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Effectiveness of Knowledge Management Strategies on Business Organizations in KSA: Critical Reviewing Study

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Abstract: Knowledge Management - KM has become an important strategic practice that helps firms to gain a competitive advantage. KM helps organisation to create, identify, document, store and redistribute the experiences, insights and knowledge that people have gained. The purpose of this paper is to examine the role of KM strategies in improving the performance of a lot of industrial and business organization in Kingdom of Saudi Arabia. So, this paper has Focused on the KM implementation in KSA as well as problems with its associated solutions that KM strategies support. Also, in this paper we discuss some methods to overcome the barriers for KM implementation in KSA and makes important recommendations for starting knowledge networks. So, our paper search for answering the following main question: how the KM solution are implemented in KSA firms while still meeting the rules set by the government. Our main findings prove that the major organizations that apply KM effectively achieve better performance in view point of: productivity, turnaround time and overall organization efficiency.

Key words: Knowledge Management (KM) · ARAMCO · Saudi Airlines (SAUDIA) · KM · Al Bayan school · KMI · Critical Success Factors · IPA · OBKM · SAP · CoP

INTRODUCTION

Usually, KM initiatives are a part of an organisation's long-term strategy to retain organisation knowledge. With increased employee turnover, it becomes essential that a firm develop methods to capture the knowledge that employees have gained during their work, document it and store it in content management systems with the appropriate keywords. This stored knowledge can be used by others to enrich themselves and learn quickly form the efforts of others [1]. For KM to be successful, it is important that KM networks must be established and there should be mechanisms for knowledge generation, capture and retrieval. KM networks refer to formal and informal links formed between employees of an organisation or a community of people or community of practice (CoP) with similar professional interests. These communities form social networks where problems are discussed and trouble shooting is used as solutions given by other members [2]. A large number of such communities are available on social media such as Facebook, Orkut and others. KM mechanisms refer to social media, informal discussion forums such as Yahoo! Groups and formal powerful KM portal that are run by content servers [3]. It is interesting to note that many large firms have invested in KM solutions and social networks where CoPs are encouraged. The US firm ConocoPhillips has invested 2.8 billion USD in such solutions and set up 120 internal networks that are aligned to the central KMI. Fluor has set up 46 CoPs and it has 24,000 members along with 3,500 subject matter experts. Schlumberger has a KMI system that creates a knowledge network of 23,000 members and the system provides savings of 1.5 billion USD annually [4].

This paper examines the power of KM networks on various industrial and business organizations. The setting for this framework would be applied in the Kingdom of Saudi Arabia environment within various organizations. The most important point of this paper is addressed as follows:

Basic and Preliminary Definitions: Some definitions of KM are available and one of them is "Knowledge Management is a series of structured processes and

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practices that help to augment the intellectual capital of an organisation by providing the means to capture knowledge, store it and share it with others" [5]. Social knowledge networks are defined as "knowledge [that] is embedded in members of communities and networks who have gained various facets of knowledge through their experiences. Social networks help these members to share their knowledge among members of a community in such a manner that all nodes and individuals of the network in turn become knowledge assets" [6].

Problem Definition: Knowledge Management as a practice is yet to be widely accepted and implemented in KSA. Certain cultural barriers and Shariah laws such as segregation of genders (even in online forums) preventing opposite gender people from coming in contact and restriction on the free use of Internet mean that knowledge networks are not able to function freely. With these curbs, one would assume that KSA firms are denied the benefits and competitive advantage that KM provides. However, a few firms have still managed to implement KM solutions and networks and have managed to obtain many benefits. The problem is to understand how the KM solutions are implemented in KSA firms while still meeting the rules set by the government.

Proposed Solution: A few private and public sector firms have implemented KM solutions and they have created knowledge networks, communities of practices and discussion forums within their organisations. Access to these social knowledge networks is restricted and available only for members of the firm. The solutions have helped the staff to learn from other members and this has increased the overall efficiency of the organisations, reduced the turnaround time and increased productivity, so we recommend and advice to use KM strategies to improve the performance of a lot of KSA organizations.

Reason for Selecting STC: KSA represents a nation where modernity and tradition live together. On the one hand, Islamic laws guide the functioning of the state. On the other hand, many modern firms are operating that must use cooperative knowledge sharing to survive and grow. The government is attempting to reduce its reliance on oil revenues by encouraging the growth of other sectors. KM will help the government, the public and private sectors firms to make use of modern methods to grow. The paper will show how some firms in KSA have used KM effectively.

Main Findings from the Research: KM solutions with social knowledge networks have been implemented successfully in KSA firms. Problems that were addressed included sharing knowledge, reusing knowledge, helping technical staff to shorten the time required for maintenance and helping people to learn in a cooperative environment. Requirements of Shariah were followed and the organisations have benefitted from the implementation.

The authors of this paper give a simple example of how this process works. In a typical day, a firm such as Ford or Microsoft carries out millions of transactions. These transactions are run as per the organisational business processes and rules. Therefore, when a component is to be outsourced, rules and procedures are available for the procurement and even a trainee executive would be able to use these processes and procure the material. Knowledge comes into play when certain unknown factors such as problems in the design, supply chain, fitment on the product and other such activities that are not documented, manifest themselves. Now, the trainee would be helpless since the operating procedures have not mentioned anything about this. However, senior purchase personnel who have experienced such problems would have the solution. This is just a simple instance of how organisation knowledge locked in individual's brain is unlocked and this is called as knowledge management.

Related Works Regarding the Km Concepts: When speaking of knowledge, there is some disagreement about the meaning and context of knowledge and information. Drucker [7] speaks of knowledge as "information that changes something or somebody by becoming grounds either for actions or by making an individual or institution capable of different or more effective action". Thus, knowledge is personal and intangible in nature that a person possesses while information is tangible and available to people who want to search for it. It is difficult to pass on knowledge but easy to pass on information. Nonaka [8] has argued that information is factual while knowledge is about commitments and beliefs. He points out that knowledge can be tacit and explicit. Tacit knowledge is understood at a subconscious level, it is difficult to articulate and it is developed from experience and action. It can be shared through interactive conversation, sharing experiences and storytelling. Examples are the skill and talent for design, composing music, drawing and painting, feelings, understanding of consumer behaviour and so on [9]. Explicit knowledge on

the other hand is precise and it can be articulated more easily, codified, documented, shared and transferred. Examples include writing software programs, repair of electronic items and so on [10]. Tacit knowledge is difficult to capture and share while explicit knowledge is easier to document, share and manage. Therefore, organisations mainly focus on managing explicit knowledge [11].

In the current economy, knowledge is seen as represented by money, people, power, learning and all these factors combine to provide a competitive advantage for a firm. Knowledge would reside in the organisations processes and in an individual's brain. Knowledge in organisation processes is stored in the form of documents, services, products, systems, facilities, patents and other such assets. These are regarded as the intellectual capital and firms try to build the intellectual capital [12].

Hansen *et al*. [13] point out that the important transition of the KM focus from processes to humans as key components helped to increase KM acceptance. This movement help in making the KM more interactive and successful. Humans generate knowledge artefacts, identify the ones that must be retained, capture, organise and then store for later retrieval. Advancement in IT has allowed users to rapidly create and upload their learning [14]. Technology has also helped knowledge networks to emerge from social networks and help to share knowledge. Organisations also create a knowledge sharing culture where employees are encouraged to share their knowledge. When KM is implemented and practiced effectively, it enhances other organisational initiatives such as business process reengineering, total quality management, organisational learning and organisational development. KM is a continuous activity and not a one-step activity [15].

According to Mohamed *et al*. [16], organisational performance depends on the interaction between three main factors in the organisational context. These are organisational design, its strategy and the behaviour of staff. Therefore, managers must select the appropriate approach to create the processes and deliver the required products and services. All these activities are run by the explicit knowledge transfer that exists in the organisation processes [13]. The understanding developed by the author of this paper is that organisation context includes variables such as processes, corporate culture, corporate knowledge, structure, knowledge, technology and other factors that are interlinked and represent the whole system [17]. Knowledge management must work within this context and must consider the interrelations formed by these elements and KM cannot work in an isolated manner from these [18].

KM CSF with its Main Drivers and Barriers: Like any organisation practice and initiative, KM has a number of critical success factors (CSFs) and a brief discussion is done on these. CSFs are defined as "areas where results if they are optimum will help to bring about a successful competitive performance" [19]. Since KM is essentially capturing the internal and external resources that an organisation controls, it is important to understand the nature of these resources so that the extent of success can be determined [20]. Organisations must be aware of the CSFs since they determine the success or failure of implementation. In other words, these activities must be addressed to ensure that KM is implemented successfully [21].

Over the years, researchers have provided different types of CSFs. These vary on the content and nature of the KM enterprise. Seven CSFs were provided by Skyrme and Amidon [22]. These are linked to an appropriate vision and architecture, business imperative, knowledge leadership, culture of knowledge creating and sharing, continuous learning, robust technology infrastructure and systematic organisational knowledge processes. Liebowitz [23] has proposed six factors that provide CSF. These are senior management support, appointing a chief knowledge officer, suitable KM infrastructure, KM systems and tools, knowledge repositories and ontology and incentives to encourage knowledge sharing and supportive culture. Three CSFs were proposed by Holsapple and Joshi [24] and these were environmental, resource and managerial support. Hasanali [25] has proposed six CSFs and these are structure; culture; leadership; IT infrastructure, measurement and roles and responsibilities. Considering the above CSFs and with further inputs from Wong and Aspinwall [26], Wong [27], Sharp [28], 11 CSFs are proposed by the author of this paper. These are management leadership and support, culture, IT, strategy and purpose, measurement, organisational infrastructure, processes and activities, motivational aids, resources, training and education and human resource management. These CSFs are considered as important because they represent the tangible and intangible processes and collect inputs from tacit and explicit processes. A critical review of the previously mentioned literature shows that these CSFs should not be

considered in isolation and individually but they work together in a shared manner. When these systems work cooperatively, a number of knowledge management outcomes are possible. These are systematic knowledge activities, employee development, customer satisfaction, good external relationship and organisational success.

While KM is being implemented in many organisations having gained popularity, some firms have realised that a number of internal and external barriers exist that hinder KM implementation. These factors are also seen to impact other indicators and thus increase the magnitude of the challenges that KM managers face. Wong and Aspinwall [26] have shown that many of the CSFs become barriers and challenges when they are not managed properly. However, when organisation culture is not managed properly, it becomes a big barrier. Proper approach means that the culture of knowledge sharing must be brought in and employees must be encouraged to share their knowledge [29]. When justified, suitable rewards and recognition must be initiated to recognise and motivate employee participation. When organisation culture is not managed efficiently, then mistrust is created. People who share their knowledge are not given recognition and others walk away with the rewards. Singh and Kant [30] have brought out some perceived barriers. These are lack of top management commitment, lack of technological infrastructure, methodology, organisational structure and culture. Other barriers are lack of organisational culture, lack of motivation and reward, staff retirement, lack of ownership and staff defection. In some instances, people tend to hide and hoard their knowledge under the fear that they would be replaced once the task is completed. There is also the fear that if others are taught their skills, then their own position is under threat. In addition, jealousies, aspirations, envy and other such negative feelings are known to hinder the exchange of knowledge and restrict the knowledge transfer mechanism [30].

KM Networks in KSA: With a realisation that KSA can move ahead by encouraging the productive growth of the Internet, several initiatives have come up. These KM networks make use of organisational social networks and external social media. Members can participate and exchange their knowledge about project management, construction, IT, education and a number of other areas [16]. A few of these cases are discussed in this paper.

Case Studies on Role of KM on KSA Organizations: A few important cases of KM strategies and its implementations are discussed in this section. These case studies are drawn for their implications on the topic.

Saudi Aramco Company: Case Study No. 1: The Saudi Aramco company invested in a KM solution called ShareK and this played the main role of supporting the KM initiatives. Many support mechanisms such as CoPs were set up. Employees could connect to the communities of their interest and share knowledge, problems and solutions, take up presentations and discussions on various work related issues. The discussions and activities were monitored by the KM administration to see that all cultural norms and confidentiality were observed as shown in Fig. 1. In a short time, Saudi Aramco has seen quick returns from the initiative. The number of patent applications that averaged at around 30 per year grew to 198 by 2011. Employees have quick access to technologies and can refer their problems to the CoPs. Knowledge is shared and stored and all the activities are thus integrated into a total KMI solution [31].

Al-Bayan School for Girls: Case Study No. 2: This interesting case study is based on using KM and social networks for a girl's school in KSA was provided by Mohamed *et al*. [16]. The case refers to introducing a KMI system with modules of e-learning systems for use by girl students of the Al-Bayan model school in KSA. The school initially used a traditional education approach and teaching was usually through a classroom based and done with face-to-face interactions. Abouchedid and Eid [32], Al Saggaf and Weckert [33] have reported about the segregation practiced in KSA schools. The scope of learning, the kind of subjects taught was limited. This was mainly because the Islamic scholars who took up teaching in girls' schools were senior people with very little exposure to IT systems and subjects of the modern world. At the same time, urgency and development in the external world meant that Saudi women had to be trained to take up meaningful positions in the modern society. The school decided to use a KMI approach to focus on the management approach for e learning. Usually, KM is associated with large organisations due to the expense, complexity and high level of technical skills needed. Fig. 2 illustrates the workflow in the KMI system.

Since the school was segregated, it was not possible to allow the girls Internet access. There was also the fear that girls would be able to communicate with the opposite

Fig. 1: ShareK, the KMI portal at Saudi Aramco [31]

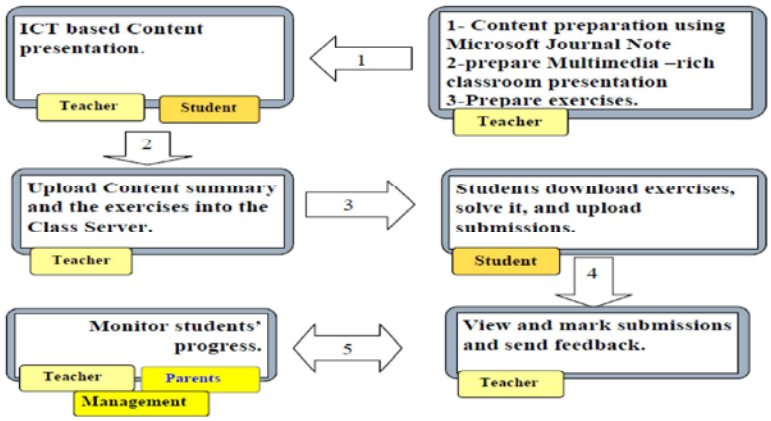

Fig. 2: Workflow in the KMI system at Al Bayan School [16]

sex through the Internet. Therefore, the KMI solution created a closed network for the registered students of the school. The girl students were able to carry out the learning tasks as shown in the above figure and complete their tasks. Also, girl students were free to discuss informally with each other through various forums on the server. Teachers could also participate and monitor the study and conversation in the community. The exchange of ideas, problems and solutions helped to increasing the effectiveness of learning. The satisfaction of the girl students was very high. The KMI initiatives also won recognition for the innovation and help it brought to girls who had to otherwise remain at home. Fig. 3 illustrates the architecture diagram of the system.

KM in Institute of Public Administration: Case Study No. 3: Al Hamoudi [34] has written about the combination of KMI and balanced scorecard - BSC in the public sector firm of KSA called Institute of Public Administration - IPA. The objective was to provide a framework for the development of KMI solutions along with BSC at IPA. The research identified 13 important factors that are important while considering the development of KMI solutions. These critical factors were arranged in four groups from the point of different perspectives. These perspectives were designed to capture the focus of IPAs strategy. The perspectives were also meant to render a balance between the internal and external organisation knowledge along with instances of tacit and explicit knowledge. The framework for the model was thus designed so that it could help to provide a path to transform the organisation when needed. A road map was also made that could help to implement the model. Fig. 4 illustrates the framework of the proposed KMI solution.

Yahya and Farah [35] have written about the public sector firms in KSA. These are traditional firms owned by the government and their role is to provide goods, services and employment to a large number of people. Traditionally public sector firms had a laid back and lax attitude. In 1998, a royal decree was announced that set up an administrative development department in each public sector firm. The objective of this department was to modernise the firms and make them accountable for the huge expenses they incurred. While improvement and

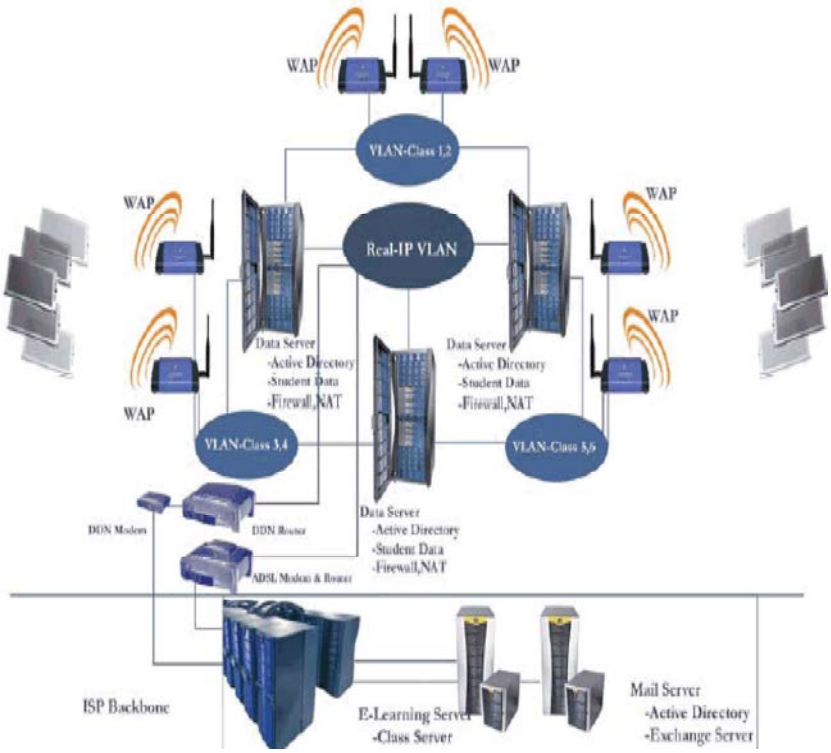

Fig. 3: Architecture diagram for KMI solution at Al Bayan [16]

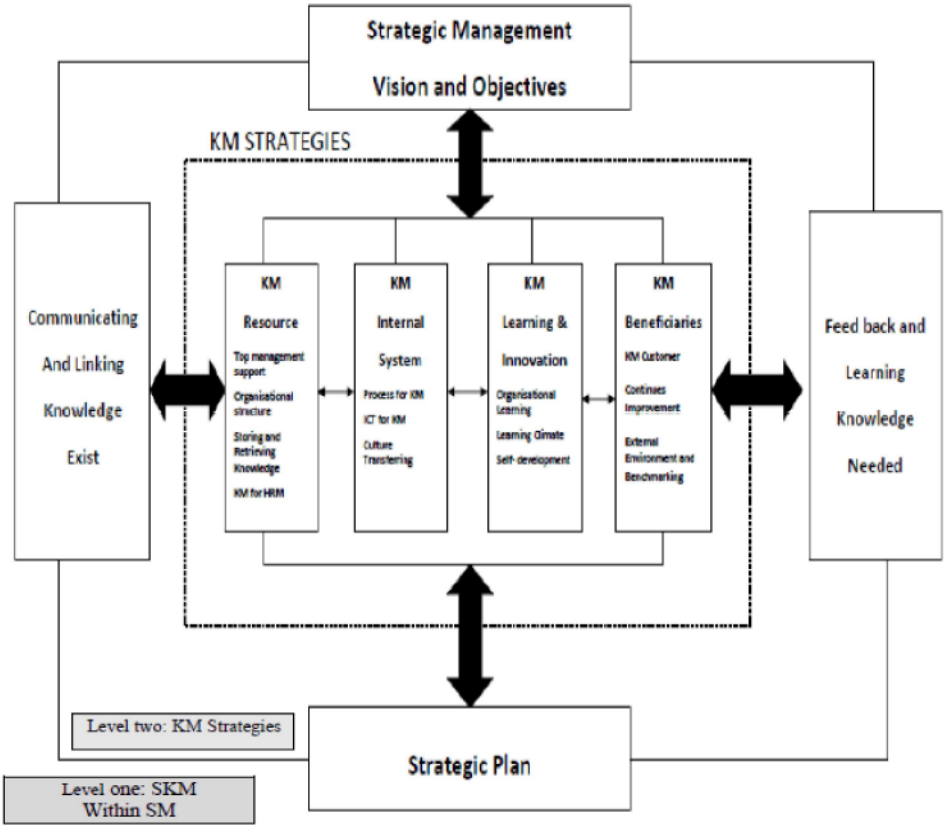

Fig. 4: KMI solution at IPA [34]

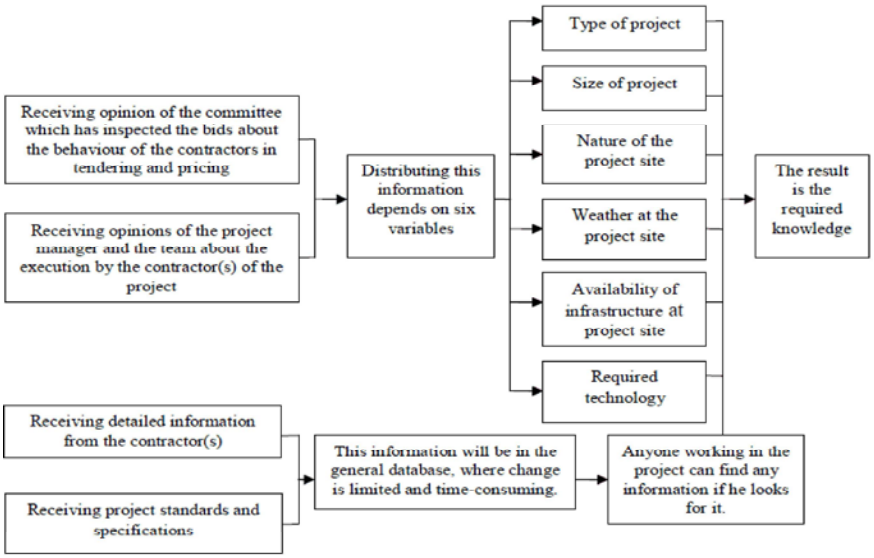

Fig. 5: KM framework of the Cons. Project Manag [36]

modernisation was brought in, there was a need to develop a KMI solution so the modernisation efforts could be shared with all. There was a need for a common vision that could create social networks among the employees. Additionally, the KMI network could also be used to develop a BSC.

KM Systems for Construction Project Management: Case Study No. 4: The field of construction does not have many implementations of KM solutions mainly because construction projects are one off efforts and each building and project has a new design. Al Shahrani and Elhag [36] have presented a paper for the KMI solution of construction firms. They argue that certain common elements such as procurement and the bidding process of contracts can be used to create a KMI solution for large construction firms that take up projects on a regular basis. Particularly, the bidding process has a number of common elements that can be standardised and the knowledge gained can be stored in the database.

The KMI solution proposed was distributed into four phases. In the first phase, the enterprise project management is used where project information. Project related experiences and learning are captured through the IT system and entered into the solution. In the second phase, an automatic capture and transfer of the knowledge and learning is done to the database. In the third phase, a knowledge repository is developed where knowledge is created and distributed in the database as per its characteristics. In the fourth phase, the KMS performance is measured and the baseline knowledge obtained from earlier projects is used for the planning activities of the subsequent projects. This phase helps to measure the performance of the KM systems [36]. Fig. 5 illustrates the workflow of this case.

Phase 3 was the most important once since all the information about the lifecycle of the project was entered into the system. The database was divided as per the implementation process and each process had variables. Tools such as online analysis processing along with data mining and a relational database were used for the project. The first phase started with the bidding process, standards, contractors and specifications databases. Important information about the bid regulations and conditions, standard reports for the bid and other opinions that verified the bids were stored in the bidding database. Contractor database was used in two stages and the first started at the end of the procurement stage and the second after the project completion [36].

KM Systems at Saudi Airlines: Case Study No. 5: Saudi Airlines (Saudia) is the official Airlines of Saudi Arabia. Started in 1945, Saudia is one of the leading airline firms in the world. It operates more than 139 advanced wide-bodied aircrafts and has internal services to many global destinations [37]. The case study on KM at Saudia was presented by Zawawi *et al*. [38]. The case on KM at Saudia called the holistic Operation- Based Knowledge Management - OBKM was meant to help the technical and sales staff at the airlines to form a closed social

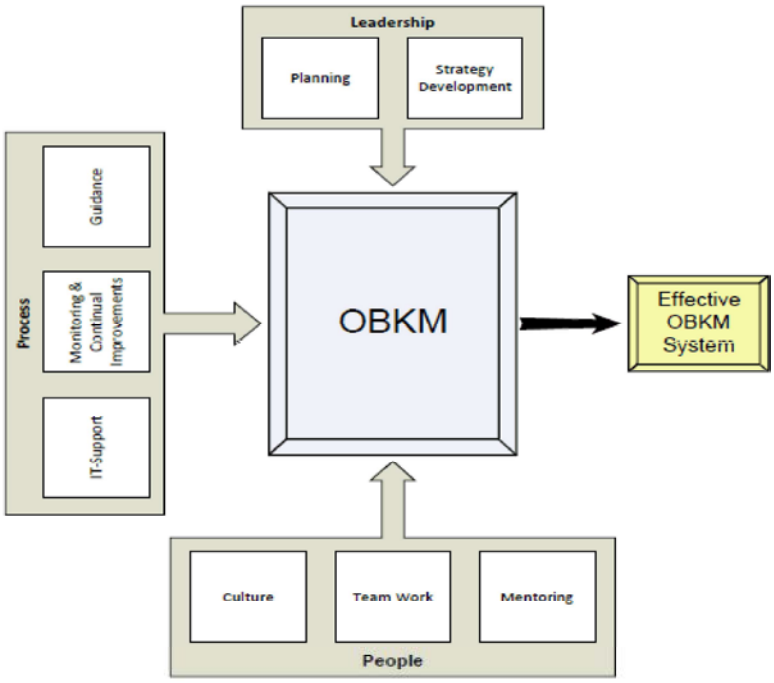

Fig. 6: KM solution for Saudia [38]

network. The main intention of this project was to share the collective knowledge of more than 35,000 staff at different airports and hangars across the world so that tips on maintenance, passenger safety, turnaround time and other such factors could be improved. The airline industry is highly regulated and passenger safety is first. All aircraft are subjected to routine maintenance after the stipulated number of hours is flown [38].

However, the longer an aircraft stays on the ground, the more is the loss that the airline suffers due to idle time. A need was felt to have a knowledge sharing mechanism for the technical team so that approaches to problems, maintenance issues, tips to reduce the idle time and increase the efficiency could be brought in. Knowledge sharing was done by means of tacit methods where the head mechanics taught the new recruits the finer points. The airlines had a number of technical and maintenance manuals, regulatory checks and procedures but KM had to explore and document the tacit knowledge and deep inner knowledge of the aircraft maintenance process. This process had to be institutionalised and the KM solution was designed to meet the needs [38].

The KM solution was built on the existing SAP NetWeaver portal component, an ERP solution that works on the the airlines had developed. The SAP application was data driven and helped to automate tasks, help in forecasting, planning, seat booking and increase the efficiency. The SAP application could be used to store and archive knowledge artefacts and help in their retrieval. However, KM is more than a database server and content manager. A model had to be derived that would help to bring in the KM process [39]. The KM model of this case is shown in Fig. 6.

The KM solution had three aspects and these were leadership, process management and people management. Leadership aspect helped the organisation and team leaders to bring in a culture of knowledge sharing. There was a move to make tacit knowledge into more explicit knowledge. Team leaders were encouraged to document their learning and knowledge in the SAP templates. Process management aspect helped to understand the workflows and organisation process better, to ensure that policy, procedures and work instructions along with monitoring and inspections were available. People management aspect help the staff to access the documents using key word search and review the solutions. They were in turn allowed to upload their learning. The overall result was very positive. Problems that took more than three days to resolve could now be understood and solved in a few hours. This helped Saudia to reduce the time spent on maintenance and repairs by 8%, a substantial gain for an industry where margins are often less than 3% [38].

Overcoming the Barriers of KM Networks in KSA: Barriers to KM are the challenges that are faced by firms in developing and deploying KM solutions, identifying knowledge gathering methods and tools and making people to participate in the initiative. This is one of the greatest barriers since people would be reluctant to part with their knowledge and skills. Al Hussain [40] has mentioned a number of barriers that that can be arranged in different categories. The categories are learning, leadership, technology and organisation. These barriers were obtained after intensive research among KM organisations of KSA and the Middle East. Each category had a number of barriers given as follows:

Learning: It had four barriers and these are knowledge sharing and there is no sharing of knowledge when the learning process is under way, lack of specialisation since there is a scarcity of KM education specialists. Other barriers are culture - where there is no culture for creative learning that helps to generate knowledge and a lack of training opportunities [40].

Leadership: The barriers in this category included experience where leaders lack experience in KM practice and collaboration where collaboration from management on KM projects does not exist. Other barriers are work methodology where weak work methodologies were used to support KM and less procedures and standards where leadership support to create standards and procedures for knowledge sharing did not exist [40].

Technology: Here, the barriers is the communication where there is a lack of efficient knowledge communication tools and employee expertise when there is a scarcity of qualified human resources that help to manage technology. Other barriers were outdated information where extensive obsolete and outdated information existed and archiving resources where insufficient technological resources were used to archive knowledge [40].

Organisation: The barriers were communication where there was no presence of proper organisational communications and culture where there was a lack of knowledge sharing culture. Other barriers were training where there was a lack of adequate organisational training and trust where there was a lack of trust in the organisation [40].

Main Findings and Important Results Regarding the KM on Various Enterprises in KSA: The authors of this paper makes some recommendations to provide for an integration of social networks and KMI solutions in KSA. The cultural and religious barriers for introducing such solutions are also given due consideration and respect.

- When introducing KM networks in organisations or in a community, it is important to ensure that CoP, for different subject areas is formed. This means that people interested in IT systems should find CoPs for their interest groups and they can keep away from other subjects such as fashion, food, clothes, etc.
- It is strongly recommended that before bringing in a KMI process, a change management process should be initiated. The change management process should help to overcome a number of barriers and cultural issues related to KMI implementation [29].
- A CoP should be sponsored and monitored by an organisation or a voluntary special interest group. A knowledge champion should be appointed for each group and this K Champ should help to monitor the activities and replies in the CoP.
- Funding can be obtained from the KSA government that would be willing to fund such legal and appropriate KM initiatives that help to further the planned knowledge society.
- It is also recommended that members should be encouraged to document their experience and learning, their trouble shooting skills in structured templates along with key words.
- A rating system should be introduced where members rate the contribution of other contributors. Members who obtain the highest rating per quarter should be given a reward and due publicity should be given.
- While creating KM initiative in an organisation, it is recommended that a closed and private network available to only company employees should be used.
- This process helps to retain confidentially and to prevent leakage of company confidential information
- Authentication should be given for the website and members should be encouraged to participate in the KMI initiative.

CONCLUSION AND FUTURE WORKS

As the conclusion the paper has examined in detail the concept, principles and practice of implementing KM solutions in KSA. It was seen that the main concept in developing KM solutions is sharing knowledge,

preventing knowledge hoarding and helping others to learn. These basic concepts can create conflicts and barriers among some people who hoard knowledge and would not be willing to give it up easily. They may fear that their importance and use may be reduced if their knowledge is given out to others. It is important to allay the fears of such people and make KM an inclusive process. The focus was on using social networks to build and drive KM solutions in an organisation and the community. Some case studies on KM implementation were studied. These studies related to different areas in KSA such as schools for girls, public sector firms, oil and chemical factory and construction firms. It was seen that the KMI solutions developed gave importance to participation from employees. In other words, the initiatives would successful only when more people participated in the initiative and they exchanged their views thus creating knowledge. KSA has seen a rise and proliferation among members for various social media. It is important that the power of this social media should be used to develop and strengthen the KM initiatives for KSA. Considering the restrictions that KSA government has placed on the use of Internet and social media, all considerations should be followed to maintain and follow the rules. We hope to extend this work in another private organizations in KSA covering: health organization, finance, educational institution,.....etc to check the entire effectiveness of applying KM in both public and private sectors on KSA.

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