aspects in detail and are heavily referenced in this study, they did not discuss the institutionalization of KM strategies which is the basis of this paper and the research questions. For instance, the concepts presented by Hirst (2010) are extensively applied in this study, but the article was not selected for final review since it discusses organizational level processes of institutionalization, a case study of KM practices in organizations. Based on the selection criteria, all those articles that do not discuss the institutionalization of KM strategies were removed. This was to ensure that the study focus and literature review methods were regularly followed.



Source: Adapted from Ngai *et al.*, (2009).

**Figure 2. Selection process and keywords, showing why some articles were not considered**

To identify key concepts, the main ideas and the gaps in the selected articles and papers, the study adopted a concept-centric analysis method (Sasson *et al.*,2017; Majuri *et al.*, 2018). After an in-depth reading and review of the selected papers these were all divided according to the key concepts covered: a practice-oriented perspective (PoP), the influencing factors (IF) and a process perspective (PP), as shown in Table 1.

**Table 1: The main study focus and key concept(s) of each of the papers or articles**

Author(s)	Summary of the main focus of the paper or article	Concepts		
		PoP	IF	PP
Yang, J. (2010)	Examined the impact of KM strategy on strategic performance in a specific context (Chinese High Technology firms). Drawing on resource-based view theory, the study shows that implementation of KM strategy is influenced by both performance-driven strategies and performance-based competencies.		X	X
Mohd Zin & Egbu (2010)	Reviewed literature to assess organizations readiness level to adopt and implement KM strategy in a specific context (Malaysian construction industry). The paper argues that successful implementation of KM strategy is influenced and should be linked to organization-wide strategy.	X	X	X
Dewah & Mutula (2016)	Discusses different knowledge retention strategies in public sector organizations, how these organizations institutionalize KM strategies and corresponding influential factors. It also provides a foundation for KM strategy/policy formulation for such organizations.		X	
Alers-Tealdi (2015)	Using institutional theory, the study envisions culture, incentive and technology as the key factors influencing institutionalization of knowledge sharing in a specific context (U.S Federal Agencies). It also provides theoretical richness and direction for management and public leadership. The thesis further explains different aspects of adoption of KM from both practice and process perspectives.	X		X
Neto <i>et al.</i> (2019)	Explains correlation between KM and Software (S/W) engineering specifically when adopting agile methods in ICT organizations. It demonstrates the role of KM strategies in managing organization's knowledge among agile teams. Also shows the impact of S/W development on KM strategies and organization learning, provides mechanisms for SW engineering professionals to implement KM strategies and the influence of agile practices on KM strategies in these organizations.	X		

Zaher, (2015)	Compares different types of management /leadership approaches and their influence on the implementation of KM strategies in organizations. It shows that leadership plays a critical role in adoption, and also identifies servant leadership to be critical in successful implementation of KM strategies in organizations.		X	X
Mulinge (2013)	Examines the paucity of information on the effect of different KM strategies in a specific context (organizations with low sales growth in the hospitality industry in Kenya), and the challenges facing these organizations in understanding of key KM strategy concepts.	X	X	
Jalil (2012)	Examines different models of KM in a specific context (law firm) and aligns the difference between technology and information. Provides suggestions for developing KM strategy in these organizations based on the relationship between harnessing organization knowledge and the overall goal of the organization.	X		X
Mangiarotti & Mention (2015)	Explains the influences of KM strategies at organizational-level on innovation performance and evaluates the impact of codification and personalization strategies. Provides evidence that the effects of KM strategies (personalization and codification) on innovation have comparable high propensity, and shows that the adoption of mixed strategies is less effective compared to a pure personalization strategy.	X	X	
Bratianu <i>et al.</i> (2015)	A structured literature review on KM and KM strategies in a specific context (environmental sustainability). Identifies the basic elements (customer relationship management, quality of human resources and adoption of ICT tools and systems) for enhancing development of suitable KM strategies.	X		
Choe (2014)	Investigates innovation outcomes when business strategies are aligned with KM strategies in a specific context (manufacturing organizations). Identifies four types KM strategies (explorative, exploitative, mixed, and negative) and three types of business strategies (differentiation, low-cost, and composite business strategies). Also the levels of	X	X	

	KM activities and degrees of processes are more enhanced when alignments are tightened.			
Robinson <i>et al.</i> (2004)	Discusses the role of KM in improving business specifically on planning and alignment of KM strategy in addressing business problems, and provides a framework for facilitating the implementation of a KM strategy in the construction industry.	X	X	
Ceptureanu <i>et al.</i> (2017)	Emphasizes the effects of KM strategies in organizational change in the energy sector in Romanian organizations and the role of KM strategies in the successful implementation of these changes. Also reveals the mediating effect of organizational learning and readiness for change as well as how to use KM strategies to implement Enterprise Resource Planning (ERP) changes effectively.	X		X
Aagaard (2013)	Examines effective implementation of KM strategies in geographically dispersed locations and the role of change agents in successful integration of KM strategies and knowledge sharing. A case study of Danish Road Directorate.	X	X	X
Pate <i>et al.</i> (2009)	Investigates the relationship and identification between organizational work group and knowledge workers and establishes a strong relationship between organizational work group and professionalism.	X	X	
Rowley (1999)	Explains the key issues influencing successful implementation of KM strategies in organizations.		X	
Perez-Soltero <i>et al.</i> (2015)	Explains the application and contribution of KM strategies in Small Mediums Enterprises (SMEs) to improve processes in response to internal organizational changes. Using a case study approach, provides a methodology for the implementation of KM strategies in SMEs in the northwest of Mexico	X	X	
Forcadell & Guadamillas (2002)	Using a case study approach, analyzes the implementation of KM strategy in the manufacturing industry and extracts a series of successful organizational factors for implementing the strategy.	X	X	

Yu & Tang (2010)	Provides suggestions for KM strategy implementation in organizations and evaluated the performance of KM from different aspects and dimensions using an evaluation matrix.	X	X	
Lee & Song (2010)	Using key theories, practices and perspectives, the papers adopts KM strategy as an approach to create and sustain the value of knowledge in maritime logistics industry.	X	X	X
	N=20	16	14	8

*Legend: PoP= Practice oriented Perspective, IF=Influencing Factors, PP= Process Perspective*

Further on, the study applied a conceptual matrix (Webster & Watson, 2002) with “adoption”, “implementation” and “entrenchment” as the different analysis units for each of the three main concepts above, as shown in Table 2. Consequently, to establish how often studies of a KM strategy domain explicitly used adoption, implementation and entrenchment terms, a summative coding was used. Similarly, the key concepts discussed in the papers with regard to the explicit use of these terms were extracted and analyzed (*marked X in Table 2*). The findings are explained and discussed in the results section.

Based on the keywords searched, reviewed and analyzed, a coding scheme was developed to identify the variables and indicators in the selected papers and articles. The analysis of the focus on adoption, implementation and entrenchment on the practice perspective, the influencing factors and the process perspective shows the extent covered and the knowledge gaps in these areas. Out of the 20 papers selected and analyzed, 12 papers discussed the factors influencing the implementation of KM strategies, while the adoption of KM strategies is discussed from a process perspective in five papers, and the influential factors are addressed in another five. Unfortunately, the entrenchment of KM strategies in organizations is not discussed at all.

## Results and findings

In general, there is a general recognition that KM strategies are a strategic asset to organizations (Jakubik 2011). However, the analysis conducted by Serenko *et al.*, (2010) shows that KM research risks losing practical relevance. The work of these authors postulates that academic relevance and rigor can potentially contribute to this loss, while it can also be possible to ensure the necessary relevance and rigor with the inclusion of practice-focused approaches. Consequently, empirical research to explain the breadth and depth of KM practices in different organizations is lacking (Kamasak, 2012). A study by Handzic (2017) asserts that KM research

has varied concepts and themes, but a practice perspective is in danger of completely disappearing, leading to “*knowledge loss*” and “*knowledge translation*” problems in organizations. A literature analysis covering a 34-year period identified policy, leadership, the external environment and organizational readiness as the main gaps in KM research literature (Dwivedi *et al.*, 2011).

**Table 2: Concept centric matrix analysis**

Articles/paper	Practice Perspective			Influencing Factors			Process perspective		
	Unit of Analysis			Unit of Analysis			Unit of Analysis		
	A	I	E	A	I	E	A	I	E
Yang (2010)				X	X		X	X	
Mohd Zin & Egbu (2010)		X			X			X	
Dewah & Mutula (2016)				X					
Alers-Tealdi (2015)	X						X		
Neto <i>et al.</i> (2019)	X						X		
Zaher (2015)		X			X				
Mulinge (2013)									
Jalil (2012)		X					X		
Mangiarotti & Mention (2015)	X						X		
Bratianu <i>et al.</i> (2015)									
Choe (2014)				X					
Robinson <i>et al.</i> (2004)				X					
Ceptureanu <i>et al.</i> (2017)				X	X				
Aagaard (2013)		X			X				
Pate <i>et al.</i> (2009)					X				
Rowley (1999)					X				
Perez-Soltero <i>et al.</i> (2015)					X				
Forcadell & Guadamillas (2002)					X				
Yu & Tang (2010)					X				
Lee & Song (2010)					X				
N=20	3	4	0	5	12	0	5	2	0

*Legend: A- Adoption, I- Implementation, E- Entrenchment*

The literature suggests that KM strategies are extensively studied, although KM strategy research studies have neglected the practice perspective (Ma & Yu 2010; Serenko, *et al.*, 2010; Jakubik, 2011). These studies further suggest that new studies looking at KM strategies should consider focusing on what actually takes place in an organizational setting in order to bridge this widening gap between academic research and practice. An analysis of the literature examining KM strategy studies between 1998-2007, using “citation analysis”, “co-citation analysis” and “social network analysis”, identified the inclusion of practice aspects as a key theme or concept that should be examined in future studies (Ma & Yu, 2010). Despite these findings, subsequent studies have not responded to this call or attempted to fill the gap.

### **Institutionalization processes**

The analysis of the selected papers reveals that there is a limited number of studies focusing on the institutionalization of KM strategies. Hirst’s PhD study (2010) provided a model for explaining the institutionalization processes, emphasizing the significance of using a practice and a process perspective. This is because examining the institutionalization of KM practices such as a KM strategy at an organizational level ensures that the inter-relationship between process and practice remains the central focus. It further recommends how a process analysis can see the links with the context and outcomes when a study examines the institutionalization of KM practices (Hirst, 2010). This study was not selected for the analysis in this paper since it did not meet the search criteria, but it provided valuable insights and highlighted gaps on the subject. Consistently, the analysis carried out in this study reveals a significant gap in literature that discusses the concepts of institutionalization of KM strategies especially from a process and practice perspective. Similarly, despite the presence of literature that has explored the factors influencing adoption and the implementation of KM strategies in organizations, there is a limited number of studies that have focused on AROs.

#### *a. A practice perspective*

Although some studies have discussed the challenges facing the implementation of KM strategies in different contexts and industries (Mohd Zin & Egbu, 2010), the literature review reveals that there are few studies that have examined the practice perspective. Consequently, none of these studies have provided a conceptual framework or model that can explain these concepts in detail. Moreover, the extent and level of discussion in most papers does not include how to link practice concepts to a process analysis and study outcome. With respect to the “practice turn”, which is one of the key stances adopted in this study, the literature review reveals a gap in the body of knowledge in this area. Consistent with other previous studies, practice is seen as an important concept in KM strategy related studies, but none of the papers

reviewed applied practice-oriented theories as a research methodology. Similarly, no clear variables or indicators are mentioned, nor their operationalization.

*b. The influencing factors*

A number of papers reviewed have attempted to address some of the factors which influence the adoption and implementation of KM strategies in different organizations and contexts, but none of the papers discussed entrenchment. For instance, Yang (2010) identifies the presence of knowledge policies as a key issue. Other factors identified include organizational readiness, culture, leadership and professionalism (Mohd Zin & Egbu, 2010; Dewah & Mutula, 2016; Zaher, 2015; Jalil, 2012; Mangiarotti & Mention, 2015; Choe, 2014). The role of practitioners is also seen as a critical factor.

*c. A process perspective*

This study did not find any publication that explicitly examines the process of adoption, implementation and entrenchment of a KM strategy in an organization. There are no papers or articles that apply or use organizational cases as part of an empirical process analysis. To effectively determine adoption, implementation and entrenchment of KM strategies at organizational level, a more comparative analysis is required for different organizations and contexts (Hirst, 2010; Selznick, 2011). This is because a process analysis provides empirical studies with a model for exploring the institutionalization processes. Furthermore, a comparative analysis can help studies identify similarities or differences. Exploring the ongoing processes can help uncover the relationship between institutionalization processes, practices and the different organizational levels. However, these concepts are largely unexplored in the extant literature.

## **Discussion**

The literature review shows that out of the selected papers and articles, the majority examined the influencing factors while the practice and process perspectives received equal attention. The studies on the implementation of KM strategies recorded the highest number followed by adoption, while the entrenchment levels have not been studied at all. As to the extent to which researchers explored the factors influencing the institutionalization of KM strategies in AROs from a practice or process perspective, the literature reveals that there are extremely limited studies. On conceptualization of institutionalization processes of KM strategies in practice, the area is scarcely discussed in extant literature. Consequently, the link between adoption, implementation and entrenchment is not well specified, justified or discussed in many of these studies. Surprisingly, there is a dearth of studies in AROs on the challenges or difficulties facing

the institutionalization of KM strategies. Consistent with assertions made by previous studies (Peppard *et al.*, 2014; Durand *et al.*, 2017; Kitsios & Kamariotou, 2019), this study provides further evidence to show that the gap between research and practice in the KM domain continues to widen. While AROs are important in the generation and management of research knowledge, not much is known on how KM strategies are institutionalized in these organizations. Further, evidence provided by extant literature shows that limited studies have paid attention to AROs in this area, despite their critical role.

The findings contribute additional evidence and confirm that the literature on the institutionalization of KM programmes, approaches and practices in organizations remains limited – as shown in the past (Hirst, 2010; Sandhawalia & Dalcher, 2011; Kushwaha & Rao, 2015; Handzic, 2017). Although some of the articles presented in this review have discussed the main elements related to institutionalization, the extent of dialogue is not sufficient to respond to the unique challenges facing organizations in this area. This inadequate research on this topic is not surprising since other studies have called for a practice turn and for the inclusion of process analysis in strategy related studies (Peppard *et al.*, 2014; Handzic, 2017; Merkus *et al.*, 2019). Consequently, inadequate studies on the subject may be responsible for low competencies to support the coherent formulation and the successful institutionalization of KM strategies in organizations. These assertions are consistent with other discussions in literature: Handzic (2017), for example, contends that KM strategies are in danger of losing practical relevance. Similarly, different documents highlight a number of practical constraints facing institutionalization of KM strategy processes, such as scant policies, weak leadership, knowledge loss, knowledge translation, external interferences and organization readiness (Dwivedi *et al.*, 2011). These discussions show that a lack of research or relevant literature in this topic is contributing to the challenges, and practitioners lack the necessary insights to recommend possible solutions. The intended benefits of KM strategies are not realized.

Future studies should try to find out why there is less research on the institutionalization of KM strategies and if indeed this is related to the challenges that organizations are facing in the field. Similarly, KM domain scholars and practitioners should find ways to demonstrate the value and benefits of KM strategies for organizations and scholars to stimulate more theoretical and empirical research. It is further noted that the topic has not attracted many studies over the years except in 2015. Unpublished reports claim that while KM and KM strategies are very important to organizations, not much is known about the way organizations have institutionalized their strategies. Studies also claim that strategy related research has not paid attention to the practical issues that affects their day-to-day execution (Peppard *et al.*, 2014; Handzic, 2017; Merkus *et al.*, 2019). It is critical for these claims to be investigated and the findings contextualized.

## Conclusion

This literature review study looked at the term institutionalization as defined by Hirst (2010), referring to the process of adoption, implementation and entrenchment. Although the analysis showed studies focusing on the specific practice, process and context, none of the studies explored the ideas of adoption, implementation and entrenchment, nor analyzed their inter-relationships. While some studies attempted to uncover the factors influencing the adoption and implementation of KM strategies, a sufficient and deeper articulation of such factors from a practice and process perspective is lacking in the extant literature. As a concept, entrenchment has not been studied or mentioned in any of the studies reviewed.

It is therefore clear that the institutionalization of KM strategies in organizations is largely unstudied, and not much is known or discussed in the extant literature. Hirst (2010) showed how theorization affects the formation of KM practices such as KM strategies through specification and justification. Unfortunately, this expanded theorization concept has not been adopted or used. While this study expanded a neo-institutional theory and recommended that subsequent studies should link a process analysis to the context, with a specific focus on an organizational level analysis, the concepts have not been used. Similarly, there are no studies which have undertaken a comparative analysis or provided a framework to compare similar or different industries or contexts regarding the institutionalization processes of KM practices such as KM strategies. This review found that institutionalization is not an adequately explored process. To date it is not known how KM strategies are adopted, implemented and entrenched in organizations, nor what processes take place in the day-to-day activities.

In general, institutionalization enhances the acceptance and use of practices reflected in a strategy prepared with the goal of solving persistent problems. Over time, the strategy can provide a guideline for the organization's success and competitiveness, and an institutionalization process can ensure that KM activities are well structured, desirable and are part of an organization's culture and routine. In the case of AROs in East Africa, however, there are no studies that articulate the processes of institutionalization and provide a framework to quantify success or the impact of KM strategies. Previous studies indicate that understanding and learning organizations as a complex, interactive and dynamic process, is important for detailed explanation of institutionalization of KM practices (Zandiy, 2017). This study has shown that there is not enough research to provide the required in-depth knowledge to understand how AROs can institutionalize KM strategies in East Africa. This situation limits these AROs and the KM community's ability to identify key areas for learning and improvement. It also fails to exhaustively and coherently explain the key processes and practices that the institutionalization

of KM strategies should consider. These concerns are consistent with the research questions for an ongoing PhD study in this area.

## References

- Aagaard, A. (2013). Effective Implementation of knowledge management strategies and the key roles of knowledge ambassadors in strategy integration: A longitudinal participative case study of cross-divisional strategy integration. *International Journal of Knowledge Management (IJKM)*, 9(3), 31-46.
- Abbas, K. D. (2015). Knowledge Management Strategies and Practices in Nigerian Agricultural Research Institutes (Doctoral dissertation, University of KwaZulu-Natal, Pietermaritzburg).
- Alers-Tealdi, L. (2015). Institutionalization of knowledge management in the federal government: an exploration of the mechanisms (Doctoral dissertation, Rutgers University-Graduate School-Newark).
- Ballantyne, P. (2009). Accessing, sharing and communicating agricultural information for development: emerging trends and issues. *Information Development*, 25(4), 260-271.
- Barley, W. C., Treem, J. W., & Kuhn, T. (2018). Valuing multiple trajectories of knowledge: A critical review and agenda for knowledge management research. *Academy of Management Annals*, 12(1), 278-317.
- Baskerville, R., & Dulipovici, A. (2006). The theoretical foundations of knowledge management. *Knowledge Management Research & Practice*, 4(2), 83-105.
- Bernaoui, R., & Hassoun, M. (2011, February). Knowledge Management (KM) in agricultural research in Algeria: Monitoring Tool to enhance the scientific productions. In 4th. International Conference on "Information Systems & Economic Intelligence" (pp. 260-265).
- Boell, S. K., & Cecez-Kecmanovic, D. (2014). A hermeneutic approach for conducting literature reviews and literature searches. *CAIS*, 34, 12.
- Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review*. Sage.
- Bratianu, C., Evangelista, P., & Durst, S. (2015). Knowledge management in environmental sustainability practices of third-party logistics service providers. *Vine*.
- Ceptureanu, E., Ceptureanu, S., Popescu, D., & Vlad, L. (2017). Two stage analysis of successful change implementation of knowledge management strategies in energy companies from Romania. *Energies*, 10(12), 1965.
- Choe, J. M. (2014). The product and process innovations through the strategic alignment of knowledge management. *Asian Journal of Technology Innovation*, 22(1), 1-15.

- Choi, B., Poon, S. K., & Davis, J. G. (2008). Effects of knowledge management strategy on organizational performance: A complementarity theory-based approach. *Omega*, 36(2), 235-251.
- Cram, W. A. (2019). (Re) considering the Concept of Reproducibility of Information Systems Literature Reviews.
- Dalkir, K. (2013). *Knowledge management in theory and practice*. Oxford OX2 8DP, UK. Routledge.
- Desouza, K. C., El Sawy, O. A., Galliers, R. D., Loebbecke, C., & Watson, R. T. (2006). Beyond rigor and relevance towards responsibility and reverberation: Information systems research that really matters. *Communications of the Association for Information Systems*, 17(1), 16.
- Dewah, P., & Mutula, S. M. (2016). Knowledge retention strategies in public sector organizations: Current status in sub-Saharan Africa. *Information Development*, 32(3), 362-376.
- Dileepkumar, G. (2010). *Micro-level Drought Preparedness with Information Management and Rural Knowledge Centres: A Framework to Support Rural Farm Families* (Doctoral dissertation, Dhirubhai Ambani Institute of Information and Communication Technology)
- Durand, R., Grant, R. M., & Madsen, T. L. (2017). The expanding domain of strategic management research and the quest for integration. *Strategic Management Journal*, 38(1), 4-16.
- Dwivedi, Y. K., Venkitachalam, K., Sharif, A. M., Al-Karaghoul, W., & Weerakkody, V. (2011). Research trends in knowledge management: Analyzing the past and predicting the future. *Information Systems Management*, 28(1), 43-56.
- Fassehi, S. (2012). An exploratory investigation into knowledge management in Western Australian knowledge-intensive small businesses.
- Forcadell, F. J., & Guadamillas, F. (2002). A case study on the implementation of a knowledge management strategy oriented to innovation. *Knowledge and Process Management*, 9(3), 162-171.
- Geeling, S., Brown, I. & Weimann, P. (2016). 'Information systems and culture - a systematic hermeneutic literature review'. *CONF-IRM 2016 Proceedings*. <https://aisel.aisnet.org/confirm2016/40>. Paper 37, 1-12
- Gourlay, S. (2006). Conceptualizing knowledge creation: A critique of Nonaka's theory\*. *Journal of management studies*, 43(7), 1415-1436.
- Gough, D., Thomas, J., & Oliver, S. (2012). Clarifying differences between review designs and methods. *Systematic reviews*, 1(1), 28.
- Grant, K. (2011). Knowledge management, an enduring but confusing fashion. *Electronic Journal of Knowledge Management*, 9(2), 117-131.

- Hendry, K. P., Kiel, G. C., & Nicholson, G. (2010). How boards strategise: A strategy as practice view. *Long Range Planning*, 43(1), 33-56.
- Handzic, M. (2017). the KM times they are a-Changin'. *Journal of Entrepreneurship, Management and Innovation*, 13(3), 7-28.
- Heisig, P. (2009). Harmonisation of knowledge management-comparing 160 KM frameworks around the globe. *Journal of knowledge management*, 13(4), 4-31.
- Hirschheim, R., & Klein, H. K. (2012). A glorious and not-so-short history of the information systems field. *Journal of the Association for Information Systems*, 13(4), 188.
- Hirst, C. A. (2010). A study of the intra-organisational processes of institutionalisation: establishing the practices of knowledge management.
- Jakubik, M. (2011). Becoming to know. Shifting the knowledge creation paradigm. *Journal of Knowledge Management*, 15(3), 374-402.
- Jalil, M. A (2012). Knowledge Management Strategy of a Law Firm. *International Journal of Business and Technopreneurship* 2(2), 353-367.
- Jami Pour, M., Kouchak Zadeh, Z., & Ahmad Zadeh, N. (2018). Designing an integrated methodology for knowledge management strategic planning: The roadmap toward strategic alignment. *VINE Journal of Information and Knowledge Management Systems*, 48(3), 373-387.
- Jennex, M. E. (2002). Knowledge management strategy: Critical issues. assessment, 2003, 2004.
- Kamasak, R. (2012). Knowledge management practice assessment and the relationship between knowledge management practices and organizational strategy development: Empirical evidence from Turkey. *New Research on Knowledge Management Applications and Lesson Learned*. DOI: 10.5772/32479
- Kushwaha, P., & Rao, M. K. (2015). Integrative role of KM infrastructure and KM strategy to enhance individual competence: Conceptualizing knowledge process enablement. *Vine*, 45(3), 376-396.
- Kitsios, F. C., & Kamariotou, M. (2019). Information Systems Strategy and Strategy-as-Practice: Planning Evaluation in SMEs.
- Kjærgaard, A., & Kautz, K. (2008). A process model of establishing knowledge management: Insights from a longitudinal field study. *Omega*, 36(2), 282-297.
- Kim, T. H., Lee, J. N., Chun, J. U., & Benbasat, I. (2014). Understanding the effect of knowledge management strategies on knowledge management performance: A contingency perspective. *Information & management*, 51(4), 398-416.
- Laghrabli, S., Benabbou, L., & Berrado, A. (2015, October). A new methodology for literature review analysis using association rules mining. In *2015 10th International Conference on Intelligent Systems: Theories and Applications (SITA)* (pp. 1-6). IEEE.

- Lawrence, T. B., Hardy, C., & Phillips, N. (2002). Institutional effects of interorganizational collaboration: The emergence of proto-institutions. *Academy of management journal*, 45(1), 281-290.
- Lee, E. S., & Song, D. W. (2010). Knowledge management for maritime logistics value: discussing conceptual issues. *Marit. Pol. Mgmt.*, 37(6), 563-583.
- Lee, A. S. H., & Lim, T. M. (2017). Strategies to improve knowledge sharing in trading construction organization. *Information Technology in Industry*, 5, 7-15.
- Lounsbury, M., & Crumley, E. T. (2007). New practice creation: An institutional perspective on innovation. *Organization studies*, 28(7), 993-1012.
- Lwoga, E. (2010). Application of knowledge management approaches and information and communication technologies to manage indigenous knowledge in the agricultural sector in selected districts of Tanzania (Doctoral dissertation).
- Ma, Z., & Yu, K. H. (2010). Research paradigms of contemporary knowledge management studies: 1998-2007. *Journal of Knowledge Management*, 14(2), 175-189.
- Majuri, J., Koivisto, J., & Hamari, J. (2018). Gamification of education and learning: A review of empirical literature. In *Proceedings of the 2nd International GamiFIN Conference, GamiFIN 2018*. CEUR-WS.
- Mangiarotti, G., & Mention, A. L. (2015). Investigating firm-level effects of knowledge management strategies on innovation performance. *International Journal of Innovation Management*, 19(01), 1550012.
- Martin, G., Massy, J., & Clarke, T. (2003). When absorptive capacity meets institutions and (e) learners: adopting, diffusing and exploiting e-learning in organizations. *International Journal of Training and Development*, 7(4), 228-244.
- Moeini, M., Rahrovani, Y., & Chan, Y. E. (2019). A review of the practical relevance of IS strategy scholarly research. *The Journal of Strategic Information Systems*.
- Mohd Zin, I. N., & Egbu, C. O. (2010, September). Readiness of organisations to implement a knowledge management strategy: A construction industry overview. In *Procs 26th Annual ARCOM Conference* (pp. 789-798). Association of Researchers in Construction Management.
- Moustaghfir, K. (2009). How knowledge assets lead to a sustainable competitive advantage: are organizational capabilities a missing link & quest. *Knowledge Management Research & Practice*, 7(4), 339-355.
- Mulinge, W. M. (2013). Knowledge management strategies and their contribution to small and medium enterprises sales growth: A case of hospitality industry in Nakuru Town (Doctoral dissertation, Egerton University).
- Neto, F. S., Rafael, B., de Souza França, R., Ziviani, F., & Parreiras, F. S. Impact of Agile Practices Adoption on Organizational Learning: a Survey in Brazil.

- Okoli, C., & Schabram, K. (2010). A guide to conducting a systematic literature review of information systems research.
- Pate, J., Beaumont, P., & Pryce, G. (2009). Organisations and the issue of multiple identities: who loves you baby?. *Vine*, 39(4), 319-338.
- Paré, G., Tate, M., Johnstone, D., & Kitsiou, S. (2016). Contextualizing the twin concepts of systematicity and transparency in information systems literature reviews. *European Journal of Information Systems*, 25(6), 493-508.
- Peppard, J., Galliers, R. D., & Thorogood, A. (2014). Information systems strategy as practice: Micro strategy and strategizing for IS. *J. Strategic Inf. Sys.*, 23(1), 1-10.
- Perez-Soltero, A., Zavala-Guerrero, A. G., Barcelo-Valenzuela, M., Sanchez-Schmitz, G., & Meroño-Cerdan, A. L. (2015). A methodology for the development and implementation of knowledge management strategy in a Mexican SME trading company. *The IUP Journal of Knowledge Management*, 13(2), 25-44.
- Ramy, A., Floody, J., Ragab, M. A., & Arisha, A. (2018). A scientometric analysis of Knowledge Management Research and Practice literature: 2003–2015. *Knowledge Management Research & Practice*, 16(1), 66-77.
- Robinson, H. S., Carrillo, P. M., Anumba, C. J., & Al-Ghassani, A. M. (2004). Developing a business case for knowledge management: the IMPaKT approach. *Construction Management & Economics*, 22(7), 733-743.
- Rowe, F. (2014). What literature review is not: Diversity, boundaries and recommendations.
- Rowley, J. (1999). What is knowledge management? *Library management*, 20(8), 416-420.
- Salami, A., Kamara, A. B., & Brixiova, Z. (2010). Smallholder agriculture in East Africa: trends, constraints and opportunities. Tunis, Tunisia: African Development Bank.
- Sandhawalia, B. S., & Dalcher, D. (2011). Developing knowledge management capabilities: a structured approach. *Journal of Knowledge Management*.
- Sasson, E., Ravid, G., & Pliskin, N. (2017). Creation of knowledge-added concept maps: time augmentation via pairwise temporal analysis. *Journal of Knowledge Management*, 21(1), 132-155.
- Schryen, G., Benlian, A., Rowe, F., Gregor, S., Larsen, K., Petter, S., Paré, G., Wagner, G., Haag, S. & Yasasin, E. (2017). Literature reviews in IS research: What can be learnt from the past and other fields?. *Communications of the Association for Information Systems*, 41(1), 30.
- Schultze, U. (2015). Skirting SLR's language trap: reframing the 'systematic' vs 'traditional' literature review opposition as a continuum. *Journal of Information Technology*, 30(2), 180-184.
- Selznick, P. (2011). *Leadership in administration: A sociological interpretation*. Quid Pro Books.

- Serenko, A., Bontis, N., Booker, L., Sadeddin, K., & Hardie, T. (2010). A scientometric analysis of knowledge management and intellectual capital academic literature (1994-2008). *Journal of Knowledge Management*, 14(1), 3-23.
- Staiger-Rivas, S., Alvarez, S., Arana, J. A., Howland, F. C., Cunha, F., Valencia, B., Armando, L., Munoz, K., & Feijoo, K. (2014). Designing knowledge management interventions in agricultural research for development: methodology, experiences, and lessons learned.
- Song, B., Li, Y., & Zhao, L. (2019). Complementary Effect of Knowledge Management Strategy on Firm Performance: Evidence from Chinese Firms. *Sustainability*, 11(13), 3616.
- Rusu, L., & El Mekawy, M. (2011). Strategic role of information technology in a multinational company: The case of an organization with subsidiaries in Egypt and Sweden. In *Cases on Business and Management in the MENA Region: New Trends and Opportunities* (pp. 135-155). IGI Global.
- Sun, P. (2010). Five critical knowledge management organizational themes. *Journal of Knowledge Management*, 14(4), 507-523.
- Templier, M., & Paré, G. (2018). Transparency in literature reviews: an assessment of reporting practices across review types and genres in top IS journals. *European Journal of Information Systems*, 27(5), 503-550.
- Tate, M., Furtmueller, E., Evermann, J., & Bandara, W. (2015). Introduction to the Special Issue: The Literature Review in Information Systems. *CAIS*, 37, 5.
- Teubner, R. A., & Mocker, M. (2008). A literature overview on strategic information systems planning. *European Research Center for Information Systems Working Paper*, (6).
- Toffel, M. W. (2016). Enhancing the practical relevance of research. *Production and Operations Management*, 25(9), 1493-1505.
- Tolbert, P. S., & Zucker, L. G. (1999). The institutionalization of institutional theory. *Studying Organization. Theory & Method*. London, Thousand Oaks, New Delhi, 169-184.
- Vom Brocke, J., Simons, A., Riemer, K., Niehaves, B., Plattfaut, R., & Cleven, A. (2015). Standing on the shoulders of giants: challenges and recommendations of literature search in information systems research. *Communications of the Association for Information Systems*, 37(1), 9.
- Webster, J., & Watson, R. T. (2002). Analyzing the past to prepare for the future: Writing a literature review. *MIS quarterly*, xiii-xxiii.
- Wagner, G., Prester, J., Roche, M., Benlian, A., & Schryen, G. (2016). Factors affecting the scientific impact of literature reviews: A scientometric study.
- Wagner, E. L., & Newell, S. (2007). Exploring the importance of participation in the post-implementation period of an ES project: a neglected area. *Journal of the Association for Information Systems*, 8(10), 508.

- Whittington, R. (2006). Completing the practice turn in strategy research. *Organization studies*, 27(5), 613-634.
- Yang, J. (2010). The knowledge management strategy and its effect on firm performance: A contingency analysis. *International Journal of Production Economics*, 125(2), 215-223.
- Yu, X., & Tang, S. (2010, August). Construction and Application of Performance Evaluation Matrix for Knowledge Management. In 2010 International Conference of Information Science and Management Engineering (Vol. 1, pp. 416-419). IEEE.
- Zandiy, M. R. (2017). Institutionalization of organizational knowledge management program in the Shiraz Municipality. *HELIX*, 7(2), 1145-1150.
- Zaher, D. (2015). Servant Leadership and the Successful Implementation of Knowledge Management in Organizations. *The JF Oberlin journal of business management studies*, 5, 39-59.

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### Acknowledgement

We acknowledge the valuable input from Professor Irwin Brown of University of Cape Town, SA and Professor Mike Teodorescu of Massachusetts Institute of Technology, USA

### Appendix

**Table 1: An initial search result using different keywords**

Key search word	Source	Number of papers
"Institutionalization of knowledge management strategies"	Google scholar	2
	Web of science and Scopus	0
"Institutionalization of knowledge management strategy"	Google scholar	0
	Web of science and Scopus	0
"Institutionalisation of knowledge management strategies"	Google scholar	3
	Web of science and Scopus	0
"Institutionalisation of knowledge management strategy"	Google scholar	0
	Web of science and Scopus	0
"Adoption of knowledge management strategies"	Google scholar	48
	Web of science and Scopus	9
"Adoption of knowledge management strategy"	Google scholar	12
	Web of science and Scopus	2
"Adoption of KM strategy"	Google scholar	3
	Web of science and Scopus	0
"Adoption of KM strategies"	Google scholar	24
	Web of science and Scopus	1
"Implementation of KM strategy"	Google scholar	0

	Web of science and Scopus	0
“Implementation of KM strategies”	Google scholar	0
	Web of science and Scopus	1
“Implementation of knowledge management strategies”	Google scholar	1
	Web of science and Scopus	141
“Implementation of knowledge management strategies” (title or abstract)	Google scholar	1
	Web of science and Scopus	8
“Implementation of knowledge management strategy”	Google scholar	101
	Web of science and Scopus	20
“Implementation of knowledge management strategies” (title or abstract)	Google scholar	2
	Web of science and Scopus	4
"Entrenchment of Knowledge management strategies"	Google scholar	0
	Web of science and Scopus	0
"Entrenchment of Knowledge management strategy"	Google scholar	0
	Web of science and Scopus	0
Total		384

**Table 2: List of search keywords**

“institutionalization of knowledge management strategies”	“institutionalization of knowledge management strategy”
“institutionalization of KM strategies”	“institutionalization of KM strategy”
“institutionalisation of knowledge management strategies”	“institutionalisation of knowledge management strategy”
“institutionalisation of KM strategy	“adoption of knowledge management strategy”
“adoption of knowledge management strategies”	“adoption KM strategies”
“adoption of KM strategy”	“implementation of knowledge management strategies”
“implementation of knowledge management strategy”	“implementation of KM strategy”
“entrenchment of knowledge management strategies”	“entrenchment of knowledge management strategy”
“entrenchment of KM strategies”	“entrenchment of KM strategy”