

# Key Factors Affecting Knowledge Sharing in Developed and Developing Countries: a specific focus on Saudi Arabia

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**Abstract**—Knowledge is considered the most valuable asset in the modern digital economy, and its dissemination is recognised as the backbone of successful economies. The dissemination of knowledge is widely recognised as a fundamental practise in any successful organization, including higher education institutes. This practise enables institutions to generate and maintain knowledge. Organizations that foster a culture of knowledge sharing are able to gain a competitive advantage and drive innovation. These organisations contribute to the enhancement of the economy. The Kingdom of Saudi Arabia has implemented strategies to incorporate knowledge-sharing initiatives within its organisations. The primary objective of this paper is to identify the key factors that impact knowledge sharing in both developed and developing nations, with a particular focus on Saudi Arabia, and to present our future work on how to deploy cloud computing for knowledge sharing in Saudi Arabia’s HEIs.

**Index Terms**—knowledge sharing, developed/developing countries, Saudi Arabia.

## I. INTRODUCTION

IN TODAY'S interconnected world, data, information, and knowledge play an increasingly important role in the development and progression of civilizations. Information is the form of data that has been organized, interpreted, and given meaning. As opposed to mere facts, knowledge incorporates comprehension, insights, and the ability to utilise information effectively [7]. Knowledge is essential for empowering individuals, organizations, and nations to make prudent decisions, foster innovation, and advance society [1]–[3]. It serves as a catalyst for social progress, economic growth, and general prosperity.

Knowledge is seen as an advantage in both developed and developing countries [4], [5]. The developed countries have institutions and programmes in place to facilitate collaboration, information sharing, and knowledge [55]. It is important to highlight factors of knowledge sharing that can be adopted by organisations in developing nations like Saudi Arabia. Saudi Arabia is among the fastest-developing na-

tions. The core of its ambitious vision 2030 is to develop infrastructure to reduce dependence on an oil economy and move into a knowledge economy. In this regard, it is important for Saudi Arabia to nurture an environment and culture of knowledge sharing. Both public and private organisations encourage their employees to share their knowledge and expertise [59]. However, an understanding of knowledge sharing from the Saudi perspective is lacking. Thus, the research paper conducts a systematic literature review to identify the key factors associated with knowledge sharing in developing and developed countries.

## II. METHODOLOGY

To answer the above research aim, this paper adopted a systematic literature review to highlight the significant factors of knowledge sharing. First, we defined our main research question, which is:

What are the key factors associated with successful knowledge-based economies?

To answer these research questions, we studied the literature focused on four key areas:

- Data versus Information versus Knowledge
- Knowledge sharing
- Knowledge sharing in developed/developing countries
- Knowledge sharing in Saudi Arabia

This is discussed in more detail in the associated sections below. In each of these sections, we implement tables that summarise the key factors discovered in the literature review.

## III. DATA VS INFORMATION VS KNOWLEDGE

Knowledge is the most valuable asset of any industrial business or academic institution [6]. The information era was recognised by the growth of information technology and the digital era due to the development of technology, particularly the Internet [7]. Some scholars [8]–[10] have long maintained

the view that knowledge is power. Knowledge comes through interpreting information, and that information comes from the attribution of meaning to data [11], [12].

Despite numerous definitions, it seems that there is still a lack of clarity around what data, information, and knowledge are and the way they relate to one another [12], [13]. Based on the Critical Delphi project [12], which used a qualitative research approach to facilitate dialogues among 57 experts from 16 different nations. They came to the conclusion that knowledge, information, and data all have a certain order. Data can only be used to generate information, and knowledge can only be used to create information [11], [12]. During their studies, they rely on the definitions of data, information, and knowledge rather than other notions such as correctness, adequacy, and definition coherence. Based on [12], Table I and Appendix A show some of the key definitions of data, information, and knowledge.

TABLE I.  
KEY DEFINITION OF DATA, INFORMATION AND KNOWLEDGE

<b>Data</b>	raw material of information, facts, symbols, and basic individual items, numeric, unprocessed, eligible to be processed to produce knowledge, without context and interpretation.
<b>Information</b>	has meaning, is able to be analysed and interpreted, has purpose, has been communicated, has been categorized, and has the ability to create knowledge.
<b>Knowledge</b>	Accumulated information, tempered by experience, meaningful, information with more context, make a difference in an enterprises, emerges from analysis.

The systematic literature study helps to conclude that data are the basic forms or fundamental units of numbers, characters, symbols, and signal readings, as well as other information such as audio, video, and text, that have been acquired by observation but are meaningless on their own. While information is described as facts, implication meaning, input, and other sorts of meaningful representations that, when encountered or provided to a human person, are used to increase his or her understanding of a subject or associated concerns, aid in decision-making, or solve problems. On the other hand, knowledge [14] is the capacity to act (know-how), recognise (know-what), and comprehend (know-why), and it is anything that exists or is stored in the mind or brain in order to better our lives and add value.

#### IV. KNOWLEDGE SHARING

According to Peter Drucker [15], knowledge rather than money, capital, or even technology forms the basis of the twenty-first century corporation. The knowledge has to be shared in order to produce value [15]–[17]. The definition of "knowledge sharing" has been attempted several times [16], [18], and [19], but depending on the context and point of view, it is still widely discussed among academics and practitioners [19]. An analysis of many knowledge sharing definitions according to [16], [18], and [19] shows a commonality in their wording that it is an activity that includes the interchange of information and knowledge across people, businesses, and communities. There are two basic types of knowledge sharing: explicit and tacit [20], [21]. According to [20], explicit knowledge could be expressed verbally, written down, represented numerically, or represented visually. Contrarily, tacit knowledge is defined as "information that cannot be readily expressed in words and is not readily comprehensible."

Some scholars [1], [16], and [17] found that sharing information inside businesses had several advantages. It may enhance decision-making, reduce redundancies, boost innovation, and make operations more efficient. Additionally, it enables the exchange of best practices, which may help firms retain their competitiveness by upholding the highest levels of quality. Additionally, information sharing among staff members in a company may foster a sense of teamwork, which can boost morale and increase job satisfaction. In general, information sharing is a critical element for the success of organizations.

#### V. KNOWLEDGE SHARING IN DEVELOPED/DEVELOPING COUNTRIES

Knowledge sharing is becoming highly significant in developed countries as organisations attempt to remain competitive and encourage innovation [4], [5]. In developed countries, knowledge can be shared through various techniques, including conferences, webinars, formal and informal networks, and other digital platform technologies [7]. whereas it is well known that businesses situated in some developing countries lack managerial acumen skills, technical tools, and other financial resources [22], [23].

Knowledge sharing in developed or developing countries may be affected by various elements either positively or negatively [16], [23], [24]. Many factors contributing to knowledge sharing behaviour have been recognised and clarified by various researchers, for example, top management support [25], [26], individual willingness [27], reward systems and motivation [28], and information technology adoption [29], including emails, websites, and online discussion forums [30]. Companies in the US use collaboration technologies like Slack and Zoom to encourage knowledge exchange among their staff members.

Professionals can communicate with one another and discuss best practises through professional networks like LinkedIn. Universities and other educational institutions frequently organise seminars and workshops to exchange information with their faculty and students.

Conversely, there is hardly much knowledge exchange in poor nations [31]. A number of reasons were reported, such as inadequate infrastructure, restricted access to technology [22], [23], and a dearth of institutions for education and research. As a result, there is frequently a restriction on the flow of knowledge between people and organizations. The capacity of people and organisations to communicate knowledge is also constrained by a lack of technology and resources. For instance, it can be challenging for people to exchange knowledge and work together when there is little access to the internet and other kinds of communication in some rural regions [31]. Studying the literature has helped to provide Table II, which lists the most common factors of knowledge sharing in developed and developing countries.

TABLE II.

COMMON FACTORS IN DEVELOPED/DEVELOPING COUNTRIES

Factor	Country	Author
Trust, security and privacy concerns	USA, China, Taiwan, Sweden,	[32], [33]
Openness to change	Saudi Arabia, Brazil	[34], [35]
Individual's willingness	USA, Dutch, Europe, Asia, Australia	[32], [36], [37]
Information Technology & social media	China, Canada & Australia, Iran, Taiwan, Hong Kong	[38]–[43]
Resource constraints	Australia, Sub-Saharan Africa	[44]–[46]
cultural norms, Organisational culture	Finland, Saudi Arabia	[34], [47]
Top management	Italy	[25], [48]
organizational commitment	China	[49]–[51]
Incentives and reward system	Finland, Taiwan, Malaysia	[47], [52], [53]

Numerous actions are being taken to encourage information exchange in both developed and developing countries. A programme called "knowledge sharing" has been established by the National Science Foundation [54] in the US to support research initiatives that foster information exchange between US scientists and their international colleagues. The initiative offers funding for global partnerships, workshops, and conferences that advance

international scientific knowledge exchange. The NSF has also provided funding for research projects that examine how technology might be used to improve knowledge exchange in developed nations. For instance, the NSF provided funding for a project that created a platform for scientists to work together on research initiatives and successfully communicate their findings to other scientists.

A multinational network of people and organisations known as the Knowledge Sharing Alliance (KSA) has gathered to exchange resources and best practises in order to promote knowledge-based economies. For the purpose of fostering a more dynamic and competitive global economy, KSA encourages its members to share and exchange knowledge, concepts, and experiences. As an illustration, KSA members can work together to create novel solutions to problems affecting the knowledge economy between nations with advanced technological infrastructure and those without it. KSA also gives users and governments access to a platform where they can get current data and resources on subjects relating to knowledge sharing, including water security, policy frameworks for investment, urban developments, and others [55].

## VI. KNOWLEDGE SHARING IN SAUDI ARABIA

Saudi Arabia has the largest economy in the Middle East and the Arab world and is among the top twenty economies in the world. It is dominated by the oil industry, which generates around 87% of budgetary income, 90% of export revenue, and 42% of GDP [56]. The greatest petroleum exporter in the world and a superpower in the energy sector is the Kingdom of Saudi Arabia [57], [58].

To expand the nation's ability to produce goods and conduct business, the government has built a number of economic and industrial cities [59]. Additionally, it has created a number of free trade zones that are intended to promote international investment. Saudi Arabia is a popular location for international direct investment, and the government has worked hard to draw in outside capital.

Knowledge sharing in Saudi Arabia is becoming increasingly important as the nation strives to become a global leader in various industries, including technology and energy. To facilitate knowledge sharing, the government has implemented several initiatives to promote collaboration, such as creating a legal framework to protect intellectual property rights and encouraging the formation of research and development centers. Additionally, universities and educational institutions are trying to develop innovative methods to facilitate the exchange [60].

On June 30, 2009, the Saudi Corporation for Electronic Information Exchange [61] was created with the goal of investing in communication and information technology

projects as well as knowledge-based businesses. The company's business field is to develop apps and e-transaction solutions for a new concept of electronic data interchange and transmission between the Customs Authority and other pertinent private and public entities in the exports and imports industry that have never been covered. Tabadul has created the Fasah platform, which simplifies import and export processes and provides a range of services that promote global trade by connecting with the appropriate authorities, tracking shipments, scheduling appointments, and offering online payment options.

Several variables, including the availability of technology [62], [63], cultural values [17], [58], the desire of individuals to share knowledge [58], and the availability of trustworthy and accurate information [64], [65], can either promote or inhibit knowledge sharing in Saudi Arabia. Many studies about factors that enable or hinder knowledge sharing in Saudi Arabia from different sectors have been reviewed; see Table III.

TABLE III.

COMMON FACTORS THAT AFFECT KNOWLEDGE SHARING IN SAUDI ARABIA

Factor	Sectors	Author
Demographics	Private companies, of varied size	[58]
Openness in communication	Education, Saudi Arabian organisations	[17], [65]
Interpersonal trust, trust, privacy	Educationm, Health	[64], [65]
Perceived usefulness and perceived ease of use	Education, Health Information	[64], [65]
Motivation and reward system	Education, Saudi Arabia Organization, eLearning Virtual Communities, Saudi Telecom STC	[17], [34], [63], [65]
Management support	Telecommunications	[17]
Nature of knowledge	Universities	[60]
Information and communication technology	Industrial and commercial sectors	[62], [63]

## VII. CONCLUSIONS

This research concludes and highlights that knowledge is an important asset for developing the economies of

developing nations like Saudi Arabia. The paper provides clear definitions of important terms: data, information, knowledge, and knowledge sharing (see Table I). The paper has carried out a systematic investigation of the literature to highlight the factors that impact knowledge sharing in developing and developed nations. Table II provides a list of these knowledge-sharing factors. The paper has also contributed a list of factors that are considered significant to the sharing of knowledge in Saudi Arabia; see Table III.

Overall, Sections III, IV, V, and VI articulated the differences and similarities between existing literature on knowledge sharing in developed and developing economies. Practitioners of knowledge management can use the factors outlined in Tables I, II, and III to assess their knowledge sharing plans. In our case, we plan to build a new knowledge-sharing cloud-based platform.

While this research paper answers our basic research question, "What are the key factors associated with successful knowledge-based economies?" Tables II and III contrast factors within Saudi Arabia as a developing nation and other developed and developing economies. It is important to note that the research paper has limitations. The factors highlighted have strong roots in the literature, which needs to be validated by building a new framework based on Knowledge Sharing Software-Based Cloud (KSSbC); see future work.

## VIII. FUTURE WORK

According to [20], [66], knowledge is currently considered to be one of an organization's key assets, alongside labor, land, and money, since it gives organisations a competitive advantage. Organizations have recognised the value of information and the benefits of managing it well, including enhancing performance, boosting productivity, and increasing profitability [1]–[3]. However, Arab countries, especially Saudi Arabia, are failing to share their knowledge. Furthermore, some scholars believe that information exchange inside Saudi Arabia's Higher Education Institute is required [67].

Due to the characteristics of cloud computing, numerous universities expressed interest in integrating cloud computing into their educational systems [68]. In order for HEIs to adopt cloud services, a clear cloud strategy that supports CC capabilities is necessary. In order to implement the cloud services plan, a new framework must be developed that meets the needs of key stakeholders, including academics, students, and HEI board directors. To have a successful cloud strategy, the key stakeholder should be involved in defining the HEI's cloud strategy, which tackles its opportunities, problems, and concerns specific to HEIs, as well as the need for the cloud strategy to be in line with the HEI's plan [69].

The research aims to enhance knowledge sharing practises among beneficiaries in Saudi universities by addressing the gap between knowledge sharing contexts and cloud computing. Therefore, we are intending to design a prototype platform named Knowledge Sharing Software-based Cloud (KSSbC) using software engineering methodologies. Based on that, a new framework will be built, tested, and validated, with key factors affecting it either positively or negatively.

APPENDIX

APPENDIX A.

DATA, INFORMATION, AND KNOWLEDGE DEFINITIONS.

Author	Definition
[70]	<p><b>Data:</b> "Data are the basic individual items of numeric or other information, garnered through observation; but in themselves, without context, they are devoid of information."</p> <p><b>Information:</b> "Information is that which is conveyed, and possibly amenable to analysis and interpretation, through data and the context in which the data are assembled."</p> <p><b>Knowledge:</b> "Knowledge is the general understanding and awareness garnered from accumulated information, tempered by experience, enabling new contexts to be envisaged."</p>
[71]	<p><b>Data:</b> "Data are a string of symbols."</p> <p><b>Information:</b> "Information is data that is communicated, has meaning, has an effect, has a goal."</p> <p><b>Knowledge:</b> "Knowledge is a personal/cognitive framework that makes it possible for humans to use information."</p>
[72]	<p><b>Data:</b> "Data are the raw observations about the world collected by scientists and others, with a minimum of contextual interpretation."</p> <p><b>Information:</b> "Information is the aggregation of data to make coherent observations about the world."</p> <p><b>Knowledge:</b> "Knowledge is the rules and organizing principles gleaned from data to aggregate it into information."</p>
[73]	<p><b>Data:</b> "Data are raw material of information, typically numeric."</p> <p><b>Information:</b> "Information is data which is collected together with commentary, context and analysis so as to be meaningful to others."</p> <p><b>Knowledge:</b> "Knowledge is a combination of information and a person's experience, intuition and expertise."</p>
[74]	<p><b>Data:</b> "Data are raw evidence, unprocessed, eligible to be processed to produce knowledge."</p> <p><b>Information:</b> "Information is the process of becoming informed; it is dependent on knowledge, which is processed data. Knowledge perceived, becomes information."</p> <p><b>Knowledge:</b> "Knowledge is what is known, more than data, but not yet information. Recorded knowledge may be accessed in formal ways. Unrecorded knowledge is accessible in only chaotic ways."</p>
[75]	<p><b>Data:</b> "Data are representations of facts and raw material of information."</p> <p><b>Information:</b> "Information is data organized to produce meaning."</p> <p><b>Knowledge:</b> "Knowledge is meaningful content assimilated for use. The three entities can be viewed as hierarchical in terms of complexity, data being the simplest and knowledge, the most complex of the three. Knowledge is the product of a synthesis in our mind that can be</p>

	<p>conveyed by information, as one of many forms of its externalization and socialization."</p>
[76]	<p><b>Data:</b> "Data are facts and statistics that can be quantified, measured, counted, and stored."</p> <p><b>Information:</b> "Information is data that has been categorized, counted, and thus given meaning, relevance, or purpose."</p> <p><b>Knowledge:</b> "Knowledge is information that has been given meaning and taken to a higher level. Knowledge emerges from analysis, reflection upon, and synthesis of information. It is used to make a difference in an enterprise, learn a lesson, or solve a problem."</p>
[77]	<p><b>Data:</b> "Data are atomic facts, basic elements of "truth," without interpretation or greater context. It is related to things we sense."</p> <p><b>Information:</b> "Information is a set of facts with processing capability added, such as context, relationships to other facts about the same or related objects, implying an increased usefulness. Information provides meaning to data."</p> <p><b>Knowledge:</b> "Knowledge is information with more context and understanding, perhaps with the addition of rules to extend definitions and allow inference."</p>
[78]	<p><b>Data:</b> "Data is a symbol set that is quantified and/or qualified."</p> <p><b>Information:</b> "Information is a set of significant signs that has the ability to create knowledge . . . The essence of the information phenomenon has been characterized as the occurrence of a communication process that takes place between the sender and the recipient of the message. Thus, the various concepts of information tend to concentrate on the origin and the end point of this communication process."</p> <p><b>Knowledge:</b> "Knowledge is information that has been appropriate by the user. When information is adequately assimilated, it produces knowledge, modifies the individual's mental store of information and benefits his development and that of the society in which he lives. Thus, as the mediating agent in the production of knowledge, the information, qualifies itself, in form and substance, as significant structures able to generate knowledge for the individual and his group."</p>

REFERENCES

- [1] N. Bontis, "Assessing knowledge assets: a review of the models used to measure intellectual capital," *International journal of management reviews*, vol. 3, no. 1, pp. 41–60, 2001. <https://doi.org/10.1111/1468-2370.00053>
- [2] A. Ismail Al-Alawi, N. Yousif Al-Marzooqi, and Y. Fraidoon Mohammed, "Organizational culture and knowledge sharing: critical success factors," *Journal of knowledge management*, vol. 11, no. 2, pp. 22–42, 2007. <https://doi.org/10.1108/13673270710738898>
- [3] H. Hussinki, A. Kianto, M. Vanhala, and P. Ritala, "Assessing the universality of knowledge management practices," *Journal of Knowledge Management*, vol. 21, no. 6, pp. 1596–1621, 2017. <https://doi.org/10.1108/JKM-09-2016-0394>
- [4] M. Mohsin and J. Syed, "Knowledge management in developing economies: A critical review," *The Palgrave Handbook of Knowledge Management*, pp. 601–620, 2018.

- [5] A. Y. Noaman and F. Fouad, "Knowledge sharing in universal societies of some develop nations," *Int J Acad Res*, vol. 6, no. 3, pp. 205–212, 2014.
- [6] H. Zhuge, "A knowledge flow model for peer-to-peer team knowledge sharing and management," *Expert Syst Appl*, vol. 23, no. 1, pp. 23–30, 2002. [https://doi.org/10.1016/S0957-4174\(02\)00024-6](https://doi.org/10.1016/S0957-4174(02)00024-6)
- [7] Z. Gaál, L. Szabó, N. Obermayer-Kovács, and A. Csepregi, "Exploring the role of social media in knowledge sharing," *Electronic Journal of Knowledge Management*, vol. 13, no. 3, pp. pp185-197, 2015.
- [8] M.-Y. Cheng, J. S.-Y. Ho, and P. M. Lau, "Knowledge sharing in academic institutions: A study of Multimedia University Malaysia.," *Electronic Journal of knowledge management*, vol. 7, no. 3, 2009.
- [9] M. J. Iqbal, A. Rasli, L. H. Heng, M. B. B. Ali, I. Hassan, and A. Jolae, "Academic staff knowledge sharing intentions and university innovation capability," *African Journal of Business Management*, vol. 5, no. 27, p. 11051, 2011. <https://doi.org/10.5897/AJBM11.576>
- [10] K. K. Jain, M. S. Sandhu, and G. K. Sidhu, "Knowledge sharing among academic staff: A case study of business schools in Klang Valley, Malaysia." UCSI Centre for Research Excellence, 2007.
- [11] G. Jifa, "Data, information, knowledge, wisdom and meta-synthesis of wisdom-comment on wisdom global and wisdom cities," *Procedia Comput Sci*, vol. 17, pp. 713–719, 2013. <https://doi.org/10.1016/j.procs.2013.05.092>
- [12] C. Zins, "Conceptual approaches for defining data, information, and knowledge," *Journal of the American society for information science and technology*, vol. 58, no. 4, pp. 479–493, 2007. <https://doi.org/10.1002/asi.20508>
- [13] "Def." <http://vlibrary.info/InfoLexicon.html> (accessed Mar. 04, 2023).
- [14] R. Garud, "On the distinction between know-how, know-why, and know-what," *Advances in Strategic Management*, vol. 14, pp. 81–101, Jan. 1997.
- [15] C. M. Jacobson, "Knowledge sharing between individuals," in *Encyclopedia of Knowledge Management, Second Edition*, IGI Global, 2011, pp. 924–934.
- [16] M. Asrar-ul-Haq and S. Anwar, "A systematic review of knowledge management and knowledge sharing: Trends, issues, and challenges," *Cogent Business & Management*, vol. 3, no. 1, p. 1127744, 2016. <https://doi.org/10.1080/23311975.2015.1127744>
- [17] R. K. Yeo and J. Gold, "Knowledge sharing attitude and behaviour in Saudi Arabian organisations: why trust matters," *International Journal of Human Resources Development and Management*, vol. 14, no. 1–3, pp. 97–118, 2014.
- [18] M. Ipe, "Knowledge sharing in organizations: A conceptual framework," *Human resource development review*, vol. 2, no. 4, pp. 337–359, 2003. <https://doi.org/10.1177/1534484303257985>
- [19] C. Nielsen and K. Cappelen, "Exploring the mechanisms of knowledge transfer in University-Industry collaborations: A study of companies, students and researchers," *Higher Education Quarterly*, vol. 68, no. 4, pp. 375–393, 2014. <https://doi.org/10.1111/hequ.12035>
- [20] M. Alavi and D. E. Leidner, "Knowledge management and knowledge management systems: Conceptual foundations and research issues," *MIS quarterly*, pp. 107–136, 2001. <https://doi.org/10.2307/3250961>
- [21] A. Fengjie, Q. Fei, and C. Xin, "Knowledge sharing and web-based knowledge-sharing platform," in *IEEE International Conference on E-commerce Technology for Dynamic E-business, IEEE, 2004*, pp. 278–281. <https://doi.org/10.1109/CEC-EAST.2004.43>
- [22] J. Kuada, "Collaboration between developed and developing country-based firms: Danish-Ghanaian experience," *Journal of Business & Industrial Marketing*, vol. 17, no. 6, pp. 538–557, 2002. <https://doi.org/10.1108/08858620210442866>
- [23] M. I. Manda and J. Backhouse, "An analysis of the barriers to e-government integration, interoperability and information sharing in developing countries: A systematic review of literature," in *Proceedings of the African Conference in Information Systems and Technology, Accra, Ghana, 2016*, pp. 5–6.
- [24] H. Alotaibi, R. Crowder, and G. Wills, "Investigating factors for E-knowledge sharing amongst academic staff," 2014.
- [25] V. Cavaliere and S. Lombardi, "Exploring different cultural configurations: how do they affect subsidiaries' knowledge sharing behaviors?," *Journal of Knowledge Management*, vol. 19, no. 2, pp. 141–163, 2015. <https://doi.org/10.1108/JKM-04-2014-0167>
- [26] R. Farooq, "A conceptual model of knowledge sharing," *International Journal of Innovation Science*, 2018. <https://doi.org/10.1108/IJIS-09-2017-0087>
- [27] B. Van Den Hooff, A. P. Schouten, and S. Simonovski, "What one feels and what one knows: the influence of emotions on attitudes and intentions towards knowledge sharing," *Journal of knowledge management*, vol. 16, no. 1, pp. 148–158, 2012. <https://doi.org/10.1108/13673271211198990>
- [28] G. Tangaraja, R. Mohd Rasdi, M. Ismail, and B. Abu Samah, "Fostering knowledge sharing behaviour among public sector managers: a proposed model for the Malaysian public service," *Journal of knowledge management*, vol. 19, no. 1, pp. 121–140, 2015. <https://doi.org/10.1108/JKM-11-2014-0449>
- [29] H. J. Mitchell, "Technology and knowledge management: Is technology just an enabler or does it also add value?," in *Knowledge management: Current issues and challenges*, IGI Global, 2003, pp. 66–78.

- [30] S. Song, "An internet knowledge sharing system," *Journal of Computer Information Systems*, vol. 42, no. 3, pp. 25–30, 2002. <https://doi.org/10.1080/08874417.2002.11647499>
- [31] I. Qureshi, C. Sutter, and B. Bhatt, "The transformative power of knowledge sharing in settings of poverty and social inequality," *Organization Studies*, vol. 39, no. 11, pp. 1575–1599, 2018. <https://doi.org/10.1177/0170840617727777>
- [32] J. S. Holste and D. Fields, "Trust and tacit knowledge sharing and use," *Journal of knowledge management*, 2010. <https://doi.org/10.1108/13673271011015615>
- [33] K. Niu, "Organizational trust and knowledge obtaining in industrial clusters," *Journal of Knowledge Management*, vol. 14, no. 1, pp. 141–155, 2010. <https://doi.org/10.1108/13673271011015624>
- [34] R. M. Al-Adaileh and M. S. Al-Atawi, "Organizational culture impact on knowledge exchange: Saudi Telecom context," *Journal of knowledge Management*, vol. 15, no. 2, pp. 212–230, 2011. <https://doi.org/10.1108/13673271111119664>
- [35] D. Nakano, J. Muniz Jr, and E. Dias Batista Jr, "Engaging environments: tacit knowledge sharing on the shop floor," *Journal of Knowledge Management*, vol. 17, no. 2, pp. 290–306, 2013. <https://doi.org/10.1108/13673271311315222>
- [36] K. Blomkvist, "Knowledge management in MNCs: the importance of subsidiary transfer performance," *Journal of Knowledge Management*, vol. 16, no. 6, pp. 904–918, 2012. <https://doi.org/10.1108/13673271211276182>
- [37] D. McNichols, "Optimal knowledge transfer methods: a Generation X perspective," *Journal of knowledge management*, 2010. <https://doi.org/10.1108/13673271011015543>
- [38] W. Lam, "Barriers to e-government integration," *Journal of Enterprise Information Management*, 2005. <https://doi.org/10.1108/17410390510623981>
- [39] S. Panahi, J. Watson, and H. Partridge, "Towards tacit knowledge sharing over social web tools," *Journal of knowledge management*, 2013. <https://doi.org/10.1108/JKM-11-2012-0364>
- [40] M. Ranjbarfard, M. Aghdasi, P. López-Sáez, and J. E. N. López, "The barriers of knowledge generation, storage, distribution and application that impede learning in gas and petroleum companies," *Journal of Knowledge Management*, 2014. <https://doi.org/10.1108/JKM-08-2013-0324>
- [41] D. Rathi, L. M. Given, and E. Forcier, "Interorganisational partnerships and knowledge sharing: the perspective of non-profit organisations (NPOs)," *Journal of Knowledge Management*, vol. 18, no. 5, pp. 867–885, 2014. <https://doi.org/10.1108/JKM-06-2014-0256>
- [42] T.-M. Yang and Y.-J. Wu, "Exploring the determinants of cross-boundary information sharing in the public sector: An e-Government case study in Taiwan," *J Inf Sci*, vol. 40, no. 5, pp. 649–668, 2014. <https://doi.org/10.1177/0165551514538742>
- [43] R. Zhao and B. Chen, "Study on enterprise knowledge sharing in ESN perspective: a Chinese case study," *Journal of Knowledge Management*, vol. 17, no. 3, pp. 416–434, 2013. <https://doi.org/10.1108/JKM-12-2012-0375>
- [44] V. Gururajan and D. Fink, "Attitudes towards knowledge transfer in an environment to perform," *Journal of knowledge Management*, vol. 14, no. 6, pp. 828–840, 2010. <https://doi.org/10.1108/13673271011084880>
- [45] S. M. Mutula and J. Mostert, "Challenges and opportunities of e-government in South Africa," *The electronic library*, 2010. <https://doi.org/10.1108/02640471011023360>
- [46] A. M. A. Qureshi and N. Evans, "Deterrents to knowledge-sharing in the pharmaceutical industry: a case study," *Journal of Knowledge Management*, 2015. <https://doi.org/10.1108/JKM-09-2014-0391>
- [47] M. Ajmal, P. Helo, and T. Kekäle, "Critical factors for knowledge management in project business," *Journal of knowledge management*, vol. 14, no. 1, pp. 156–168, 2010. <https://doi.org/10.1108/13673271011015633>
- [48] A. Titi Amayah, "Determinants of knowledge sharing in a public sector organization," *Journal of knowledge management*, vol. 17, no. 3, pp. 454–471, 2013. <https://doi.org/10.1108/JKM-11-2012-0369>
- [49] J. P. Meyer and L. Herscovitch, "Commitment in the workplace: Toward a general model," *Human resource management review*, vol. 11, no. 3, pp. 299–326, 2001. [https://doi.org/10.1016/S1053-4822\(00\)00053-X](https://doi.org/10.1016/S1053-4822(00)00053-X)
- [50] A. Newman and A. Z. Sheikh, "Organizational commitment in Chinese small-and medium-sized enterprises: the role of extrinsic, intrinsic and social rewards," *The International Journal of Human Resource Management*, vol. 23, no. 2, pp. 349–367, 2012. <https://doi.org/10.1080/09585192.2011.561229>
- [51] S. SamGnanakkan, "Mediating role of organizational commitment on HR practices and turnover intention among ICT professionals," *Journal of management research*, vol. 10, no. 1, pp. 39–61, 2010.
- [52] M.-Y. Cheng, J. S.-Y. Ho, and P. M. Lau, "Knowledge sharing in academic institutions: A study of Multimedia University Malaysia.," *Electronic Journal of knowledge management*, vol. 7, no. 3, 2009.
- [53] M.-C. Huang, Y.-P. Chiu, and T.-C. Lu, "Knowledge governance mechanisms and repatriate's knowledge sharing: the mediating roles of motivation and opportunity," *Journal of knowledge management*, vol. 17, no. 5, pp. 677–694, 2013. <https://doi.org/10.1108/JKM-01-2013-0048>
- [54] nsf.gov, "NSF - National Science Foundation," 2023. <https://www.nsf.gov/> (accessed Mar. 06, 2023).
- [55] M. & C. M. Kampmann, "Knowledge Sharing Alliance: Facilitating Dialogue for Universal Development," 2014, Accessed: Mar. 07, 2023.

- [Online]. Available: [www.oecd.org/knowledge-sharing-alliance](http://www.oecd.org/knowledge-sharing-alliance)
- [56] "Forbes," 2023, Accessed: Mar. 08, 2023. [Online]. Available: <https://www.forbes.com/places/saudi-arabia/?sh=a6fedf84e5c1>
- [57] N. Al Mudawi, "ACCE-GOV: a new theoretical framework for cloud computing adoption for e-government system in developing countries (Saudi Arabia perspective)," University of Sussex, 2021.
- [58] S. T. H. Dulayami and L. Robinson, "The individual and the collective: Factors affecting knowledge sharing in Saudi Arabian companies," *Journal of Documentation*, vol. 71, no. 1, pp. 198–209, 2015. <https://doi.org/10.1108/JD-09-2014-0121>
- [59] "Vision 2030," 2023, Accessed: Mar. 08, 2023. [Online]. Available: <https://www.vision2030.gov.sa/>
- [60] F. Ghabban, A. Selamat, and R. Ibrahim, "New model for encouraging academic staff in Saudi universities to use IT for knowledge sharing to improve scholarly publication performance," *Technol Soc*, vol. 55, pp. 92–99, 2018. <https://doi.org/10.1016/j.techsoc.2018.07.001>
- [61] "Tabadul," 2023, Accessed: Mar. 07, 2023. [Online]. Available: <https://www.elm.sa/en/about/Pages/Tabadul.aspx>
- [62] S. Q. A.-K. Al-Maliki, "Information and communication technology (ICT) investment in the Kingdom of Saudi Arabia: Assessing strengths and weaknesses," *Journal of Organizational Knowledge Management*, vol. 2013, p. 1, 2013. <https://doi.org/10.5171/2013.450838>
- [63] F. Yassin, J. Salim, and N. Sahari, "The influence of organizational factors on knowledge sharing using ICT among teachers," *Procedia technology*, vol. 11, pp. 272–280, 2013. <https://doi.org/10.1016/j.protcy.2013.12.191>
- [64] M. Al-Khalifa, S. Khatoun, A. Mahmood, and I. Fatima, "Factors influencing patients' attitudes to exchange electronic health information in Saudi Arabia: an exploratory study," *International Journal of Advanced Computer Science and Applications*, vol. 7, no. 8, 2016.
- [65] D. Chandran and A. M. Alammari, "Influence of culture on knowledge sharing attitude among academic staff in eLearning virtual communities in Saudi Arabia," *Information Systems Frontiers*, vol. 23, pp. 1563–1572, 2021. <https://doi.org/10.1007/s10796-020-10048-x>
- [66] R. Fullwood and J. Rowley, "An investigation of factors affecting knowledge sharing amongst UK academics," *Journal of Knowledge Management*, 2017. <https://doi.org/10.1108/JKM-07-2016-0274>
- [67] F. M. Alsaadi, "Knowledge Sharing Among Academics in Higher Education Institutions in Saudi Arabia," 2018.
- [68] A. N. Tashkandi and I. M. Al-Jabri, "Cloud computing adoption by higher education institutions in Saudi Arabia: an exploratory study," *Cluster Comput*, vol. 18, pp. 1527–1537, 2015. <https://doi.org/10.1007/s10586-015-0490-4>
- [69] A. Ali, "Cloud computing adoption at higher educational institutions in the KSA for Sustainable Development," *International Journal of Advanced Computer Science and Applications*, vol. 11, no. 3, 2020.
- [70] Quentin L. Burrell, "Isle of Man International Business School, Isle of Man. Definition 7 on p. 481 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-49," p. 7, 2023.
- [71] Raya Fidel, "University of Washington, Seattle, WA. Definition 17 on page 483 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.
- [72] William Hersh, "Oregon Health Science University, Portland, OR. Definition 24 on page 484 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493," 2023.
- [73] Charles Oppenheim, "Loughborough University, Leicestershire, UK. Definition 32 on page 485 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.
- [74] Richard Smiraglia, "Long Island University, Brookville, NY. Definition 38 on page 486 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493," 2023.
- [75] Anna da Soledade Vieira, "Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil. Definition 42 on page 486 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.
- [76] Donald Hawkins, "Information Today, Medford, NJ. Definition 21 on p. 483 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.
- [77] Donald Kraft, "Louisiana State University, Baton Rouge, LA. Definition 25 on p. 484 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.
- [78] Aldo de Albuquerque Barreto, "Brazilian Institute for Information in Science and Technology, Brazil. Definition 3 on p. 480 of Zins, C. (2007). *Conceptual Approaches for Defining Data, Information, and Knowledge*. JASIST, 58, 479-493.," 2023.