

# Effect of Environmental Factors on Knowledge Sharing in Construction Organization

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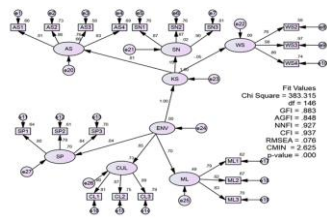
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## Graphical abstract



## Abstract

The processes of environmental factors are milieu-focus, which can influence the knowledge sharing in construction organization. This study examines the possible effect of environmental factors in respect to managerial leadership, strategy/planning and culture on the relationship to the knowledge sharing. The study was carried out on project managers in construction organizations in Nigeria using a stratified random sample of 323 of different designations. A hypothesized model of knowledge sharing, and environmental factors was tested using structural equation modeling approach, and a proposed model was therefore developed. All the factor loadings were significant, leading to a prudent model achievement. The study serves as a guide to the construction managers for sharing knowledge in the construction organization. The finding indicated that environmental factors demonstrated significant influence on knowledge sharing.

**Keywords:** Knowledge management; knowledge sharing; construction organization; environmental factors

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## 1.0 INTRODUCTION

Knowledge management (KM) is a groundbreaking system increasingly adopted as a major source of competitive advantage in increasing organizational performance. Construction organization has still being assessed to strong resistance due to different factors, culture, leadership and strategy [1]. The majority of industries are affected by transition to a knowledge economy, organization services by professionals and management leadership in trying to accomplish their objectives [2, 3]. The construction society have to commence to follow as the knowledge management process is progressively predictable a preferred authoritative advantage and a resource of viable benefit to progress corporate institutions [4, 5]. Reviews from construction reports and inventiveness identify numbers of enhancement themes, including organization culture, strategy, innovation and leadership [6, 7]. Knowledge management is indisputably essential to organization learning and performance and as such environmental factors such as strategy, culture and leadership should be a foundation stone for organization performance in the construction industry [8]. The heroine of knowledge management with environmental factors as a means of

probable improvement for the construction organizations has been highlighted by [7, 9], and [10]. Moreover, the construction organization does not have a moral commitment for inventing new ideas and major construction contractors studies recognize the stumpy amount of firms devise a plan for contrivance knowledge management system [1, 11, and 12].

In knowledge-intensive organization, critical issues for incessant enhancement of quality and efficiency are needed, many of which are classified as a project-based [13]. This is how the environmental issues of the construction societies function in relation to their social system; i.e., how individual group work, how individuals mingle within the project society, how leadership and management are performed, and the quality of products/strategies performed. Managing over projects has become a standard way of performing a business which has been classified to crucial parts of the business strategies in many organizations [14, 15]. These projects are coordinated within a short period, and all experiences' skill specialists coordinate together to undertake the complex task within the encoded period of time [16]. In construction organization nowadays, knowledge becomes one of the most important factors in a profitable and societal order of business [17]. Construction projects-based

companies have also identified that knowledge has become a business competitive advantage for efficiency and effectiveness [10, 18]. Construction companies have to consider organization culture, leadership and product strategy that facilitate intra team development for new information and consider the sharing of such information to others [8, 19]. Organization studies on culture, leadership and strategy have stress the prominence of human factors as morals, inspirations and belief, which pave the way for more research on knowledge sharing in the project based [2]. Thus, continues learning at individual-level team and company level should be encouraged within the project-based companies. Sharing of knowledge is complex and multidimensional. Therefore, there is a need to understand the efficacy of environmental effect on knowledge sharing. This paper aims to examine the effect of environmental factors in relation to culture, leadership and strategy on knowledge sharing.

## ■2.0 KNOWLEDGE SHARING

Various researchers in the knowledge management field, stress more light on the significance influence of sharing knowledge and innovative development of organization in research and development. [16], and [17] argue that it is apparent that a futuristic construction firm must grow knowledge to boost performance. [1] and [20] further argue that sharing of knowledge is paramount towards the driven national and sustainable complete advantage. In construction domain knowledge sharing can be referred to as professional social bond and togetherness that comprehend the workers' exchange of experience and talents for productivity and efficiency improvement of the organization. This is a medium where the talent and experience of the professionals have been circulated to other colleagues or workers with the purpose of solving problems and articulating groundbreaking policy. Sharing of knowledge can be said to occur when professional in the industry choose to transfer his in-build talent and experiences with others in the construction organizations [21]. [22] describe sharing of knowledge to stream of demand for new inventive knowledge while [23], concord that knowledge sharing involve the act bequeathing knowledge and the act of accepting knowledge in construction organization. Thus, knowledge bequeathing is the individual practice to share their private capital talent to staffs, colleagues and groups that needed such knowledge. Knowledge acceptance is a process of negotiating with employees, staffs and friends to stimulate on the importance of sharing available talent.

To attain an anticipated knowledge sharing within the organization, the established factors of knowledge sharing needed to be put in place helpful capitals that can enhancement sharing of knowledge among the individual. Sharing of knowledge consists of employee valuable skill and experiences been exchanged among others. It happens both at personal level and organizational level; knowledge sharing involves mingling together with friends, staffs to solve your encounters sooner and professionally. Organizationally knowledge sharing is the founding, salvaging and transmission talent based knowledge [24]. Thus, theory of planned behavioral (TPB) is one of the most acknowledged models of human objective in social behaviora and organizations of science guide fiction [25, 26]. The model concords that humane behavior can be prophesied by humane attitude while social norms are brashness towards sharing described knowledge and information coming from personal desire to share; willingness to share is designate as humane belief that encourages sharing of knowledge. Therefore, the potential of environmental factors in respect to culture, strategy and leadership as a predictor of

environmental factors as an assumption that providing influence in sharing knowledge.

## ■3.0 RESEARCH METHODOLOGY

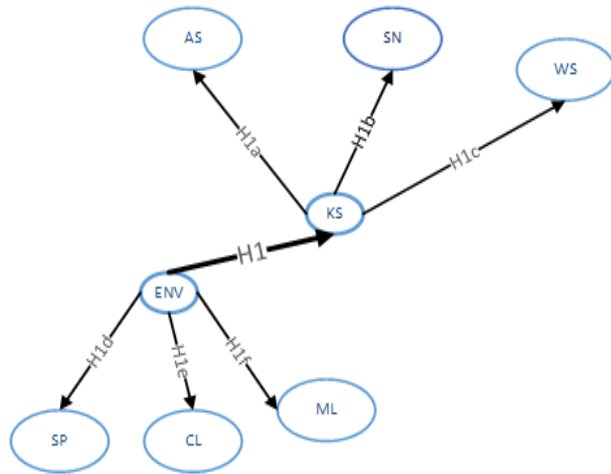
Sharing of attainable knowledge in the organization was accessed using three item; attitude to share knowledge in the organization, willingness to share the knowledge and the social norm which were adopted and reformed from [27], [28], and [23]. Three indicators were used to measure project manager's attitude to share knowledge while three indicators were used to measured social norms of the project managers, and four indicators were used to measured project managers' willingness to share attainable knowledge respectively. Project manager's attitude to share comprehends knowledge exchange and information arriving from project managers desire to share. Willingness to share consists of human ideology to be engross in sharing of knowledge and social norms are regarded as a community influence to share the available knowledge.

Environmental factor was measured using three variables as suggested by [29]. The variables were strategy and planning, culture and managerial leadership. Culture was measured using three indicators collaboration between employees, creative thinking, and awareness, which were adopted from [30]. Strategy and planning were measured with effectiveness, conferences and seminar organization and chain management application, which was adopted from [31], while managerial leaderships were measured with great role play by organizations, encouragement by management and mixing the right team which was adopted from [32] and [33], respectively. The method of data collection used in the study was achieved with the means of the personal contact survey questionnaire. A stratified random sampling procedure was engaged to obtain the required sample size of the population of PM in the construction organization. A total of 500 questionnaires were administered, out of which 323 were returns representing 63.4%, which is above the recommendation by [34], for data collection concerning organization. The results obtain was subjected to exploratory factor analysis (EFA), and the results are shown in Table 1 and Table 2.

### Research Hypothesis

Knowledge management is viewed as actively constructed in social setting [35]. Knowledge is not objective entity but a subjective and social artefacta [36]. Social constructivist agrees that know-how and skill in organizations are produce with the aid of shared agreement through social interactions [37]. [38] argue that when a group of people or individual interact, they influence each other's perspective or reality of construction is shared. Thus, this knowledge can either be explicit or tacit [39]. Tacit can be achieved through skill, data, information and theory. Social networks pave the way for skill and information to be acquired in organizational settings [40]. The theory of social cognitive suggested that knowledge was transferred, shared within a nominated environment or loop [41]. [42] argues that knowledge sharing is a product of social norms of a group, peoples' attitude to share available knowledge within a social setting and the ideas that operate in peoples' willingness to share their knowledge. Attitude reflects personal ideology to perform an action; therefore, attitude impacts knowledge sharing [43]. All these above-mentioned persisted with the some theoretical believes that people willingness to share, attitude to share and social norms determine the sharing of knowledge [44]. However, the association between environmental factors and knowledge sharing signifies that there exist influence of environmental factors on knowledge sharing.

Thus, the confirmatory factor analysis was developed (Figure 1) with hypothesis and sub-hypothesis as-  
 H1; environmental factors display statistically important impact on knowledge sharing  
 H1a. AS can positively impact KS  
 H1b. SN can positively impact KS  
 H1c. WS can positively impact KS  
 H1d. SP can positively impact ENV  
 H1e. CL can positively impact ENV  
 H1f. ML can positively impact ENV



Note; KS= Knowledge Sharing, WS= Willingness to share, SN= Social norm for sharing, AS= Attitude to Share, ENV= Environmental factors, ML= Managerial learning, CUL= Culture, SPT=Strategic and products

Figure 1 Confirmatory analysis of knowledge sharing and environmental factors

4.0 RESULT

Result Summary for Exploratory Factor Analysis (EFA)

Table 1 shows the Kaiser-Mayer-Okin (KMO) measures of sampling accuracy for the environmental factor after, measure of sampling activities (MSA), population correlation matrix and also Bartlett’s Test of sphericity display as follow; the value of KMO .865 is above recommended value of .5 by [45] and the p value is significant, and the total variance extracted for the exploratory factor analysis (EFA) is 56.633% and 14.797%. Therefore the result of factor analysis is meaningful.

Original measures of knowledge sharing consist of eleven indicators. Table 2 indicate the result of EFA with homogeneity of the indicators, the Kaiser-Meyer-Olkin measure sample of adequacy is .769 also exceeding 0.5 as lower boundary if factor analysis was to be evocative [45, 46]. The factor analysis extracted two factors with eigenvalue above one, thus the factor explain 31.569% and 29.149% of the variance.

Analysis of Result for Confirmatory Factor Analysis (CFA)

The constructs and the indicators in the measuring model were analyzed using confirmatory factor analysis (CFA) as proposed by different researchers [45, 47]. All the estimated factor loading exceeded the benchmark acclaimed by [48] of 0.5 and 0.6 values for EFA and CFA respectively as recommended by [49] at the p level of p=0.001. The reliability, Cronbach Alpha, T-value and average variances calculated for the measurement model are presented in the Table 3. The observed normality calculated  $\chi^2$  for the measuring model are 2.625 (CMIN) where  $df = 146$ . This result signifies a reasonable value as recommended by [50, 51]. The comparative fit index (CFI) recorded 0.937, which are above the range of benchmark recommended value of  $\geq 0.9$  by [52, 53]. The goodness of fit index (GFI) recorded a value of .883, and the adjusted goodness of fit index (AGFI) measured .848 value, which is within the range recommended by [45, 54, and 55]. Thus, the root mean square (RMSEA) recorded 0.076 which indicate a good and reliable value recommended by [56, 57, and 58]. The researchers argue that if the value of RMSEA is less than 0.08, the model represents a good fit.

Table 1 Test of reliability -KMO and Bartlett’s Test for environmental factors

KMO		Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.865
Bartlett’s Test of Sphericity	Approx. Chi-Square	1304.646
	df	28
	Sig	0.000

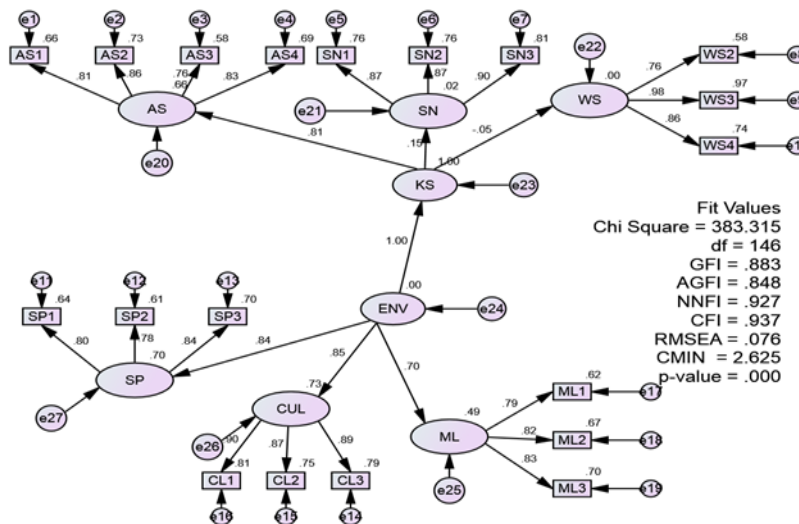
Table 2 Test of reliability -KMO and Bartlett’s Test for knowledge sharing.

KMO		Result
Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.769
Bartlett’s Test of Sphericity	Approx. Chi-Square	1835.037
	df	45
	Sig	0.000

**Table 3** Measurement variance analysis, validity and reliability for knowledge sharing and environmental factors.

Variable/ indicators	Estimates	Cronbach Alphas	T- Value	Variance extracted
<b>Attitude To share</b>				
AS1	.81			
AS2	.86	.884	17.514	.666
AS3	.76		14.759	
AS4	.83		16.721	
<b>Social norm</b>				
SN1	.87			
SN2	.87	.911	19.042	.775
SN3	.90		19.871	
<b>Willingness's to share</b>				
WS2	.76			
WS3	.98	.900	16.736	.759
WS4	.86		16.011	
<b>Strategy and product</b>				
SP1	.80			
SP2	.78	.853	14.477	.651
SP3	.84		15.833	
<b>Culture</b>				
CL1	.81			
CL2	.75	.916	20.198	.670
CL3	.89		21.563	
<b>Managerial learning</b>				
ML1	.79			
ML2	.82	.855	13.876	.662
ML3	.83		14.042	

Note; KS= Knowledge Sharing, WS= Willingness to share, SN= Social norm for sharing, AS= Attitude to Share, ENV= Environmental factors, ML= Managerial learning, CUL= Culture, SPT=Strategic and products.



Note; KS= Knowledge Sharing, WS= Willingness to share, SN= Social norm for sharing, AS= Attitude to Share, ENV= Environmental factors, ML= Managerial learning, CUL= Culture, SPT=Strategic and products

**Figure 2** Confirmatory analysis of knowledge sharing and environmental factors

**5.0 DISCUSSION**

The research considered path loading of approximately 0.2 and above as a high significant loading as recommended by [46, 59]. The influence of environmental factors on knowledge sharing was accessed through the hypothesis 1 (H1) with sub-hypotheses ranges from H1a, H1b, H1c, H1d, H1e and H1f as shown in Figure 1. The structural equation analysis (AMOS) output for the confirmatory model analysis demonstrated strong and reliable path loading (Figure 2). All measuring construct and indicators for environmental factors have a path loading that ranges from .70

to .90 while knowledge sharing showed a strong relationship in all the constructs and indicator except for people willingness to share with -.5 value. Environmental factors revealed path loading of 1 on knowledge sharing. Thus, this strongest loading in the confirmatory analysis, which signifies that environmental factors (strategy/planning, culture and managerial learning) effectively reflect the project manager to share their knowledge. The main hypotheses (H1) together with hypotheses (H1d, H1e and H1f) agree with the postulation that environmental factors influence tacit knowledge sharing. The research reveals that relationship between organizational culture, organizational leadership,

organizational strategy and knowledge sharing has a strong effect which postulates a clue regarding how organizations can promote a suitable knowledge sharing through culture, leadership and strategy. The influencing relationship is greatly associated with attitude to share knowledge and social norms within the construction environment in sharing knowledge. The project managers are not willing to share their tacit knowledge with individual in the construction organization, which is in line with [60], ideas saying the experiences of individual are laying in their respective head. Thus, the result supported the main hypothesis.

Table 4 summarized the factors' loadings for all hypothesized path for the analysis. The result shows that H1c (ws) is not supported with path loading of -.05. This signifies that project managers in organizations are not willing to share their knowledge just because some look at knowledge as power or symbol of authority, attempt to leverage their knowledge will amount to loss of power.

H1; environmental factors can positively influences knowledge sharing (Table 4).

**Table 4** Summary of the structural equation model result.

Hypothesis	Hypothesized path	path coefficient	Result
H1a	AS can positively impact KS	.81	Supported
H1b	SN can positively impact KS	.15	Supported
H1c	WS can positively impact KS	-.05	Not Supported
H1d	SP is significant to ENV	.84	Supported
H1e	CUL is significant to ENV	.85	Supported
H1f	ML is significant to ENV	.70	Supported
H1	Environmental factors can positively impact knowledge sharing	1	Supported

## 6.0 CONCLUSION

The research has a subsequent contribution to the body of knowledge in the distinct ways; first, the research produces a research model for empirical research that highlighted the effect of organizational culture, organizational leadership, organizational strategy and knowledge sharing on organizational performance based on the views of project managers in Nigerian construction organizations. Secondly, the researcher provides a research framework for scholars and construction practitioners who intend to carry out research- related research. Thirdly, the research adopted three valid constructs for knowledge sharing that can be used as a reference to further studies. In addition, the study hypotheses' model was validated through structural equation model in different model approach such as Cornbrash Alpha, the average variance extracted, T-value calculated, exploratory factor analysis and confirmatory factor analysis. Structural equation model was used to confirm the research model and the standardized regression coefficient to show the significant level of each element in the model. Thus, reliable measurement provided by the study can be used to analyze the effect of organizational culture, organizational leadership and organization strategy independently to knowledge sharing in construction organization. The study also reveals that the social norm of construction workers is weak in relation to share their knowledge and willingness to share is not supported.

All the environmental factors of the study supported the relationship with high path loading ranging from .70, .84 and 85 for organizational leadership, organizational strategy and organizational culture respectively, meaning environmental factors influence the share of know-how exchange with the workers in construction organization. Consequently, environmental factors have the potential to share the project manager's knowledge among their colleagues and co-workers in construction organization. The study also reveals that sharing of knowledge is within the context of theoretical and skill embedded in every individual head which the workers are not willing to share. Finally, by providing a reliable measurement model used to analyze behavior pater of organizational culture, organizational leadership and organization strategy to knowledge sharing the study makes a significant body of knowledge in the field of knowledge management and provides a sound basis for evidence

for further research. It is glaring that environmental factors influence knowledge sharing in construction organization.

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