Article

Investigating knowledge management contribution to dispute minimization of airport development projects in Indonesia

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Abstract: Most airport development projects entail disputes due to the features that are distinctive and complicated. Disputes can be minimized through creative problem-solving by implementing knowledge management practices into the system. This study investigates the direct influence of knowledge management (KM) on dispute minimization (DM) along with the key factors for developing a strategy that can enhance KM success. A mixed method was adopted including statistical data analysis based on the PLS-SEM and descriptive analysis with the SECI (Socialization, Externalization, Combination, Internalization) model approach for strategy development. These findings show that KM has a positive and significant direct influence on DM, while the factors that are considered to have a significant influence on KM success are human resources management (HR) and learning & training (LT) on airport development projects in state-owned airport companies. This research supports the importance of a well-developed HR system accompanied by regular LT to all members of the organization to optimize and encourage the spread of knowledge in the organization.

Keywords: knowledge management; dispute; development; projects; airport

1. Introduction

The main objective of a construction project is to complete the construction works according to the contract's specifications, but ineffective contract management often paves the way for dispute (Teerajetgul et al., 2009). Disputes are bound to happen in any relationship, even if the parties try to avoid them because each party naturally wants to protect their interests and position (Hardjomuljadi, 2020). Construction is highly conflict-prone, and due to the complexity of work, competitive environment, and intricate project documents, there is a tendency to be involved in conflicts (Shash and Habash, 2021). Disputes are a regular occurrence in construction projects, especially in more complex projects (Silva et al., 2023). Most airport projects are on an international level, complex, with significant costs, and are initiated by different stakeholders across diverse fields of expertise (Cevikbas et al., 2023). Airport construction and renovation projects frequently encounter disputes daily, leading to negative outcomes (Battal, 2017).

The other consideration is that the construction industry is experience-based. Hence both knowledge and judgment based on experience are considered critical to the prevention and resolution of disputes and issues related to it (Liu et al., 2019). Utilizing project information effectively and converting it to project knowledge enables project managers to benefit from previous experiences and apply this knowledge to upcoming projects, resulting in decreased contract disputes and the avoidance of potential issues (Wong and Hui, 2006). Knowledge is a precondition

for managing errors, and knowledge management practices are essential for capturing, storing, disseminating, and reusing contract management experience gained from previously completed projects (Love et al., 2018). Implementation of knowledge management would be successful with a good and proper understanding of the various knowledge management processes supported by the critical success factors of knowledge management, at the same time appreciating the tangible and intangible results arising out of implementation of knowledge management (Ali et al., 2012). Hence, it is essential to research the factors affecting knowledge management implementation and possible strategies that can be used to enhance the successful implementation of knowledge management. The author's motivation for this research stems from the lack of prior studies discussing the impact of knowledge management on disputes in airport development projects. For this reason, the study aims to answer the following research question.

- RQ1: Does the successful knowledge management practice affect dispute minimization?
- RQ2: What are the key factors that support successful knowledge management practice?
- RQ3: What strategies can be used to implement knowledge management to minimize disputes?

2. Literature review and hypotheses
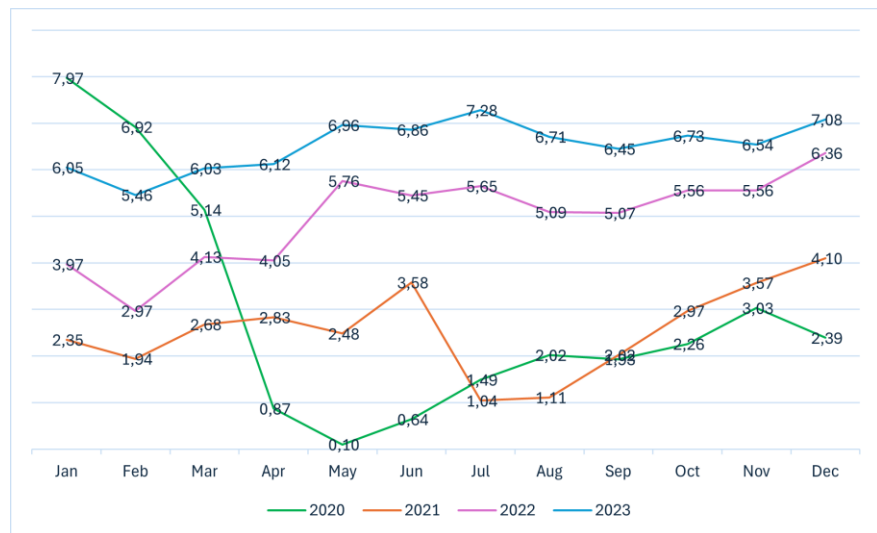
2.1. Airports in Indonesia

Figure 1. Air traveler numbers in Indonesia.
Source: Indonesian Central Bureau of Statistics, 2024.

Indonesia, being the biggest archipelago globally with 17,504 islands, heavily depends on air travel for connectivity between its western and eastern regions (Fitriani et al., 2018). In the execution of air travel operations, two key systems to emphasize are airports as the management of supporting facilities and infrastructure, and airline companies as operators of aircraft in their fleet. The international airport as one of the country's gateways is a hub of the air transportation system and has a

very important role in elevating the dignity of the country and supporting its economy (Qadarsyah et al., 2022). Data on the rise in domestic and international air traveler numbers post-COVID-19 pandemic has been documented by the Indonesian Central Bureau of Statistics. In 2020, there were 34.76 million air transportation passengers, which decreased to 30.67 million in 2021 as it was the post-pandemic recovery period from Covid-19. Yet, the number of air travel passengers rose once more in 2022 to 59.62 million and saw a significant surge in 2023, reaching 78.27 million passengers, as shown in **Figure 1.**

In Indonesia, airport operations have been regulated in the law which states that airports are vital assets and can only be managed by state-owned companies, regional-owned companies or the government, this is due to the role of airports as infrastructure to strengthen the archipelagos' vision and the country sovereignty in supporting national security (Kurniasih et al., 2019). Therefore, seven large-scale airport development projects are categorized as National Strategic Projects according to the regulation of the coordinating minister for Economic Affairs of the Republic of Indonesia number 7 in the year 2023. The NSP work progress and completion are strictly monitored by the central government thus it is necessary to avoid delays such as minimizing the occurrence of construction disputes.

2.2. Knowledge management and dispute

Arcadis' 2022 Global Construction Dispute Report reveals that worldwide disputes mainly stem from poorly written or incomplete claims, contract document errors, and lack of understanding or fulfilment of contractual obligations by the parties involved. In a study conducted by Khalef et al. (2024) on the causes of dispute on airport projects in the United States, it was found that the most common causes of dispute were due to ambiguities in contract interpretation, losses incurred, safety issues, and negligence or lack of duty of care. Underlying this, it can be said that project members need to have knowledge and skills in communication, negotiation and problem-solving abilities to run the project smoothly.

Knowledge, as such, is a critical organizational resource because it plays an integral part in organizational effectiveness (Onofre and Teixeira, 2022). Knowledge is the process of identification of opportunities, optimization, and active management for the creation of value, enhancement of productivity, and making a profit to maintain competitive profitability through effective knowledge management (Nakamori, 2020). Knowledge management promotes effective decision-making, innovation, and collaboration (Rajiani and Normuslim, 2023). Secondly, knowledge management influences dispute resolution capacity strongly, driven through the development of human resources due to the capability of keeping mediators in touch with the work to be done and general knowledge outside of work (Suriani et al., 2023). A literature study on previous research was conducted to obtain knowledge management activities that can prevent disputes as written in **Table 1.**

Table 1. KM activities to prevent disputes.

No	Activities	References
1	Conduct training to gather knowledge on contract management	Hu et al., 2023; Wang et al., 2019
2	Conduct regular progress meetings and updates	Gamil and Abdul Rahman, 2020; Wang et al., 2019
3	Launch an introductory campaign and training for all project participants on communication	Gamil and Abdul Rahman, 2020
4	Execute better communication and dialogue among members	Natek and Zwilling, 2016; Sabri and Torp, 2022
5	Placing members from different departments in the same project	Rehman, 2013
6	Provide incentives to motivate members to share knowledge	Rehman, 2013
7	Learn to develop contract data and tender documents effectively and in a language that is understandable to all parties	Gamil and Abdul Rahman, 2020; Sabri and Torp, 2022; Wang et al., 2019
8	Learn to implement a filing system in manage project information	Gamil and Abdul Rahman, 2020
9	Develop a communication flowchart and responsibility matrix	Septari and Latief, 2020
10	Establish a database of lessons learned and best practices	Natek and Zwilling, 2016
11	Provide an enabling infrastructure for the codification of members' knowledge	Rehman, 2013
12	Electronically document and record discussion results or meeting minutes	Hu et al., 2023
13	Develop new ideas, concepts, or innovations related to the project collaboratively	Hu et al., 2023
14	Explore the internet to gather all information related to the project	Hu et al., 2023
15	Develop project documents collaboratively	Natek and Zwilling, 2016
16	Updating existing tangible and intangible intellectual assets collaboratively	Natek and Zwilling, 2016
17	Learn to develop new contractual agreements that are simple, fair, and based on win-win solution principles	Sabri and Torp, 2022; Wang et al., 2019
18	Learn to develop a communication system to manage the dissemination of project information	Gamil and Abdul Rahman, 2020
19	Adopt a suitable communication system to establish communication frequency and maintain information	Gamil and Abdul Rahman, 2020
20	Provide leadership skills among top management	Gamil and Abdul Rahman, 2020
21	Carry out training & certification of expertise to members	Hayati and Latief, 2019
22	Implementing job training programs for members	Hu et al., 2023; Natek and Zwilling, 2016
23	Assigning members to be directly involved through learning by doing	Hu et al., 2023; Natek and Zwilling, 2016
24	Conduct socialization as a forum for members to share experiences and new things	Hu et al., 2023
25	Conduct conferences and brainstorming (related to the projects)	Natek and Zwilling, 2016

Knowledge can be classified into two ways: there is explicit and implicit knowledge. Implicit knowledge is acquired from experience, activity, and participation in each setting. The knowledge is acquired by learning and comprises cognitive and technical elements. Implicit knowledge is a personal attribute not easily put through articulation (Ni et al., 2018). Explicit knowledge, on the other hand, could be documented in formal language and articulated. It can be recorded, expressed, and disseminated within a language or another form of symbols that take material form (Igbinovia and Ikenwe, 2018). This is because knowledge management is instructive in the fact that organizations must make use of existing knowledge to enable them to make decisions faster and more efficiently (Yap and Toh, 2020). Effective and efficient knowledge can be utilized to better contract management practices to bring down the impact of changes in contracts that bring

disputes (Wang et al., 2019). Hence, it can be proposed that there is a significant influence of knowledge management practices on dispute minimization (H1).

2.3. Knowledge management success factors

Nowadays, organizations believe in the critical role of knowledge to gain sustainable competitive advantage (Ahmadvand and Eghbali, 2020), thus, knowledge management practice is essential for organizations, and they must be aware of factors that will influence the effectiveness of knowledge management initiatives (Adegbembo et al., 2020). Determining the critical success factors of knowledge management can play a significant part in increasing competitive advantage; further, it may enhance organizational performance and improve the chances of success in implementing knowledge management if the priority has been decided (Ghasemi and Valmohammadi, 2023). Several previous research works deal with the key factors responsible for the practice of knowledge management. The study zeroed in on six factors that were seen as influential following the literature made public on or after 2018 through 2023, including IT support (IT), human resources management (HR), the knowledge management process (KP), organizational culture (OC), learning & training (LT), and leadership support & commitment (LS).

Modern IT is crucial to the application of knowledge management because it may provide firms with access to specialized knowledge sources, technical databases, decision support systems, management models, and efficient ways to handle competitive circumstances, it is a crucial tool to facilitate organizational KM practices for better performance (Kamal et al., 2019). With IT support, members may collaborate across time and location to solve problems and make choices by capturing, storing, and sharing knowledge (Gunasekera and Chong, 2018). Hence, it can be proposed that there is a significant influence of IT on KM (H2).

Individuals are the creators of knowledge in organizations, and most of the organization's knowledge is in their minds (Ghomi and Barzinpour, 2018). Therefore, retaining knowledgeable members is crucial for organizations in the current knowledge era (Othman et al., 2018). The more HR management practices that consist of career management, professional training, and assurance are implemented, the greater the knowledge enhancement process will be (Figueiredo et al., 2016). Hence, it can be proposed that there is a significant influence of HR on KM (H3).

The knowledge management process within the organization includes the activities of knowledge creation, knowledge sharing, knowledge storage, and knowledge use (Gonzalez and Martins, 2017). Onyeagam et al. (2020) state the critical ingredients required to build and grow a sustainable knowledge management program to enhance the competitive position of construction organizations consisting of people, process, content/IT, and strategy. Hence, it can be proposed that there is a significant influence of KP on KM (H4).

Organizational culture refers to the fundamental idea values, and social norms that control the behaviour and performance of people within the organization (Ghomi and Barzinpour, 2018). Often, organizational culture becomes merged with managerial performance and knowledge management as these three move together on an equal footing in developing performance efficiencies (Rashid et al., 2020).

Hence, it can be proposed that there is a significant influence of OC on KM (H5).

One of the ways by which management can bring about effective knowledge management practices is through training its members. Training ensures the systematic development of behavioural attitude patterns, knowledge, and skills members require to carry out assigned tasks (Renukappa et al., 2021). Training and resource development are essential for the effective use of knowledge management since they foster member interaction and generate new knowledge for the company (Septari and Latief, 2020). Hence, it can be proposed that there is a significant influence of LT on KM (H6).

Support from direct superiors is vital in helping members share knowledge with colleagues at all organizational levels, the support and commitment of the leadership will undoubtedly affect the availability of resources, IT infrastructure, and policies that support the successful implementation of knowledge management (Muhammed and Zaim, 2020). Leaders need to grasp the importance of knowledge management to support decisions about its implementation in a proactive manner (Kunthi et al., 2018).

Hence, it can be proposed there is a significant influence of LS on KM (H7).

To address RQ1 and RQ2, a research framework must be developed for utilization in statistical analysis with PLS-SEM. Given the lack of substantial research on the direct influence of successful KM on DM, this research model investigates whether KM serves as an important predictor of DM. This study also takes into consideration six key factors including IT, HR, KP, OC, LT, and LS which are considered to directly influence KM, however, no analysis of the direct influence of key factors on DM is carried out. The research model is shown in **Figure 2**.
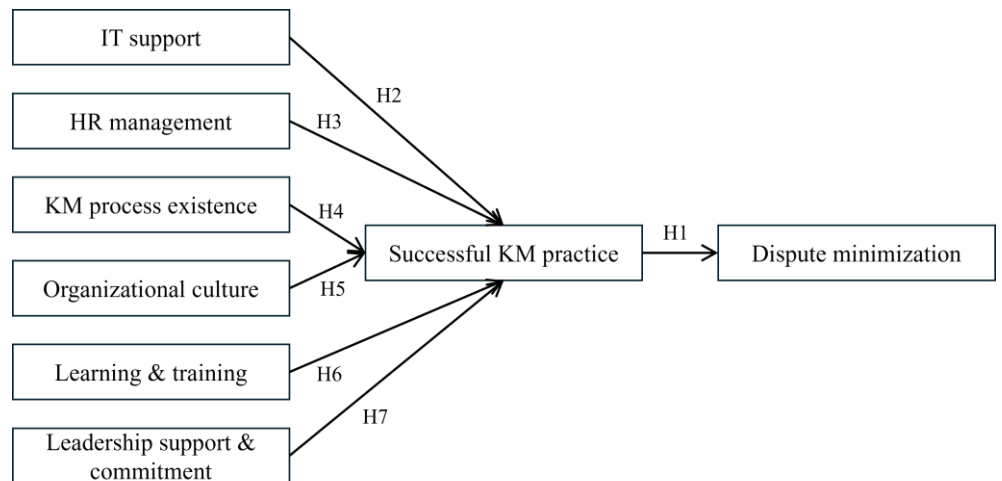

Figure 2. Research model.

2.4. Knowledge management and the SECI model

Qualitative data analysis was required to answer RQ3 in this study, thus a descriptive method with the Nonaka SECI (Socialization, Externalization, Combination, Internalization) model approach as modeled in **Figure 3** was used. The selection of the SECI model as an approach in developing strategic model recommendations is since the SECI model supports social interaction in the transfer

of tacit knowledge into explicit knowledge and the SECI model can be applied to the scope of individuals, groups, and organizations. The SECI model greatly assists in the transfer of information when developing a knowledge management system within an organization (Canonico et al., 2020). The SECI model proposes four different processes of interaction including socialization, externalization, combination, and internalization (Mardiani et al., 2023). According to Nurcahyo and Sensuse (2019) each process has a following meaning.

- Socialization is a process of social interaction between individuals to achieve tacit knowledge, generally in the form of a discussion process, story, or sharing experiences.
- Externalization is a process of transforming or translating tacit knowledge into explicit knowledge, usually in the process of externalization, which is writing and analysis of reports or documents.
- Combination is the process of dispersing and or adding to known explicit knowledge. Dissemination of documented knowledge can be done through meetings education, and training processes.
- Internalization. This is the process of changing explicit knowledge into tacit knowledge. The general form of the internalization process is through learning processes undertaken or the experience that everybody goes through.
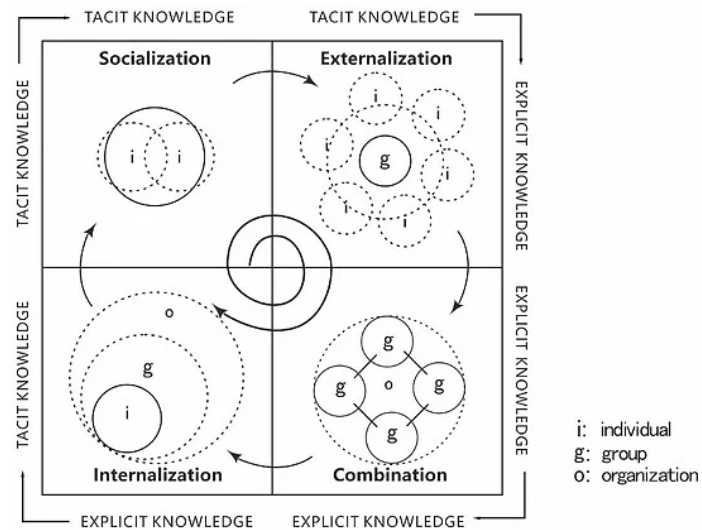

Figure 3. Nonaka SECI model.

Source: Wang and Kim, 2023.

3. Methodology

This study begins with data collection from a literature study. Data is used to formulate a survey questionnaire for respondents. The questionnaire consists of six factors and thirty indicators using a Likert scale from 1–5 to assess each respondent's answer. A preliminary survey was carried out to enhance the questionnaire's content validity and reliability. The final questionnaire as detailed in the Appendix was sent to 100 respondents from state-owned airport company and consultant supervisors who experienced more than 5 years in airport construction projects through email from February to April 2024. A total of 90 responses were

obtained from 20 airports managed by state-owned company. A validation survey was also conducted with three experts who have work experience of more than 15 years in airport projects.

The PLS-SEM method is used for quantitative data analysis to address both RQ1 and RQ2 at the same time. According to Hair et al. (2014), the most prominent reasons for using PLS-SEM are justified by attributing nonnormal data, small sample sizes, and formatively measured constructs. Their research explains that the minimum sample size for a PLS model should be at least equal to the larger of the following: ten times the most significant number of formative indicators used to measure one construct; or ten times the most significant number of inner model paths directed at a particular construct in the inner model. Therefore, the minimum sample size of this study is $10 \times 6 = 60$. A sample size of $90 > 60$ was used in this study to run the SmartPLS 3.29 software.

Furthermore, to answer RQ3 in the form of strategy development, descriptive data analysis is used with the SECI model approach. Qualitative research has a descriptive nature and tends to use an inductive approach, thus the process and meaning based on the subject's perspective are more highlighted in qualitative research (Fadli, 2021). This method begins with a literature study followed by a data reduction process to emphasize and focus on knowledge management activities. The next step is to verify whether the strategy model is appropriate and relevant through an expert validation process, so hence credible answers can be obtained. The last is concluding in the form of a description or illustration of an object that was unclear at first but after being studied became clear.

4. Results

4.1. Data analysis of RQ1 and RQ2

4.1.1. Assessment of the outer model

The main goal of the outer model assessment is to get the results of the validity and reliability test of the indicator (Sarstedt et al., 2017). Assessment begins by checking convergent validity which is measured using the AVE value which must be greater than 0.5. The next step is determining the dependability of each indicator using the outer loading value with the provision that the minimum value is 0.7 to be said to be ideal (Sarstedt et al., 2017). Following with internal consistency measurement to ensure that the indicator variables have sufficient internal consistency value, the composite reliability value, and Cronbach's alpha must be more than 0.7. **Table 2** shows that all indicators have a factor loading and Cronbach's alpha value > 0.7 with AVE value > 0.5, so it can be said that all indicators are ideal, and the research model has met convergent validity.

Lastly, examination of discriminant validity to test the extent to which an indicator is genuinely different from other indicators based on the Heterotrait-Monotrait (HTMT) ratio test value where the HTMT ratio value of each indicator variable that can be used must be < 0.9 (Hair and Alamer, 2022). The results of the HTMT ratio are shown in **Table 3** and found that all HTMT ratio values of each

indicator variable are < 0.9, so the discriminant validity assessment is valid and can proceed to the inner model assessment.

Table 2. PLS-SEM algorithm results.

Indicator	Loading factor	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
IT1	0.776			
IT2	0.868	0.720	0.840	0.637
IT3	0.746			
HR1	0.714			
HR2	0.907			
HR3	0.926	0.886	0.915	0.686
HR4	0.777			
HR5	0.797			
KP1	0.789			
KP2	0.832	0.817	0.875	0.636
KP3	0.822			
KP4	0.744			
OC1	0.738			
OC2	0.845	0.881	0.915	0.731
OC3	0.933			
OC4	0.892			
LT1	0.876			
LT2	0.867	0.860	0.903	0.702
LT3	0.872			
LT4	0.727			
LS1	0.753			
LS2	0.873			
LS3	0.859	0.917	0.935	0.707
LS4	0.864			
LS5	0.826			
LS6	0.865			
KM1	0.862			
KM2	0.884	0.765	0.862	0.678
SM3	0.713			
DM	1.000	1.000	1.000	1.000

Table 3. HTMT ratio values.

Variables	DM	HR	IT	KP	LT	LS	OC	KM
DM								
HR	0.213							
IT	0.118	0.647						
KP	0.278	0.738	0.492					
LT	0.304	0.713	0.323	0.509				

Table 3. (*Continued*).

Variables	DM	HR	IT	KP	LT	LS	OC	KM
LS	0.133	0.584	0.426	0.657	0.558			
OC	0.216	0.697	0.395	0.713	0.625	0.645		
KM	0.391	0.654	0.443	0.479	0.643	0.429	0.547	

4.1.2. Assessment of the inner model

The first step of assessment is measuring model collinearity. The model collinearity is done by checking the collinearity statistics (VIF) value must be greater than 0.2 but smaller than 5 and if the value obtained is outside the required value interval, then the indicator should be considered for removal from the structural model or combined in one other indicator (Marliana, 2020). The next step is to measure the determination coefficient with the R^2 value. Hair and Alamer (2022) explains that the R^2 value in the inner model has an interval value with different interpretations of predictive power: 0–0.1 = weak; 0.11–0.3 = moderate; 0.3–0.5 = strong; > 0.5 = robust.

Table 4. VIF and R^2 values.

Variables	VIF		R^2	R^2 adjusted
	KM	DM		
HR	2.844			
IT	1.408			
KP	2.060			
LT	1.950			
LS	1.823			
OC	2.217			
KM		1.000	0.416	0.374
DM			0.121	0.111

Table 4 above shows the VIF value of the inner model found that all variable indicators have VIF values < 3, so the research model can be said to have passed the collinearity test. **Table 4** also shows the R^2 adjusted value 0.374 in the model relationship, indicating a strong level of accuracy or predictive power of the relationship model between IT, HR, KP, OC, LT, and LS to KM. The R^2 adjusted in the DM relation model of KM is at 0.111, which can be interpreted as the accuracy or predictive power of the relationship model between KM and DM is low to moderate.

Testing on the *t*-value and *p*-value of each relationship proves the validity of the relation. Doing a test of significance, it can be said that any association is significant between the variables while *t*-values are more than 1.96 and *p*-values are less than 0.05 (Hair et al., 2014). This test was estimated through PLS Bootstrapping with 5000 samples in SmartPLS. **Table 5** shows that "KM" significantly directly affected "DM" as the *t*-value is equal to 3.143 and the *p*-value is 0.002, hence H1 was supported. Results also indicated that "HR" (*t*-value = 2.508, *p*-value = 0.012) and

"LT" (*t*-value = 2.640, *p*-value = 0.008) have a significant direct effect on "KM"; hence H3 and H6 were supported. Meanwhile, the other factors "IT" (*t*-value = 0.803, *p*-value = 0.422), "KP" (*t*-value = 0.239, *p*-value = 0.811), "LS" (*t*-value = 0.244, *p*-value = 0.807), and "OC" (*t*-value = 1.026, *p*-value = 0.305) have no significant direct influence on "KM". Hence H2, H4, H5, and H7 were not supported.

Table 5. PLS-SEM bootstrapping results.

Path	Original sample (*O*)	Sample mean (*M*)	Standard deviation (STDEV)	*T* statistics (|O/STDEV|)	*P*-values
HR → KM	0.312	0.291	0.124	2.508	0.012
IT → KM	0.069	0.077	0.086	0.803	0.422
KP → KM	−0.028	0.005	0.116	0.239	0.811
LT → KM	0.311	0.320	0.118	2.640	0.008
LS → KM	−0.032	−0.025	0.132	0.244	0.807
OC → KM	0.115	0.106	0.112	1.026	0.305
KM → DM	0.348	0.347	0.111	3.143	0.002

4.1.3. Goodness of fit index

For the outer model and inner model to be evaluated, determine the overall combined performance using the GoF index value with the criteria of calculation: 0.1 = GoF Small; 0.25 = GoF Moderate; 0.38 = GoF Large (Hair et al., 2013). The results from calculating the GoF index manually are as below. The GoF value of the research model equals 0.418 > 0.38; which means the research model has a significant ability to explain empirical data. Also, it can have the conclusion that the model's feasibility level is 42%

$$GoF = \sqrt{\left(\overline{AVE} \times \overline{R^2}\right)}$$

$$= \sqrt{\left(\left(\frac{0.637 + 0.686 + 0.636 + 0.731 + 0.702 + 0.707 + 0.678 + 1.000}{8}\right) \times \left(\frac{0.374 + 0.111}{2}\right)\right)}$$

$$= \sqrt{(0.722 \times 0.243)}$$

$$= \sqrt{0.175}$$

$$= 0.418$$

4.2. Data analysis of RQ3

4.2.1. Data reduction

In developing the strategy, a literature review process of prior studies related to knowledge management activities to prevent disputes was conducted and resulted in a list of activities as shown in **Table 1**. During this phase of data reduction, two actions are taken. The initial action involves sorting and classifying the activities from **Table 1** into two groups according to key factors that foster successful knowledge management practice: HR and LT. Next, categorize the activities into socialization, externalization, combination, and internalization (SECI) processes based on the definition of each process, thereby obtaining the data in **Table 6**.

Table 6. Final data reduction.

Process	HR activities	LT activities
Socialization	Placing members from different departments in the same project	Conduct conferences and brainstorming (related to the projects)
	Provide incentives to motivate members to share knowledge	Launch an introductory campaign and training for all project participants on communication
	Conduct regular progress meetings and updates	Conduct socialization as a forum for members to share experiences and new things
Externalization	Establish a database of lessons learned and best practices	Learn to implement a filing system in managing project information
	Provide an enabling infrastructure for the codification of members' knowledge	Learn to develop new contractual agreements that are simple, fair, and based on win-win solution principles
	Electronically document and record discussion results or meeting minutes	Learn to develop tender documents effectively, in a language that is understandable to all parties
Combination	Execute better communication and dialogue among members	Explore the internet to gather all information related to the project
	Develop a communication flowchart and responsibility matrix	Learn to develop a communication system to manage the dissemination of project information
	Develop new ideas, concepts, or innovations related to the project collaboratively	
Internalization	Implementing job training programs for members	Conduct training to gather knowledge on contract management
	Assigning members to be directly involved through learning by doing	Conduct training & certification of expertise to members, including the construction system used and mind mapping in dispute resolution
		Provide leadership skills among top management

4.2.2. Expert validation

During this phase, a questionnaire was administered, and an online meeting was held with 3 professionals who have over 15 years of expertise in airport development projects. They are used to provide feedback and suggestions regarding the activities in **Table 6** and whether they are appropriate and relevant to the conditions in the current airport projects in Indonesia. The professionals believed that, in general, the KM activities were both relevant and applicable to the airport projects as it stands now. However, there are inputs in the form of several additional activities, such as in the internalization process, it is necessary to add HR by "coaching & mentoring" and in the combination process of LT, it is necessary to add "making leaflet/brochure /banner related to excellent work culture".

4.2.3. Data presentation

During this phase, data presentation is conducted based on the data in **Table 6** and several inputs of improvements from experts in the form of an overview of the knowledge management implementation strategy model as shown in **Figure 4,** hence the readers can easily understand the proposed knowledge management implementation strategy to minimize disputes in airport development projects with the SECI model approach.
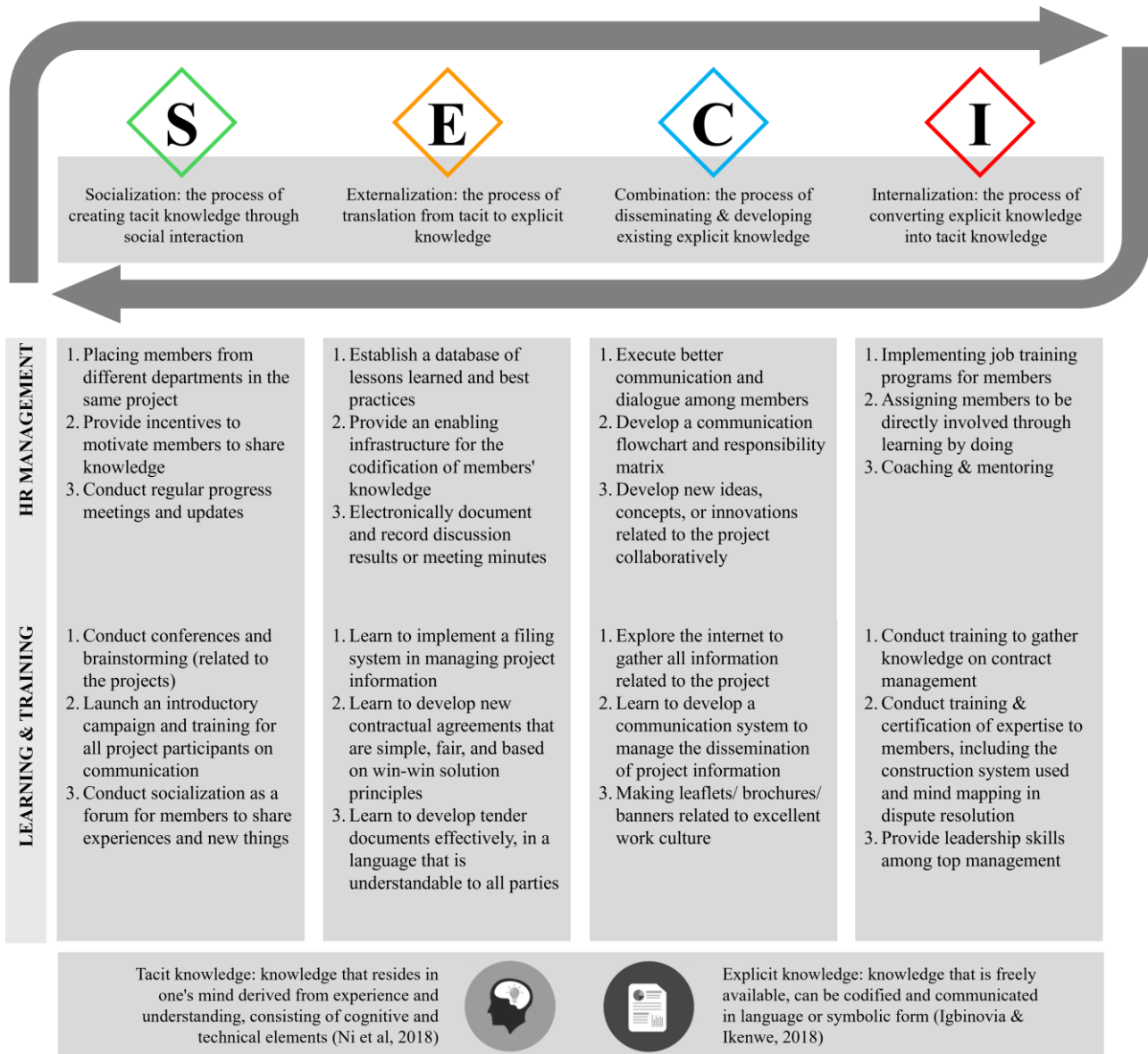
Figure 4. Proposed knowledge management implementation strategy.

5. Discussion

This research aims to investigate how knowledge management practice (KM) impacts the dispute minimization (DM) of airport development projects in Indonesia. The finding indicates that "KM" has a positive and significant direct effect on the "DM" of airport development projects. It aligns with prior research which indicates that error management requires knowledge and knowledge management procedures are critical for capturing, storing, sharing, and repurposing contract management expertise from previously finished projects (Love et al., 2018). In another study, Wang et al. (2019) utilized contract management to help construction professionals handle changes and disputes in contracts by including them in knowledge management procedures.

The involvement of the private party in the development of public airports is questionable and, therefore, creates management complications because of conflict in objectives and profit-making outlooks of the private partner (Chourasia et al.,

2021). In addition, most of the causes of dispute in airport development projects are the various interpretations between the owner and contractor of the provisions in the contract documents and their completeness. So, a win-win solution is needed using communication and negotiation skills which are tacit knowledge and exist within a person. Consequently, knowledge management practices are influential factors that can improve organizational performance (Rajiani and Normuslim, 2023) thus can encourage the emergence of innovative strategies for resolving disputes that are very common in airport development projects.

This study finds two of the six influencing factors that have a positive and significant direct influence on "KM" in airport development projects, are "HR" and "LT". The results of prior research support these findings, which show that human-related components such as human resource management, training, and rewards have the most significant influence on the application of knowledge management (Onofre and Teixeira, 2022). The enhancement of members' skills and knowledge increases the ability to satisfy work demands and perform better, therefore, investment in members' skills will send a positive signal to them that they are the organization's most precious asset (Memon et al., 2017). Regularly, activities such as skills certification, internships, benchmarking, and webinars are commonly conducted as part of the learning and training process for airport development projects. Airport projects recognize that organizational learning helps adaptation, identifies inefficiencies, and develops a climate of creativity (Rajiani and Normuslim, 2023). Thus, long-term investment in the form of regular learning and training programs for members needs to be carried out by airport project organizations to create professional human resources so knowledge management practice can be more optimal and as much as possible can minimize the occurrence of disputes.

The result revealed that "IT" has no significant direct influence on "KM" in airport development projects. This finding contradicts prior studies according Kamal et al. (2019) that present-day IT support has a significant role in the knowledge management implementation, as it can provide organizations with key tools, including the use of technical databases, systems for decision support, and management models useful in solving competitive situations and regarding access to sources of specialized knowledge. More than technology, the ideas presented by this group envisage the proposition that IT tools for knowledge management are beyond that (Al-Mahaseneh and Harb, 2023). It can be said that IT infrastructure support in state-owned airport companies must be complemented by IT-savvy human resources to have a meaningful impact on knowledge management implementation.

The result found "KP" has no significant direct influence on "KM". This result does not align with earlier findings that identified people, processes, IT, and strategy as the main things to build and develop to construct sustainable knowledge management programs in the construction industry (Onyeagam et al., 2020). The airport project has implemented the knowledge management process although the practice has not been systematic and comprehensive, some examples are placing professional human resources in each field within the work unit, having a regular agenda for weekly coordination meetings, and implementing benchmarking programs. However, knowledge management frameworks, methods, processes, and

tools will be helpful as much as their basics are put in place; otherwise, they will remain at their lowest minimal effectiveness (Hagmann and Gillman, 2017).

The result also considered "OC" has no significant direct influence on "KM". This finding further supported the earlier work of Chang and Lin (2015) in that not all organizational cultures significantly affect knowledge management: the "strictly controlled" culture negatively influenced, while, on the other hand, the "closed system" and "professional-oriented" cultures did not significantly affect individuals' intention to transfer and apply their knowledge on the organization. It can be said that currently, the organizational culture of the airport project does not pay more attention to the value and meaning of knowledge, even though organizational knowledge is an important thing because it can produce excellence in competition. Therefore, the airport project should consider implementing a culture that supports member's learning process such as giving members the freedom to develop new ways of completing work, building member's confidence that sharing knowledge will not bring them down, and motivating members in the form of incentives and rewards.

The last is "LC" with the result that there is no significant direct influence on "KM". This finding consistent with KR (2024) theory contests that organizational commitment does not much affect the performance of its members, one of which is the performance of executing knowledge management. This is because the airport project organization has clear standard operating procedures (SOP) and there is a clear division of tasks and responsibilities so that the member's work system is not based on the leadership but on the SOP. Therefore, airport project organizations need to develop SOPs for implementing knowledge management that are easy to implement.

Some of the findings in this study are quite surprising and different from previous theories. The reason why this surprising finding can occur is that it cannot be confirmed whether all research participants have fully understood and implemented knowledge management since the level of maturity of knowledge management within the state-owned airport company has not been measured. Maturity level measurement allows organizations to develop, implement, and compare the success of knowledge management (Sukma et al., 2021).

This study proposed a knowledge management implementation strategy model focused on dispute prevention efforts through key success factors, including "HR" and "LT" with the SECI model approach. Some of the "HR" activities and "LT" activities listed in **Figure 4** have been implemented in state-owned airport companies by now. Nevertheless, these activities are not yet consistently conducted periodically by the state-owned airport companies. Therefore, these strategy recommendations for implementing knowledge management can be a firm basis for developing standard operating procedures (SOP) of the project since implementing these recommendations can minimize the occurrence of conflicts and disputes.

The findings are based on assessing the state-owned company airports as the object of research. In Indonesia, airport operations have been regulated in the law which states that airports are vital assets and can only be managed by state-owned companies, regional-owned companies, or the government this is due to the role of airports as infrastructure to strengthen the archipelagos' vision and the country

sovereignty in supporting national security (Kurniasih et al., 2019). However, there are currently two airports in Indonesia that are managed using a public-private partnership (PPP), which are led by a state-owned airport company: Dhoho Kediri Airport and Hang Nadim Batam Airport. Considering this, it can be said that the core values and culture prevailing in PPP airports are not much different from state-owned airport company, hence the findings can be applied to PPP airports in Indonesia.

6. Conclusion

The main focus of airport companies is to provide services to passengers. One form of service is providing adequate and comfortable airport infrastructure. Facts reveal that disputes and conflicts inevitably occur in construction projects, especially airport development projects because they have a complex scope of work, consist of various stakeholders and are supervised by domestic and foreign aviation regulators. The adverse impact of disputes can lead to project stalling and legal cases. Considering this, being aware of the knowledge that has not been optimally utilized by the organization, the application of knowledge management is an important instrument. The investigation found "KM" supported by "HR" and "LT" has a positive and significant direct influence on "DM" in airport development projects. This study highlights the importance of utilizing an organization's intangible assets with knowledge management practices to prevent and encourage innovative problem-solving, as well as highlighting human resource management strengthened by continuous training and learning will significantly help the success of the implementation of knowledge management in the organization. Additional research is required to comprehend the factors that have no significant impact on "KM" including "IT", "KP", "OC", and "LS" to determine if these results are specific to airport projects. Although this study contributes to knowledge management in Indonesia, it is important to acknowledge that the research is preliminary and based on limited data. This study needs to be broadened to enhance the robustness and comprehensiveness of statistical analysis and model development.

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References

Adegbembo, T., Awodele, O., & Oke, A. (2020). A Principal Component Analysis of Knowledge Management Success Factors in Construction Firms in Nigeria. Journal of Construction Project Management and Innovation, 10(1), 42–54. https://doi.org/10.36615/jcpmi.v10i1.346

Ahmadvand, M., & Eghbali, H. (2020). Modelling critical success factors of knowledge management in Tehran project-based construction companies. Available online: https://ssrn.com/abstract=3569696 (accessed on 2 June 2023).

Ali, L., Al-Hakim, Y., & Hassan, S. (2012). The relationships among knowledge management processes, innovation, and organisational performance in the Iraqi MTS. In: Proceedings of the 6th Knowledge Management International Conference (KMICe).

Al-Mahaseneh, S., & Harb, Y. (2023). The Assimilation of ICT Knowledge Management Practices in Organizations: An Empirical Study. Journal of the Knowledge Economy, 14(2), 752–779. https://doi.org/10.1007/s13132-022-00938-7

Battal, Ü. (2017). Airport Project Financing in Turkey, Research on Problems and Solutions. Available online: https://www.researchgate.net/publication/321529586_AIRPORT_PROJECT_FINANCING_IN_TURKEY_RESEARCH_ON_PROBLEMS_AND_SOLUTIONS (accessed on 2 June 2023).

Canonico, P., De Nito, E., Esposito, V., et al. (2020). Knowledge creation in the automotive industry: Analysing obeya-oriented practices using the SECI model. Journal of Business Research, 112, 450–457. https://doi.org/10.1016/j.jbusres.2019.11.047

Cevikbas, M., Okudan, O., & Işık, Z. (2023). Determination of the most appropriate alternative dispute resolution methods for airport projects: A fuzzy VIKOR approach. KSCE Journal of Civil Engineering, 27(8), 3192–3203. https://doi.org/10.1007/s12205-023-1864-4

Chang, C. L., & Lin, T. C. (2015). The role of organizational culture in the knowledge management process. Journal of Knowledge Management, 19(3), 433–455. https://doi.org/10.1108/JKM-08-2014-0353

Chourasia, A. S., Dalei, N. N., & Jha, K. (2021). Critical success factors for development of public-private-partnership airports in India. Journal of Infrastructure, Policy and Development, 5(1), 1259. https://doi.org/10.24294/jipd.v5i1.1259

Figueiredo, E., Pais, L., Monteiro, S., et al. (2016). Human resource management impact on knowledge management: Evidence from the Portuguese banking sector. Journal of Service Theory and Practice, 26(4), 497–528. https://doi.org/10.1108/JSTP-12-2014-0269

Gamil, Y., & Abdul Rahman, I. (2020). Assessment of critical factors contributing to construction failure in Yemen. International Journal of Construction Management, 20(5), 429–436. https://doi.org/10.1080/15623599.2018.1484866

Ghasemi, B., & Valmohammadi, C. (2023). Identification and prioritization of critical success factors of knowledge management implementation using a novel hybrid group decision-making model. VINE Journal of Information and Knowledge Management Systems, 53(6), 1086–1118. https://doi.org/10.1108/VJIKMS-02-2021-0023

Ghomi, H., & Barzinpour, F. (2018). Identifying the success factors of knowledge management tools in research projects (Case study: A corporate university). Management Science Letters, 8(8), 805–818. https://doi.org/10.5267/j.msl.2018.6.006

Gonzalez, R. V. D., & Martins, M. F. (2017). The Knowledge Management Process: a theoretical and conceptual study (Portuguese). Gestão & Produção, 24(2), 248–265. https://doi.org/10.1590/0104-530x0893-15

Gunasekera, V. S., & Chong, S. C. (2018). Knowledge management critical success factors and project management performance outcomes in major construction organisations in Sri Lanka: A case study. VINE Journal of Information and Knowledge Management Systems, 48(4), 537–558. https://doi.org/10.1108/VJIKMS-06-2018-0051

Hagmann, J., & Gillman, H. (2017). The future of knowledge management in large development programmes and organisations: lessons from a large-scale institutional experiment. Knowledge Management for Development Journal, 13(1), 4–24.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial Least Squares Structural Equation Modeling: Rigorous Applications, Better Results and Higher Acceptance. Long Range Planning, 46(1–2), 1–12. https://doi.org/10.1016/j.lrp.2013.01.001

Hair, J. F., Sarstedt, M., Hopkins, L., et al. (2014). Partial least squares structural equation modeling (PLS-SEM). European Business Review, 26(2), 106–121. https://doi.org/10.1108/ebr-10-2013-0128

Hair, J., & Alamer, A. (2022). Partial Least Squares Structural Equation Modeling (PLS-SEM) in second language and education research: Guidelines using an applied example. Research Methods in Applied Linguistics, 1(3), 100027. https://doi.org/10.1016/j.rmal.2022.100027

Hardjomuljadi, S. (2020). Use of dispute avoidance and adjudication boards. Journal of Legal Affairs and Dispute Resolution in Engineering and Construction, 12(4). https://doi.org/10.1061/(ASCE)LA.1943

Hayati, K., & Latief, Y. (2019). Risk analysis and prevention system to minimize claim and dispute on construction projects. IOP Conference Series: Earth and Environmental Science, 365(1). https://doi.org/10.1088/1755-1315/365/1/012030

Hu, J., Lee, J., & Yi, X. (2023). Blended knowledge sharing model in design professional. Scientific Reports, 13(1). https://doi.org/10.1038/s41598-023-43505-z

Igbinovia, M. O., & Ikenwe, I. J. (2018). Knowledge management: processes and systems. Information Impact: Journal of Information and Knowledge Management, 8(3), 26. https://doi.org/10.4314/iijikm.v8i3.3

Indonesia, B. P. S. Jumlah Penumpang Angkutan Udara Internasional Pada Januari 2024 naik 0,41 persen dibandingkan desember 2023. (2024). Available online: https://www.bps.go.id/id/pressrelease/2024/03/01/2360/jumlah-penumpang-angkutan-udara-internasional-pada-januari-2024-naik-0-41-persen-dibandingkan-desember-2023.html (accessed on 28 July 2024).

Kaleh, Ramy., & El-adaway, I. H. (2024). Investigating Causes of Disputes Resulting in Litigation in Airport Development Projects in the United States Using Graph-Based Techniques. Journal of Management in Engineering, 40(3). https://doi.org/10.1061/jmenea.meeng-5903

Kamal, S. S., Kadir, W. A., Abdullah, W., et al. (2019). Critical success factors of knowledge management that enhance organizational performance. Journal of Scientific and Engineering Research, 6(4), 48–56.

Khalef, R., & El-adaway, I. H. (2024). Investigating causes of disputes resulting in litigation in airport development projects in the United States using graph-based techniques. Journal of Management in Engineering, 40(3). https://doi.org/10.1061/jmenea.meeng-5903

KR, M. Y. A. R. A. (2024). Analysis of the Influence of Leadership and Organizational Commitment through Job Satisfaction on Performance. East Asian Journal of Multidisciplinary Research, 3(1), 253–264. https://doi.org/10.55927/eajmr.v3i1.8039

Kunthi, R., Sensuse, D. I., & Tobing, R. P. (2018). Critical Success Factors of the Implementation of Knowledge Management at PT XYZ. In: Proceedings of the 6th International Accounting Conference.

Kuo, R. Z., & Lee, G. G. (2011). Knowledge management system adoption: Exploring the effects of empowering leadership, task-technology fit and compatibility. Behaviour and Information Technology, 30(1), 113–129. https://doi.org/10.1080/0144929X.2010.516018

Kurniasih, R., Rohman, N., Suprayitno, H. (2019). Preliminary Review of Fixed Assets Management at I Gusti Ngurah Rai International Airport, Bali (Indonesian). Jurnal Manajemen Aset Infrastruktur & Fasilitas, 3. http://dx.doi.org/10.12962/j26151847.v3i0.6434

Liu, J., Li, H., Skitmore, M., et al. (2019). Experience mining based on case-based reasoning for dispute settlement of international construction projects. Automation in Construction, 97, 181–191. https://doi.org/10.1016/j.autcon.2018.11.006

Love, P. E. D., Smith, J., Ackermann, F., et al. (2018). The praxis of stupidity: an explanation to understand the barriers mitigating rework in construction. Production Planning and Control, 29(13), 1112–1125. https://doi.org/10.1080/09537287.2018.1518551

Mardiani, E., Samsuryadi, Abdiansyah (2023). SECI Model Design with a Combination of Data Mining and Data Science in Transfer of Knowledge of College Graduates' Competencies. International Journal of Advanced Computer Science and Applications, 14(7). https://doi.org/10.14569/IJACSA.2023.0140736

Memon, M. A., Sallaeh, R., Baharom, M. N. R., et al. (2017). The relationship between training satisfaction, organisational citizenship behaviour, and turnover intention: A PLS-SEM approach. Journal of Organizational Effectiveness, 4(3), 267–290. https://doi.org/10.1108/JOEPP-03-2017-0025

Muhammed, S., & Zaim, H. (2020). Peer knowledge sharing and organizational performance: the role of leadership support and knowledge management success. Journal of Knowledge Management, 24(10), 2455–2489. https://doi.org/10.1108/JKM-03-2020-0227

Nakamori, Y. (2020). Knowledge Construction Methodology Fusing Systems Thinking and Knowledge Management. Springer Verlag.

Natek, S., & Zwilling, M. (2016). Knowledge Management Systems Support SECI Model of Knowledge-Creating Process. Available online: https://toknowpress.net/ISBN/978-961-6914-16-1/papers/ML16-251.pdf (accessed on 2 June 2023).

Ni, G., Cui, Q., Sang, L., et al. (2018). Knowledge-Sharing Culture, Project-Team Interaction, and Knowledge-Sharing Performance among Project Members. Journal of Management in Engineering, 34(2). https://doi.org/10.1061/(asce)me.1943-5479.0000590

Fitriani, I. N, Arifien, M., & Juhadi, J. (2018). The Phenomenon of Indonesia's Small Outer Islands and Administrative Territories (Indonesian). Available online: http://journal.unnes.ac.id/sju/index.php/edugeo (accessed on 2 June 2023).

Nurcahyo, R., & Sensuse, D. I. (2019). Knowledge Management System with Seci Model as Knowledge Sharing Media in Software Development Process at Tarumanagara University Computer Center (Indonesian). Jurnal Teknologi Terpadu, 5(2).

Onofre, I., & Teixeira, L. (2022). Critical Factors for a Successful Knowledge Management Implementation: A Systematic Literature Review. The Electronic Journal of Knowledge Management, 20(2), 93–109.

Onyeagam, O., Nwaki, W., Obonadhuze, B., et al. (2020). The Impact of Knowledge Management Practices on The Survival and Sustenance of Construction Organisations. CSID Journal of Infrastructure Development, 3(2), 173. https://doi.org/10.32783/csid-jid.v3i2.157

Othman, A., Ismail, S., Yahya, K., et al. (2018). Critical success factors in implementing knowledge management in consultant firms for Malaysian construction industry. Management Science Letters, 8(5), 305–316. https://doi.org/10.5267/j.msl.2018.4.017

Qadarsyah, R., Soleh, S., Ruselvi, N. (2022). Civil-Military Cooperation Strategy in Airport Management between PT Angkasa Pura II and Husein Sastranegara Air Force Base (Indonesian). In: Proceedings of the National Seminar on Science Technology and Innovation Indonesia (Senastindo). https://doi.org/10.54706/senastindo.v4.2022.220

Rajiani, I., & Normuslim, N. (2023). Knowledge management and organizational learning to improve the organizational performance of mines in Indonesia. Journal of Infrastructure, Policy and Development, 7(2). https://doi.org/10.24294/jipd.v7i2.2227

Rashid, M. S., Kamal, N., & Yeop, B. (2020). The Effect of Organizational Culture on Knowledge Management and Managerial Performance of Government Department in Dubai. European Journal of Multidisciplinary Studies, 5(1), 47–53.

Rehman, W. U. R. (2013). Knowledge creation (seci) through Human resource practices and rapport: a conceptual model from social perspective. The Business & Management Review, 4(2).

Renukappa, S., Suresh, S., & Alosaimi, H. (2021). Knowledge management-related training strategies in Kingdom of Saudi Arabia construction industry: an empirical study. International Journal of Construction Management, 21(7), 713–723. https://doi.org/10.1080/15623599.2019.1580002

Marliana, R. R. (2020). Partial Least Squares-Structural Equation Modeling on the Relationship Between Student Satisfaction Level and Google Classroom Quality Based on Webqual 4.0 Method (Indonesian). Jurnal Matematika, Statistika Dan Komputasi, 16(2), 174–186. https://doi.org/10.20956/jmsk.v16i2.7851

Fadli, M. R (2021). Understand the design of qualitative research methods (Indonesian). Humanika, 21(1), 33–54. https://doi.org/10.21831/hum.v21i1

Sabri, O. K., & Torp, O. (2022). Corrective and Preventive Action Plan (CAPA) for Disputes in Construction Projects: A Norwegian Perspective. Infrastructures, 7(5). https://doi.org/10.3390/infrastructures7050063

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2017). Partial Least Squares Structural Equation Modeling. In Handbook of Market Research. Springer International Publishing. https://doi.org/10.1007/978-3-319-05542-8_15-1

Septari, A. W., & Latief, Y. (2020). Evaluation of the maturity level and critical success factors of the knowledge management implemented in state-owned construction company in Indonesia. IOP Conference Series: Materials Science and Engineering, 930(1). https://doi.org/10.1088/1757-899X/930/1/012016

Shash, A. A., & Habash, S. I. (2021). Disputes in Construction Industry: Owners and Contractors' Views on Causes and Remedies. Journal of Engineering, Project, and Production Management, 11(1), 37–51. https://doi.org/10.2478/jeppm-2021-0005

Silva, P. M., Domingo, N., & Ameer Ali, N. A. N. (2023). Causes of disputes in the construction industry—a systematic literature review. Journal of Financial Management of Property and Construction, 29(2), 193–210. https://doi.org/10.1108/jfmpc-03-2023-0012

Sukma, A., Andriariza, Y., & Sari, R. (2021). Measurement of the Maturity Level of Knowledge Management Implementation in Non-Ministry Government Institutions. Pekommas, 6(1), 25–32. https://doi.org/10.30818/jpkm.2021.2060103

Suriani, S., Yunus, K., & Abduh, T. (2023). Knowledge management mediator strategy for resolving industrial conflicts in Makassar. Journal of Public Administration and Government, 5(1), 83-91. https://doi.org/10.22487/jpag.v5i1.747

Teerajetgul, W., Chareonngam, C., & Wethyavivorn, P. (2009). Key knowledge factors in Thai construction practice. International Journal of Project Management, 27(8), 833–839. https://doi.org/10.1016/j.ijproman.2009.02.008

Wang, C., Yap, J. B. H., Wood, L. C., et al. (2019). Knowledge modelling for contract disputes and change control. Production Planning and Control, 30(8), 650–664. https://doi.org/10.1080/09537287.2019.1572247

Wang, J., & Kim, E. (2023). The development and validation of an instrument to collaborative teaching assessment under the impact of covid-19 through the SECI model. Sustainability, 15(12), 9540. https://doi.org/10.3390/su15129540

Wong, J. T. Y., & Hui, E. C. M. (2006). Construction project risks: Further considerations for constructors' pricing in Hong Kong. Construction Management and Economics, 24(4), 425–438. https://doi.org/10.1080/01446190600601602

Yap, J. B. H., & Toh, H. M. (2020). Investigating the principal factors impacting knowledge management implementation in construction organisations. Journal of Engineering, Design and Technology, 18(1), 55–69. https://doi.org/10.1108/JEDT-03-2019-0069

Appendix

Table A1. Information technology support (IT).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[IT1]: How frequently do you use the internet to capture project information?	◯	◯	◯	◯	◯
[IT2]: How frequently do you use electronic document management systems for the ease of sharing project information?	◯	◯	◯	◯	◯
[IT3]: How frequently do you use video conferencing software such as Gmeet, Zoom, Teams, etc. to facilitate discussions?	◯	◯	◯	◯	◯

Table A2. Human resources management (HR).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[HR1]: How frequently does your organization provide promotions to members?	◯	◯	◯	◯	◯
[HR2]: How frequently does your organization upgrade members skills and knowledge?	◯	◯	◯	◯	◯
[HR3]: How frequently does your organization develop techniques to retain members knowledge?	◯	◯	◯	◯	◯
[HR4]: How frequently does your organization conduct mediation to resolve conflicts between members?	◯	◯	◯	◯	◯
[HR5]: How frequently does your organization manage careers based on members performance?	◯	◯	◯	◯	◯

Table A3. Knowledge management process existence (KP).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[KP1]: How frequently does your organization adopt knowledge management processes that can easily be implemented?	◯	◯	◯	◯	◯
[KP2]: How frequently do you share your knowledge with other members either online or offline?	◯	◯	◯	◯	◯
[KP3]: How frequently do you engage in knowledge sharing to take faster decisions?	◯	◯	◯	◯	◯

Table A3. (*Continued*).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[KP4]: How frequently do you engage in knowledge sharing to improve your communication skills?	◯	◯	◯	◯	◯

Table A4. Organizational culture (OC).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[OC1]: How frequently do you work in collaboration with other members to support each other?	◯	◯	◯	◯	◯
[OC2]: How frequently do you conduct collective activities to build bonding among members?	◯	◯	◯	◯	◯
[OC3]: How frequently do you utilize teamwork in solving specific problems?	◯	◯	◯	◯	◯
[OC4]: How frequently does your organization encourage members to create knowledge or innovation?	◯	◯	◯	◯	◯

Table A5. Learning & training (LT).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[LT1]: How frequently do you participate in regular training regarding the roles and duties of each member?	◯	◯	◯	◯	◯
[LT2]: How frequently do you participate in training specifically designed for knowledge management implementation?	◯	◯	◯	◯	◯
[LT3]: How frequently do you participate in certified skills training?	◯	◯	◯	◯	◯
[LT4]: How frequently do you expend your budget on training as a long-term investment action?	◯	◯	◯	◯	◯

Table A6. Leadership support & commitment (LS).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[LS1]: How frequently do your leaders emphasize the importance of knowledge management?	◯	◯	◯	◯	◯
[LS2]: How frequently do your leaders motivate you to implement knowledge management effectively?	◯	◯	◯	◯	◯

Table A6. (*Continued*).

	1. Extremely infrequent	2. Fairly infrequent	3. Moderately frequent	4. Frequently	5. Most times
[LS3]: How frequently do your leaders act as role models for the knowledge management implementation?	◯	◯	◯	◯	◯
[LS4]: How frequently do your leaders develop an atmosphere of trust among members?	◯	◯	◯	◯	◯
[LS5]: How frequently do your leaders manage to share their knowledge to avoid mistake?	◯	◯	◯	◯	◯
[LS6]: How frequently do your leaders encourage discussion activities to solve problems?	◯	◯	◯	◯	◯

Table A7. Successful knowledge management practice (KM).

	1. Extremely disagree	2. Disagree	3. Neither agree nor disagree	4. Agree	5. Extremely agree
[KM1]: Your organization run a knowledge inventory such as an e-library or knowledge centre accessible to all members	◯	◯	◯	◯	◯
[KM2]: Your organization runs discussion forum activities to provide sharing, problem solving and collaboration	◯	◯	◯	◯	◯
[KM3]: There is no knowledge gap between you and your leader in achieving performance	◯	◯	◯	◯	◯

Table A8. Dispute minimization (DM).

	1. Extremely disagree	2. Disagree	3. Neither agree nor disagree	4. Agree	5. Extremely agree
[DM1]: In the last five years, disputes have rarely occurred in the execution of airport development projects	◯	◯	◯	◯	◯