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List of Abbreviations

Acronym	Definition
HEI	Higher Educational Institutions
KM	Knowledge Management
KMS	Knowledge Management System
IT	Information Technology
ICT	Information and Communication Technology
KBS	Knowledge Based Systems
NVU	Nile Valley University
KP	Knowledge Portal
FAQs	Frequently Asked Questions
CSFs	Critical Success Factors
SMEs	Small and Medium-sized Enterprises
PHP	Hypertext Preprocessor
URL	Uniform Resource Locator

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INTRODUCTION

This chapter introduces the current research with the background of the problem described first. After that, the problem statement, objective, key research questions, research hypotheses, scope, expected contribution, research importance, and the structure of this thesis are described respectively.

1.1 Background

Implementation of knowledge management (KM) in universities is very important because universities normally have two main roles: acquire new knowledge by scientific conferences and researches, and disseminating knowledge by teaching the students, and then among the society for further growth.

Knowledge has become a valuable resource in all universities, and knowledge management became very important due to its systematic management of an organization's knowledge assets for creating value and meeting tactical & strategic requirements.

It consists of the initiatives, processes, strategies, and systems that sustain and enhance the storage, assessment, sharing, refinement, and creation of knowledge.

Knowledge has been recognized as an essential resource that significantly contributes to the performance of universities.

Hence difficulties of accessibility to individual's thoughts and experiences must address, it will help academic staff and students to pick up their capabilities, talents, prior knowledge and experience and work on that to enlarge and adapt this knowledge more effectively and easier to cope up with present environment, and hence enhancing performance of higher education institute (HEI).

Any implementation of knowledge management project facing many challenges, so Sudanese universities needs to model for the requirements of successful implementation of KM in the university environment.

Sudanese universities need to clear and applicable framework of KM implementation for enhancing performance in order for the framework reduces the time, effort, cost, and provide guidelines to avoid the errors and road map to achieve successful KM implementation.

In order to test a proposed framework for enhancing university performance, knowledge portal must implements in the university's environment.

A knowledge portal was implemented in the Nile Valley University, a survey on academic staff and students need to be conducting in order to proving that using knowledge portal facilitating knowledge management processes, and enhancing university academic performance.

1.2 Problem Statement

Sudanese universities need clear guidelines for the requirement of successful knowledge management implementation.

Also Sudanese universities need a framework work as a roadmap for the application of knowledge management for enhancing universities performance.

Knowledge management processes in the university's environment need to be automate in order for enhancing university performance.

1.3 Research Aims and Objectives

The aim of this study is to investigate the role of knowledge management implementation in enhancing universities performance.

Given the problems presented above, the goals of this study are:

1) Proposing a framework of KM implementation for enhancing universities performance.
2) Implement knowledge portal in order to reflect processes in the proposed framework.
3) Conduct survey on academic staff and students in order to prove that using of knowledge portal facilitating knowledge management processes, and enhancing overall university performance.

1.4 Research Hypotheses

H1: Using knowledge portal positively and significantly affects on facilitating knowledge management processes.

H2: Implementing knowledge management positively and significantly affects on university performance.

1.5 Research Scope

The scope of this research focused on implementation knowledge portal for the Nile Valley University (NVU) - faculty of science and technology as a case study of effectively knowledge management system for enhancing academic staff and student's performance.

1.6 Expected Contribution:

This research aims to encourage knowledge sharing and other knowledge management processes in Sudanese universities, because it is the best way for enhancing performance of academic staff and students.

The researcher proposed applicable framework of KM implementation for enhancing universities performance, also researcher discusses challenges of the implementation of knowledge management in universities environment and a proposed a model for the requirement of successful implementation of KM project.

Financial resources normally hinder the successful implementation of knowledge management, so researcher present Mediawiki software as free and open source knowledge management system, and finally the researcher discuss steps of using knowledge portal from academic staff and students and everyday processes of knowledge management in the university sector.

1.7 Research importance

Implementation knowledge management is very useful and important to any higher education institution in order for:

i. Universities are the main source of preparing, transfer and developing human skills from lecturer to students.
ii. Universities have good IT infrastructure and knowledge sharing culture.
iii. Expert knowledge may be lost.
iv. Improving the quality of the education process.
v. Increasing efficiency and effectiveness of the Curriculum.
vi. Increasing productivity and creativity.
vii. Improving the overall performance in order to achieving a competitive advantage.

1.8 Thesis Structure

This thesis comprises six chapters, followed by references and appendices.

Chapter 1: gives an introduction to the research subject.

Chapter 2: discusses the literature review and some related work.

Chapter 3: presents research framework.

Chapter 4: introduces the implementation knowledge portal: case study of the Nile Valley University.

Chapter 5: presents data analysis result and discussions.

Chapter 6: presents the conclusions of the work and some recommendations.

LITERATURE REVIEW

This chapter describes the preliminary concepts and existing literature on knowledge management, the role of information technology in knowledge management implementation, the role of KM in enhancing universities performance. Section 2.1 describes an overview of knowledge, knowledge management, their types and processes. Section 2.2 describes importance of KM in the higher education institute; also it discusses importance of knowledge sharing culture, and risk of losing knowledge in universities. Section 2.3 discusses importance of information technology in knowledge management implementation, and knowledge management system. Section 2.4 describes success and failure factors of KM implementation in the universities environment. And finally section 2.5 discusses the relationship between KM and organizational performance.

2.1 Knowledge and Knowledge Management

Knowledge will be the main economic resource instead of financial investments, natural resources and work force (Drucker, 1995). Knowledge is embodied in people, and acquired on an individual basis. Therefore the entirety of knowledge on any one subject is usually impossible to obtain. No one person can take responsibility for collective knowledge (Fox & Rainie, 1999) .

Davenport & Prusak (1998) mentioned that knowledge locates at the apex of three-story pyramid (as shown in Figure 2.1):

i. At the first level of pyramid is data, which are unprocessed facts and figures without any added interpretation or analysis.
ii. The second level of pyramid is information; Information is data that has been interpreted so that it has meaning for the user.
iii. Knowledge locates at the third level of the pyramid. Obviously, it is more general and convincible than data or information, but still needs these two as a foundation. The knowledge includes structured experience, value, judgment, vision, intuition, expert's comment, and other values. Knowledge stems from information just as the information is originated from data.

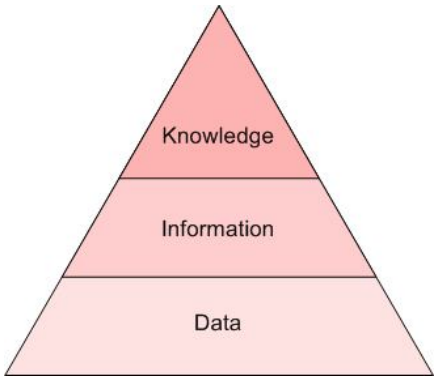

Figure 2.1: The structure of knowledge

Knowledge management was initially defined as the process of applying a systematic approach to the capture, structure, management, and dissemination of knowledge throughout an organization in order to work faster, reuse best practices, and reduce costly rework from project to project (Nonaka & Takeuchi, 1995) .

According to Dalkir (2005) knowledge management is the deliberate and systematic coordination of an organization's people, technology, processes, and organizational structure in order to add value through reuse and innovation.

KM is the process of transforming data into information and intellectual assets and thus enhancing its value. It also helps in connecting people with the knowledge that they need to initiate action (Kidwell et al, 2001). In fact, KM is making the right knowledge available to the right person at the right time in the right presentation for the right cost (Holsapple & Joshi, 1999).

Knowledge management brings together three core organizational resources (as shown in Figure 2.2) that are: people, processes and technologies. To enable organization to use and share information more effectively (Petrides, A, & Nodine, 2003).

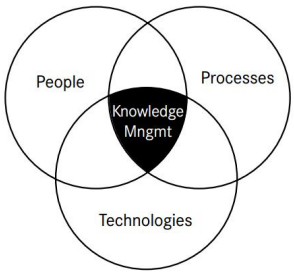

Figure 2.2: The Key Realms of Knowledge Management

According to Smith (2001) there are two types of knowledge.

i. Explicit Knowledge: is recorded and well documented information that helps in taking action and also expressed in formal language.
ii. Tacit knowledge: is knowledge people carry around in their head. It is embedded within the head/minds of researchers of the institution or organization.

According to Tsai et al, (2006) OVUM proposed a model for the exchange of knowledge as shown in Figure 2.3. It is obvious that the tacit knowledge can be converted into explicit knowledge by intense coordination process.

All processes include:

i. Sharing: To share personal tacit knowledge with others.
ii. Capture: Extract the essence from the tacit knowledge to become organizational explicit knowledge.
iii. Classification: By proper classifying, the capturing knowledge and being stored at the place where it is easy to access for all employees, i.e. at Website.
iv. Understanding: By fully understanding, the actual meaning of explicit knowledge can be extended; then the corresponding innovated knowledge can be shared with others.

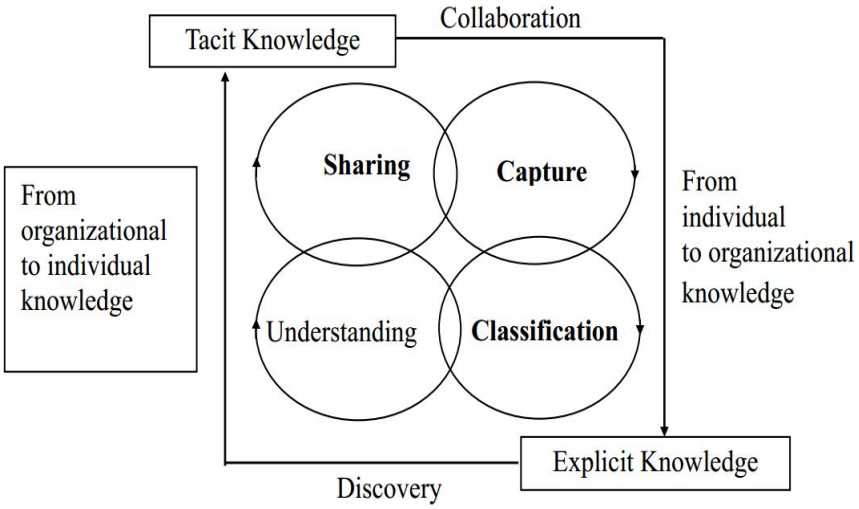

Figure 2.3: OVUM Structures of Knowledge Exchange and Integration

2.1.1 The Nonaka and Takeuchi Knowledge Spiral Model (SECI)

Convert tacit knowledge into explicit knowledge has attracted many researchers concerns, most popular of knowledge conversion or process is introduced by Nonaka and Takeuchi (1995) as shown in figure 2.4. They have investigated the relationship between tacit knowledge and explicit knowledge and have described four phases of knowledge conversion: socialization, externalization, combination and internalization.

1) Socialization: Transfer tacit knowledge from one person to another person.
2) Externalization: Translate tacit knowledge into explicit knowledge.
3) Combination: Combine different bodies of explicit knowledge to create new explicit knowledge.
4) Internalization: Extract the explicit knowledge from and deliver it to that person where it is translated into tacit knowledge.

These four words (socialization, externalization, combination and internalization) constitute the first letters of Nonaka & Takeuchi (SECI) model.

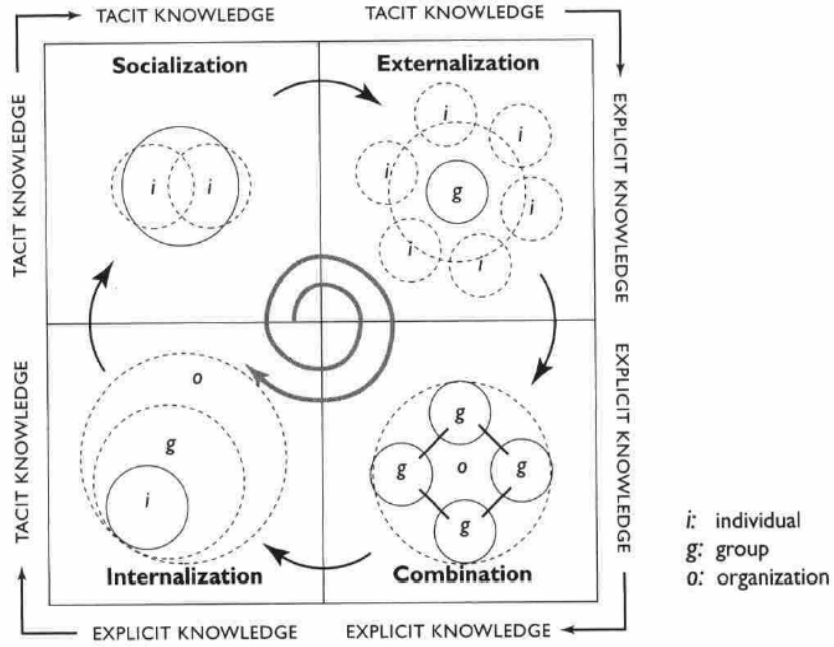

Figure 2.4: The Spiral Model (SECI)

2.1.2 KM Processes

According to Dalkir (2005) there are four Knowledge management processes for gathering knowledge:

1) Knowledge discovery: development of new tacit or explicit knowledge from the synthesis of prior knowledge.
2) Knowledge capture: process of retrieving either explicit or tacit knowledge that resides within people, or organizational entities.
3) Knowledge sharing: process through which explicit or tacit knowledge is communicated to other individuals.
4) Knowledge application: process through which explicit or tacit knowledge is utilized to guide decisions and actions.

2.2 KM in the Higher Educational Institute

Higher education institutions are knowledge-based organizations, composed of a large number of academic staff and students who are interacting with each other's, for a purpose of share effective knowledge inside them and improving teaching activities. Each HEI is unique in its scope, size, and priorities, so HEIs need

to manage their knowledge effectively for preserving competitive advantages to ensure the quality of their products and to ensure that a good academic experience is achieved by their students.

Implementing knowledge management using specific KM techniques and technologies in higher education institute is vital as it is in the corporate sector. We are critically needed to KM in universities because the floods of huge quantity of knowledge through the universities are needed to effective management.

If information is the currency of the knowledge economy, human expertise is the bank where it is kept, invested and exchanged (Omotayo, 2015). There are a lot of motivations for implementing KM in universities:

1) All universities have a good infrastructure for information.
2) Sharing of knowledge is smoothly in all institutes. Due to academic environment in general is considered trustful in the sense that no one is hesitating nor being afraid of publishing knowledge.
3) Improving the quality of educational programs and scientific research.
4) Improved speed of curriculum revision and updating.
5) The fear of losing academic staff's undocumented knowledge.

Sudan as a country is naturally endowed with large population. Abukashawa (2016) Assert that the public higher education institutions comprise 30 universities, and the private higher education institutions comprise of 13 universities and 60 colleges, so managing knowledge is the key towards organizational performance to get the competitive advantage, HEI are suitable places to utilizing knowledge.

According to (Nour, Nadir, & Khalid, 2013) the knowledge based system (KBS) by itself is not a solution to any development problem; it only provides an opportunity. Authors assert that provide learning workspaces and sharing knowledge not to be significant to the role of KBS in Sudanese HEI due to the lack of KBS jobs in Sudan in addition it is a new field and it is not known for most Sudanese institutions. Authors mention some challenges for Implementing KBS in Sudanese HEI includes:

i. Lack of relative KBS tools and techniques.
ii. Low level of awareness and understanding of the topic.
iii. Lack of implementation of research based system in term of KBS.

According to Bhusry, Ranjan (2011) the growth in the number of HEIs in the last decade has increased competition and the pressures for performing better. This

has forced the institutions to recognize the need for knowledge management initiatives which is a key asset. KM intervention differed from institution to other depending upon the organizational structure, goals and targets, organizational responsibilities and the decision making authority. The results of the study assert the opinion that KM initiatives can play an important role in enhancing the performance and effectiveness of HEIs in their major work domains.

Bhusry, Ranjan (2011, p. 36) confirm that HEIs create explicit knowledge in the form of documents, procedures, results as well as tacit knowledge in the form of experiences, judgments, views and perceptions that resides with individuals. KM in higher educational institutions aims at integrating the knowledge produced at all levels and using it towards the institute's goals and targets. This will have the implications of improving the operational quality, capacity development and effectiveness of the organization leading to enhanced productivity and performance.

Pinto (2012) asserts that HEIs face many challenges in the knowledge economy such as:

i. Renew economic and social systems.
ii. Extend knowledge and specialist skills.
iii. Engage effectively in knowledge production.
iv. Be interconnected with industry, research centers and other institutions.
v. Produce top quality graduates.

Universities are the main instruments of society for the constant pursuit of knowledge. Institutions of higher education can deeply benefit from KM by creating and maintaining relevant knowledge repositories, improving knowledge access, enhancing the knowledge environment and valuing knowledge.

On the other hand, these issues miss their importance if the institution does not have a strategy and a culture of creating, sharing and collaboration between the various actors across the organization.

2.2.1 Importance of Knowledge Sharing Culture

Effective knowledge sharing is essential for the universities, due to the knowledge anchored in academic staff minds can get lost if they decide to leave the university or died.

Academic sector have significant opportunities to apply knowledge management practices to their mission. Academic staff and students must interact together to collect, analyze, synthesize and disseminate knowledge to develop mutual benefit for universities growth, knowledge sharing opens the opportunity to all members of universities to share the knowledge, techniques, experiences, and ideas they have to other members.

According to Daud, Hamid (2006) knowledge sharing is a mechanism for faculty members to capture, disseminate, transfer and apply useful knowledge. As a conclusion, the study shows that successes of knowledge sharing are based on three main factors; motivation, encouragement and stimulation of individual employees to capture, disseminate, transfer and apply useful knowledge that will benefit all employees and leaders.

Matin et al (2010) assert that effective knowledge sharing will causes overall organizational performance improvement in terms of learning, growth, internal processes, customer and financial affairs.

Matin et al (2010, p. 103) define knowledge sharing as any processes include knowledge flows between resource and receiver. Each person or organizational unit can be a source, sender, facilitator or mediator between source and receiver. In fact, the aim of any knowledge sharing process is to transfer the knowledge from resource to receiver successfully; Generally fundamental fields which can impact knowledge internalizing are:

1) The relationship between source and receiver.
2) Knowledge format.
3) Receiver's tendency to learn.
4) The capability of sharing the knowledge.
5) The environment where knowledge is shared.

Lastly, the structure of the university is recommended to be flat structure and linkages between colleges must be established to increase the interaction between colleges and produce integrated body of knowledge so that the university can avoid reinventing the wheel.

Knowledge sharing is vital to the success of knowledge management practices in all organizations, inclusive of universities.

2.2.2 Risk of Losing Knowledge in Universities

Knowledge has been acknowledged as a vital competitive asset in HEIs.

In the current knowledge economy, employees in an organization are considered the key competitive advantage, and most important asset. If an employee leaves an organization, they take the knowledge they have acquired with them. The loss of knowledge is a potential threat to an organizations existence, especially if an employee with valuable knowledge leaves to join a competitor (Hana, Lucie, 2011).

According to Jennex (2009) the probability of knowledge loss factor rates the likelihood of a human knowledge source being lost. Loss of human knowledge sources occurs in several ways like retirement, turnover, disability, and job change.

Factors that influence probability of knowledge loss include age, health, uniqueness of skills and knowledge, demand for skills and knowledge, years of service, and social network. Factors that impact the consequence of a loss of human knowledge sources include criticality to competitive advantage, key skill, key experience, and key contributor.

There are two factors that mitigate the overall consequence of knowledge loss: ease of replacement and numbers of sources possessing the knowledge.

2.3 The Role of Information Technology in KM

Information technology (IT) infrastructure considered as a crucial element in the linkage of information and knowledge integration in universities because with good IT infrastructure the knowledge become available anywhere and anytime.

According to Akhavan et al (2010) there are normally two dimensions associated with any KM. The first dimension includes technologies and communication technologies, and the other one includes human resource of organizations.

The role of IT in KM is a vital aspect for any organization which intends to use the technologies for managing their knowledge. In fact, conversion process of information and knowledge happens through IT which represents the external power of understanding, learning and gathering the necessary information. If properly used, IT can also accelerate knowledge-sharing capabilities in both time and space dimensions.

Liophanich (2014) finding that information technology infrastructure is one of the most critical factors for the KM success. It allows faster and more convenient knowledge accessibility, knowledge sharing, and knowledge exchange. Only

availability of IT infrastructure is not enough for KM success. It must be clearly understood, accepted, proper use as well as reliable, accurate and user-friendly to play role in KM efforts.

The following main applications were found to facilitate KM.

1) A web portal is a single point of access for employees to capture, store, and access knowledge.
2) An eLearning is used to accelerate learning cycle.
3) Collaborative software brings people working together; document or ideas pass through a team online by two-way communication and then increase speed of organization's interaction.

The major information and communication technology (ICT) tools used for the purpose of KM are email, voice mail, teleconference, videoconference, wikis, instant messaging, online learning applications, FAQ database, reporting tools, e-calendars, collaboration tools, data servers for repository of documents and others (Alhawari et al, 2012)

2.3.1 Knowledge Management System

Knowledge Management System is the key in achieving key competitive advantage in the university sector. According to Frost (2017) knowledge management systems refer to any kind of IT system that stores and retrieves knowledge, improves collaboration, locates knowledge sources, searches repositories for hidden knowledge, captures and uses knowledge, or in some other way enhances the KM process.

Knowledge management systems have many categories like:

1) Groupware systems.
2) The intranet and extranet
3) Data warehousing, and data mining.
4) Decision Support Systems
5) Wikis
6) Content management systems
7) Document management systems

Wikis can be used to enhance the learning process. A wiki is a web communication and collaboration tool that can be used to engage students in learning with others within a collaborative environment.

By incorporating wikis into the classroom, educators can better prepare students to make innovative uses of collaborative software tools (Kevin & Joseph, 2007) .

Chia-Han et al (2009) assert that wiki is open source systems available for small research communities. Currently, wiki has not only changed the conception of building knowledge in an on-going process, but also become a popular tool of sharing knowledge worldwide.

Wiki help students quickly grasp the expertise of their specific domain knowledge as new comers and become experienced researchers at the end of their learning process.

2.4 Success and Failure Factors of KM Implementation in HEI

This section discusses most critical factors contributing to a successful implementation of knowledge management and barriers of implementation in the Sudanese universities environment. Investigating failure factors of knowledge management projects will reveal lessons learned for knowledge management practitioners and researchers.

2.4.1 Success Factors of KM Implementation in HEI

Organizations always look for factors which lead into successful knowledge management system (KMS) implementation in order to acquire competitive advantages.

Heaidari et al (2011) investigate the most critical success factors (CSFs) in implementing a KMS such as:

1) Organizational culture.
2) The commitment by senior managers.
3) Employee involvement.
4) Employee training.
5) Teamwork.
6) Information technology infrastructure.
7) Performance measurement.
8) Knowledge structure.

Skyrme, Amidon (1997) indicates CSFs for the implementations of a KM include:

1) The need to have a strategic link between KM and business objectives.
2) Developing a compelling vision for KM.
3) The existence of KM leadership.
4) Possessing a knowledge creating and sharing culture.
5) Having a well-developed technology infrastructure.
6) The need for measurement of KM activities and outcomes.
7) Adequate control and coordination of KM activities.
8) Provision of enabling resources and training.
9) Possessing a KM ontology and repository.
10) Introducing new structures, roles and responsibilities.
11) Providing motivational incentives.

Margilaj, Bello (2015) assert that CSFs of KM are:

1) Culture of organization.
2) Leadership in management.
3) Organizational structure.
4) Information technology.
5) Organizational strategy.

Firms benefit from a comprehensive understanding of the factors that are critical to the implementation of KM. (Sedighi & Zand, 2012) Identifies eight major factor's clusters that influence the success of KM implementations in organizations.

Two clusters illuminate environmental factors like macro factors that include seven sub factors legal, economic, political, social, educational, technological, and lastly globalization. And meso factors that includes two sub folders partnership, benchmarking. And remain six clusters denote organizational factors like culture, structures & procedures, human & financial Resources, technology & infrastructure, strategy & leadership, and KM processes.

The Republic of Sudan is considered one of the Islamic and Arabian country, and the Arabian's and Islamic culture are mostly is the same in all other country specially in the sharing culture, In the study conducted in the Jordanian private universities, Al-oqaily et al (2014) revealed that most important successful factors of KM implementations are: organizational culture, effective & systematic processes,

knowledge measures, knowledge organization, and knowledge systems infrastructure. The universities should be aware of many KM implementations determinates such as distinguished between qualification levels, the differences of employees' experience years, the effective IT infrastructures. Therefore, the universities represent efficient environments to adopt the KM implementations.

Samad et al (2014) confirming the effectiveness of knowledge management systems and investigate most critical factors contributing to a successful implementation of knowledge based system like:

1) Leadership.
2) Employee training.
3) Performance measurement.
4) Information system infrastructure.

Statistical tool helps researcher to conclude that leadership and information system infrastructure have significant relationship with implementation of knowledge management system.

2.4.2 Failure Factors of KM Implementation in HEI

Saeed and Mohammad (2011) observed that most important obstacles to knowledge management replacement in Iranian institutions are as follows:

1) Unawareness of senior managers about knowledge management concepts.
2) Lack of proper competition among institution for attracting customers.
3) Lack of formation of knowledge management team.
4) Lack of proper information interchange among institutions.

Frost and Crnjar (2014) classified knowledge management implementation barriers into:

1) Organizational Barriers include poor management support, poor organizational structures, lack of leadership, insufficient planning, lack of awareness of KM provisions and lack of knowledge sharing.
2) Human Barriers include cultural barriers, staff retirement, staff defection and failure in ownership. These barriers lead to poor employee motivation, which subsequently fails to be committed to

work and reduces their productivity and drive to achieve the objectives of the sector.

3) Technical Barriers include insufficient infrastructure, poor IT design and planning, poor networking and lack of maintenance and training needs.
4) Political Barriers include the challenges involving the creation of meritocracy of ideas and knowledge markets.
5) Financial Barriers comprise of financial needs for professional development, poor financial investment of the organization, and insufficient IT investment.

Frost (2014) investigated the more specific problems, labeled "resultant failure factors". The problems outlined in these factors would generally come about as symptoms of deficiencies with one or more of the factors. For instance, losing knowledge due to staff retirement is a result of poor planning. Similarly, a lack of widespread contribution could be the result of an inadequate organizational culture.

Nour-Eldin et al (2011) Assert that most staff in Sudanese companies agrees with the failure factors (poor infrastructure, cost problem, security issues, and growth of ICT).

2.5 KM Implementation and Organizational Performance

Karadsheh et al (2009) Emphasizes there is a strong competition among organizations and rapid changes in business surroundings. Therefore, the organizations start thinking of developing their performance and processes. In this regard, KM processes have turned out nowadays to become an organization strategic resource to the extent in which KM is viewed as a base of success or failure.

Devi and Narayanamma (2014) investigate the relationship between implementation of KM and organizational performance. The results revealed that learning based KM is relatively high when compared to other constructs of KM in academic institutions and capture based KM is a better predictor of organizational performance.

The degree of an achievement to which an employee’s fulfill the organizational mission at workplace is called performance; the job of an employee is build up by degree of achievement of a particular target or mission that defines boundaries of performance (Cascio, 2006)

Abdel et al (2012) investigated the role of knowledge management in enhancing the organizational performance in some Egyptian organizations, results of correlation analysis show significant relationship between knowledge management elements and performance improvement measures, also the paper assert that factors like organization type and size affect level of adopting knowledge management; whereas factor like sector type affects the role of knowledge management in enhancing the organizational performance.

Knowledge management works to develop the university performance and links it directly to the society, knowing the need of the marketplace, setting the relevant curricula and the effective teaching methods that serve the society, especially through the internet webs that facilitate knowledge sharing with the society, and the rapid communication with it (Munir & Rohendi, 2012) .

Ruiz-Mercader et al (2006) provides empirical evidence of the relationship between information technology and learning in small businesses as well as their impact on organizational performance. The authors are seen information technology as a key tool in knowledge management processes. Nevertheless, the presence of information technology neither guarantees knowledge creation, knowledge distribution nor knowledge use.

Gholami et al (2013) investigate KM practices like knowledge acquisition, knowledge storage, knowledge creation, knowledge sharing, and knowledge implementation, and organizational performance includes critical components such as productivity, financial performance, staff performance, innovation, work relationships, and customer satisfaction.

Thus, small and medium-sized enterprises (SME) managers should be committed to provide a supportive climate and culture, one that motivates employees and supervisors to implement the mentioned KM practices.

(Pinto, 2012) proposes a framework to manage knowledge, as well as the processes and activities that enhance knowledge, in higher education institutions.
The framework proposed includes a technological infrastructure that supports KMS architecture: databases, repositories, intra and internet, email server, etc. In an upper layer, the KMS offer support to the knowledge management processes and activities.

The framework establishes a relationship between processes and tools, facilitating the selection of the most appropriate KMS according the organization needs and strategy.

KMS can offer a relevant contribute to KM activities, by supporting and enhancing processes related with organizational knowledge crucial to the organization.

However, this contribute can only be achieved if KMS are focused on the processes that bring value added and competitive advantage to the institutions, according their strategic objectives.

RESEARCH FRAMEWORK

3.1 Introduction

This chapter discusses the proposed model for the requirement of the successful KM implementations; also it's discussing the proposed framework of KM implementation for enhancing universities performance.

3.2 Model for the Requirement of Successful KM Implementation

The researcher proposed model for the requirement of successful implementation of KM project as shown in figure 3.1, the model consists of four requirements respectively IT infrastructure, university culture, management structure and support, and finally human and financial resources.

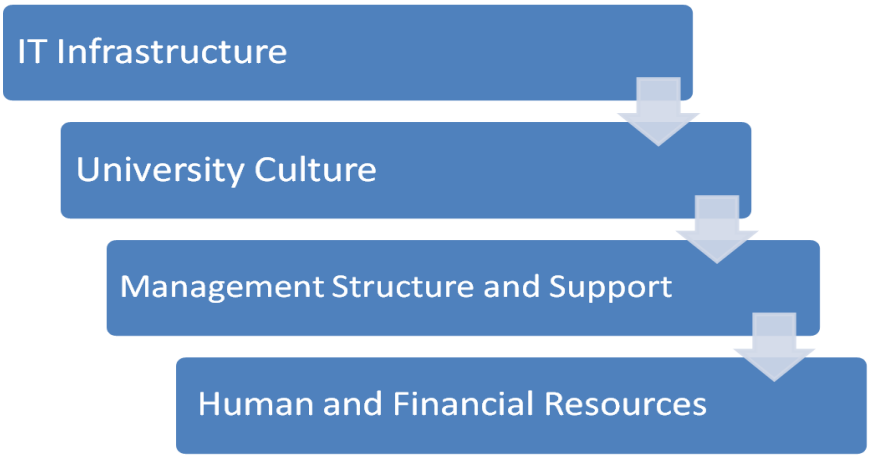

Figure 3.1: Proposed model for the requirements of successful KMS implementation

3.2.1 Information Technology Infrastructure

IT infrastructure is the combination of communication technologies, systems (databases, servers, computers, information devices) and the processes that make it all work.

Implementing knowledge portals in the universities can provide excellent infrastructure for accessing, storing and sharing knowledge; due to the most universities are already having a good information technology infrastructure.

Excellent IT infrastructure is very useful in:

1) Support the universities systems needs.
2) Enables and facilitates knowledge management efforts.

3) Supports collaboration work, and allows all university members to access all global resources.

3.2.2 University Culture

Literature reveals a very important role to university culture for successful implementation of KM due to anyone can copy a company's strategy, but nobody can copy their culture.

University culture encompasses collective values, beliefs, norms, principles, behaviors and habits of university members that contribute to the unique social and psychological environment of the university.

University culture affects the way academic staff and student interacts with each other, and society, university should prepare appropriate culture in order to increase productivity, growth, efficiency and reduce counterproductive behavior and turnover of academic staff.

Universities must invest in training for enhancing academic staff knowledge. Also strong internal communications and encouragement leading to a high level of performance and innovation.

University culture is very important in facilitating knowledge sharing and creation of it for successful implementation of KM, and academic staff must be willing to share their knowledge with others.

Management of the university has a main role in motivation and support sharing of knowledge.

In order to maintain competitive advantage, university will be required to abandon their ideas of knowledge hoarding and embrace knowledge sharing.

3.2.3 Management Structure and Support

The role of management structure and support in knowledge management is driven and support KM, through hiring expert academic staff.

Management responsible for managing the day-to-day operations and profitability, implement board decisions and initiatives and to maintain the smooth operation of the university. Senior management support is important for the implementation of IT projects; also senior management must offer rewards and incentives for knowledge creation and sharing.

The university structure must not be so rigidly enforced so as to stifle informal structures such as communities of practice, where knowledge sharing and creation may be taken.

University structure impact knowledge flows, so vision, goals, ideals and a climate of trust can serve as a way to lessen the distance between university members and community.

University management, structure and culture must be 'knowledge-friendly' and help to build the capabilities university needs to achieve its strategy.

3.2.4 Human and Financial Resources

The objective of KM Implementation is access to knowledge and information in less time and without effort, knowledge portal need to professional administrator which the main role is daily maintenance of the knowledge base and newcomers training for the university to deal with the knowledge portal, preferably the university should be appointed knowledge management team, and trained the team to perform their duties to the fullest.

In order to successful implementation, financial resources must be allocated to acquire new competencies through training and development.

All academic staff and students should participate in a knowledge portal project and senior management should motivate and encourage knowledge sharing.

3.3 The proposed framework of KM implementation for Enhancing the University Performance

The researcher presented framework for KM implementation as shown in figure 3.2. Framework is very important for the universities that intend to implement the KM system, because framework reduces the time, effort, cost, and provide guidelines to avoid the errors and road map to achieve successful KM implementation.

The proposed framework is consisted of five knowledge management main processes. These main KM processes are:

i. Identify and capture.
ii. Organize and storage.
iii. Sharing knowledge.
iv. Application of knowledge.
v. Evaluation of knowledge.

The outcome of the implements the proposed framework is enhancing the university performance.

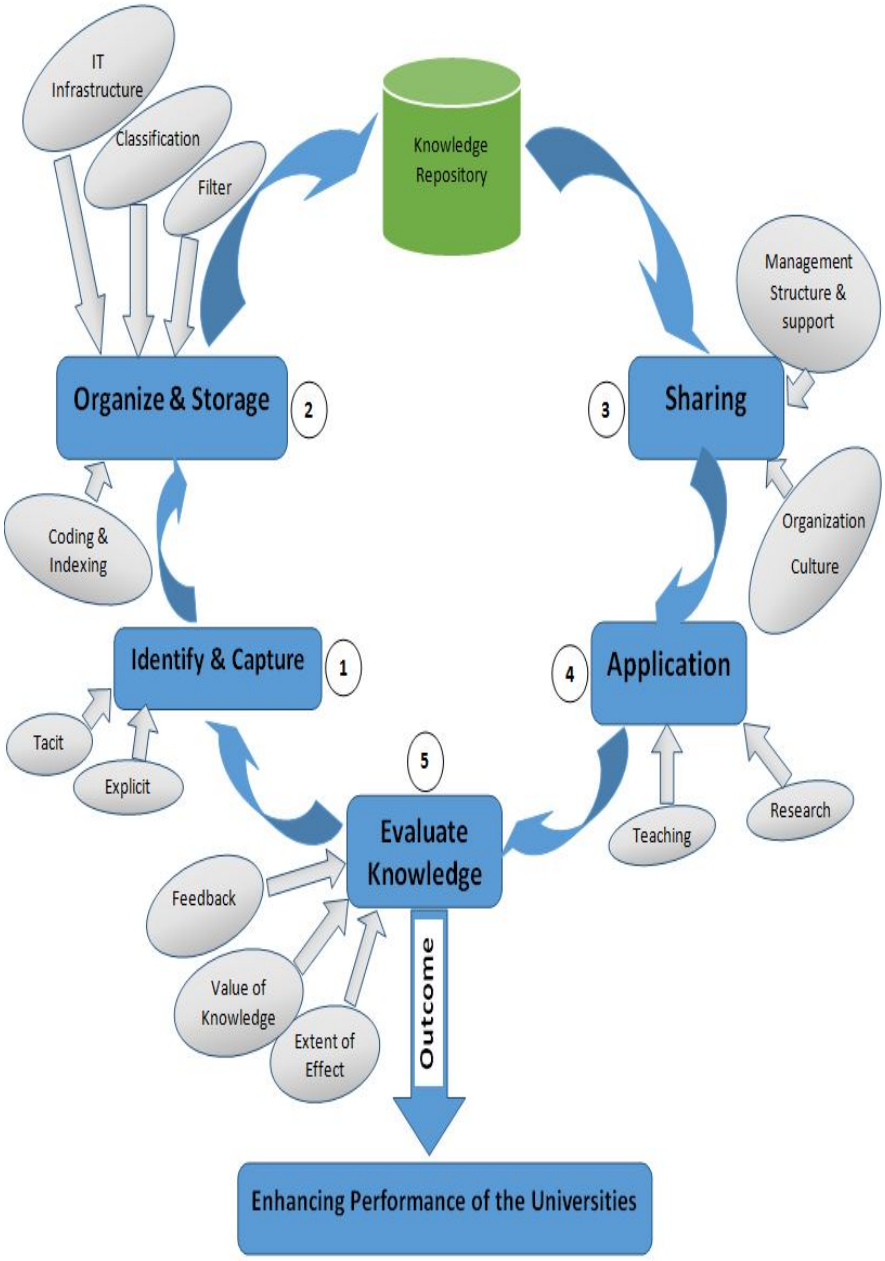

Figure 3.2: Proposed Framework of Using KM for Enhancing Universities Performance

3.3.1 Knowledge Identify and Capture

Identify and capture is first KM process which framework will start with it, the generation of a new knowledge is the result of developing a collaborative and sharing culture in the universities.

University member can identify and capture new knowledge from:

1) Analyzing existing information to create new knowledge.
2) Combining explicit knowledge exists in university.
3) Extracting tacit knowledge found in expert academic mind.

Identify knowledge determines different sources of knowledge.

Knowledge capture converts tacit knowledge founded in the mind of expertise human into explicit form, and then knowledge becomes available to everyone in the university or in the society.

3.3.2 Knowledge Organize and Storage

Knowledge organize provides filtering, coding, indexing, and finally classifying knowledge for easy later recovery.

1) Knowledge filtering is doing by knowledge workereful to ensure knowledge is accurate, valuable and up-to-date before it can be shared.
2) Knowledge coding is the process of assigning a code to explicit knowledge for the purposes of classification or identification.
3) The knowledge index is referenced or indicator to the place where knowledge is located in the knowledge base.
4) Knowledge classifying is arranging knowledge in classes or categories depending on shared characteristics for easy access later.

Knowledge store used to access university knowledge by maintaining the generated knowledge in the knowledge base to facilitate knowledge dissemination.

With good IT infrastructure the knowledge have become available anywhere and anytime, also IT facilitates the transformation of tacit knowledge into explicit knowledge.

3.3.3 Knowledge Sharing

Knowledge sharing is a process of transferring knowledge between academic staff, student and then to the overall society to avoid reinventing the wheel. This process is considered an important process over all other KM processes because knowledge considered a valuable intangible asset, and because the main goal of KM is to share lessons learned, best practices and connecting people with the knowledge.

The importance of knowledge sharing in the university's environment due to the knowledge anchored in academic staff minds can get lost if they decide to leave the university or died.

Process of knowledge sharing depends on many factors like:

i. University culture.
ii. Trust.
iii. Management structure and support.
iv. Incentives and rewarded.

Some of academic staff or students don't have knowledge share culture; they imagine if they publish their personal knowledge lose their competitive advantage, therefore the management played a major role in this by giving support, incentives and rewarded to academic staff and students.

Information technology infrastructure and systems facilitate knowledge sharing process.

3.3.4 Knowledge Application

Knowledge application is process of using stored knowledge in:

i. Establish or confirm facts.
ii. Reaffirm the results of previous work,
iii. Solve new or existing problems,
iv. Support or develop new theories.
v. Performing tasks.
vi. Making decisions.

Knowledge applied in university sector in two important fields teaching and research, knowledge is useless without application because the real value of knowledge is not in plentiful but in the right application of it, and also application without knowledge is very dangerous because it may be leading to wrong way.

When we apply knowledge in teaching and research, new knowledge will generate from the observation, and we can learn from it.

3.3.5 Knowledge Evaluation

Not all knowledge existed in the knowledge base is useful and applicable, so evaluate knowledge is very important especially in universities environment.

After evaluating knowledge by commenting in discussion page, we see the value of it, and is it rich or poor. In addition we will see extent of effect and send feedback to the knowledge worker and that will contribute to overall university performance.

Evaluate knowledge maintains it up-to-date in the knowledge base; also evaluate knowledge after applying it indicates the success of KM cycle.

3.3.6 The Outcome of the Framework Implementation

Successful implementation of the proposed framework of Knowledge management will enhance the university performance. This enhancement includes:

1) Increasing academic staff and student's knowledge.
2) Knowing the need of the marketplace for alumni.
3) Setting the relevant curricula and the effective teaching methods that serve the society, especially through the internet webs that facilitate knowledge sharing with the society, and the rapid communication with it.

Senior managers should be committed to provide a supportive climate and culture, one that motivates employees and supervisors to implement the mentioned KM practices.

THE IMPLEMENTATION OF KNOWLEDGE PORTAL

4.1 Introduction

This chapter analysis the profile of Nile Valley University as the case study of knowledge portal implementation will be conducted, and functions of MediaWiki software as a knowledge portal implemented will be investigated.

4.2 Profiles of Nile Valley University as the Case Study of KM Implementation

Nile Valley University has a special and unique place among the Sudanese universities. It is the first and foremost university to be established in the north of Sudan. It was established in 1990. Two other universities have branched from the Nile Valley University: Shendi University and Dongola University.

Nile Valley University has twelve faculties and two centers. Every year the number of student's admission is increasing due to the provision of new programs, courses and specializations.

Nile Valley University in all its faculties and colleges, always seeks to observe and maintain self-assessment and accreditation, and total quality insurance.

NVU gives especial care and attention to scientific research, authorship and publication. The university supports the dissemination and sharing of knowledge through the Nile scientific Journal. The journal aims to provide an opportunity for researchers to publish their research in all branches of knowledge, the journal accepts all researches whether in Arabic or English.

Nile Valley University has good information technology infrastructure, its offers networking services for all colleges and centers, all colleges are connected with fiber optic with high-speed of the internet.

Also the university has website which consists of a page for every college, center, and academic staff, NVU website published all the university news, and presenting another services like e-registration, email, and digital library.

4.3 Knowledge Portal Implementation in the Nile Valley University

Universities are faced challenges from lack of proper and organized knowledge. For that purpose the researcher implemented knowledge portal in the Nile Valley University, also researcher discuss steps of using knowledge portal from academic staff and students and everyday processes of knowledge management.

Specialized knowledge portal (KP) is a tool used for research collaboration and knowledge management.

KP provide a flexible knowledge environment to a potentially large number of users, it's doing all KM main Processes like capturing, classification, storing, sharing and leveraging what their university members know, KP is flexible and easy to use and may provide almost any kind of content or functionality.

KP present various types of content like projects, lessons learned, solutions methodologies, procedural frameworks, frequently asked questions (FAQs), case studies, technology news, reports, university member skills, contact information, education, experiences, know-how, and best practices.

4.3.1 Knowledge Portal Used: MediaWiki

Researcher introduces Mediawiki as a knowledge portal work as a knowledge management system in a university environment because it is considered a content management system and groupware at the same time. Currently, wiki is a popular knowledge sharing tool well-known to most web users; it’s an example of technology with high ease of use.

The first version of the software was deployed to serve the needs of the Wikipedia encyclopedia in 2002. Wikipedia and other Wikimedia projects continue to define a large part of the requirement set for MediaWiki. The software is optimized to efficiently handle large projects, which can have terabytes of content and hundreds of thousands of hits per second.

The software has more than 900 configuration settings and more than 2,200 extensions available for enabling various features to be added or changed.

MediaWiki is a free and open-source wiki application. it runs on many websites, including wikipedia, wiktionary, wikia, wikihow and wikileaks and wikimedia commons. It is written in the PHP programming language and stores the contents into a database. Like WordPress, which is based on a similar licensing & architecture, it has become the dominant software in its category.

It has also been deployed by some companies as an internal knowledge management system, and some educators have assigned students to use MediaWiki for collaborative group projects.

A number of alternative wiki encyclopedias to Wikipedia run on MediaWiki, including citizendium, metapedia, scholarpedia and conservapedia. MediaWiki is also used internally by a large number of companies, including Novell and Intel.

MediaWiki has been partially or fully translated into more than 70 languages. Wikipedia, MediaWiki's first program, is one of the highest traffic sites on the World Wide Web.

4.3.2 Functions of Knowledge Portal

Researcher used mediawiki software as knowledge portal for the following reasons (Kevin & Joseph, 2007, p. 66) :

1) Mediawiki support Arabic, and not all students fluent in English.
2) Mediawiki is open source and free, no need to fund.
3) Mediawiki is a web system which provides online collaborative environment and community building for knowledge sharing and experiences with each other.
4) Mediawiki is used for idea generation, and bring user feedback for evaluating existing knowledge.
5) Mediawiki is very useful for communities of practice, and communication between geographically distributed groups.
6) Everyone can contribute or modify the information on the web page; with full control of users and groups in editing content and viewing it.
7) It is very easy for Mediawiki to set up a topic to allow users to publish their opinions in the same set of pages, this easy to use lead to effective participation.
8) Users may not need to extensive training.
9) Friendly and popularity interface.
10) Wikis are best suited for building a knowledge base from a variety user input.
11) Knowledge will be more available at anytime and anywhere.
12) There is also no need for specialized software to be installed on end-users.
13) Mediawiki is accessible through any web browser even through mobile.

4.4 MediaWiki Implementation in the Nile Valley University

The researcher installing mediawiki software on the local computer, and then uploads it on 5hark.net hosting. Therefore, everyone can access it from a link (http://nvuit.5hark.net), as shown in figure 4.1, so all academic staff, students, and even members of society can benefit from authorized knowledge sharing from university.

The formal language of knowledge portal is Arabic, because it's mother tongue of all Sudanese, but users have an account can change it to any other language from their preferences.

The default configuration in the mediawiki is anyone can create an account and edit the information. The researcher disable creates account button, and denies everyone doesn't have an account from editing information on the knowledge portal, but they can read anything as showed in figure 4.2.

Only academic staff and authorized user have an account can login into portal and editing the content so can deny unreliable and incorrect knowledge from publishing on portal.

Figure 4.1: Main Page

Figure 4.2: Main Page of Knowledge Portal without login

The researcher proposed framework of KM implementation in the universities environment, which consisting of five KM processes leads to enhance universities performance.

i. First process is identifying knowledge and captures it. In the main page of the implemented knowledge portal authorized users can create and edit main page, to create a new page search it in the search box at the top of the page, if the page is found you can edit it, else you can create it from creating a page link as shown in figure 4.3.

ii. The second process is organized and stores knowledge. Mediawiki is automatically generate a table of contents from four heading level of title and subtitles that user created as shown in figure 4.4, which helping in coding and classifying the knowledge for easy access later, user can hide a table of contents or let it visible.

Mediawiki presented built-in editor contains nine buttons which offers many type of formatting for web page like bold, italic, internal and external link, heading, insert picture and sound, ignore wiki formatting and using HTML format, horizontal

line, (*) for bullet list, and (#) for numbered list, as shown in figure 4.5, with mediawiki editor you can show a preview for a page before saving it.

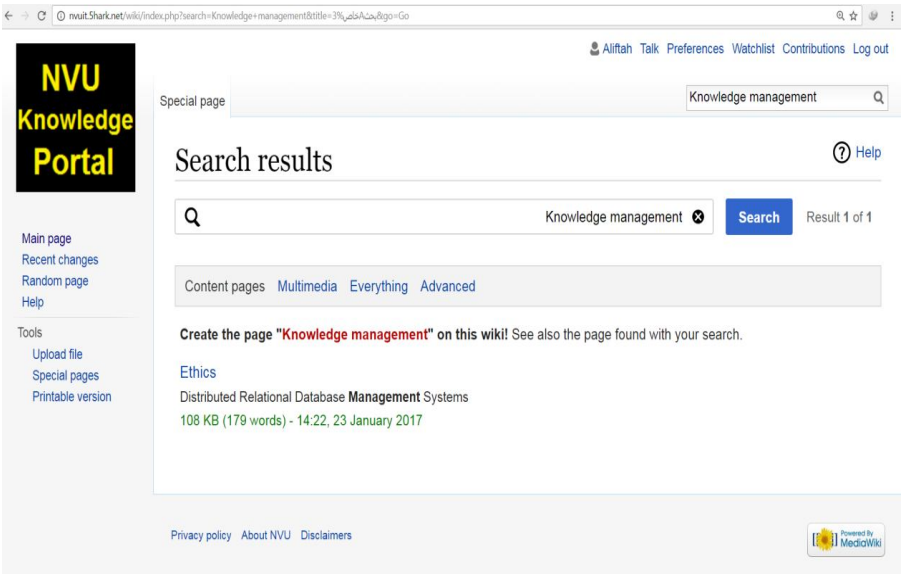

Figure 4.3: Search on a Page and Create a New page

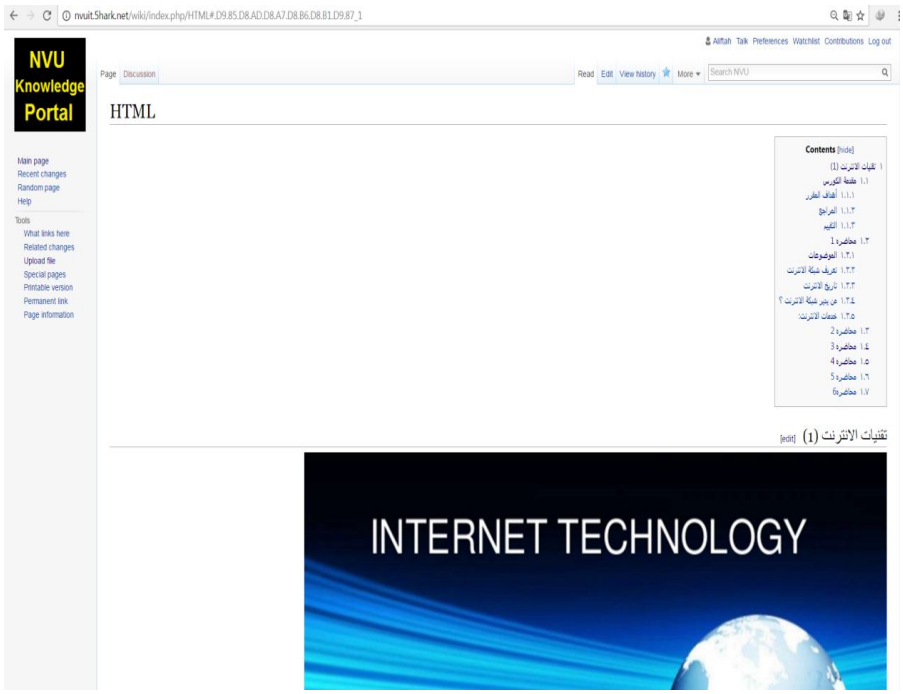

Figure 4.4: Automatic Table of Contents

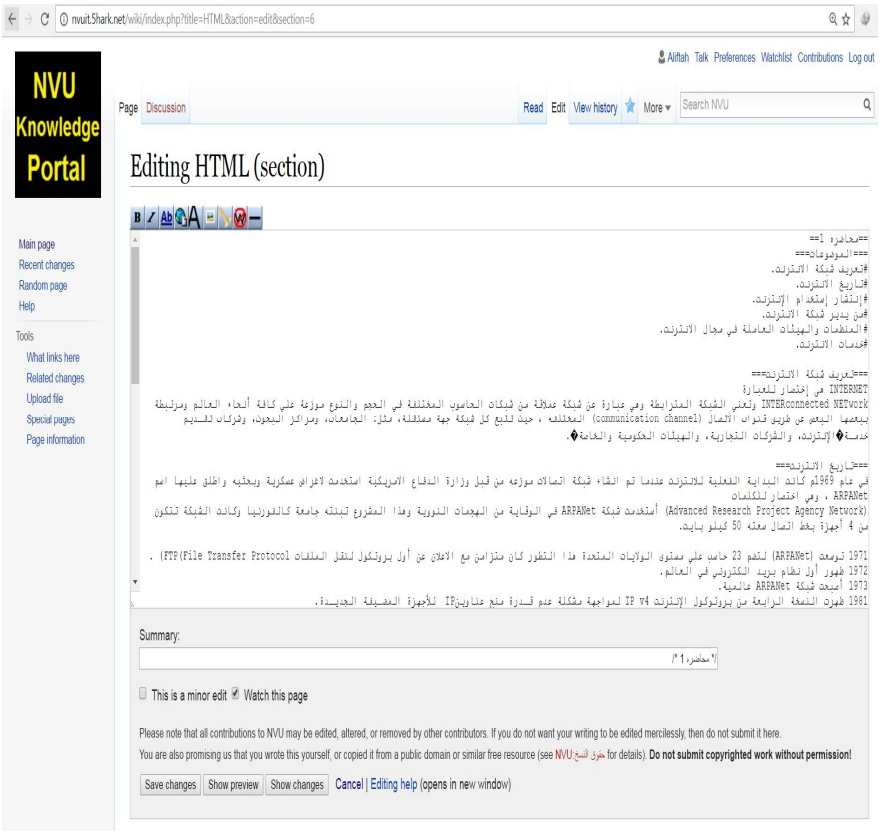

Figure 4.5: Editing of Page.

The ‘preferences’ page allows the user to configure their settings. ‘My watch list’ shows the pages they are watching, ‘my contributions’ shows the pages this user has either edited or commented, and log out for log out from your account.

Authorized users only have to edit page content privilege, and doing all other operations like delete, move, and protection. All changes are usually tracked and reversible.

Every user has a talk page where is can discuss improvements to articles or other ideas, when other editors need to contact you, they will usually do this by leaving a message on your talk page.

Every page has discussion page because discussion is a core value of the wiki system, all users can edit discussion page contents even users don't have an account on portal, this is very vital process because academic staff need evaluation from their colleagues and also from their students, so students can ask questions or offer their opinions or observations.

All knowledge of the university storing in the online database, so everyone can access it. The knowledge portal implementing in this research is using the MySQL database system.

iii. The third process is sharing knowledge. All users can view overall content of the knowledge portal and the history of editing. The star icon allows users to “watch” the page, which means to have the page appear under the user’s ‘my watch list’.

iv. The fourth process is the application of knowledge, which is the stored knowledge can apply in confirming facts, and solve new or existing problems.

v. The fifth process is evaluation of knowledge, which is very useful process to enhance overall university performance because not all knowledge existed in the knowledge base is useful and applicable, so evaluate knowledge through feedback at discussion page is a very important especially in universities sector.

Every created page in the KP has a discussion page which allows students don't have an account to ask questions, or offer their opinions, so any errors can be observed.

Also the used knowledge portal supports evaluation of all active users, and active pages in accurate statistics.

In the right side of the page (if the language is Arabic) there are some important links like

1. Recent change.
2. Random page.
3. Help page.
4. Tools which contain:
   i. Printable version of the page.
   ii. Upload files.
   iii. Special pages which contain:
      a. Maintenance report.
      b. List of pages.
      c. Create account (for administrator only).
      d. User rights.
      e. Block user.

f. Delete user contributions.

g. User list as shown in figure 4.6

h. Active user list as shown in figure 4.7.

i. Pages with the fewest revisions as shown in figure 4.8.

j. All public logs which show all activities from all users as shown in figure 4.9.

k. Gallery of new files as shown in figure 4.10.

l. Statistics page which show you all detail of university knowledge portal as shown in figure 4.11.

Top management can incentives and rewarding academic staff and students according to accurate statistics proposed from knowledge portal.

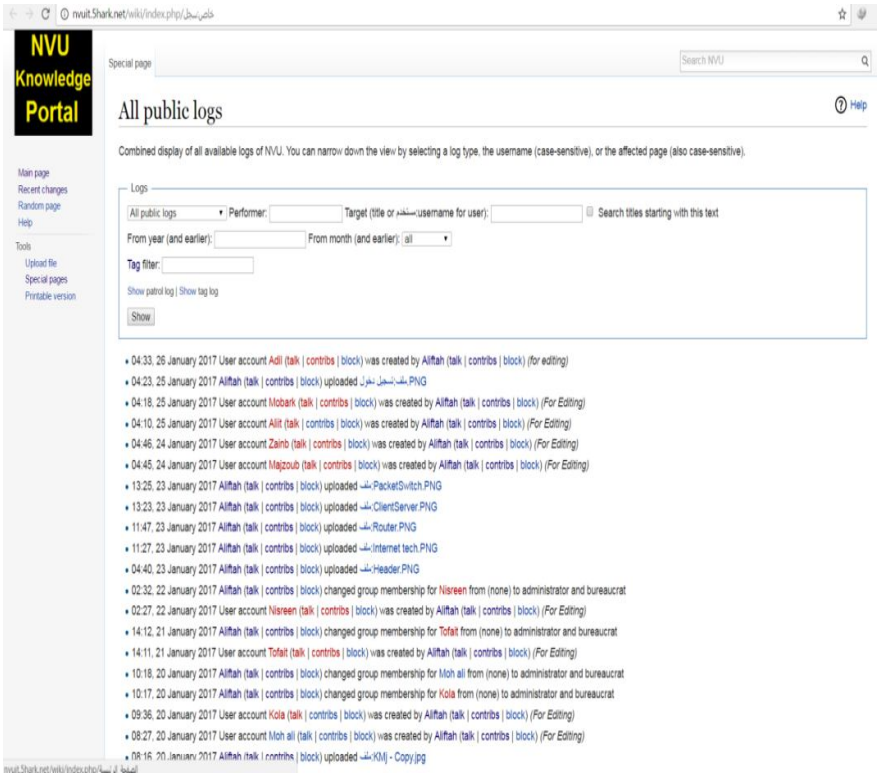

Figure 4.6: User List and their Contributions.

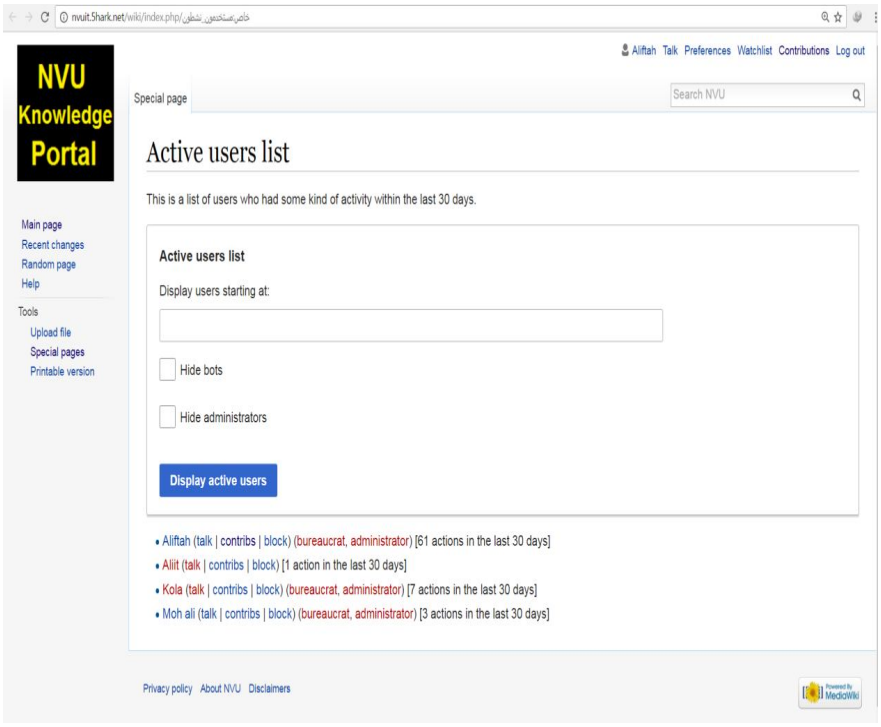

Figure 4.7: Active User List and their Actions.

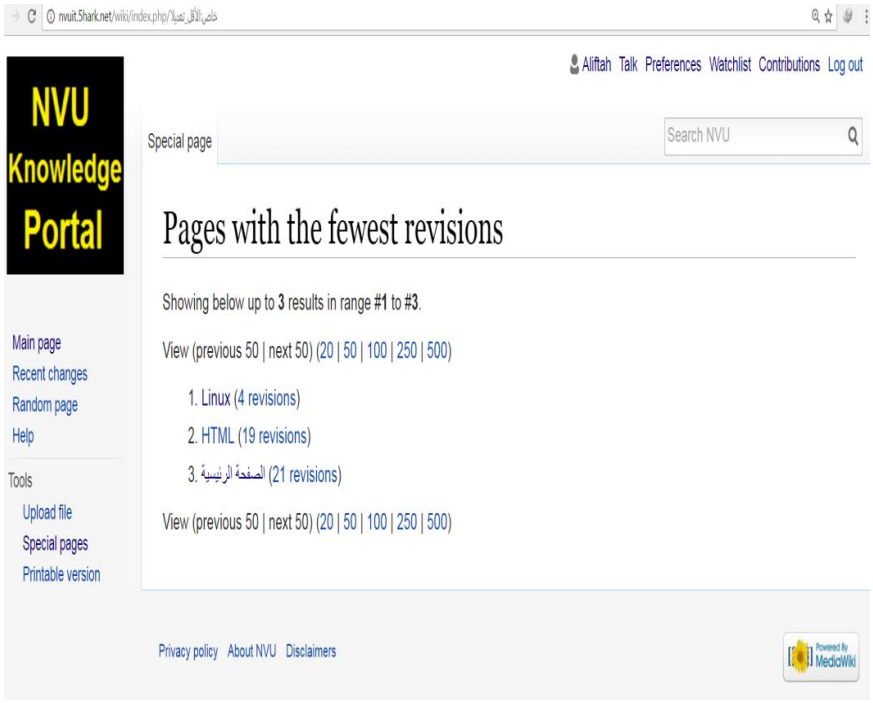

Figure 4.8: Pages with the Fewest Revisions.

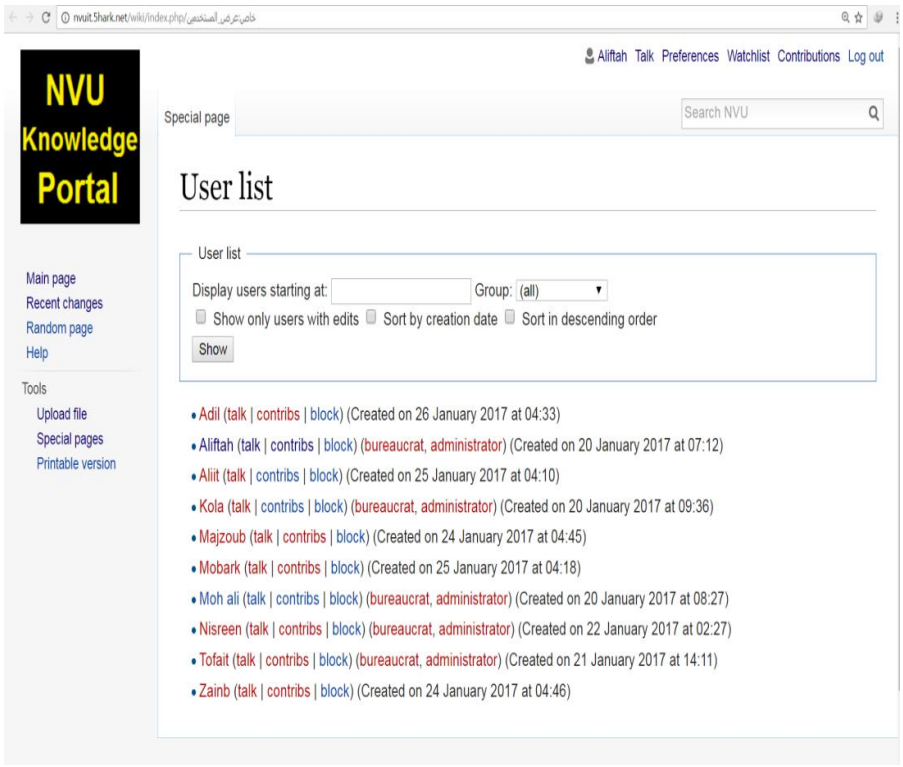

Figure 4.9: All Public Logs.

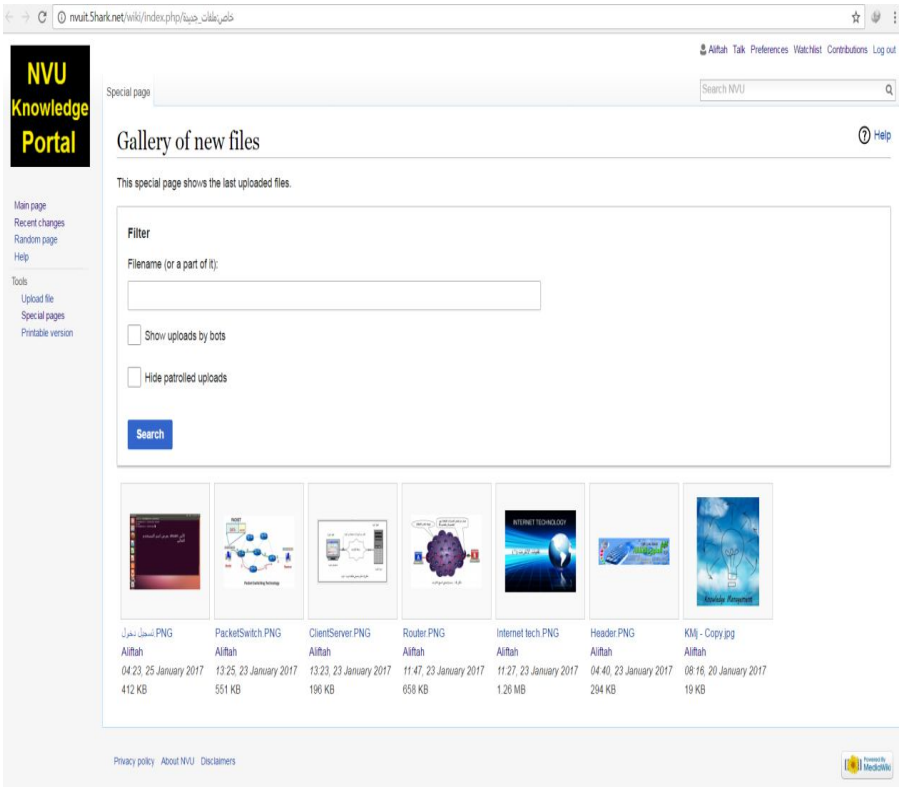

Figure 4.10: Gallery of New Files

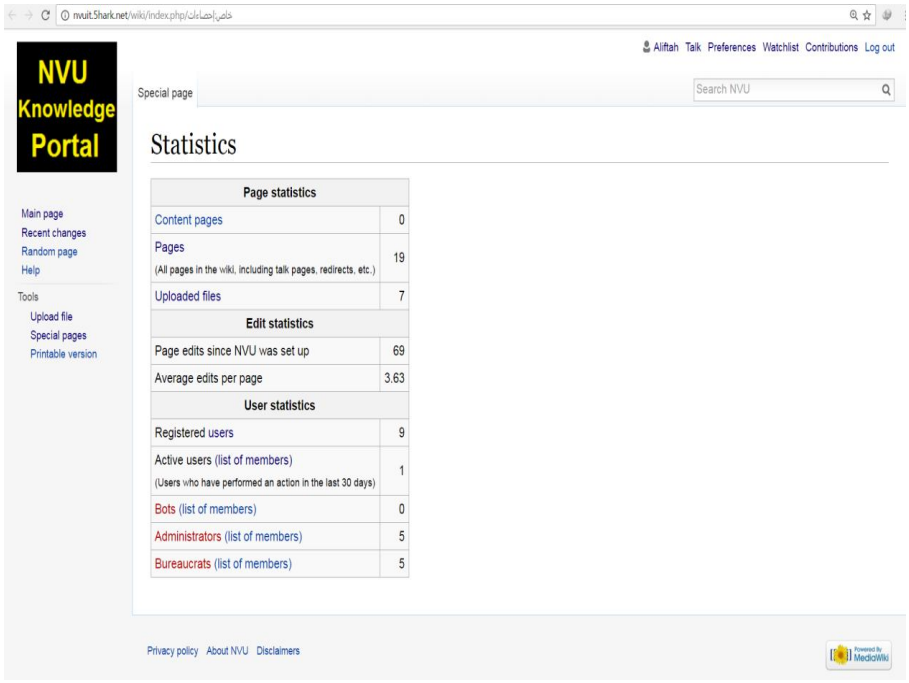

Figure 4.11: Statistics

DATA ANALYSIS, RESULTS AND DISCUSSIONS

5.1 Introduction

A questionnaire is carried out as a part of my research. This study discusses knowledge management processes in the knowledge portal implemented at Nile Valley University. Survey was conducted on the academic staff and students to see how knowledge portal implementation enhancing university performance.

5.2 Data Analysis

Firstly a questionnaire is distributed and collected data from academic staff and students at the Nile Valley University - faculty of science and technology. Then data is sorted and classified in a mathematical form by appling various statistical operations using SPSS to get clear and accurate results.

The questionnaire consists of three sections, the first section gathers demographics information such as age, gender, and job. The second section gathered information's about knowledge management processes at the knowledge portal implemented in the NVU. Finally the third section gathered information about the role of knowledge portal in enhancing university academic performance.

5.3 Degree of Questionnaire Reliability

Scale: all variables

Table 5.1: Case Processing Summary

		N	%
Cases	Valid	10	100.0
	Excluded[a]	0	.0
	Total	10	100.0

Table No 5.2: Reliability Statistics

Cronbach's Alpha	N of Items
.849	10

Tables (5.1) and (5.2) display case processing summary, reliability and internal consistency using SPSS program for testing the study questions, alpha value reached at (0. 849) This means the degree of validity and reliability of this study is high and this enables us to analyze data and get correct and truthful results, analysis based on likert scale which usually have five potential choices (strongly agree, agree, neutral, disagree, strongly disagree).

Table No 5.3: Likert Potential Choices

Value	Weighted average
Strongly agree	From 5.00 to 4.20
agree	From 4.19 to 3.40
Neutral	From 3.39 to 2.60
Disagree	From 2.59 to 1.80
Strongly disagree	From 1.79 to 1.00

5.4 Sample Size

Data was collected from questionnaire that was distributed to a total of **80** academic staff and students, the demographic background relating to the respondent‘s gender as follow, (**61.3%**) of the **75** usable responses were males, while (**38.7%**) of the total respondents were female. (See figure 5.1).

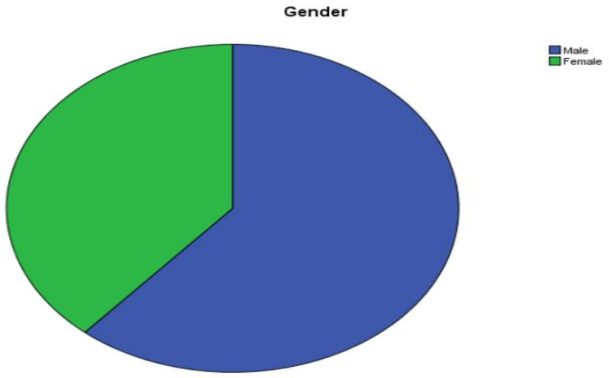

Figure 5.1: Gender of respondents

In terms of age, the results revealed that the largest percentage of respondents were in the age group of 20-30 (74.7%), followed by the age group of (less than 20) constituting around (12.0%) of the total respondents, whilst the age group 30-40 and age group (more than 40) consisted of (6.7%) in equally. (See figure 5.2).

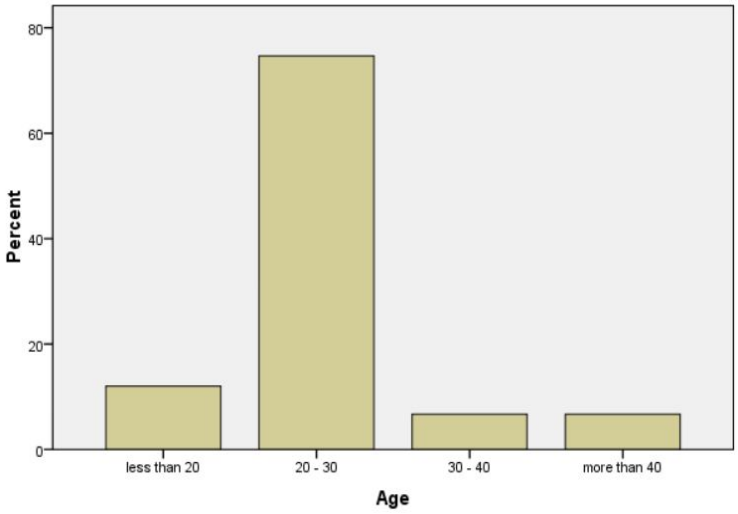

Figure 5.2: Respondents' Age

In terms of job, figure 5.3 shows that the majority of respondents (66.6%) are students and (33.3%) are academic staff.

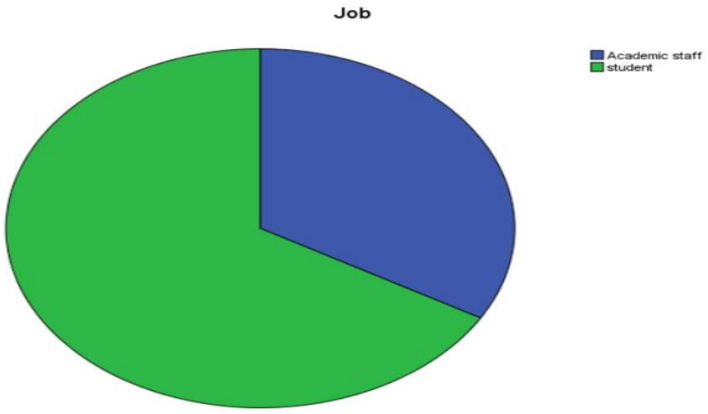

Figure 5.3: Respondents' Job

Secondly: Knowledge management processes at the knowledge portal:

Variable 2.1:

The table 5.4 displays the result of mean for variable 2.1 " Using knowledge portal facilitates generating a new knowledge and the dissemination of tacit knowledge " is 4.45 so the result according to likert is strongly agreed.

Table 5.4: Using knowledge portal facilitates generating a new knowledge and the dissemination of tacit knowledge.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	38	35	0	2	0	4.45	.643	Strongly Agree
Percent	50.7	46.7	0.0	2.7	0.0			

Variable 2.2:

The table 5.5 displays the result of mean for variable 2.2 "Using knowledge portal facilitates indexing, classifying, and storing the knowledge" is 4.43 so the result according to likert is strongly agreed.

Table 5.5: Using knowledge portal facilitates indexing, classifying, and storing the knowledge.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	40	30	3	1	1	4.43	.756	Strongly Agree
Percent	53.3	40.0	4.0	1.3	1.3			

Variable 2.3:

The table 5.6 displays the result of mean for variable 2.3 "Using knowledge portal facilitates the knowledge sharing" is 4.61 so the result according to likert is strongly agreed.

Table 5.6: Using knowledge portal facilitates the knowledge sharing.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	52	19	2	2	0	4.61	.676	Strongly Agree
Percent	69.3	25.3	2.7	2.7	0.0			

Variable 2.4:

The table 5.7 displays the result of mean for variable 2.4 "Using knowledge portal facilitates application of knowledge in teaching and research" is 4.33 so the result according to likert is strongly agreed.

Table 5.7: Using knowledge portal facilitates application of knowledge in teaching and research.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	33	36	4	2	0	4.33	.704	Strongly Agree
Percent	44.0	48.0	5.3	2.7	0.0			

Variable 2.5:

The table 5.8 displays the result of mean for variable 2.5 " Using knowledge portal facilitates evaluation of existing knowledge with the feedback process" is 4.19 so the result according to likert is agreed.

Table 5.8: Using knowledge portal facilitates evaluation of existing knowledge with the feedback process.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	33	27	12	2	1	4.19	.896	Agree
Percent	44.0	36.0	16.0	2.7	1.3			

Section 3: The role of knowledge portal in enhancing university performance

Variable 3.1:

The table 5.9 displays the result of mean for variable 3.1 "Using knowledge portal increases the speed and efficiency of the treatment of faculty members and students to the problems they face" is 4.23 so the result according to likert is strongly agreed.

Table 5.9: Using knowledge portal increases the speed and efficiency of the treatment of faculty members and students to the problems they face.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	35	28	7	4	1	4.23	.924	Strongly Agree
Percent	46.7	37.3	9.3	5.3	1.3			

Variable 3.2:

The table 5.10 displays the result of mean for variable 3.2 "Allowing academic staff only to modify content of the home page helped provide reliable knowledge" is 4.44 so the result according to likert is strongly agreed.

Table 5.10: Allowing academic staff only to modify content of the home page helped provide reliable knowledge.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	45	22	5	2	1	4.44	.842	Strongly Agree
Percent	60.0	29.3	6.7	2.7	1.3			

Variable 3.3:

The table 5.11 displays the result of mean for variable 3.3 "Using knowledge portal facilitates understanding of the curriculum through asking questions at the discussion page which allows modifying the content for everyone" is 4.47 so the result according to likert is strongly agreed.

Table 5.11: Using knowledge portal facilitates understanding of the curriculum through asking questions at the discussion page which allows modifying the content for everyone.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	45	24	2	4	0	4.47	.794	Strongly Agree
Percent	60.0	32.0	2.7	5.3	0.0			

Variable 3.4:

The table 5.12 displays the result of mean for variable 3.4 "Using knowledge portal management can incentives and rewards active members and the active pages through the provision of accurate statistics" is 4.24 so the result according to likert is strongly agreed.

Table 5.12: Using knowledge portal management can incentives and rewards active members and the active pages through the provision of accurate statistics.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	29	37	7	2	0	4.24	.732	Strongly Agree
Percent	38.7	49.3	9.3	2.7	0.0			

Variable 3.5:

The table 5.13 displays the result of mean for variable 3.5 "Using knowledge portal management can incentives and rewards active members and the active pages through the provision of accurate statistics" is 4.20 so the result according to likert is strongly agreed.

Table 5.13: Using knowledge portal management can incentives and rewards active members and the active pages through the provision of accurate statistics.

Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Frequency	33	29	9	3	1	4.20	.900	Strongly Agree
Percent	44.0	38.7	12.0	4.0	1.3			

5.5 Discussions

Hypothesis number one:

Using knowledge portal positively and significantly affects on facilitating knowledge management processes.

Variables:

1. Using knowledge portal facilitates generating a new knowledge and the dissemination of tacit knowledge.

2. Using knowledge portal facilitates indexing, classifying, and storing the knowledge.

3. Using knowledge portal facilitates the knowledge sharing.

4. Using knowledge portal facilitates application of knowledge in teaching and research.

5. Using knowledge portal facilitates evaluation of existing knowledge with the feedback process.

Table 5.14 shows the result of mean for five variables that used in provision of the hypothesis "Using knowledge portal positively and significantly affects on facilitating knowledge management processes" is 4.40 so the result according to likert is strongly agreed.

Table 5.14: Using knowledge portal positively and significantly affects on facilitating knowledge management processes.

Hypothesis One:	Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Variable 2.1	Frequency	38	35	0	2	0	4.45	.643	Strongly Agree
	Percent	50.7	46.7	0.0	2.7	0.0			
Variable 2.2	Frequency	40	30	3	1	1	4.43	.756	Strongly Agree
	Percent	53.3	40.0	4.0	1.3	1.3			
Variable 2.3	Frequency	52	19	2	2	0	4.61	.676	Strongly Agree
	Percent	69.3	25.3	2.7	2.7	0.0			
Variable 2.4	Frequency	33	36	4	2	0	4.33	.704	Strongly Agree
	Percent	44.0	48.0	5.3	2.7	0.0			
Variable 2.5	Frequency	33	27	12	2	1	4.19	.896	Agree
	Percent	44.0	36.0	16.0	2.7	1.3			
Hypothesis Result	Frequency	196	147	21	9	2	4.40	.501	Strongly Agree
	Percent	52.3	39.2	5.6	2.4	.5			

Hypothesis number two:

Implementing knowledge management positively and significantly affects on university performance.

Variables:

1. Using knowledge portal increases the speed and efficiency of the treatment of faculty members and students to the problems they face.

2. Allowing academic staff only to modify content of the home page helped provide reliable knowledge.

3. Using knowledge portal facilitates understanding of the curriculum through asking questions at the discussion page which allows modifying the content for everyone.

4. Using knowledge portal management can incentives and rewards active members and the active pages through the provision of accurate statistics.

5. Using knowledge portal had a clear and direct impact on improving the performance of the university and achieves a competitive advantage.

Table 5.15 shows the result of mean for five variables that used in provision of the hypothesis "Implementing knowledge management positively and significantly affects on university performance" is 4.31 so the result according to likert is strongly agreed.

Table 5.15: Using knowledge portal positively and significantly affects on facilitating knowledge management processes.

Hypothesis One:	Scale	Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Mean	Std. Deviation	Result
Variable 3.1	Frequency	35	28	7	4	1	4.23	.924	Strongly Agree
	Percent	46.7	37.3	9.3	5.3	1.3			
Variable 3.2	Frequency	45	22	5	2	1	4.44	.842	Strongly Agree
	Percent	60.0	29.3	6.7	2.7	1.3			
Variable 3.3	Frequency	45	24	2	4	0	4.47	.794	Strongly Agree
	Percent	60.0	32.0	2.7	5.3	0.0			
Variable 3.4	Frequency	29	37	7	2	0	4.24	.732	Strongly Agree
	Percent	38.7	49.3	9.3	2.7	0.0			
Variable 3.5	Frequency	33	29	9	3	1	4.20	.900	Strongly Agree
	Percent	44.0	38.7	12.0	4.0	1.3			
Hypothesis Result	Frequency	187	140	30	15	3	4.31	.492	Strongly Agree
	Percent	49.9	37.3	8.0	4.0	0.8			

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Successful implementing knowledge management system is increases productivity by making knowledge available more quickly and easily. Learning faster means staying competitive.

Tacit knowledge represent a major challenge in the retrieval and storage, the solution for enhancing performance of HEI is developing Knowledge base which the knowledge experts and academic staff convey their tacit knowledge by expressing their beliefs and perceptions, and by describing and demonstrating their skills and experience.

Each individual in the University must have responsibility to create new knowledge and transfer it into organizational knowledge.

The academic environment in general is considered trustful in the sense that no one is hesitating nor being afraid of publishing knowledge. The knowledge resides in teachers minds can get lost if they decide to leave the university or die, higher education is a center of knowledge creating, delivering, and learning for society.

The researcher proposed framework of KM implementation for enhancing universities performance, also proposed model for the requirement of successful implementation of KM project in the university sector, also the researcher implement knowledge portal with mediawiki software as knowledge management system in the Nile Valley University, and the researcher discuss steps of using knowledge portal from academic staff and students and everyday processes of knowledge management.

finally the researcher conduct survey in order to answer the key research questions after upload knowledge portal on the internet and creates accounts for academic staff to be able to upload their courses and gives the URL of the knowledge portal to students for viewing the content and return their feedback, results of the analysis has proved that using knowledge portal positively and significantly affects on facilitating knowledge management processes, and implementing knowledge management positively and significantly affects on university performance.

6.2 Recommendations

In future wiki studies, its recommended dissemination of applying the knowledge portal to all Nile Valley University colleges, and then to all Sudanese universities.

Academic staff provided training sessions on using mediawiki software before they are asked to start using it.

Hiring knowledge worker for content daily update.

It is very important to spread the culture of the knowledge sharing and enrich the Arabic content, and should encourage active users in the system.

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Appendix 1: Code used in mediawiki software

```
# for disable create account.
$wgGroupPermissions['*']['createaccount'] = false;

# for disable editing.
$wgGroupPermissions['*']['edit'] = false;

# function for enable users to edit discussions page
public function isAllowed( $action = '' )
{
        if ( $action === '' )
 {
                return true;
}
    /* Special Cases */
    global $wgTitle;
    //Allow them to edit talk pages
    if ($wgTitle->isTalkPage() && strcmp("edit", $action) ==
0)
        return true;
    $this->loadFromDatabase();
        return in_array( $action, $this->getRights(), true );
         }
```

Appendix 2: Questionnaire

بسم الله الرحمن الرحيم

جامعة السودان للعلوم والتكنولوجيا

كلية الدراسات العليا

ماجستير تقانة المعلومات

إستبيـــــان

السلام عليكم ورحمة الله وبركاته، يقوم الباحث بدراسة حول "دور إدارة المعرفة في تحسين آداء الجامعات "، و ذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في تقانة المعلومات.

يرجى قراءة فقرات الاستبانة المرفقة و اختيار الإجابة التي تعكس الواقع الفعلي وتحري الدقة والحياديه والموضوعية مما يسهم في نجاح هذه الدراسة، علماً أن المعلومات التي ستعبأ من قبلكم ستعامل بسرية تامة، و لن تستخدم إلا في أغراض البحث العلمي.

شكراً لحسن تعاونكم و تقبلوا فائق الاحترام و التقدير،،،

ملاحظة: يمكن تعريف **إدارة المعرفة** بأنها عبارة عن العمليات التي تساعد المنظمات على توليد المعرفة والحصول عليها واختيارها وتنظيمها واستخدامها ونشرها وتحويل المعلومات الهامة والخبرات التي تمتلكها المنظمة والتي تعتبر ضرورية للانشطة الإدارية المختلفة كاتخاذ القرارات، وحل المشكلات والتخطيط الاستراتيجي.

أولاً:- البيانات الشخصية والوظيفية:

ضع علامة (✓) في المربع المناسب:

1. الجنس: ذكر ☐ أنثى ☐
2. العمر: أقل من 20 ☐ 20 – 30 ☐ 30 – 40 ☐ 40 فأكثر ☐
3. العمل: هيئة تدريس ☐ طالب ☐

ثانياً: عمليات إدارة المعرفه على بوابة المعرفه:	أوافق بشده	أوافق	محايد	أوافق	لا أوافق بشده
إستخدام بوابة المعرفة يسهل توليد معرفه جديدة ونشر المعرفه الضمنية.					
إستخدام بوابة المعرفة يسهل فهرسة وتصنيف وتخزين المعرفة.					
إستخدام بوابة المعرفة يسهل تبادل المعرفة.					
إستخدام بوابة المعرفة يسهل تطبيق المعرفة في مجالي التدريس والبحث.					
إستخدام بوابة المعرفة يسهل تقييم المعرفة عن طريق عملية التغذية الراجعة.					

ثالثاً: دور إستخدام بوابة المعرفه في تحسين آداء الجامعه:	أوافق بشده	أوافق	محايد	أوافق	لا أوافق بشده
يؤثر إستخدام بوابة المعرفه على سرعة وكفاءة معالجة أعضاء الهيئة التدريسية والطلاب للمشكلات التي تواجههم.					
السماح للأساتذه فقط بتعديل محتوى الصفحه الرئيسيه ساعد في تقديم معرفه موثوقه.					
إستخدام بوابة المعرفه يسهل من فهم المقررات الدراسيه من خلال طرح الأسئله في صفحة النقاش التي تتيح تعديل المحتوى للجميع.					
يساعد إستخدام بوابة المعرفه الإداره في تحفيز وتشجيع الأعضاء النشطين والصفحات النشطه من خلال تقديم إحصاءات دقيقه.					
إستخدام بوابة المعرفه كان له تأثير واضح ومباشر في تحسين آداء الجامعه وتحقيق الميزه التنافسيه لها.					