



## **Internet of Thing (IoT) to Enhance Knowledge Sharing between Faculties, Best Practice and Proposed Modified Systems for Middle East and Gulf Region Area**

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### **ABSTRACT**

The sharing of knowledge has made it easier for organizations to leverage and maximize on the dissemination and exchange of information between individuals. Modern technological advancements have further impacted positively on the sharing of knowledge through the integration of Internet of Things (IoT). The integration between the existing forms of knowledge sharing and IoT portend to offer inclusive and effective ways of knowledge management in organizations. By making a focus on the Middle East region, as well as the entire Gulf region, the study analyzed the existing materials regarding knowledge sharing and IoT within the region. The significance of such review is that it provides a basis for understanding how IoT has been utilized in the Middle East to enhance the processes of sharing knowledge in businesses. These discussions have further been used to come up with a model for knowledge sharing with reference to the faculty at the university to create a competitive advantage in comparison with the other surrounding universities. Based on the study findings, a model has been recommended to aid in the process of rolling out an effective means of knowledge sharing while using IoT.

**Key words :** Knowledge Sharing, IoT, Middle East, Knowledge Management, Gulf region

### **1. INTRODUCTION**

Knowledge is an integral element for modern organizations especially in the modern times. As such, the sharing of such knowledge becomes a crucial subset of knowledge management in organizations. Knowledge sharing encompasses the exchange, dissemination, and transfer of knowledge from one individual to another [1]. With regards to an organization, knowledge sharing involves both the formal and informal ways through which knowledge is exchanged between team groups as well as amongst individuals. Based on these explanations, knowledge sharing comes out as people-oriented and organization-aligned set of

activities that aid in the processes of sharing know-how that ensures workers, teams, and the enterprises collaborate effectively. The explanations by [2] observe that the processes of knowledge sharing go beyond the mere disclosure of information within an organization. For this reason, knowledge sharing as well incorporates experiences and beliefs in an organization that aid in communication as regards tasks and functionalities within the organizational outfits. The findings by [3] denote that the process of knowledge sharing has been shown to take place through face to face modes of interaction or by means of codification. Of notice is that these two mechanisms of knowledge sharing relate to tacit knowledge and explicit knowledge respectively.

The internet of things (IoT) has come up as a buzzword in the modern times owing to technological advancement [4] explain the internet of things (IoT) as an outcome of interrelated computing gadgets, machines, and devices with a view to transfer data and information. In this regard, IoT encompasses an interconnection between these devices and gadgets through unique identifiers [5] affirm that IoT entails the networking of the various physical objects that have IP addresses for the purposes of internet connectivity. For this reason, IoT acts as a mechanism that allows for the communication between objects and the systems that are internet-enabled. As such, it follows that IoT transcends the traditional gadgets and devices for instance smartphones, desktops, and laptops, to include the basic range of machines and objects that are utilized daily with a view to transmit communication [6]. These explanations have made the case that IoT makes it easier to connect the objects that are used daily, be it mechanical tools, automobiles, or even the kitchen appliances. Based on these observations, seamless communication is made by embedding devices and gadgets to the internet and leading to an interaction between, things, processes, and people.

### **2. RESEARCH PROBLEM**

To ensure that organizations have access to the best means of attaining competitive advantages in their respective markets, the sharing of knowledge is crucial. However, knowledge cannot have positive impacts on organizations in case the

proper and ideal means of sharing it are lacking. As such, [3] denotes that knowledge sharing is a crucial subset of knowledge management in organizations. More so, with the ever increase need to harness knowledge for the collective attainment of the shared organizational goals, the input of knowledge cannot be ignored. With the rise in IoT during the modern times [5] organizations should endeavor to maximize on the chances offered by interconnectivity between the internet and objects to enhance the sharing of knowledge. It is based on this discussion that this paper seeks to address specific questions;

- 1) How can the Internet of Things (IoT) enhance the sharing of knowledge between faculties?
- 2) What do the existing studies indicate as regards the use of Internet of Things (IoT) in enhancing the sharing of knowledge in the Middle East and Gulf region area?
- 3) What are the best practices as regards the proposed modified systems for the faculties in Middle East and Gulf region area for the purposes of effective knowledge sharing through IoT?

### 3. SIGNIFICANCE OF THE STUDY

Knowledge in organizations provides the basis for the maximization of chances that lead to competitiveness. However, it is notable that organizations are complex structures that involve a conglomeration of unique individuals working together and who utilize diverse processes and systems to attain a common organizational aim. As such, there exists the need to ensure that both the complex structures, which can be embedded with internet, and people interconnect for the need to have a mutual vision as regards the organizational objectives through a unique knowledge sharing that incorporates [7]. In an era when competitiveness in industries is high, the significance of the study is showcased by its core aim to formulate an inclusive mode of IoT for the purposes of sharing knowledge between the organizational structures, objects, and the individuals. Moreover, these discussions have been supported by findings [8-9] that indicate the integration of IoT mechanisms lead to the acquisition of a knowledge sharing approach that helps organizations in making better and informed modes of decision making. For this reason, the significance is showcased by the outcomes of stimulating growth and enhancing delivery to the customers [10] denote that knowledge sharing is more than just merely communicating with the workers for the purposes of attaining information. As such, knowledge sharing through the integration of IoT comes out as an inclusive approach that infers multilateral exchange between teams, groups, parties, and individuals with a view to interchange skills, information, expertise, and experiences.

### 4. LIMITATIONS OF THE STUDY

Limitations reduce the scope and scale of attaining informed findings in a study. The foremost limitation with regards to this study entails the reliance on purely existing literature and findings in relation to the interconnection between knowledge sharing and IoT. As a result, these previous findings may not have incorporated experimental activities and therefore leading to evidence that relied on non-experimental outcomes. It is in this scope that the failure to incorporate experimental evidence may lead to variables that have the potentiality to change the outcomes of the study. It is notable that such variables have the potency to change the findings of these previous researches, affecting this study as well. The second limitation is based on the choice of Middle East and the entire Gulf region as a basis for the study. It is notable that each region has unique and distinct characteristics that determine the manner business processes are carried out. For this reason, the limitation means that the study lacks a mode of comparison between different regions with reference to the formulation of a model of IoT for enhancing knowledge sharing between faculties. The third limitation is founded on the assumption that the faculties involved have the capacity to adopt and embrace the use of IoT in sharing knowledge. Notably, not all the entities within a faculty would be willing to offer their expertise, information, or skills and as such limiting the sharing of knowledge. The scenario means that individuals may not necessarily adopt the IoT model for the purposes of sharing knowledge, negating the assumption made in the study.

### 5. OPERATIONAL DEFINITION

The topic of this study is as follows; “A model that enhances the sharing of knowledge between faculties via the various means of IoT.” Essentially, the choice of the topic is founded on the need to make informed, effective, and inclusive ways of sharing knowledge via processes and people in the faculty. The different components with reference to the topic of the study have been described in the following sentences;

*The attributes of interest:* This incorporates a mechanism for enhancing the processes of sharing knowledge through IoT by solely focusing on the Middle East and the Gulf region.

*Instruments of measuring:* The researcher will collect the relevant information and data from the various academic journals, books, and articles. In this case, the following online but credible resource sites will be utilized; Jstor, Google Scholar, EBSCO, and Science Direct.

*Method of testing:* The researcher will gather data from a minimum of 27 sources and a maximum of 32 sources. Notably, these sources will range from reliable websites, published reports, conference proceedings, academic journals, and books. Importantly, the researcher will only make use of the sources from 2015 onwards.

*The criteria of decision:* The researcher will make reviews to the selected sources that relate to the topic of the research. Of notice is that such review may be in part or in full.

## 6. RELATED WORK

The significance of knowledge management has increased in the past few decades. Knowledge management has come out as a key pillar with reference to organizational strategy through the approach of knowledge sharing [11]. It is in this context that the implementation of an effective means of knowledge management becomes more beneficial to an organization. However, the adoption of knowledge management practices, such as knowledge sharing, had been hindered in the past with reference to the nations in the Middle East. Research findings indicate that the concept of knowledge management had been delayed in the Middle East owing to the social conflicts, political issues, and economic blockades [12 -13]. The political developments in the recent past further impacted on the usage of the idealized knowledge management practices. Research shows that the Arab Spring also contributed to the deformed manner of actualizing the knowledge management practices [13-14]. For this reason, the lack of an effective means of knowledge management had huge implications on Middle East organizations that wanted to have an inclusive means of knowledge sharing. It is in this context that knowledge management had not been fully actualized in the Middle East region. Research also indicate that for years the Middle East region suffered from the lack of global partnership in terms of knowledge sharing [15-16]. Based on these explanations, Middle East organizations experienced a lack of strategic alliance in knowledge sharing owing to the deformed global reputation of the region.

Despite these issues, in the recent times, knowledge management has been showcased as a concept that is highly adopted by the organizations across the Middle East. Studies have shown that knowledge management in the Middle East is utilized by the private sector, public firms, NGOs, as well as the governmental bodies [17-18]. These findings have been supported by [17] and [19] who indicate that such upsurge of using knowledge management in the Middle East has been based on the maximization of the knowledge-based economies. Importantly, such knowledge management practices have tapped into the knowledge sharing by creating, acquiring, and transmitting information, expertise, and skills. The significance of such development in terms of knowledge sharing have aided the organizations operating in the Middle East region to acquire a more increased rate of social and economic development by tapping into the competent means of knowledge sharing [20] and [21] affirm that the rolling out of an effective ICT program in the Middle East has eased in the processes that lead to communication between enterprises and individuals. These dynamic ICT platforms and channels in the Middle East have not only eased businesses to innovate but also create mechanisms that help in the sharing of both personal and institutional knowledge. The outcome of the

continued use of effective knowledge management as a means of sharing knowledge in the Middle East has therefore been enriched by the flow in communication channels as rolled out by the advanced ICT.

The impressive surge in the use of sharing knowledge as based on knowledge management in the Middle East has been spurred by the utilization of IoT in the region. It has been projected that the investment in IoT within the Middle East will hit the \$12 billion mark in 2021 [22]. The projection will be up from \$7 billion in 2018. These statistics showcase that the embracement as regards the IoT in the Middle East has increased immensely over the last few years. In a study conducted, it was found out that almost 46% of the enterprises in UAE have invested, whether heavily or moderately, in IoT while it was found out that roughly 40% of Saudi organization utilize IoT [23]. Notably, research has indicated that most of the organizations within the Middle East region plan to have IoT integration with regards to their daily activities [24]. The most important aspect is that the adoption of these IoT mechanism in the future for these Middle East businesses have been sanctioned by the top-level decision-making organs and as such showcasing the significance of the undertakings. Hanappi [25] offers credence to these discussions by denoting that more than a third of the enterprises in the Middle East have embraced IoT in their undertakings. According to these findings, it has further been stated that IoT has occupied a crucial role in these businesses by reducing their overreliance on declining resources while at the same time improving their economic fortunes. These explanations affirm that there has been a surge in the utilization of IoT henceforth aiding in the sharing of knowledge within the organizational level.

## 7. RESEARCH METHOD AND PROCEDURES

### A. Methodology of the Study

In this study, the methodology utilized relied on a comprehensive review with regards to the applicable literature in terms of the use of IoT to create best ways of knowledge sharing. To ensure that the review was fully inclusive and informed, the study used the various cases of organization in the Middle East that use IoT for the purposes of sharing knowledge. Notably, a descriptive research was adopted to further explicate on this study. As such, the descriptive nature of the study offered an exploratory approach that further explained the use of IoT in advancing the knowledge sharing undertakings within the Middle East region. Moreover, the future and the current trends with regards to IoT usage in the Middle East were explored to showcase the projections on the usage of sharing knowledge by the organizations.

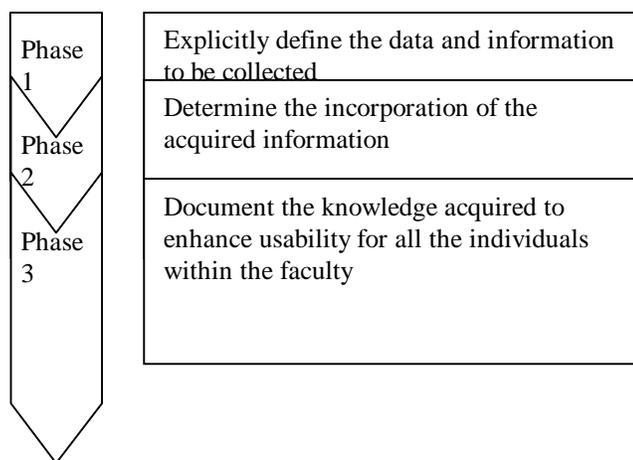
### B. Procedure followed to draw conclusions

Skimming was adopted as a process that aided in exploring and understanding the chosen topic by touching on both IoT

and knowledge sharing. The significance of skimming was based on the adoption of a systematic review as a mechanism that powered this study. For this reason, skimming ensured that the systematic review was able to cover all the sources that have relevance to the study. From the use of skimming, the researcher was able to utilize specified keywords that enhanced the attainment of extracted sources that showed relevance to the chosen topic. Essentially, skimming and systematic review made sure that the material acquired was analyzed based on its uniqueness and applicability to the topic.

## 8. RESULTS

The results attained from the study have showcased three distinct outcomes. Of notice is that these three study outcomes have been relevant to the Middle East region and based on the aspect of knowledge sharing as powered by IoT. Figure 1 shows the proposed model for knowledge sharing model for the faculty.



**Figure 1:** Proposed knowledge sharing model for the faculty

### ***A. There has been a surge in the adoption of knowledge sharing in the Middle East***

The findings have shown that knowledge management as used by the enterprises in the Middle East has increased. Alamil [17] and Arif [26] denote that after years of stagnation, organizations in the Middle East have put in place measures and mechanism that conceptualize knowledge management. It is notable that knowledge management provides the basis for the creation of knowledge sharing. Moreover, the findings have indicated that most of the nations in Middle East have adopted the development of IoT to create effective means of knowledge sharing. Masa'deh [27] indicate that Saudi Arabia,

UAE, Jordan rank as among the leading nation in the Middle East to use IoT as a means of enhancing knowledge sharing platforms. For this reason, the organizations in these Middle East countries have been able to attain a comprehensive means of sharing information, skills, and expertise among the group teams and individuals. Moreover, the development means that organizations operating in the Middle East have been able to maximize on these opportunities to promote the exchange of information and data with other entities outside the region [28]. It follows, as a result, that the advancement has provided a viable platform for these organizations to reap from the benefits of sharing data and information with shareholders from other regions. Hanappi [25] also support these findings by indicating that organizations in the Middle East have tapped into the advancement to create an improved means of asset utilization through the maximization of knowledge sharing. Premised on these indications, the findings denote that these entities have managed risk through sharing of knowledge through advanced IoT mechanism and as a result driving up profitability.

### ***B. Tapping into IoT leads to new means of knowledge sharing***

The findings make a case that the increased advancement as regards IoT in the Middle East has led to not only new means of sharing knowledge in organization but also improved and effective means of knowledge management. Abd-Elmiaam [27] and Abed [28] indicate that the creation of new ways of knowledge sharing as aided by IoT has ensured that organizations operating in the Middle East have access to avenues that deliver value to the long-term business goals. Significantly, the scenario implies that these organizations have unlocked opportunities that they may have previously not been able to maximize. Businesses in countries such as Saudi Arabia and UAE have been shown to deploy knowledge-sharing mechanisms that derive value from the daily interaction with their workforces and other stakeholders [22]. Moreover, these affirmations make the case that these companies derive a new form of revenue generation by leveraging on the opportunities offered by the usage of IoT to come up with effective ways of sharing knowledge. Also, these findings have indicated that the improved means of sharing knowledge through IoT with reference to the businesses in Middle East have aided in supporting the crucial enablers of organizational success [29]. In this case, these organizational outfits have acquired a massive potential in expanding not only their productivity but also maximizing on the interactions that arise from the information and data sharing processes. Furthermore, the scenario denotes that these Middle East organizations have maximized on IoT to create integrated ways of solving organizational challenges and therefore acquiring value creation in the long-term [30].

### ***C. Social and culture issues can affect the adoption of IoT, influencing knowledge sharing***

The findings imply that the cultural and social aspects in the Middle East have the potentiality to negatively influence the

long-term implementation of IoT as a means of knowledge sharing by organizations. Al Otaibi [23] observes that cultural restrictions in the Middle East have previously been quoted as being a key factor in overseas' organizations failing to share knowledge with the businesses operating within the region. Effectively, these cultural and social issues reduce the ability of Middle East organizations to add value to their business processes by reducing the level of engagement. Skepticism of knowledge sharing platforms has also been pointed out as a key hindrance to the long-term adoption of IoT with reference to knowledge management as used by Middle East enterprises [12]. For this reason, most of the local businesses are cynical in terms of embracing IoT in that the societal beliefs are of the opinion that such models are westernized. By alluding to IoT as being in contradiction to the local beliefs, it leads to the lack of an inclusive platform with reference to attaining a comprehensive means of knowledge sharing [31]. The consequence of such a situation is that the local businesses fail to create coherent models of knowledge sharing as a result of the disdain of IoT in the region.

## 9. CONCLUSION

From the findings, it is evident that there has been a noticeable increase in relation to the implementation of knowledge sharing within the Middle East region. Such a situation is favorable for the building of a knowledge sharing system between faculties using IOT to create a competitive advantage of the university. Moreover, this has been spurred by the finding that tapping into IoT creates improved and new ways of knowledge sharing for organizations. However, the skepticism of IoT based on the local culture portends to provide a potential blockade to the construction of a knowledge sharing system between faculties. It is, therefore, recommended that measures should be taken when creating the knowledge sharing system to avoid failure. Three phases have been recommended for the project. The first phase will explicitly define the type of information and data to be collected by the university when rolling out the knowledge sharing system. Secondly, distinct means of determining how the information will be incorporated will come up. Thirdly, there will be documentation of the knowledge acquired for the purposes of enhancing usability within the entities in the faculty.

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