

Knowledge and Organisational Success: Developing a Scale of Knowledge Framework

Mohammed Almohammedali, Peter Duncan, David Edgar

Abstract—The aim of this exploratory research is to understand further how organisations can evaluate their activities, which generate knowledge creation, to meet changing stakeholder expectations. A Scale of Knowledge (SoK) Framework is proposed which links knowledge management and organisational activities to changing stakeholder expectations. The framework was informed by the knowledge management literature, as well as empirical work conducted via a single case study of a multi-site hospital organisation in Saudi Arabia. Eight in-depth semi-structured interviews were conducted with managers from across the organisation regarding current and future stakeholder expectations, organisational strategy/activities and knowledge management. Data were analysed using thematic analysis and a hierarchical value map technique to identify activities that can produce further knowledge and consequently impact on how stakeholder expectations are met.

The SoK Framework developed may be useful to practitioners as an analytical aid to determine if current organisational activities produce organisational knowledge which helps them meet (increasingly higher levels of) stakeholder expectations. The limitations of the research and avenues for future development of the proposed framework are discussed.

Keywords—Knowledge creation, knowledge management, organisational knowledge, scale of knowledge, knowledge impact.

I. INTRODUCTION

It can be argued that organisational success is a measure of the extent to which the organisation meets the expectations of its stakeholders [1]. Such stakeholders can include any group or individual that is affected, or can affect the organisation. Stakeholder expectations may change over time, leading to a ‘gap’ between current organisational activities directed at meeting initial/current stakeholder expectations, and the activities required to meet future (perhaps different) expectations. Part of the role of knowledge management is to reduce this gap between activities and expectations through the efficient use of tacit and explicit knowledge, facilitated by Information Systems (IS). The aim is to enhance organisational activities over time to enable the organisation to meet what are typically higher levels of stakeholder expectations [2]. Business uncertainty and economic change require management to focus on the process of knowledge

creation and challenges managers to examine all business activities to make sure that these contribute to organisational knowledge creation [3]. Such knowledge creation can add value to products/services with implications for how stakeholder expectations are met [4]. Knowledge creation has become one of the most important assets in organisations. Knowledge creation is a tacit process that can create an advantage in competitive markets [5]. Various organisations have recognised this and have encouraged knowledge management in their organisational systems, using practical wisdom sourced from knowledge during routine work to continue creating knowledge [6]. Knowledge is created across three stages. The first stage is data, which can be collected by organisations and is available in the form of statistics. Such data is transformed into information when it is organised and into a more meaningful format [5], [7]. When these meaningful messages assist with solving problems and making decisions, they can be called ‘knowledge’ [8]. Knowledge is divided into three different kinds: human knowledge, social knowledge and structured knowledge. Human knowledge is built inside the individual and refers to the skills of knowing ‘how’, and the expertise of understanding ‘why’. Social knowledge is obtained by working together in a team or in a group. Structured knowledge is knowledge ingrained in organisational routines and systems [4].

The complexity of managing individuals in organisations along with changes in customer behaviours, changes in competition, world economy fluctuations and emerging international trade agreements make knowledge management a complicated proposition to manage in terms of organisational knowledge, created knowledge, and the integration of knowledge into organisation processes [9]. All of these issues increase the chances of losing tacit knowledge due to the nature of this type of knowledge such as in termination or transfer of employees [5]. The loss of such important knowledge may make it difficult for organisations to add more value to their product/service to meet stakeholder expectations. Stakeholders are any individuals or groups of people that can affect or can be affected by an organisation’s actions [10]. Thus, organisations should be ready for change, at both strategic and operational levels in relation to both stakeholder expectations, and organisational knowledge creation [1]. The purpose of this paper is to generate a ‘Scale of Knowledge (SoK) Framework’, which can help managers identify the extent to which their organisation meets its stakeholders’ expectations, and the scope of its activities that create knowledge. The framework is developed through a review of the literature and the findings of empirical work

M. Almohammedali is a researcher focusing on social practice, business strategy, knowledge creation and innovation. He is currently a doctoral student with Glasgow School for Business and Society (GSBS), Glasgow Caledonian University (GCU), Glasgow G4 0BA, UK (phone: 141-331-3205; e-mail: mohammed.almohammedali@gcu.ac.uk).

P. Duncan is a Senior Lecturer in the Department of Business Management, GSBS, GCU (e-mail: p.b.duncan@gcu.ac.uk).

D. Edgar is Professor of Strategy and Business Transformation at the GSBS, GCU. He is now with GCU (e-mail: d.a.edgar@gcu.ac.uk).

conducted at a private hospital in the healthcare sector in Saudi Arabia.

II. BACKGROUND

The processes of how knowledge can flow through individuals and how knowledge can be created in organisations has a major effect on creating competitive advantage [11]. It has been argued that organisations prefer to enhance the sharing and transferring of knowledge between individuals instead of transferring knowledge within markets. This may be because the more knowledge organisations have, the greater are their options to grow and expand into new markets [12]. Thus, knowledge management in organisations seeks to enable knowledge creation and the adoption and enhancement of knowledge shared by individuals to prevent knowledge being lost, and to enrich organisational knowledge [13].

It has been argued that knowledge shapes information, and that information helps to inform managers as to what kind of data needs to be collected. Knowledge is located in organisational processes, and information is located in specific activities [8]. Organisations that fail to identify the information needed to enhance their explicit knowledge will inevitably collect valueless data. This will not only cost organisations financially, but will also create knowledge that is not useful in developing and reengineering organisational processes to satisfy stakeholder expectations.

Understanding different types of knowledge is an important step to be able to evaluate organisational activities that may or may not generate knowledge to meet stakeholder expectations. It is also useful to determine what IS is needed.

A. Tacit Knowledge

Tacit knowledge can be understood as the collective skills of individuals embedded in the mind gain by the interact with others [11] and the harnessing of tacit knowledge can create an advantage. Polanyi was the first researcher to study tacit knowledge systematically. He stated that individuals appear to know more than they can explain [14]. Tacit knowledge leads to responses to external changes and may leads to develop a new process. This form of knowledge, however, is unlikely to transfer easily between individuals or through the formal structure of interactions [15]. Tacit knowledge is gained by individuals through interactions and socialisation with others who come from different cultures [11]. It is shaped differently according to various organisational situations [16]. Thus, it takes a long period of time to develop fully within an individual [17]. Because tacit knowledge ties in with individual skills, experience, behaviours and know-how, it has to progress through a long process to be captured by other individuals [13]. Also, combining tacit knowledge amongst individuals can tie into the tacit routines of organisations [18]. Tacit knowledge, individually or collectively cannot transfer completely without loss or change. For this reason, such a form of knowledge should be managed with caution. Hence, it is necessary to transfer this knowledge between individuals with as little change or misinterpretation as possible [19]. In

addition, because tacit knowledge is sourced from an individual, everyone in an organisation should be involved in order to maximise the benefit of this knowledge [20]. The result of this involvement can improve organisations activities [21]. Tacit knowledge is hidden deep within the heart of individuals. Thus, it is hard to analyse it in the way a consultant might analyse organisations. This means tacit knowledge vanishes when employees leave [22].

B. Explicit Knowledge

Explicit knowledge is knowledge that is collected, shared, and transferred in organisations using a defined method [23]. This knowledge can be documented in a structured method. Organisations use systematic language in codified structures to use this knowledge in their social community and transform tacit knowledge into organisational processes. Thus, organisations use IS to enhance this knowledge by using computer software [24]. There are two kinds of explicit knowledge and these are individual-explicit knowledge, which refers to cognitive skills in individuals, reflected in their ability to assume problem solutions and their ability to predict changes [20], and collective-explicit knowledge, which is information coded and simplified in organisations. Such information is usually stored as organisational policy and is found in any place where the social community can access and interact with it [18], [25]. Tacit and explicit knowledge should be used at all organisation levels. This is required from organisations to provide a space in different organisational activities to encourage knowledge sharing among the social community [26].

Organisations consist of a social community committed to transforming knowledge into valuable products and services by using the available resources within the limits of organisational rules. Organisations persist because they provide a source of knowledge to help their social community to make desired decisions within structured rules that are not provided to individuals. Thus, organisational knowledge is different from individual knowledge because it is the result of mixing both the tacit knowledge of individuals and the explicit knowledge of organisations [27]. By obtaining this kind of knowledge, organisations can respond to external changes. Organisational knowledge has two elements; information and know-how, which provide competitive systems through their characteristics. These are shared in the organisation and it is difficult for competing organisations to imitate such knowledge [12]. From this literature, we can conclude that organisations rely explicitly on their communities. Without providing such communities with enough explicit knowledge they can face fierce competition that is difficult to compete with. In addition, organisations will not be able to survive by providing explicit knowledge to the social community and by not allowing tacit knowledge to be shared between social communities.

C. Information Systems

Information is what individuals need to know to perform organisational activities. It should include facts and symbols in

order to be considered 'useful' information. Data is the fundamental element of information and it has no value when it is considered separate to other elements. For a hospital patient, their first name, last name, sex and age are examples of data. Some researchers argue that information is driven from data and knowledge is driven from information. If IS professionals fail in their plan to provide 'useful' information to the organisation, it can cost organisations financially with ramifications for stakeholder satisfaction [5].

Organisations use IS to enhance the use of explicit knowledge in social communities in their daily jobs and routines. They can also produce significant benefits by providing information that helps with knowledge creation between individuals. IS can help management in organisations with their activities [19] because it is designed to meet stakeholder expectations by linking the social community in organisations to their IS. Hence, organisations can perform based on the new knowledge they have gained [28]. When organisations are able to increase shared knowledge; this results in less room for individuals to share knowledge in their own society. The higher the value of explicit knowledge, the higher the value of the IS to organisations [19]. The opposite can be true when there is less knowledge shared, so that the more contextual information is needed in organisations, the less IS is valued in the organisation. On the other hand, organisations often possess lots of information, but with little value. Thus, information is only valued if it increases knowledge at an individual level. Organisations can fail to turn information into knowledge that can help to make decisions and solve problems. This is because IS can only enhance organisational knowledge. To do this IS needs to have the capability to collect data and analyse it to become information that can be used to make decisions and solve problems. IS can fail to turn information into knowledge when organisations fail to consider how to adopt it and fail to implement it within activities in an organised way [5]. In addition, organisations should consider two factors: their organisational culture and the necessity to continue updating their processes which might result in the reengineering of activities [28].

D. Knowledge Management

Markets are changing and becoming more competitive. At the same time, organisations are reengineering their processes locally and globally to produce and serve their customers more efficiently. Operational managers shift their operations towards more economic places that fit best into their strategy to meet stakeholder expectations and reduce risk [29]. Globalisation and international agreements such as NAFTA (North American Free Trade Agreement) have an impact on stakeholder expectations [30]. Thus, creating and maintaining a competitive advantage is becoming more difficult. Moreover, public and private services such as those in healthcare in Saudi Arabia are becoming more aggressive in pursuit of service quality. The use of IS in healthcare sectors across the world has become widespread since healthcare specialists can, for example, increasingly view patient health

histories from all over the world, and can learn how the patient has been treated. Stakeholders across the sector can now view or observe results and share knowledge with others. Thus, healthcare leaders face new challenges to create organisational strategies and design work processes to perform activities that meet the changing expectations of stakeholders. Beyond the healthcare sector, this imperative to create knowledge and adapt processes in the face of changing stakeholder expectations also applies to other organisations/sectors more generally.

E. Knowledge Gap between Activities and Stakeholder Expectations

Many writers on strategic management have argued that senior managers need to evaluate and develop their strategies to make necessary changes to the strategies and processes of their organisation to meet stakeholder expectations [1], [31], [32]. However, creating an appropriate strategy is not the only factor that enables organisations to compete or satisfy stakeholder expectations. Strategy needs to be translated into logical methods of performing activities in all organisational parts and levels, in order to meet organisational goals and stakeholder expectations. This implies that senior managers need to develop and implement activities, redesign processes, change and allocate resources, invest in human capital and technology and enable the use of explicit and tacit knowledge [33]. However, stakeholder expectations change and evolve over time. Activities performed to meet *initial* (current) expectations may have to change and evolve to meet *future* (potentially new) stakeholder expectations. There may be a time 'lag' (*gap*) as organisations, having committed to activities based on initial expectations, have to reconfigure and adapt to these future/new expectations. One challenge for senior managers is how best to use organisational knowledge to reduce the lag/gap between initial/future stakeholder expectations and the organisational activities which will meet these expectations [34]. Fig. 1 illustrates the gap between current organisational activities and the new stakeholder expectations that was changed by the time of crafting and implementing the activities.



Fig. 1 Gap in Organisations

The role of 'knowledge management' (see Fig. 1) is to attempt to forecast future stakeholder expectations and determine the changes that are required in organisational activities in order to meet these new expectations. Such a process can reduce any disparity between current activities (meeting initial expectations) and the activities required to meet future expectations.

There are a number of frameworks which provide insights for managers on how organisational knowledge and its management might benefit their organisations. Such benefits can reduce any perceived gap between organisational activities and their stakeholders' expectations [18], [35], [36]. However, to date, none of these frameworks have clarified the link between changing stakeholder expectations and the consequent potential need for knowledge management to facilitate change in an organisation's activities. This paper will develop a SoK Framework which links organisational knowledge management to the extent to which organisational activities meet stakeholder expectations.

III. METHODOLOGY

This section explains and justifies the research methodology adopted in generating the SoK Framework.

A. Abductive Research Approach

The abductive research approach is useful for researching an event from the perspective of people who have experienced an event first hand in order to comprehend social reality as understood by those in the situation [37]. This fits well with an exploratory research plan focussed on the interactions between three interrelated constructs, which are 'social' in nature: knowledge management, organisational activity and stakeholder expectations.

An abductive approach is concerned with, providing a description of everyday activities, knowledge and related issues (for this research that includes organisational activities relating to knowledge creation, sharing or use and related challenges). This approach to research provides a structure for data collection. The abductive strategy goes beyond a constructivist view of the social community by also considering the source of its explanatory accounts (such as sources of individual knowledge for this research).

B. Single Case Study: Hospital Organisation in Saudi Arabia

A single case study strategy was adopted for this research in the form of an exploratory study focusing on a contemporary phenomenon; the interaction between stakeholder expectations and organisational activities facilitated through knowledge management. The study is grounded in a real-life context where the boundaries as to the event itself and the context are not clear [38]. What qualified as a 'case' for this research was broad and open-ended due to the exploratory nature of the work. As such, a case could be any organisation where the interactions of stakeholder expectations, organisational activities and knowledge management could be investigated.

The case chosen was a family owned/run private sector hospital organisation in Saudi Arabia. The organisation has three branch hospitals in different cities plus a Head Office, and so it is spread across four locations. For reasons of commercial confidentiality, specific details regarding the case are not provided in this paper. The hospital was chosen based on convenience/ease of access for research purposes.

C. Data Collection

This research followed a qualitative sampling method suitable for the subject and environment of the study [39]. Face-to-face in-depth semi-structured interviews took place with eight managers from across the organisation. Interviewees were selected by senior gatekeepers/managers providing access to the organisation. At the request of the researchers, the selection criteria were: 8-10 managers from across a wide range of different departments/branches of the organisation. The roles/departments of those interviewed are presented in Table I; Hospital C was not represented it was a new hospital that was just established.

TABLE I
PROFILE OF INTERVIEWEES

Branch	Interviewee Position/Role
Head Office	Chairman and Vice President
Head Office	Human Resources (HR) Manager
Head Office	Management of Information Systems (MIS) Manager
Hospital A	Hospital Administrator
Hospital A	Medical Record Manager
Hospital A	Outpatient Manager
Hospital B	Food Services Manager
Hospital B	Pharmacy Director

Based on the stakeholder expectation/organisational activity 'gap' identified in Fig. 1 (Section II), the purpose of the interviews was to identify participant perspectives on aspects such as stakeholders and their expectations; activities within their department; knowledge sharing activities/processes; and sources of knowledge (such as internal/external), how knowledge could be embedded/utilised within the hospital, and the related challenges in doing this. After the eighth interview, a state of data saturation was reached and additional interviews would not have contributed further to the study.

The research also accessed information about the standards required by the Joint Commission International Accreditation (JCI) for hospitals; and official company newsletters.

D. Data Analysis

Interviews were recorded and thematic analysis conducted. The themes related to (inter alia), current/future stakeholder expectations, organisational strategy, organisational activities that generate knowledge, and the possible ways that activities that can meet future stakeholder expectations.

A hierarchical value map technique [40] was used to identify the nature of knowledge (eg tacit/explicit) embodied in the organisation's activities, the relative value of knowledge and the consequences and attributes of this knowledge. Key to this stage was to review the direction of knowledge sharing: for example uni-directional such as employees gaining tacit knowledge through learning from experience, or multi-directional such as explicit new knowledge entering the organisation captured via its IS.

E. Summary

The key research design decisions are summarised in Fig. 2.

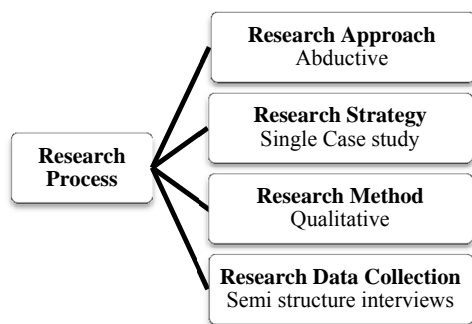


Fig. 2 Summary of Research Design

IV. FINDINGS

Interviewees identified three principle sources of knowledge within their organisation: knowledge from top management, knowledge from the JCI accreditation documents and lastly knowledge from Aramco invitations to seminars and conferences. The last two are forms of knowledge emanating from external sources. Aramco is a leading government-owned firm in Saudi Arabia and represents a key (potential/actual) client organisation.

The organisation's processes were based on the following international performance standards: the Central Board for Accreditation of Healthcare Institutions and the JCI Accreditation Standard for Hospitals. In looking in depth at those standards in the context of the literature, a key finding is that those standards only rely on management leadership as an element to generate knowledge for the organisation. Other standards do not require the company to capture individual knowledge, tacit knowledge, or the processes to be changed from the new knowledge created within the individuals.

Interviewees regarded employees as well qualified for their jobs and they viewed such employees as being in possession of a good level of knowledge from their previous experience. However, they were aware that the organisation's processes did not capture employees' knowledge or new knowledge gained through the organisation's activities. This can mean that in order to meet stakeholder expectations, the organisation should consider changing some of its processes to benefit from individual knowledge; not only to update their activities but also to redesign those activities to meet future stakeholder expectations in a timely manner.

The study found conflicts between stakeholder expectations and also found that the hospital attempted to balance those expectations but only prioritise two groups of stakeholders. These are top management, who are the shareholders, and the JCI. The analysis suggests that the organisation relies on complaints raised by its clients to enhance their operational processes. Other interviewees have stated that they are not required to feedback nor there is an activity to explicit their knowledge to the hospital. If the organisation relies on external rather than internal knowledge as to enhance processes, then it may be that current (internal) knowledge will not be useful in creating new processes that can meet stakeholder expectations. As it is complaints that are being

relied upon clients' feedback, this suggests that current processes may not meet client expectations.

V. SCALE OF KNOWLEDGE FRAMEWORK

Developed from insights from both the literature and findings of the empirical work, Fig. 3 presents the SoK Framework. The overall thrust of the Framework is the notion of a gap or lag between current activities/knowledge and changing stakeholder expectations.

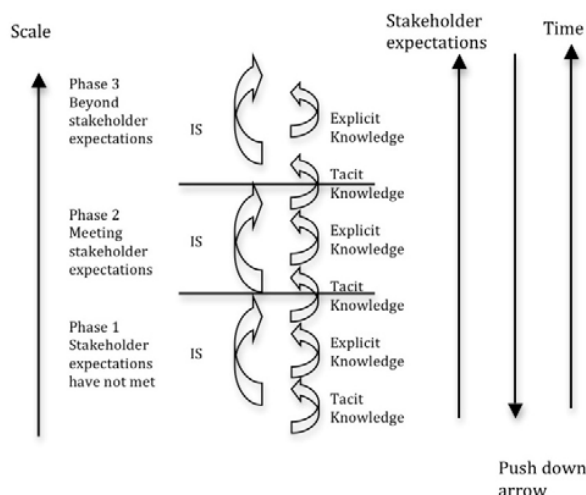


Fig. 3 The Scale of Knowledge (SoK) Framework

On the right hand side of the SoK Framework are three arrows that indicate factors which managers should consider. Firstly, *Stakeholders' Expectations*, which are expected to evolve (from the bottom of the diagram upwards) and typically become more onerous over *Time* (the third arrow; bottom of the diagram upwards). The second arrow represents the *Push Down force(s)*. These forces 'push' or 'bear down' on an organisation, stopping it from benefiting from their knowledge. These issues differ from one organisation to another and may include cultures, government regulations and so on. These arrows suggest that there are issues managers must discover, analyse and overcome to enable the effective management of knowledge in the organisation.

Impacted by factors indicated by the arrows, the central part of the SoK Framework identifies the well-known knowledge creation spiral between tacit and explicit knowledge [3], [17]. Knowledge, and its effective management are key influences on organisational activities and the extent to which these activities meet stakeholder expectations. In the contemporary organisational context, these activities and knowledge management are facilitated via the use of IS. Organisational knowledge/activities are influenced by stakeholder expectations, push down factors and time.

The final part of the SoK Framework (on the left-hand side) is the Scale of Knowledge. This provides an indication of the extent to which the organisation has been effective in matching its current activities/knowledge management to stakeholder expectations. The scale has three phases. The term

'phase' has been chosen rather than, for example, 'level' as the matching of activities/expectations is likely to be an ongoing process with an organisation transitioning from phase to phase, and back again over time. The three Phases are discussed below.

A. Phase 1: Stakeholder Expectations Have Not Been Met

In this phase there is clearly a negative gap between the organisation's activities and expectations of their stakeholders since expectations are not being met. This suggests that knowledge management may not be effective in creating and sharing knowledge to enable the organisation to configure its activities appropriately. Efforts to enhance knowledge management and organisational activities may lead the organisation to move to Phase 2.

B. Phase 2: Meeting Stakeholder Expectations

In Phase 2, typically new organisational knowledge would result in activities meeting stakeholder expectations. For example as a result of recruitment and selection processes, the organisation may harness the tacit knowledge of new employees and enhance employees' explicit knowledge through the adoption of appropriate IS. This may enable the organisation to meet stakeholders' expectations and achieve, for example, a competitive advantage.

Managers in many organisations may relate to moving from Phase 1 to Phase 2. However, as most organisations attempt to move from Phase 1 to Phase 2, stakeholder expectations may have already increased (see the arrows on the right hand side of the framework; discussed above). This means that the organisation remains at Phase 1 and does not move. Alternatively, an organisation currently at Phase 2 may move 'back' to Phase 1 as activities/knowledge no longer meet new expectations. This emphasises the importance of identifying and understanding the issues around stakeholder expectations, push down factors and time, in order to enable the organisation to evolve through the scale/phases as is appropriate.

C. Phase 3: Beyond Stakeholder Expectations

This phase is difficult to achieve as it implies that the organisation's activities are configured to meet expectations which are beyond what stakeholders expect. This is likely only to be possible for organisations with sophisticated knowledge management processes, which enable appropriate 'foresight' to analyse or intuit how stakeholder expectations will develop in the future.

The importance of the SoK framework is that it allows managers to gain insights into the extent (scale) to which their current activities and the knowledge that generates/facilitates these activities, meets initial/current or future stakeholder expectations. Moving from one phase to another phase is a long journey and leaders of organisations should appreciate the importance of time.

VI. RESEARCH LIMITATION

This paper was exploratory, and its empirical aspect was based on only one organisation in one country, with one set of organisational activities and stakeholders. Given the exploratory dimension of the research, there are limits to the extent to which the SoK Framework can be generalised. The paper focused on the perceptions of a sample of eight managers from the case study organisation regarding stakeholder expectations, organisational activities and the role of knowledge and its management. However, it is acknowledged this presents a narrow view of the organisation and, for example, data were not collected from all stakeholders of the organisation, such as patients. The exploration of data from the broad stakeholder group could give a better understanding of how to use organisational knowledge to implement activities that meet stakeholder expectations.

VII. CONCLUSION

It can be argued that an organisation's success relates to the extent to which its activities meet the expectations of its stakeholders. However, these expectations may evolve and become more demanding over time. This means that there is likely to be a 'gap' or 'lag' between the current configuration of an organisation's activities to meet stakeholder expectations as they evolve. Organisational strategies, particularly in relation to knowledge and its management, and the related use of IS are important in both configuring activities but also in attempting to reduce any activity/stakeholder expectation gaps.

This paper has explored the knowledge management literature in the context of how IS can be useful in organisational knowledge creation. It identified sources of organisational knowledge and how this knowledge can be used to meet stakeholder expectations. Based on this review, and a single case study of a hospital organisation in Saudi Arabia, a SoK Framework was developed which linked knowledge management and organisational activities to changing stakeholder expectations. The framework can be used by managers to scale their organisation's activities/knowledge to their stakeholders' expectations. Using this framework, managers can assess the health of their organisation's knowledge, and its management.

As the paper is exploratory, further research is required to develop and validate the SoK Framework across, for example other organisations, sectors and countries.

VIII. RECOMMENDATION FOR FUTURE STUDY

Saudi Arabia is a developing country. It relies in imports for most of their products and for low wages man power. This may mean that Saudi culture is affected by the knowledge of foreigner manpower; and Saudi culture may have created an ideology that knowledge can only be sourced by the external sources which leads to a belief that knowledge cannot be created from current organisation activity. If this assumption is true then organisation with this ideology in Saudi Arabia will be more likely to perceive of a gap between activities and

stakeholder expectations. A recommendation for future study is to investigate cultures in developing countries in terms of organisational knowledge creation.

REFERENCES

- [1] A. Braganza and R. Lambert, "Strategic integration: developing a Process-Governance Framework," *Knowl. Process Manag.*, vol. 7, no. 3, pp. 177–186, Jul. 2000.
- [2] S. Zyngier and F. Burstein, "Knowledge management governance: the road to continuous benefits realization," *J. Inf. Technol.*, vol. 27, no. 2, pp. 140–155, Nov. 2011.
- [3] I. Nonaka, *Organizational Knowledge Creation Theory: Evolutionary Paths and Future Advances*, vol. 27, no. 8, 2006.
- [4] N. Konno, I. Nonaka, and J. Ogilvy, "The Mind of the Scenario Thinker," *World Futures*, vol. 70, no. December, pp. 37–41, 2014.
- [5] J. Gunnlaugsdottir, "Seek and you will find, share and you will benefit: organising knowledge using groupware systems," *Int. J. Inf. Manage.*, vol. 23, no. 5, pp. 363–380, Oct. 2003.
- [6] H. Nonaka, Ikujiro; Takeuchi, "The wise leader," *Harv. Bus. Rev.*, vol. 89, no. 5, pp. 58–67, 2011.
- [7] D. De Long and L. Fahey, "Diagnosing cultural barriers to knowledge management," *Acad. Manag. Exec.*, vol. 14, no. 4, pp. 113–127, 2000.
- [8] A. Braganza, "Rethinking the data-information-knowledge hierarchy: towards a case-based model," *Int. J. Inf. Manage.*, vol. 24, no. 4, pp. 347–356, Aug. 2004.
- [9] C. Kerr, C. Farrukh, R. Phaal, and D. Probert, "Key principles for developing industrially relevant strategic technology management toolkits," *Technol. Forecast. Soc. Change*, vol. 80, no. 6, pp. 1050–1070, 2013.
- [10] R. E. Freeman, *Strategic management: A stakeholder approach*. Boston: Pitman, 1984.
- [11] I. Nonaka and G. von Krogh, "Perspective--Tacit Knowledge and Knowledge Conversion: Controversy and Advancement in Organizational Knowledge Creation Theory," *Organ. Sci.*, vol. 20, no. 3, pp. 635–652, Jan. 2009.
- [12] B. Kogut and U. Zander, "Knowledge of the Firm, Combinative Capabilities, and the Replication of Technology," *Organ. Sci.*, vol. 3, no. 3, pp. 383–397, Aug. 1992.
- [13] O. a. El Sawy, I. Eriksson, A. Raven, and S. Carlsson, "Understanding shared knowledge creation spaces around business processes: precursors to process innovation implementation," *Int. J. Technol. Manag.*, vol. 22, no. 1/2/3, p. 149, 2001.
- [14] M. Polanyi, *The Tacit Dimension (with a new foreword by Amartya Sen)*. London: The University of Chicago Press, 2009.
- [15] R. M. Grant, "Reflections on knowledge-based approaches to the organization of production," *J. Manag. Gov.*, vol. 17, pp. 541–558, 2013.
- [16] M. Shin, T. Holden, and R. a. Schmidt, "From knowledge theory to management practice: towards an integrated approach," *Inf. Process. Manag.*, vol. 37, pp. 335–355, 2001.
- [17] G. von Krogh, "Care in Knowledge Creation," *Calif. Manage. Rev.*, vol. 40, no. 3, pp. 133–153, Apr. 1998.
- [18] I. Nonaka and A. Y. Lewin, "A dynamic theory of organizational knowledge creation," *Organ. Sci.*, vol. 5, no. 1, pp. 14–37, 1994.
- [19] M. Alavi and D. E. Leidner, "Reveiw: Knowledge Mangement and Knowledge Management Systems: Conceptual Foundations and Research Issues," *MIS Q.*, vol. 25, no. 1, pp. 107–136, 2001.
- [20] J. W. Cortada and J. A. Woods, *Knowledge management yearbook yearbook: 1999-2000*. Oxford: Butterworth-Heinemann, 1999.
- [21] V. Grover and T. H. Davenport, "General Perspectives on Knowledge Management : Fostering a Research Agenda," pp. 5–21, 2001.
- [22] R. M. Grant and C. Baden-Fuller, "A Knowledge Accessing Theory of Strategic Alliances," *J. Manag. Stud.*, vol. 41, no. 1, pp. 61–84, 2004.
- [23] A. Braganza and K. C. Desouza, "Implementing section 404 of the Sarbanes Oxley Act: recommendations for information Systems organizations," *Commun. Assoc. Inf. Syst.*, vol. 18, pp. 464–487, 2006.
- [24] C. R. do Rosário, L. M. Kipper, R. Frozza, and B. B. Mariani, "Modeling of tacit knowledge in industry: Simulations on the variables of industrial processes," *Expert Syst. Appl.*, vol. 42, pp. 1613–1625, 2015.
- [25] I. Nonaka and R. Toyama, "The theory of the knowledge-creating firm: Subjectivity, objectivity and synthesis," *Ind. Corp. Chang.*, vol. 14, no. 3, pp. 419–436, 2005.
- [26] S. Brown and P. Duguid, "Knowledge and Organization: A Social Perspective," *Organization Sci.*, vol. 12, no. 2, pp. 198–213, 2001.
- [27] G. von Krogh, K. Ichijo, and I. Nonaka, *Enabling knowledge creation*. New York: Oxford University Press, 2000.
- [28] T. H. Davenport, J. G. Harris, D. W. De Long, and A. L. Jacobson, "Data to Knowledge to Results:," *Calif. Manage. Rev.*, vol. 43, no. 2, pp. 117–138, 2001.
- [29] A. H. Jebrin and A. J. Abu-Salma, "Conceptual knowledge approach to operational risk management (a case study)," *Int. J. Bus. Manag.*, vol. 7, no. 2, pp. 289–303, 2012.
- [30] S. Tengblad and C. Ohlsson, "The framing of corporate social responsibility and the globalization of national business systems: A longitudinal case study," *J. Bus. Ethics*, vol. 93, pp. 653–669, 2010.
- [31] A. A. Thompson and A. J. Strickland, *Crafting and executing strategy: text and cases*, 12th ed. McGraw-Hill, 2001.
- [32] J. B. Barney and W. S. Hesterly, *Strategic management and competitive advantage: concepts.* / Jay B. Barney, William S. Hesterly. Pearson/Prentice Hall, 2010.
- [33] G. Zellner, "Towards a framework for identifying business process redesign patterns," *Bus. Process Manag. J.*, vol. 19, pp. 600–623, 2013.
- [34] Y.-J. Yeh, S.-Q. Lai, and C.-T. Ho, "Knowledge management enablers: a case study," *Ind. Manag. Data Syst.*, vol. 106, no. 6, pp. 793–810, 2006.
- [35] G. Petrash, "Dow's journey to a knowledge value management culture," *Eur. Manag. J.*, vol. 14, no. 4, pp. 365–373, 1996.
- [36] A. Andersen, *The knowledge management assessment tool (KMAT)*. London: The American Productivity and Quality Center, 1996.
- [37] N. Blaikie, *Approaches To Social Enquiry*, 2nd ed. Cambridge: Polity Press, 2007.
- [38] R. K. Yin, *Case Study Research Design and Methods*, Fourth. London: SAGE Publications Inc., 2009.
- [39] K. M. Eisenhardt and M. E. Graebner, "Theory building from cases: Opportunities and challenges," *Acad. Manag. J.*, vol. 50, no. 1, pp. 25–32, 2007.
- [40] T. J. Reynolds and J. C. Olson, *Understanding consumer decision making: the means-end approach to marketing and advertising strategy*. Psychology Press, 2001.