Strategies of Knowledge Management Techniques in Saudi Higher Education Institutions

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Abstract

Many technical means are used to transform organizational inputs into outputs that contribute to knowledge management and development. Technologies are the most important determinant of knowledge management. Institutions that employ technologies in the best way to manage knowledge will have the best ability to survive and continuity in light of the current competition in the knowledge services market. The use of knowledge management techniques works to collect, classify, store, communicate or share knowledge between people and institutions, as well as improving the ability of employees to communicate with each other because there are no barriers that exist due to place, time, and job level, in addition to providing more flexibility in knowledge sharing. In light of this, this study seeks to shed light on recent trends in employing knowledge management techniques in Saudi higher education institutions.

Disciplinary: Knowledge Management.

1 Introduction

There is no doubt that the importance of information and knowledge, their concept and their role in the progress and development of societies by activating the role of knowledge management in supporting risk management, and the challenges facing developing countries in general and

Saudi higher education institutions, especially in the era of the knowledge explosion, and technical and technological development has become enormous.

Information is exposed to many risks and attacks in the stages of collection, processing, and retrieval - whether reading, printing, or downloading - in the transfer and exchange stage and the storage stage, and these risks and attacks differ according to these same operations, as each stage has its risks and means of protection, and in general the Most of the lists of classification of risks and attacks depend on the criterion of the placement of information from the system, given the importance of these transactions for the development of higher education and the strengthening of the knowledge-information society [1].

The importance of this research comes about the importance of information and the role of knowledge management in the knowledge economy and how to manage and avoid risks, and this comes after the rapid growth of knowledge and the pursuit of Saudi higher education institutions to build a sophisticated knowledge society. From setting legislation and laws for information and data and organizing it to reach the optimal building of the modern knowledge and technological society and to avoid risks.

2   Challenges Facing Saudi Higher Education

Some Saudi higher education institutions face shortcomings in the presence of cognitive technologies to support their knowledge orientation in general. At a time when it should strive to provide technical infrastructure and learning organization through the freedom to access and share knowledge using multiple technologies such as e-mail

A. The lack of a mechanism for the knowledge management system to document knowledge and distribute the knowledge owned by employees so that the company loses the employee's knowledge in the event of the employee's resignation, retirement, or death [2].

B. Explain the understanding of the employees of the educational institutions of the importance of exchanging knowledge through various means of communication, which in turn contributes to satisfying the policy of employees to be active in sharing their knowledge[3].

C. Universities seek to develop information technology through the availability of an information technology department that supports the storage and exchange of knowledge and the provision of the Internet for all employees to be able to exchange and generate knowledge at any time and anywhere and to protect information from any danger to which it is exposed (Figure 1), for example:

- o **Threats:** It means the potential danger to which the information system of the education systems may be exposed. It may be a person, such as a spy, a professional criminal, or a hacker, or something that threatens devices, programs, or data, or an event such as fire, power outages, and natural disasters [4].
- o **Vulnerabilities:** It means an element, point, or location in the system through which the aggressor is likely to carry out or be hacked. For example, people who use the system are considered a weak point if their training is not sufficient to use and protect the system, and the Internet connection may

be a weakness, for example, if it is not be encrypted. The spatial location of the system may be a weak point as if it is not equipped with the means of prevention and protection, and in general, the weaknesses are the driving reasons for achieving threats or risks and attacks. Related to this terminology is Countermeasures: it means the technique used to protect the system, such as passwords, locks, monitoring methods, firewalls, and others [5].

o **Risks and Attacks:** It is used synonymously with the expression threat, although it is a fact related to the impact of threats when they occur, and a successful information security strategy is based on risk analysis and risk analysis, and the analysis of risks and attacks is a process and not just a limited plan, and it starts from Questioning about threats, then weaknesses, and finally the appropriate means of prevention to deal with threats and means of preventing weaknesses [6].

o **Incidents:** It is a broad term that includes risks and attacks and includes errors. It is in the sense used in technical information security studies. It refers to intentional or unintended acts and covers attacks and technical errors. However, the precise description of this concept in the performance-administrative and legal framework, He must bear it on unintended accidents, which may be risked by nature and without an intentional factor, or be unintended technical errors [7].

Figure1: The security wheel.

Saudi higher education institutions, regardless of their educational services, are exposed to intense competition as a result of the wave of globalization that the world is witnessing. This new reality has been imposed on Saudi higher education institutions to further improve the quality of education provided, to face potential risks and threats, and to respond to developments and urgent changes to become competitive and sustainable organizations. To meet these challenges, employing knowledge management to support risk management for universities is one of the ways that can be reported.

This study attempts to identify the reality of knowledge management in support of risk management and to identify the role of the reality of knowledge management in the effectiveness of the activities of Saudi higher education institutions. Many international universities have passed

their laws. As concepts of data and information, and these concepts are what added a new color to the concept of knowledge, as it became necessary to develop a special strategy for how to manage information, and then the so-called knowledge management appeared. As the role of knowledge management is to avoid risks and to build an integrated vision for information and knowledge systems [8].

3 Information and Knowledge Management

Information and knowledge management plays an important role in reducing the digital divide between Arab universities, especially in the Kingdom of Saudi Arabia, on the map of the knowledge society (Figure 2). The disclosure of gaps in the laws and legislation of information and knowledge in the Kingdom of Saudi Arabia is of great importance in the type of education, information, and knowledge and supports its development to be in support of the directions and plans of the state. Transformation into a knowledge society that serves the Saudi society and contributes to its renaissance at the regional and international levels [9].
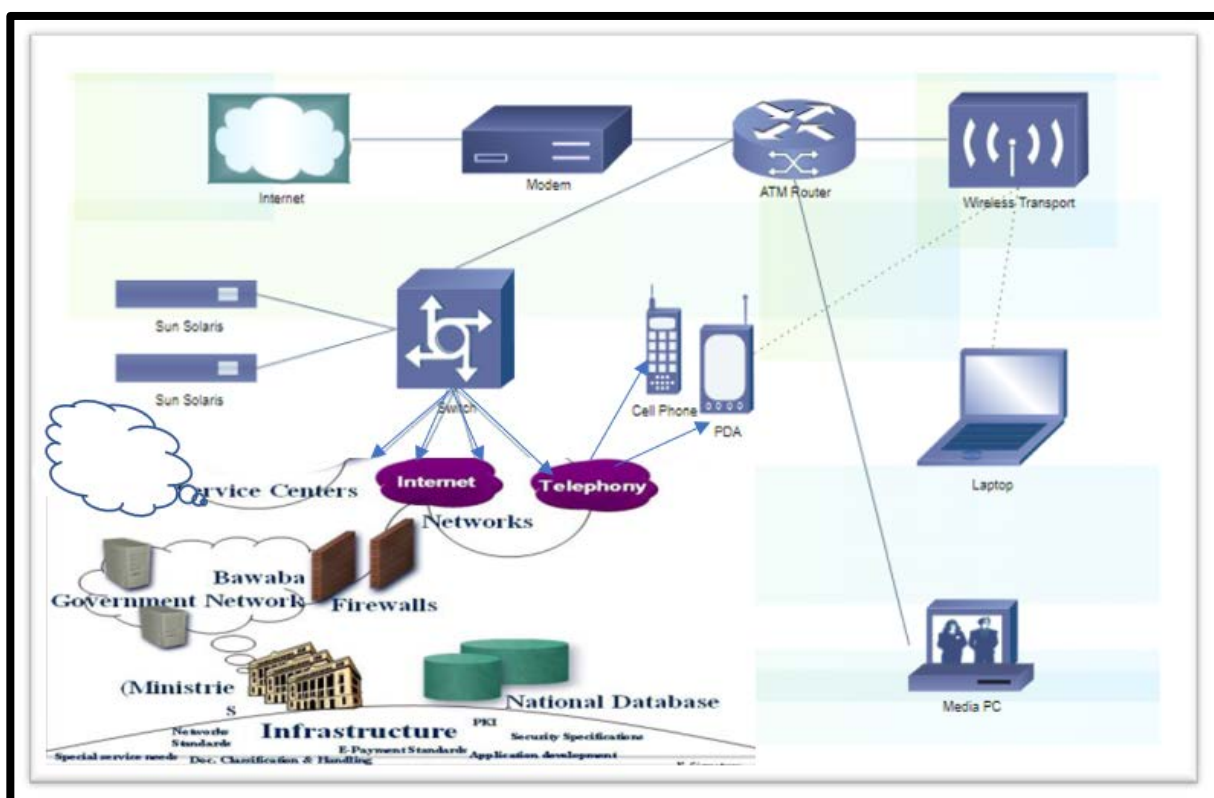

Figure 2: Social networking sites

Knowledge management is gaining increasing importance in light of the multiple risks and major challenges facing Saudi higher education institutions today. To achieve the desired benefit from adopting the knowledge management approach in Saudi higher education institutions, the role of modern knowledge and management of the technological community must focus on the effective use of this approach by employing it in achieving and strengthening the strategic and operational goals of universities. The capabilities and skills of the different universities and the skills of their cadres, achieving development, improving and sustaining these capabilities and

skills, and the management of each organization must focus on directing knowledge management processes towards achieving effective knowledge integration for all universities and dedicating it (institutionalizing knowledge), and it must focus on implementing a knowledge strategy that ensures the effectiveness of the processes of knowledge. Knowledge management in all educational units in an integrated manner [10].

3.1 Knowledge

Knowledge is the material of classified (extracted) information. That is, it is the result of what an individual, organization, or society possesses of information, science, and culture at a particular time. Knowledge is an inferential result or summary of data and information, which are the ideas and concepts extracted from a set of these reports [11].

The organized processes of discovering, selecting, organizing, technology, and presenting information in a way that helps employees of Saudi higher education institutions improve their field of interest and understanding. The specific knowledge management activities of these organizations help to focus on acquiring, storing, and using knowledge to solve problems, as well as focusing on dynamic learning, strategic planning, and decision-making [12].

3.2 Explicit Knowledge

Explicit knowledge is formal, structured knowledge that can be expressed in written codes and transferred between two people, for example, information stored in an organization's archives, including (brochures on policies, procedures, documents) and business procedures.

1. The Internet: It is a global communications network that allows the exchange of information through smaller networks through which computers are connected around the world. And it operates according to specific systems and ware with the unified protocol, which is the Internet protocol.

2. Intranet: This is an internal network that provides the knowledge employee with several services and also allows sharing in Knowledge.

3. Extranet: An extension of an organization's internet created for specific users outside the organization, these users may be employees, financiers, partners, or distributors of the institution itself, in which the extranet is used, except with a password, to secure its protection.

4. Systems Work Knowledge: It is a group of systems that work on generating serious information and knowledge and provide quick and low-cost tools to obtain and manage traffic in a better way in different organizations. Cognitive work applications include computer-assisted design systems and hypothetical protective systems.

5. Systems Office Automation: This organizer is used to automate tasks Administrative lifting of all integrated and these systems are represented by: Email retrieval For information word processing teleconferences. Recent trends in the use of knowledge management techniques in Saudi higher education institutions / d. Nurn bint Nasser Al-Hazan International Journal of Library and Information Sciences.

6. Support Decision-Based-Knowledge Systems: It enables the manager to make more complex and extensive decisions.

7. Systems Intelligence Artificial: An effort to develop based systems to computers, they perform gender-like behavior, and such systems can learn natural languages Carrying out consistent physical tasks and simulating human experiences.

4 Related Work

Previous studies and research focused on knowledge management technology and emphasized the need to form a technical structure that represents an appropriate infrastructure to support knowledge management processes and enhance the role of institutions to achieve distinctive competitiveness. Perhaps the most important knowledge management techniques that have been monitored through previous studies are:

4.1 The Types of Artificial Intelligence Systems

Building a specialized work team in self-defined tasks so that they are used in locations where the tasks are complex and characterized by uncertainty to address those opportunities with the knowledge and specializations required to make a solution to the problems. Knowledge is applied by relying on the main and subsidiary technical systems, see Table 1.

Table 1: The Types of Artificial Intelligence Systems

1. Systems Expert [13]	An expert system is a knowledge-based system that is not An intelligent computer system that can solve difficult problems using knowledge and methods Inference expresses knowledge or a set of information in computer symbols. The model symbols These systems, it is based on facts, data, assumptions, and definitions based on experience Compiled and on the knowledge of human experts.
2. Natural Language [14]	The process of processing difficult-to-understand medical languages By receiving the computer with several direct commands in this language and then enabling the computer to A dialogue together with individual users and this type of system can be used in machine translation And Alkhalas and purely texts proved Almarajah.
3. Neural Networks [15]	These include computers or software that try to Simulate the work of neurons in the human body, as this network works in an interconnected and close manner and parallel. Neural networks, also known as artificial neural networks (ANN) or simulated neural networks (SNNs), are a subset of machine learning and lie at the heart of deep learning algorithms. Its name and structure are inspired by the human brain, as it mimics the way biological neurons send messages to each other.
4. The Vision Machine [16]	It is represented by two systems: the first is the linear system, and it is the one that senses only one beginning, and the second is the matrix system, and it is the one that senses something in three areas (stereoscopic).
5. Systems IT Hybrid [17]	It is increasingly being used in many applications Japanese companies also have applications for these systems to include office equipment and machinery.
6. Computing Cloud [18]	It is a model for enabling a network user to access the network Network from anywhere, anytime, easily, and when you need a common set of resources Configurable computing (networks, servers, storage devices, applications, and services) that can be provided and delivered quickly with minimal administrative effort or supplier intervention the service. Cloud computing contributes to building the standard either individually through individual applications provided by cloud computing or collectively through social applications provided by them m intercourse and also contribute to Clouds and allow individuals to communicate and participate in building learning contents Create a repository (bank) of knowledge in addition to offering solutions at low cost and flexibility To achieve maximum investments as well as the most fertile technical environments to serve cooperation in various fields Its forms are flexible to accommodate all requirements of cooperation, teamwork, and resource sharing.
7. Social Networks Social [19]	Social networks are defined as a term given On a group of sites on the Internet appeared what the second generation of the Web or what is known as Web 0.2 allows people to communicate in a virtual community environment that brings them together according to interest groups Recent trends in employing knowledge management techniques in Saudi higher education institutions / d. Nurn Bint Nasser Al-Hazan International Journal of Library and Information Sciences. All this is done through direct communication services such as sending instant messages or viewing the personal files of Fakhrin and knowing their news and information that they make available for display.

8. Digital repository [20]	An online information base that may be created By an educational institution to collect, manage, preserve, make available and disseminate the educational outputs of the educational institution And its academic community of faculty members and students.
9. Data Base [21]	With a structure with a specific structure that includes electronically stored data and is done It is within its scope to control and access data through computers.
10. Data mining [22]	the process of discovering knowledge in databases by selecting Patterns and trends in the data collected using different methods such as classification or analysis Serial, cluster, cosmetic, or association rules.
11. Ontology [23]	It appeared in philosophy in the sense of ontology, and it was recently rugged in Science Information in ontologies (concept maps) is a graphic representation of knowledge using a set of information A description of the concepts in a specific domain and the relationships to these concepts and may include ontology for the class, its beings, and relationships, it is important Concept maps are one of the effective tools for representing knowledge and building on it, as well as for their distinctive number Characteristics are that they are hierarchical, organized, interrelated, interpretive, integrative and conceptual. Building unit with concepts.
12. The Intranet of Things of the Internet[24]	With the new generation of the Internet, the network that allows understanding between interconnected devices (via Internet Protocol) and these devices include Various tools, sensors, sensors, artificial intelligence tools, etc., and it goes beyond this Definition The traditional concept, which is the communication of people together with computers and smartphones through a network One global and through the traditional Internet protocol. Perhaps what distinguishes the Internet of Things is that it allows both sexes to be free from space, meaning that a person can Control the tools without the need to be in a place to deal with a device. and help The Internet of things in smart education also reduces costs, saves time and effort, and also improves learning Operational efficiency enhances the reliability of the system and its components. And adherence to safety standards and management Emergencies and empowering university educational institutions with non-discriminatory communication together with beneficiaries in areas Education and together really help to facilitate the explanation of the different concepts to the student and to link the units of the Intranet of things Baloqa to be simulated.
13. Human resources [25]	The human aspect is the main part of knowledge management; Because Knowledge moves from individual knowledge to organizational knowledge in the organization. What is meant by individuals here is a cadre of Faculty members, information systems staff, knowledge management, research and development sources, and managers Human resources and individuals contribute to knowledge management processes. Hence, the individuals become the components The main component of knowledge management programs as they are knowledge makers who create knowledge as part of They work while they provide the intangible assets or resources that become vital to competitive success and growth. In light of this, the human resources department must develop its methods of polarization to obtain The most knowledgeable individuals where it is necessary to have specialists in the fields of knowledge management techniques within Recent trends in employing knowledge management techniques in Saudi higher education institutions The International Journal of Library and Information Sciences. Human resources of the institution, which ignites a mainstay to facilitate the absorption of knowledge management and the exploitation of its operations. The human resources management should open the institution's personnel to the source of external knowledge by facilitating participation in conferences, seminars, and workshops, which contribute to the development of their knowledge and hospitality. To the necessity of developing strategic and operational plans in line with the levels of scientific knowledge and technical developments In the fields of education, training, rehabilitation, and human resource development.
14. Financial Resources [26]	Ensuring financial support from higher management is an effective contribution to achieving management activities Knowledge, Therefore, institutions must allocate a significant budget to employ knowledge management techniques, which represents a strong point in favor of activating knowledge management in its various dimensions, if attention is given to this strategically and operationally. Third: Operations The knowledge of the institution is seen as representing the intellectual capital in it, but it is present in it The mind of the employees of the institution and has a value as one of the intangible assets of the institution, in other words, it is It can be seen or touched as in physical assets. In recent years, interest has increased in the institution's intellectual assets and their impact on institutions and on how to manage them and make them more productive, and some went further than that in terms of adhering to the fact that the value of institutions increasingly lies in their intangible assets. Most researchers differ in their definition of knowledge management processes, some of them mention them in a detailed and expanded way, and some of them shorten and intensify them by including some of them under the umbrella of one term or designation. Managing knowledge through employees, attracting and maintaining them. Hence, we find the processes that the technical trend focuses on as major processes, such as: diagnosing knowledge, acquiring knowledge, storing knowledge, spreading and distributing knowledge, sharing knowledge, and applying knowledge. The mechanisms of using these main and subsidiary techniques in knowledge management processes can be explained as follows.
15. Knowledge Identification [27]	Through the discovery of knowledge in the management of Knowledge and identifying the people working for it and their locations. Knowledge is diagnosed through the representation of experiences Scientific expertise is extracted through direct meetings, what are the experts so that the news is drafted in the form of databases.
16. Acquisition Knowledge [28]	Through which knowledge is obtained from various sources, for example (experts, specialists, databases, and institution archives) Using training, attending conferences and workshops, and using experts and periodicals publications, e-mail means, and individual learning.

17. Storage of Knowledge [29]	A process that stores knowledge in manuals or knowledge guides Or a knowledge base Cases or rules and instructions are stored and added to what you own. The institution consists of the knowledge stored in the minds of many of its employees, taking into account the possibility of conducting the study And purely and retrieval of the stored metaphor, and knowledge is usually stored in the knowledge base to access it Recent trends in the use of knowledge management techniques in Saudi higher education institutions International Journal of Library and Information Sciences. Quickly, through the intranet, several services are available to the knowledge employee, and it also allows them to share knowledge. In light of this, we note that the knowledge store helps in adding new knowledge, encoding it, and integrating old knowledge with what is new.
18. Knowledge Sharing [30,32]	Knowledge sharing refers to making knowledge available Sharing and what we notice is that there is a difficulty in sharing knowledge with others and your complacency to keep it at the head The person, on the contrary, means the ease of sharing data and information, having access to files or documents and easily providing them to others, whether as individuals or institutions. Most organizations have been concerned with the process of sharing knowledge to improve operations or for that purpose in services and searching for the best applications. Therefore, knowledge sharing can be classified into two types of characteristics: Collective participation: a way to share ideas and a way for the free flow of knowledge beyond what it allows Knowledge repositories or decision support systems. Participation is also in the form of Town, which is used To collectively generate, transfer and share knowledge. Individual participation: Most organizations have one or more (experts) who know They are credited with the success of the organization's operations and finding ways to have them share their knowledge with It is the basis for complementing the successes of the institution. It is worth noting that knowledge sharing is obscured through various online tools such as e-mail and web applications 0.2 (wikis, blogs, social networks, and RSS feeds.) Distribution and Deployment Knowledge Matching the right person at the right time is the essence of the distribution process, and knowledge is disseminated Through the Internet and the Intranet.
19. Application Knowledge [33,34]	It means making it more suitable for use in the implementation of knowledge management activities and more related to them, and the application of knowledge leads to the creation of knowledge of new tasks and allows individual and group learning processes through applied methods, including work and training and internal experts. Hence, there are three mechanisms for applying knowledge: A defined set of rules, procedures, and instructions that are established to transform tacit knowledge For experts to explicit knowledge for non-experts. Performance patterns and process specifications allow individuals to apply and integrate their specialized knowledge without The need to communicate with others.
20. knowledge Management [35,31]	Knowledge-based decision support systems that enable standards to make decisions with a wider range It is more complex, and it is worth noting that the application of knowledge management requires adding appropriate information technologies to creating the organization's environment to reach the maximum possible use of knowledge so that it is an environment conducive to the effective management of knowledge and then it is possible to store, transfer and apply knowledge. In general, such an environment requires appropriate organizational structures to manage Knowledge so that it is flexible and adaptable to the environment and provides leaders and an organizational culture that encourages team spirit at work and supports the principle of continuous learning and knowledge sharing.

5 Proposal Methodology

Revealing the role played by knowledge management techniques in Saudi higher education institutions, which helps those in charge of setting policies related to knowledge management. Then an urgent need to benefit from the huge stock of knowledge, whether implicit or explicit, in the management of Saudi higher education institutions. The study's contribution to identifying and developing the basic techniques of knowledge management that can be used to improve and develop its selection in Saudi higher education institutions (Figure 3).

The Neural Networks predict a continuous or categorical target based on one or more predictors by finding unknown and possibly complex patterns in the data. We can build the network by using the calculation between each pair of the variables through using the Neural Networks Algorithms for building as the maximum level. It starts with the extended tree with the non-existence of the edges and the signs of the random variable as an approach. Then, we will find the variable of the non-controller where its weight with one of the observable variables is the maximum limit. Applying to natural network log, the network consists of the six variables: (x1, x2,

x3, x4, x5, y) where it constitutes a network of two heads of input and output changes which vary from (x1...........x5, y) with different gradual colures (blue-yellow) the most colored and thickness line represents the most effective and important. These future variables have all been coded and compared with the dependent variable (z) where we can distinguish which of them is more or less important or need improvement or treatment. The network is formed from colored lines. The blue color represents the positive effect and the yellow color is the negative effect. If the colored line gets darker and thicker, it will be more positive and has a higher impact and interest. If the colored lines become lighter and thinner, they will be less positive and have no impact or interest.
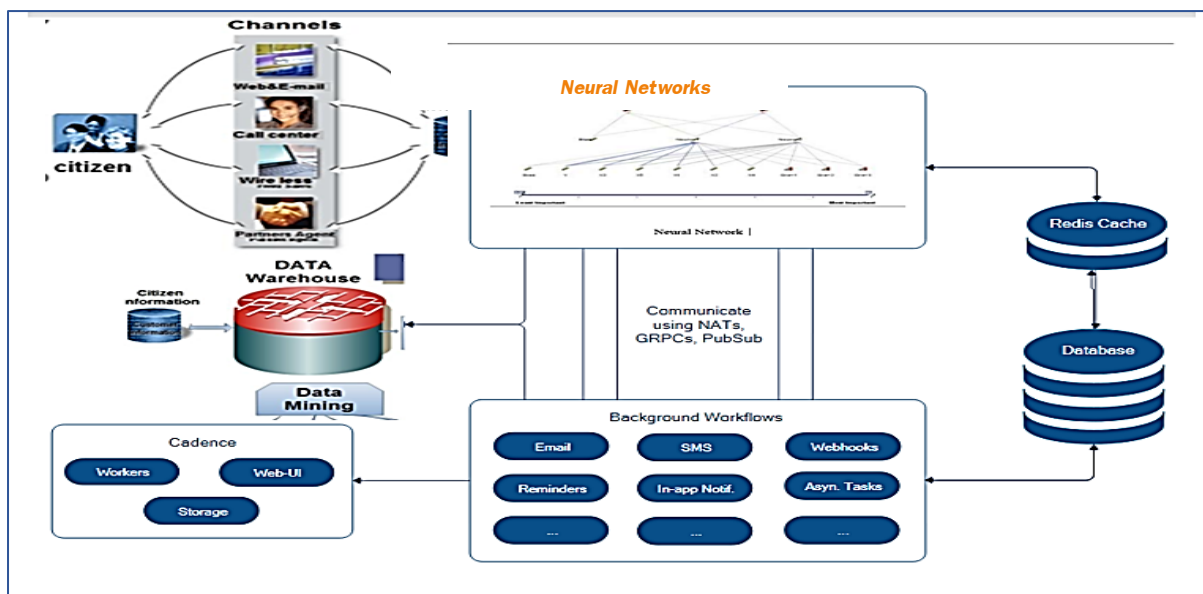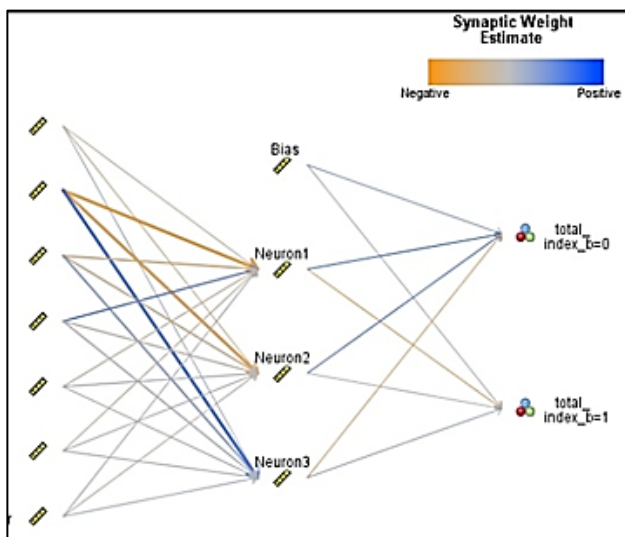

Figure 3: Proposal model.

Figure 4: Neural network model

Artificial Neural Networks (ANNs) consist of layers of nodes, containing an input layer, one or more hidden layers, and an output layer. Each node, or artificial neuron, is connected to another and has a single load associated with it. If the output of any individual node is higher than the specified threshold value, that node is activated, sending data to the next layer of the network. Otherwise, no data will be passed to the next layer of the network (Figures 4 and 5).
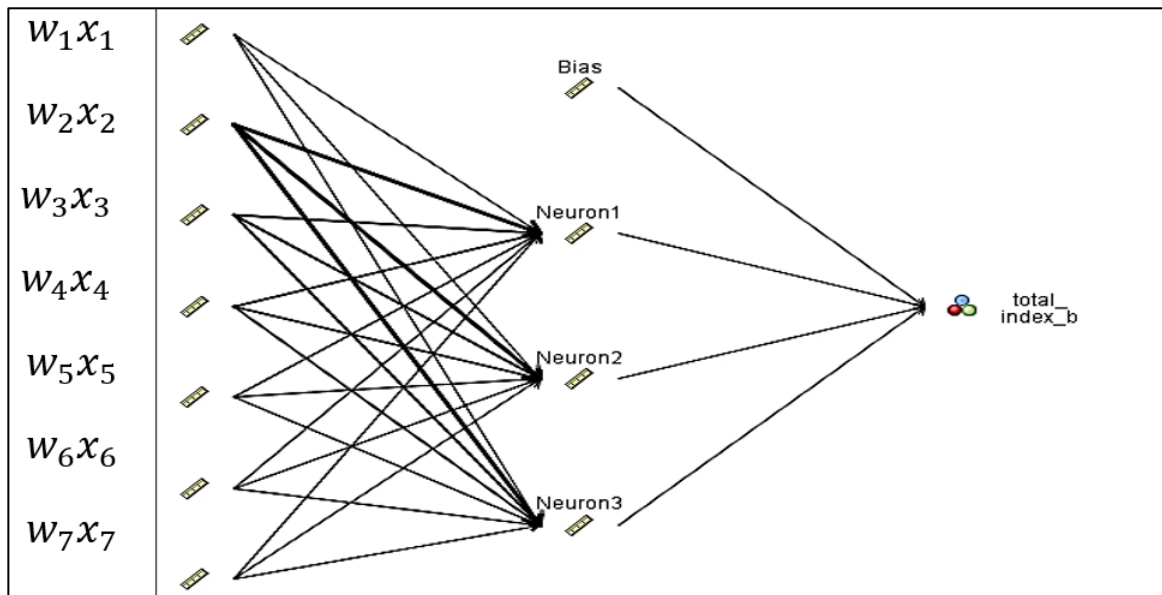
Figure 5: Neural network model with weight.

$$\sum_{i=1}^{m} w_i x_i + bias = w_1 x_1 + w_2 x_2 + w_3 x_3 + bais$$

$$Output = f(x) = \begin{cases} 1 & if \quad \sum w_1 x_1 + b \geq 0 \\ 0 & if \quad \sum w_1 x_1 + b < 0 \end{cases}$$

Once you select the input layer, the weights are allocated. These weights help determine the importance of any variable that has been identified, as the largest of them has a greater contribution to the output than the other inputs. All inputs are then multiplied by their respective weights and then summed. Then, the output is passed through the trigger function, which selects the output. If these outputs exceed the specified limit, they "launch" (or activate) the node, passing data to the next layer in the network. As a result, the outputs for one node are located in the inputs of the next node. The process of passing data from one layer to the next defines this neural network as a feed-forward network.

Let's analyze what a single node looks like using binary values. We can apply this concept to a more realistic example, such as if you go surfing (yes: 1, no: 0). The decision to go or not to go is our expected outcome or y-hat. Let's assume that three factors are influencing your decision-making.

6 Findings

In this part, the most important findings of the study are reviewed about the study sample's vision towards the educational work environment, work relations, workload, and their acceptance of the application of information technology in the current work system, and the suggested recommendations as follows:

- It turns out that about 78% of the opinions of the study sample agree very much and agree that the inclusion of information technology in the work system will improve the work system.

The majority of the study sample believes that the inclusion of information technology will achieve transparency in data knowledge and circulation, increase work efficiency and reduce human errors.

- About two-thirds of the study sample believe that the inclusion of information technology in the work system will lead to an increase in the sense of the value of workers and distinguish them from others in terms of their knowledge and use of the computer, as it will increase and open up other fields of work for them with a better wage.

- A quarter of the study sample believes that the inclusion of information technology in the work system will lead to an increase in the wage, whether it is additional or rewards.

- There is a statistically significant relationship between the duration of work in the current location and the preference for the work method, as the results showed that about 90% of the study sample prefer to work using the computer.

- About 74% of the study sample are moderately satisfied with the work environment.

- There is a statistically significant relationship between specialization, educational level, work duration, and work environment.

- There is no statistically significant relationship between workload, work relations, and all personal characteristics of the sample

- The subject needs further study, as the study population was small and needs to be studied on a larger scale. We suggest that it be carried out in several different departments in different governorates.

Providing the climate for spreading the culture of electronic management through holding seminars and meetings with specialists, provided that the influential administrations and those affected by the application of electronic management participate in them.

The importance of human resources in the successful application of electronic management.

Attention to the strategic direction of applying electronic management through a clear vision and specific long-term goals. Intensive and continuous training of employees on the use of computers and information technology, especially the provision of Internet connection so that employees become accustomed to using it and understanding it, and the provision of an e-mail system that helps facilitate and speed up communication between veterinary departments in the Eastern Province. Restructuring some procedures so that they are applied electronically.

7 Conclusion

Knowledge management techniques are the mainstay of knowledge management in the management of storage, transfer, and sharing of knowledge through which organizations can be supported in automating knowledge management processes to achieve increased speed, efficiency, and quality of their operations, thus achieving a permanent competitive advantage. This study aims to identify the modern trends in the employment of knowledge management techniques in Saudi higher education institutions. The study includes an analysis of the results of the theoretical framework that relied on documents, studies, and courts, and it contains many techniques used in

institutional environments that can be employed in knowledge management processes. The development of a proposed framework for the employment of knowledge management techniques in Saudi higher education institutions, and consists of various classifications (inputs, components, processes, outputs) so that it can help in the actual and clear application of procedures for the employment of knowledge management techniques for the actual benefit of knowledge in Saudi higher education institutions in proportion to the scientific value The study recommended the need to improve the efficiency and effectiveness of knowledge management techniques in Saudi higher education institutions and to take advantage of the dazzling web technologies to organize the knowledge in institutions and the Internet of Things technology in the service of scientific research and the formation of research town groups to share research interests and trends as well as ensure the facilitation of education and the investment of experiences and knowledge accumulated by individuals and faculty members, and monitoring material and moral rewards for employees who contribute to the transfer and sharing of knowledge.

8 Availability of Data and Material

Data can be made available by contacting the corresponding author.

9 Acknowledgement

10 Reference

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