

Article

Enhancing Job Satisfaction and Productivity through Knowledge Management Infrastructure: A Case of Construction Industry

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Abstract: This study rigorously investigates the influence of knowledge management infrastructures (KMI) on employees' job satisfaction (JS) within the Iranian construction sector. It specifically investigates how structural, cultural, and technological facets of KMIs affect this satisfaction. The research adopts a quantitative methodology, utilizing established measurement tools from Gold et al. for KMIs and Hackman and Oldham for JS. The empirical information was gathered via a survey distributed to stratified random sample of 150 employees and managers from five diverse construction firms in Iran. Examining the collected data with the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach, the study presents nuanced insights. It identifies that while cultural and technological infrastructures of KMIs significantly contribute to JS, the structural infrastructure does not exhibit a similar impact. Additionally, demographic factors such as age and professional experience were found to be non-contributory in the dynamics between KMIs and JS. However, gender and educational background emerged as significant moderating variables. Remarkably, employees with advanced academic qualifications reported higher satisfaction, likely due to the alignment of specialized knowledge with their professional roles. This research contributes to the current knowledge base by outlining the distinct components of KMIs that bolster JS in the construction industry, thereby offering a targeted framework for industry practitioners and policymakers to enhance employee well-being and organizational efficiency.

Keywords: knowledge management; construction industry; job satisfaction; construction companies; productivity; competitive advantage



Citation: Tabejamaat, S.; Ahmadi, H.; Barmayehvar, B.; Banihashemi, S. Enhancing Job Satisfaction and Productivity through Knowledge Management Infrastructure: A Case of Construction Industry. *Buildings* **2024**, *14*, 790. <https://doi.org/10.3390/buildings14030790>

Academic Editors: Guangdong Tian, Maxim A. Dulebenets, Amir M. Fathollahi-Fard and Honghao Zhang

Received: 27 December 2023

Revised: 29 February 2024

Accepted: 1 March 2024

Published: 14 March 2024



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1. Introduction

Knowledge represents a strategic wealth and serves as a key source of competitive advantage in contemporary business environments [1]. Knowledge is a key resource for success in businesses [2]. Entrepreneurs and organizations that can effectively develop and leverage their knowledge stand a greater chance of success in today's competitive world [3]. In other words, implementing a standardized and successful knowledge management model enhances their competitive advantage and productivity in the industry or market [4].

A recent study indicates that knowledge exchange within digital clusters can contribute to increased product innovation, especially when the exchange is more focused and centred around technical and marketing knowledge. Following this model, in the construction industry, leveraging networking events and digital platforms for sharing and distributing knowledge can facilitate the innovation process, leading to enhanced productivity and advancement in the construction sector [5].

Organizations aiming to generate value for their stakeholders now consider knowledge management (KM) indispensable [6] and sustainable [7]. Therefore, applying knowledge

efficiently helps organizations increase their competitive advantages. Masa'deh, Almajali, Alrowwad, and Obeidat [8] believed that "Organizations operating in a dynamic environment must have strong KM capabilities that develop and support work practices and routines that enable organizations to respond to changing conditions and maintain a competitive advantage" [8]. Hence, this study is intended to investigate the role of effective KM in organizational satisfaction of construction companies.

Culture plays a fundamental role in entrepreneurship. National culture serves as a significant source of competitive advantage for minority businesses. Businesses and organizations on the growth path create value through cultural capital, social networks, and alignment with the specific needs of customers. Policies should be designed to support national businesses and promote diversity in entrepreneurial markets in a way that their organizational culture moves toward maturity of knowledge management, and this maturity enhances the effectiveness of an organization's knowledge management [9].

KM is recognized as a critical competency, especially in engineering and for government, commercial, or non-profit social organizations [10,11]. Achieving effectiveness in KM necessitates strategic institutionalization, a challenge often encountered in organizations with temporary work contracts or project-based structures [12].

Some researchers have drawn and examined companies' KM capabilities in the KM enablers and KM processes [13–15]. Processes within KM encompass activities associated with the 'creation', 'acquisition', 'storage', 'sharing', and 'utilization of knowledge' to enhance organizational effectiveness and competitiveness [13,15–18].

Human resources, as the superior resource in an organization, can enhance employees' performance if it is managed and developed effectively. On the other hand, improving human resource management enhances project success rates in organizations [19]. Besides, the overall performance of employees is linked to their job satisfaction (JS) which in turn stimulates to make extra efforts. Therefore, JS, is considered crucial for both individuals and organizations. Moreover, efficiently implementing KM within organizations stands as a pivotal factor in elevating JS, enhancing efficiency, cutting costs, leveraging organizational knowledge, advancing strategic projects, and attaining competitive advantages in the global market [20,21].

The literature indicates that employees' job performance demonstrates a positive correlation with their JS on construction projects [22]. Increasing the level of JS among employees is a fundamental and significant challenge for organizations since it directly leads to numerous desirable results in organizations, including performance on the job, rate of employee turnover, profit generation, customer satisfaction, and workforce well-being [23]. Human capital can lead to the adoption of pro-environmental construction practice through green work climate [24] and this leads to JS, consequently supplying stakeholders with the essential information regarding initiatives undertaken by the firm that can encourage the necessary green behavior at the construction site [25].

Knowledge provides a source of power for organizations to develop their expertise by taking advantage, solving existing problems, increasing organizational learning, and creating new opportunities for both employees and organizations in the future [26]. However, knowledge becomes effective when it manages optimally in an organization, and this management requires infrastructure in an organization [26]. Meanwhile, JS can be seen "as a necessary outcome of successful organizational behavior management (OBM) interventions" [27].

Implementing knowledge management within the green construction supply chain can enhance the construction industry and improve building productivity by overcoming obstacles to the adoption of green and sustainable resources [28].

On the path towards more sustainable construction methods, Saeed Kamranfar, Yousef Azimi, Mohammad Gheibi, Amir M. Fathollahi-Fard, and Mostafa Hajiaghahi-Keshteli (2022) offer valuable insights into the challenges facing the construction industry. Their research indicates that a network of interconnected obstacles has hindered the development of green construction. These obstacles are classified into five main categories: economic,

technological, institutional, socio-cultural, and informational. Job satisfaction can serve as an effective factor in overcoming socio-cultural barriers also knowledge management infrastructure can play a significant role in addressing informational obstacles in the transition towards more sustainable construction methods [29].

The construction industry, burdened by the substantial expenses and prolonged time-lines inherent to its projects, necessitates the adoption of KM across three critical dimensions: structural, cultural, and technological. The integration of KM within these dimensions presents a compelling economic rationale. However, in Iranian construction firms, the influence of KM infrastructure (KMI) on employee JS is a relatively unexplored area of research. The focus on Iran's construction industry for this study is informed by the sector's substantial investment and growth, mirroring challenges in developing countries [30]. Iran's construction industry, with significant financial turnover and an anticipated steady growth [31], presents a fertile ground for examining the impact of KMI on JS. The country's commitment to advancing construction and infrastructure [32], coupled with the research team's access to reliable data and familiarity with the local industry, underscores the strategic choice of Iran as a case study. This setting offers a nuanced understanding of how cultural and technological infrastructures within KM can influence JS of building industry in emerging markets. Consequently, selecting Iran as the study context satisfactorily met all necessary conditions for generating high-quality data, encompassing the ease of data access, the relevance and timeliness of the findings, and the research team's comprehension. This choice aligns with the data quality framework outlined by Strong, et al. [33], indicating that Iran provides an optimal scenario for collecting dependable data for academic investigation. These reasons highlight a crucial need for research to understand how KM practices influence workforce contentment within this sector.

Knowledge management infrastructure (KMI) encompasses a framework and a suite of services aimed at facilitating the generation, storage, dissemination, and utilization of knowledge within an organization. It comprises various tools and technologies such as content management systems, collaborative platforms, and search engines. The primary objective of KMI is to streamline the discovery and exchange of knowledge, ultimately fostering enhanced decision-making, innovation, and problem-solving capabilities within the organization [34].

The purpose of this research is to investigate the function of KM and its infrastructures in enhancing JS of employees in Iranian construction companies. This research can contribute to the employees' JS within the work environment, provide solutions to enhance the performance of KM in construction companies and boosts organizational performance and productivity. The study's values and contributions go beyond the Iranian context by investigating the influence of KMI on JS of employees within construction companies, a topic that has remained unexplored so far. It will further unveil the scientific association of KM with the JS and provide statistical validity on the optimal development of KMI to improve employee's satisfaction and commitment within construction companies.

In the following sections of the article, after reviewing the background and theoretical framework, statistical research will be conducted, which includes explaining the conceptual model, methodology, and results. Subsequently, the findings of the statistical research will be discussed and examined, and finally, in the conclusion section, the research findings, limitations, and suggestions for future research will be presented.

2. Background and Theoretical Framework

To enhance the coherence of background and theoretical framework, this section has been divided into various subsections. Considering the indicators of knowledge management and job satisfaction and their impacts in the construction industry, the relationship and influence between them are delineated separately in the context of knowledge management infrastructure, organizational structure, organizational culture, and cognitive population.

2.1. Knowledge Management and Construction Companies

Yusof and Bakar believe that KM is “A set of strategies and practices implemented in organizations, which is essentially crucial for the development of construction companies. In the construction sector, there is a growing recognition that KM can catalyze the necessary innovation and enhance business performance needed in the sector” [35]. Kamara et al. (2002) acknowledged that “Organizations increasingly recognize effective KM as a means through which they can fulfill their need for innovation and enhanced business performance” [35]. Faraj et al. (1999), believe that, “In the present-day competitive marketplace, the success of a construction business hinges crucially on the quality of its knowledge concerning markets, products, services, and technologies” [35]. Companies proficient in applying knowledge exhibit strong competitiveness and can effectively translate their intellectual capital into significant collective achievements. The more adept a team is at applying and managing knowledge, the higher the probability of quality team actions and superior team performance [36].

2.2. Knowledge Management Infrastructures (KMI) and Job Satisfaction (JS)

KM includes absorbing, codifying, using, and exploiting the knowledge and experience of employees [12]. KM has a significant effect on JS, and “Consequently, organizational leaders are recommended to incorporate knowledge management activities in their organizations, not only to enhance the performance of knowledge workers but also to enhance their well-being in the workplace” [37]. “Satisfaction from the knowledge management process” has been confirmed in contemporary research field of organizational management [38]. Interestingly, JS significantly fosters influence on knowledge dissemination within project members [39].

JS, as Locke (1976) states, is among the extensively investigated domains in the field of behavior within organizations. It’s defined as a positive emotional condition stemming from an assessment of one’s job or professional encounters” [36]. Many analysts attribute widespread workforce dissatisfaction to a blend of insufficient compensation, inflexible work environments, limited advancement opportunities, and inadequate benefits [40]. Since staff contentment is the foremost crucial element affecting success of KM in project-oriented organizations [11], using KM will efficiently improve the JS of employees and increase the competitive advantage of organizations [8]. Facilitating KM depends on the associated capabilities. KM capabilities are systems within the organization that consistently foster the creation, attainment, storage, protection, and share the knowledge on organizations [41]. These abilities contain KMI (knowledge management infrastructure) capabilities and processing capabilities. Since focus here is on the KM infrastructure, this study will use three key capabilities to indicate KMI. These abilities encompass organizational culture, organizational structure, and technological elements, as Gold et al. [42] suggested.

2.3. Structural Knowledge Management Infrastructures (SKMI)

Structural KMI, or structural knowledge management infrastructure, refers to the foundational elements within an organization that facilitate knowledge creation, sharing, and utilization [43]. It’s essentially the framework that enables and supports effective knowledge management practices.

Organizational structure (OS) describes how tasks and sub-efforts expected to implement a philosophy are arranged [44]. OS deals with official distribution of recruitment roles and administrative systems to uphold and merge specific job tasks. There must be an appropriate structural infrastructure to unlock the complete knowledge capacity [45]. OS performs a decisive participation on employing technological systems and networks for communication, facilitating cooperation and knowledge sharing within organizations [46]. Based on the proposed concepts, the hypothesis of the effect of the structural infrastructures of KM on JS is articulated as outlined below:

H1. *Structural Knowledge Management Infrastructures has a significant effect on Job Satisfaction.*

2.4. Cultural Knowledge Management Infrastructures (CKMI)

Islam, Jasimuddin, and Hasan [47], believed that “Culture encompasses worth, beliefs, doctrine, and way of behaving which exist in company. Every organization possesses its distinct culture. A suitable culture of organization can act as a necessary condition for efficacy of KM” [8]. If the organizations resist against change, KM programs do not operate effectively. Therefore, a suitable organizational culture includes a culture that promotes share, coordinate, participation, and knowledge attainment through staff [48].

Culture of organization stands as among pivotal agents influencing JS [8,42,49,50]. Culture establishes a shared mindset and comprehension that affects the way staff perceive the organizational truth and, consequently, molding viewpoints and functions of staff [51]. Multiple studies showed which culture of organization and JS have a positive relationship with each other [8,52,53], while findings of some research such as [54] did not demonstrate any connection linking with culture and JS. In spite of the numerous studies carried out to scrutinize the connection within culture and JS, Masa’deh, Gharaibeh, Maqableh, and Karajeh [55] reasoned which connection with culture and JS requires additional scrutiny [55]. Hence, connection with culture of organization and JS it has been proposed in hypothesis that follows:

H2. *Cultural Knowledge Management Infrastructures has a significant effect on Job Satisfaction.*

2.5. Technological Knowledge Management Infrastructures (TKMI)

Ability of technology pertains to the basic of organization structure’s information technology, contains physical equipment, software, internal and external networks and databases [46]. Technology facilitates the effectiveness of KM [8]. According to [56,57], technology is categorized to three groups depending on the goal of KM: ref. [58] knowledge production instruments that activate acquire, combination and the process of creating knowledge; (two) The knowledge coding instruments for codification implicit and obvious knowledge and (three) instruments for knowledge exchange which eliminate time, geographical and social distance related to collaborative knowledge exchange and broadcast. Findings show that as companies increase their investment on information technology, staff of that company are likely to experience higher satisfaction with circumstances at work and connections between coworkers [56,57,59]. Hence, the tertiary assumption can be framed in the following:

H3. *Technological Knowledge Management Infrastructures has a significant effect on on Job Satisfaction.*

2.6. Demographic Variables and Job Satisfaction

Earlier studies show which result of demographic factors upon JS cannot be judged with the certainty. However, some research results [60,61] show that in case of academic organizations, members of faculty who are men possess greater quantities of JS Regarding advantages, salaries, and job upgrade than their female counterparts. In contrast, other studies show that gender has no significant effect on JS [62,63]. Link amongst age and JS has also surrendered conflicting conclusions since several studies indicated which their link seems U-shaped [64–66]. Belias, Koustelios, Sdrolas, and Aspridis [67]’s study have found that work experience in public institutions affects employees’ sense of JS. Wae [68] discovered that staff with experience exhibit higher levels of satisfaction compared to the counterparts with low experience [68]. Conversely, some research indicates that experience does not affect staff’s satisfaction [69,70]. Academic rank is another predictor of JS. The greater the standing in academia, the greater stable the work and consequently, the superior the JS [62]. Therefore, the hypotheses related to the effect of demographic variables on JS are presented as follows:

H4a. The effect of Knowledge Management Infrastructures on Job Satisfaction is moderated by the age variable.

H4b. The effect of Knowledge Management Infrastructures on Job Satisfaction is moderated by the gender variable.

H4c. The effect of Knowledge Management Infrastructures on Job Satisfaction is moderated by the work experience variable.

H4d. The effect of Knowledge Management Infrastructures on Job Satisfaction is moderated by the academic rank variable.

3. Statistical Research

3.1. The Conceptual Model

The present research examines effect from KMI, encompassing Structural KMI (SKMI, OS), organizational KMI (OKMI, OC) and technological KMI (TKMI, OT) as independent factors upon JS, as the dependent factor. Additionally, demographic factors such as gender, age, work experience, and educational level of employees have been taken into account as the moderating variables (Figure 1).

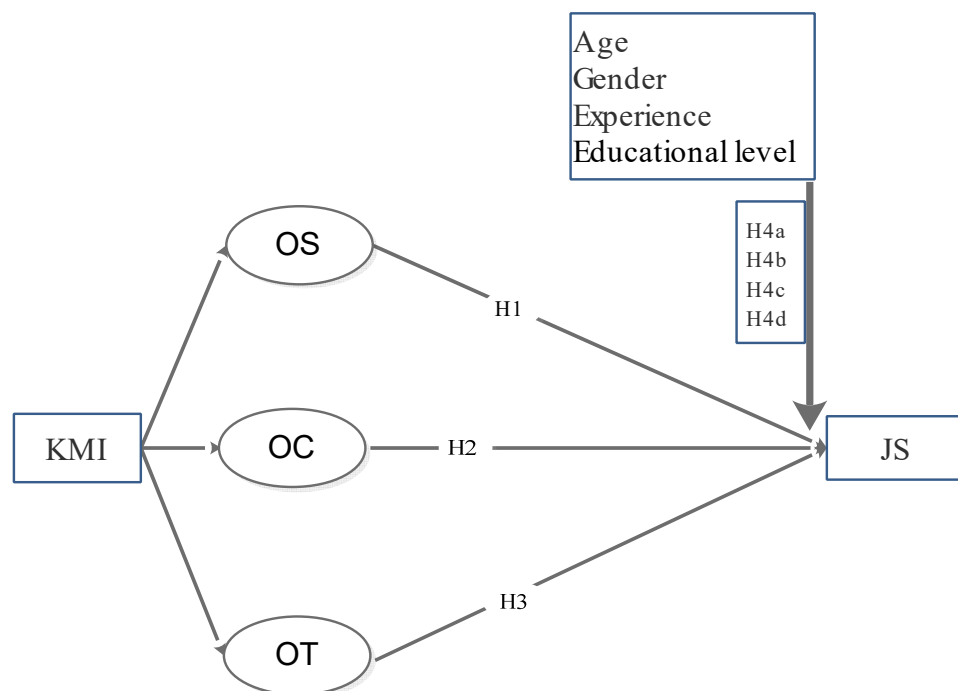


Figure 1. Conceptual model.

3.2. Methodology

The current study adheres to an applied research paradigm, with the objective of transferring established scientific knowledge into the specific context of construction companies within Iran. Employing a data collection methodology aligned with descriptive survey principles, the research primarily seeks to characterize and analyze the prevailing circumstances. The list of certified companies was downloaded from the data bank of licensed construction companies. The company names of the list were sorted alphabetically. Afterwards, a random selection was carried out by using a non-replacement random selection technique as explained by Ghoddousi and Hosseini [71].

The study's target population encompassed 218 managers and senior experts hailing from various construction companies. The selection of these people was based on their experience in the KM field. Individuals with over five years of professional expertise were

selected as the target population. To establish an appropriate sample size, the insights provided by Krejci and Morgan (1970) were referenced, indicating a minimum requirement of 138 participants. Recognizing the potential for non-cooperation and the risk of incomplete questionnaire responses, 150 surveys were disseminated face-to-face within the selected sample survey in 2022. Ultimately, 140 participants successfully provided complete responses, forming the basis for data analysis, indicating a 93% response rate. For data collection, the research deployed measurement tools designed for KMI, as outlined by Gold et al. (2001), alongside JS questionnaires originally developed by Hackman and Oldham [72]. In evaluating the generated research theories, the research utilized partial least squares structural equation modeling (PLS-SEM) methodology. SmartPLS is a graphical user interface software for variance-based structural equation modeling utilizing the partial least squares path modeling method [73]. This advanced analytical technique allows for the experiment of intricate connections among various factors [74]. The analysis was executed using the SmartPLS software (version 3.2.8), providing a robust platform for scrutinizing research propositions.

The Questionnaire's Authenticity and Validity

A preliminary sample of 15 members was employed for the pre-test phase. The questionnaire's questions yielded an alpha coefficient for Cronbach of 0.862, showing an elevated degree of internal coherence. Table 1 presents the structural reliability, computed using Cronbach's alpha, alongside the structural reliability coefficient.

Table 1. Cronbach's alpha coefficients and structural reliability of research constructs.

	α	Combined Reliability
JS	0.841	0.865
OS	0.928	0.942
OC	0.841	0.882
OT	0.867	0.900

According to Table 1, the values of the reliability indices are bigger than 0.7 that implies an appropriate degree of dependability. Therefore, JS and KMI questionnaires are reliable.

3.3. Results

The research process involved several distinct steps. Initially, the statistical population was characterized and described. Subsequently, the relationships existing between the variables were quantified using PLS analysis in the second step. The third phase encompassed the establishment of the external research model through the fitting of the measurement model. Moving forward, the fourth step entailed testing the hypotheses formulated for the research. Finally, the fifth step involved the configuration of the research's internal model, encompassing the culmination of the analytical process.

3.3.1. Describing the Statistical Population

The demographic composition of the studied population reveals that out of the total participants, 127 (90.8%) are male, while 13 (9.2%) are female. In relation to age distribution, 38 participants (27%) are below the age of 35, 75 participants (53.5%) fall within the age range of 35 to 45, and 27 participants (19.5%) are aged 45 and above. Regarding educational attainment, 125 participants (89%) have obtained master's degrees, 12 participants (8.5%) possess bachelor's degrees, and three participants (2%) hold doctorate degrees. A substantial portion of the participants, specifically 102 individuals, boasts a work experience spanning 10 to 15 years.

3.3.2. Validation of the Relationships between the Variables

Overall study paradigm has been illustrated inside Figure 2. This model summarizes the outputs in connection with standard factor loading of the various factors. T-statistics and utilizing bootstraps are provided to gauge the importance of connections.

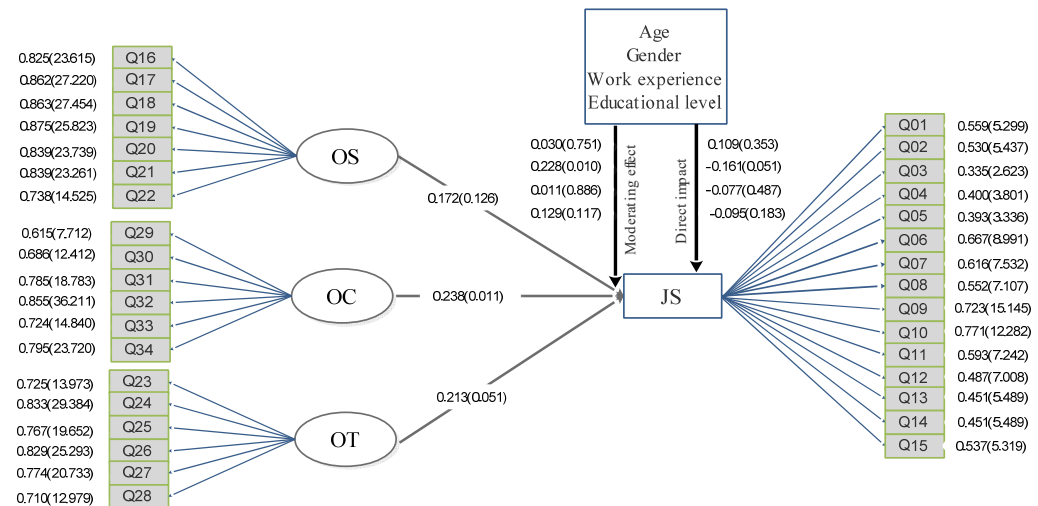


Figure 2. External model.

According to Figure 2, the factor loading estimates are greater than 0.5, and the t-test statistic is greater than 1.96. Therefore, the external model is approved. The next step is to determine the relationships between research variables.

In general, the relationships between variables based on partial least squares categories are of two categories:

1. External model: shows the relationships between hidden and obvious variables.
2. Internal model: examines the relationships between hidden variables with each other.

3.3.3. To Fit the External Model of Research (Measurement Model)

This research used authenticity convergence, combined dependability, α , and divergent authenticity to fit external model. Average Variance Extracted [45] was used to check the convergent validity. If the convergent validity is higher than 0.5, the convergent validity of the construct is established [75]. The composite reliability having a greater factor loading is significant and composite reliability of structures is superior compared to α . To calculate the convergent validity and composite reliability, subsequent connections should be created:

$$CR > 0.7; CR > AVE; AVE > 0.5$$

According to Table 2, CV values are bigger than 0.5. Therefore, validity convergence of investigated constructs approved. Since α for all factors exceeds 0.7, the reliability is duly approved. Combined reliability amount is greater than the extracted average variance and on any situation, is over 0.7 threshold.

Table 2. Convergent validity, Cronbach's alpha, and composite reliability of study constructs.

	CV	α	CR
JS	0.508	0.841	0.865
OS	0.698	0.928	0.942
OC	0.559	0.841	0.882
OT	0.600	0.867	0.900

Heterotrait-Monotrait Ratio (HTMT) was used to check divergent validity [76]. If the construct's divergent validity is less than 0.9, then the differential construct validity is verified.

Based on Table 3, the value of HTMT for all of the investigated structures is less than 0.9. Therefore, the divergent validity is verified.

Table 3. Divergent validity matrix, alpha for research constructs.

	JS	OS	OC	OT
JS	1			
OS	0.451	1		
OC	0.459	0.449	1	
OT	0.471	0.679	0.750	1

3.3.4. Testing Research Hypotheses

- *Investigating the influence of KMI on JS*

To find out influence of structural, cultural, and technological KM infrastructures on JS, the coefficient of each structure should be analyzed; the larger coefficient indicates the greater impact of that structure on JS. Therefore, the results of Table 4 test hypotheses 1 to 3.

Table 4. Summary of research hypothesis test results.

	Path Coefficient	T Statistics	p Values	Findings
H1: OS → JS	0.172	1.532	0.126	Positive but nonmeaningful
H2: OC → JS	0.238	2.560	0.011	Positive and meaningful
H3: OT → JS	0.213	1.952	0.051	Positive and meaningful

According to Table 4, OS has no significant effect on employee JS ($T = 1.532$; $P\text{-Coefficient} = 0.172$). Therefore, hypothesis H1 is not confirmed. However, OC has a significant effect on employee JS ($T = 2.260$; $P\text{-Coefficient} = 0.238$). As a result, hypothesis H2 is confirmed. Likewise, OT has a significant effect on the JS of the employees of construction companies ($T = 1.952$; $P\text{-Coefficient} = 0.213$). Therefore, hypothesis H3 is also confirmed.

Based on the results, among the KMI, only the OT and OC have significant impacts on the JS of the employees of construction companies, and the effect of OT is more significant than OC.

- *Examining influence of demographic variables on JS*

Before discussing how demographic factors moderate the effect, we examine the direct effect of age, gender, work background, and educational level on JS.

According to Table 5, specifications of age, sex, professional background and educational degree did not significantly affect JS at a level of 0.05. In other words, JS does not depend on age, gender, professional background and educational degree.

Table 5. The direct effect of demographic factors on JS.

	Path Coefficient	T Statistics	p Values
Age → JS	0.109	0.929	0.353
Gender → JS	−0.161	1.951	0.051
Work experience → JS	−0.077	0.695	0.487
Educational level → JS	−0.095	1.332	0.183

The moderating role of specifications of age, sex, professional background, and educational degree in influence of KMI on the JS is shown in Table 6.

Table 6. Moderating effect of demographic factors on KMIs and JS.

	Path Coefficient	T Statistics	p Values
H4a: Moderator effect of age on KMI → JS	0.030	0.317	0.751
H4b: Moderator effect of Gender on KMI → JS	0.228	2.561	0.010
H4c: Moderator effect of Experience on KMI → JS	0.011	0.144	0.886
H4d: Moderator effect of educational level on KMI → JS	0.129	2.396	0.017

As outlined in Table 6, the analysis demonstrates that participants' age fails to moderate the relationship between KMI and JS ($t = 0.317$; P-Coefficient = 0.030). Consequently, Hypothesis H4a is not substantiated, indicating that age does not exert an influence on JS. In contrast, gender emerges as a moderating factor in the connection between KMI and JS ($t = 2.561$; P-Coefficient = 0.228). This verifies Hypothesis H4b, namely the influence of KMI on JS is indeed influenced by the gender variable. Furthermore, the analysis reveals that participants' work experience does not serve as a regulating element in connection among KMI and JS ($t = 0.144$; P-Coefficient = 0.011). Consequently, Hypothesis H4c is not upheld, suggesting that the impact of KMI on JS remains consistent across individuals with varying levels of work experience. Conversely, the participants' educational level does exhibit a regulating function in connection among KMI and JS ($t = 2.396$; P-Coefficient = 0.129). Consequently, Hypothesis H4d is confirmed, indicating that the level of education does influence the effect of KMI on JS. In summary, the analysis provides insights into how demographic variables, namely gender, work experience, and educational level, can influence the relationship between KMI and JS, thereby enriching our understanding of these dynamics.

- *To fit the internal research method (structural framework)*

To fit an internal structural framework, Determination, Q^2 index, and the GOF (Goodness of Fit) indicator were utilized (Tenenhaus, Vinzi, Chatelin and Lauro, 2005). As part of this methodology, the calculation of two key indices, namely Cross-validated Redundancy and Cross-validated Communality, was carried out. The coefficient of determination, as outlined in Table 7, serves as one of the fundamental measures. This coefficient evaluates the extent to which the variance in the endogenous constructs is explained by the model. The Q^2 index, often referred to as the Stone-Geyser criterion, serves to assess the predictive capability of the model. Specifically, a Q^2 value that turns zero or negative for an endogenous construct signifies the need for the re-evaluation of the relationships between this construct and other components within the model. The calculation of the Q^2 value leverages the blindfolding technique implemented in the SmartPLS software. In the context of this methodology, cross-validated redundancy and cross-validated communality are computed, contributing to the model assessment. These indices aid in comprehending the reliability and integrity of the constructs within the model. Ultimately, the results of these analyses, including the coefficient of determination, are detailed in Table 7, providing a comprehensive picture of the internal model's performance and predictive capacity.

Table 7. Coefficient of determination and Q^2 index for endogenous research constructs.

	R^2	CVR	CVC
OS	0.698	0.685	0.598
OC	0.559	0.604	0.620
OT	0.600	0.671	0.601
JS	0.808	0.436	0.428

As per Table 7, the coefficient of determination signifies the model's quality in predicting forthcoming outcomes, and it is observed to be substantial. The coefficient determining JS stands at 0.808, indicating a satisfactory level of predictability. Furthermore, the positive values attributed to cross-validated redundancy and communality signify the model's

reliability. Consequently, the assessment of the constructs' predictive prowess ranges from moderate to strong.

3.4. GOF Index

The GOF index was used as an overall measure of the model fit. This index is calculated by using the square root of the product of the "average R^2 " and "average communalities":

Wetzels et al. [77] Proposed three thresholds of 0.01, 0.25, and 0.36 to represent weak, medium, and strong values for the Goodness-of-Fit statistic. Goodness of fit score in this research is equivalent:

$$\text{The value of ratio of determination } (\overline{R^2}) = 0.751$$

$$\text{Average of communalities } (\overline{R^2}) = 0.63$$

$$\text{GOF} = \sqrt[2]{0.375137 \times 0.630} = 0.390$$

With a GOF factor of 0.390, it can be concluded that framework fits well.

4. Discussion

As stated in the introduction, the operative management of knowledge and implementation of knowledge management has emerged as a critical factor in enhancing productivity, innovation, competitive advantage and overall performance of to-day's organizations. By examining the interplay between job satisfaction and the mechanisms through which knowledge is created, shared, and applied within the company, the authors intend to shed light on the key drivers and implications of this relationship. Through a comprehensive analysis of empirical findings and theoretical frameworks, the article explores how investments in KMI can contribute to fostering a positive work environment, enhancing employee engagement, and ultimately, driving organizational success in Iranian construction companies.

The findings of this study highlight that both technological KMI (TKMI) and cultural KMI (CKMI) have substantial and positive effects on employees' JS. This is attributed to technology's role in facilitating seamless integration of information and communication systems, thereby fostering active and cohesive collaboration among employees. Such collaboration, underpinned by communication and interpersonal interaction, has been established as pivotal for the success of projects [78]. The results of this part are in line with the findings of Löhr et al. [78], confirming that TKMI and CKMI are the foundation of communication and interpersonal interaction, two essential factors for project achievement. As recent studies show (see among others Sweis et al. [57], Hajir et al. [56], Hosseini et al. [59], Ra'ed Masa'deh et al. [8]) increasing the investment in IT can increase job satisfaction among employees.

- Furthermore, the elimination of communication barriers among different organizational units enhances task execution, thus contributing to heightened satisfaction. Moreover, a culture that encourages opportunities, fosters supportive relationships among peers and supervisors, promotes teamwork, trust, and effective leadership, plays a pivotal role in elevating JS [8,79]. Similarly, Masa'deh [8] demonstrates cultural factors strengthen teamwork and increase job satisfaction. Therefore, the results of this section confirm the second hypothesis of the study.
- Moreover, the research indicates that structural KMI (SKMI) does not exert a significant effect on JS within Iranian construction companies. The prevalent traditional hierarchical structure within these companies dictates roles, responsibilities, and information flow, influencing interaction and knowledge sharing. This structure, characterized by top-level managers making critical decisions, hinders the favorable impact of SKMI on employees' satisfaction.
- Interestingly, the study's results reveal that both age and work experience do not directly impact JS. Participants across different age groups and work experience levels

in Iranian construction companies exhibit a consistent satisfaction with using KMI. This contrasts with some views, such as that of Belias, Koustelios, Sdrollias, and Koutiv [80], which suggests that employees with limited experience might experience higher anxiety, leading to decreased satisfaction [8]. However, Masa'deh et al. [8] argue that age and work experience could positively influence the relationship between KMI and JS, highlighting the role of environmental factors and organizational culture in shaping this relationship. Consequently, according to the results of this part, hypotheses H4a and H4c are not confirmed. The previous studies examining the effect of age and work experience on job satisfaction present various results. For instance, the findings of Yılmaz, 2014 and Sekar, 2012 contradict this paper's result while the result of Belias, Koustelios, Sdrollias, and Aspridis [67] is in line with this study.

- Additionally, the study establishes that while gender does not bear a direct relationship with JS, it can moderate the impact of KM on JS (see, for instance, Toker [62] and Ward et al. [63]). Gender differences potentially influence information processing and interpersonal dynamics among employees, consequently affecting their perception of the work environment. Variations in job-related expectations between genders can be attributed to these differences, with women often valuing social aspects more, while men prioritize self-expression. This points to the necessity of adapting human resource policies to accommodate gender differences, which significantly influence JS. So, H4b has confirmed.
- The educational attainment does not directly correlate with JS, yet it does moderate the relationship between KM and JS. Employees possessing higher academic degrees exhibit higher satisfaction levels due to specialized knowledge aligned with their professional domains. Toker [62] validates that an academic degree can be a moderator between KM and JS as well. Therefore, H4d has confirmed.
- This study underscores the intricate relationships between KM infrastructures, demographic factors, and JS within the context of Iranian construction companies. It emphasizes the importance of considering these factors while formulating organizational strategies to optimize employee satisfaction and performance. Expanding businesses are widely recognized as significant contributors to employment, innovation, and competitiveness. The construction industry has demonstrated substantial growth in recent years, driven by the Iranian government's policies focusing on housing for young individuals and those with low incomes, in addition to infrastructure ventures such as dam and road projects. Meanwhile, knowledge stands as a valuable resource for companies aiming to enhance growth performance amidst a turbulent business environment. However, the effective utilization of this knowledge relies heavily on managerial capability. Otherwise, it remains underutilized within the organization.

5. Conclusions

This study investigated the influence of KMI on JS of employees within Iranian construction companies, a topic that has remained unexplored. The research findings unveil that the existing state of knowledge management within Iranian construction companies does not significantly contribute to the job satisfaction. Conversely, variables such as age, gender, work experience, and educational level can bolster the effectiveness of knowledge management infrastructure, consequently amplifying this virtue.

In light of these findings, managers are encouraged to consider adapting traditional hierarchical structures, given that organizational structure can considerably shape employees' attitudes and behaviors. These insights extend beyond the construction industry and offer practical implications for other engineering companies grappling with similar challenges. Furthermore, within construction projects, effective knowledge management translates into the application of lessons learned—encompassing both positive and negative experiences—to circumvent repetitive mistakes. This approach leads to the enhanced project implementation efficiency, fostering a sense of accomplishment and contentment among both managers and employees within these organizations. Additionally, fostering

knowledge sharing cultivates commitment, engendering a sense of efficacy within the organization. Recognizing the pathways through which job satisfaction can be heightened represents a strategic initiative on the part of managers. The study underscores that the optimal development of knowledge management infrastructures can maximize employees' satisfaction and commitment, contributing to overall organizational success.

This study highlights the significant impact of cultural and technological elements over structural ones. For practitioners, adopting tailored KMI strategies that prioritize cultural alignment and technological integration can lead to a more satisfied and productive workforce. Policymakers are advised to consider these findings when developing industry standards and educational programs, emphasizing the need for a skilled workforce capable of navigating and contributing to a knowledge-rich environment. This strategic focus on KMI can foster a more innovative, efficient, and content workforce, driving the construction industry forward.

However, the findings of this study should be treated with cautions. The study's focus on Iranian construction companies may limit the generalizability of its findings to other cultural or industrial contexts. Moreover, the research does not extensively explore the specific mechanisms through which different KMIs impact JS. In addition, the research does not fully account for the possible effects of external economic and regulatory factors on KMI and JS dynamics, while these limitations may overshadow this study's findings.

Future research directions could include comparative studies across different cultural and industrial contexts to better understand the universal applicability of these findings. Additionally, in-depth qualitative research could provide further insights into how different aspects of KMI specifically impact employee satisfaction and how external factors might influence this relationship. Exploring the role of technology in facilitating knowledge management, especially in the context of rapidly evolving digital tools in construction, could also be a valuable area for further investigation.

Author Contributions: Conceptualization, S.T. and H.A.; methodology, H.A.; software, S.T. and H.A.; validation, H.A., B.B. and S.B.; formal analysis, S.T.; investigation, S.T. and S.B.; resources, S.T. and S.B.; data curation, S.T.; writing—original draft preparation, S.T.; writing—review and editing, S.T., H.A. and S.B.; supervision, S.B.; project administration, H.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: Some or all data or models used during the study are available from the corresponding author by request.

Conflicts of Interest: The authors declare no conflicts of interest.

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