

**FACTORS LIMITING THE IMPLEMENTATION OF KNOWLEDGE MANAGEMENT IN CONSTRUCTION COMPANIES IN INDIA****Jay Prakash<sup>1</sup>, Dr. Rumna Bhattacharyya<sup>2</sup>**<sup>1</sup>Research Scholar, ICFAI Management School, ICFAI University, Jharkhand, India.

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<sup>2</sup>Professor, ICFAI Management School, ICFAI University, Jharkhand, India.**Abstract**

The construction industry is now focusing on knowledge as a new competitive advantage, with GDP (Gross Domestic Product) growth rates being determined by the quality and quantity of knowledge used in production. Knowledge management (KM) practices are crucial to improving industry effectiveness and leveraging knowledge as a key to power. KM has gained importance as industrialized economies shift from natural resources to intellectual assets. Organizations use knowledge management as a strategic process to enhance learning and performance by utilizing knowledge in both short- and long-term ways. It involves four dimensions: acquisition, conversion, application, and protection, all of which are closely linked to organizational performance. Proper support systems are essential for knowledge generation, code, and transfer. Implementing KM in the construction industry can lead to industry growth, but it also presents challenges and factors that need to be addressed. Despite these challenges, KM is essential for the growth and success of the construction industry.

**Keywords:** Knowledge management, factors, limitations, construction industries or organizations.

**1. Introduction**

Organizations use knowledge management as a strategic process to improve learning and performance by acquiring knowledge from internal and external sources, selecting it from resources, producing information, internalizing it, and externalizing it. Corporate culture, technology, leadership, employee motivation, and external elements are a few examples of the factors that affect knowledge management. These factors can be categorized into managerial influences, resource factors, and environmental aspects, with explicit knowledge being tangible and implicit knowledge not. KM involves the development, duration, organization, and collective sharing of knowledge, including efficient storage and retrieval of information for users. A failure of a knowledge management system can be attributed to factors such as managerial influences, resource factors, and environmental aspects. Implementing KM may be feasible or not based on these factors. In summary, knowledge management is a critical process that involves the acquisition, organization, and sharing of knowledge, with the potential for failure if technology fails to meet user expectations and is not fully utilized.

***Poor Goal Setting At  
Implementation  
Stage***

*Lack Of Understanding  
Of Customer  
Needs*

**Poor Content  
Organization**

*Complex And  
Inferior  
Content Presentation*

**Poor Structure  
of Knowledge Base**

*Storing  
Irrelevant  
Information*

**Using  
Non – Scalable  
Knowledge Bases**

*Non Approachability  
of The  
Knowledge Base*

**Lack of  
End – To – End  
Collaboration**

*Inadequate Feedback  
and Measuring  
Process*

**Inaccessibility  
Across Mobile  
Devices**

*Poor Goal Setting  
At Implementation  
Stage*

**Poor Goal Setting  
At Implementation  
Stage**

*Poor Goal Setting  
At Implementation*

*The first step in creating a knowledge management system is to determine its purpose and how it can benefit your organization. It is essential to identify what content to include, as customers seek quick and appropriate answers to problems. Organization is crucial for maintaining and locating information, as customers may have to scan articles for the necessary information.*

*Simplicity is key, and content should be simple and handy, incorporating GIFs, videos, screenshots, and flow diagrams when necessary. A proper structure in the knowledge base can be unprofessional, and a cloud-based solution is recommended for better data security and recovery.*

*Organizations that lack a knowledge-sharing culture struggle to deploy a knowledge management system, as everyone, from experts to CEOs, is required to contribute to the knowledge base. Hoarding knowledge is a big sin, and organizations should strive to create a knowledge-sharing culture.*

*Failing to collect timely feedback to measure the performance of the knowledge base can be consequential, as the absence of precise metrics does not help with system improvement. Support and service operations are restricted not just to office hours but round the clock, with remote work options allowing users to access the knowledge base anytime and anywhere.*

*Personalized content is essential for keeping customers engaged. Without a defined process for access permission, ownership of content, and approval methods, the knowledge management system may become outdated and meaningless. A dedicated team is often needed to ensure the system functions perfectly.*

*It is essential to update the knowledge base regularly to keep the content relevant and meaningful to users. Poor keyword use that is not optimized for search engine discovery can lead to users being unable to access all the information in the knowledge base.*

*In conclusion, creating a well-organized knowledge management system is crucial for ensuring its effectiveness and satisfaction. By focusing on simplicity, organization, and a knowledge-sharing culture, organizations can create a valuable resource for their customers and improve their overall knowledge management system.*

*Stage*  
*Accessibility*

**Research Objective:** The purpose of this research is to identify the factors limiting in implementation of a Knowledge Management System of Small-to-Medium Scale Construction Companies in India.

**2. Related study**

Knowledge can be classified as tacit or explicit. Tacit knowledge consists of cognitive and technical elements, such as abstract concepts and concrete skills. Explicit knowledge is easily transmitted and articulated in formal language, while tacit knowledge is intrinsic and influenced by individual experiences, beliefs, perspectives, instincts, and values. Both types of knowledge are essential for understanding and applying knowledge effectively.

**Managerial Influences:** (Asiedu, 2015) Administrative factors like coordination, control, measurement, and leadership are what make knowledge management such a crucial component of organizational success. Coordination involves harmonizing activities and ensuring appropriate resource use, while control ensures the availability of necessary knowledge resources and processors. Measurement evaluates knowledge, resources, and activities, linking them to financial outcomes. Leadership plays a vital role in these managerial influences, as alignment with the organization's goals and strategy establishes favorable conditions for effective knowledge management. Effective knowledge management requires effective coordination, control, and measurement to ensure the efficient use of resources.

**Resource Influences:** (Saretsalo, 2015) Leadership, measurement, and management are crucial in ensuring the efficient allocation of resources for knowledge activities within an organization. The availability of funding, human knowledge manipulation skills, and organizational knowledge resources, such as artifacts, culture, strategy, and participants' knowledge, play a significant role in guiding these activities.

**Environmental Influences:** (Hislop, 2013) External factors like competition, economics, technology, politics, education, and social factors significantly influence knowledge management. These factors can restrain an organization's initiatives, but their convergence can offer opportunities for improving knowledge management, despite limited control over these external influences.

**Systems Supporting KM:** (Becerra-Fernandez & Sabherwal, 2014) The creation, archiving, retrieval, sharing, and application of information inside an organization are all included in knowledge management. Technologies like groupware systems, expert systems, decision support systems, document management systems, simulation systems and database management systems are examples of knowledge support systems that make these tasks easier.

Groupware systems improve collaboration and make it easier to share messages and pertinent documents, while expert systems assist employees in making decisions that a domain expert would typically make (Wang, Noe, & Wang, 2014). Document management systems store and share knowledge efficiently, saving time and resources. Decision support systems present knowledge to users, enabling them to make informed decisions by combining raw data, documents, and personal knowledge. Database management systems facilitate easy storage and retrieval of stored data,

ensuring consistent organization and accessibility of knowledge within the organization. (Alyoubi, 2015) By simulating real-world events and evaluating their financial advantages, simulation systems assist businesses in making sure that the right information is applied to develop successful commercial ventures that support strong financial performance.

### **Relationship between Knowledge Management and Organizational Performance:**

Organizational performance is a company's ability to meet stakeholder needs and survive in the market, encompassing both financial and nonfinancial aspects (Gholami, Asli, Nazari-Shirkouhi & Noruzy, 2013). Non-financial performance measures, such as innovation ability, client satisfaction, internal business process efficiency, and employee satisfaction, significantly impact the entity's performance. Knowledge management acquisition, conversion, application, and protection are closely linked to organizational performance. Acquisition ensures adequate knowledge stocks, conversion improves expertise and efficiency, and application transforms knowledge into real innovations, improving overall performance (Zaied, Hussein & Hassan, 2012). Knowledge is a crucial source of sustainable competitive advantage, and increasing knowledge protection is necessary to prevent imitation by competitors. Processes for knowledge protection include trademarks, nondisclosure contracts, and patents. Addressing these dimensions can enhance performance and maintain a competitive edge (Rasula, Vuksic & Stemberger, 2012).

### **3. Opinion Survey and Discussion**

This study aims to analyze the growth, knowledge, and implementation levels of knowledge management (KM) in the states of Andhra Pradesh and Telangana. It focuses on the implementation of this approach in both the government and private sectors. A survey will be conducted on 40 construction firms from both sectors, resulting in 120 samples. Qualitative methods will be used to categorize data into patterns, with government organizations consisting of executive engineers, superintending engineers, and garrison engineers, and private construction businesses employing project managers, construction managers, and quality engineers. Data will be collected through in-person interviews using a questionnaire, conducted in a structured, semi-structured, or unstructured format. Qualitative approaches will be employed to evaluate the validity of the hypothesis and determine if the hypothesis needs to be formulated differently. The questionnaire will inquire about interactions among group members to identify key characteristics for understanding and formulating hypotheses. The data obtained will be measured using a five-point Likert scale. This approach ensures that full corporate knowledge is easily accessible and packaged for direct application.

Hypotheses:

1. There is no impact of KM implementation on solving problems faced in the projects of construction organizations in Andhra Pradesh and Telangana State.
2. There is a positive impact of KM implementation on solving problems faced in the projects of construction organizations in Andhra Pradesh and Telangana State.

To compare knowledge management practices, criteria for similarity were established using knowledge management modeling. These criteria include the allocation of knowledge management activities to the relevant process of providing products and services by the service provider; the

similarity lies in the knowledge management activities being compared; and the similarity of outcomes directly affects the results obtained from implementing knowledge management activities, contributing to achieving objectives such as contract security, customer satisfaction, and company profits.

**Nominal Variables are:** Qualification & Designation

**Mixed model ANOVA:** Mixed-model ANOVA is a statistical method that combines between-subjects and within-subjects designs, incorporating both fixed and random effects. It is used in a 2-way ANOVA with repeated measurements and involves choosing a single nominal variable and multiple metric variables, typically more than two. A mixed analysis of variance is employed in this context (table 1 & table 2).

**Table 1. Mixed model ANOVA for H1 & H2**

			<b>Freq uency</b>	<b>Mod e</b>	<b>Varian ce</b>	<b>Minimu m</b>	<b>Maxim um</b>	<b>Rang e</b>	<b>Media n absolut e deviati on</b>
<b>Available Data</b>	<b>E</b>	<b>Dip</b>	11	5	1.62	2	5	3	1
		<b>PhD</b>	1	5		5	5	0	0
		<b>BE</b>	53	4	0.96	1	5	4	1
		<b>ME</b>	21	4	0.95	2	5	3	1
	<b>M</b>	<b>Dip</b>	4	3	0	3	3	0	0
		<b>PhD</b>	6	4	2.17	1	5	4	1
		<b>BE</b>	12	4	0.93	2	5	3	0
		<b>ME</b>	12	5	1.09	2	5	3	1
<b>Take Reference</b>	<b>E</b>	<b>Dip</b>	11	4	0.87	2	5	3	1
		<b>PhD</b>	1	3		3	3	0	0
		<b>BE</b>	53	2	1.23	2	5	3	1
		<b>ME</b>	21	2	1.46	2	5	3	1
	<b>M</b>	<b>Dip</b>	4	4	0.92	2	4	2	0.5
		<b>PhD</b>	6	4	1.77	1	4	3	1
		<b>BE</b>	12	2	1.9	2	5	3	1.5
		<b>ME</b>	12	3	1.55	1	5	4	0.5
<b>Ksharing Daily</b>	<b>E</b>	<b>Dip</b>	11	3	1.49	1	5	4	1
		<b>PhD</b>	1	5		5	5	0	0
		<b>BE</b>	53	3	1.44	1	5	4	1
		<b>ME</b>	21	5	1.66	1	5	4	1
	<b>M</b>	<b>Dip</b>	4	1	4.25	1	5	4	1.5
		<b>PhD</b>	6	5	2.57	1	5	4	0.5

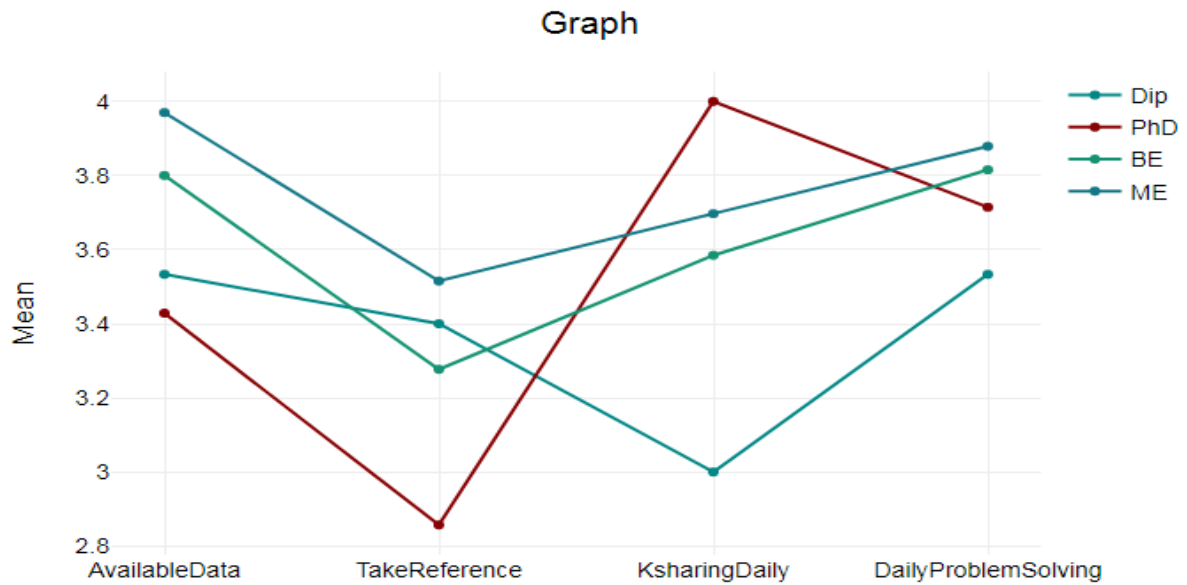
<b>Daily Problem Solving</b>	<b>E</b>	<b>BE</b>	12	5	0.75	3	5	2	0.5
		<b>ME</b>	12	4	1.73	1	5	4	1
		<b>Dip</b>	11	3	1.07	2	5	3	1
		<b>PhD</b>	1	4		4	4	0	0
		<b>BE</b>	53	5	1.21	2	5	3	1
	<b>ME</b>	21	5	1.29	2	5	3	1	
	<b>M</b>	<b>Dip</b>	4	3	0.92	3	5	2	0.5
		<b>PhD</b>	6	4	2.27	1	5	4	1
		<b>BE</b>	12	4	1.52	1	5	4	1
		<b>ME</b>	12	5	1.54	1	5	4	0.5

Table 2. Descriptive statistics: H1 & H2

	<b>Available Data</b>	<b>Take Reference</b>	<b>Ksharing Daily</b>	<b>DailyProblem Solving</b>	<b>Total</b>
<b>Dip</b>	3.53	3.4	3	3.53	3.37
<b>PhD</b>	3.43	2.86	4	3.71	3.5
<b>BE</b>	3.8	3.28	3.58	3.82	3.62
<b>ME</b>	3.97	3.52	3.7	3.88	3.77
<b>Total</b>	3.79	3.33	3.57	3.79	3.62

Table 3. ANOVA results (H1 & H2)

	<i>Sum of squares</i>	<i>df</i>	<i>Mean Squares</i>	<i>F</i>	<i>p</i>	<i>η<sup>2</sup></i>	<i>η<sup>2p</sup></i>
<b>AvailableData, TakeReference, KsharingDaily, DailyProblemSolving</b>	17.27	3	5.76	4.39	.005	0.03	0.04
<b>Qualification</b>	7.03	3	2.34	1.8	.152	0.01	0.04
<b>RM Factor x Qualification</b>	6.93	9	0.77	0.59	.807	0.01	0.01
<b>Residuals (Between Subjects)</b>	151.46	116	1.31				
<b>Residuals (Within Subjects)</b>	456.29	348	1.31				



Hypothesis - 1

**Figure 1. Positive and negative impact of KM implementation on solving problems faced as per survey at field**

**Table 4. Bonferroni Post-hoc-Tests RM Factor (H1 & H2)**

		<i>Mean diff.</i>	<i>Std. Error</i>	<i>t</i>	<i>p</i>	<i>95% CI lower limit</i>	<i>95% CI upper limit</i>
<b>Available Data</b>	<b>Take Reference</b>	0.46	0.13	3.522	.004	0.2	0.72
<b>Available Data</b>	<b>Ksharing Daily</b>	0.23	0.149	1.515	.794	-0.07	0.52
<b>Available Data</b>	<b>DailyProblemSolving</b>	0	0.143	0	1	-0.28	0.28
<b>TakeReference</b>	<b>KsharingDaily</b>	-0.23	0.164	-1.424	.943	-0.56	0.09
<b>Take Reference</b>	<b>DailyProblemSolving</b>	-0.46	0.144	-3.185	.011	-0.74	-0.17
<b>Ksharing Daily</b>	<b>DailyProblemSolving</b>	-0.22	0.151	-1.492	.831	-0.52	0.07

A mixed ANOVA was performed to test whether there was a significant difference between the groups of the first factor Available Data, Take Reference, Ksharing Daily and Daily Problem Solving (repeated measures) in relation to the dependent variable, a significant difference between the groups of the second factor Qualification in relation to the dependent variable, and whether there was an interaction between the two factors Available Data, Take Reference, Ksharing Daily and Daily Problem Solving and Qualification in relation to the dependent variable. The mixed ANOVA showed that there was a significant difference between the groups of the first factor Available Data, Take Reference, Ksharing Daily and Daily Problem Solving in relation to the dependent variable,  $F(3, 348) = 4.39, p = .005$  (table 3), it showed that there was no significant difference between the groups of the second factor Qualification in relation to the dependent variable,  $F(3, 116) = 1.8, p = .152$  and it showed that there was no interaction between the two variables Qualification and Available Data, Take Reference, Ksharing Daily and Daily Problem Solving in relation to the dependent variable,  $F(9, 348) = 1.8, p = .807$ .

**4. Research Discussion for Factor’s Limits**

The essay classifies the influence of implementation elements into three distinct categories: people, organizational, and cultural. People-related concerns encompass factors such as staff’s level of enthusiasm, lack of self-confidence, absence of trust among team members, personnel’s inability and incapacity, and the transfer of persons within the project team. Organizational challenges encompass limitations on sharing, insufficient motivation (in terms of rewards and incentives), company policies, and inadequate management of time and resources (table 5 & 6). The cultural obstacles identified include linguistic barriers, bureaucratic and hierarchical challenges, and a lack of technological advancements. When adopting knowledge management (KM) in construction sectors, it is crucial to be prepared and focused on all phases and hurdles. The KM obstacles are classified and prioritized based on their significance for generation, storage, distribution, and application processes. Implementation hurdles can be categorized into five groups: process or organization-related, people related technology related, knowledge related and environment related. Factor limitations are provided for textual and survey analysis discussions.

**Table 5. Factors related to People and limitations**

<b>Factors</b>	<b>Description</b>
The problem is defined by a hefty workload and a lack of slack times in the available schedule.	The workload has resulted in insufficient time for KM activities to be executed effectively.
The anxiety associated with losing control and ownership of intellectual property, one’s unique competitive advantage, or one’s professional identity.	Knowledge is often viewed as a source of power and competitive advantage, affecting individuals and organizations, posing both personal and organizational issues.
The source or recipient of knowledge is considered	The source unit’s trustworthiness significantly impacts the recipient’s behavior, potentially leading to cultural

trustworthy or reliable.	issues if trust is lacking.
The statement is incomplete and lacks sufficient retentive capacity.	The recipient's capacity to routinely or institutionally use new knowledge can result in its non-use.
The statement is incomplete and does not provide enough information to generate a summary.	The recipient's inability to utilize knowledge beyond their own experience and knowledge is a significant issue.
Interpersonal and communication skills were lacking in the individual.	It is possible to overcome the problem of poor communication and inefficient thinking or idea expression.
The person is really stressed out and afraid of losing anything or taking a chance.	Some typical reasons why people steer clear of particular vocations are fear of losing their jobs, feeling that their expertise is inadequate, or lacking confidence in their ideas.
The statement is incomplete and lacks any meaningful information.	Intrinsic motivation may stem from personal reasons, while extrinsic motivation may be influenced by reward systems or incentives.
The lack of top management support is a significant issue.	Ineffective communication and knowledge management are the outcomes of top or middle management's lack of support for novel concepts and adjustments.
The text discusses the diverse aspirations of various teams.	Teams that operate independently of one another rather than as cohesive ones are said to be engaging in silo thinking.
The text focuses on the unique characteristics of different individuals.	The text points out the disparities that exist among individuals with regard to education, gender, training, personal attributes and experiences.

**Table 6. Factor limits related to Technology**

<b>Factors</b>	<b>Description</b>
<i>Lack of available technology</i>	The matter at hand concerns the lack of immediate maintenance of integrated technology and the absence of internal and external technical support.
<i>Trash Information</i>	This phenomenon denotes the accumulation of extraneous or pointless data and information, which impedes the ability to locate critical information when required.
<i>Legacy Systems</i>	Large, obsolete, extensively modified, difficult-to-maintain, and obsolete legacy systems impede KM practices considerably.

<i>Useless Technology</i>	Inadequate assimilation capacity, which pertains to human factors, may result in complications including unfamiliarity with systems, excessive complexity, and interfaces that are not user-friendly.
<i>Unrealistic Expectations of Technology</i>	The focus should be on enhancing the current situation and aligning with future KM goals by focusing on technology.

**Table 7 . Processes/Organization Related Factor Limits**

<b>Factors</b>	<b>Description</b>
The issue of inconsistency between knowledge and crucial organizational objectives is a significant concern.	The task of gaining insights from setbacks and deficiencies in performance becomes more arduous in the absence of universally understood objectives.
Poor targeting of knowledge	In order to maximize the utility of a KM system, it is imperative to precisely identify the domains that require knowledge application and the corresponding information requirements.
Distance/arduous relationship	The term "communication gap" refers to the inability to effectively exchange knowledge, particularly when the knowledge is derived from geographically dispersed or tacitly incorporated.
Leadership styles	Poor managerial direction and leadership can hinder the implementation of quality management.
Culture	Organisational culture, influenced by national culture, can hinder knowledge sharing and reuse, leading to a blame culture and hindering knowledge management.
Strict Rules and Regulations	The current system limits the potential for innovation, preventing the introduction of new ideas and impedes knowledge transfer and learning.
The issue may be characterized by an unclear or strict job description.	This results in personnel abstaining from accountability for duties they perceive as extraneous, consequently impeding the efficacy of knowledge management.

Decentralization refers to the separation of power and authority, often characterized by silos, turf-ism, and powerful departmental structures.	The focus on efficiency in departments often neglects the issues in other silos, leading to neglect of organization-wide problems.
Low rates of knowledge retention among highly trained and experienced personnel, in addition to high employee and management turnover, characterize the issue.	Low retention rates of employees pose a significant barrier to knowledge management (KM) as they leave the organization with a valuable knowledge repository.
Long-term organizational success	Achievement of success with existing processes and competencies may impede the generation of novel ideas and innovation, thereby impeding knowledge management and organizational learning.
The organization is experiencing a lack of consistency in its strategic, systems, policies, practices, and Knowledge Management (KM) processes.	When the implementation of knowledge processes and the strategic direction of an organization regarding KM are not aligned, KM can become ineffective.
Unproven-ness	The knowledge source may not be re-used if it is not considered a proven source of useful information, which pertains to people-related issues.
Need for Rewards	The absence of incentives or rewards for implementing quality management processes or methods results in poor quality management.
The innovator and/or sponsor lack formal authority.	The level of authority of the innovator or KM originator within an organization significantly influences the implementation of KM.
The absence of congruence between innovation, corporate principles, and attitudes is a notable concern.	This often leads to the non-implementation or consideration of innovative ideas.

**Table 8. Environment Related Factor’s Limits**

<b>Factors</b>	<b>Description</b>
The text does not provide enough information to generate a summary.	Due to the possibility of secrets being revealed, the person is reluctant to provide suppliers or partners access to their sensitive information.
An important problem is the delay that occurs between organizational activity and environmental response.	An innovation's opponents may argue that the interval between its success and inefficiency is proof of its inefficiency.
The rapid technological advancements have significantly impacted various aspects of our lives.	Even in cases where an organization is open to embracing novel concepts, lengthy implementation periods may make innovation obsolete.

**Table 9. Characteristics of Knowledge Related Factor’s Limits**

<b>Factors</b>	<b>Description</b>
Causal ambiguity is a concept that arises from the fact that certain situations or events may have a causal relationship.	The degree of difficulty associated with the pertinent knowledge increases its ambiguity and decreases its acceptance.
The person thought that the information was useless for anything in the future.	A lot of the time, knowledge that is thought to be obsolete is ignored and left out of the system.

**5. Conclusion**

Ultimately, knowledge management is an important procedure for any firm in India (table 8 & 9). Primarily, it fosters ingenuity and originality inside the construction sector, hence augmenting the total industry efficacy. Hence, it is crucial to use suitable support systems for the purpose of generating, encoding, and transmitting knowledge among the participants in businesses in order to guarantee its proper utilization (table 6 & 7). Furthermore, it is crucial to safeguard the information in order to prevent replication by rivals. Efficiently managing knowledge enables a business to achieve high performance, thereby gaining a competitive advantage in the market.

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