การจัดการความรู้ของหน่วยงานบริหารจัดการท่าอากาศยานในประเทศไทย ในภาวะโควิด19

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Thai Airport Operator's Knowledge Management During COVID-19

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Article Info

บทคัดย่อ

ท่าอากาศยานทั่วโลกรวมถึงประเทศไทยได้รับผลกระทบจากปัจจัยหลายประการ เช่น การแข่งขันระหว่างศูนย์กลางท่าอากาศยาน (Hub) เทคโนโลยีใหม่ และโรคระบาด โดยในช่วงการระบาดของโรคโควิด 19 การแสวงหาความรู้ที่สำคัญ และการจัดการความรู้ (Knowledge Management: KM) เป็นสิ่งจำเป็นเพื่อให้การดำเนินการของท่าอากาศยาน ประสบความสำเร็จ เพื่อรับมือกับความท้าทายดังกล่าว งานวิจัยนี้มีวัตถุประสงค์ดังต่อไปนี้ 1) เพื่อศึกษาการใช้ KM ในช่วง COVID-19 ของหน่วยงานบริหารจัดการท่าอากาศยาน ด้วยการวิเคราะห์ SWOT 2) เพื่อศึกษาการวางแผนกลยุทธ์ KM ในช่วงหลังโรคโควิด 19 สำหรับหน่วยงานบริหารจัดการท่าอากาศยาน ด้วยการวิเคราะห์ TOWS Matrix โดยงานวิจัยนี้เป็นการวิจัยเชิงคุณภาพ และใช้การสุ่มตัวอย่างแบบเจาะจง รวบรวมข้อมูลโดยการสัมภาษณ์เชิงลึกผู้บริหารและพนักงานที่ปฏิบัติงานที่หน่วยงานบริหารจัดการท่าอากาศยานในประเทศไทย

จากการวิเคราะห์ด้วย TOWS Matrix บทความนี้กำหนดกลุ่มกลยุทธ์ KM ดังต่อไปนี้สำหรับหน่วยงานบริหารจัดการท่าอากาศยาน 1. ใช้จุดแข็งของความรู้ด้านการจัดการท่าอากาศยาน ทรัพยากร นโยบาย และระบบการเรียนรู้ข้ามสายงานเพื่อสร้างกระบวนการทำงานที่คล่องตัวและทำให้เกิดองค์กรแห่งการเรียนรู้ดิจิทัล 2. ลดจุดอ่อนด้านแรงจูงใจ การสื่อสาร และวัฒนธรรม KM โดยใช้การปรับแต่ง KM กระบวนการทำงานที่คล่องตัวและแพลตฟอร์มดิจิทัล 3. ใช้ความรู้ด้านการจัดการท่าอากาศยาน ตลอดจนนโยบาย KM และทรัพยากรเพื่อเอาชนะภัยคุกคามจากภายนอก เพื่อให้มั่นใจว่าสนามบินมีความเกี่ยวข้องและประสบความสำเร็จอย่างต่อเนื่อง 4. ลดจุดอ่อนของการทำ KM ในองค์กรเพื่อหลีกเลี่ยงภัยคุกคาม เช่น การเปลี่ยนแปลงที่เกิดขึ้นจากเทคโนโลยีดิจิทัล โรคระบาด และการสูญเสียความรู้ที่สำคัญเนื่องจากพนักงานเกษียณอายุ โดยงานวิจัยนี้แนะนำหัวข้องานวิจัยที่เกี่ยวข้องกับการพัฒนาการนำ KM ไปใช้ในหน่วยงานบริหารจัดการท่าอากาศยานในอนาคต

Abstract

Airports worldwide, including Thailand, have been affected by a number of factors, including, but not limited to, competition between major airport hubs, emerging technologies, and pandemic. During the COVID-19 pandemic, obtaining critical knowledge and employing knowledge management (KM) to successfully execute airport operations have been necessary. To cope with such challenges, this study has the following objectives: 1) to conduct a SWOT analysis of airports operator's KM implementation during COVID-19; 2) to conduct a TOWS Matrix analysis to identify KM strategies for the airport operator in the post COVID-19 period. Using a qualitative method and purposive sampling technique, this study has collected data using in-depth interviews with executives and employees working at the airport operator in Thailand.

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Based on TOWS Matrix analysis, this study has formulated the following groups of strategy for airport KM. 1. Utilizing the strengths of airport knowledge, resources and policy, and a cross functional learning system to maximize the opportunities of creating an agile work process and enabling a digital learning organization. 2. Overcoming weaknesses in KM motivation, communication, and culture by maximizing the opportunities of KM customization, an agile team, and a digital platform. 3. Highlighting the strengths of airport knowledge as well as KM policy and resources to overcome external threats to ensure the airport's continued relevance and success. 4. Minimizing the internal weaknesses of KM to avoid threats such as digital disruption, pandemic, and the loss of critical knowledge due to retired employees. This study also recommends research areas that are relevant to the future development of KM implementation for airport operators.

1. Introduction

Airports around the world have played a major role in the tourism and air transport industries by connecting cities, countries, and continents. Furthermore, the airport is considered by tourists as the first and last image of a destination (Fakfare et al., 2021). Airports also provide critical infrastructure which contributes greatly to the air transport value chain by stimulating regional socioeconomic development through the promotion of business and tourism-related activities (See et al., 2022), as well as providing commercial activities at the airport such as retail shopping, entertainment services, and food and beverages (Kiliç & Çadirci, 2021).

Nonetheless, airports have been influenced by recent disruptions and crises. Whilst past pandemics such as SARS in 2002 and H1N1 in 2009 caused serious airport disruption (Kuo et al., 2022), COVID-19 has had a more devastating impact around the world (Miao et al., 2022) through travel restrictions which affected the passenger volume, the number of flights, the airline flow patterns, and the airport network (Kuo et al., 2022). In turn, COVID-19 has severely influenced the aviation value chain particularly at airports (Michelmann et al., 2023), and airports in Thailand are no exception (Paethrangsi et al., 2022).

During COVID-19, businesses have focused on knowledge management (KM) processes in order to attain a sustainable competitive advantage and to assess rapidly evolving external uncertainties (Mahdi & Nassar, 2021; Ng et al., 2021). As changes in airport operating procedures are inevitable due to COVID-19 (Choi, 2021), KM plays a key role for airport operators during COVID-19 (Buhusayen et al., 2020). It is crucial to develop a KM strategy that allows airports to store and discover new knowledge (Gamo-Sanchez & Cegarra-Navarro, 2015) in order to sustain and maintain airport effectiveness. Whilst knowledge is arguably the most valuable resource that affects organizations in uncertain times (Mennini et al., 2022), organizations around the world still lack the systemic knowledge to effectively tackle the challenges related to COVID-19 (Li et al., 2023). In addition, there is a lack of study that investigates how KM strategies are executed (Pepple et al., 2022), particular in the context of Thai airports during COVID-19.

To ensure that the implementation of KM in pandemic situations works successfully, it is necessary to develop a strategy that employs a framework and to prioritize strategies that are the most important during a pandemic such as COVID-19. As the TOWS matrix can be considered as one of the strategic frameworks for risk and crisis situations (Dandage et al., 2019), this research aims to employ the TOWS matrix in order to develop post COVID-19 KM strategy for Thai airport operators.

The research objectives are 1) to conduct a SWOT analysis of airports operator's KM implementation during COVID-19; and 2) to conduct a TOWS Matrix analysis to identify the KM strategies for airport operators post COVID-19.

2. Literature review

2.1 Knowledge management

There are two major perspectives of KM strategy that dominate KM literature, which are codification and personalization strategies. Both perspectives are widely adopted by the KM community. The codification strategy of KM focuses on the capture, codification, storage and dissemination of explicit knowledge and employing it in compliance with the organizational objectives. On the other hand, personalization strategy is concerned with increasing knowledge flow in the organization through networks and interaction (Oluikpe, 2012).

In general, KM can be defined as the process of knowledge identification (Mennini et al., 2022; Miao et al., 2022), creation or acquisition (Abdalla et al., 2022; González-Ramos et al., 2023; Li et al., 2023; Pepple et al., 2022; Vrontis et al., 2021), organization and storage, transferring (Abdalla et al., 2022; Mennini et al., 2022; Miao et al., 2022; Öberg & Lundberg, 2022; Pepple et al., 2022), leveraging knowledge and making strategic decisions to improve organizational performance (Abdalla et al., 2022; Mennini et al., 2022). As the definition of KM has been widely-discussed by a number of authors (Abdalla et al., 2022), this study has adopted Miao et al. (2022)'s definition of KM as an integrative method for identifying, managing, and sharing knowledge.

Management literature conceptualizes KM in numerous ways (Abdalla et al., 2022; Ng et al., 2022). For instance, The knowledge-based view regards knowledge as an organization's most crucial resource (Grant, 1996). Developed from the resource-based view, knowledge-based theory argues that the organization's competitive advantages require unique knowledge in an organization (Chang et al., 2022), also known as the knowledge capital or intellectual capital (Lim & Dallimore, 2004), to sustain innovative achievement (Miao et al., 2022). In turn, knowledge capital is a fundamental intangible asset that is considered as a driver of value in an organization (Lim & Dallimore, 2004) which affects an organization's short-term performance as well as an organization's response to a dynamic environment (Chang et al., 2022).

In turn, organizations should employ KM as a vital strategic resource to maintain a sustainable competitive advantage (Latif et al., 2021; Pepple et al., 2022; Rabal-Conesa et al., 2022; Vrontis et al., 2021). In general, KM provides a number of advantages, such as a better decision-making process, enhanced customer service, improved efficiency, improved performance, and reduced costs (Chong et al., 2000; Pepple et al., 2022). Whilst knowledge capital provides a number of advantages, it should be pointed out that direct business benefits can be challenging to measure (Chong et al., 2000).

More importantly, KM is a significant activity for an organization and cannot be achieved quickly as it requires an organization to create an organizational structure and establish a system to support KM (Li et al., 2023). Firstly, it is essential that board level members of the management team are willing to invest in knowledge and provide funding to support KM execution. Secondly, KM requires knowledge teams. Knowledge cannot be fully utilized unless an organization has assigned a KM team with clear responsibility and goals. Thirdly, an organization needs to have the appropriate technological infrastructure to support KM (Chong et al., 2000).

In particular, a number of authors have discussed KM implementation at airports. Atalay and Sarvan (2014) examined the usage of KM in airport operations in Turkey. The results revealed that airport terminal management is strictly regulated by international and national institutions, whereby explicit knowledge sharing was found to be prominent over tacit knowledge sharing. Gamo-Sanchez and Cegarra-Navarro (2015) studied factors influencing the success of a KM-program in a small-sized airport in Spain. The findings revealed that airport KM requires every department member

to cooperate and communicate with all airport users, not only internal (e.g. managers, engineers, coordinators, technicians and any other airport staff), but also external (e.g. passengers). Al-Qarni et al. (2019) conducted a KM study in airports in the Kingdom of Saudi Arabia and reported that the KM processes (creating, sharing, and application) had a positive and significant impact on the airport's service innovation.

In addition, Buhusayen et al. (2020) examined airports in Australia during COVID-19 and highlighted the importance of involving frontline managers in operational decisions as they have the necessary knowledge to respond to the situation. Such an issue has been supported by Bencsik (2022) that organizations have faced KM difficulties as they need to solve unknown problems by relying on formerly acquired and scattered knowledge. Oktari et al. (2023) added that it is necessary for organizations to quickly acquire critical knowledge in order to make the right strategic decisions during COVID-19.

2.2 TOWS Matrix

As one of the tools extensively used for planning and analyzing strategic actions (Dandage et al., 2019), SWOT analysis (Strength, Weakness, Opportunities and, Threats) has been utilized in identifying environmental relationships and enables an organization to develop strategies (Ravanavar & Charantimath, 2012). SWOT analysis can be categorized into two dimensions: the internal strengths and weaknesses, and the external opportunities and threats (Oktari et al., 2023). Although SWOT analysis is a method of evaluating an industry, sector, or organization (Oktari et al., 2023), this method alone does not enable an organization to make particular decisions (Ravanavar & Charantimath, 2012) as SWOT analysis identifies only an organization's internal and external factors (Dargahi et al., 2019).

To fill such gaps, the TOWS Matrix (Weihrich, 1982) is largely recognized as an advancement of SWOT in alternative strategy development by maximizing the internal strengths and external opportunities, as well as minimizing the internal weaknesses and external threats for respective stakeholders (Gottfried et al., 2018; Ravanavar & Charantimath, 2012). As a type of situational analysis framework, TOWS analysis can be employed to generate the most effective strategies which align with available resources and capabilities (Das et al., 2022).

The TOWS matrix identifies four strategic groups: Strength-Opportunity (SO), Strength-Threats (ST), Weaknesses-Opportunities (WO), and Weaknesses- Threats (WT) in order to form alternative strategies (Ravanavar & Charantimath, 2012). Finally, TOWS strategies need to be prioritized (Oktari et al., 2023). Simply put, the TOWS matrix method can provide a valuable and efficient tool to assist in strategic planning which helps to enhance decision-making (Dargahi et al., 2019).

3. Methodology

Due to the exploratory nature of this research, a qualitative methodology has been utilized using in-depth interviews to collect data. Qualitative methodology has been applied in a number of studies (e.g. Buhusayen et al., 2020; Oktari et al., 2023; Pepple et al., 2022) to examine how KM practices are implemented, and the factors that influence their effectiveness. According to Chutiphongdech and Vongsaroj (2022a) who studied airports in Thailand, an exploratory research can be utilized to answer research questions, to base a study on grounded theory, and to seek additional information due to the limitations of the literature on such issues.

The target population includes executives and employees working at the airport operators in Thailand. In total, there are a total of 38 airports in Thailand (Civil Aviation Authority of Thailand, 2020) managed by different airport

operators, which consists of six airports operated by a state enterprise, three privately owned airports and 29 public airports operated by the Department of Airports (DOA) (Chutiphongdech & Vongsaroj, 2022b).

As Oktari et al. (2023) proposed, interviews can be conducted to examine strengths, weaknesses, opportunities, and threats, as well as to identify alternative solutions using the TOWS matrix, regarding the implementation of KM during COVID-19. Gottfried et al. (2018) added interviews with a small number of experts can generate sufficient data for the TOWS analysis. In this study, in-depth interviews were held with 44 employees from one of airport operators in Thailand. This airport operator was chosen as it has over 40 years of knowledge and experience managing some of the largest airports in Thailand in terms of passenger numbers. Based on data in 2021, this airport operator served 77.10% of passengers in Thailand, whilst another two airport operators served 21.10% and 1.60% (Krungsri, 2023). Therefore, this airport operator was chosen for the case study.

Samples were selected using a purposive sampling technique. To maintain confidentiality for the respondents, their name and organization cannot be revealed. Nonetheless, the respondents' profiles are shown below.

Table 1:

Respondent profile

Variable	n	%
Gender		
- Male	17	38.64
- Female	27	61.36
Total	**44**	**100.00**
Positions		
- CEO	1	2.27
- Vice President	3	6.82
- Director	4	9.09
- Employee	36	81.82
Total	**44**	**100.00**
Departments		
- Innovation Management	11	25.00
- Human Resources	11	25.00
- Organization Development & Evaluation	10	22.73
- Strategy Development	8	18.18
- Executive Office	4	9.09
Total	**44**	**100.00**

The interviews were conducted during August-September 2022. By adapting the interview questions developed from the review of literature and Weihrich (1982)'s TOWS Matrix, the guiding questions were as follows: 1) What are the Strengths (S), Weakness (W), Opportunities (O), and Threats (T) of KM practices during COVID-19? and 2) What are the TOWS strategies to optimize the utilization of KM during COVID-19?

To analyze the data, a content analysis technique was utilized to determine the relationships between the SWOT themes and tables were constructed to identify the themes. As Buathong and Lai (2017) recommended, content analysis can be considered as an effective technique for generating valid inferences from texts in the context of their use. Content analysis can be conducted using an inductive or a deductive approach. For the inductive approach, categories are developed based on generalizations from the collected literature, whereas the deductive approach's categories are selected or specified even before the collected literature is analyzed (Goel et al., 2019). In this paper, the deductive approach is used with categories informed by the SWOT analysis frameworks.

To generate rich and meaningful data, Stemler (2001) pointed out that content analysis utilizes coding and categorizing of the data. A category is a group of words with similar meaning or connotations and must be mutually exclusive and exhaustive. To ensure data validity, which refers to the extent to which findings accurately describe reality (Hoepfl, 1997, p. 58), this paper has employed a respondent validation technique (Silverman, 2000) by summarizing the interview data with each interviewee to ensure data accuracy. In this paper, most interviewees agreed that the transcriptions were accurate; only a few interviewees requested minor revisions.

4. Results

At the time of data collection, it should be pointed out that this airport operator employed the following KM strategies: 1. Creating participation and motivation in KM for personnel at all levels; 2. Personnel development at all levels aiming towards a learning organization; 3. Development of a systematic knowledge management process; 4. Knowledge management information system development; 5. Creating a knowledge exchange working environment. Based on the interviews, respondents reported that these KM strategies remain crucial to an organization. Nonetheless, the effectiveness of these strategies should be enhanced, which justify this paper's aim to propose more effective KM strategies through the SWOT analysis and TOWS Matrix.

By employing content analysis, this paper has categorized data into different themes that met the data saturation principle, as illustrated in a table below.

Table 2:

Taxonomy of themes

Theme cluster	Theme
1. Strengths	S1. Airport management knowledge
	S2. Policy and resources supporting KM
	S3. Cross-functional learning system
2. Weaknesses	W1. KM motivation and communication
	W2. KM organizational structure
	W3. KM risk management
3. Opportunities	O1. KM customization
	O2. Agile work process
	O3. Digital KM platform
4. Threats	T1. Changing needs due to pandemic
	T2. Disruption and competition

Once qualitative data is categorized into different themes, the next step is to describe each theme. To accomplish such as process, a commonly used approach is to provide direct quotes from respondents (Ryan & Bernard, 2003). Following this method of presentation, a number of quotes are used in the sections below to present the research findings.

4.1 SWOT Analysis

The first research objective is to conduct a SWOT analysis on the airports operator's KM implementation during COVID-19. SWOT analysis can be utilized to determine which strategies should be prioritized for KM implementation during COVID-19 (Oktari et al., 2023), where the comparison of internal and external elements is the first stage of the SWOT analysis. Based on the first interview questions which examine the KM practices during COVID-19, the results are shown below.

Strengths

S1. Airport management knowledge

As one of the largest airport operators in Thailand, the respondents, particularly the management (CEO, Vice President, and Director) agreed that employees have in-depth knowledge of airport management with many years of airport management experience. Such strengths include knowledge of many aspects such as airport operational standards, airport policies, and airport security. For example, the construction of Thailand's largest airport allowed employees to learn about the methods and procedures for developing a new airport. This provided very unique airport management knowledge that cannot be found from other operators in Thailand. One employee noted that:

"Nearly 30% of our employees have worked at this airport operator for over 15 years, and some of them have been rotated in various positions. While this means our employees have a high level of experience in airport management, some employees who have worked for a very long time have not updated themselves enough with the latest trends and knowledge in airport management."

S2. Policy and resources supporting KM

The second strength is having clear KM policies and plans, both long-term and short-term, to be used as a framework for operations, with a committee and a working group to execute policies for KM. The executives have also discussed the resources available to implement KM, such as the Knowledge Management System (KMS) which is an online KM platform that has been developed to be the center of knowledge sources in the organization. Furthermore, there are plans to further develop the KMS into a Digital Learning Center which integrates e-learning, KM resources, and other human resources development features. While the employees are also aware of such a system, one of them emphasized that:

"Although we have enough budget to support KM, a bigger issue is the complexity and time-consuming process of getting project approval. This issue is also related to other policies, such as financial policy, which should be revised to support KM as well as other strategies."

S3. Cross-functional learning system

There are cross-functional KM practices, such as a project-based innovation competition which utilises the knowledge and expertise of employees from different fields to develop innovations. This competition is organized every two years. The participants are invited to form a team, which consists of employees from different departments, to come up with innovative solutions for the airport. According to one of the executives:

"The employees not only learn from other team members who have different areas of expertise, but also acquire knowledge and insights through a series of training sessions, such as the design thinking framework, which they can apply in a project."

During COVID-19, this competition was redesigned to be offered online. One respondent from the Innovation Management department added that:

"While we (the employee) are already busy with day-to-day operation, this competition has helped us to see the airport from a different perspective by working with team member across various departments."

Weaknesses

W1. KM motivation and communication

Despite having a KM strategy and resources, respondents, particularly those in non-managerial positions, pointed out that senior executives need to lead by example in order to motivate the employees to utilize KM as part of their work. One employee suggested that:

"KM is still considered by some employees to be a complicated matter. If the executives in all levels could lead by example, it would be helpful for us to see real use cases of KM that can be applied towards our work."

Moreover, more two-way communication from senior executives is also needed, as some employees do not yet perceive the advantages or benefits of using KM, particularly during COVID-19 when crisis response and recovery are the priorities. On the other hand, some employees have already undertaken KM as part of their work; however they were not aware that it was part of the KM process.

W2. KM organizational structure

According to the interviews, a large number of employees perceived KM as the responsibility of the Human Resources Department. One respondent from the Human Resources department argued that:

"We have a limited number of staff, whereas this airport operator has over 8,000 employees in 6 airports and a head office. The only way for us to drive KM is to empower and motivate each department to utilize KM."

In addition, there was a lack of KM culture that promotes the exchange of knowledge within the organization; knowledge is mainly shared within a department and with an informal approach. This is partly due to the organizational structure which separates the teams into discreet units (working 'in silos') with key knowledge stored within the departments. This represented a challenge during COVID-19 when a number of employees were working from home.

W3. KM risk management

There is a lack of alignment between the KM plan and risk management, which results in a number of issues. Although the airport operator has a wealth of knowledge and experience, there is a lack of systematic storage of knowledge, particularly in a digital format, which affected the transfer of knowledge particularly in the early stages of COVID-19. Although most airport executives and employees have acquired significant knowledge, most knowledge can be considered as tacit knowledge which can be challenging to extract or store. Therefore, there is a risk of losing this knowledge, which means an organization needs to plan KM to minimize these risks. One executive highlighted that:

"If our employees resign, there is a risk of losing the knowledge that they had gained over the years of experience working at this airport operator. To minimize the risk, we have organized a few knowledge sharing seminars, inviting our experienced employees, or those who about to retire, to share their knowledge with other employees."

Opportunities

O1. KM customization

One of the opportunities to enhance KM strategies is to provide KM customization which conforms to the requirements or limitations of each department or job responsibility. According to the interviews, participants pointed out that an organization-wide strategy would not be able to successfully execute KM, particularly during COVID-19 as it requires specific knowledge related to crisis recovery. As the KM process consists of identifying, managing, and sharing

knowledge, an organization needs to examine the KM need within each department in order to 'identify and manage' whether there is existing knowledge within an organization, or whether the knowledge needs to be acquired from outside the organization. One employee stated that:

"We have employees in different locations (e.g. airports and headquarters), as well as those working different shifts (day and night shifts). For example, our aircraft maintenance employees would need different knowledge than those working in the customer service area."

Consequently, an organization needs to 'share' such knowledge with the right person by utilizing the right approaches. For example, an organization could create a list of training programs that the employees in each department need to take in order to acquire the necessary knowledge to perform their tasks.

O2. Agile work process

Whilst this organization has encouraged a cross-functional learning system, there is only one major innovation competition event held every two years. To implement cross-functional learning organization-wide, each department could employ an agile work process, focusing on a result-driven rather than a process driven approach. Agile projects require a cross-functional team and focus on achieving short-term goals by splitting the work phase into smaller projects. As a result, employees can acquire knowledge from a cross-functional team, make a significant impact and can accomplish their goals quickly. However, some respondents stated that an agile work process might not be beneficial to certain departments. One executive stated that:

"In some work areas related to safety and security, our employees' work process is highly regulated by airport operation protocol, such as the International Civil Aviation Organization (ICAO), particularly for practices related to airport safety. While employees in these work areas do not benefit from agile work processes, they can still use agile work process to enhance collaboration between different departments."

O3. Digital KM platform

With the organization's strength in airport management knowledge and weakness in terms of the risk of having non-digitalized knowledge documents, there is an opportunity for the organization to utilize a digital KM platform, such as a web or mobile application, which consists of two major functions. Firstly, such a platform should be able to provide key knowledge for routine tasks as well as tasks that need to be adapted during disruptions such as COVID-19. Secondly, the platform needs to provide a one-stop service for employees to undertake self-paced digital learning specific to each task, which enables them to learn anytime, anywhere, and on any device. At the time of data collection, this organization was in the process of developing a digital KM platform. An executive stated that:

"Right now we have a few different platforms for different purposes. The goal is to have a one stop service so that our employees can learn and share knowledge, and then apply the new knowledge to enhance their own work efficiency." Another employee added that *""Currently those platforms are not so user friendly, and therefore it is crucial to take into account the design considerations when developing the KM platform."*

Threats

T1. Changing needs due to pandemic

During the post Covid-19 pandemic in which airlines have started to resume flight operations, many airport departments may not be fully ready to serve passengers, in terms of the readiness of employees as well as the post COVID-19 travel policy. In addition to the information and knowledge which needs to be updated for employees, another factor is that many airport staff work shifts. Therefore, the COVID-19, as well as future pandemic, can result in changing needs of both passengers and employees. An executive stated that:

"While we all learn and recover from the COVID-19, future pandemics might be different and require a different set of skills and knowledge in order to recover from the crisis. Therefore, future pandemics can be a threat as our solutions during COVID-19 might not be relevant or applicable in another pandemic."

T2. Disruption and competition

Digital disruption forces airports to adapt to keep pace with passenger's changing demand. As the approval process and technology implementation process at this airport operator can be time consuming, sometimes the digital trends have already been changed by the time that the technology has been implemented. One executive added that:

"Another factor that could disrupt this airport operator is the growing trend of direct flights between secondary cities in Thailand, rather than connecting at our airport hubs in Bangkok, which might affect our revenue in the long term."

As airports could be affected by digital technology, passengers' changing demand, and airport competition, KM implementation in a period of disruption needs to be reconsidered.

4.2 TOWS Matrix

As a number of authors (e.g. Dandage et al., 2019; Dargahi et al., 2019; Ravanavar & Charantimath, 2012) have explained, Strength-Opportunity (SO) strategies focus on the maximization of opportunities by using the inner strengths while Weakness-Opportunity (WO) strategies aim to overcome internal weaknesses to realize external opportunities. Strength-Threat (ST) strategies highlight the internal strengths which can be used to overcome external threats while Weakness-Threat (WT) strategies aim to minimize the internal weaknesses to avoid external threats such as worst-case scenarios. As the second research objective is to conduct a TOWS Matrix analysis to identify the KM strategies for the airport operator in the post COVID-19 era, three vice presidents and four directors were consulted to finalize the KM strategies. These seven executives were asked to identify key strategies for optimizing the utilization of KM during COVID-19 based on the results of the first interview question. The following strategies are then formulated based on the TOWS matrix.**Table 3**

TOWS Matrix Strategies for airport KM

	Strengths	Weaknesses
Opportunities	**Strengths-Opportunities (SO)** 1. Utilize the strength of airport knowledge (S1) to enable a digital learning organization (O3) which encourages the employees to learn from relevant knowledge that has been identified, managed, and shared through the KM digital platform. 2. Utilize the strength of a cross-functional learning system (S3) to enhance the agile work process (O2) which requires a cross-functional team to focus on achieving short-term, but high impact, goals. 3. Leverage policy and resources supporting KM (S2) to develop an agile work (O2) process that enhances KM and allows for quick adaptation to changing needs.	**Weaknesses-Opportunities (WO)** 1. Utilize the agile work process (O2) to counteract the weakness in a KM organizational culture (W2) which derives from working in silos. With the agile method, in contrast, the employees will learn from their team who come from various departments. 2. Adapting a KM sharing process to suit each job within an organization (O1) in order to enhance the employee's motivation to perform KM (W1), as well as to examine the KM needs in each job position or department. 3. Use a digital KM platform (O3) to customize KM strategies, enhance communication (W1), and ensure efficient and effective KM processes.

	Strengths	Weaknesses
Threats	**Strengths-Threats (ST)** 1. Use airport management knowledge (S1) to identify and mitigate the KM risks associated with changing needs in the post COVID-19 era (T1) to ensure the airport's continued relevance and success. 2. Review the KM policy and resources (S2) to ensure that the changing needs and demands of the employees and passengers in the post COVID-19 era (T1) are considered. Moreover, an organization will need to establish a policy in case of future pandemics. 3. Maximize the cross-functional learning system (S3) to create resilience against external threats such as pandemic (T1), digital disruption, and competition (T2).	**Weaknesses-Threats (WT)** 1. Minimize the lack of systematic storage of knowledge, which affects the transfer of knowledge (W3) in order to avoid being disrupted by digital technology (T2). Simply put, the organization needs to identify, digitalize, store, and share its knowledge, which will enable the employees to keep pace with the digital disruption. 2. Identify and manage the risks of airport KM (W3) for experienced airport employees to enhance the organizational structure so that it can respond efficiently to disruption and competition (T2). 3. Minimize the lack of KM motivation (W1) by encouraging the executives to communicate directly with the employees regarding the importance of utilizing KM to recover from the pandemic (T1).

5. Discussion

This study has achieved its aim by conducting a SWOT analysis of airport operator's KM implementation during COVID-19 and conducting a TOWS Matrix analysis to identify the KM strategies for the airport operator in the post COVID-19 era. As Oktari et al. (2023) pointed out that it is crucial to develop KM strategies to deal with crises, this study has developed four strategies. Firstly, SO strategies utilize the inner strengths of airport knowledge, supporting resources and policy, and a cross functional learning system to maximize the opportunities of creating an agile work process as well as enabling a digital learning organization. Secondly, WO strategies illustrate how the airport operator can overcome weaknesses in KM motivation, communication, and culture by maximizing the opportunities of KM customization, an agile team, and a digital platform.

Thirdly, the ST strategies highlight the internal strengths of airport knowledge as well as KM policy and resources, which can be used to overcome external threats such as pandemics to ensure the airport's continued relevance and success. Finally, WT strategies minimize the internal weaknesses of KM to avoid threats such as digital disruption, pandemic, and competition. All four strategies are crucial to the airport operator's resilience during pandemics as they enable the employees to solve challenging issues through a systematic KM approach.

It is envisaged that this study not only has managerial implications for airport executives and stakeholders, but also makes two major academic contributions. Firstly, this study has contributed to the limited studies on how KM strategies are executed (Pepple et al., 2022) particularly during COVID-19 (Li et al., 2023) in the context of airport operators. Secondly, this study has supported literature that indicated that KM is a critical tool during a crisis (Ng et al.,

2022), and the ability to manage during the COVID-19 pandemic relied on the ability to effectively manage its diverse knowledge resources (Abdalla et al., 2022).

Whilst this study is an exploratory research that attempts to understand the airport operator's KM implementation during COVID-19, it has only collected data from one of the largest airport operators who manage major airports in Thailand. Consequently, the findings may not be generalizeable to other airport operators. Due to the dynamic and competitive nature of the airport business, there are other aspects of disruption that may have an influence on the airport's KM implementation, including but not limited to, natural disasters, emerging pandemics, digital disruption, competition from other modes of transport, and more. Therefore, future studies could compare the KM strategies implemented by other competing airport operators. In addition, future studies could examine the airport operator's KM which contributes to alternative corporate strategies, strategic goals, and planning associated with KM in order to enhance the organization's competitiveness.

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