Technological
Communication

BBRC
Bioscience Biotechnology
Research Communications

Biosc.Biotech.Res.Comm. Vol 13 No (4) Oct-Nov-Dec 2020 Pp 2176-2180

Proposed Framework to Build Information Technology Infrastructure for Sharing of Knowledge

Hamad Al-Badri* and Ashraf Badawood
College of Business, MIS, University of Jeddah,
Jeddah, Kingdom of Saudi Arabia

ABSTRACT

The current research project proposes a framework that can be used for building IT infrastructure for sharing of knowledge, with particular emphasis in the gulf region. The research project is important as currently, there is scarcity of the research projects addressing similar issues especially for the KM based infrastructure in the gulf region. Previously, authors have demonstrated that an effective approach of sharing knowledge is with IT. There are only a limited number of research works addresses KM infrastructure for the gulf region. To achieve this, the project effectively answers two research questions: what are the existing studies regarding IT and knowledge sharing from the gulf perspective. In addition, what framework, based on IT and knowledge-sharing concepts, can be used to build IT infrastructure for sharing of knowledge? The IT infrastructure can find a way of easing the sharing of tacit knowledge in much the same way as it eases the sharing of explicit knowledge, by demonstrating what makes the knowledge valuable, subsequently capturing this tacit knowledge in an explicit way, which can be achieved via the mode of externalization (tacit knowledge to explicit knowledge). The research used the systematic literature review as the research methodology to study the research objectives initially set from carrying out the study on past studies. In coming up with the IT infrastructure it is important to consider unique needs of an organization, the ease of use of the IT infrastructure for SOK, the availability of the technology as well as costs related to the technology. This report proposed a framework to build IT infrastructure for sharing of knowledge in the gulf region after considering the various findings.

KEY WORDS: FRAMEWORK; IT INFRASTRUCTURE; SHARING OF KNOWLEDGE; GULF; MIDDLE EAST.

INTRODUCTION

Knowledge management (KM) became a mainstream business management tool only during late 80s but gained prominence worldwide only after globalization. As the globalization allowed economic, social and technological changes to improve gradually, the knowledge management is seen as a tool to connect the branches worldwide with the knowledge gathered. Initially originated as a theory, the KM experts had many issues when they try to convert the theory into a working model. After, the widespread of internet and intranet, the implementation of the KM became easier (Antunes and Pinheiro, 2020; Ode and Ayavoo, 2020). Knowledge is an important strategic resource for individuals, groups and organizations. Knowledge can provide individuals, groups and organizations with some sustainable competitive advantages within today's highly competitive economy (Alaffad & Masrom, 2017).

One way to do this is through the information technology (IT) infrastructure within such organizations. Today, many organizations in the gulf have been undertaking

Article Information:
Corresponding author email: *halbadri@uj.edu.sa*
Received 09/10/2020 Accepted after revision 10/12/2020
P-ISSN: 0974-6455 E-ISSN: 2321-4007
Thomson Reuters ISI Clarivate Analytics
Web of Science ESCI Indexed Journal

Identifiers & Pagination:
Vol 13(4) E-Pub 31st Dec 2020 Pp- 2176-2180

Published by Society for Science & Nature India
DOI: *http://dx.doi.org/10.21786/bbrc/13.4/82*

some considerable initiatives for ensuring knowledge sharing become embedded in their organizations and in the day-to-day operations (Albassam, 2019; Dirani & Hamie, 2017). For example in the United Arab Emirates (UAE), government and the private sector have continued collaborating with the various western-based institutions in attempts at improving SOK in the region (Alshamsi & Ajmal, 2018).

In the gulf, adoption of processes for knowledge sharing has been partly motivated by establishment of the western based organizations in the gulf region (Youseff et al., 2017). In that manner, western-designed best practices and methodologies of sharing knowledge have been subsequently employed by gulf organizations. In gulf region, there have been efforts to do this and plans have been forwarded for ensuring the gulf citizens have active roles in this knowledge economy (Al-Ahbabi, 2017). The current research project proposes a framework that can be used for building IT infrastructure for sharing of knowledge, with particular emphasis in the gulf region. In many developed region across the globe, processes regarding sharing of knowledge (SOK hereafter) have been relatively well developed compared to the gulf region, owing to use of E-learning and technology (Akhavan & Mahdi Hosseini, 2015). Adopting such an approach in the gulf has often been gradual, with much emphasis that research institutions (Skaik & Othman, 2015) should undertake this.

For example in the United Arab Emirates (UAE), government and the private sector have continued collaborating with the various western-based institutions in attempts at improving SOK in the region (Alshamsi & Ajmal, 2018). However, using the western-designed best practices and methodologies of SOK has come with a price, as there is little emphasis on the peculiarities of the gulf region and way of life (Skaiak & Othman, 2015). Moreover, a recent research project that was funded by the European Union has indicated that within the gulf countries, the trends of IT are starkly different as a result of different development levels within and between the gulf countries (Göll & Zwiers, 2018). Despite that, the levels of IT adoption have continued to be pervasive in the gulf, and the increasing prevalence of IT in the region offers an opportunity to design infrastructure for sharing of knowledge (Göll & Zwiers, 2018).

To achieve this, the project effectively answers two research questions: What are the existing studies regarding IT and knowledge sharing from the gulf perspective? What framework, based on IT and knowledge sharing concepts, can be used to build IT infrastructure for sharing of knowledge? The outcomes of the current research project would not only be insightful to academics but also to the practitioners based in the gulf. Moreover, the study is significant as it fills the gap that currently exists in the present body of research work owing to lack of studies on similar topic. Overall, this contributes to the body of knowledge particular to the gulf region. A significant limitation of the project lies in the methodology that has been used.

The literature review methodology in use is convenient for the purposes of the research scope, and has overcome the impracticality of gathering primary data from the various gulf countries that have been considered in the framework. However the limitation of relying on the literature review methodology is that it has put the investigator at a disadvantage of not having the benefits of primary data collection, such as loss of control over the research process, and the loss of ability to get the most current data that would have been enhanced by primary research methods (Bryman, 2016).

MATERIAL AND METHODS

Definitions: For the purposes of the present research project, the operational definition is concise, detailed and clear definition of the measures employed in the research. For present research project, having an operational definition is fundamental towards collecting the intended data. The operational definition is especially significant as decisions have to be made regarding whether the data collected are valuable or useless, to do away with potential confusion. For example, the data collection process would not be helpful if definition of the timely and relevant data is not given (Slife et al., 2016). In the data collection, it was essential that the investigator had consistent approach towards sourcing and collecting data. This means defining how the data is collected, to remove room for inconsistent and erroneous data. Having the detailed operational definition blocks out any ambiguity in the data collection (Slife et al., 2016).

The following operational definition has been adopted:
Characteristic of interest: Framework to build IT infrastructure for sharing of knowledge, concentrating in the gulf region.

Measuring instrument: Investigator would collect data from scientific sources present online and in the physical library. Test method: Data from at least 27 scientific sources would be collected and analyzed. Only recent sources published after 2015 would be considered. Decision criteria: Systematically review the data from the sources. Only published material after 2015 would be considered and unpublished material (such as manuscripts) or material published before 2015 would be excluded.

Methodology: Conducting a systematic literature review (SLR) was deemed highly appropriate for present project. The SLR involved identifying, selecting and subsequently critically appraising research so as to answer the two

earlier formulated research questions (Dewey & Drahota, 2016). The SLR followed clearly defined plan in which some criteria were stated prior to conducting the reviews, such as having specific requirements on the information that was searched and reported within a particular timeframe. To be more specific, the SLR employed in the current study considered research only from scientific sources (published journal articles, conference proceedings and white papers) which was based on issues linked to SOK, and preferably concentrating the studies on the gulf region (Kuwait, Oman, Saudi Arabia, UAE, Qatar and Bahrain) and wider Middle East region.

The SLR was highly convenient, and an advantage is that it assisted in weeding out possible sources with little value to add to present research. For instance, the investigator quickly skimmed through the abstracts and methodology of potential sources and if they showed no relation to the gulf context, they were excluded (Thome et al., 2016). The process used to identify the sources involved first accessing the online academic databases, such as the university database, for material on SOK. Keywords relating to the research topic (Information_Technology+Sharing_of_Knowledge+Gulf+Middle_East) were input in the search field, as well as the synonyms, as shown in table 1 below:

Table 1. Keywords plus synonyms

Keyword	Synonyms
Information Technology	IT, I.T, InfoTech
Sharing of Knowledge	Knowledge Sharing, Knowledge Management, Information Sharing
Gulf	Kuwait, Oman, Saudi Arabia, United Arab Emirates/UAE, Qatar, Bahrain
Middle East	MidEast
Source: Author's own	

The search outcomes revealed numerous academic and industry sources, including journal articles, white papers, and industry reports (Thome et al., 2016). To improve search outcomes, the search was limited to studies published post 2015. Based on recommendations of Atkinson and Oppenheimer (2016), a data repository had to be first established for the collected data, which linked the data to the two research questions earlier aforementioned. The purpose was to ease later analysis of such data. From the repository, the investigators first condensed the data.

This involved the selection, the aggregation and the simplification of data that the repository contained. In such data condensation, the investigator decided on some segments of the studies' findings which required coding, in addition to deciding the studies' findings which were not important, such as studies that were not written in clear English. Moreover, parts of the studies that were not deemed to be important (such as author's biography details, foreword and reflections) were eliminated. Such condensation sharpened, organized and focused the literature to be usable by the investigator (Thome et al., 2016).

After condensing the findings of literature, the investigator read and re-read the condensed material and subsequently generated initial codes, which were used to assign meaning to the segments of literature collected. This enabled the investigator to rapidly identify the segments linking to the two research questions. From the collected literature, the repeated observations that were made were given the codes. An example is that if Information Technology (IT) had impacts on Sharing of Knowledge (SOK), code that was assigned was 'IT-yes-SOK'. Alternatively, if Information Technology (IT) had no impacts on Sharing of Knowledge (SOK), then the assigned code was 'IT-no-SOK'. Different codes were assigned for all the patterns that could be observed in the literature, echoic the suggestions by Thome et al. (2016) on the issue of 'codes and coding'. This was done until all the literature was coded, and patterns in the literature clearly identified. As this project did not involve use of primary research respondents, then consent was implied to have been given to the original research team, and research ethics were further observed by not attempting to identify respondents in the original research discussions.

Procedure followed to draw conclusion: The method of 'extended text' is commonly applied in displaying data. However, such data is usually bulky, and has a less rigorous structure when compared to the alternative of the partial ordered display (POD) method. This utilization of POD approach enabled the investigator to quickly link the identified segments using the codes, and subsequently link to the research questions. The literature that was earlier condensed was categorised, and findings of different studies compared. The investigator relied on Microsoft Access (MS Access) 2016 application for categirizing as well as comparing the literature findings, via matrices.

In spite of being assisted by technology, the onus of conducting the resaecrh still fell on the investigator, and care was taken not to cede the control of research process. Through a feature of 'relational database' offered by MS Access 2016 application, different segments of the literature collected and assigned codes were linked. It was thus possible to have clear perspectives on the different athors who shared same position. For example,

the relational data base showed the authors who had similar understanding on impacts of IT on SOK, and vice versa. Finally, to arrive at a conclusion, the investigator compared and contrasted the different literature segments obtained from different scientific sources, arriving at definite findings (Thome et al., 2016).

RESULTS AND DISCUSSION

In the gulf and the larger Middle East region, the explicit knowledge is often stored within knowledge management systems that can be accessed by the members of the organization, and IT plays a big role in this storage and retrieval (Al-Busaidi & Olfman, 2017; Hossain, 2015). The knowledge is usually arranged in terms of 'taxonomy', where the metadata is associated with particular knowedge; this helps in serching and retrieving such knowledge. Organizations can opt to use IT solutions having advanced search capabilities. On the other hand, interactive forums are used for accessing tacit knowledge, where people are connected to their colleagues in both informal and formal settings. However, this is not as common as the searching and retrieval of explicit knowledge. The design of the solutions for SOK were initially narrow in scope in the gulf, but have remained general enough so that many organiztions (both large and small) can comfortably apply them. Such general designs have allowed for newer solutions to be tested prior to implementing and/or impacting broader user groups (Skaik & Othman, 2015).

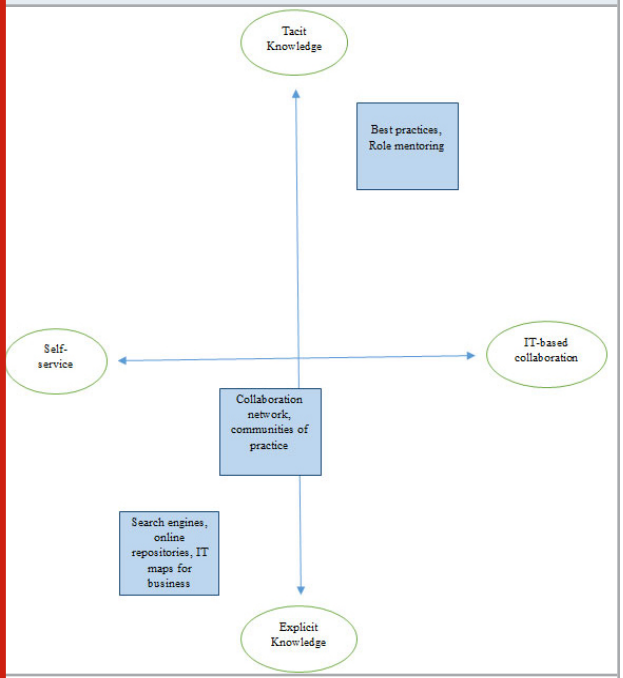
The literature has also revealed that there are scenarios in which widespread launching of SOK solutions could be desired, such as having centralized sites for whole organization to access experts, content and so forth, whih is still taking root in the gulf as the SOK concept is mostly a western concept. Authors, have also called for representatives of gulf businesses to be included in designing the SOK solutions. From the perspective of knowledge management, the early involvement by the future users can work well towards adopting more user-friendly solutions.

A close integration of the steps in the SOK with the actual steps undertaken in the organization's IT processes can geneate an overall unified structure that ensures members of the organization would routinely use the SOK solutiosn as an aspect of their everyday work lives. Whereas the goals could be deploying the SOK solutions and defining measures for effectiveness and use, am possible outcome is that the SOK solutions would be implemented with IT infrastructure support in placem (Al-Shamsi & Ajmal, 2018; Alaffad & Masrom, 2017).

A critical initial step towards the implementation of the SOK solutions is havimng a training plan and the relevant IT infratsructure support. As the members of the organization would be end users of the SOK solutions, training and testing an initial representative group could demonstrate the effectiveness of the IT infrastructure towards SOK (Chiabrishilli & Zaim, 2018; Obeidat et al., 2016). Training can subsequently be followed by close support which can include technical assistance and information sessions, especiallyn in the early implementation stages. In the implemnetation of the SOK solutions, the progress can be evaluated through active utilization of the IT infratsructure. Measures can include number of unique members/visitors as well as usimng the IT infrastructure to improve sharing of tacit knowledge.

As such, the leaders of the organizations can play big roles in reinforcing and modeling desired behaviours as well as utilizing SOK approaches (Hossain, 2015; Islam et al., 2015). Ongoing recognition of the desired SOK behaviours, supported by use of IT infrastructure, can promote this desired use of IT infrastructure for sharing of knowledge. However, there is need for clear accountability for the SOK solutions.

Figure 1: Proposed framework to build IT infrastructure for sharing of knowledge in the gulf region.



Source: Author's own

The IT infrastructure can find a way of easing the sharing of tacit knowledge in much the same way as it eases the sharing of explicit knowledge, by demonstrating what makes the knowledge valuable, subsequently capturing this tacit knowledge in an explicit way, which can be achieved via the mode of externalization (tacit knowledge to explicit knowledge). In coming up with the

IT infrastructure it is important to consider unique needs of an organization, the ease of use of the IT infrastructure for SOK, the availability of the technology as well as costs related to the technology (Skaik & Othman, 2015; Zaim, 2016). From the findings, a proposed framework to build IT infrastructure for sharing of knowledge in the gulf region is shown in figure 1 below:

CONCLUSION

For organizations and individuals to maintain competitive advantages, both organizations and individuals rely on systems, which are focused on selecting and imparting specific set of knowledge, abilities and skills. As knowledge is an important aspect, facilitating the generation, utilization and subsequent sharing of knowledge has become increasingly important today. The high importance in sharing explicit knowledge between the members of the organization, and making such knowledge available to each member, which also includes the new members of the organization who could refer back to the knowledge management systems for obtaining expert information.

The literature review findings indicated that there are some feasibility challenges about reliance on information technology for sharing the tacit knowledge. The research carried out on the Gulf nations with the help of the systematic literature review. After considering multiple aspects, the study here proposed a framework to build IT infrastructure for sharing of knowledge in the gulf region. It is also recommended that future research building can build on the findings of this study, but can also include primary data to make the findings more robust.

REFERENCES

Akhavan, P., & Mahdi Hosseini, S. (2015). Determinants of Knowledge Sharing in Knowledge Networks: A Social Capital Perspective. IUP Journal of Knowledge Management, 13(1).

Alaffad, A., & Masrom, M. A. (2017). Knowledge management framework for the collaborative innovation projects: A case of aviation industry in the UAE. International Journal of Advanced and Applied Sciences, 5(2), 76-80.

Albassam, B. A. (2019). Building an effective knowledge management system in Saudi Arabia using the principles of good governance. Resources Policy, 64, 101531.

Al-Busaidi, K. A., & Olfman, L. (2017). Knowledge sharing through inter-organizational knowledge sharing systems. VINE Journal of Information and Knowledge Management Systems, 1-17.

AlShamsi, O., & Ajmal, M. (2018). Critical factors for knowledge sharing in technology-intensive organizations: evidence from UAE service sector. Journal of Knowledge Management, 1-19.

Antunes, H.D.J.G. and Pinheiro, P.G., (2020). Linking knowledge management, organizational learning and memory. Journal of Innovation & Knowledge, 5(2), pp.140-149.

Atkinson, H., & Oppenheimer, M. R. (2016). Design Research–History, theory, practice: histories for future-focused thinking. Cheltenham: Edward Elgar.

Bryman, A. (2016). Social research methods. Oxford: Oxford university press.

Dewey, A., & Drahota, A. (2016). Introduction to Systematic Reviews: Online Learning Module Cochrane Training. London: Palgrave.

Dirani, K. M., & Hamie, C. S. (2017). Human resource education in the Middle East region. European Journal of Training and Development, 41(2), 102-118.

Göll, E., & Zwiers, J. (2018). Technological trends in the MENA region: The cases of digitalization and information and communications technology (ICT). Abu Dhabi: MENARA Working Papers.

Hossain, A. (2015). Evolution of mutual knowledge-based economy in regional integration: an experience from the Cooperation Council of Arab States of the Gulf. Journal of the Knowledge Economy, 6(4), 790-817.

Islam, M. Z., Jasimuddin, S. M., & Hasan, I. (2015). Organizational culture, structure, technology infrastructure and knowledge sharing. Vine, 45(1), 67-88.

Ode, E. and Ayavoo, R., (2020). The mediating role of knowledge application in the relationship between knowledge management practices and firm innovation. Journal of Innovation & Knowledge, 5(3), pp.210-218.

Skaik, H. A., & Othman, R. (2015). Investigating academics' knowledge sharing behaviour in United Arab Emirates. Journal of Business and Economics, 6(1), 161-178.

Slife, B. D., Wright, C. D., & Yanchar, S. C. (2016). Using operational definitions in research: A best-practices approach. The Journal of Mind and Behavior, 119-139.

Thomé, A. M. T., Scavarda, L. F., & Scavarda, A. J. (2016). Conducting systematic literature review in operations management. Production Planning & Control, 27(5), 408-420.

Youssef, M., Haak-Saheem, W., & Youssef, E. M. (2017). A structural equation model for knowledge sharing behavior in an emerging economy. Journal of Knowledge Management.

Zaim, H. (2016). Analysing the effects of knowledge management processes on human resource management practices: A case study on an oil company in the Gulf region. Middle East Journal of Management, 3(3), 230-243.