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A CUSTOM INTEGRATED KNOWLEDGE MANAGEMENT SYSTEM FRAMEWORK OVER THE CLOUD FOR ARBA MINCH UNIVERSITY STAFF

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Abstract

Effective knowledge management is crucial for universities like Arba Minch University (AMU) to maintain a competitive edge. However, the efficient management and dissemination of knowledge within university communities pose significant challenges. As one of Ethiopia's eight research universities, AMU must establish robust knowledge management (KM) conditions to facilitate staff knowledge-sharing practices, making existing knowledge accessible, and generating new knowledge. AMU lacks adequate mechanisms for staff to share knowledge and collaborate on various tasks virtually. In response to this, our research introduces a custom integrated KM system deployed over the cloud to enhance collaboration and knowledge sharing among AMU staff. Utilizing a design science approach and a mixed research methodology, we investigated collaboration and knowledge sharing among AMU staff. The analysis revealed that 81% of respondents were dissatisfied with the current environment regarding the accessibility of knowledge sharing, indicating that knowledge within the institution is not easily accessible at any time and from any location. Additionally, 73% of respondents acknowledged the importance of Knowledge Management Systems. Based on these findings and the needs of the staff, we developed a cloud-based integrative KM framework designed to capture, represent, and share knowledge among AMU staff. The study concludes that the implementation of the developed KM framework in the institution can significantly improve the accessibility, sharing, and preservation of knowledge among AMU staff, ultimately enhancing the university's competitiveness and knowledge-sharing capabilities.

Keywords: ***Cloud-based, Integrative Knowledge Management System, Knowledge Sharing, Collaboration, Explicit knowledge, Tacit knowledge***

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I. INTRODUCTION

Every higher education (HE) institution in Ethiopia has three major responsibilities, i.e., teaching, research, and community engagement. To carry out these responsibilities, higher education institutions (HEI) should organize teaching and learning activities, do scientific research, and support students and lecturers to implement the knowledge they obtained in the community. Furthermore, HEIs consist of people with different educational backgrounds, cultures, and experiences[1], and everyone has the knowledge to contribute to the organization. Those differences lead to different approaches in their contributions to real-world problem-solving. Individuals' knowledge is not sufficient to be applied to solving the organization's challenges and problems[2][3]. In today's competitive atmosphere, the development, and productivity of institutions are dependent on several factors such as knowledge-sharing capabilities for sustainable competitive advantages. This means that organizations must have the means to create, manage, and share knowledge to be competitive and profitable. Currently, the ability of institutions to innovate depends on the way they manage the knowledge used for the exchange of facts between people[4][5]. However, the implementation of KM is a prerequisite for understanding and developing the necessary infrastructural elements that support the creation and management of knowledge [6].

In our country, research universities play fundamental roles in promoting knowledge production by focusing on cultivating high-quality graduates with analytical, problem-solving, and interpersonal understanding skills, thereby contributing to Ethiopia's goal of building a knowledge-based society. The university's strategic focus on knowledge management can bring further progress and growth advantages of knowledge sharing. This is because research cooperation is the basis for the cultivation of existing knowledge and the production of new knowledge. To achieve this goal, one of the key steps the government has identified is implementing knowledge management to improve the performance of universities. This requires every researcher and faculty member to practice appropriate and effective knowledge management by successfully creating, acquiring, storing, and distributing knowledge in teaching and research activities [7][6].

Thus, developing a cloud-based integrative knowledge management framework for universities is an important step toward improving collaboration, knowledge sharing, and decision-making

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within the institutions. The framework enables stakeholders to capture, store, retrieve, share, and apply knowledge and information securely and efficiently, and it can help support the institution's research, teaching, and administrative missions. The academic institutions have different fields of knowledge and experience which must be shared among employees[8]. This shows that KS is necessary for the universities, especially for the professional development, reputation, and self-empowerment of faculty and staff. AMU is one of the eight research universities in Ethiopia, understanding and providing the essential environment for knowledge management. This is necessary to encourage researchers and faculty to trust each other, collaborate, and be motivated to share ideas and participate in discussions through different communication methods for sharing information and knowledge to generate new knowledge[7][9].

In the literature, different conditions have been proposed as prerequisites by many researchers allowing to enable the sharing of knowledge to support and strengthen cooperation between researchers in research universities. These are called knowledge management enablers and are divided into individuals (lack of trust, motivation, and lack of commitment), organizations (lack of guidance, lack of support, and participation in senior management), technology (lack of compatibility between various information technology systems) and communication structure (poor and limited communication of knowledge sharing) which are essential for knowledge sharing to happen[10][11]. Most of the staff conduct research at AMU and participate in many community services. However, based on the inaccurate view that “knowledge is power”, they tend to retain knowledge for personal academic achievements rather than share. This is because they believe that if knowledge is made public, it may endanger and threaten the status of researchers’ and teachers’ recognition and power[12]. In addition, due to the absence of knowledge management tools to support the exchange of knowledge between staff, all scholars cannot fully access and use the knowledge within the organization.

Therefore, to overcome the above problems, this research set out to develop an appropriate cloud-based integrative knowledge management method to virtually increase the research collaboration and knowledge sharing between AMU staff.

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II. LITERATURE REVIEW

Many academic members failed to realize that effective research collaboration among members would increase their effectiveness and contribute to the generation of institutional capabilities that are vital to the university's performance. The study [13] expressed the concern that faculty members lack the sharing of mutual visions in accomplishing their university's goals and objectives by somehow placing greater importance on their scholarly achievement.

As discussed in a study [2] the main goal of knowledge management is to store knowledge in a repository so that the knowledge can be used and/or updated later in the future. The researcher developed the knowledge management framework for Indonesian higher education institutions. As discussed, HEI's knowledge can be gathered from daily activities done in the organization like business processes and activities such as learning in classes, student mentoring, scientific research, information sharing, and management meetings. During these activities, knowledge is captured and then managed in a structured process called the KM cycle (capturing, structuring, storing, disseminating, and implementing). They also expressed different factors that are necessary to successfully run the explained knowledge management cycle. This model is good and relevant to this study; however, some components must be explored to make it suitable for any kind of knowledge-producing sector[2]. The potential of cloud-based technologies in enhancing knowledge management and sharing within organizations has been widely recognized in prior research studies. Cloud-based knowledge management (KM) frameworks can significantly improve the accessibility and availability of information for employees. By allowing users to access and share knowledge from any location with an internet connection, these cloud-based systems break down geographical barriers and enable collaboration across the globe [14]. In addition to improved accessibility, cloud-based KM systems offer enhanced scalability and flexibility. These platforms can easily scale up or down to accommodate changing organizational needs and user demands, providing the necessary infrastructure to manage increasing volumes of knowledge and users [15]. The flexibility of cloud-based platforms also enables the easy integration of new features and functionalities as required by the organization, ensuring the KM system evolves with the changing needs of the business. These platforms enable users to create, share, and discuss content, fostering a culture of knowledge exchange and peer-to-peer learning.

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The cloud-based nature of these platforms ensures that knowledge is centrally stored and accessible to all authorized users with a minimum latency which can further reduce carbon emissions. This promotes cross-functional collaboration and green knowledge management and sharing. The role of IT and cloud computing in supporting the overall knowledge management processes, including knowledge capture, storage, and distribution, has been widely recognized[16][17]. Cloud-based KM systems can automate and optimize various knowledge management tasks such as knowledge capture, indexing, and retrieval. This improves the efficiency and effectiveness of the overall KM lifecycle. The cloud infrastructure also ensures the secure storage and backup of organizational knowledge protecting it from local system failures or data loss.

Knowledge management is vital to HEIs because it brings crucial benefits to educational institution processes such as research, curriculum development, student and alumni services, administrative services, and strategic planning. It is necessary to point out the valuable knowledge, create a methodology for receiving and consolidating knowledge, perform the spread of knowledge among the students and staff, and generate new knowledge and innovation through knowledge sharing. In a study, the researchers present a framework that increases knowledge sharing and collaboration in higher education institutions. The developed framework has four main components: knowledge acquisitions, knowledge repository, knowledge sharing, and knowledge storage along with different sub-activities[3]. However, the researcher has failed to come up with a framework evaluation and testing to check whether it is improving collaboration within higher education institutions [18].

III. RESEARCH METHODOLOGY

This section explains the research methodology used for conducting the study in the selected domain. The study used design science research.

In this study, design science (DS) was selected to conduct this study. DS develops an artifact for IK capturing, representing, and sharing, and its performance can be determined through prototypical demonstration. As shown in Fig. 1 design science research methodology has six basic activities[19].

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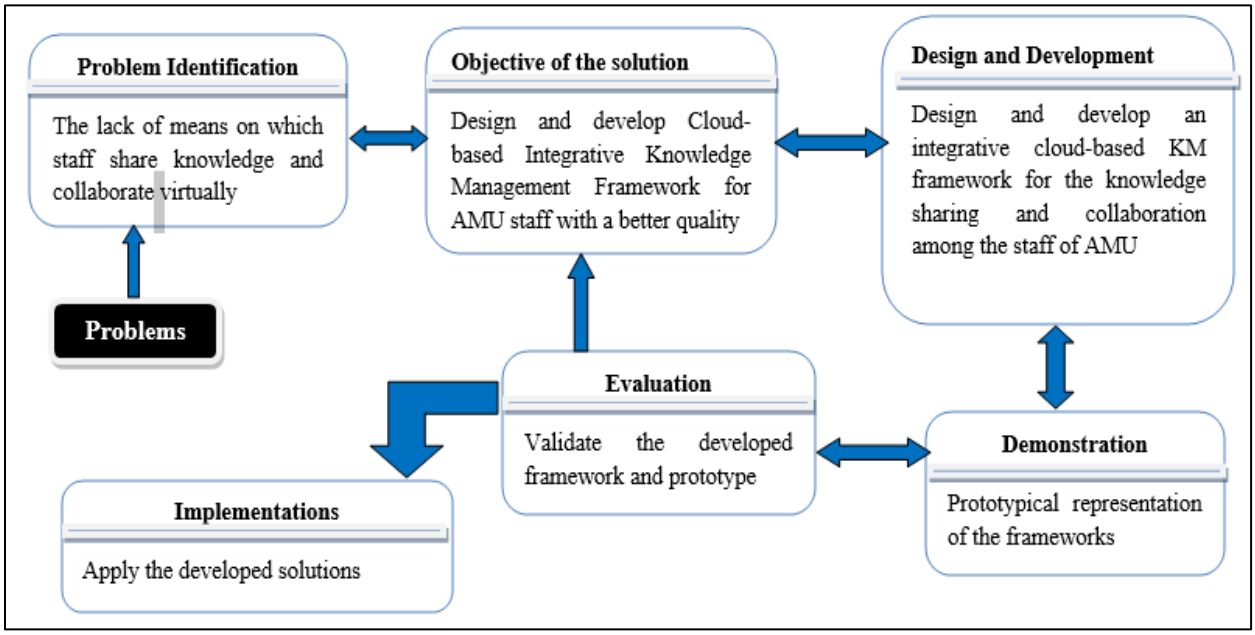

Fig. 1. DS model of knowledge management system (KMS in HEIs Activities)

A. Research Framework

In this research study, a baseline Information Systems Research Framework is used as presented in Fig. 2.

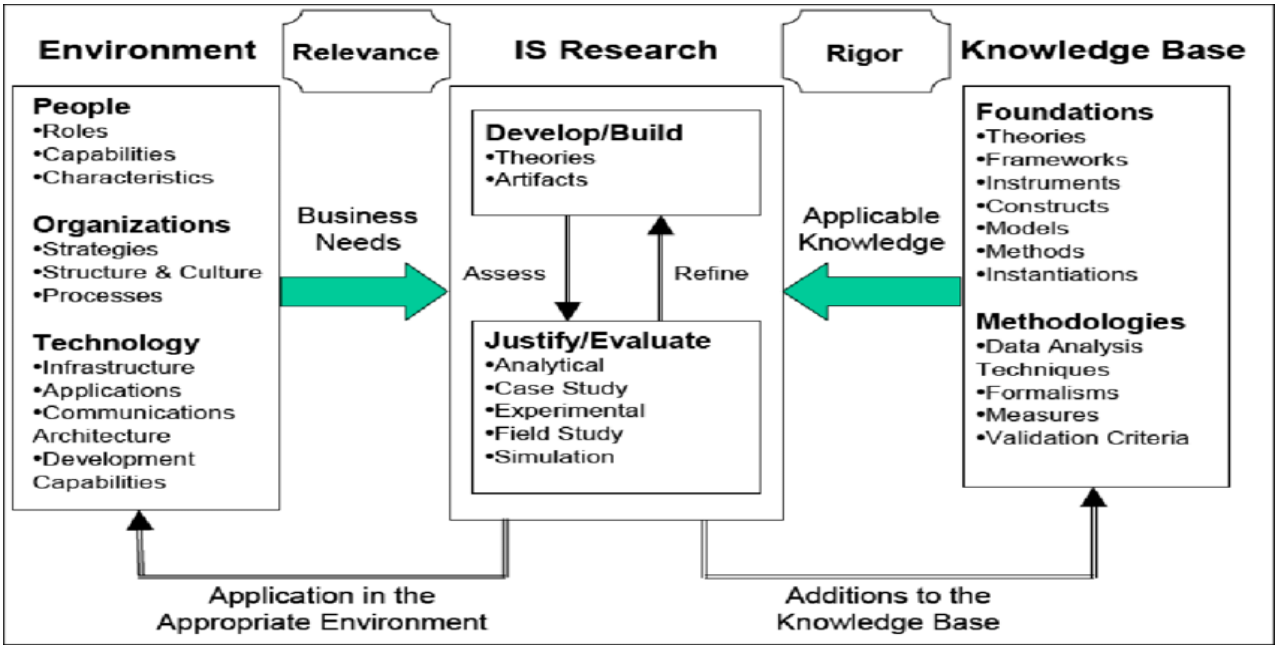

Fig. 2. Information systems research framework

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The Information Systems Research Framework is essential in the field of Knowledge Management (KM) because it provides a structured and comprehensive approach to understanding and addressing the complexities involved in managing and sharing knowledge within organizations. Information Systems Research Framework facilitates the integration of technological, human, and organizational aspects to ensure that KM systems are both innovative and practically relevant. By guiding the development, implementation, and evaluation of KM systems, the Information Systems Research Framework ensures that these systems are not only theoretically sound but also effective in real-world applications. This framework helps capture, represent, and disseminate knowledge efficiently, thereby enhancing collaboration and knowledge sharing among stakeholders. The importance of the Information Systems Research Framework in KM emphasizes the inability of continuous improvement and adaptation of KM systems to meet evolving organizational needs[20].

B. Research Approach

Fig. 3 presents the details of major data and knowledge-gathering approaches used in this study.

C. Sampling Design

In this study, the sampling techniques employed were purposive and stratified sampling methods. The purposive sample size was 342 individuals, consisting of AMU staff from five campuses: Main, Abaya, Nech-sar, Kulfo, and Chamo. The survey questionnaire was administered to 332 participants, and interviews were conducted with 10 participants to gather primary data.

D. Data Collection Methods

The data collection methods and data sources used in this study are clearly described in Fig. 3.

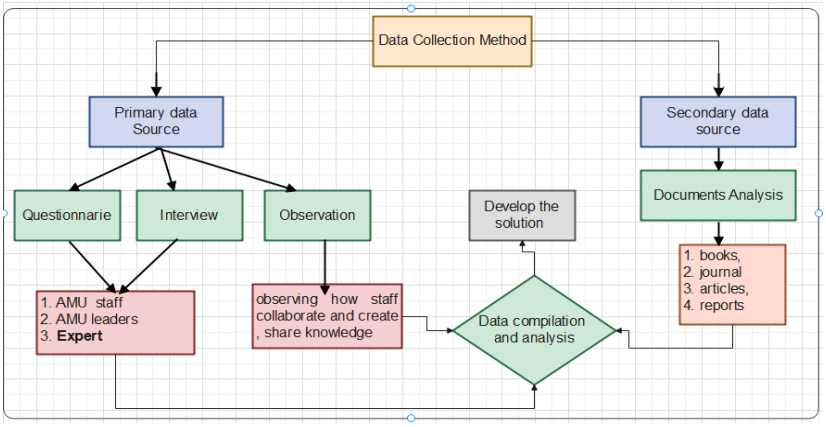

Fig. 3. Data collection method

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E. Data Analysis and Tools Selections

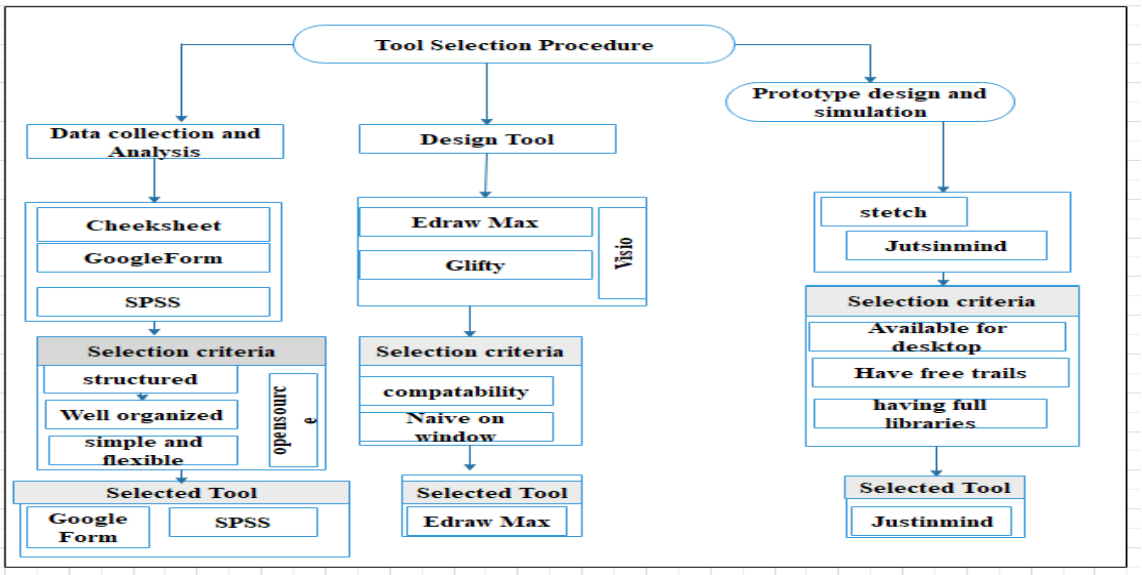

Fig. 4. Tool selection

IV. DATA ANALYSIS AND DISCUSSION

Among the distributed questionnaires, 322 were adequately filled and returned, yielding a response rate of 95.3 %.

A. Demographic Composition of the Respondents

70% of the respondents are male while 30% are female. Regarding the age of respondents, very few are in the age category of 51 and above while the majority are between 24 and 30. 180 respondents are between 24 and 30, 100 between 31 and 40, 25 between 41 and 51, and the remaining below 20 and above 51 years of age as shown in Fig. 5 below.

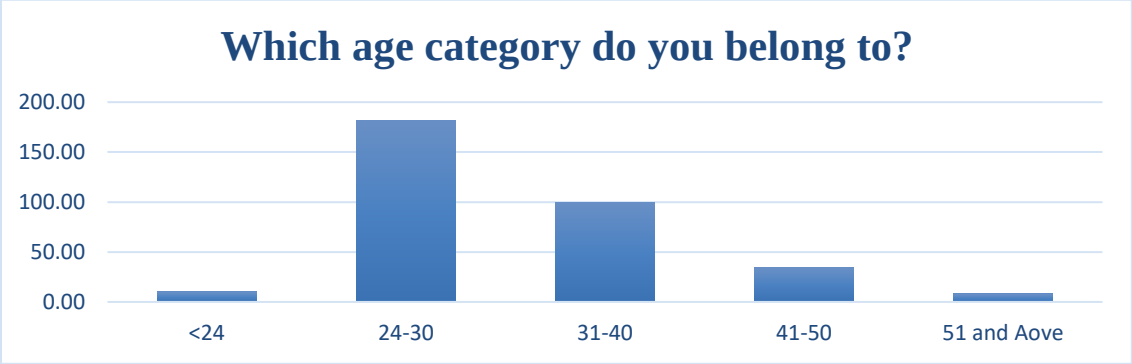

Fig. 5. Respondents distribution by age

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When it comes to their level of education, 60% of the respondents are MSc holders. Around 30% of them are with a PhD and above qualification, while 10% of them are BSc degree holders.

The majority of respondents, 54%, have the academic rank of lecturer. Assistant professors without PhD and assistant professors with PhD constitute 15%, and the fewest are Associate professors and full professors which constitute 9% and 7% of respondents, respectively.

The majority of the respondents, 40%, have a work experience of 1-5 years. 30% of them have work experience of 6-10 years, 21% of them have 11-15 years, and the remaining 9% have 16 years and above work experience.

B. Knowledge Sharing Practices

According to the respondents' response results, the majority, i.e., 60% of respondents had a low level of awareness regarding the importance of knowledge management in their organization, while 30% of respondents had a medium level of understanding of the importance of knowledge management. The remaining 10% of responses had a high level of understanding of the importance of knowledge management.

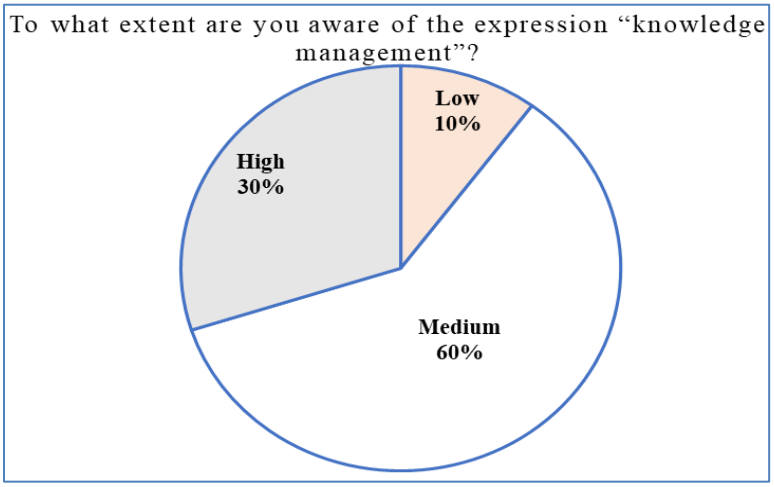

Fig. 6. Awareness of the expression "knowledge management"

According to the result shown in Fig.6 above regarding the awareness of the respondents about the expression "knowledge management", the majority of respondents (60%) reported their awareness as medium level, 30% as high level, and the remaining 10% of the respondents had a low level of awareness about the expression "knowledge management".

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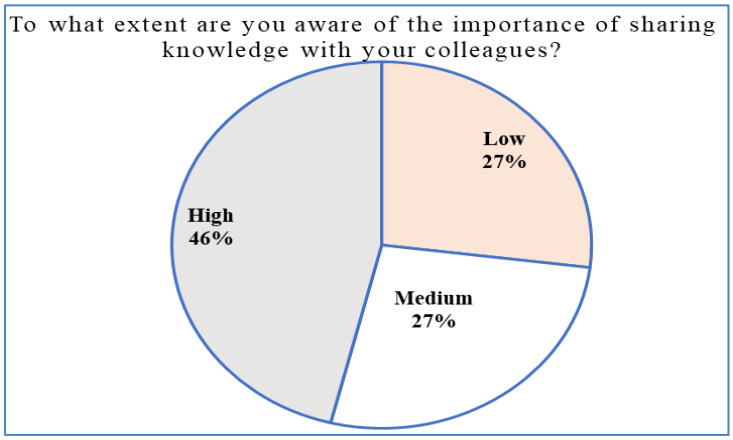

Fig. 7. Awareness of knowledge sharing

Fig. 7 above shows that the majority of respondents, 46%, confirmed that they are aware of the importance of sharing knowledge with their colleagues. Those who reported low and medium level of awareness about this constituted 27% each.

According to the respondents' responses, the majority of the respondents, 73%, reported high belief in the value of KM for the success of their organizations, 24% of respondents reported medium-level belief, and 3% of respondents had low belief.

Similarly, during our interview, we asked this same question and they answered they highly believed KM is valuable for the success of organizations.

C. KM Barriers

There are many barriers in the institution that we had identified. According to the respondents' responses, the majority of the respondents, 60% agreed that there are KM barriers in the organization, 30% of respondents consider maybe there are, and 10% of respondents do not think that there are KM barriers in the organization. Based on the presented question, the majority of respondents confirmed that there were many KM barriers in the organization like no platform (which takes the lion's share) lack of communication media, lack of training, lack of motivation, lack of encouragement, lack of support, and lack of trust between them. So, this finding encourages the researchers to propose a new knowledge-based KM System for AMU.

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D. Organization Support

Fig. 8 to 10 show the responses from questions offered with YES, MAYBE, and NO answers as levels of measurement.

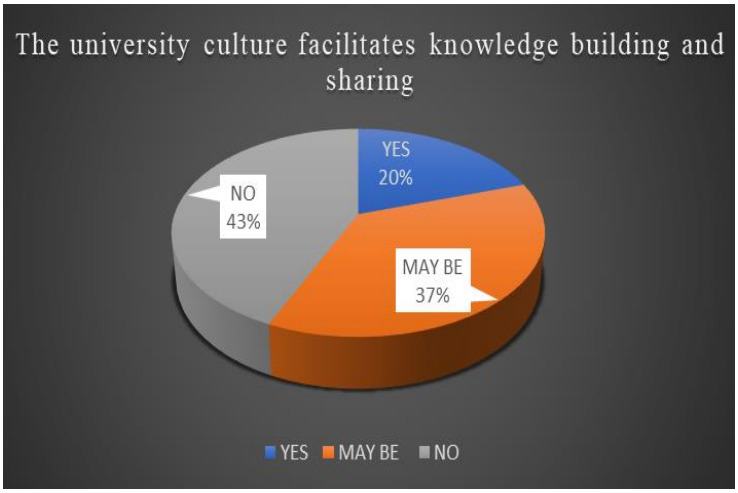

Fig. 8 Culture of the university on knowledge sharing

According to the respondents' responses shown in Fig. 8 above majority of the respondents, 43%, responded 'no' confirming that there is no facilitation from the university on knowledge sharing. 37% of respondents responded with a 'maybe' and 20% responded 'yes' approving that the university facilitates knowledge sharing.

In the university, 43% of the respondents agreed that there are conducive environments for enhancing knowledge-sharing attitudes. 35% responded with uncertainty, while 22% disagreed that there is a supportive working environment that fosters knowledge-sharing attitudes.

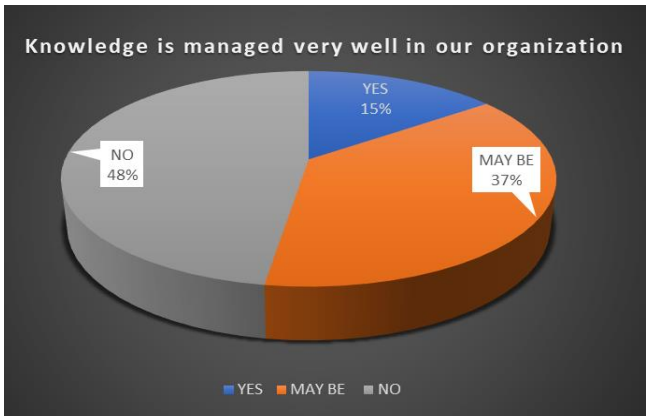

Fig. 9. Knowledge management in the university

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According to the respondents' responses as shown in Fig. 9 the majority of the respondents i.e., 48%, do not agree that there is good knowledge management in university, 37% of respondents responded with 'maybe' and 15% agreed that knowledge is managed very well in the university.

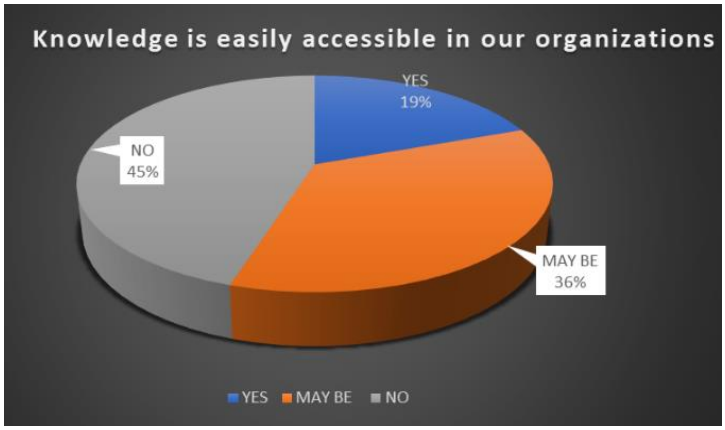

Fig.10. Knowledge accessibility in the university

According to the respondents' responses as shown in Fig. 10 above, the majority of the respondents i.e., 45%, do not agree that knowledge is easily accessible in university, 36% think it may be easily accessible, and 19% agree that it is easily accessible.

E. Infrastructure

The purpose of this section is to assess and identify the infrastructure of the institution toward KM practices. The responses are presented in Fig. 11-13.

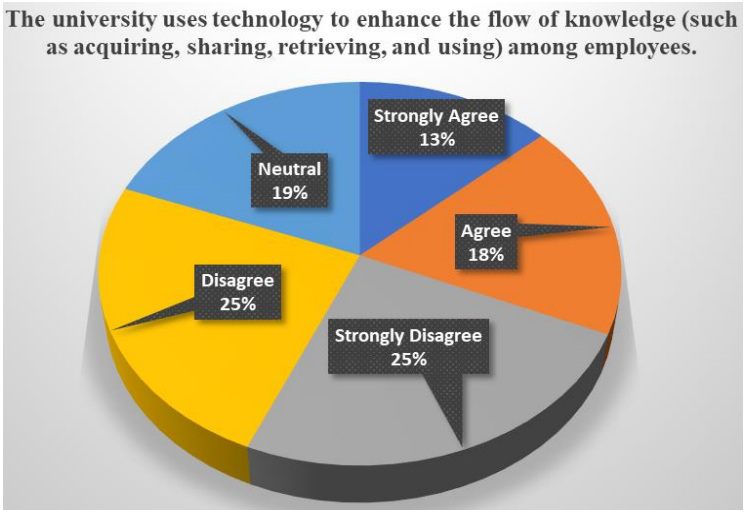

Fig. 11. Technology enhances the flow of knowledge in the university

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As shown in Fig.11 the majority of respondents disagreed and strongly disagreed with the statement of the existence of technology that enhances the flow of knowledge among staff in the institution with 25% responses each while 19% are neutral about this statement. On another hand, 18% of respondents agreed and 13% of the respondents strongly disagreed with this statement.

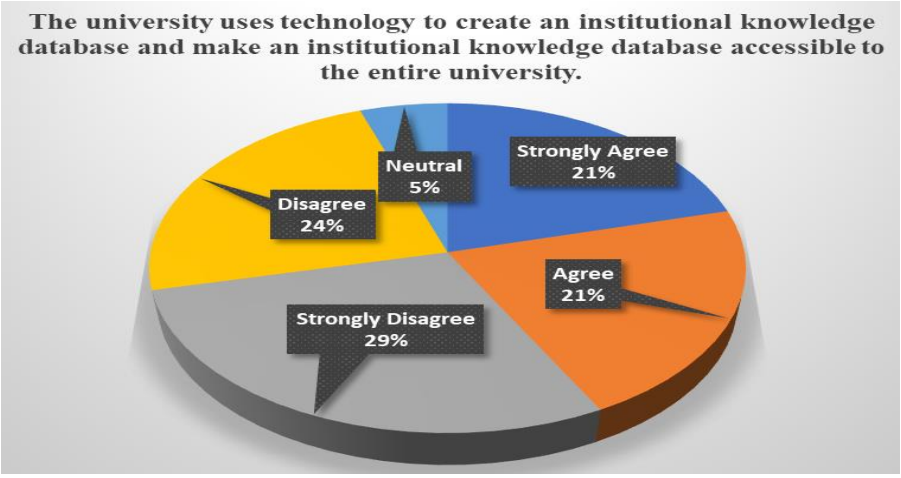

Fig. 12. Existence of accessible knowledge DB in the university

As shown in Fig. 12 above, the majority of respondents strongly disagreed with the statement on the existence of a knowledge database accessible to staff in the institution which is 29% of the responses, and also 24% disagreed with this statement. But 21% of respondents agreed and strongly agreed, whereas 5% of respondents were neutral on this statement.

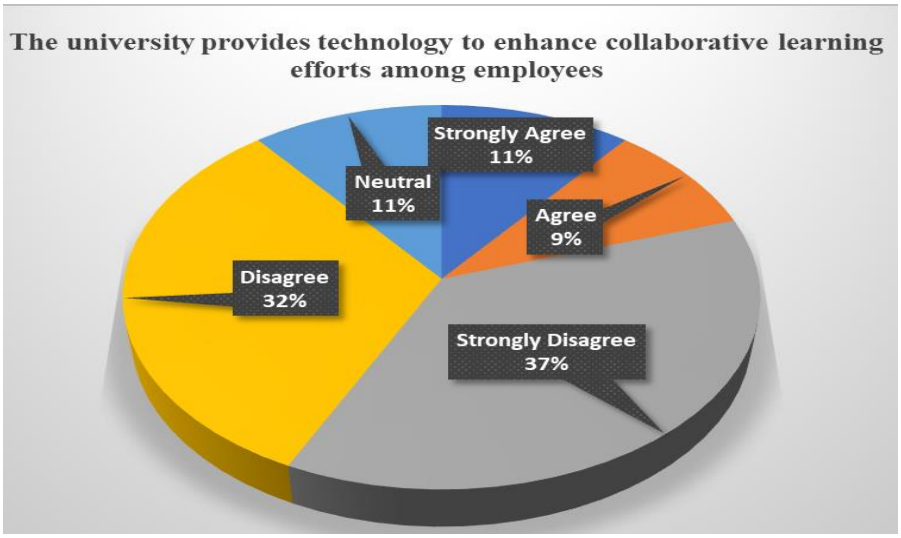

Fig. 13. Existence of accessible knowledge DB in the university

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As shown in Fig. 13, the majority of respondents strongly disagreed with the statement that technology enhances collaboration among staff in the institution which is 37% of responses, and 32% disagreed with this statement while 11% were neutral. Those that agreed and strongly agreed were 9% and 11%, respectively.

V. Summary of Fact-Findings

The survey and interview data analysis indicates that existing state-of-the-art knowledge management and sharing practices in HEIs of Ethiopia in general and Arba Minch University as a case typically lagging. These fact findings provide a new knowledge thrust towards the need for an alternative knowledge management system that can facilitate the knowledge creation, sharing, and collaboration among the staff.

Several emerging technologies can provide a platform for creating knowledge management systems. Cloud computing plays a pivotal role in overcoming the challenges faced by Knowledge Management (KM) and knowledge sharing in institutions like Arba Minch University (AMU) and other similar institutions. Since Cloud-based solutions offer scalable, flexible, and cost-effective platforms that enable seamless access to information and collaborative tools from any location at any time and therefore it was selected for developing a new knowledge-based KM System Framework. Cloud computing was primarily perceived to facilitate new KM systems that can offer low maintenance costs, high accessibility, and unified data silos that facilitate effective knowledge sharing and collaboration. A study [21] underscores the transformative impact of cloud-based KM systems by noting that they significantly enhance organizational agility and knowledge dissemination capabilities.

After rigorous technical observations, it was reveled that a cloud-based integrative Knowledge Management (KM) framework needs to be designed and tested for Arba Minch University (AMU) to fix the several critical reasons pinpointed in survey and technical observations. It was postulated that such a framework can address the current challenges of knowledge accessibility and sharing among AMU staff. With 81% of respondents expressing dissatisfaction with the ease of accessing

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knowledge, a cloud-based solution can ensure that information is available anytime and anywhere, thus enhancing overall knowledge dissemination and accessibility.

Creating a custom cloud-based Knowledge Management (KM) system for Arba Minch University (AMU) is crucial to meet the university's unique needs such as its specific workflow and collaboration requirements. While existing solutions like Microsoft SharePoint or Google Workspace are powerful, they often require expensive and complicated customization to fit perfectly. A custom system can be more cost-effective over time, as it avoids ongoing licensing fees and extensive modifications. It would also integrate smoothly with AMU's existing systems, making it easier to use. Additionally, a tailor-made solution could likely have higher user adoption because it would be designed with AMU staff in mind, reducing the need for extensive training. It can also allow AMU to implement precise security measures and compliance protocols tailored to their specific requirements. In the long run, a custom KM system can provide AMU full control over future updates and improvements, ensuring it remains effective and relevant[22].

A. Proposed Solution and its Functionalities

The proposed KM framework as depicted in Fig. 14 has three components that are required to fit the requirement of AMU contexts, those are organizational, technological, and infrastructural which are discussed below.

1) ***Organizational Component*** As depicted in Fig. 14, the organizational component contains a knowledge capture module. The knowledge capture module is responsible for capturing and organizing knowledge both (tacit and explicit) and information from various sources such as research papers, reports, and data sets. It can help the organization's culture in knowledge building, sharing, and trust and encourage the staff members to improve the working environment with proper guidance and experts in the area. The second attribute of the organizational component identified is the top management (with a leadership commitment) that should provide different types of reward and recognition (such as monetary, and non-monetary) as well as motivations based on the guidelines and policies otherwise the reward can be biased leading to improper KM practices within the organization with a detrimental effect on knowledge creation, sharing, and building the collaboration among the staff members. The third attribute of the organizational

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component identified is the KM Team's involvement which is the most important to create awareness about KM and provide training on the platform for the staff members as well as supporting the users as needed promptly in addition to managing the platform account.

2) ***Technological Component****:* The second component as depicted in Fig. 14 of the proposed framework is the technological component and, in this component, the technology adopted has four characteristics, those are simplicity, accessibility, trust, compatibility, and integration. Those characteristics can help the users' perception of the KM system as easy to use, with accessibility in needed time (24/7), not biased for rewarding (in retrieving the right users who highly contribute towards the KS), as operating in available users' devices for KM practices, and as integrative to other institutions' systems as indicated in a similar study[23]**.**

3) ***Environmental Component****:* As depicted in Fig. 14, the last component of the proposed framework is the environmental or infrastructural component. The infrastructural component indicates the factors that are considered for the competitiveness of the institution. So, to be able to work with their partners that are more advanced in technology, AMU should use modern technologies such as cloud computing technology services. In the infrastructure component, the major factors that were identified as influential for successful KM are well-updated ICT infrastructure (that supports the current state of the art) and resource support to be a competitive global university. So, the proposed framework is designed to meet the current state of the art.

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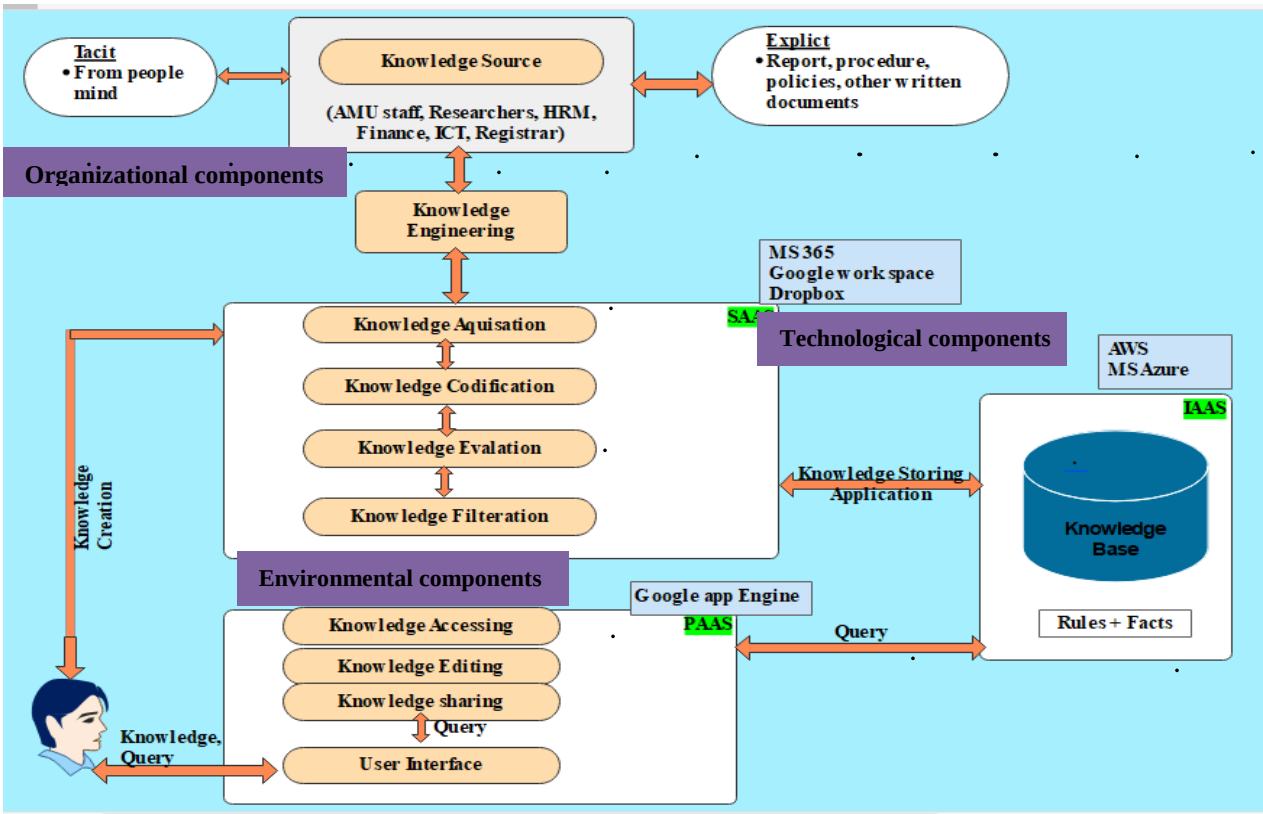

Fig. 14. Proposed cloud-based KM framework for AMU staff (CBKMF-AMU)

VI. CONCLUSIONS

In the fourth industrial revolution (digital age), every HEI needs to have judicious adoption of emerging technologies such as cloud to ensure the survival and competency with other organizations to become more relevant and impactful. To obtain local and global recognition as top universities, they must include digital technology in their process. To be the best universities, they should be able to withstand the changes brought upon by modernization. This is impossible without sufficient knowledge and expertise. The objective of this study was to design and develop an integrative cloud-based knowledge management framework for AMU that will facilitate knowledge-sharing practices between and/or among academic staff members and make the university competitive and more efficient.

By implementing this cloud-based KM framework, AMU can improve its ability to create, share, and apply knowledge, and can enhance its reputation as a center of excellence for teaching,

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research, and innovation. This KM framework can help AMU to better leverage its knowledge and expertise in a variety of ways by enhancing collaboration and knowledge sharing. The university can use these KM tools and techniques to foster collaboration and knowledge sharing among faculty, staff, and students.

The framework ensures that employees have access to the expertise held within the organization, reduces mistakes to a minimum, and helps people make smarter, informed decisions. Moreover, it builds a more efficient workplace, enables faster decision-making, increases team collaboration, optimizes the employee onboarding and training process, and reduces turnover. It also aids in assessing, curating, and documenting knowledge; identifying where and in what form the knowledge exists; ensuring the captured knowledge is accessible to everyone in a company; creating a culture of knowledge sharing and continuous improvement; finding ways to generate new, relevant knowledge; preventing knowledge loss by storing important information when experienced employees leave; centralizing information and helping employees not to waste time trying to figure out answers; accumulating best practices, and boosting productivity and efficiency amongst employees as well as at the organizational level.

RECOMMENDATIONS

In future, the researchers can focus their attention on thinking that the findings can be based on other sampling methods by increasing the sample size that generalizes for the whole staff of AMU. This research focused only on internal KM barriers; thus, future researchers may also incorporate external barriers to the KM framework.

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REFERENCES

[1] A. T. Gure and D. P. Sharma, "Assessment of knowledge sharing practices in higher learning institutions: A new exploratory framework – AT-DP KSPF," *IUP J. Knowl. Manag.*, vol. 17, no. 4, 2019.

[2] I. Nuryasin, Y. Prayudi, and T. Dirgahayu, "Prototype of knowledge management system for the higher education institution in Indonesia," *Semin. Nas. Apl. Teknologi Inf.*, 2013.

[3] M. Pinto, "Knowledge management in higher education institutions: A framework to improve collaboration," 2014 9th Iberian Conference on Information Systems and Technologies (CISTI), Barcelona, Spain, 2014, pp. 1-4, doi: 10.1109/CISTI.2014.6876876.

[4] L. Antonczak, M. Neukam, and S. Bollinger, "When industry meets academia," *Pacific J. Technol. Enhanc. Learn.*, vol. 4, no. 1, 2022, doi: 10.24135/pjtel.v4i1.134.

[5] T. Koundyannan, S. Abdul Kadir, R. Basri, and A. F. M. Ayub, "Predictors of school effectiveness: School culture and climate of Sekolah Kebangsaan Malaysia," *Int. J. Acad. Res. Bus. Soc. Sci.*, vol. 10, no. 11, 2020, doi: 10.6007/ijarbss/v10-i11/8148.

[6] "Role of knowledge management on organizational performance, Case of Jimma University in Ethiopia," *J. Int. Bus. Manag.*, vol. 4, no. 5, pp. 1 -18, 2021, doi 10.37227/jibm-2021-05-722.

[7] C. N. L. Tan, "Enhancing knowledge sharing and research collaboration among academics: the role of knowledge management," *High. Educ.*, vol. 71, no. 4, 2016, doi: 10.1007/s10734-015-9922-6.

[8] A. Tuni and D. Prasad Sharma, "Exploratory Assessment of Knowledge Sharing Practices in Ethiopian Higher Academic Institutions," *SSRN Electron. J.*, 2019, doi: 10.2139/ssrn.3361259.

[9] W. U. Rehman, M. Ilyas, and N. Asghar, "Knowledge sharing, knowledge management strategy and performance a knowledge-based view," *Pak. Econ. Soc. Rev.*, vol. 53, no. 2, 2015.

[10] C. N. L. Tan and S. Md. Noor, "Knowledge management enablers, knowledge sharing, and research collaboration: a study of knowledge management at research universities in Malaysia," *Asian J. Technol. Innov.*, vol. 21, no. 2, 2013, doi: 10.1080/19761597.2013.866314.

[11] R. Ishrat and W. Rahman, "Effect of attitude and individual perception on knowledge sharing in Peshawar University: An empirical study," *FWU J. Soc. Sci.*, vol. 13, no. 2, 2019.

[12] D. P. Sharma and K. Khandelwal, "Knowledge-based systems, problem-solving competence, and learnability," in *Communications in Computer and Information Science*, 2011. doi: 10.1007/978-3-642-25734-6_93.

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*Corresponding author- **Basha Kesim***

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[13] M. A. Fauzi, C. T. Nya-Ling, R. Thursamy, and A. O. Ojo, "Knowledge sharing: Role of academics towards research productivity in higher learning institution," *VINE J. Inf. Knowl. Manag. Syst.*, vol. 49, no. 1, 2019, doi: 10.1108/VJIKMS-09-2018-0074.

[14] H. A. Smith and J. D. McKeen, "Knowledge Management in Organizations: The State of Current Practice," in *Handbook on Knowledge Management*, *C. W. Holsapple*, Ed. New York: Springer, 2003, pp 395–410 . doi: 10.1007/978-3-540-24748-7_18.

[15] A. Al Hadwer, M. Tavana, D. Gillis, and D. Rezania, "A systematic review of organizational factors impacting cloud-based technology adoption using technology-organization-environment framework," *Internet of Things (Netherlands)*, vol. 15. 2021. doi: 10.1016/j.iot.2021.100407.

[17] P. Mell and T. Grance, "The NIST definition of cloud computing," in *Cloud Computing and Government: Background, Benefits, Risks*, 2011. doi: 10.1016/b978-0-12-804018-8.15003-x.

[18] S. Saberi, M. Kouhizadeh, J. Sarkis, and L. Shen, "Blockchain technology and its relationships to sustainable supply chain management," *Int. J. Prod. Res.*, vol. 57, no. 7, 2019, doi: 10.1080/00207543.2018.1533261.

[19] M. K. Ahmed *et al.*, "Leveraging expert knowledge for mobile livestock care : Combining AHP and naïve bayes for diagnosis, treatment, and management," vol. 31, no. 4, pp. 341–349, 2024.

[20] C. N.-L. Tan and S. M. Noor, "Knowledge management enablers toward knowledge sharing and research collaboration at research universities in Malaysia," in *Proceeding Of Knowledge Management International Conference (KMICE)2014, vols. 1 and 2*, 2014.

[21] S. Gregor and A. R. Hevner, "Positioning and presenting design science research for maximum impact ," *MIS Quarterly*, vol. 37, no. 2, pp. 337–355, 2013.

[22] M. Saratchandra and A. Shrestha, "The role of cloud computing in knowledge management for small and medium enterprises: A systematic literature review," *Journal of Knowledge Management*, vol. 26, no. 10. 2022. doi: 10.1108/JKM-06-2021-0421.

[23] Y. Abbas, A. Martinetti, M. Rajabalinejad, F. Schuberth, and L. A. M. van Dongen, "Facilitating digital collaboration through knowledge management: A case study," *Knowl. Manag. Res. Pract.*, vol. 20, no. 6, 2022, doi: 10.1080/14778238.2022.2029597.

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