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Impact of COVID-19 Crisis on Knowledge Management Practices in Sultanate of Oman

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Abstract: This research was conducted with the aim of identifying various changes made to knowledge management (KM) practices implemented by organizations in the Sultanate of Oman following the onset of the COVID-19 crisis. Further, the study focused on identifying the impact of those changes on various aspects of human resources management. Snowball and purposive sampling techniques were used to collect relevant data from 110 line managers in various organizations in the Sultanate of Oman. Data were analyzed using descriptive statistics and Chi-squared and post-*hoc* tests. The Bonferroni correction method was adopted to reduce the risk of Type I error. The findings indicated that organizations started utilizing an inside-out approach to KM after the COVID-19 crisis began, shifted KM process from manual to computer-based and spending from conventional to e-KM activities. Key finding is that the organizations demonstrated an increased dependency on internal knowledge sources. In addition, line managers began measuring the effectiveness of KM practices, a metric which had been mostly neglected in the pre-pandemic period. Perceived benefits of these changes included increased employee motivation and engagement, increased employee learning and job-related skill, along with an enhanced knowledge-sharing culture across the organization. Important measures taken to mitigate the perceived negative impact of these changes, or enhance the perceived positive impact, included consistent persuasive communication with employees and identifying alternate financial resources to support KM activities. This research contributes to the field of KM and projects it as a supportive discipline to effective crisis management. Findings of this research can help in identifying the areas of training and improvements in the KM framework. This research is global and topical in nature as it relates to the e-KM practices during the ongoing global COVID-19 crisis and portrays the changing e-learning scenario in the organizations in Oman, one of the prominent countries in the middle east and represents the middle east regional culture and economy.

Keywords: COVID-19, Crisis, knowledge acquisition, knowledge storing, e-learning, knowledge sharing culture, measurement of effectiveness

1. Introduction

Global crises affect all aspects of life, including the functioning of the corporate sector, and have a significant impact on various individual stakeholders and society at large (Jacob, 2012; OECD, 2020). The ongoing health crisis, COVID-19 has proved itself to be one of the worst global crises humans have ever experienced; in addition, fear of the disease, social distancing measures, travel bans, and widespread global unpredictability have prompted a new recession and impacted the global economy (Ozili and Arun, 2020). The COVID-19 pandemic has affected all sectors of the economy at the macro level, as well as all functional areas of businesses at the micro level. This study is significant as it directly deals with the impact of COVID-19 on one of the business functions, Knowledge Management (KM). The COVID-19 crisis has pressurized the organizations to make changes to their KM practices. In this context, it was decided to carry-out research with the aim of identifying various changes made to the ongoing KM practices and the impact of those changes. The study was conducted from the perspective of line managers working at public and private sector organizations in the Sultanate of Oman, one of the leading economies in the middle eastern part of the world (Evans, 2018) which is spread across 18 countries with more than 410 million population. The paper is structured as follows: a description of the problem, i.e., impact of COVID-19 crisis on KM practices in Oman, detailed literature review to identify the underlying theory and extant literature in the research area, clearly formulated research objectives and methodology, detailed discussion of results and providing implications for practice and research in the area of KM implementation during the ongoing COVID-19 crisis.

2. Background

This review reflects on relevant topics related to the effect of the current COVID-19 crisis on KM practices in the Sultanate of Oman. The review starts with the definition and meaning of a crisis, progresses to the role of KM in

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crisis management, and concludes with KM practices in the Sultanate of Oman. This creates a basis for the subsequent research and allows for the identification of specific research objectives.

Etymologically, the word 'crisis' originates from the Ancient Greek '*krísis*' meaning "vitally important or decisive state of things" (Online Etymology Dictionary, n.d.). According to the Oxford Learner's Dictionaries (n.d.), a crisis refers to a time of great danger, doubt, or difficulty during which problems must be solved, or important decisions made. From a business perspective, a crisis is defined by three common elements: unexpected circumstances, a visible threat, and insufficient time for decision-making (Stern, 2003). Organizations may experience various types of crisis (Miller, 2004) such as, natural crises - cyclone Emma, economic or financial crises - sub-prime, technological crises - y2k, and malevolence - WannaCry. In terms of recent events, the ongoing COVID-19 pandemic can be added to the list of crises currently being faced by organizations. The respiratory disease caused by the coronavirus has emerged as one of the greatest health and socioeconomic threats in modern history with devastating consequences, including the loss of an estimated 400 million jobs (Patterson, 2020).

According to Davenport and Prusak (1998), KM includes building an organization-wide repository of job-related information, essentially including all aspects of KM such as policies and practices along with establishing an organization-wide culture of knowledge sharing. Rosário et al., (2021) reviewed the literature from 2009 to 2019 on KM in health management and concluded that KM is highly fragmented and requires development. Mnasri and Papakonstantinidis, (2020) through their case research conducted in Belgium suggested detrivialization as a method to explore existing knowledge and indicated that effective organizational communication can contribute to this strategy. According to Arias-Pérez, Velez-Ocampo, and Cepeda-Cardona (2021), digitalization of knowledge management activities can help improve organizational performance through enhanced innovation capability. KM implementation operates on the premise that individuals who are embodied with knowledge are expected to share their knowledge with fellow employees (Dul, Ceylan and Jaspers, 2011) to ensure a collective improvement in performance (Yakhlef, 2010) and create a competitive advantage for their organization (Hislop, 2013). But it is noteworthy to mention that individual differences do play key role in the effective implementation of KM across the organization. Turyahikayo, Pillay and Muhenda (2021) in their research based on in-depth interviews of the public sector employees, found that Knowledge seekers attitude is one of the major antecedents of knowledge sharing behavior. Similarly, research focusing on the role of individual behavior indicates that confidence in the employees could influence both knowledge transfer in case of knowledge givers and knowledge reception in case of learning employees (Nair, Pillai and Demirbag, 2021). Research by Afshar-Jalili, Cooper-Thomas, and Fatholahian (2021) on counter-productive knowledge behavior indicates that individual differences is one of the antecedents of knowledge behavior of employees at workplace. However, while companies often make an effort to prioritize knowledge sharing as a key activity within their organization (Amayah, 2013), not all employees participate in the process, with some choosing to withhold their knowledge from others (Connelly et al., 2012). Hence, it is also important to address issues such as knowledge hiding when building a knowledge-sharing culture across an organization (Peng, 2013). Our literature review focusing on individual differences is important as this paper focuses on employees as individual knowledge seekers during the current pandemic.

2.1 Relationship between KM and crisis management

Literature on relationship between KM and crisis management indicates that effective implementation of KM helps during crises. Rosário et al., (2021) opined that in the current pandemic crisis, effective implementation of KM facilitates the utilization of healthcare information and supports management decision making in hospitals. According to Marie and Horváthová (2019), every crisis could be an effective source of knowledge. Wang and Belardo (2009) concluded that there were significant relationships between KM strategies and crisis characteristics. AhmadYousefi et al. (2020) reported a positive relationship between KM components and crisis management programs in their recent research on drought crisis management. Shaw et al. (2007) studied the importance of building a KM strategy during times of crisis in the United Kingdom and found that managers used knowledge to combat crisis and concluded that identifying deficiencies in the attitudes of people towards KM processes enabled managers to effectively overcome the negative effects of a crisis. Abuzyead and Sherif (2017) indicated that while managers focus more on knowledge acquisition, storage and transfer, implementation would contribute more effectively during crisis. They emphasized that organizations should create a room for implementation of the knowledge learnt. Back in 2017, Alkandari, Masa'deh and AL-Lozi conducted literature review to understand the relationship between KM and crisis and concluded that KM has a key role to play and is a key variable in organizational crisis management strategy. According to them, usually crisis management

focuses on managing financial resources whereas using knowledge to find solutions to organizational crisis can be helpful. Koraeus and Stern in 2013 and Hosseini et al. in 2014 conducted studies to understand the role of KM in dealing with natural crises and found that KM enables instant learning and helps not only in solving the ongoing crisis but also it prepares the organization for next crisis. This is important because, the damage range can be reduced with the help of knowledge and can support informed decisions. According to Cania and Korsita (2015), who researched about the economic crisis that began in 2008, KM plays an important role to successfully cope with crisis situations and can emerge as an effective tool during difficult times. More recently, Marcão, Pestana and Sousa (2020) conducted research on the impact of current pandemic, COVID-19 in pharma sector and proved that Gamification can contribute to employee engagement in KM activities particularly during the pandemic times.

Thus, the available literature on relationship between KM and crisis, explains the role KM can play in effective crisis management but not about the impact of crisis on KM activities of the organizations. This led us to formulate the research question i.e., what is the impact of the current crisis, COVID-19 on the KM activities of the companies in Oman.

2.2 KM practices in Oman

In recent years, organizations in the Sultanate of Oman have recognized the importance of implementing KM strategies, especially with the recent knowledge revolution and the rapid flow of knowledge in all sectors (Supreme Council for Planning, 2019). The Government of Oman has begun to promote web platforms like Knowledge Oman to contribute to the goal of transforming the country into a knowledge-driven society (Knowledge Oman, n.d.). According to research conducted by Al-Busaidi et al. (2010) in the petroleum sector, "motivated employees gain significant benefits from sharing their knowledge to a repository knowledge-management system". Further, Shamsudin et al. (2016) found that knowledge-collecting behavior was perceived to hold several advantages over knowledge-donating behavior among Omani employees, including increased perceptions of job security, employability, and promotional opportunities. In 2019, the leading oil and gas exploration and production company Petroleum Development Oman (PDO) organized a stakeholder's event titled 'Knowledge Management: Towards a Knowledge-based Economy', aimed at not only raising awareness about KM practices in the country, but also to support Oman's 2040 vision of a knowledge-based economy (Knowledge management key, 2019). According to Al-Toubi and Malik (2018), PDO is a pioneer of KM implementation in the country and uses both KM governance and resources to achieve business goals by successfully implementing various KM practices, such as learned lessons, staff on-boarding (including skills profiling), and best practices sharing sessions. This indicates that various KM practices are currently being implemented in Oman, benefiting both employees and other stakeholders.

In general, KM practices in the Sultanate of Oman differ from one organization to another, as each organization follows different KM application processes and models according to its strategic attitudes. Some organizations consider KM to be an integral component of HRM, while others allocate a special section or department for KM. These disparate approaches in the implementation of KM are closely related to the thinking and policies employed by those in senior management positions, in addition to the size of the organization itself and the scope of its activities. At the same time, all organizations in Oman subscribe to a perceived need for complementarity and interdependence between KM and HRM actions. Thus, even after reasonable implementation of KM practices, there nevertheless remains a dearth of research related to KM in the Sultanate of Oman (Al-Busaidi et al., 2010).

3. Research objectives and methodology

The current research is aimed at identifying answers for some of the key research questions related to KM implementation in organizations. It is the need of the hour to find out whether the ongoing COVID-19 crisis has affected the KM practices of organizations in Oman. If yes, what changes did the organizations make to their KM practices after the COVID-19 crisis began? How are those changes implemented: whether stopped totally or reduced or increased or being done differently? Did the changes affect the main purposes of KM: learning and development, knowledge sharing, skill development, improved performance due to learning, etc.? Did the impact vary with sector, size and department of the organization? What is being done to mitigate the perceived negative effect of the changes? Thus, based on these research questions, the key objectives of this research were formulated as, identifying the changes made to KM practices by organizations in the Sultanate of Oman after the onset of the ongoing COVID-19 crisis, evaluating the perspective of line managers with regard to the

impact of those changes on various aspects of HRM, and identifying measures taken to enhance the positive effects and mitigate the negative effects of these changes.

This descriptive research was conducted to study the impact of the current COVID-19 crisis on KM practices in the Sultanate of Oman which is a representative of middle eastern as well as the global economy. Domestic organizations such as Zubair Corporation and Bank Muscat are global firms with businesses spread across the world. Also, the manpower of Oman is majorly based on expatriate population drawn from different parts of the world, thus giving a global perspective to this study. The sample comprised line managers in various public and private sector organizations in the Sultanate of Oman. Snowball sampling and purposive sampling techniques were used as non-probability methods of recruiting participants (Taherdoost, 2016). Two sampling techniques were used to select the sample from the population. Firstly, the snowball sampling technique was used as it was difficult to identify employees from the managerial cadre. The questionnaire link was circulated among those in the managerial positions who are known to the researchers. Further, they were requested to forward and circulate the questionnaire link to those whom they are aware of. It is assumed that people have their own networking with those in their professions, level of jobs and area of functioning. Secondly, the purposive sampling technique was used to ensure that the respondents held reasonable information and knowledge of various KM practices in their respective organizations (Saunders, Lewis and Thornhill, 2007).

A link to a self-administered questionnaire was sent to more than 300 respondents through email and via WhatsApp messages. Overall, 114 responses were received, of which 110 valid responses were used in the analysis. The data was analyzed using SPSS software (version 17.0). Descriptive statistics, multiple-response set analysis, and Chi-squared analysis were employed to study changes made to KM practices following the onset of the current COVID-19 crisis (Chisnall, 2004; Saunders, Lewis and Thornhill, 2007). These analyses were helpful in analyzing the empirical data. But the important aspect is interpretation of data which cannot be made based on only the initial analyses. Hence, post-*hoc* tests were conducted to strengthen the interpretation of the findings. A post-*hoc* analysis was conducted using Cramer's V value to evaluate the strength of associations between the respondents' demographic characteristics and their responses (Cramer, 1946; Cohen, 1988; Kim, 2017; Saunders, Lewis and Thornhill, 2007). A contingency table analysis enabled evaluation of the differences between categories (Argyrous, 1997) and the Bonferroni correction method was utilized to avoid Type I error (García-Pérez and Núñez-Antón, 2003).

3.1 Questionnaire design

The questionnaire used in the current research was divided into two parts to determine the demographic characteristics of the sample and their responses to problem-related questions, respectively. Demographic questions in Part A included the type of organization (i.e. public or private) at which the respondent was employed, the size of their organization in terms of number of employees (i.e. small, medium, or large), and their specific department (i.e. Production, HR, Finance, Marketing, etc.). Problem-related questions in Part B were designed to: (a) seek information related to changes to KM practices after the current COVID-19 crisis began; (b) determine the perceived impact of those changes on various aspects of HRM; and (c) seek information related to measures adopted to enhance the positive impact or mitigate the negative impact of those changes. Questions in the latter section of the questionnaire were presented in the form of 10 statements covering various key aspects of KM, including knowledge identification and acquisition, knowledge storing and sharing, measurement of the effect of KM activities, spending on KM activities, and other aspects. Respondents were required to identify the type of change made to the given practice in their respective organizations (i.e. no change, totally stopped, reduced, slightly increased, and drastically increased). Aspects related to HRM included employee motivation, engagement, learning, job-related skills, performance, and knowledge-sharing culture in the organization. The respondents were required to identify the perceived impact of changes to these HRM aspects (i.e. no impact, somewhat negative impact, high negative impact, somewhat positive impact, and high positive impact). The final question in the questionnaire was designed to identify measures taken to enhance the positive impact or mitigate the negative impact of changes made to KM practices with regards to these aspects of HRM.

3.2 Reliability and validity of the questionnaire

The questionnaire was translated into the local language of Arabic in order to ensure understanding of the questions by the respondents and receive accurate responses, thereby enhancing the reliability of the collected data. The reliability of the instrument was found to be satisfactory at a Cronbach's alpha value of 0.719 (Cronbach, 1951).

4. Results and discussion

4.1 Demographic characteristics of the sample

The demographic characteristics of the sample are presented in Table 1. Overall, 35.5% of the respondents were from public sector organizations, while the remaining 64.5% were employed in private sector organizations. This finding is indicative of national statistics as, according to the 2020 e-census, 63% of all employees in Oman work in private sector (Al Hattali, 2020). The size of the organization was determined based on the number of people employed in that organization, as per Gartner's classification of organization size (Gartner glossary, n.d.) and the classifications of the Public Authority for the Development of Small and Medium Enterprises, Riyada, Oman (New SME classification, 2016). The majority of respondents worked in medium-sized organizations with between 101 and 999 employees. Although the respondents represented various diverse backgrounds—viz. Marketing and Customer Service, Production and Quality Control, Finance and Accounting, and Health, Safety and Environment (HSE) Management—the majority (~35%) were employed in HR department.

Table 1: Demographic characteristics of sample (N=110)

Demographic variable		Number	Percentage
Type of organization	Public	39	35.5
	Private	71	64.5
Number of employees	Less than 100 employees	20	18.2
	101 to 999 employees	66	60.0
	1000 employees and more	24	21.8
Department of the respondent	Production / Quality	20	18.2
	HR / Administration	37	33.6
	Finance / Accounting	21	19.1
	Marketing / Customer service	19	17.3
	Others - HSE, etc.	13	11.8

4.2 Changes to knowledge management practices after COVID-19

It is well-known that the current COVID-19 pandemic has impacted all spheres of life, including the business environment. As a result, organizations across the world have had to make changes to several functions, such as reducing production, adopting contact-less activities, and changing their financial plans. In this research, we aimed to identify the changes made to KM practices by organizations in Oman after the COVID-19 crisis began.

Respondents indicated the level of change made to each KM practice—including knowledge identification and acquisition, knowledge storing, knowledge sharing, measurement of the effectiveness of KM activities, and spending on KM activities—at their respective organizations. The respondents indicated the degree of change made to each KM practice as either no change, totally stopped, reduced, slightly increased, or drastically increased.

Table 2: Changes made to KM practices after the onset of COVID-19 crisis

KM component	Practice	Level of change made (% of responses)				
		No change	Totally stopped	Reduced	Slightly increased	Drastically increased
Knowledge identification & acquisition	From external sources	23.6	---	64.5	7.3	4.5
	From internal sources	20.9	---	3.6	29.1	46.4
Knowledge storing methods	Using paper-based processes	30.9	---	69.1	---	---
	Using computer-based processes	19.1	---	0.9	21.8	58.2
Knowledge sharing sessions	External resources	29.1	---	57.3	7.3	6.4
	Internal resources	27.3	---	2.7	27.3	42.7
Spending	On conventional KM activities	19.1	---	80.9	---	---
	On e-KM activities	30.0	---	17.3	22.7	30.0

KM component	Practice	Level of change made (% of responses)				
		No change	Totally stopped	Reduced	Slightly increased	Drastically increased
Other KM aspects	Measurement of effectiveness	25.5	---	---	25.5	49.1
	Overall use of IT	29.1	---	---	30.0	40.9

Two important findings can be noticed from the analysis presented in Table 2. Firstly, many organizations in the Sultanate of Oman persevered with KM practices (i.e. did not completely stop) after the onset of the COVID-19 crisis. Secondly, approximately 20–30% of organizations did not make any changes to KM practices, thereby maintaining the status quo. Therefore, it appears that the current COVID-19 pandemic has not disrupted or ceased the KM activities of these organizations. These findings are consistent with those reported by Wenzel, Stanske and Lieberman (2020) during their research into strategic responses to crisis with specific reference to the COVID-19 pandemic, wherein it was found that perseverance or status quo responses were being adopted by some companies as a medium-term strategy. It was found in the current research that majority of the organizations have increased the usage of digital processes in KM. This finding conforms with the related literature which clearly states that business models and KM practices are shifting from manual to electronic processes (Seetharaman, 2020; Priyono, Moin and Putri, 2020; Arias-Pérez, Velez-Ocampo, and Cepeda-Cardona, 2021).

4.2.1 Knowledge identification and acquisition

Following the onset of COVID-19, organizations in the Sultanate of Oman changed from an outside-in to an inside-out approach with reference to the identification and acquisition of knowledge. Around 65% of respondents indicated that their organization had reduced practices related to identifying and acquiring knowledge from external sources (Table 2). This finding also matches results from Wenzel, Stanske and Lieberman (2020), who similarly found that companies retrench or reduce certain activities during crises. However, such an approach does not necessarily affect the innovativeness of an organization as Doloreux (2015) concluded that firms do not lose innovative ability if they do not seek knowledge from external sources. It seems that many managers began to realize the utility of their manpower after the pandemic began and started searching for knowledge within existing internal sources. Indeed, 75.5% of respondents indicated that their organizations began searching for knowledge internally. Thus, these data indicate a trend towards an inside-out approach to knowledge identification and acquisition after the COVID-19 crisis began.

As presented in Table 3, the Chi-squared analysis revealed that the size of the organization was significantly associated with knowledge identification and acquisition practices ($\chi^2(6, N = 110) = 17.263$; $p < 0.01$). A Cramer's V value of 0.280 greater than the standard 0.22 indicated a strong, statistically significant association between the variables (Cramér, 1946). Although the contingency table analysis revealed that medium and large organizations reduced such practices after the COVID-19 crisis began, the z-test post-*hoc* analysis with Bonferroni correction revealed that the difference was significant only for medium-sized organizations ($p < 0.05$). Thus, it can be concluded that small and large organizations are still dependent upon external sources for their knowledge identification and acquisition practices. This finding matches with the studies of Marie and Horváthová (2019) who surveyed managers and owners of small businesses in Czech Republic and found that small organizations are benefitting from tapping the knowledge from internal as well external sources.

Furthermore, a strong, statistically significant association was observed between knowledge identification and acquisition practices and the respondents' department within the organization ($\chi^2(12, N = 110) = 22.791$; $p < 0.01$; Cramer's V = 0.263) (Table 3). Based on this initial analysis as well as the contingency table analysis, it was found that Finance, Marketing and HSE departments have increased such practices compared to Production and HR departments in the surveyed organizations. However, the z-test post-*hoc* analysis with Bonferroni correction revealed that this difference was not significant ($p < 0.05$). Thus, it can be interpreted that increases in knowledge identification and acquisition from internal sources occurred across entire organizations, irrespective of department. This finding contradicts with Falkenberg, Woiceshyn and Karagianis (2003) who found that organizations are shifting from internal to external sources of information and the costs of knowledge transactions have increased. But now, during the current pandemic crisis, the organizations are forced to cut costs and that could be a reason for shifting back to the internal sources.

4.2.2 Knowledge storing methods

Nearly 70% of respondents indicated that their organizations had reduced usage of manual knowledge storing processes, such as paper files and manually filled forms (Table 2). In turn, 80% of respondents indicated that their organizations had increased computer-based knowledge storing processes after the COVID-19 pandemic began in order to avoid human contact and adhere to social distancing guidelines. This finding conforms with conclusions drawn by Seetharaman (2020) regarding the business model shift from physical to digital processes after the onset of the COVID-19 pandemic. Changes to knowledge storing practices were not associated with the type of organization, size of the organization, or the department of the respondents. Thus, it can be interpreted that this change is pervasive across all sectors of businesses. This finding is consistent with those reported in a case study analysis by Priyono, Moin and Putri (2020) in which companies were observed to convert their ongoing physical business functions to digital platforms, with this digitalization occurring across all types of business and across all departments within an organization.

4.2.3 Knowledge sharing sessions

Overall, 70% of respondents reported that their organizations had increased the number of knowledge sharing sessions with the help of internal resources (Table 2). This indicates that trainers and speakers for these knowledge sharing sessions were employees of the organization. This is a major change compared to previous practices of inviting external speakers, along with nominating and sponsoring employees for external training programs. This finding corresponds to Amayah's (2013) research indicating that companies prioritize knowledge sharing as a key activity in their organization. Similarly, Dul, Ceylan and Jaspers (2011) opined that employees who are embodied with job-related skills and knowledge are expected to share it with their colleagues. There was a strong, statistically significant association between 'reduction in dependency on external resources for knowledge sharing sessions' and the size of the organization ($\chi^2(6, N = 110) = 21.629$; $p < 0.01$; Cramer's V = 0.314) (Table 3). The Chi-squared analysis, contingency table analysis, and subsequent post-*hoc* tests with Bonferroni correction indicated that medium-sized organizations have implemented this change more than small and large organizations ($p < 0.05$). Thus, it can be interpreted that small and large organizations are still dependent on external sources for knowledge sharing sessions and training programs. This finding contradicts with the findings of Capello (1999) who indicated that knowledge generation and sharing in large organizations happens internally. But is consistent with the opinion of Svetina and Prodan (2008) that small organizations can be benefited by relying on the external sources of knowledge.

4.2.4 Spending on knowledge management activities

The majority of the respondents (81%) indicated that their respective organizations had reduced spending on conventional KM activities, such as remuneration to speakers, expenses related to facilities for KM sessions, and other organizing expenses such as printing and stationery. This is very likely due to a reduced dependency on external speakers and resources, along with the reduced need for physical resources, as well as the ubiquitous nature of the Internet allowing for digitization of KM activities. In turn, respondents indicated that their organizations had increased spending on digital KM activities, such as purchasing KM software and registering for online KM platforms. Changes with regards to spending on KM activities were not associated with any of the demographic variables of the respondents. This is likely because most organizations have shifted from conventional to e-KM practices regardless of sector or department, due to which their spending on former has decreased while the latter has increased. This finding is consistent with observations reported by Wang and Wu (2020) who found that COVID-19 has forced organizations in the health sector to adopt information technology (IT)-enabled KM practices. While the researchers did not focus on the costs involved with this change, it can be inferred that shifting from physical to IT processes involves increased spending on IT-related or digital activities.

4.2.5 Measurement of effectiveness of knowledge management practices

Three-quarters of respondents (75%) reported that their organizations had only begun to measure the effectiveness of KM sessions and activities after the COVID-19 pandemic had begun. In contrast, only a quarter of respondents indicated that their organizations had already started measuring the effectiveness of their KM activities prior to the current pandemic. As presented in Table 3, changes to the implementation of measurement metrics to evaluate the effectiveness of KM activities was associated with type of organization, although the effect size of this association was medium (Cramer's V=0.303; $p < 0.05$). In particular, public sector organizations drastically increased measurement of the effectiveness of KM processes after the COVID-19 crisis began ($\chi^2(2, N = 110) = 10.12$; $p < 0.01$). The z-test post-*hoc* analysis with Bonferroni correction confirmed this difference to be significant ($p < 0.05$).

Table 3: Association between changes made to KM practices and demographic variables - $\chi 2$ independent test

Change	Associated with	*p*-value	Effect size (Cramer's V)	Contingency table analysis	Bonferroni correction
Reduction in identification and acquisition of knowledge from external sources	Size of organization – small, medium & large	0.008 Significant	0.280 Strong	Medium and large organizations	Significant for only medium organizations
Increase in identification and acquisition of knowledge from internal sources	Department of the respondent – Fin, Mktg, Production, HR, HSE	0.030 Significant	0.263 Strong	Finance, Marketing and HSE departments	Not significant for any department
Reduction in number of knowledge sharing sessions from external sources	Size of organization – small, medium & large	0.001 Significant	0.314 Strong	Medium organizations	Significant
Increase in the measurement of effectiveness of KM practices	Type of the organization – public & private	0.006 Significant	0.303 Medium	Public sector	Significant

4.3 Perceived impact of changes to knowledge management practices

This analysis presents findings related to the perception of the respondents with regards to the impact of aforementioned changes to KM practices on various aspects that are relevant for HRM. For this purpose, we have selected few aspects that are key and relevant for HRM which included, employee motivation, employee engagement, employee learning, job-related skills, employee performance, and the knowledge-sharing culture in the organization. This is important because according to Wang (2009), KM, as an integral part of HRM, plays a pivotal role when implementing crisis management strategies. The respondents indicated the perceived effect of KM changes on each of these aspects as either having no impact, somewhat negative impact, high negative impact, somewhat positive impact, or a high positive impact (Table 4).

Table 4: Perceived impact of changes to KM practices on various aspects of HRM (% of responses)

	No impact	Somewhat -ve impact	Highly -ve impact	Somewhat +ve impact	Highly +ve impact
Employee motivation	20.9	---	---	23.6	55.5
Employee engagement	11.8	---	---	33.6	54.5
Employee learning	11.8	---	---	40.9	47.3
Job related skill and knowledge	11.8	---	---	37.3	50.9
Employee performance	10.0	---	---	41.8	48.2
Knowledge sharing culture in the organization	10.9	---	---	37.3	51.8

At the outset, it can be noted that the respondents did not perceive the KM changes to have any negative impact. This finding corresponds with those reported in a review of related literature by Beheshtifar (2013) wherein employees were found to exhibit organizational optimism. Furthermore, the majority of respondents (88.1%) indicated that post-COVID-19 changes made to KM practices positively impacted employee engagement. This is consistent with the findings of Juan et al. (2018) who found that knowledge sharing positively affects employee engagement. In addition, 79.1% of respondents indicated that KM changes had a positive impact on employee motivation; thus, it can be concluded that knowledge itself can be a motivator. Similarly, a case study analysis conducted by Åmo (2006) in Norway indicated that employees can be motivated to be more innovative by increasing their knowledge base.

According to the line managers, changes made to KM practices were perceived to positively impact employee learning (88.2%), job-related skills (88.2%), employee performance (90%), and the knowledge-sharing culture of the organization (89.1%). Yakhlef (2010) also noted that knowledge sharing resulted in a collective improvement of employee performance. Another recent study by Ahmed et al. (2020) with reference to employee motivation and knowledge management during COVID-19 also reported similar results. According to these researchers, an

organization-wide knowledge-sharing culture has a positive impact on organizational performance. Chi-squared and subsequent contingency table analyses revealed that public sector organizations more frequently reported KM changes to have an impact on job-related skills ($\chi^2(2, N = 110) = 6.69$; $p < 0.05$; Cramer's V = 0.247). However, the z-test post-*hoc* analysis with Bonferroni correction revealed that this difference was not statistically significant ($p > 0.05$). Thus, it can be interpreted that the perceived impact of changes made to KM practices was equal across all departments and organizations, regardless of type of the organization or sector of the organization.

4.4 Measures taken to mitigate the negative effect and/or enhance the positive effect of changes to knowledge management practices

This analysis is aimed to identify measures taken by organizations to mitigate the perceived negative effects and/or enhance the positive effects of changes made to KM practices following onset of the current COVID-19 crisis. A total of 108 valid responses to this question were received and used in the analysis.

Table 5: Measures taken to mitigate -ve effect/enhance +ve effect (multiple response set analysis, N=108)

Measures taken	N	% of overall responses	% of respondents
Persuade employees consistently through communication	55	27.4%	50.9%
Find alternative financial resources to support knowledge management activities	43	21.4%	39.8%
Making partnership with other organization/institution to cover the needs	41	20.4%	38.0%
Reduce some of the knowledge management activities rather than complete stop or removal	30	14.9%	27.8%
No measures taken	24	11.9%	22.2%
Motivate employees through rewards and incentives	8	4.0%	7.4%
Total	201	100.0%	186.1%

Data are presented in Table 5 arranged in descending order. In total, 55 respondents (50.9%) indicated that their organization had attempted to persuade employees consistently through communication to cope with KM changes. This finding agrees with the findings of Shaw et al. (2007) who found that companies in the UK utilized improved internal communication to attempt to persuade employees during a crisis. This is important because not all employees may be willing to share their knowledge (Connelly et al., 2012), known as knowledge hiding behavior (Peng, 2013). Hence, it can be interpreted that companies in the Sultanate of Oman have been implementing measures of crisis communication and change management techniques to encourage acceptance of KM changes.

The second most frequently reported measure by respondents (39.8%) was to identify alternative financial resources for KM sessions, such as sponsors. Al-Toubi and Malik (2018) reported that large organizations in Oman provide resources as part of their overall KM governance. In addition, in order to mitigate the negative impact of KM changes, 38% of respondents reported that their companies had begun exploring partnership options with external parties, such as training institutions and benchmarked organizations. Moreover, nearly 30% of respondents indicated that their organizations had reduced KM activities rather than halting such activities entirely. However, the majority of the respondents (~93%) reported that their organizations did not provide incentives to encourage a knowledge-sharing culture. But this point needs to be seriously noted as Jackson et al. (2012) reported that lack of reward is a major barrier to the growth of KM practices. One key finding of the current analysis was that approximately one-fifth of respondents reported that their organizations had not taken any measures to mitigate the negative effects and/or enhance the positive effects of changes made to KM practices after the COVID-19 crisis began. This is alarming as such measures represent an important aspect of both change management and crisis management processes within an organization.

Further, the crosstabulation analysis revealed that the most common measure, i.e., to persuade employees consistently through communication, was most frequently adopted by small and medium organizations, in private sector and by HR and Marketing departments. However, as per the Chi-squared analysis, these measures together did not vary according to the sector or organization size or department of the respondents.

Thus, it can be interpreted that managers in all departments and all types and sectors of organizations have made similar changes.

5. Conclusion and recommendations

This research was conducted to examine changes made to KM practices by organizations in the Sultanate of Oman following the onset of the COVID-19 crisis. This study is conducted from the perspective of line managers only and included the measures taken to enhance the perceived positive effects and mitigate the perceived negative effects of these changes. Moreover, the study was restricted to organizations in the Governorate of Muscat. As the snowball sampling technique was used, it cannot be assured that the sample completing the questionnaire was representative of the entire population group.

The current research helped in finding the answers for research questions raised in formulating the research problem. The ongoing COVID-19 crisis has impacted various functional areas of businesses including the KM function. Organizations in Oman have made changes to their regular KM practices after the crisis began. The changes can be noticed from the point-of-view of KM framework including, knowledge identification and acquisition, knowledge storing and sharing, along with spending on KM activities and measuring the effectiveness of KM implementation. It is in fact interesting to know that some of the organizations have not made any changes and continued their ongoing KM practices even in case of COVID-19 crisis that has hit their bottom line. This is consistent with the conclusion made by Wenzel, Stanske and Lieberman (2020). Organizations have indeed changed the way their KM activities are being performed. While large organizations started depending more on the internal resources, small and medium firms' knowledge needs are being fulfilled through external sources (Marie and Horváthová, 2019). Spending on KM activities is being significantly reduced due to the dependency on e-knowledge sources and digital processes (Seetharaman, 2020; Priyono, Moin and Putri, 2020; Arias-Pérez, Velez-Ocampo, and Cepeda-Cardona, 2021). Important change made to KM practices is that the managers now started measuring the effectiveness of the KM implementation that was mainly missing the pre-COVID-19 period. The perceived impact of those changes has been notably positive on organizational behavior. For example, the changes made to KM practices have resulted in increased employee engagement in the KM activities, enhanced employee learning of job-related skill, and has increased the knowledge sharing culture in the organizations. Line managers have undertaken several measures to mitigate the perceived negative effect or enhance the positive effect of the changes including, persuasive communication (Ahmed et al., 2020; Shaw et al., 2007) and finding alternative financial resources to support the KM activities (Al-Toubi and Malik, 2018).

As KM practices can help to combat crises, it is recommended that such practices be made an important part of all functional areas of business. KM is an effective component of crisis management not only in preventing and reducing negative consequences, but also in enhancing the ability of both the organization and its employees to cope positively. KM can accelerate the process of managing change in an organization, enhancing the skills of its employees, and contributing to its rapid growth. Organizations, whether private or public, must fulfill their knowledge needs through internal sources, especially during the current crisis since it is not clear when the pandemic will end. As small organizations are still dependent on external sources of knowledge, it is recommended that they either develop their own internal knowledge resources or search for cost-effective external sources in order to reduce expenses related to KM practices. Effective use of computer-based KM activities would also yield better results, such as the use of tailored software. In addition, the number of digital knowledge sharing sessions can be increased, as there are no restrictions on the physical presence of employees due to the availability of the Internet and local intranet networks. Recorded virtual sessions also allow learners not only to refer back to learning resources whenever needed, but also to acquire knowledge at their own pace. As knowledge itself is a motivator, managers can use KM practices as an opportunity to motivate their employees, thereby enabling managers to leverage knowledge sharing as a non-monetary motivation technique. In turn, a reduction in KM practices or ceasing such activities completely negatively affects employee motivation. Additionally, the continuation of KM practices enhances organizational knowledge-sharing culture during a crisis.

5.1 Implications for research

Changes made to KM practices have a positive impact on employee engagement, job-related skills, and overall organizational performance. This research implies identifying effective ways of measuring the impact of KM practices so as to inform the design and implementation of specific programs to suit the needs of the

organization. It implies the observation and investigation of crisis management and change management principles in the effective implementation of KM changes. For instance, while cost reduction with regards to KM sessions contributes to crisis management, persuading employees to participate in the KM process contributes to change management.

5.2 Implications for practice

The findings of this research can help in identifying the areas of training for line managers in areas related to measurement of effectiveness of KM practices across the world in general and across the middle east region in particular, as this research was conducted in Sultanate of Oman, one of the dynamic and diversifying economies in the region. The current research analysis shows that organizations in the Sultanate of Oman have made various changes to their KM practices in response to the ongoing COVID-19 crisis, with such changes having a perceived positive impact on employee learning, job-related skills, and the overall knowledge-sharing culture of the organization. The research also revealed that the organizations have taken certain measures to mitigate the perceived negative impact or enhance the positive impact of these changes, including consistent persuasive communication with employees and identifying alternate financial resources to support KM activities.

5.3 Future scope of study

It was found in this research that small and large organizations in the Sultanate of Oman are still dependent upon external resources for knowledge identification and acquisition. This could be attributed to a lack of appropriate knowledge resources within the organization in the case of small organizations, or due to the increasing accessibility of affordable external knowledge resources via the Internet in large and small organizations alike. This proposition could be tested in future studies.

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Analysing the Communication Process Between Middle and top Managers Through the Concept of 'Ba'

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Abstract: In the last few decades the relevance of knowledge management to organizations has become increasingly apparent. However, there are varying levels of emphasis on researching different aspects of this multidimensional construct. One such dimension is knowledge sharing, which is extensively researched from an impact perspective but with limited research on understand dynamic interactions of actors. In this research, we aim to explore factors influencing knowledge sharing among top and middle managers during the strategy communication process. We further draw on the concept of 'ba' as an alternative interpretive tool for understanding managerial interaction dynamics. Adopting a qualitative approach, 32 semi-structured interviews were conducted across a single case Kuwaiti public sector ministry and collated data presented as a thematic narrative to capture managerial perspectives. The findings indicate that organizations benefit more from aligning heterogenous groups within common collective spaces, and that social spaces or contexts are critically important for sharing knowledge pertinent to successful execution of strategies. Furthermore, the propensity to share knowledge was found to be dependent on the tribal affiliations of individual actors, and knowledge sharing dispositions was impacted by prejudices and social stereotypes. The research proposes practical considerations for organization management to foster knowledge exchange among the workforce.

Keywords: 'ba', knowledge sharing, strategy communication process, top and middle managers, public sector

1. Introduction

Organizational knowledge often assumes a variety of forms, which not only contribute to its complexity but make its communication and management challenging (Blackler, 1995, Obembe, Al Mansour and Kolade, 2020). As such knowledge is created and sustained through human involvement, there is a need to understand the social practices of individuals involved in the development process. Nonaka and Takeuchi first proposed the SECI model of organization knowledge creation in 1995. However, in recognition of the limitations of this model, Nonaka and colleagues introduced the concept of 'ba', to capture a broader dynamic view of knowledge creation and provide a conceptual understanding that supports creation and utilization of such knowledge (Nonaka and Konno, 1998; Nonaka, Von Krogh and Voelpel, ., 2006; Nonaka and Toyama, 2015). Thus, the development of 'ba' promotes an understanding of knowledge creation and equally, information delivery between individuals within organizational boundaries.

The knowledge management literature, particularly in the strategy discipline, has taken different theoretical perspectives. These include for instance, the resource-based view which represents organizations and their respective strategies as sets of collective resources that can be exploited to achieve sustainable competitive advantage (Jarzabkowski *et al*., 2016; Bromiley and Rau, 2016). The dynamic capability view on the other hand is underpinned by institutional routines, managerial perspectives, and the ability for institutions to integrate and develop internal competences (Rashidirad *et al*., 2017; Liu *et al*., 2018). We then have the knowledge-based view which further considers knowledge as the most vital asset through which organizations develop their strategies and acquire unique strategic positioning (Donate and de Pablo, 2015; Dong *et al*., 2017).

These approaches often erroneously position Knowledge management and exchange as clearly comprehensible tangible elements in strategy process. Hence the need for, alternative views to consider the development of social constructs for interpreting individual social behaviour. One such is institutional theory, which provides deeper insight into social structures within organizations (Tolbert and Zucker, 1999; Peters, 2019). Similarly, social practice theory (Giddens, 1984; Bourdieu, 1990), helps us to understand the dynamic interaction activities of social actors within knowledge sharing and strategy communication processes. However, even with such alternative views, there is still limited explanation for how knowledge is created and shared through social interactions among sets of individuals. It is in this regard that we propose the use of the

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concept of 'ba' to explain how knowledge and information are communicated between individuals in order to ensure desirable strategy outcomes.

Based on the premise that human interactions are embedded within their social constructs and practice, we provide insight on how knowledge is managed, communicated, and transferred among two managerial groups; top and middle managers, in a public sector context (Titi Amayah, 2013; Henttonen, Kianto and Rialto, 2016; Jørgensen *et al.*, 2020). We apply the concept of 'ba' in the context of strategic management to understand its application in interpreting individual interactions – particularly as it relates to communications between various strategy processes (formulation, implementation, and control). In so doing, we engage the concept of 'ba' to address the research question; what factors influence knowledge sharing during communication of strategy processes among top and middle managers? Furthermore, in addressing this research question, through the application of 'ba', we contribute to the knowledge management literature by extending the applicability of 'ba' beyond knowledge creation to knowledge sharing.

2. Theoretical background

2.1 Knowledge creation and 'Ba'

Nonaka and Takeuchi's (1995) authorship of The Knowledge-Creating Company marked a watershed moment in knowledge management studies. Since then, there has been a considerable expansion in the knowledge management literature, including parallel interests in its interrelated concepts; knowledge generation, representation, accessibility, and transfer (Lahti and Beyerlein, 2000). There have also been a proliferation of research into various dimensions of knowledge, including knowledge types (Forés and Camisón, 2016), knowledge creation process (Nonaka and Toyama, 2015), knowledge-based theory (Nonaka, Von Krogh and Voelpel, 2006; Low and Ho, 2016; Nikolaou, 2019); knowledge transfer (Manfredi Latilla, 2018), knowledge sharing (Obembe, 2010; 2013; Ahmad and Karim, 2019), organizational epistemology (Tsoukas, 2005), knowledge acquisition (Yli-Renko, Autio and Sapienza, 2001), knowledge taxonomies (Saeed and Sattar Chaudhry, 2002), and enabling contexts (Choo and Alvarenga Neto, 2010; Fletcher, 2014). Due to the significant progresses in the field, knowledge creation is often positioned in the literature as a core dynamic asset of organizations, which allows internal social actors to interact and exchange relevant knowledge.

Organizational knowledge is thus viewed as an asset that is embedded in interactions of individuals and constructed through social practice involving individual actors (Von Krogh, Nonaka and Ichijo, 1997, 1997; von Krogh, 1998; Von Krogh, Nonaka, and Rechsteiner, 2012). Knowledge creation is viewed within the organizational context as the process of making knowledge created by individuals available and linking it to the main organizational knowledge structure (Nonaka, Von Krogh and Voelpel, 2006). This organizational knowledge process is also part of the wider concept of knowledge management (KM), characterized by its complexity and ambiguity. This complexity is thus due to the intricacy of individuals and their interactive relations, which serve as the main source of knowledge creation and knowledge sharing.

The introduction of 'ba' to the knowledge creation model is particularly significant as it provides a context for social praxis. The word itself roughly equates to 'place' and has been defined as a shared context in motion, i.e., emergent contexts where knowledge is shared, created, and utilized (Nonaka and Toyama, 2003). The concept can also be construed in terms of shared physical or mental spaces where relationships develop. In this regard, we opine that it is this temporal and spatial attribute of 'ba' that enables the shared context to continuously evolve and facilitate participant interaction (Nonaka, Toyama and Konno, 2001).

Nonaka and Konno (1998) identified four types of 'ba'; originating 'ba', interacting or dialoguing 'ba', cyber or systematizing 'ba', and exercising 'ba'. Each of these correspond to the four stages of the SECI model of knowledge creation and provide support platforms for the knowledge spiral process. Nonaka and Toyama (2003) further argue that dialectic thinking allows for the transcendence and synthesis of seeming contradictions to create a 'good ba' and energy, for knowledge conversion and movement along the knowledge spiral. However, the 'ba' thus created is itself still dependent on participants having multi-viewpoints to foster the shared context.

Although the introduction of 'ba' to the knowledge management literature was geared towards providing a basis for the articulation of the knowledge conversion process as social praxis, according to Nonaka and Toyama (2003) it can either hinder or stimulate knowledge creative activities. In a similar vein, in considering

the originating 'ba' and the interacting 'ba', which both lend themselves to social interaction, we posit that social spaces may equally facilitate or hinder communication of knowledge among individuals. Indeed, Nonaka, Von Krogh and Voelpel, (2006) noted the possibility for 'ba' to constitute a hindrance to creating new knowledge as both originating and interacting 'bas' may foster groupthink as well as limit the participation of outsiders within the collective spaces.

2.2 Knowledge sharing within the strategy communication process

Knowledge is considered the most valuable intangible asset for social actors and invariably the most valuable strategic organizational resource (Wang and Noe, 2010). Unlike other fixed resources, knowledge is produced and reproduced through its use and application (Dodgson, 1993). Knowledge sharing can be construed as a social communication process; the exchange of information, skills, and ideas between social actors within a certain context, With the organization context representing boundaries within which the process occurs (Cooper *et al*., 2019).

Since knowledge sharing enhances organizational effectiveness, employee performance, and creativity (Andrews and Delahaye, 2000; Inkinen, Kianto and Vanhala, 2015; Jamshed and Majeed, 2018), it is required in all strategy processes, including formulation, implementation, and control. The engagement of various social actors in the strategy process further provides an opportunity for shared understanding (Wooldridge and Floyd, 1990). Choo and Alvarenga Neto (2010) similarly identified strategy/structure as one of four groups of conditions that enable knowledge creation. The others being; social/behavioural, cognitive/epistemic, and information systems/management. In essence, shared knowledge between internal social actors can enhance strategy communication, regardless of the organization size (Bennett, 2001). Furthermore, in strategy-related research, strategy-as-practice researchers have undertaken extensive research into strategic management and social practice. For instance, both Whittington (2006) and Jarzabkowski and Spee (2009) offer justifiable explanations for the interrelations between practitioners, their practices and interactions, and the praxis of their organizations. We thus identify an existent nexus between knowledge sharing and social practices in strategy communication and further view 'ba' as a useful interpretive tool for making sense of this vital link. In this sense, Bennett (2001) notes that 'ba' is not limited by the size of an organization, but rather depends on managerial attitudes, traits, and dispositions. These attributes may prove essential to boost knowledge sharing propensities between various managerial levels during the strategy communication process.

2.3 Top and middle manager knowledge sharing in the strategy communication process

There is a general belief that strategy-related practices are solely directed by top management teams, seen to be the ideal strategy practitioners (Jarzabkowski, 2005; Raes *et al.*, 2011; Ouakouak, Ouedraogo and Mbengue, 2014). However, many researchers have highlighted the importance of looking at other managerial levels within the strategy communication process (Ahearne, Lam and Kraus, - 2014; Gatenby *et al*., 2015; Obembe, Al Mansour and Kolade, 2020). Middle managers play a critical strategic role during strategy formulation and implementation processes (Huy, 2001; Mantere, 2008; Rouleau and Balogun, 2011; Martin-Rios, 2016).

Within normal organizational contexts, a clear knowledge sharing process may not always be apparent due to differences in individuals' approaches to social interaction. Several researchers have stressed the importance of aligning managerial groups during various strategy processes (Wooldridge, Schmid and Floyd, 2008; Raes *et al.*, 2011; Glaser, Fourné and Elfring, 2015). Adamides (2015) highlights the importance of engaging functional stakeholders in the communication process itself as it positively influences the alignment of the overall organizational strategy. Equally, Al Saifi, Dillon and McQueen, (2016) articulated the critical role of top and middle managers in supporting knowledge sharing by, for example, encouraging manager engagement in the decision-making loop, building teams, aligning knowledge into practice, and encouraging formal and informal communications.

Although strategy communication research supports the importance of alignment between top and middle managers in sharing knowledge, scant attention is given to the dynamic interaction between the managerial groups, which may lead to misunderstandings and delays in executing strategies (Raes *et al*., 2011).

3. Methodology

3.1 Sampling and data collection

This research is geared towards understanding how strategic knowledge is communicated between top and middle managers. As such, we adopted a qualitative approach to explore the perceptions, beliefs, stories, experiences, and practices of individuals within the managerial levels. Our data was collected as a single case study from a public sector organization in Kuwait (Yin, 2014).

Although the Kuwaiti public sector is context is vast in nature, our choice of the particular case organization was premised on two factors. First, was the fact that the case organization is one of the largest and most active ministries in Kuwait. Secondly, the selected case organization has a significant number of internal interacting departments and units, which makes it conducive for exploring how strategic knowledge is communicated across managerial levels.

A total of 32 semi-structured interviews were conducted and respondents were identified through a combination of purposive and snowball sampling techniques (Patton, 2015). The interview protocol was designed and refined prior to engaging in the actual fieldwork activities to assure clarity and all ethics protocols were duly observed. Table 1 below reports the profile of the interviewees.

Table 1: Interviewee profile

S/N	ID	Managerial Level	Gender	Managerial Role	Job Function	Minimum Experience
1	I-1-MM	Middle Management	Male	Departmental Head	Project Supervisor	8 Years
2	I-2-MM	Middle Management	Female	Departmental Head	Supervisor in Supply Projects	8 Years
3	I-3-MM	Middle Management	Female	Departmental Head	Technical Support Team Leader	8 Years
4	I-4-TM-R	Top Management (Retired)	Male	Division Head	Manager in Control Unit and Surveillance	10 Years
5	I-5-TM	Top Management	Male	Division Head	Manager in Maintenance	10 Years
6	I-6-MM	Middle Management	Male	Departmental Head	Supervisor in Administrative Affairs	8 Years
7	I-7-TM	Top Management	Female	Unit Head	Manager in Training and Research	10 Years
8	I-8-MM	Middle Management	Male	Departmental Head	Assistant Supervisor in Media	8 Years
9	I-9-MM	Middle Management	Male	Departmental Head	Networks Team Leader	8 Years
10	I-10-MM	Middle Management	Male	Departmental Head	Consumer Affairs Consultant	8 Years
11	I-11-TM	Top Management	Male	Division Head	Manager in Projects and Networks	10 Years
12	I-12-MM	Middle Management	Female	Departmental Head	Assistant Supervisor in Maintenance	8 years
13	I-13-MM	Middle Management	Male	Departmental Head	Quality Assurance Team Leader	8 years
14	I-14-MM	Middle Management	Male	Departmental Head	Consultant in Administrative Affairs	8 years
15	I-15-MM	Middle Management	Male	Departmental Head	Assistant Team leader in Legal Affairs	8 years
16	I-16-MM	Middle Management	Male	Departmental Head	Supervisor in Operation and Maintenance	8 years
17	I-17-MM	Middle Management	Male	Departmental Head	Supervisor in Technical Services	8 years
18	I-18-TM	Top Management	Male	Division Head	Manager in Networks Maintenance	10 years
19	I-19-MM	Middle Management	Male	Departmental Head	Supervisor in Technical Control	8 years

S/N	ID	Managerial Level	Gender	Managerial Role	Job Function	Minimum Experience
20	I-20-MM	Middle Management	Male	Departmental Head	Production Supervisor	8 years
21	I-21-TM	Top Management	Male	Division Head	Manager in Bids and Internal Affairs	10 years
22	I-22-MM	Middle Management	Male	Departmental Head	Employment Team Leader	8 years
23	I-23-TM	Top Management	Male	Division Head	Manager in Project Design	10 years
24	I-24-TM	Top Management	Male	Division Head	Manager in Financial Affairs	10 years
25	I-25-TM	Top Management	Male	Division Head	Manager in Planning and Follow-Up	10 years
26	I-26-MM	Middle Management	Male	Departmental Head	Assistant Team Leader in Internal Quality Assurance	8 years
27	I-27-TM-R	Top Management (Retired)	Male	Division Head	Manager in Training and Development	10 years
28	I-28-TM	Top Management	Male	Unit Head	Manager in Human Resources Department	10 years
29	I-29-TM	Top Management	Female	Unit Head	Manager in Emergency Planning	10 years
30	I-30-MM	Middle Management	Female	Departmental Head	Team Leader in Project Design	8 years
31	I-31-MM	Middle Management	Female	Departmental Head	Assistant Manager for Archiving	8 years
32	I-32-MM	Middle Management	Male	Departmental Head	Team Leader in Directory	8 years

Keys: I-TM: Interviewee from top management; I-MM: Interviewee from middle management; I-TM-R: Interviewee from top management (Retired).
Additional note: Due to ethical considerations, and at the request of the organization, the job functions of the interviewees have been anonymized.

3.2 Data coding and analysis

Upon finalizing the interviews, we manually analysed the collected data. Although manual coding can be time-consuming, we found it beneficial for the data analysis process as it allows researchers to be more conversant with the coded data (Chenail, 2012; Grbich, 2013). We adopted a thematic analysis approach, which is widely utilized in qualitative research and allows for researchers to compare theory and practice in parallel (Braun *et al.*, 2019). First, open codes were assigned to each interview question and further broken down into sub-codes to create a sense of meaning to the raw data.

All the interviews were transcribed by one of the authors yielding 92 pages of transcribed data and 61 potential sub-themes. Common terms used by respondents were aggregated to form meaningful categories (see Table 2 below).

Table 2: Theme and code commonalities across the interviews

Serial	Theme	Relative Codes	Respondents	Similar Words	Interviews
1	Dispositions of top management	Losing power Legitimacy	27	Hidden information, no clear rules, various opinions, deny promises, avoid rotation, changes in priorities, culture conflict, delegation issues, personal act, mentality	1-8, 10-12, 14, 16, 18-25, 27-32
2	Functionality of middle managers	Protection Lobbying Tribes	28	Social connection, collective community, line of command, protection, definition of authority, code of conduct, grouping, procedure and process, networks, nepotism	2-24, 26, 28-32

3	Intersective impediment of knowledge sharing	Togetherness Consensus	31	Shared understanding, connection, formal and informal routes, communication disruption, individual bias, teamwork spirit, collectivism ethos	1-17, 19-32

The coding process involved reviewing each transcript and identifying codes and themes that potentially offer insights to the proposed research aim. We controlled for data reliability by following a respondent validation technique in which we referred back to each respondent after transcribing the relevant interviews. Upon completing the manual analysis, we linked the codes that have clear connections to each other. For instance, "social ties" were linked to "lobbying" and further linked to "tribes". Figure 1 below, represents the final thematic map and code aggregation. Upon finalizing the data reduction process, three main themes were identified and reported as a narrative: dispositions of top management, functionality of middle manager, and interceptive impediment of knowledge sharing.

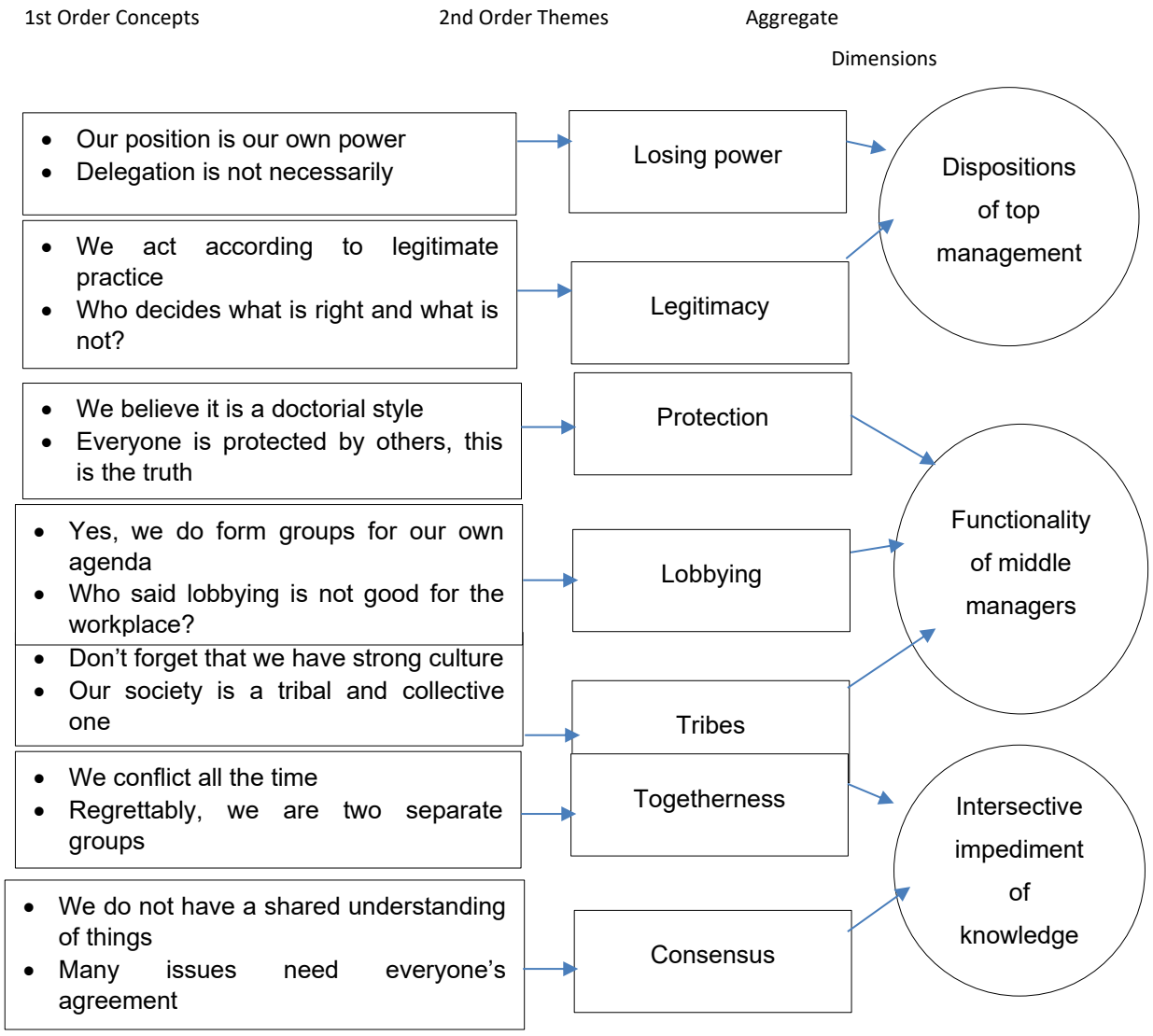

Figure 1: Final thematic map and code aggregation

(Source: Adapted from Corley and Gioia, 2004)

4. Empirical data and findings

The research findings indicate that whilst certain aspects of knowledge sharing may be considered as routine, in reality the process often proves significantly challenging when exchange of such knowledge involves interactions between individuals. This is because human social practice is complicated, and determining the

nature of this complicity is what is interesting. Furthermore, human cognition is influenced by the nature of social practice within the organizational context. Due to the complexity of human cognition, it was difficult for both top and middle management to create a shared understanding and, thus, a clear space to freely share each other's knowledge. This in turn negatively contributed to the accomplishment of many strategic objectives within the various stages of the strategy process. The communication between the two managerial groups was also found to be regulated by their social interaction and the consequent influence of social ties.

In contrast to middle managers, top managers were disinclined to share information, strategies, or other skills and experiences. It was also interesting to note that not sharing information could provide certain security for top managers in the sense of retaining their position and associated power. This view was shared by 27 of the 32 interviewees, and is further exemplified by the following quotes:

> *We enjoy full authority as we act as top managers… sharing a lot of information might not benefit us in the long run! Right?! (I-29-TM)*

> *From my experience, I think line managers enjoy not sharing all the details as this might let them feel devalued and threaten them along the way! (I-1-MM)*

Furthermore, the fear of being replaced appears to be a reason for distrust and disconcert among the managers. This view is represented in the following quote:

> *One of the main reasons why they behave in such manner is that they think from inside that we may harm them one day and jump into their chairs! (I-14-MM)*

> *In the job, I trust no-one, I only act according to my own feelings… you never know who your enemy might be! (I-18-TM)*

> *I think that we should treat everyone here as a colleague, not as a friend or a family member… you cannot be open to everyone, don't you think?! (I-21-TM)*

It was interesting to note that not openly sharing knowledge with others in the organization for lengthy periods might provide legitimacy for such practice. It may however be difficult to change this attitude without top leadership intervention:

> *When I remind my division manager about his responsibility to provide everything he knows to aid me supervise the various projects I am assigned to, he keeps saying 'no' and 'go and complain if you think that this is your right'! (I-2-MM)*

Similar views were expressed by the top managers, as exemplified in the comment below:

> *We are not entitled to give everything we know to others… we act legally, and our practice is legitimate by work principles! (I-7-TM)*

The top management sense of entitlement to retain knowledge appears further facilitated by a clear separation in operational and mental space among the two managerial groups:

> *If top managers think they have their own connections which protect them from accountability, we do also have even stronger connections to back us up! (I-3-MM)*

> *Top managers should not forget that we are a valuable asset to them and to this ministry, if we do not exist, they do not exist, if they think they are immune from serious issues, we also have our own immune system! (I-6-MM)*

The findings also indicate that social connections arising from familial relationships and cultural spaces may be integral to knowledge sharing among the managers as expressed in the following comments:

> *Our culture is a collective one… we do work in groups and we form lobbies for the benefit of individuals… this is obvious to everyone! (I-28-TM)*

> *I openly share information with my relatives or those who belongs to my last family name… I also share the same information with those whom I've known for years and years… other than that I consider myself preservative! (I-9-MM)*

> *It is much easier for me to get the required information from someone who is connected with me by the blood or share the same family title!... truth cannot be denied. (I-29-TM)*

The social connections and social practice of both top and middle managers within the ministry helped to understand the intersective impediment of KS as the third theme of this research. This was the most common theme in the dataset as it was addressed in 31 of 32 interviews conducted. The social connection node was anticipated given the Kuwaiti culture. Kuwait is considered a collective society bounded by strong ties between societal members; families, neighbours, and friends. These strong social ties play a critical role in building trust, mutual acceptance, and creating spaces for sharing knowledge. It is noteworthy that both top and middle managers acknowledge the absence of appropriate interactive spaces for socializing:

> *We need to feel for each other for the benefit of work, we need to be colleagues rather than enemies of one another… I think this kind of spirit is missing somewhere! (I-3-MM)*

> *We need to spend more time together, doing inside and outside social activities to know each other closely… but this should be in a way to keep an acceptable distance between us! (I-23-TM)*

The latter response however seems to stress the importance of keeping certain spaces between the two management levels to avoid undesired future consequences. It can also be inferred that both teams act personally and rarely sat with each other and shared knowledge openly. Such disconnections lead to lack of information consensus between actors, as exemplifies in the following comments:

> *How can we reach a common understanding if we do not get together, trust each other, speak loudly and support one another!?" (I-25-TM)*

> *I always get direct instructions from my manager to implement certain projects, but I really do not understand the single details which are more needed than just go and do! (I-32-MM)*

Such views highlight the importance of forming a shared understanding or "consensus" between the management levels. Reaching a common understanding makes the work process smoother and allows more tasks to be accomplished.

5. Discussion of findings

In the extant knowledge management literature, there is still limited research on the facilitating contexts for social and behavioural influences, particularly among managerial groups. Although responses varied between the managerial groups, the findings suggest that public sector organizations will benefit from aligning heterogenous groups within common collective spaces in order to better facilitate knowledge sharing.

Our findings further outline the importance of context or social space in sharing knowledge relevant to executing organization strategies. This is evident from the observation that communication process tended to be largely associated with the tribal backgrounds and family affiliations of concerned parties. Furthermore, there were indications that individuals are more inclined to share knowledge where an enabling group environment exists rather than at individual levels. This is in line with the notion that where a team 'ba' exists, the self becomes part of the collective (Nonaka and Konno, 1998). In this regard, the greater the possibility of establishing a common space of interaction, the more inclined individuals inhabiting the space will share their knowledge.

We equally observed that communications between top and middle managers appeared to be affected by prejudices, social stereotypes, and social connections, which were likely to influence knowledge sharing tendencies and quality. The willingness of both managerial groups to share knowledge appeared to be further predicated on their expectations of equal treatment. This supports existing research that individual tendency to share knowledge in organizations is predetermined by the prevalence of conducive contexts and experiences (Obembe, 2013).

Surprisingly the cultural context was a major barrier to communicating knowledge required for strategy implementation. Although the existing culture was recognized as being collective, this was not suitably convincing to foster knowledge sharing between the two managerial levels. Indeed, normative personal interests acted as both enablers and impediment to knowledge sharing when respondents were required to

communicate on strategy-related matters. The normative personal expectations thus present as a double-edged sword within the organizational context. This is contrary to the findings of Titi Amayah (2013), who concluded that personal benefits were one of three main motivations that makes a unique contribution to the process of knowledge sharing.

6. Conclusion

The aim of this paper was to explore communication of strategic knowledge among top and middle managers in the public sector domain through the application of 'ba'. Our findings reveal that public sector knowledge-sharing research is fragmented. The findings of this research also suggest that knowledge sharing, in reference to the strategy communication process in a public sector organization, depends on the social practices of individuals. Furthermore, the process of communication is strongly associated with the tribal affiliations of individuals. The process of knowledge sharing between and within top and middle managers was found to be more active on the collective level than the individual. Moreover, the willingness to share strategy-related knowledge is affected by the prejudices of individuals as well as social connections and stereotypes prevalent among the managerial groups. To this end, we concluded that given appropriate contexts or 'ba', there will be a greater propensity for knowledge sharing within public sector organizations.

6.1 Recommendations and managerial implications

If the findings are generalized beyond the single-selected organization, implications for practice could be clear. It is vital to appreciate that human interactions are complicated and require continuous study. Future research could involve conducting a conventional survey to predict some of the influencing communication attributes of top and middle managers in each strategy phase to see if their opinions change in each phase.

The research findings suggest a number of managerial implications and recommendations which can be taken into consideration. First, is the need for public sector organizations to provide necessary spaces for managers to be able to share their knowledge. Having the appropriate collective spaces will invariably facilitate socialization, which fosters organizational knowledge creation. In addition, for public sector organizations to successfully implement their planned strategies, it is imperative for them to promote a collaborative knowledge sharing culture. This may require them to implement and execute social engagement activities that encourage the alignment of individuals of different backgrounds and support the spirit of teamwork and togetherness.

6.2 Directions for future research

Since the focus of this study has been on perceptions of top and middle management, there is scope for further research to examine how social spaces impact knowledge sharing among other cadres of the organization (for instance, front-line employees). Furthermore, our focus was on one public sector ministry, but the possibility exists to examine the research findings in a wider context (multiple case studies) for the purpose of generalization of results.

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Why People Keep Using Knowledge Management Systems: A Causal Analysis of Continuance Behavior

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Abstract: This study examines the factors that cause a person to become a continuous user of a knowledge management system by examining continuance behavior. Continuance behavior is the decision to continue using a product after initial use. The data for this study were obtained using an online survey. The results were analyzed using partial least squares structural equation modeling. Six main hypotheses were developed which resulted in the evaluation of fourteen hypotheses. The results show that the technological features of a knowledge management system positively influence a user's evaluation with limited influence from the system's community features. The results produced a 58% coefficient of determination for knowledge management systems continuance intention and 37% for knowledge management systems continuance behavior. This investigation serves as a foundation for further research on the continuance usage of knowledge management systems. It addresses the needs of practitioners by examining which conditions they can manage to increase the purposeful use of their organizations' knowledge management systems. The study also addresses the needs of academia by expanding the literature on continuance behavior of knowledge management systems.

Keywords: Continuance Behavior, Expectation Disconfirmation Theory (EDT), Government, KMS, Partial Least Squares (PLS), Structural Equation Modeling (SEM), Survey

1. Introduction

A knowledge management system (KMS) is an information system designed to facilitate the storage, retrieval and transfer of knowledge (Alavi and Leidner, 2001; Argote, McEvily and Reagans, 2003). A KMS also involves interaction between people, processes and technology (Bolisani and Handzic, 2014). An information system is a platform that enables an individual and organization to collect, store, process, and transfer information (Lehaney, Lovett and Shah, 2011). Organizations use KMSs as the foundation for the technological component of knowledge management, consisting of people and processes (Alavi and Leidner, 2001). Previous KMS studies focused on describing the critical features of KMSs (Alavi and Leidner, 2001; Hansen, Nohria and Tierney, 1999). Researchers have noted that organizations need to evaluate whether invested resources are being used effectively to improve performance and create a competitive advantage (Krogh, Nonaka and Aben, 2001; O'Dell and Grayson, 1998). Kalling (2003) proposed that organizational KMS efforts may not be directly linked to a performance outcome based on profit but may be linked to a performance outcome if different metrics are considered. Kalling (2003) suggested that knowledge in an organization is not used widely again after initial use. Heisig, et al. (2016) suggested that more research is needed to understand the link between the use of KMSs and productivity. Nisar, et al. (2019) suggested that increased activity using the collaborative dimensions of a KMS coupled with improved knowledge quality in the system results in improved knowledge sharing; however, the impact on productivity is not consistent. These and other efforts highlight the importance of understanding how individual participation leads to KMS contributions (Ardichvili, 2008). Addressing the nature of KMS implementation in organizations is a promising area for study (Wang and Wang, 2016).

Because of the growing evidence that KMSs can lead improve performance, it stands to reason that studies should be available to support practitioners and researchers in this endeavor. However, when examining the existing literature, the following information is lacking: First, it is unclear why KMSs are often underutilized. Second, there is little research on the connection between using a KMS and performance at any level of the organization (Heisig, et al., 2016). While both areas are of interest, this research focuses on understanding system use.

Organizations have experienced a high level of KMS failures. According to Smith, Mills and Dion (2010), as many as 84% of KMS projects have no significant effect. Malhotra's (2005) research indicates failure rates as high as 70%. The reasons for these failures vary. However, one area that has been addressed is a lack of individual

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engagement (Ardichvili, 2008; Heisig, et al., 2016). Given the lack of individual engagement, organizations need to determine what influences individuals to regularly use KMSs.

Given the ineffectiveness of KMS projects, it is helpful to understand the link between KMS projects and KMS use (He and Wei, 2006; Lin and Tseng, 2005; Tseng, 2008; Small and Sage, 2006). Increasing individual use of a KMS ultimately leads to organizational improvement. The research on the use of information systems is well established and focuses on conditions that influence an individual's initial decision to use an information system (Davis, 1989; Venkatesh, et al., 2003). Another area of information-systems research focuses on determining what influences a user's decision to continue using a technology after initial adoption (Bhattacherjee, 2001). Users who incorporate a KMS into their work routine can enhance individual and organizational performance. Organizations that understand what influences their workers can improve their KMSs to encourage engagement. This study addresses an individual's intention to use and the actual use of, a KMS after initial adoption. There are a limited number of studies on KMS use after initial adoption, also known as continuance (Chen, 2007; He and Wei, 2006, 2009).

2. Background

2.1 Knowledge Management System

A KMS is an information system designed to facilitate the creation, storage, retrieval and transfer of knowledge (Alavi and Leidner, 2001; Argote, McEvily and Reagans, 2003). The primary purpose of a KMS is to support the knowledge-management activities of individuals in the organization to improve their performance. Although KMSs can take different forms, there are four common features: collaboration, repositories, process codification, and knowledge directories (Maier, 2007).

Collaborative tools increase the flow of knowledge between individuals in the organization by improving communication. Collaborative tools function better when individuals know each other and develop trust (Prusak and Cohen, 2001). Applications that support collaboration include email, chat, discussion boards and web conferencing.

Many KMSs act as a repository by collecting knowledge from individuals that others can access and reuse (Earl, 2001). The knowledge captured is typically context and domain specific. For a repository to be successful, individuals must be willing to contribute and make their knowledge explicit. Furthermore, as individuals contribute to the repository, a process must be in place to maintain the quality of the knowledge (Alavi and Leidner, 2001; Earl, 2001; Gold, Malhotra and Segars, 2001).

Process tools allow an organization to codify processes, work practices, procedures and other improvements within the KMS to improve organizational performance (Binney, 2001; Earl, 2001). Process tools are consistently updated through after-action reviews, lessons-learned sessions, and benchmarking of external organizations. Process tools augment decision-making by providing the most relevant practices.

Directory applications allow individuals to develop profiles and make them available to the entire organization (Earl, 2001). All organizational members are encouraged to create accurate profiles and share knowledge when contacted by fellow members.

This study examines a KMS that incorporates collaboration, repository, and process features to explore how an individual becomes a continuous user. This study is designed to help practitioners understand why individuals do not use a KMS consistently, which makes the system ineffective and results in project failure (Heisig, et al., 2016; Malhotra, 2005). This study examines systems-acceptance research that addresses an individual's initial acceptance of technology and some follow-up-use (Davis, 1989) and continuance research, which focuses on the effectiveness of the follow-up use of technology (Bhattacherjee, 2001). The goal is to understand what drives an individual to use a KMS continuously.

2.2 Systems-Acceptance and Continuance Research

Systems-acceptance research primarily addresses an individual's initial acceptance of a given technology (Davis, 1989). In organizations, individuals face an initial decision as to whether to accept a new technology. Sometimes, they must accept the new technology involuntarily (Goodhue and Thompson, 1995). However, users do have a

choice in their follow-up responses. The follow-up response after initial acceptance is known as post-acceptance or continuance.

In information-systems research, continuance makes information-system use effective. Information systems that are continuously used can significantly impact an organization (Cooper and Zmud, 1990; Kwon and Zmud, 1987). However, users' continuance behavior is uneven. Some will continue to use a system regularly and others will choose to restrict their use.

Continuance is evaluated from two perspectives. One perspective examines continuance behavior as an extension of initial acceptance (Mathieson, 1991; Taylor and Todd, 1995a). The other approach examines continuance as post-confirmation of the initial decision (Tiwana and Bush, 2005). The first approach understands continuance in terms of the same factors that led to initial acceptance. The continuance decision via initial acceptance is evaluated by numerous approaches, including innovation diffusion theory (Rogers, 2003), the technology acceptance model (Davis, 1989), the theory of planned behavior (Ajzen, 1991; Taylor and Todd, 1995a) and social cognitive theory (Compeau and Higgins, 1995). These approaches assume that the same characteristics that explain initial acceptance also justify continuance.

Continuance results from different psychological conditions (Bhattacherjee, 2001; Tiwana and Bush, 2005). Continuance as post-confirmation of the initial decision suggests that initial acceptance does not guarantee continued use. Expectation disconfirmation theory is used to examine continuance behavior (Oliver, 1980). Disconfirmation, satisfaction, and perceived usefulness are the three variables of expectation disconfirmation theory. This approach requires an individual to compare his or her expectations of an experience with the reality.

Bhattacherjee, Perols and Sandford (2008), examine the differences between early and late adopters of information systems using expectation disconfirmation theory. Bhattacherjee (2001) developed a model of information-system continuance based on expectation disconfirmation theory. Expectation disconfirmation theory is rooted in consumer-behavior research and is extended into the context of information systems. One of the key findings of the Bhattacherjee (2001) information system continuance study is that a user may discontinue using a system after initially accepting it.

2.3 Continuance Model

The information systems continuance model, which is grounded in consumer-satisfaction research, is based on expectation disconfirmation theory (Anderson and Sullivan, 1993; Oliver, 1993). Expectation disconfirmation theory suggests that an individual's decision to repurchase or use a product is based on the confirmation of an initial expectation, the perception of the product's performance and the level of satisfaction with the product. A purchaser's initial expectation is seen as influencing satisfaction. In expectation disconfirmation theory, satisfaction is a crucial variable driving repurchase intention.

Continuance intention is similar to repurchase intention for a consumer product. First, a consumer purchases an item; this is the initial decision. Second, a consumer develops an initial opinion of that purchase. Third, based on their subsequent experience compared with their initial opinion, a consumer may decide to repurchase the product. In the information-systems context, systems acceptance is the initial decision that weighs heavily on future use. If the initial experience aligns with or exceeds the expectation of that experience, then the user is likely to continue using the system.

The information systems continuance model shows that an individual's intention to continue using an information system is influenced by their satisfaction and perception of its usefulness (Bhattacherjee, 2001). Perceived usefulness and satisfaction are both influenced by disconfirmation. Disconfirmation involves comparing a user's previous use to a user's current use. Additionally, perceived usefulness measures a user's post-usage acceptance, which is a stronger indicator of future use than user satisfaction (LaTour and Peat, 1980). Jennex and Olfman (2006) addressed the variables of intent to use/perceived benefit and satisfaction in the knowledge management success model. Satisfaction is seen as a strong proxy for KMS use, as different users will use a KMS as needed. Nevertheless, use on a frequency-type basis may be infrequent yet the use may be effective. Use/perceived benefit extends the concept of perceived consequences (Thompson, Higgins and Howell, 1991). Perceived consequences are the anticipated outcomes of value based on an individual's actions (Triandis, 1979). Therefore, intent to use/perceived benefit serves as a proxy for understanding whether use will occur in the future (Jennex, 2012).

Bhattacherjee, Perols and Sandford (2008) proposed an extension of the information systems continuance model by evaluating and elaborating on factors influencing the original model. The extended model incorporates information-technology (IT) self-efficacy and facilitating conditions. These two variables are part of perceived behavioral control as developed in the theory of planned behavior (Ajzen, 1985, 1991). Users' perceptions that their organizations support them are known as facilitating conditions (Bhattacherjee, Perols and Sandford, 2008). Examining facilitating conditions is expected to explain what moves a user from the intention to use the system to actually using it.

Bhattacherjee, Perols and Sandford's (2008) extended model alters the terminology from perceived usefulness to post-usage usefulness to avoid confusion with previously developed initial-acceptance models. The extended model removes the relationship between usefulness and satisfaction because said relationship is not clearly defined. In addition, the extended model adds IT self-efficacy and facilitating conditions. IT self-efficacy addresses an individual's belief that they can use a system based on their understanding. Facilitating conditions address an individual's belief that they have support from their organization to use the information system. This KMS-continuance model examined in this study is shown in Figure 1.

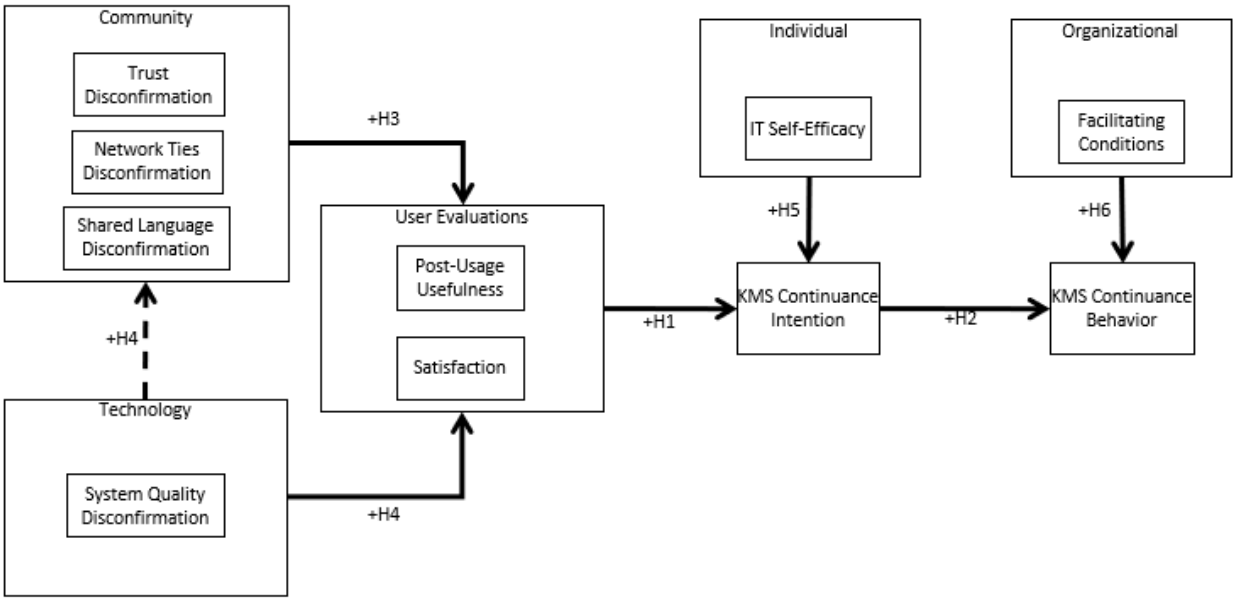

Figure 1: Research Model of Knowledge Management System Continuance

As a result, it is proposed that

(H1) Hypothesis 1: User evaluation is positively related to increased KMS-continuance intention.
(H2) Hypothesis 2: KMS-continuance intention is positively related to increased KMS-continuance behavior.

2.4 Dimensions of Knowledge Management Systems

As previously stated, knowledge management consists of people, processes and technology. Therefore, KMSs primarily focus on the technology of knowledge management (Alavi and Leidner, 2001). In this research, four dimensions are examined that are expected to be related to user evaluation, continuance intention and continuance behavior. The four dimensions are community, technology, the individual and the organization (Maier, 2007).

Community refers to social interactions' influence on KMS use (Prusak and Cohen, 2001). Community is evaluated through the lens of social capital theory, which suggests that the strength of an individual's relationships leads to social actions (Nahapiet and Ghoshal, 1998). Social capital theory, developed by Nahapiet and Ghoshal (1998), consists of three components: the relational, structural and cognitive levels. The relational dimension of social capital theory consists of trust, norms, obligation and identification. The structural dimension consists of network ties, network configuration and appropriable organization. Finally, the cognitive dimension consists of a shared language and shared narratives. This study hypothesizes that trust, network ties and shared language are related to a user's evaluation of a KMS.

(H3) Hypothesis 3: Community interaction is positively related to increased user evaluation.

The technological dimension explains how a KMS facilitates and enhances user evaluations. When executed properly, a KMS supports improved processes and decision-making activities (Lucas, 1990). KMSs allow organizations to better manage their processes by creating, storing, transferring and applying new knowledge. In addition, a KMS can facilitate and enhance individual and collaborative activities. Technological attributes can influence an individuals' willingness to use a KMS (Schiuma, Andreeva and Kianto, 2012). The attributes examined include reliability, user-friendliness, accuracy and accessibility. The technology dimension represents the quality of the knowledge, the effectiveness of accessing the knowledge and the ease of interaction.

(H4) Hypothesis 4: The level of technological quality is positively related to increased user evaluation and community interaction.

Organizations provide KMSs to their employees as well as the strategy and resources to use them. Individuals must contribute to the KMS to make its use worthwhile. All knowledge starts with the individual and spreads to others, resulting in new knowledge that the organization can magnify in the KMS (Nonaka, 1994).

Individual and organizational dimensions are modeled using the concept of perceived behavioral control. Perceived behavioral control is the belief that individuals have adequate control over their behavior (Ajzen, 1991). Perceived behavioral control is a multifaceted measure that includes the variables self-efficacy and controllability. Applying a perceived behavioral-control concept to information systems explains individual behaviors in voluntary and involuntary situations (Venkatesh and Davis, 2000). Self-efficacy is an individual's perception of their ability to accomplish a task. IT self-efficacy is an individuals' perception of their ability to operate a technology effectively (Venkatesh, et al., 2003). Controllability is the control individuals perceive themselves as having over the resources needed to accomplish a task.

As noted above, perceived behavioral control has two components: self-efficacy and controllability. Self-efficacy addresses an individual's perception of control and is inwardly focused. Controllability addresses an individual's perception of external control (Bhattacherjee, Perols and Sandford, 2008; Taylor and Todd, 1995b). Bhattacherjee, Perols and Sandford (2008) examined the internal and external aspects of control in the extended information systems continuance model. Venkatesh, et al. (2003) examined IT self-efficacy's influence but found it negligible. While the multiple-measure nature of perceived behavioral control may be unclear, Bhattacherjee, Perols and Sandford (2008) showed that self-efficacy positively influences information systems continuance intention. Controllability, also known as facilitating conditions, positively influences actual use. IT self-efficacy is expected to impact continuance intention, and facilitating conditions are expected to impact continuance behavior.

The organizational dimension encompasses actions by the organization that influence individuals to use a KMS. This organizational dimension is external to the individual and thus out of their control. The organizational dimension is measured by facilitating conditions. Facilitating conditions encompass the following concepts controlled by the organization: supportive leadership, organizational structure and availability of resources. Venkatesh et al. (2003, p.453) defined facilitating conditions as "the degree to which an individual believes the organizational and technical infrastructure exists to support their use of the system."

Facilitating conditions enhance an individual's ability to use a given system. The organization's leadership can support and encourage KMS use by providing external resources, such as training, collaboration time and remote access (Bhattacherjee, Perols and Sandford, 2008; Davenport, De Long and Beers, 1998; Kerno, 2008). Additionally, an organization should reduce unnecessary rules and structures to encourage employees to interact freely and cohesively (Davenport and Prusak, 1998; McKeen, Zack and Singh, 2006). Finally, organizations must reduce and eliminate barriers by integrating and embedding the KMS into daily processes (Wiig, 1997).

(H5) Hypothesis 5: IT self-efficacy is positively related to increased KMS-continuance intention.
(H6) Hypothesis 6: Facilitating conditions are positively related to increased KMS-continuance behavior.

2.5 Research Model

The research model uses concepts and definitions from the KMS and information systems continuance literature. In addition, the approach captures individuals' perceptions of their use of KMSs.

The hypotheses are drawn from the theory that individuals will continually use a system that provides usefulness and satisfaction. The community dimension explains how the strength of individuals' trust, network ties and shared language influences their actions. The technology dimension affects the structural dimension of network ties. Both the community and technology dimensions directly influence users' perceptions of usefulness and satisfaction. These factors subsequently influence users' intention to use the system, which directly affects actual use. Users' intentions to use the system are also influenced by their IT self-efficacy, which affects their confidence in using the system. Finally, users' actual use is influenced by their perception of external support from their organization.

3. Research Methods

3.1 Methods of Analysis

Partial least squares (PLS) structural equation modeling (SEM) is a useful approach in situations in which theory is not well developed (Wold, 1985). Research on KMSs and information-system acceptance are well established, but their combination is not; thus, PLS is an appropriate analysis method (Cepeda-Carrion, Cegarra-Navarro and Cillo, 2019).

The PLS approach allows the evaluation of the relationship between independent (exogenous) variables, dependent (endogenous) variables and the interrelationship of both. PLS is a SEM approach widely conducted using a two-step process (Chin, 1998; Sosik, Kahai and Piovoso, 2009). The first step is the estimation of the measurement model, which is similar to factor analysis. A measurement model shows how the measurement items relate to their latent variables. A latent variable cannot be observed directly. The measurement model provides reliability information and factor loadings about the latent variable of interest. The second step is the estimation of the structural or path model. The structural model estimates the path coefficients that determine the relationship between independent and dependent variables. The path coefficients indicate the strength of the relationships between variables. PLS generates t-values, R^2, composite reliability and average variance extracted (AVE).

3.2 Measures

The current study emphasizes the KMS characteristics that influence an individual's continued use of a KMS. The variables used are based on previously developed multi-item variables.

The community dimension of a KMS is modeled by three variables—trust, network-ties and shared-language disconfirmation. The disconfirmation approach asks individuals to compare their current experience to their prior expectations regarding said experience (Bhattacherjee, 2001; Oliver, 1980). The three variables and associated measurement items are based on previous research of social capital theory (McKnight, Choudhury and Kacmar, 2002; Nahapiet and Ghoshal, 1998; Tiwana and Bush, 2005). Trust disconfirmation uses six items that measure the competency and benevolence of trust. Network-ties disconfirmation uses three items and shared-language disconfirmation uses two items.

The technology dimension of KMSs is modeled by a single variable—system-quality disconfirmation. Three items compose this variable from previous research (Clay, Dennis and Ko, 2005; McKinney, Yoon and Zahedi, 2002).

Two variables measure a user's evaluation of a KMS: Post-usage usefulness and satisfaction. Post-usage usefulness is measured by four items adapted from Davis (1989) and Bhattacherjee (2001). Satisfaction is measured by three items adapted from Spreng, MacKenzie and Olshavsky (1996) and Bhattacherjee (2001).

The individual dimension of KMSs is measured by IT self-efficacy, which is itself measured by three items (Bhattacherjee, Perols and Sandford, 2008). The organizational dimension of a KMS is measured by facilitating conditions that consist of three items adapted from Bhattacherjee, Perols and Sandford (2008) and Venkatesh et al. (2003). KMS-continuance intention is measured by three items (Bhattacherjee, 2001). KMS-continuance behavior is measured by three items adapted from Bhattacherjee, Perols and Sandford (2008). Five items

measure demographic data. User comments are collected with two questions. The data-collection model is presented in Figure 2. Table 1 shows the measurement items for the variables used in this study.

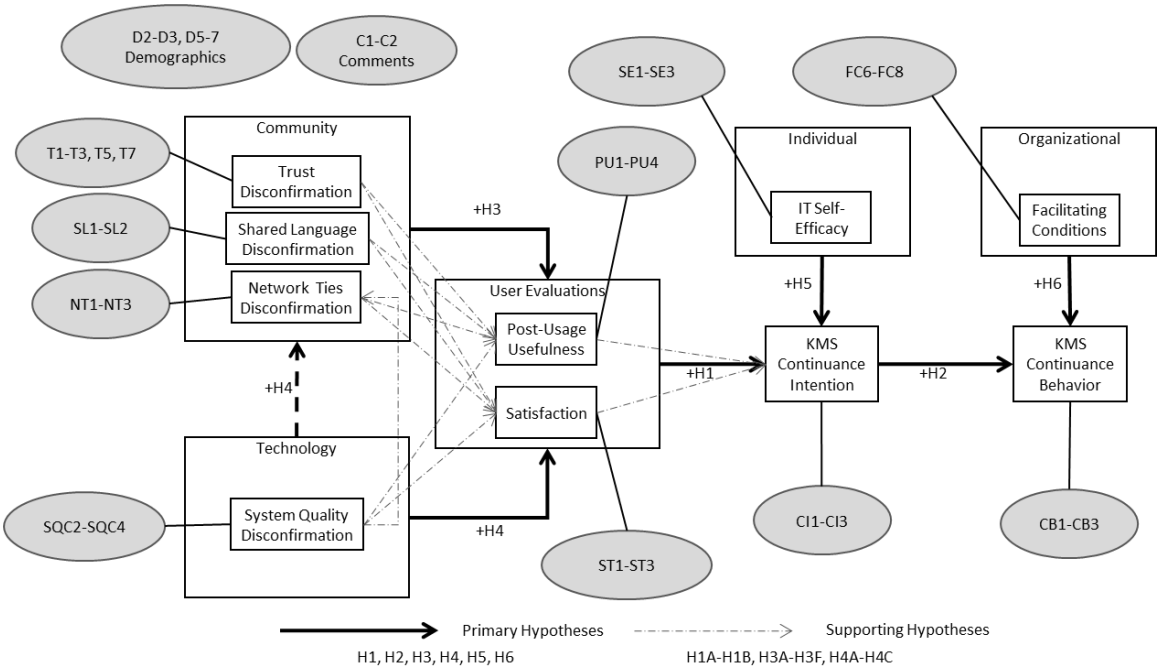

Figure 2: Data-Collection Model

Table 1: Measurement Items of Variables

Measurement items of variables: Exogenous (I) and Endogenous (D)	
Facilitating Conditions (I)	
FC6	My organization provides the time needed to use the KMS.
FC7	My organization's leadership supports the use of the KMS.
FC8	My organization encourages me to integrate the use of KMS into regular processes.
Information-Technology Self-Efficacy (I)	
SE1	I can perform my job using Air Force Knowledge Now (AFKN) resources without assistance from others.
SE2	I can perform my job using AFKN resources if I have adequate time to complete the job.
SE3	I can perform my job using AFKN using only the online help feature as a reference.
KMS-Continuance Intention (I/D)	
CI1	I intend to continue to use this KMS in the future.
CI2	My personal intentions are to continue using this KMS to acquire, create, store, or transfer knowledge.
CI3	If permitted by my organization, I would like to continue to use this KMS to acquire, create, store or transfer knowledge.
KMS-Continuance Behavior (D)	
CB1	How many times have you visited AFKN in the last month? 0 | 1–3 | 4–6 | 7–9 | 10–12 | more than 12
CB2	What percentage of work do you currently perform using knowledge from the AFKN KMS?
	0% | 1–10% | 11–20% | 21–30% | 31–40% | more than 40%
CB3	How much time throughout your week do you spend sharing knowledge with the AFKN KMS?
	Less than 1 hour | 1–3 | 4–6 | 7–9 | 10–12 | more than 12 hours
Network-Ties Disconfirmation (I/D): Compared to my initial membership in this AFKN KMS community, …	
NT1	Members know each other more closely than I expected.
NT2	Members professionally interact (on the KMS) more closely than I expected.
NT3	Members network more often than I expected.

Measurement items of variables: Exogenous (I) and Endogenous (D)							
Post-Usage Usefulness (I/D)							
PU1	Using the KMS will increase my productivity (e.g., work is completed faster).						
PU2	Using the KMS will improve my performance (e.g., makes my work routine better).						
PU3	Using the KMS will make me more effective (e.g., helps me make better decisions).						
PU4	I find the KMS to be useful in my job.						
Satisfaction (I/D) – Questions were positioned at intervals throughout the survey and used different scales.							
	How do you feel about your overall experience using AFKN?						
ST1	Very Dissatisfied	Dissatisfied	Dissatisfied Somewhat	Neutral	Satisfied Somewhat	Satisfied	Very Satisfied
ST2	Very Displeased	Displeased	Displeased Somewhat	Neutral	Pleased Somewhat	Pleased	Very Pleased
ST3	Very Frustrated	Frustrated	Frustrated Somewhat	Neutral	Contented Somewhat	Contented	Very Contented
Shared-Language Disconfirmation (I): Compared to my initial membership in this AFKN KMS community, …							
SL1	A common language is used to share ideas more than I expected.						
SL2	A common set of terms is known by members more than I expected.						
System-Quality Disconfirmation (I): Compared to my initial membership in this AFKN KMS community, …							
SQ2	The accuracy of stored knowledge is greater than I expected.						
SQ3	The ease of using the AFKN interface is greater than I expected.						
SQ4	Technical support for AFKN interface is better than I expected.						
Trust Disconfirmation (I): Compared to my initial membership in this AFKN KMS community, …							
T1	My trust in other members is greater than I expected.						
T2	My belief that other members have good intentions is greater than I expected.						
T3	My belief in the reliability of others is greater than I expected.						
T5	My community's general knowledge of the subject matter is greater than I expected.						
T6	My community's overall capability as an expert source of knowledge is greater than I expected.						
T7	My trust in this community's ability to protect sensitive material is greater than I expected.						

3.3 Data collection and sample

In previous studies, KMSs were presented as a combination of human and technical components. In this study, the United States Air Force (USAF) KMS is examined (Bartczak, Turner and England, 2008; Fitzgerald, 2004), specifically the Air Force Knowledge Now (AFKN) System. The USAF has more than 600,000 individuals working for multiple organizations around the globe. The individuals that work in the Air Force are classified as civilians, officers, or enlisted personnel. AFKN consists of 300,000 users organized into knowledge communities. AFKN users may join communities, access repositories, locate experts and perform organizational processes. AFKN use is tracked through web-based metrics. Community owners can customize the structure of the interface for the needs of the users.

AFKN administrators reported that the KMS is used in one of three ways: as a repository, a collaborative platform, or a process tool. The repository approach allows users to find and exchange documents. Any member of AFKN can use the search interface to access the repository of accessible open knowledge. The collaborative approach provides various virtual tools, such as email, chat and conference features. Finally, the process approach allows organizations to embed functions on the AFKN platform used as part of an organization's regular work routines.

Sampling was performed by randomly selecting 375 communities from AFKN. This number was selected by determining the size of the various knowledge communities and then developing a stratification for sampling. The community facilitators were contacted to determine whether they would allow their community to be surveyed. Once a commitment was obtained, the community's members became part of the candidate pool. Of the 375 communities, 157 agreed to be part of the study. The candidate pool consisted of 13,750 individuals and 1,115 invitations were sent to randomly selected members to obtain a minimum of 97 responses. The questionnaire was open and available for two weeks from April 27, 2010 to May 11, 2010.

The minimum sample size of 97 was determined by using a significance level of 0.05, a power of 0.80 and a medium effect size of 0.15. These parameters are common in social science and business research (Hair et al. 2017). In conjunction with the KMS-continuance model, these parameters resulted in a sample size of 85, which was adjusted by 15% to compensate for measurement error, which made the minimum size 97 (Lehmann, 2006).

G*Power 3 was used to determine the minimum sample size (Faul et al., 2009). While this sample size was sufficient to perform the PLS analysis on the KMS-continuance model, it fell short of the sample size needed to generalize the results to the AFKN population. A sample-size calculation was conducted to determine the sample size required to generalize the findings for the AFKN population of 300 thousand with a 5% margin of error. The result was a recommended sample of 384.

The response rate was 19.7%, with 221 complete responses. This is above the 97 required to test the KMS-continuance model but below the 384 responses needed to generalize to the AFKN population. As a result, the margin of error was increased to 6.9%, making the required responses 202. The respondents' demographic breakdown was as follows: 43.4% civilians, 22.2% officers and 34.4% enlisted personnel. Overall, 51.6% of the respondents used the repository features, 19.5% used the collaborative features, and 28.9% used the organizational process features. AFKN use tended to be voluntary and there were low rates of non-voluntary use. Table 2 displays the results.

Table 2: Sample Characteristics

Variable	Count	Percentage
Voluntary		
Yes	202	91.40
No	19	8.60
Months of membership		
Less than 1	4	1.81
1 to 12	66	29.86
13 to 24	52	23.53
25 to 36	49	22.17
37 to 48	22	9.95
49 to 60	18	8.14
More than 60	10	4.52
Rank distribution		
E-1 through E-4 (1)	3	1.36
E-5 and E-6 (2)	29	13.12
E-7 through E-9 (3)	44	19.91
O-1 through O-3 (4)	16	7.24
O-4 through O-6 (5)	33	14.93
O-7 through O-10 (6)	0	0.00
GS-1 through GS-5 (7)	0	0.00
GS-6 through GS-10 (8)	3	1.36
GS-11 through GS-15 (9)	6	2.71
Contractor (10)	60	27.15
Other (11)	27	12.22
Position		
Facilitator	19	8.60
Expert	20	9.05
Leader	35	15.84
Beginner	54	24.43
Outsider	27	12.22
Bystander	66	29.86
Purpose of Community		
Organization	65	29.41
Project Team	51	23.08
Functional Interest	105	47.51
KMS Use		
Repository	114	51.58
Collaborative	43	19.46
Process	64	28.96
Total	**221**	

As part of the survey, respondents were asked to comment on factors that affected their decision to participate in their primarily community. The response was optional and no guidance was provided. The response results were grouped initially by whether the tenor of the response was positive or negative. After the initial

assessment, the responses were grouped into six categories supported by a pilot study and a literature review. The thematic categories were repository performance, accessibility, content quality, organizational support, availability of time to access and collaboration. Overall, there were 96 comments from 76 individuals or 34.4% of the 221 respondents. Of the 96 comments, 42.7% were positive and 57.3% were negative. Table 3 displays the results of the open-comment responses.

Table 3: Open-Comment Response Summary

Variable	Count	Percentage
Positive or Negative		
Positive	41	42.71
Negative	55	57.29
KMS Use (Positive)		
Repository	24	58.54
Collaborative	7	17.07
Process	10	24.39
KMS Use (Negative)		
Repository	36	65.45
Collaborative	9	16.36
Process	10	18.18
Thematic Response (Positive)		
Repository Performance	17	41.46
Accessibility	5	12.20
Content Quality	11	26.83
Organizational Support	2	4.88
Availability of Time	1	2.44
Ability to Collaborate	5	12.20
Thematic Response (Negative)		
Repository Performance	0	0.00
Accessibility	23	41.82
Content Quality	17	30.91
Organizational Support	8	14.55
Availability of Time	6	10.91
Ability to Collaborate	1	1.82
Total	**96**	

4. Operationalization and Validation

The data collection model, presented in Figure 2, highlights the relationship among the following ten variables: trust disconfirmation, network-ties disconfirmation, shared-language disconfirmation, system-quality disconfirmation, post-usage usefulness, satisfaction, IT self-efficacy, facilitating conditions, KMS-continuance intention, and continuance behavior. The variables based on previous research are presented in Section 3.2 and Table 1. The relationships shown in the model are tested by PLS using SmartPLS Version 3.0 (Ringle, Wende and Becker, 2015). SmartPLS provides an assessment of the measurement and structural models. SmartPLS provides t-values and path coefficients for the measurement and structural models. It also provides an R^2 for the structural model. Hypotheses are assessed based on the path coefficients of the structural model (Henseler et al., 2014).

4.1 Measurement Model

The assessed measurement model establishes model reliability and validity. The items evaluated as part of the measurement model are internal-consistency reliability and indicator reliability. Internal-consistency reliability indicates how well our items measure what they are expected to measure and are measured by evaluating the Cronbach's alphas, Rho alphas and the composite reliabilities of the variables shown in Table 4 (Fornell and Larcker, 1981; Hair et al., 2019; Sosik, Kahai and Piovoso, 2009). Internal-consistency reliability is 0.60 for exploratory research; however, there is a range of 0.70–0.95 for confirmatory research (Chin, 1998; Hair, 2009; Hair et al., 2019). Results above 0.95 indicate redundant variables. The ten variables have internal-consistency reliability values between 0.70 and 0.95.

Table 4: Composite Reliability, Cronbach's Alpha and Average Variance Extracted

#	Variables	# of Items	Mean	SD	Cronbach's Alpha	Rho Alpha	Composite Reliability	AVE
1	Facilitating Conditions (FC)	3	4.91	1.43	0.83	0.83	0.83	0.63
2	IT Self-Efficacy (SE)	3	5.11	1.27	0.89	0.89	0.89	0.73
3	KMS-Continuance Behavior (CB)	3	2.25	1.39	0.82	0.82	0.82	0.61
4	KMS-Continuance Intention (CI)	3	5.66	1.05	0.95	0.96	0.95	0.87
5	Network-Ties (NT) Disconfirmation	3	4.15	1.28	0.87	0.87	0.87	0.70
6	Post-Usage Usefulness (PU)	4	4.98	1.26	0.93	0.94	0.93	0.78
7	Satisfaction (ST)	3	5.27	1.16	0.90	0.91	0.90	0.76
8	Shared-Language (SL) Disconfirmation	2	4.70	1.10	0.83	0.83	0.83	0.71
9	System-Quality (SQ) Disconfirmation	3	4.69	1.27	0.78	0.78	0.78	0.55
10	Trust (T) Disconfirmation	5	4.83	1.12	0.89	0.90	0.89	0.63

Indicator reliability measures the proportion of each indicator's variance explained by the respective latent variable. An acceptable rule of thumb is that each item's loading should be 0.7 or greater (Hair et al., 2019). The bold items in Table 5 represent the loadings for the measurement model. All the loadings exceed the 0.7 threshold, which indicates acceptable reliability.

Construct validity of the measurement model is determined by evaluating factor loadings and cross-loadings while establishing convergent and discriminant validity. A generally accepted rule of thumb is to accept items with loadings of 0.7 or greater (Bollen, 1989). Bollen (1989) suggested that larger factor loadings indicate unidimensionality. In addition, items should load closely with their respective variables and load poorly with other variables. In this study, all items load well with their respective variables.

Convergent validity measures how well the measurement items relate to the variable (Campbell and Fiske, 1959). Convergent validity is established when the AVE is 0.5 or greater (Fornell and Larcker, 1981). AVE is a measure of the variance shared between the variable and its indicators. Each measurement item should load on its latent variable with a significant t-value (Chin, 1998). Table 4 indicates that all AVE range from 0.55 to 0.87.

Discriminant validity is established when each set of measurement items correlates weakly to other sets of measurement items (Campbell and Fiske, 1959). Discriminant validity is established when the square root of the AVE is consistently greater than the off-diagonal correlations. Discriminant validity can also be established by removing items that load poorly or appear to load on more than one variable. Table 6 reflects discriminate validity for all measurement items. Table 7 provides an evaluation of discriminate validity using the heterotrait-monotrait (HTMT) ratio. The desired HTMT ratio is 0.85 or less (Hair et al., 2019). The HTMT ratio is below 0.85 for all the latent variables.

Table 5: Loadings and Cross-Loadings

1) Facilitating Conditions, 2) IT Self-Efficacy, 3) KMS-Continuance Behavior, 4) KMS-Continuance Intention, 5) Network-Ties Disconfirmation, 6) Post-Usage Usefulness, 7) Satisfaction, 8) Shared-Language Disconfirmation, 9) System-Quality Disconfirmation, 10) Trust Disconfirmation

Items	1	2	3	4	5	6	7	8	9	10
FC6	**0.78**	0.35	0.34	0.33	0.31	0.35	0.46	0.21	0.36	0.29
FC7	**0.80**	0.29	0.39	0.41	0.20	0.38	0.42	0.19	0.36	0.22
FC8	**0.79**	0.32	0.41	0.43	0.17	0.43	0.40	0.10	0.31	0.17
SE1	0.38	**0.86**	0.32	0.43	0.11	0.53	0.64	0.13	0.57	0.26
SE2	0.31	**0.82**	0.28	0.35	0.20	0.57	0.60	0.13	0.60	0.32
SE3	0.35	**0.88**	0.37	0.37	0.22	0.58	0.62	0.21	0.64	0.37
CB1	0.34	0.28	**0.77**	0.50	0.16	0.41	0.32	0.03	0.26	0.19
CB2	0.38	0.32	**0.79**	0.41	0.25	0.44	0.33	0.14	0.33	0.25
CB3	0.40	0.29	**0.77**	0.40	0.27	0.36	0.27	0.26	0.26	0.28
CI1	0.45	0.36	0.47	**0.90**	0.23	0.69	0.59	0.12	0.33	0.27
CI2	0.52	0.47	0.58	**1.01**	0.25	0.71	0.64	0.16	0.44	0.29
CI3	0.40	0.42	0.51	**0.89**	0.20	0.68	0.54	0.19	0.40	0.31
NT1	0.22	0.15	0.25	0.21	**0.84**	0.29	0.24	0.47	0.31	0.53
NT2	0.21	0.17	0.26	0.18	**0.82**	0.32	0.32	0.48	0.38	0.49
NT3	0.28	0.19	0.22	0.22	**0.85**	0.37	0.33	0.42	0.37	0.51

Items	1	2	3	4	5	6	7	8	9	10
PU1	0.47	0.64	0.47	0.61	0.36	**0.90**	0.69	0.27	0.61	0.4
PU2	0.46	0.59	0.47	0.62	0.38	**0.89**	0.68	0.28	0.56	0.45
PU3	0.37	0.53	0.45	0.61	0.37	**0.83**	0.61	0.28	0.56	0.45
PU4	0.43	0.55	0.43	0.79	0.28	**0.91**	0.71	0.23	0.56	0.38
ST1	0.44	0.56	0.31	0.58	0.37	0.63	**0.84**	0.21	0.66	0.40
ST2	0.53	0.69	0.32	0.56	0.28	0.70	**0.91**	0.17	0.73	0.40
ST3	0.43	0.64	0.40	0.53	0.28	0.66	**0.86**	0.22	0.68	0.41
SL1	0.14	0.16	0.19	0.12	0.49	0.29	0.18	**0.86**	0.32	0.53
SL2	0.22	0.15	0.12	0.17	0.44	0.22	0.20	**0.83**	0.38	0.52
SQ2	0.31	0.50	0.26	0.30	0.32	0.52	0.53	0.36	**0.75**	0.57
SQ3	0.34	0.56	0.22	0.30	0.24	0.47	0.64	0.30	**0.73**	0.42
SQ4	0.32	0.50	0.32	0.33	0.38	0.45	0.60	0.25	**0.74**	0.45
T1	0.21	0.30	0.23	0.21	0.50	0.35	0.32	0.46	0.47	**0.75**
T2	0.19	0.27	0.23	0.28	0.47	0.40	0.36	0.50	0.53	**0.79**
T3	0.22	0.30	0.18	0.21	0.56	0.35	0.39	0.49	0.50	**0.79**
T5	0.19	0.28	0.27	0.21	0.46	0.37	0.36	0.52	0.54	**0.78**
T7	0.32	0.32	0.31	0.31	0.44	0.44	0.41	0.48	0.53	**0.85**

Table 6: Discriminant Validity

#	Latent Variables	1	2	3	4	5	6	7	8	9	10
1	**Facilitating Conditions**	**0.79**									
2	**IT Self-Efficacy**	0.40	**0.85**								
3	**KMS-Continuance Behavior**	0.48	0.38	**0.78**							
4	**KMS-Continuance Intention**	0.49	0.45	0.56	**0.93**						
5	**Network-Ties Disconfirmation**	0.28	0.21	0.29	0.24	**0.83**					
6	**Post-Usage Usefulness**	0.49	0.66	0.52	0.75	0.39	**0.88**				
7	**Satisfaction**	0.54	0.73	0.39	0.63	0.36	0.77	**0.87**			
8	**Shared-Language Disconfirmation**	0.21	0.18	0.18	0.17	0.55	0.30	0.23	**0.85**		
9	**System-Quality Disconfirmation**	0.44	0.71	0.36	0.42	0.43	0.65	0.79	0.41	**0.74**	
10	**Trust Disconfirmation**	0.29	0.37	0.31	0.31	0.61	0.48	0.46	0.62	0.65	**0.79**

Table 7: Heterotrait-Monotrait Ratio

#	Latent Variables	1	2	3	4	5	6	7	8	9	10
1	**Facilitating Conditions**										
2	**IT Self-Efficacy**	0.40									
3	**KMS-Continuance Behavior**	0.48	0.38								
4	**KMS-Continuance Intention**	0.49	0.45	0.56							
5	**Network-Ties Disconfirmation**	0.28	0.21	0.29	0.24						
6	**Post-Usage Usefulness**	0.49	0.66	0.52	0.75	0.39					
7	**Satisfaction**	0.53	0.72	0.40	0.63	0.36	0.76				
8	**Shared-Language Disconfirmation**	0.21	0.18	0.19	0.17	0.55	0.30	0.23			
9	**System-Quality Disconfirmation**	0.44	0.71	0.36	0.42	0.43	0.65	0.79	0.41		
10	**Trust Disconfirmation**	0.29	0.37	0.31	0.31	0.61	0.48	0.46	0.62	0.65	

4.2 Structural Model Assessment

The structural model was assessed by estimating the variance (R^2 values) and the path coefficients. The R^2 values measure the model's predictive power in relation to the dependent variables (Chin, 1998; Chin, Marcolin and Newsted, 2003). The level of R^2 is explained differently in the literature. Falk and Miller (1992) considered an R^2 from 0.11 to 0.75 as significant. Chin (1998) and Chin, Marcolin and Newsted (2003) developed different categories to explain R^2 significance levels with an R^2 of greater than 0.67 considered substantial, 0.33 to 0.67 moderate and 0.19 to 0.33 weak. Hair et al. (2019) referred to R^2 values of 0.75, 0.50 and 0.25 as substantial, moderate, and weak, respectively.

Path coefficients indicate the strength of the relationships between the different variables tested in the model. T-values were used in the measurement model and the structural model to determine the significance of the paths. The path coefficients were estimated using the consistent bootstrapping method with the recommended sample size—500 initially and 5,000 for finalization (Chin, 1998; Dijkstra and Henseler, 2015). Significant path relationships indicate support for the hypotheses (Bentler, 1985). Chin, Marcolin and Newsted (2003)

recommended that standardized paths be at least 0.20 and stated that they should be 0.30 to be considered meaningful.

The model results shown in Figure 3 indicate that two significant paths meet the recommended 0.20 cutoff and five significant paths exceed the recommended 0.30 cutoff. Seven paths fall below the 0.20 cutoff. The variance explained by trust, network-ties, shared-language and system-quality disconfirmation to post-usage usefulness is 44% and satisfaction is 65%. The pathways from trust, shared-language and network-ties disconfirmation to post-usage usefulness and satisfaction are not significant at the p = 0.05 level. The pathways from system-quality disconfirmation to post-usage usefulness and satisfaction are all significant at the p = 0.05 level. System-quality disconfirmation also has a significant pathway to network-ties disconfirmation at the p = 0.05 level. The variance explained by the pathway from system-quality disconfirmation to network-ties disconfirmation is 18%. The variance of KMS-continuance intention explained by post-usage usefulness, satisfaction and IT self-efficacy is 58%. The pathways from post-usage usefulness and satisfaction are significant at the p = 0.05 level. The pathway from IT self-efficacy to KMS-continuance intention is insignificant. The amount of variance explained by KMS-continuance intention is moderate based on Chin, Marcolin and Newsted (2003). The variance obtained this study is similar to the research on information systems conducted by Bhattacherjee, Perols and Sandford (2008) and in Chen's (2007) KMS research. The amount of variances of KMS-continuance behavior explained by continuance intention and facilitating conditions is 37%. The pathways from KMS-continuance intention to continuance behavior and from facilitating conditions to KMS-continuance behavior are both significant at the p = 0.05 level. According to Chin's criteria (1998), the variance explained is weak to moderate. The variance from intention to action in this study is similar to previous information systems continuance research (Bhattacherjee, Perols and Sandford, 2008). This result suggests that the KMS-continuance model functions similarly to previous information-systems research. Table 8 presents a summary of the hypotheses.

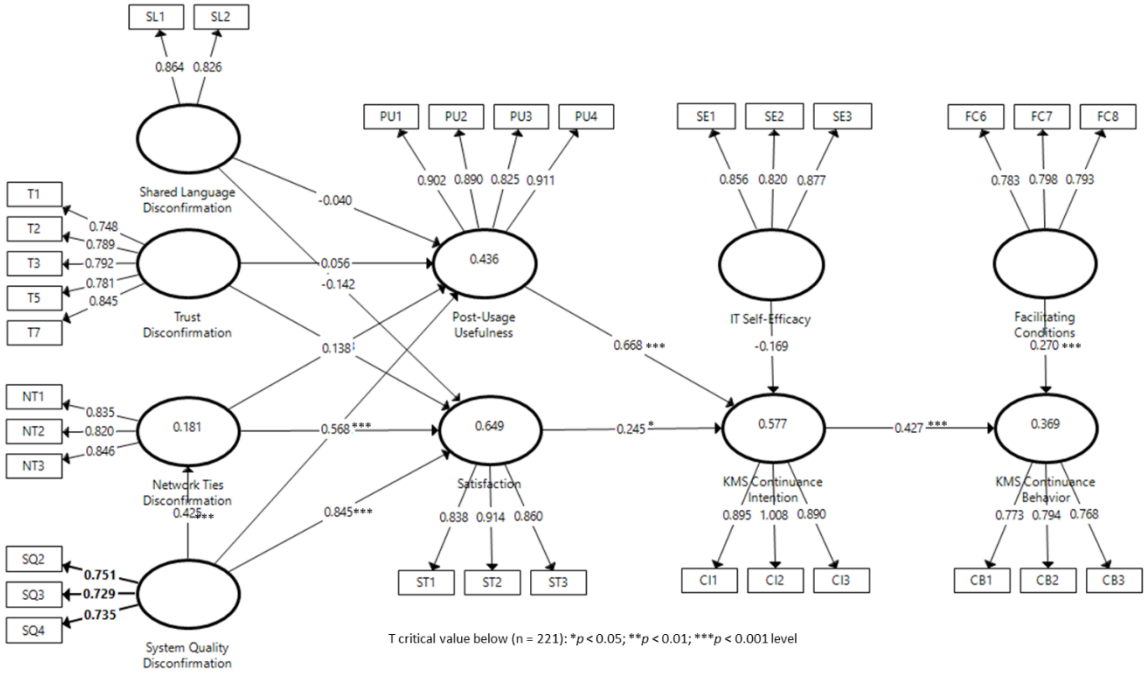

Figure 3: Knowledge Management System Continuance PLS Model Results

Table 8: Summary of Hypotheses

Structural Path	Standardized Path Coefficients	T-Value	Supported
H1A: Post-Usage Usefulness → KMS-Continuance Intention	0.67***	7.78	Yes
H1B: Satisfaction → KMS-Continuance Intention	0.25*	2.24	Yes
H2: KMS-Continuance Intention → KMS-Continuance Behavior	0.43***	6.64	Yes
H3A: Trust Disconfirmation → Post-Usage Usefulness	0.06	0.05	No
H3B: Trust Disconfirmation → Satisfaction	−0.06	0.55	No
H3C: Network-Ties Disconfirmation → Post-Usage Usefulness	0.14	1.33	No
H3D: Network-Ties Disconfirmation → Satisfaction	0.11	1.39	No
H3E: Shared-Language Disconfirmation → Post-Usage Usefulness	−0.04	0.43	No
H3F: Shared-Language Disconfirmation → Satisfaction	−0.14	1.73	No
H4A: System-Quality Disconfirmation→ Network-Ties Disconfirmation	0.43***	4.58	Yes
H4B: System-Quality Disconfirmation → Post-Usage Usefulness	0.57***	4.83	Yes
H4C: System-Quality Disconfirmation → Satisfaction	0.85***	9.21	Yes
H5: IT Self-Efficacy → KMS-Continuance Intention	−0.17	1.69	No
H6: Facilitating Conditions → KMS-Continuance Behavior	0.27***	3.44	Yes

*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$ (two-tailed)

5. Discussion and Conclusions

This study examined what influences a person to become a continuous user of a KMS by studying continuance behavior. The results show that the community and technology dimensions affect a user's evaluation of the KMS. Additionally, individual attitudes and organizational support are important influencers, but their influence is not even. The findings, limitations and the needs of practitioners and academia are addressed in this section.

This study examined the community dimensions of trust, network ties and shared language using a disconfirmation approach. These dimensions were based on social capital theory and were expected to work together to influence a user's evaluation of the KMS (Nahapiet and Ghoshal, 1998). In this examination, all the community dimensions indicated few or no significant pathways to influencing the user's post-usage usefulness evaluation. In contrast to the community dimension, the technology dimension positively influences both post-usage usefulness and satisfaction. While members may have had limited experience with the system's community features, many were clear in their system-quality disconfirmation answers. Whether a user belongs to a community or not, they all require technology to access the KMS. Additionally, system-quality disconfirmation positively influences the community dimension of network-ties disconfirmation. The data show that users' experience with the system's technology affects how network ties are formed. However, as previously noted, while network-ties disconfirmation mediates system-quality disconfirmation, it does not significantly affect post-usage usefulness or satisfaction. According to the results, the community dimensions appear to have minimal influence on the user's evaluation. Although these variables should have influenced the user's evaluation, they did not. These variables may not be salient in the users' minds based on the culture of the Air Force and the openness of the AFKN system. Based on these results, additional investigation is needed to understand better when the community dimension of KMSs becomes a significant factor.

User evaluations in the form of satisfaction and post-usage usefulness significantly influence an individual's KMS-continuance intention. Post-usage usefulness has a more substantial influence than satisfaction on KMS-continuance intention. This indicates that an individual's continuance-intention decision is based on a holistic evaluation of the KMS versus short-term gratification. This finding aligns with previous studies showing that post-usage usefulness is less time sensitive and a more robust indicator of future action (LaTour and Peat, 1980). KMS-continuance intention is a significant influence on KMS-continuance behavior. While an intention-to-action gap exists in the current study, the 37% of variance explained by intentions on behavior is similar to previous information system research (Bhattacherjee, Perols and Sandford, 2008). Lastly, given the functional nature of KMS use, a gap in intention to use should be expected, as frequency-based measures are not the best way to measure the actual use of a KMS. This finding aligns with Jennex (2017), who suggested that actual use will occur when appropriate.

Individual and organizational dimensions were examined using IT self-efficacy and facilitating conditions. IT self-efficacy was expected to influence KMS-continuance intention; however, the data did not support this expectation. In the research by Bhattacherjee, Perols and Sandford (2008), IT self-efficacy influenced

information system continuance intentions. Facilitating conditions were established in previous research to model external resources' influence and were expected to influence KMS-continuance behavior (Bhattacherjee, Perols and Sandford, 2008; Venkatesh, et al., 2003). Facilitating conditions, as used in this study, added additional factors to explore other dimensions viewed as external resources. Facilitating conditions influence the KMS-continuance behavior by 5%.

Another finding indicates that individuals have limited time to use a KMS; however, when they use the system, they use it to access updated repositories and work-process features. Unfortunately, several respondents indicated that their ability to access and navigate the KMS was low and that the information in the KMS was not maintained. Respondents who said they used the collaborative system features found the tools too cumbersome. As a result, individuals often sent emails rather than using more collaborative tools such as chat, discussion forums and web conferencing. Respondents noted that the networking features were useful but still too immature to work effectively. This feedback is helpful for developers looking to increase system's accessibility and usability.

Furthermore, research was needed to determine how and why an individual becomes a continuous user of a KMS in order to reduce system-failure rates (Kerno, 2008; Tseng, 2008). The analysis shows that quality is a significant factor influencing an individual's evaluation of a system. Users indicated that curation of quality content and system accessibility are important factors influencing their continued use. Accessing the system in the study required a card interface. This feature limits the time that users can spend on the system. Unless individuals have the same home accessibility as work accessibility, they are less likely to participate and become continuous users. Additionally, users must know which features are available, how to access them and these features must be convenient to use.

One limitation of this study lies in the demographics of the survey group. According to the data, approximately 19.5% of the respondents used collaborative features. Additionally, the results of the community-dimension questions had a non-significant impact in the analysis. These two combinations limit the understanding of those who use the KMS collaboratively.

Additionally, KMS users who mainly use the repository and process features may have different needs from those using the collaborative features. This effort studied a wide range of users. More research is needed to focus on users who use the collaborative features of the KMS. The analysis of the specific KMS-usage approach showed no difference when compared to the entire sample. While theory supported the development of the community dimension, the results in this study were limited and more research is needed.

The current study used self-reporting frequency measures of usage. This approach may not accurately indicate an individual's actual usage. However, measuring KMS usage by a non-frequency-based measure may be a better indicator than a frequency-based measure extracted from archival data given the use-as-needed nature of KMSs.

Another limitation of this study is the lack of responses from the highest-ranking individuals in the organization. While there are senior executives who have access to the system, none responded to the survey. An examination of how senior individuals use a KMS is of interest. A dimension that could be examined is the impact of senior-level leadership's using the KMS on the actual use by less senior individuals in the organization

Future research should employ a two-step approach that establishes a baseline of initial expectations followed by a disconfirmation measure. This approach has been used in past research efforts that employed the disconfirmation method (Chen, 2007). Future studies could also investigate the link between continuance behavior and other performance outcomes at the individual, team and organizational levels.

Finally, the research results indicate that practitioners of KMSs must ensure their systems are accessible, the available functions are clear and the content is curated and of high quality. Additionally, practitioners must ensure that the use of the KMS is integrated into organizational processes so their members have designated time and resources to participate. For academia, this study expands the literature on continuance behavior in relation to KMS. It also indicates several additional dimensions for study, including the collaborative dimensions of KMSs, senior executive participation and an approach that can be connected to organizational outcome metrics to determine whether KMS use impacts performance.

Disclosure statement

The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of the Air Force, the Department of Defense, or the US Government. Distribution A: Approved for Public Release, Distribution Unlimited. USAFA-DF-2020-388.

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Causes and Consequences of the Academic Migration from BRICS Countries to Developed Economies

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Abstract: One of the major problems in the relationship between the Global South and the Global North is the the drain of intellectual capital from the economies and education systems of the most developed countries of the Global South, which bothers both developing countries and some European ones. The purpose of the study is to reveal the reasons for the migration of scientists and students from Brazil, the Russian Federation, India, China, South Africa (BRICS countries) and identify the consequences of the process through the example of a Russian university by studying the characteristics of personal experience and motivation of students and teachers. The research is devoted to the study of academic activity abroad and the attitude of 360 four- and five-year students and 321 teachers at Novosibirsk State University (Novosibirsk, the Russian Federation) towards the practice. The survey results revealed that a relatively small number of respondents (31.07% of teachers and 9.03% of students) have experience of foreign academic activity; the large majority of participants highly assessed the possibility of studying and working abroad (4.87 and 3.48 on a 5-point Likert scale among teachers and students, respectively). The results of the study are in line with the findings of similar studies on academic migration in other BRICS countries; therefore, they can be extrapolated in a broader context. In particular, according to all respondents, the possibility of repeated or circular migration is extremely low (0.88 and 1.61). The research results can help to manage international research and exchange programs, as well as to regulate university training programs and academic migration. The novelty of the study lies in the analysis of the motivation of scientists and students on academic migrating and their assessment of migration intentions based on an example of a single educational institution and region.

Keywords: academic migration; BRICS; brain drain; foreign academic activity; global research; global South and North

1. Introduction

The phenomenon of international exchange and human capital flight has been studied for more than a decade as it significantly affects the development of national economies. One of the most important events in the global political and economic life was the rapid development of countries that traditionally belonged to the third world and their achievement of several key economic indicators that are close to those of the most developed economies (Wolhuter and Chigisheva, 2020). This fact was recognized by Western researchers and described in Building Better Global Economic BRICs – an analytical report made by Goldman Sucks in 2001 which projected that the group of countries including Brazil, India, China and the Russian Federation would exceed the economic growth rates of the G6 countries until 2050. Some years later, as a result of another analytical response from the Goldman Sucks Group, South Africa was also joined to these countries. Thus, the concept of BRICS as a kind of unique group of countries with advanced indicators of economic growth emerged (Sebri and Dachraoui, 2020).

In fact, some researchers almost immediately after the BRICS (Brazil, the Russian Federation, India, China, South Africa) acronym introduced by Goldman Sacks analytics became widespread in academic research and media indicated that this term reference was completely speculative, not supported by any serious calculations and described it as an emotional perception of global changes in transnational trade and capital movement rather than a sound concept (Horvath and Carpenter, 2020; Wolhuter and Chigisheva, 2020). It was noted that the

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selection conditions for the formation of the group of BRICS countries violate the rules of a sufficient logical basis for classification, because there is not a single parameter that would unite all these countries. BRICS countries have different levels of GDP growth, different scale and structure of the economy, level of political participation or influence on their regions, different population sizes, etc. The expectation that the economies of these countries will overtake the G6 level by 2050 can also be extended to other rapidly developing countries (Sebri and Dachraoui, 2020; Wolhuter and Chigisheva, 2020; Secundo et al., 2020). Indonesia, South Korea, and some African countries could have been included in the group of undoubted leaders of economic and social development. It seems that the expert selection for the BRICS group was carried out based on the number of people (43% of the world's population in 2016) and the size of the territory, which contributes to their national economy. The second significant selection criterion was the abundance of natural resources concentrated in these countries (Müller, 2020; Sebri and Dachraoui, 2020).

At the same time, all BRICS countries belong to the Global South - these are countries with developing or transitional economies as opposed to the Global North, which involves countries of the traditional colonial metropolis with the highest level of economic development, social security and military potential (Horvath and Carpenter, 2020; Müller, 2020). One of the major problems in the relationship between the Global South and the Global North is the brain drain from the economies and education systems of the most developed countries of the Global South, which bothers both developing countries and some European ones, such as Italy (Cattaneo, Malighetti and Paleari, 2019; Gupta, 2018; Ilić and Milosavljević, 2017). Brain drain involves the loss of both intellectual capital and human potential, and the investment in education that feeds the more advanced economies. Researchers note that all BRICS countries, as well as almost all countries of the Global South, are affected by the consequences of brain drain.

However, the problem of migration of highly skilled labor and intellectual capital is not unambiguous. Researchers point out that actually there is an effect of reverse transmission: migrants returning to their homeland bring new knowledge, methods of learning and work, and technologies; while working abroad, they generate huge cash flows that become a solid part of the investment potential for their home countries, and as a diaspora abroad, they create economic and socio-political support for their home countries (Bailey and Mulder, 2017; Dragan and Milosavljevic, 2018; Korobkov, 2020).

Hereinafter, "academic" refers to persons who study, teach, or do research at universities or public research centers, such as research institutes and institutes of national academies of sciences in post-Soviet countries or China. In all cases, to refer to certain groups of this category, such as teachers, students or scientists, they will be mentioned separately.

Most studies on intellectual migration are focused on scientists, students, and teachers from China; there is less research devoted to the situation in Brazil and India, and the problems of intellectual migration are insufficiently studied in the Russian Federation and South Africa (Novgorodtseva and Belyaeva, 2020; Tarasyev and Agarkov, 2019). At the same time, the researchers note that the features of the migration process of highly skilled labor and intellectual capital can be better understood if there is a wide range of field studies conducted in educational institutions and training centers, as well as in individual regions and countries (Gui, Liu and Du, 2019; Kubota, 2020).

In addition, most of the research in this area has been carried out on the basis of qualitative methodology: selected unstructured interviews, analysis of individual experience, analysis of individual or group discourse on the exchange of scientists from certain countries, etc. (Cattaneo, Malighetti and Paleari, 2019; Dragan and Milosavljevic, 2018; Leung, 2017; Wang, 2020). The research proposed in this article is quantitative and intends to encourage researchers to conduct measurable studies in the field of the flow and transfer of intellectual resources and the features of these processes, as well as their impact on individual economies and the global economy. In addition, this study, in contrast to those listed below, focuses on the individual experience of academics, as the central agents of both intellectual capital management processes and academic migration. It is the factors of personal motivation and intentions, according to researchers, that reflect the trends of academic migration most fully and can be used for predicting and further factor analysis of this process in quantitative research (Vangen, C., 2016; Van Holm, Wu and Welch, 2019; Tarasyev and Agarkov, 2019; Miguelez and Temgoua, 2020).
The study aims to contribute to the research in this area based on the examination of a Russian university. The purpose of the study is to reveal the reasons for the migration of scientists and students from BRICS countries

and identify the consequences of the process through the example of a Russian university by studying the characteristics of personal experience and motivation of students and teachers. The novelty of this study lies in the analysis of the motivation of scientists and students for academic migration and the assessment of migration intentions based on a survey of a single educational institution and region (Novosibirsk State University, the Russian Federation). The study also aims to fill the gap related to the insufficient quantitative research on academic migration.

2. Literature review

The phenomenon of academic migration from BRICS countries is obviously large-scale, and it does not lend itself to accurate statistics and qualifications (Chang, Chen and Xiong, 2018; Leskina et al., 2020; Wolhuter and Chigisheva, 2020). Researchers point out that the academic community, including scientists, teachers and students, tend to migrate by means of business travel, tourist visas and other methods rather than by accepted or fixed routes (Rostovskaya et al., 2020). Therefore, according to researchers, the statistics of academic migration provided by officials, in particular in the Russian Federation, cannot be considered adequate (Kosyakov and Guskov, 2019; Tarasyev and Agarkov, 2019).

At the same time, the migration movement is ambiguous. In the past five years, studies conducted in China, India or Brazil have shown that there are three migration flows: a flow from the Global South to the Global North, a return flow to participate in national science programs, and a circular or repeated migration (Bailey and Mulder, 2017; Dick and Duchêne-Lacroix, 2016). Thus, there is a loss of skilled workers seeking a higher standard of living, available technologies, and research opportunities; however, there is a reverse process that involves the transfer of acquired technologies and knowledge to the homeland (Bouabid, Paul-Hus and Larivière, 2016; Vangen, 2016).

One of the complex research topics is assessing the quality of the intellectual potential of the BRICS member countries and its role in migration. Some researchers point out that the countries of the Global North are in the phase of both economic and academic stagnation, and the quality of education and training is declining; in particular, this refers to secondary education (Miao and Wang, 2017). Therefore, it is important to attract intellectual resources from abroad in order to maintain high-tech society and manufacturing (Bouabid, Paul-Hus and Larivière ,2016; Horvath and Carpenter, 2020). Replenishment of intellectual capital is critical for maintaining the sustainable competitive development of both large and small and medium-sized businesses, which are an important part of the economies of most developed countries (Bryl and Fijałkowska, 2020; Secundo et al., 2020). On the other hand, there are studies that indicate that higher level of technology, as well as the better quality of education, research and academic programs in developed economies, attract students and scholars from the Global South (Faist, 2018; Leskina et al., 2020; Miguelez and Temgoua, 2020).

A serious problem generated by the outflow of intellectual resources from the BRICS countries is the decrease in the investment attractiveness of sending countries, while the cash flows that migrants return to their homeland stimulate consumption, in particular, exports of goods and services from the countries migrants leave for, rather than investment in infrastructure or human capital (for example, in education). Thus, the countries of origin of migrants remain resource donors and consumption markets (Chang, Chen and Xiong, 2018). It should be noted that in different BRICS countries the situation varies dramatically; in particular, in China, where the domestic market is largely dominated by national products and technologies, while other BRICS countries are large commodity importers (Dall'agnol et al., 2019; Solimano, 2016).

The problem of academic mobility is a serious issue. Academic mobility is becoming one of the major factors of social stratification and an important factor in the development of knowledge management processes in universities and international research centers that attract scientists from different countries (Va Van Holm, Wu and Welch, 2019; Vătămănescu et al., 2019). In this regard, an important question regards the distribution of the products of the intellectual capital accumulated in such research centers and the return of the financial results of the activity of this intellectual capital to the homelands (Iacuzzi, Massaro and Garlatti, 2020; Secundo et al., 2020). Thus, the ability to cross national borders and study abroad is a determinant of a high position in the academic community; however, at the same time, migrants most often experience "downward social mobility" (Leung, 2017). The phenomenon used to be viewed as an exclusively positive issue in relation to migrants while in fact it brings them traumatic and uncertain results.

Modern researchers are shifting from the term “brain drain” as not corresponding to reality and come up with parallel terms, such as “brain gain” and “brain sharing” (Gurieva, 2016; Rostovskaya, Pismennaya and Skorobogatova, 2018). The latter is related to the fact that academic mobility in a digital society may not be associated with real geographic movement as the scientist continues to work in their country. Some scholars have a rather revolutionary view of academic transfer and mobility which they describe as a temporal rather than spatial phenomenon as it is associated with a different period of life rather than movement (Wang, 2020).

Several studies indicate that the motivation and intention of academics are the primary factor of academic migration, and analyze cross-sections of the economic, political and psychological elements of this process (Vangen, 2016; Volokh and Gerasimova, 2019; Wang, 2020). Research based on interviews with academic migrants also emphasizes the problem of motivation; studies from across the global South indicate that these motivations have much in common across regions (Leung, 2017; Van Holm, Wu and Welch, 2019; Novgorodtseva and Belyaeva, 2020). However, direct research into the motivation of academic migration using representative surveys and quantitative methodology is lacking (Ilić and Milosavljević, 2017; Gui, Liu and Du, 2019; Korobkov, 2020).

3. Material and Methods

The study was conducted at Novosibirsk State University (Novosibirsk, the Russian Federation) in November 2020 with the participation of 360 four- and five-year students (graduates) studying humanitarian and natural sciences. The confidence interval of 5% for the general population of the students studying at the university, the sample provides reliable results. There were 185 men and 175 women aged 22 - 29 years involved in the experiment.

The second group of respondents - teachers of the same university - involved 321 people. There were 171 men and 150 women aged 31-64 years. Under the same conditions, the sample is representative and the results of the survey provide statistically significant results.

The participants were invited to participate in the study on a voluntary basis and were informed of both the objectives and methods of the research. Each participant received an electronic (by email) or a physical copy of the questionnaire with a unique random number, which guaranteed the confidentiality of participation. No personal information was collected or used during the study.

Based on the data obtained, we studied the percentage of responses and calculated the Spearman's rank correlation coefficient between some answer options and groups of participants by gender, age and specialization (natural science or humanitarian) to identify dependencies. Spearman's rank correlation coefficient was used since we used ordinal data in this test, not continuous data.

The survey questions were selected based on the features of foreign research on this issue over the past 5 years (Bailey and Mulder, 2017; Cattaneo, Malighetti and Paleari, 2019; Leung, 2017; Wang, 2020). The assessment was based on a 5-point Likert scale, where 1 is a slight agreement or complete disagreement with the statement, and 5 – complete agreement with the statement. In the statistical processing and visualization of the results, the arithmetic mean of the estimates for each answer option was used. To study the Spearman's rank correlation coefficient, we relied on the aggregates of the responses given by the participants for each answer option rather than on their mean values. It should be considered that the respondents may have simultaneously referred themselves to several groups as they have experience of different types of academic activities abroad.

The test used for this study was developed by the author on the basis of research. This pilot study serves as a reference for the subsequent more accurate verification of the validity of this text. Reliability of the test was checked using Cronbach alpha and got a high enough score: $\alpha = .716$. The validity of the study was confirmed by a special additional survey of study participants, who were asked to assess whether the content of the questions and assessments of the test offered to them corresponds to the content of the object under study. Confirmation was received from all study participants.
When interviewing students and teachers, the question was focused on both the intention to take part in international interaction and work and the real experience of this kind. In the study, the real experience is reflected by two indicators: the percentage of the number of respondents with relevant experience and the

subjective assessment of the experience based on the Likert scale ("positive/negative" or "I want to do this again/I do not want to do this again."

The research results were processed in SPSS 22.0 and visualized in MS Excel 2013.

4. Results

Figure 1 shows the respondents' assessment of their desire to take part in certain academic activities abroad. It should be noted that in this case, the assessment refers not only to the experience but also to the general intention to participate. The desire to take part in international academic programs (4.87 points by students and a slightly more cautious estimate of 3.48 points by teachers) and get a job in commercial companies related to the academic activity (4.19 and 4.47, respectively) prevail. In the second case, the teachers gave a higher assessment due to the obviously greater experience and confidence in their capabilities when working for commercial organizations.

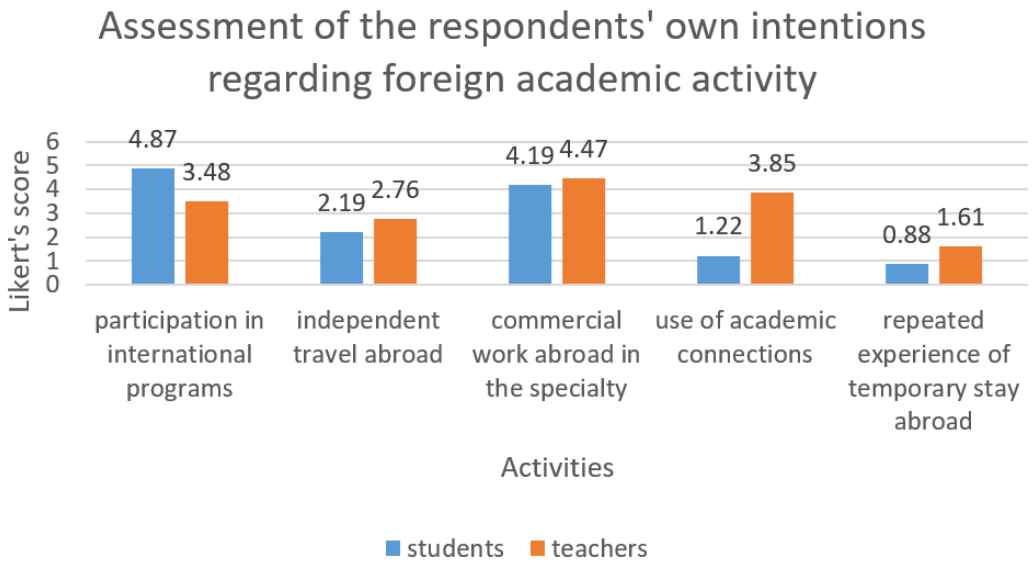

Figure 1: The respondents' intentions to conduct foreign academic activities

The possibilities of independent travel abroad to implement some plans of academic development received a lower assessment. Nevertheless, the assessment of independent activity in this direction is unexpectedly high (2.19 and 2.76, respectively). Both groups of participants gave the lowest assessment to the possibility of the multiple use of the experience of studying or working abroad - 0.88 and 1.61, respectively. The teachers and researchers naturally demonstrated much greater enthusiasm in the assessment of the possibility of using academic connections to go abroad for academic purposes compared to students who have not established such connections yet (3.85 and 1.22, respectively).

Figure 2 shows the percentage of respondents who have real experience of certain academic activities abroad. In the sample, there were no students who had acquired a scientific degree abroad or built an academic career abroad. The number of teachers with such experience also turned out to be low (Figure 2). There are also very few of those who continue their research abroad (8.12%), and it is natural that there are very few of them among students (0.18%); as a rule, these are the participants in international programs or holders of certain academic grants. At the same time, up to a third of the teachers and scientists surveyed either have work experience abroad or plan to continue this experience (31.02% and 31.07%, respectively). There are extremely few students in this category. Despite the fact that there is a rather noticeable part of students who also have such experience (5.28% and 9.03%, respectively), it is obvious that there is no real basis in the form of experience for the positive expectations of commercial work related to academic interests abroad (Figure 1).

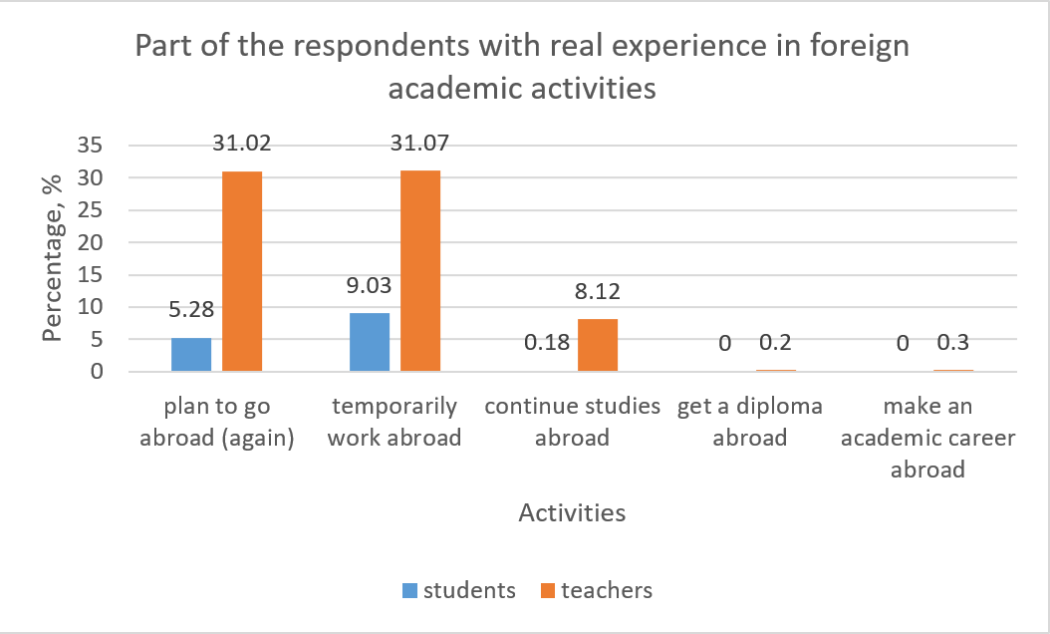

Figure 2: The respondents with real experience of foreign academic activities

Figure 3 shows the respondents' assessment of their own experience of foreign activities; it is a very important fact that it almost coincides with the estimates given by the relative percentage of those who have such experience. In general, according to students, academic experience abroad was assessed as low; apparently, this is due to their lack of involvement, lack of information about academic connections, and relatively little interaction with them. The sample may have included mainly those who did not have high achievements as a result of such experience, which may be a manifestation of sampling bias; however, this is unlikely due to the statistical reliability of the sample.

The teachers gave a high assessment to the possibility of going abroad again and conducting temporary academic activities abroad. However, their assessment can be described as rational and positive rather than overestimated (3.48 and 3.17, respectively).

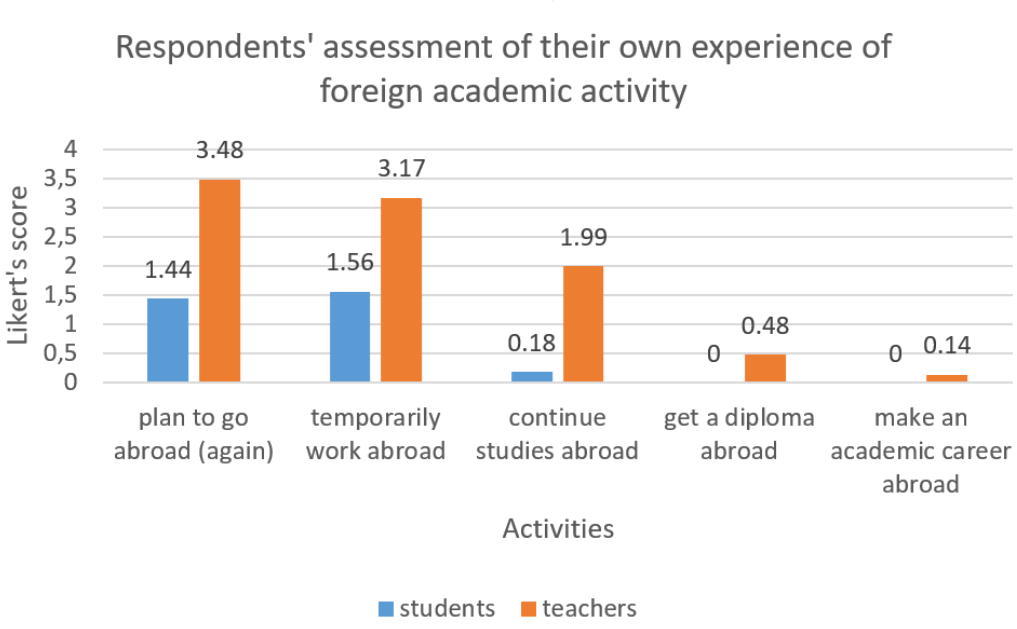

Figure 3: Respondents' assessment of their experience of foreign academic activities

Figure 4 shows the percentage of respondents who have certain experience of academic work, education and other types of academic activity abroad by groups. There are very few of them among students. There are 17.82% of those students who take part in some kind of international academic programs, including student exchange programs, etc. This is the highest indicator among students. The number of teachers in this group of respondents is also the highest (74.82%). The percentage of those who tried to get a job abroad in an academic environment or in commercial organizations on their own with the help of academic connections is approximately at the same level and ranges from 12.86% to 16.95%.

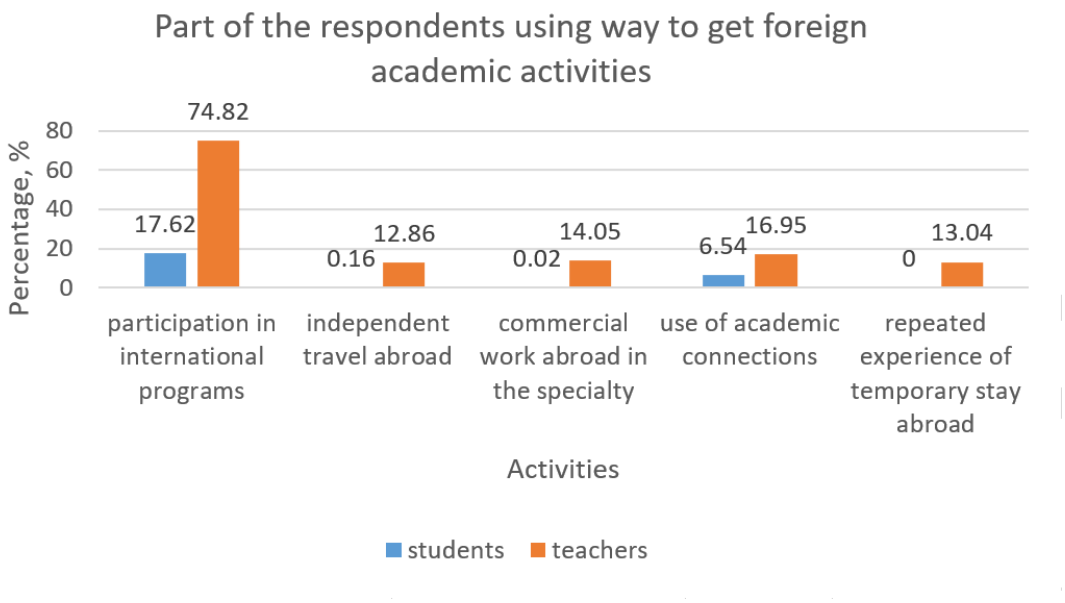

Figure 4: Percentage of respondents who have the experience of academic activities abroad

Figure 5 demonstrates the respondents' assessment of different ways of gaining access to academic activity abroad. The teachers and researchers assigned the highest points to the use of their own academic connections (4.15) and the work in the commercial sector in the field of specialty (4.12); a slightly lower assessment was also given to the participation in international programs (3.11). The possibility of independent travel and the experience of traveling abroad and being "suspended" for a long time are negatively assessed and given extremely low points (1.02 and 1.85, respectively).

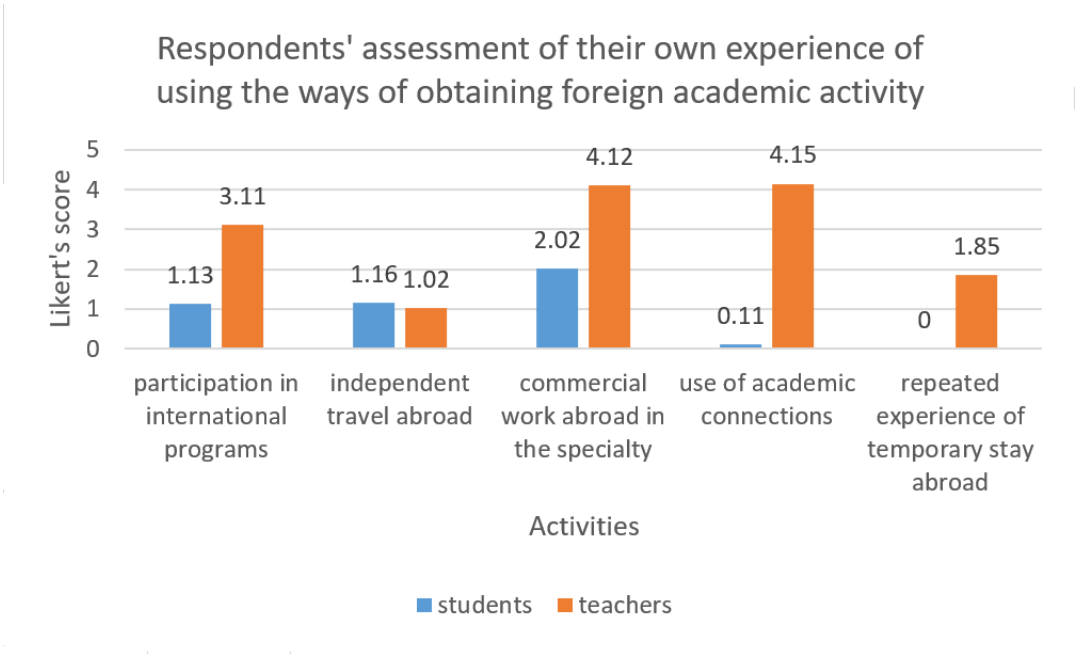

Figure 5: Respondents' assessment of the ways to get the experience of foreign academic activity

The assessment of the experience by students seems to be clearly overestimated based on unreasonable expectations in comparison to previous indicators. Thus, 4.15 for the use of academic connections is the assessment of the experience by teachers - students tend to draw their own conclusions based on teacher experience rather than their own. At the same time, the possibility of independent attempts to get a job abroad in the academic field is also rated low by students (1.16).

For reasons of space, we will describe only those Spearman's rank correlation coefficients (ρ) that have values according to current research practice estimated as an average or high correlation coefficients, that is, above $\rho \geq 0.35$. The indicator was selected based on global experience and the fact that most of the ratios of the values in the study turned out to be below the threshold. Full information on correlations is presented in the Appendix (Tables 1-3).

First of all, it should be noted that the study did not reveal any significant correlations related to gender characteristics. No correlations that exceeded the threshold in relation to the group of students were found. A more detailed study of statistical data gives some grounds to assert that this result is largely associated with the relatively poor involvement of students in real academic activity abroad and the heterogeneity of such experience and its assessment in their environment. It seems that this issue requires a more thorough further assessment and research.

There were also almost no significant correlations found between the estimates and age categories. Weak correlations were found between the use of academic connections abroad to conduct academic activities and the 50-60 age group ($\rho = 0.3587$ for real experience and $\rho = 0.4102$ for intension only) and the over 60 age group ($\rho = 0.5817$ for real experience and $\rho = 0.6781$ for intension only). This is quite natural and is associated with the experience and accumulated connections of people with extensive academic experience. A correlation between the possibility of academic activity abroad through commercial employment in the specialty and the 40-50 age group ($\rho = 0.4119$ for real experience and $\rho = 0.3912$ for intension only) was also revealed; however, the correlation is not strong enough.

Based on this approach, the stronger correlations should be noted. The strongest correlation was found between the group of those who had real experience in connection with academic interests in commercial companies abroad and the representatives of natural sciences ($\rho = 0.6891$ for teachers and $\rho = 0.7102$ for students), as well as between participation in international programs and the representatives of humanitarian specialties ($\rho = 0.5415$ for teachers and $\rho = 0.592$ for students). These correlations indicate the logic of the distribution of the interests of both researchers and foreign institutions that attract them or tend to attract them to participate in international activity.

5. Discussion

It should be noted that the research results are fully consistent with the results obtained by researchers from other countries based on the analysis of the personal experience of individuals, interviews, and other methods. Principally, the survey results indicate the presence of the same trends in the Russian Federation and other BRICS countries, which demonstrates the possibility of extrapolating the research results both to other educational institutions and other countries of the region.

Thus, according to Chinese researchers, one of the major problems of young scientists is the so-called repeated migration or circular migration, which includes those who try to build a scientific career in the countries of the Global North but cannot live and work there permanently (Teplyakov and Teplyakova, 2018). The main problem of researchers and students from China and India who try to build their careers in this way is the shock of social displacement. In the homeland most of them belong to the middle class or upper middle class; when they move, they significantly lower their social status and spend a lot of time and effort to take a more worthy position without a guarantee that they will achieve success (Chellaraj, 2019; Faist, 2018; Rostovskaya, Pismennaya and Skorobogatova, 2018). Significant intellectual migration rates have led to the fact that there is rather fierce competition for jobs in universities and research centers of the Global North, and various forms of temporary employment of scientific personnel have been common for a decade (Chang, Chen and Xiong, 2018; Wang, 2020). This also led to the class stratification in the academic environment - there are permanent employees (post-doctoral students, adjuncts, teachers having a permanent contract) and the “lower” class of temporarily employed research workers (Solimano, 2016). Due to the circular nature of migration in China, this has led to

the fact that a number of young scientists and teachers are also temporary workers in their homeland, which creates "permanent temporality" with special psychology, characteristics of the division of labor and specific social connections (Ivenicki, 2020). In our research, both the possibility of circular migration and the experience of repeated trips were given low points by all groups of participants and were not included in the expectations or intentions of the respondents. Due to the fact that this issue has not been considered separately in detail and requires further studies, it can be concluded that the phenomenon of circular migration and its negative consequences are also characteristic of the Russian Federation as such a pronounced negative attitude can be formed only on the basis of a certain common experience (Antoshchuk and Ledeneva, 2019).

According to almost all researchers, a higher standard of living, protection from unstable political and economic situation in the home country, a higher income, and wider access to the experimental base and opportunities for contact with colleagues are the reasons for the migration of scientists and students (Dwyer, 2018). Our research also confirms these findings as it is the opportunity to work for commercial companies based on the academic experience that is the most precious experience of academic activity and is included in the plans and intentions of all groups of respondents with the highest scores.

Several researchers note that the social connections and the processes of introduction of foreign researchers to the workplace environment play a significant role in the characteristics of scientific migration (Bouabid, Paul-Hus and Larivière, 2016). The most extensive data have been accumulated on Chinese migration and, to a lesser extent, on Indian and Brazilian migration; there is almost no structured information about the academic migrants of South Africa and the Russian Federation. A common problem is the more laborious integration into the networks of mutual assistance and contacts characteristic of the Global North and the development of closed networks of support and data exchange by the representatives of the scientific Global South, which are largely tailored to their interests. It is known that Chinese migrants prefer to concentrate on work and demonstrate higher productivity compared to their Western counterparts, but they have much more limited access to the resources and research opportunities that open through academic connections (Antoshchuk and Ledeneva, 2019; Ivenicki, 2020).

When people arrive in another country or stay there for a long time, they experience a certain culture shock and lack of social contacts (Vangen, 2016). Moreover, researchers indicate that this is associated with the intellectual and social barrier rather than the language barrier. At the same time, migrants note a generally very positive attitude towards them on the part of the Global North residents, and the absence of xenophobia or aloofness (Van Van Holm, Wu and Welch, 2019). This contributes to the formation of closed scientific diasporas and the return transfer of scientists to their homeland. Most BRICS countries implement special programs designed to stimulate the return of scientists and students to their homeland (Korobkov, 2020; Volokh and Gerasimova, 2019; Zvereva, Belenkova and Kruse, 2020). China has made the greatest efforts in this regard since the late 1990s (Miao and Wang, 2017).

In our study, the respondents also indicated they expect a low chance of permanent stay abroad and a relatively moderate chance of repeated trips, which may also show a not fully positive assessment of their personal experience. At the same time, most participants also rated the expectation of establishing an academic career abroad as low, except for those who have already had such experience or are trying to implement it. This confirms the results of other studies of academic migration from BRICS countries which also noted a low percentage of implementation of career aspirations in the countries of the Global North among those who are trying to do this (Antoshchuk and Ledeneva, 2019). Monopolization of knowledge, access to resources, and publishing monopoly, which limits access to the ability to publish research, were cited as the most important reasons (Collyer, 2018; Tripathi et al., 2018). Similarly, Chinese researchers had collected the opinions of Chinese and Indian scholars, who described the monopolization of methodology and presentation of scientific research in accordance with the intellectual tradition adopted in the West, which greatly limited the possibilities of their colleagues from the Global South (Chellaraj, 2019).

6. Conclusion

According to most foreign studies and the results of the present research, the most significant motivation for academic migration is the expectation of higher incomes, social protection, and access to opportunities for academic development. There is a large gap in the quantity and quality of research on academic migration from the BRICS countries to countries of “global North”. The study illustrates the findings of quantitative research on

academic migration focusing on the Russian experience in the context of the more common problems and trends that characterize all BRICS countries. The results obtained are in line with those of similar - predominantly qualitative - studies on academic migration from other BRICS countries, which makes it possible to extend the validity of the results to a more general level. The survey based on the 5-point Likert scale revealed that a small number of respondents (31.07% among teachers and 9.03% of students) have real experience of academic migration in its various forms while the overwhelming majority highly assess the academic opportunities abroad (4.87 and 3.48 among teachers and students, respectively). Much of the motivation of both groups was focused on the opportunity to work in the commercial sector due to their academic activity (4.19 and 4.47, respectively). In particular, according to all respondents, the possibility of repeated or circular migration is extremely low (0.88 and 1.61). The novelty of the study is its quantitative nature and the focus on the Russian experience, which has not been studied earlier. Including the Russian experience into the broader picture of academic migration from BRICS countries will make it possible to draw much more accurate conclusions and recommendations for the future. A practical contribution of the study is the provision of insights into the issue, which can be useful for setting policies to regulate academic migration. In particular, enhancing the development of loyalty programs for students and academic workers can be suggested, as well as the implementation of national academic employment programs.

The limitations of the research are related to the fact that the study is based on the example of one Russian university and involves graduates of two senior years of study. Also, it does not consider differences in the nationality of the respondents, their socio-economic status, the connections with institutions, relatives, business contacts or friends abroad, etc. Also, the study does not differentiate between separate academic fields, for example, medicine or engineering sciences, etc., within which the motivations for migration can differ significantly.

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Conflicts of interest

The authors declare that there are no conflicts of interest related to this article.

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Appendix

Table 1: Spearman's rank correlation coefficient between some answer options and groups of participants by gender

	students		teachers	
	male	female	male	female
Respondents' assessment of their own experience of foreign academic activity				
plan to go abroad (again)	0.019	0.2347	0.2243	0.2114
temporarily work abroad	0.2216	0.1875	0.2716	0.2618
continue your studies abroad	0.2708	0.2672	0.291	0.2291
get / confirm a degree abroad	0.3099	0.3081	0.3021	0.2601
make a scientific career abroad	0.2619	0.2212	0.3211	0.1603
Assessment of the respondents' own intentions regarding foreign academic activity				
participation in international programs	0.2201	0.2812	0.2314	0.2433
independent travel abroad	0.2416	0.1672	0.2709	0.2862
commercial work abroad in the specialty	0.2093	0.2374	0.3102	0.2607
using your own academic connections	0.2413	0.2768	0.2605	0.3099
experience of multiple temporary stay abroad	0.2092	0.3033	0.3044	0.2806
Part of the respondents with real experience in foreign academic activities				
participation in international programs	0.2216	0.2334	0.2408	0.2684
independent travel abroad	0.2619	0.2019	0.2474	0.3091
commercial work abroad in the specialty	0.2809	0.3001	0.2134	0.2654
using your own academic connections	0.2307	0/2161	0.1904	0.1877
experience of multiple temporary stay abroad	0.1887	0.2075	0.2264	0.2709
Part of the respondents using way to get foreign academic activities				
participation in international programs	0.1933	0.2316	0.2309	0.2219
independent travel abroad	0.1418	0.2061	0.1673	0.1708
commercial work abroad in the specialty	0.2109	0.2842	0.2375	0.2463
using your own academic connections	0.189	0.1901	0.2106	0.2277
experience of multiple temporary stay abroad	0.1854	0.2155	0.208	0.2166
Respondents' assessment of their own experience of using the ways of obtaining foreign academic activity				
plan to go abroad (again)	0.1902	0.2113	0.2877	0.2483
temporarily work abroad	0.2798	0.2197	0.1793	0.1619
continue your studies abroad	0.3001	0.2803	0.2037	0.091
get / confirm a degree abroad	0.201	0.1678	2.081	0.2008
make a scientific career abroad	0.2901	0.3087	0.3002	0.2195

* Correlations found to be statistically significant

Table 2: Spearman's rank correlation coefficient between some answer options and groups of participants by age

	Age, years				
	18 - 30	30 - 40	40 - 50	50 - 60	over 60
Respondents' assessment of their own experience of foreign academic activity					
plan to go abroad (again)	0.1897	0.2817	0.2288	0.3388	0.1782
temporarily work abroad	0.2217	0.3001	0.2502	0.3116	0.09
continue your studies abroad	0.2191	0.2095	0.3107	0.3006	0.1492
get / confirm a degree abroad	0.2417	0.2773	0.278	0.2357	0.1674
make a scientific career abroad	0.3001	0.2816	0.2487	0.2186	0.0027
Assessment of the respondents' own intentions regarding foreign academic activity					
participation in international programs	0.3217	0.298	0.2247	0.2306	0.1608
independent travel abroad	0.3107	0.2923	0.1893	0.2144	0.1809
commercial work abroad in the specialty	0.3204	0.2236	0.3912*	0.2134	0.1788
using your own academic connections	0.109	0.2894	0.2654	0.4102*	0.6781*
experience of multiple temporary stay abroad	0.31012	0.1999	0.2419	0.1236	0.2672
Part of the respondents with real experience in foreign academic activities					
participation in international programs	0.2799	0.2809	0.3102	0.3028	0.3107
independent travel abroad	0.3113	0.3201	0.3214	0.2889	0.2204
commercial work abroad in the specialty	0.3216	0.3099	0.4119*	0.2194	0.1819
using your own academic connections	0.3003	0.2763	0.2297	0.3587*	0.5817*
experience of multiple temporary stay abroad	0.3076	0.1419	0.1926	0.1765	0.2116
Part of the respondents using way to get foreign academic activities					
participation in international programs	0.2413	0.1871	0.2109	0.1632	0.098
independent travel abroad	0.2903	0.2142	0.2103	0.2117	0.0175
commercial work abroad in the specialty	0.3316	0.1984	0.1977	0.1816	0.1022
using your own academic connections	0.3128	0.1877	0.1706	0.1634	0.1238
experience of multiple temporary stay abroad	0.3097	0.1693	0.2209	0.1092	0.1678
Respondents' assessment of their own experience of using the ways of obtaining foreign academic activity					
plan to go abroad (again)	0.1432	0.2419	0.1903	0.2107	0.007
temporarily work abroad	0.2612	0.2714	0.0987	0.1668	0.0613
continue your studies abroad	0.1676	0.1786	0.2463	0.1897	0.0417
get / confirm a degree abroad	0.1896	0.1923	0.2833	0.2108	0.1092
make a scientific career abroad	0.2151	0.2087	0.6155	0.1432	0.007

* Correlations found to be statistically significant

Table 3: Spearman's rank correlation coefficient between some answer options and groups of participants by specialization (natural science or humanitarian)

	students		teachers	
	natural science	humanitarian science	natural science	humanitarian science
Respondents' assessment of their own experience of foreign academic activity				
plan to go abroad (again)	0.3111	0.1232	0.2891	0.2998
temporarily work abroad	0.2819	0.2668	0.299	0.2674
continue your studies abroad	0.1564	0.1607	0.2961	0.091
get / confirm a degree abroad	0.2708	0.1617	0.2092	0.1933
make a scientific career abroad	0.2109	0.2783	0.1645	0.2451
Assessment of the respondents' own intentions regarding foreign academic activity				
participation in international programs	0.2708	0.2102	0.2718	0.2273
independent travel abroad	0.2216	0.209	0.2677	0.2324
commercial work abroad in the specialty	0.1408	0.3001	0.193	0.1238
using your own academic connections	0.1891	0.298	0.1673	0.2164
experience of multiple temporary stay abroad	0.2019	0.2907	0.1866	0.1906
Part of the respondents with real experience in foreign academic activities				
participation in international programs	0.592*	0.319	0.5415*	0.3228
independent travel abroad	0.091	0.1916	0.2816	0.1789
commercial work abroad in the specialty	0.3328	0.3391	0.3209	0.2891
using your own academic connections	0.2816	0.2367	0.2859	0.2579
experience of multiple temporary stay abroad	0.1903	0.2091	0.198	0.2271
Part of the respondents using way to get foreign academic activities				
participation in international programs	0.235	0.1922	0.1981	0.1709
independent travel abroad	0.2461	0.2369	0.1974	0.1596
commercial work abroad in the specialty	0.2616	0.1708	0.2534	0.0179
using your own academic connections	0.3112	0.2971	0.3103	0.2219
experience of multiple temporary stay abroad	0.2806	0.2629	0.3106	0.2919
Respondents' assessment of their own experience of using the ways of obtaining foreign academic activity				
plan to go abroad (again)	0.2271	0.3113	0.3214	0.2809
temporarily work abroad	0.7102*	0.2748	0.6891*	0.2809
continue your studies abroad	0.2791	0.2419	0.2781	0.2853
get / confirm a degree abroad	0.2817	0.3022	0.2419	0.1771
make a scientific career abroad	0.312	0.2456	0.1904	0.2913

* Correlations found to be statistically significant

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In this issue of the EJKM, a number of papers are highlighting and investigating, through empirical studies, some recurring issues in the KM literature and unresolved problems of today's global world.

An example of such a problem is the transfer of scholars and skilled researchers from weaker countries to the 'rich world', which can lead to a loss of capabilities and competitiveness in the nations where the people are educated and trained. In "Causes and Consequences of the Migration of Scientists and Students from the Brics Countries to Developed Economies" by Bela Khakhuk, Natalia Morgunova, Lydia Nosenko, Lyudmila Posokhova and Elena Zatsarinnaya explores the reasons for the migration of scientists and students from BRICS countries (taken as an example of the "weak world" or "Global south") to western (richer) countries, based on a survey of academic students in a Russian university. Two results are especially important: first, students consider 'scientific migration' as a likely event in their career; second, circular or 'reversed' migration is unlikely. This is an important signal for governments of weaker countries: Policies to keep their skilled students are essential if these nations want to really exploit their investments in higher education.

The second paper deals with a popular topic today: the impact of COVID-19. In particular, Venkat Ram Raj Thumiki and Ana Jurcic in their paper "Impact of COVID-19 Crisis on Knowledge Management Practices in Sultanate of Oman" explore how the pandemic impacted the KM practices of companies. Although the study considered a specific country, their findings are of general interest and show how organizations started using an "inside-out" approach to KM after the COVID-19 crisis began, changing KM processes from manual to computer-based, and spending on e-KM activities. The paper also reported on how companies had increased dependency on internal knowledge sources and how line managers began measuring the effectiveness of KM practices, a metric which had been mostly neglected in the pre-pandemic period. This made it possible to highlight the perceived benefits to employees and also the possible criticalities, which provided insights into the possible areas of training and improvement to further develop fruitful KM initiatives.

Knowledge sharing, quite a popular topic in the KM literature and in our journal as well, is addressed in the third paper "Analysing the Communication Process Between Middle and Top Managers Through the Concept of Ba", by Jarrah Al-Mansour and Demola Obembe. This paper focuses on the social factors influencing knowledge sharing through a qualitative study among top and middle managers in a public organization. They found that social spaces or contexts are critically important for sharing knowledge for successful strategies. Additionally, the propensity to share knowledge may depend on the 'tribal' affiliations of individual actors and the existence of prejudices and social stereotypes.

In the final paper "Why People Keep Using Knowledge Management Systems: A Causal Analysis of Continuance Behavior", Eric Tucker and Tim Kotnour examine the factors that may induce a person to become a 'continuous user' of a KM system. Indeed, when a company establishes a KM system, its success strongly depends on the willingness of potential users to adopt the system as an effective tool for their KM processes, and if they stop using the system, this is clearly a problem. Their results show that the technical features of the KM system are more critical than other factors, such as, for example, the community features. This is an important point that contributes to the long debate on the acceptance factors of a KM system and, more generally, of an information technology.

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