

Examining The Effect of Knowledge Management Practices On Organizational Performance in The Construction Industry in Ethiopia

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Abstract

Knowledge management is the process of transforming information into actionable knowledge and making it accessible to those who can use it effectively. It encompasses practices that enable organizations to acquire, share, preserve, and utilize knowledge and expertise to enhance performance. This study is unique in its focus on the influence of knowledge management practices on the organizational performance of the construction industry in Ethiopia. By exploring how these practices affect the industry, the research uncovers a range of interdependent factors that significantly impact the construction sector. It also identifies critical issues that the industry faces, providing valuable insights for practitioners and scholars alike. Importantly, the findings of this study are not limited to the Ethiopian construction industry but can be applied to similar sectors in Ethiopia and beyond.

Keywords: knowledge management, knowledge management practices, organizational performance, construction industry, Ethiopia

1. INTRODUCTION

Whether theoretical or practical, knowledge is a crucial asset for any organization. It serves as a repository of intellectual wealth, driving the organization's progress and setting it apart from its competitors. In this context, effective knowledge management becomes a strategic imperative for organizations, enabling them to leverage their unique knowledge resources for enhanced performance (Mahajan, 2016; Muthuveloo, 2017).

There are two distinct schools of thought in knowledge management (KM): codification and personalization. The codification camp emphasizes systems-oriented approaches to knowledge that focus on collection and categorization, providing a structured framework for KM. On the other hand, the personalization camp focuses on the people-to-people connection approach, emphasizing the importance of individual interactions in knowledge creation and sharing, which fosters a collaborative environment. Eventually, organizations should apply both methods when implementing KM within the organization, but one of the two will usually take dominance (Leibowitz, 2012).

KM is a crucial strategy for organizations to survive and improve their performance. It involves managing knowledge at different stages of an organization's process, identifying, optimizing, and actively managing intellectual assets that create value, increase productivity, and help gain and sustain competitive advantage. KM is a process that involves coordinating, organizing, and making organizational knowledge available for acquiring, sharing, retaining, and applying to achieve corporate aims and objectives. As Mohaghegh et al. (2024) described, KM helps organizations consolidate their position in the competitive environment, which is key to creating a competitive advantage. Polas et al. (2023) also emphasized the importance of KM in achieving and maintaining a competitive advantage.

2. BACKGROUND OF THE STUDY

The construction industry is renowned globally for its labor and intensive information exchange (Odubiyi et al., 2019). It is one of the most persuasive sectors worldwide and in individual countries; it is also one of the most profitable industries in the world, and it assists in achieving economic development for the nation (Adepoju & Aigbavboa, 2020).

The construction industry is a crucial sector of the economy, playing an essential role in a country's social and economic development (Ofori, 2015). It is one of the world's most profitable industries, driving economic growth and contributing significantly to the global economy. With \$10 trillion in yearly economic activities, it is considered one of the largest sectors. However, it has unique features that must be appreciated to perform effectively and efficiently (Adepoju & Aigbavboa, 2021).

In most developing countries, like Ethiopia, the industry has faced the challenge of adopting and using modern technologies to ensure effective resource management and improve efficiency and effectiveness (Odubiyi et al., 2019). Construction companies in developing countries need help managing information and knowledge-related resources in construction project management. Much of the information about past projects is not used again, resulting in poor quality of work and project delays (Ferrada et al., 2013)

Many developing countries, such as Ethiopia, have struggled to incorporate modern technologies into their industries to manage resources effectively and improve efficiency. Construction companies in these countries require assistance in managing information and knowledge-related resources in project

management. Often, information from past projects is not utilized, leading to poor-quality work and project delays. (Odubiyi et al., 2019; Ferrada et al., 2013).

3. THEORETICAL BACKGROUND

KM practices acquire, store, understand, share, and apply knowledge within the organization. Gholami et al. (2013) pointed out that KM practices positively and significantly influenced organizational performance, and KM practices can play a significant role in improving productivity, financial performance, staff performance, innovation, work relationships, customer satisfaction, and improving organizational performance (Gholami et al., 2013, p. 9). KM practices in this study are acquiring knowledge, sharing knowledge, retaining Knowledge, and applying organizational knowledge to enhance organizational performance.

Furthermore, Meher and Mishra (2022) portrayed that KM practices are not only meant to develop the skills and knowledge of employees but also focus on the individual benefit of the employee. Different studies reveal that KM practices are helpful only at the organizational level, such as organizational performance, job satisfaction, organizational innovation practices, and strategic decision-making processes are in the place (Meher & Mishra, 2022).

The construction industry in developing countries faces significant problems and challenges today. Ethiopia's construction industry is not different from any other developing or African country's current practices. To transform, the industry needs due attention from public and private stakeholders. Therefore, this study aims to examine the effect of KM practices on organizational performance in Ethiopia's construction industry.

The fundamental problems the construction industry faces today in developing countries are unreliable contractors, poor image of the industry, problems related to safety issues, lack of skilled labor, bureaucracy, corruption, competitive tendering procedures, over-specification or/ over design, failure of sub-contractors, reliance on traditional procurement, late payment, cost overrun, late completion are among others (Yap et al., 2019).

4. METHODOLOGY

A research framework, a theoretical or conceptual framework for KM, is a comprehensive system that includes people, processes, and technology. It ensures that KM is applied systematically and effectively to improve organizational performance in any knowledge domain (Waheed, 2020). KM frameworks and models are classified into two categories: descriptive and perspective, as described by Sivasubmanian (2016). The explanatory models attempt to characterize the nature of the KM phenomenon, while prospective models prescribe methodologies for implementing KM. These theoretical models explain how organizations acquire, share, retain, and apply knowledge (Sivasubmanian, 2016).

Researchers have proposed different models to address various aspects of KM (Mittal & Kumar, 2019). In line with the KM perspective, multiple researchers have discussed KM framework models and their purposes in facilitating KM implementation within organizations from different angles. Most of the research on KM framework models have focused on creating new organizational knowledge by transforming personal knowledge and interactions (Senseuse & Cahyaningsih, 2018).

5. THEORETICAL DEVELOPMENT

An organization needs to develop a theoretical framework for its KM practices to create a complete and integrated KM system comprising three pillars: people, process, and technology. This system will allow the organization to acquire, share, retain, and apply valuable knowledge as needed, tailored to the organization's specific requirements (Salzano et al., 2016). The theoretical development of the study is presented in Figure 1 below.

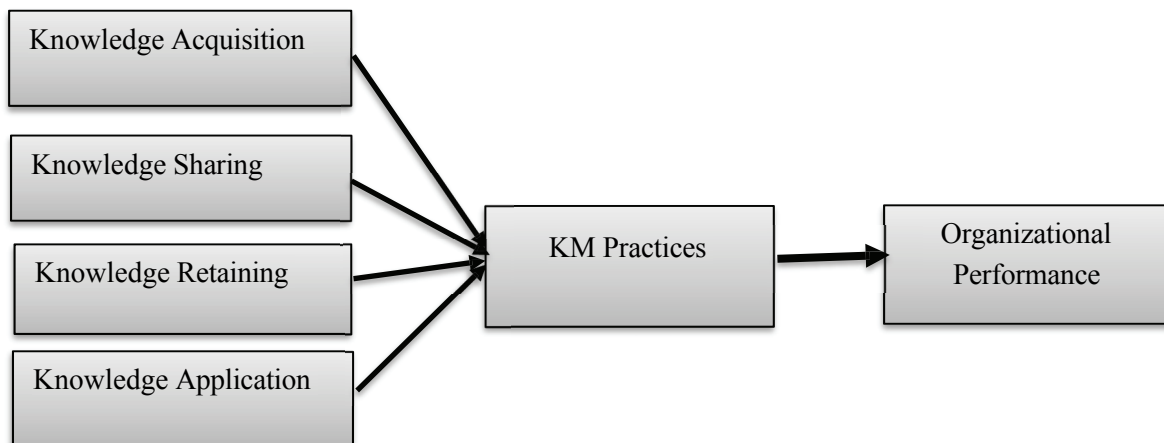


Figure 1: KM Practices Conceptual Framework

The above-presented conceptual framework of KM practices is designed to answer the research questions (RQS) and objectives intended to be answered through this study.

RQ1: What are the knowledge management practices in the Ethiopian construction industry?

RQ2: What factors influence the organizational performance of the construction industry in Ethiopia?

The objective set in this study to answer the research questions are;

Objective one: To examine the effect of knowledge management practices on organizational performance in the construction industry in Ethiopia

Knowledge Acquisition

Knowledge acquisition is a comprehensive understanding of the processes underlying an entity's observable behavior (Leu & Abbass, 2016). Moreover, external knowledge acquisition is a process by which organizations integrate knowledge from the environment into their existing knowledge bases. It is also an essential capability for a company's developing activities in dynamic environments where competitive advantages depend on renewal, innovation, and quick responses to changes in technology, competition, preferences, and the needs of customers (Ortiz et al., 2018). Thus, knowledge acquisition is the fundamental element of KM practices and an essential KM process and positively affects the organizational performance of construction companies. It can help construction companies to be efficient and effective in achieving competitive advantage (Håkansson & Ingemansson, 2011).

Knowledge Sharing

Knowledge sharing refers to moving knowledge between different organizational actors within and between departments and hierarchical levels. The critical goal of Knowledge sharing among employees in the organization is to transfer knowledge into corporate assets and resources (Henttonen et al., 2016). Knowledge sharing is the process through which explicit or tacit knowledge is communicated to an individual or group. It is a popular means of social interaction in organizations. It enables workers to solve problems creatively and provides excellent sustenance for designing strategies, making decisions, and building a learning environment. It is the knowledge exchange between individuals, within and among teams, organizational units, and organizations (Abbas & Sağsan, 2019). Therefore, knowledge sharing is essential because it enables the spread of knowledge as the collective organizational knowledge and helps the company use available resources efficiently and effectively (Ahmad, 2017).

Knowledge Retaining

Knowledge retention refers to the various systems and activities that capture and preserve knowledge, allowing it to remain within an organizational system after being introduced. This also includes all activities that ensure the knowledge remains viable within the system (Peterson, 2012). Knowledge retention refers to an individual's direct experience, observations, knowledge and routines, organizational processes, practices, and culture (Kumar, 2017). People in an organization who operate at an individual, group, personal, and organizational level are the carriers of knowledge. Therefore, retaining organizational knowledge is crucial for a successful company in the era of the knowledge economy (Agarwal & Islam, 2015). Knowledge retention is an organization's capability to retain unique and critical understanding, whether tacit or explicit. It helps improve the organization/ team's knowledge, memory, and performance while avoiding knowledge drain and low employee engagement. Therefore, knowledge retention captures critical knowledge and expertise at risk of loss when employees leave an organization (Peterson, 2012).

Knowledge Application

Knowledge application is the process by which organizations utilize their knowledge to make informed decisions and solve problems, ultimately leading to improved organizational performance (Becerra-Fernandez, 2015). This process allows companies to use knowledge to better their operations, develop new products, and create new knowledge assets. Additionally, knowledge application helps organizations identify their source of competitive advantage by utilizing knowledge integration methods to solve organizational problems. As a result, knowledge application is a critical aspect of KM practices, as the primary objective of KM is to ensure that available knowledge is applied for the organization's benefit (Ode & Ayavoo, 2020).

Organizational Performance

Performance is a comprehensive concept that applies to all activities within organizations of all kinds. Organizational performance refers to the quality of work and staff efficiency in decision-making, process improvement, and development. It is also the extent to which the organization meets its own needs and the needs of stakeholders to survive and grow (Abualoush et al., 2018). Organizational performance is an indicator of an organization's ability to meet the requirements of its stakeholders and

remain competitive in the market. It is also known as the outcome of the actions or activities of an organization's members that measures how well an organization has achieved its objectives (Ha et al., 2016).

6. SURVEY DESIGN

The questionnaire was designed to ensure a high response rate and eliminate difficulties. A pilot study was conducted, and feedback was incorporated into the final version. The questionnaire was divided into five sections: socio-demographic characteristics, forms of knowledge, organizational performance, and factors affecting organizational performance and barriers to KM implementation, and the effect of knowledge and KM practices on organizational performance. Respondents rated the level of influence on a five-point Likert scale, and the data was analyzed using SPSS version 26. The questionnaire was sent to 190 participants, who were selected through random sampling. Of the 190 respondents, 105 completed the questionnaire, demonstrating a significant level of engagement. Four responses were invalid, and the rest, 101, were valid for the analysis. Thus, the overall response rate, a crucial indicator of the study's reliability, was 53.2 %.

6.1 Demographic Information of the Respondents

The analysis and interpretation of the current study are based on the entire sample. Out of the 101 valid responses considered for the study, the majority (79.2%) of the participants were male, and (20.8%) were female. In terms of experience, (35.6%) had 5-10 years of experience, 18.8% had 16-20 years of experience, 18.8% had greater than 20 years, 15.8% had 11-15 years of experience, and only 10.9% had less than five years of experience in the construction industry. 89% of respondents had at least five years of experience and above.

Regarding their positions in their respective companies, 44.4% worked as senior engineers, 23.8% as project managers, 4% as Chief Executive Officers (CEO), and the remaining 8.8% as university professors and researchers in universities and research institutions. In terms of company size, 39.6% were from medium-sized companies, 21.7% from large-sized companies, 8.9% from very large-sized companies, and 29.7% did not specify their company size. The demographic information of the study sample is presented in a table.1 below.

Table 1: Demographic Information of the study sample (N=101)

Variables	Category	N	%
Gender	Male	80	79.2
	Female	21	20.8
Years of experience	Less than 5 years	11	10.9
	5 - 10 years	36	35.6
	11- 15 years	16	15.8
	16 – 20 years	19	18.8
	Greater than 20 years	19	18.8
Organization type	Construction Companies	44	43.6
	Consulting Companies	30	29.7
	Governmental? Regulatory	19	18.8
	Others	6	7.9
Position of the respondent	CEO/Owner	4	4.0
	General Manager	19	18.8
	Project Manager	24	23.8
	Senior Engineer	45	44.6
	Others	9	8.9
Size of the organization	0 – 99	40	39.6
	100 – 199	22	21.8
	200 – 299	9	8.9
	300 - 399	1	1.0
	Greater than 400	29	28.7

6.2 Factor Analysis

In order to determine the factors that relate to the effect of KM practices on organizational performance in the construction industry in Ethiopia, statistical measures such as the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's Sphericity Test and the determinant score were calculated to assess the suitability of the data set for factor analysis. Factor analysis is a statistical technique that helps to summarize data inter-relationships and group variables accordingly. This technique identifies variables that have potential commonalities and examines the relationships within a group of observed variables. Therefore, factor analysis is an essential statistical method used to identify the factors that influence organizational performance in the construction industry in Ethiopia.

6.2.1 Data Validation and Reliability

The concepts of validity and reliability are closely linked and they refer to different properties of a measuring instrument (Sürücü, 2020). Reliability refers to the consistency and stability of the measuring instrument over time and the ability to produce similar results when applied multiple times (Sürücü, 2020). A statistical internal consistency analysis is necessary to check the scores' reliability. Cronbach's alpha (α) is a commonly used test for internal consistency, which is required to establish the reliability of scores and is a prerequisite for validity (Oyewobi, 2014).

An online platform was utilized to gather quantitative data by sending a questionnaire to participants through Google Forms. The questionnaire link was shared with the participants, and email and phone

call reminders were sent to ensure a reasonable response rate. To assess the instrument's reliability and measure internal consistency, the researcher used Cronbach's Alpha (α). Table 2 below presents the Cronbach's Alpha (α) values for the study constructs.

Table 2: Cronbach's alpha (α) value of the research constructs (N=101)

Questionnaire Segment	Number of Measured Constructs	Cronbach's Alpha (α)
Knowledge and KM Practices	36	0.944
Barriers Impeding KM	8	0.908
Factors Affecting Organizational Performance	8	0.892
Essential components of KM	4	0.925
Role in implementing KM	4	0.885
Organizational Performance	5	0.884
Total Variables	65	
Alpha (α) Cronbach's for all constructs		0.941

6.2.2 Suitability Assessment of Data for Factor Analysis

The suitability of data for factor analysis was analyzed for the KM practices in the construction industry using the Kaiser-Meyer-Olkin (KMO) measure. Bartlett's Test of Sphericity was used to check the appropriateness of the dataset for factor analysis. The KMO statistics value is equal to 0.878, which is greater than the recommended value of 0.6, indicating that the data set is suitable for factor analysis. The associated degree of significance is less than 0.0001, with a test value of 2332.775. The principal components analysis (PCA) was done using SPSS, version 26. Before proceeding with PCA, the researcher evaluated the data's suitability for factor analysis. The KMO (Kaiser-Meyer-Olkin Measure) of 0.878 and Bartlett's Test (Chi-square = 2332.775, $p = 0.000$) suggest that the application of factor analysis is appropriate. This confirms the suitability of factor analysis for these data sets and assures the methodology used. (Belayneh, 2016).

Table 3: Kaiser-Meyer-Olkin and Bartlett's Test of Sphericity (N=101)

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.878
Bartlett's Test of Sphericity	Approx. Chi-Square	2332.775
	df	496
	Sig.	0.000

Table 4: Eigenvalues and Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	13.07	40.841	40.841	13.069	40.841	40.841	4.533	14.16	14.16
2	2.83	8.831	49.672	2.826	8.831	49.672	4.321	13.50	27.67
3	1.96	6.140	55.812	1.965	6.140	55.812	3.866	12.08	39.75
4	1.52	4.743	60.556	1.518	4.743	60.556	3.372	10.53	50.29
5	1.42	4.450	65.006	1.424	4.450	65.006	2.672	8.35	58.64
6	1.26	3.937	68.943	1.260	3.937	68.943	2.325	7.27	65.90
7	1.05	3.277	72.220	1.049	3.277	72.220	2.021	6.32	72.220
8	.910	2.845	75.065	—	—	—	—	—	—
31	.085	.266	99.785	—	—	—	—	—	—
32	.069	.215	100.000	—	—	—	—	—	—

Extraction Method: Principal Component Analysis.

Seven factors were identified, and they account for 72.22% of the total variance. According to Shrestha (2021), the retained factors should explain at least 50% of the total variance. This suggests that the seven factors identified are reasonable and that factor analysis is helpful for the variables. The KMO value of 0.887 also supports this conclusion.

The initial solution indicates that the final solution will extract only seven factors. The first component, which is the KM process, explains a 14.16% variance with an eigenvalue of 13.07. The second component, project quality management, explains a 13.50% variance with an eigenvalue of 2.83. The third component, networking and knowledge-sharing practices, explains a 12.08% variance with an eigenvalue of 1.96. The fourth component, transparency in the knowledge-acquiring process, explains a 10.53% variance with an eigenvalue of 1.52. The fifth component, the benefits of tacit knowledge sharing, explains an 8.35% variance with an eigenvalue of 1.42. The sixth component, networking for better organizational communication, explains a 7.27% variance with an eigenvalue of 1.26. Finally, the seventh component, organizational knowledge loss, explains a 6.32% variance with an eigenvalue of 1.05.

Table 5: Descriptive Statistics of KM Practices related variables

Item No	Variables	Mean	Std.Dev.	Rank
1	KM Process	3.43	0.71	2
2	Project Quality Management	3.45	0.71	1
3	Networking and Knowledge-Sharing Practices	3.42	0.75	3
4	Transparency in Knowledge Acquiring Process	3.29	0.79	5
5	The benefit of Tacit Knowledge Sharing	2.92	0.59	7
6	Networking for Better Organizational Communication	3.18	0.82	6
7	Organizational Knowledge Loss	3.37	0.82	4

6.2.3 Correlation and Regression Analysis

Table 6: Descriptive Statistics

Variables	Mean	Std. Deviation
Knowledge Acquisition	3.42	0.75
Knowledge Sharing	3.29	0.79
Knowledge Retaining	2.98	0.60
Knowledge Application	3.18	0.82
Organizational performance	3.37	0.82

Table 7: Correlation Analysis

Variables	Knowledge Acquisition	Knowledge Sharing	Knowledge Retaining	Knowledge Application	Organizational performance
Knowledge Acquisition	1				
Knowledge Sharing	0.610**	1			
Knowledge Retaining	0.473**	0.538**	1		
Knowledge Application	0.711**	0.718**	0.487**	1	
Organizational Performance	0.648**	0.578**	0.414**	0.637**	1

Note: ** Correlation is significant at the 0.01 level (2-tailed).

6.2.4 Regression Analysis

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.706 ^a	0.498	0.477	0.590
a. Predictors: (Constant), KAP (Knowledge application), KR (Knowledge retaining), KA (Knowledge acquisition), and KS (Knowledge sharing).				
b. Dependent Variable: OP (Organizational performance)				

Table 9: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	33.161	4	8.290	23.806	0.000 ^b
	Residual	33.430	96	0.348		
	Total	66.591	100			
a. Dependent Variable: OP (Organizational performance).						
b. Predictors: (Constant), KAP (Knowledge application), KR (Knowledge retaining), KA (Knowledge acquisition), and KS (Knowledge sharing).						

Table 10: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficient	t Stat	Sig.	95.0% Confidence Interval for B		Collinearity Statistics	
		B	Std. Error	Beta			Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	0.548	0.338		1.622	0.108	-0.123	1.218		
	Knowledge Acquisition	0.383	0.116	0.351	3.303	0.001	0.153	0.614	0.463	2.160
	Knowledge Sharing	0.169	0.115	0.163	1.476	0.143	-0.058	0.397	0.429	2.333
	Knowledge Retaining	0.051	0.121	0.038	0.426	0.671	-0.188	0.291	0.673	1.485
	Knowledge Application	0.252	0.120	0.252	2.104	0.038	0.014	0.490	0.364	2.750

a. Dependent Variable: OP (Organizational performance).

7. DISCUSSION AND CONCLUSION

The study conducted an analysis of knowledge management practices in the construction industry of Ethiopia. The researchers used various statistical methods, such as factor analysis, correlation analysis, and regression analysis, and analyzed 32 items. The factor analysis helped the researchers identify seven essential components based on the eigenvalue rules that significantly affect the organizational performance of the industry. These components were ranked based on their mean scores. The seven factors that were identified were - (1) Project quality management, (2) KM process, (3) Networking and knowledge-sharing practices, (4) Organizational knowledge loss, (5) Transparency in the knowledge-acquiring process, (6) Networking for better organizational communication, and (7) The benefit of tacit knowledge sharing.

The analysis showed that project quality management ranked the highest with a mean score of 3.45, followed by KM process with a mean score of 3.43, and networking and knowledge-sharing practices with a mean score of 3.42. The fourth-ranked factor was organizational knowledge loss with a mean score of 3.37, transparency in the acquiring process ranked fifth with a mean score of 3.29, networking for better organizational communication ranked sixth with a mean score of 3.18, and the benefit of tacit knowledge-sharing ranked seventh with a mean score of 2.92. These findings highlight the importance of effective knowledge management practices in improving the organizational performance of the construction industry in Ethiopia.

The results of the correlation analysis show a positive relationship between the independent variables (knowledge acquisition, knowledge sharing, knowledge retaining, and knowledge application) and the dependent variable (organizational performance). The correlation coefficients for the independent variables and the dependent variable are 0.648, 0.578, 0.414, and 0.637, respectively.

The regression analysis of the study reveals that the variables of knowledge acquisition and knowledge application have p-values of 0.001 and 0.04, respectively. This signifies a rejection of the null hypothesis, which implies that there is a significant correlation between the independent variables and the dependent variable in the regression model. Hence, it can be concluded that knowledge management practices have a positive and significant impact on the performance of organizations in the construction industry in Ethiopia. The study also emphasizes that knowledge acquisition is a crucial element of knowledge management and an essential component that positively and significantly affects organizational performance in the construction industry of Ethiopia.

Furthermore, based on the results of the regression analysis presented in Table 8, it is clear that KM practices have a significant impact on the construction industry in Ethiopia. The R-value of 0.706 indicates that a one-unit change in KM practices can affect 71% of organizational performance in this industry. Additionally, the R square value shows that organizational performance-affecting factors can result in a 50% deviation in the organizational performance process. It is, therefore, evident that implementing effective KM practices is crucial to enhancing organizational performance in the construction industry in Ethiopia.

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