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Reality of Knowledge Management Application from Faculty Members' Perspective in Economics and Administrative Science Colleges in Sudanese Universities

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Abstract
The study aimed at investigating the level of applying knowledge management processes from faculty members' perspective in Economics and Administrative Science colleges in Sudanese universities. The study sample consisted of (136) faculty member from (10) public and private universities in Sudan. Results showed that the application of knowledge management processes in Sudanese universities was low. Knowledge management processes domains include knowledge generation, in the first rank, followed by knowledge storage and organization, knowledge sharing and distribution and knowledge application, respectively. There are no statistically significant differences among participants due to gender, academic position and years of experience. The study recommended developing the infrastructure of Sudanese universities, affording knowledge management requirements and addressing deficits in the domains of knowledge management processes.
Keywords: Knowledge Management; Sudanese Universities; Faculty Members

Introduction
Recently, intensive discussions have been held on knowledge management. Many theoretical and applied multidisciplinary studies in knowledge management have been conducted. The Internet has featured countless knowledge management websites and specialized journals. Many research and academic institutions around the world are interested in holding conferences, intellectual forums and workshops on this subject. Therefore, it is considered one of most important subject that is now receiving great attention in management applications and sciences. Knowledge management has become an independent subject taught in many universities. At the level of higher education, there is growing demand for university education, expansion of higher education institutions to meet this demand, increased competition among universities to attract more students, and pursuit of excellence through offering more innovative programs. Knowledge management is perceived as a distinguished way for achieving university performance excellence and development.

Theoretical framework
Definition of knowledge
There are countless and varied attempts to define the term of knowledge resulted from adopting different study approaches and the various academic and professional backgrounds of the researchers. Khaleifi and Quadria define knowledge as the process of integrating information, experience and sensory perception; it is science obtained from information acquisition (2017). Knowledge is a combination of ideas, concepts, regulations and procedures on which the individual depends on his decisions making and behavior adoption. According to Altwalba, It is information combined with experiences, personality, facts, judgments and values interacting within a framework of unique cognitive structures that allow individuals and organizations to create new learning environment (2016).
Hbayna defines knowledge as the product of processing, analyzing and organizing information and the experience of employees utilized to create value added in the organization to become an intellectual capital (2014). It is the efforts exerted by managers to organize and build the organization's capital of information resources, i.e. the intellectual capital (Daft, 2010).

Aleethawy and Alfadalah (2013) argue that knowledge can be defined through its domains: coding and storage, procedural complexity, learning possibility and observation. It is necessary to distinguish between knowledge, on one hand, and information and data, on the other. Data is the primary material of the information, including facts, recorded notes and information system inputs, i.e. it is basic facts, forms, observations or measurements without content or organization. Information is a set of organized data associated with a particular subject that constitutes facts, concepts, performance, conclusions and beliefs. It constitutes calculated and valuable experience and knowledge achieved in current or anticipated use. Information is the result of data processing through compilation, classification, analysis and organization in a way that serves particular purposes (Alsmaray and Alzoaby, 2004).

Hanona and Alawady agree that knowledge is objective information that cannot be codified, including wisdom, insight and experience of employees, and can be shared via e-mail, notes or oral conversations. When

knowledge is available, it can be applied to decision-making processes (2011).

Knowledge classification:

Knowledge management specialists have attempted to classify and divide knowledge in various ways. Draft (2010) considers classifying knowledge into two basic categories: (1) explicit knowledge, organized knowledge with limited content, which is characterized by external manifestations, expressed in drawing, writing, and speaking and transferred by technology. (2) Tacit knowledge is skills, ideas and experiences that individuals have in their minds. It refers to intuition, inner feeling, and personal knowledge that cannot be codified or transferred by technology. It cannot be easily expressed, since it is produced by experience and revealed through practice. Tacit knowledge is usually shared in social context, such as interactive conversation, storytelling and shared experience (Draft, 2010) (Janus, 2016).

Farhati believes that knowledge is divided as follows (2016):

1- Know-what: related to knowing how things work or applying certain procedures that reach something like dismantle and installation of a particular device.
2- Know-what (cognitive knowledge): experience resulting from knowledge accumulation on a given topic.
3- Know-why: involves a deeper understanding of inter-relations and causation.
4- Know-who: knowing individuals with knowledge, abilities and skills.
5- Self-knowledge: formed by the individual with his own effort, depending on his intellectual abilities and mental energy.
6- External knowledge: the individual derives from the techniques of communication, information and social interaction among people.
7- Core knowledge: it is the minimum scope and level of knowledge required just to "play the game". It will not assure the long-term competitive viability of an organization.
8- Advanced knowledge: it enables an organization to be competitively viable and to achieve strong competitive position in the market.
9- Innovative knowledge: it enables an organization to lead its industry and competitors and to significantly differentiate itself from its competitors.

Knowledge management:

Knowledge management is a set of proactive activities that an organization uses to create, absorb and disseminate its knowledge. It is the practices and tools used by organizations to identify, represent and disseminate knowledge, experience, intellectual capital and other forms of knowledge to employ, reuse and transfer knowledge and learning, thus enhancing organizational adaptability, survival and efficiency of organizations (Tarekegn, 2017).

Knowledge management has been also defined as a set of knowledge, expertise, technology, relationship with beneficiaries of the organization's services and professional capabilities that enable an organization to acquire knowledge assets that can be used for its subsequent operation in a distinctive and cost-effective manner. It is the process of collecting, documenting, classifying, developing and organizing the knowledge assets of the organization and storing them in a manner that facilitates their use in business and subsequent decision-making processes. It is also known as the organized effort directed by an organization to collect, classify, organize and store all kinds of knowledge relevant to the organization's activity and make it ready for deliberation and participation among members, sections and units of the organization in order to increase the efficiency of decision making and organizational performance (Alzyadat, 2008).

Knowledge management is different from information management. Information management is a new scientific field its primary objective is the acquisition of information, preserving it and ensure its confidentiality, in addition to its transfer, storage and retrieval. It include the use of more efficient tools, including documents, software, audios and videos. Therefor, it is data-centered in terms of the most effective ways of its acquisition, accuracy, processing, storage and retrieval. It is a technical mean to ensure the provision of information. Knowledge management is a more advanced stage; it analyzes information and all available knowledge assets and manages the processes related to these assets in the form of knowledge development, perservation, use and participation.

Othman points out that dealing with data and information is information management and working with humans is knowledge management. Knowledge management appreciates originality, innovation, speed of mind, adaptability, intelligence and learning. It seeks to activate the organization's potentials in these aspects through encouraging critical thinking, innovation, relationships, patterns, skills, cooperation and participation. It supports individual and group learning and encourages sharing experience, success and failure (2010).

There are three key elements that contribute to knowledge management: individuals, processes and technology. Individuals are the main source of knowledge and the responsible for performing the processes of knowledge acquisition, generation, storage, dissemination and application within the organization. Processes are the ways in which knowledge is acquired, generated, stored, disseminated and applied. Technology is one of the

tools utilized to store and retrieve knowledge when needed and helps in the acquisition, dissemination and application of knowledge from various sources inside and outside the organization (Khaleifi and Quadria, 2017).

Knowledge management processes:

Many researchers and specialists dealt with knowledge management processes from different perspectives according to multiple approaches. It resulted in a difference in the field of knowledge management in relation to their processes and arrangement. Accordingly, there no defined number of knowledge management processes. Table (1) presents the classification of knowledge management processes from different perspectives. The most important knowledge management processes with a relative agreement are as following:

1. Knowledge Identification

Knowledge identification means identifying the type of knowledge required by an organization and specifying its sources and ways of acquisition. It is essential to knowledge management program because it aims at discovering the organization's knowledge, identifying the people who are carrying it and their location, and determining the source of this knowledge in information resources and databases (Maher and Hussein, 2014).

2. Knowledge Acquisition

Gonzalez and Martins define knowledge acquisition as the organization's internal processes that facilitate the creation of implicit and clear knowledge among the members of the organization at all organizational levels, identifying and acquiring information and identifying external sources of knowledge (2017). Namely, it is the extraction from human resources such as experts and knowledge available in digital and physical media, as well as transferring and storing it in knowledge base or knowledge management system. In both cases, tacit knowledge and explicit knowledge cannot be fully polarized and confirmed for many reasons, including the impossibility of representing knowledge and the existence of the constraints that impede the implementation of the process of attracting knowledge and thus its representation and programming in information systems.

3. Knowledge Generation

Knowledge generation is defined as the creation of knowledge through the participation of working team and groups to generate new intellectual capital in new issues and practices that contribute to defining and solving problems in an innovative and continuous manner. It enables an organization to excel in achievement and acquiring high market position through strategic implementation, new action lines development, quick problem solving, best practices transfer, professional skills development and management assistance in the recruitment and retention of talented personnel.

Many terms, including knowledge acquisition, purchase, invention, absorption or discovery utilized to refer to knowledge generation and acquisition, but in different ways and from different sources. Purchasing refers to acquiring knowledge though direct employment and employment contracts, acquisition refers to the acquisition of knowledge inherent in creative minds, innovation refers to creating new, undiscovered and undisclosed knowledge and discovery refers to the identification of available knowledge (Al-Barasi, 2015) (Alzatma, 2011).

4. Knowledge Storage

Although organizations generate knowledge, they forget it so the process of knowledge storage refers to the importance of organizational memory. Organizations face a high risk as a result of losing much knowledge carried by individuals who leave for one reason or another. Knowledge storage is very important, especially for organizations with high turnover rats, part-time contracts and consulting employment. Employees take their undocumented tacit knowledge with them, while documented knowledge remains in the organization system. Knowledge can be stored in various forms, including written documents, information databases, human knowledge stored in expert systems, knowledge documented organizational procedures, documented regulatory processes and tacit knowledge gained from individuals and networks (Altwalba, 2016).

5. Knowledge Distribution

Knowledge distribution is the process of transferring right knowledge to individuals who need it in time in order to carry out essential tasks by finding good means of communication and culture that encourage their dissemination within the boundaries of the organization. It represents the sharing of available knowledge, whether tacit or explicit. It is important to focus on tacit knowledge available in the minds, experiences and skills of the know-how individuals and how they can distribute it. This is the biggest concern of departments in an organization. This process can be done through the availability of communication means, distribution channels and networks to disseminate knowledge, in addition to disseminating the culture of sharing and exchange of knowledge among employees. Forming work teams and groups, helps spread knowledge among and generate creative ideas. It leads to organization distinction, encouraging research and development and distributing knowledge (Gubran & Al-Mansouri, 2015).

6. Knowledge sharing

Knowledge sharing is integral to knowledge management and involves the exchange of knowledge (information, skills and experiences) within and among organizations. Although knowledge sharing may take one direction, it is often two-way and may flow in multiple directions where each party learns from the other. The term is not limited to communication only because a lot of knowledge in organizations cannot be easily expressed (Janus,

2016).

7. Knowledge application

Knowledge application is the purpose of knowledge management and its most prominent operations. Knowledge comes from work and how to teach it to others, where it requires learning and explanation. Learning coms through experience and application that improves the level of knowledge and deepens it. In light of this, knowledge application should be taken as apriority and the utmost of the knowledge management process (Azuaby and Azaydy, 2012) (Alaydarose, 2012).

Knowledge should be used as a basis for the development of new knowledge through integration, creativity, in addition to the expansion of the existing knowledge base and the use of this knowledge in decision-making processes (Gonzalez and Martins, 2017).

Table (1) Knowledge management processes

S.	Author(s)	Classification of knowledge management processes
1	Gonzalez and Martins, 2017 Ali, 2017	Knowledge Acquisition, Knowledge Storage, Knowledge Distribution, Knowledge Application.
2	Alnashar, 2016	Knowledge Identification and determine its goals, Knowledge Acquisition, Knowledge Storage and organization , Knowledge Distribution and dissemination, Knowledge Application and usage, Follow-up and evaluation.
3	Abu Muammar, 2016	Knowledge Identification, Knowledge Creation, Knowledge Storage, Knowledge Distribution, Knowledge Application.
4	Altahayna & Alkhaledy, 2015	Knowledge Share and transfer, Knowledge Application, Knowledge Storage and organize, Knowledge Generate.
5	Abu Alnady and Alkeelany, 2015	Knowledge Identification, Knowledge planning, Knowledge Acquisition, Knowledge Storage, Knowledge Generate, Knowledge Sharing, Knowledge Distribution.
6	El Badawy and Magdy, 2015	Knowledge Creation, Knowledge Conversion, Knowledge Storage, Knowledge Distribution.
7	Abdulrahman and Tadros, 2014 Al-Othman, 2013	Knowledge diagnosis, Knowledge objectives identification, Knowledge Generate, Knowledge Storage, Knowledge Distribution, Knowledge Acquisition, Knowledge Retrieval, Knowledge Sustain.
8	Hamady, 2013	Access to knowledge resources, Knowledge Application, Knowledge Generate
9	Al-Agla and Abou Alkhair, 2012 Alaydarose, 2012	Knowledge Identification, Knowledge Acquisition, Knowledge Storage and retrieval, Knowledge Transfer, Knowledge Application, Knowledge Planning, Knowledge Organization, Knowledge Sharing, Knowledge Distribution, Knowledge update, Knowledge fellow-up and control
10	Azuaby and Azaydy, 2012	Knowledge Acquisition, Knowledge Generation, Knowledge Storage, Knowledge Distribution, Knowledge Application.
11	Abu Alola, 2012	Knowledge Identification, Knowledge Acquisition, Knowledge Generate, Knowledge Storage, Knowledge Distribution, Knowledge Application.
12	Shishon, 2011, Odah, 2010	Knowledge Creation, Knowledge Acquisition, Knowledge Organize, Knowledge Availability.
13	Marquardt, 2002	Knowledge Acquisition, Knowledge Generation, Knowledge Storage, Extracting and analyzing Information, Knowledge Distribution, Knowledge Application

Higher Education in Sudan

The establishment of higher education in Sudan goes back to the foundation of Scientific Institute in 1912, Kitchener School of Medicine in 1924 and high schools in the end of 1930s. In 1980s, the total number of higher education institutions did not exceed (17) institutions from which (4) public universities, (11) colleges and a high public institute as well as a private university, a private college and Cairo University, Khartoum branch. Subsequently, Ministry of Education and Scientific Research and National Council for Higher Education and Scientific Research were established. After 1990s, a great expansion occurred in higher education and was represented in establishing new government and private universities. The number of universities reached (40) universities and (65) technical universities and colleges. The study domains varied and the programs number

increased to (1500) programs. In addition, the great expansion included students' admission which exceeded (500.000) students resulted in the emergence of new techniques like open education and distance learning (Said & Adam, 2016).

Literature review

Al-barasi (2015) aimed at evaluating the reality of applying knowledge management processes from the perspectives of faculty members and presenting a proposal for applying these processes in Omar Al-Mukhtar University. The study sample consisted of (120) participants and the questionnaire was distributed to them. The study results revealed weak interest in knowledge management and low level of its application. The study also revealed that there were not any bases or systems to apply these processes. The study results also showed that there were no statistically significant differences in evaluating the reality of applying knowledge management processes that can be attributed to the scientific specialization variable. After analyzing and clarifying results, the study presented a proposal to apply knowledge management processes in Omar Al-Mukhtar University.

Abujamee (2015) aimed at identifying the reality and significance of knowledge management in College of Education, Teba University from the perspectives of its employees. Does knowledge management level of college employees' responses differ according to gender, nationality, position, years of experience and scientific degree? The study tool was a questionnaire that covered (3) main elements in knowledge management processes which are knowledge generation, knowledge publishing and knowledge application mechanisms. The study sample consisted of (159) participants. Results revealed that the total arithmetic mean of knowledge management is high in the significance domain and intermediate in reality domain. There were no statistically significant differences due to gender and nationality. However, there were statistically significant differences due to experience variable, in favor of 10 years of experience and above. There were statistically significant differences in academic position variable in reality domain favoring higher academic position.

Altahayna & Alkhaledy *(*2015*)* aimed at identifying the degree of applying knowledge management processes in colleges of Sports Education in Jordan universities from the perspectives of faculty members. The study also aimed at identifying the statistically significant differences in the degree of applying knowledge management processes attributed to the variables of gender, experience and academic position. The sample consisted of (51) faculty members from the colleges of Sports Education in Jordanian university and Hashemite University. The sample answered a questionnaire consisted of (35) paragraphs that represent (4) main domains in knowledge management which are knowledge generation, knowledge storage and organization, knowledge transferring and sharing and knowledge application. Results revealed that the degree of applying knowledge management in colleges of Sports Education was generally high. The domain of knowledge transferring and sharing achieved the first rank, followed by knowledge application knowledge storage and organization and knowledge generation, respectively. Results revealed that there were not statistically significant differences in the degree of applying knowledge management processes attributed to gender, experience and academic position.

Gubran & Al-Mansouri (2015) aimed at identifying the degree of applying knowledge management processes in Sultan Qaboos University in Sultanate of Oman from the perspectives of its faculty members. The study sample consisted of (207) faculty members. To achieve study objectives, a questionnaire consisted of (36) paragraphs was prepared and distributed to five domains which are knowledge identification, knowledge generation, knowledge storage, knowledge distribution and knowledge application. The results showed that the degree of applying knowledge management processes in Sultan Qaboos University in Sultanate of Oman was intermediate from faculty members' perspective. Moreover, the study revealed that there were no statistically significant differences among the averages responses of faculty members in the degree of applying knowledge management processes in Sultan Qaboos University due to gender, academic position and nationality. However, there were statistically significant differences due to college and years of experience.

Nayak et al. (2014) aimed at studying and comparing knowledge management processes which are generating, discovering, organizing, storing, publishing and applying knowledge in public and private higher education institutions in regions of Udupi and south Kanara in India. The study population consisted of all faculty members in these two institutions. (201) participants were selected as a sample. The study revealed that there were no statistically significant differences among generating, discovering, organizing and applying knowledge in all higher education institutions. There is a significant difference between knowledge storing and publishing as well as its effectiveness in all higher education institutions.

Al-Othman (2013) aimed at investigating knowledge management level of awareness and its significance among employees in Naif Arab University for Security Sciences. It also aimed at identifying the obstacles that encountered knowledge management and ways to develop its application. The study population consisted of (101) faculty members and administrative employees with university degree (Bachelor and above). The study utilized the analytical descriptive approach and questionnaire. The results showed that the level of employees' awareness of knowledge management and its significance was high in Naif Arab University for Security

Sciences. Moreover, participants agreed to a medium degree on the reality and the obstacles of applying knowledge management in Naif Arab University.

Al-Agha & Abu Al-Khair (2012) showed great interest towards discovering the reality of applying knowledge management processes in Al-Quds Open University and revealing the procedures of its development through identifying whether there were statistically significant differences regarding the reality of applying knowledge management processes in Al-Quds Open University due to years of experience, educational district and scientific degree. The study utilized the descriptive approach and formed a questionnaire consisted of seven domains which represent knowledge management processes. The questionnaire was distributed to (250) academic supervisors in Al-Quds Open University. The study results showed that applying knowledge management processes in Al-Quds Open University was relatively medium. In addition, there were no statistically significant differences in the reality of applying knowledge management processes in Al-Quds Open University due to years of experience and educational districts.

Abdulrahman & Tadros (2014) identified the level of practicing knowledge management in Al-Balqa Applied University in Jordan from the perspective of administrative employees in middle and higher management and the relationship between practicing level and the variables of administrative level and years of experience. To achieve study objectives, a questionnaire was designed and covered nine domains of practicing knowledge. The sample consisted of (198) participants. Study results indicated that the level of practicing knowledge management in Al-Balqa Applied University from the perspective of administrative employees in middle and higher management was intermediate in all domains. It also revealed that there were no statistically significant differences in the total degree of practicing knowledge management due to the variables of administrative level and years of experience.

Abu Alola (2012) aimed at identifying the degree of practicing knowledge management processes which are generating, organizing, sharing and applying knowledge in College of Education in Taif University. Study population and sample consisted of all faculty members in the college. The study utilized the descriptive analytical survey and found out that the four processes include positive and negative practices. The descending order of relative significance of knowledge management processes was knowledge organization, knowledge generation, and knowledge sharing and knowledge application.

Alzatma (2011) aimed at explaining the role of knowledge management and its relation to unique performance in colleges and Middle Technical Institutes in Gaza sector. The sample consisted of (279) faculty members, heads of administrative departments with doctorate, master or bachelor degree and emeritus in five colleges that were chosen randomly. To achieve study objectives, the study utilized the descriptive analytical approach. To reach the required data, a questionnaire was designed and it consisted of three domains which are knowledge management requirements, knowledge management processes and performance. Results revealed that the ranking of employees practicing in Middle Technical Colleges for knowledge management processes was knowledge identification, knowledge generation, knowledge storage and finally knowledge distribution.

Odah (2010) showed interest towards revealing the reality of knowledge management in Palestinian Universities and the ways to support them. The sample consisted of (327) administrative leaders in Islamic University, Al-Azhar University and Al-Aqsa University. The most significant results were the ranking of employees' practicing in knowledge management processes according to significance. It was knowledge application, knowledge organization, knowledge generation and knowledge sharing, respectively.

Ramachandran et al., (2009) aimed at studying and comparing the practices and applications of knowledge management among public and private higher education institutions in Malaysia. The study data was collected from (594) academies from three public educational institutions as well as three private educational institutions. The study concluded that among knowledge management processes, acquisition, sharing, organization, storage and application, knowledge sharing got the highest rank among all knowledge management processes while knowledge application got the lowest rank. Generally, the degree of practicing or applying knowledge management processes for institutions under study was intermediate. There are big differences in applying knowledge management processes among public and private higher education institutions.

Methodology

Higher education in Sudan encounters a lot of problems and challenges including showing interest towards increasing social demand for university education, expansion in students' admission, low learning outcomes, low education quality and the gap among knowledge presented by these institutions, society needs and development requirements. In addition, weakness in qualifying and training faculty members, lack of scholarships' opportunities, decrease in faculty members' scientific productivity, low spending on scientific research, emigration of Sudanese brain drain annually and finally the defects in the infrastructure of university education.

Problem statement

The administrative literature contains many references to benefits that organizations gain through applying the concepts and tools of knowledge management. These benefits include developing and reinforcing the

performance level, improving the competitive position, increasing productivity and achieving competence and effectiveness as well as reaching to creativity and quick response to beneficiaries' requests, improving the level of outcomes quality and empowering employees in addition to increasing their integration into organizations, etc. On university education level, many studies refer to the importance of adopting knowledge management as a strategy to upgrade university education in many countries. Knowledge finding, transferring, generalizing and spreading represent the main cause of establishing universities. Therefore, it is necessary to adopt knowledge management to improve and develope the educational process. There is a lack of interest towards applying knowledge management in Sudanese higher education institutions. The study problem can be summarized in revealing the level of practicing and applying knowledge management in a number of Sudanese universities.

Questions

The study seeks to answer the following questions:

1- What is the reality of knowledge management processes from faculty members' perspective in Economics and Administrative Science Colleges in Sudanese Universities?
2- Are there statistically significant differences in the reality of applying knowledge management processes from faculty members' perspective in Economics and Administrative Science Colleges in Sudanese Universities due to gender, academic position and years of experience?

Objectives

The most important objectives of the study are represented in the following:

1- Identifying the reality of knowledge management processes in Economics and Administrative Science Colleges in Sudanese Universities through studying and analyzing different processes of knowledge management.
2- Identifying statistically significant differences among the sample average responses to the study domains due to gender, academic position and years of experience.
3- Modest contribution to enrich Sudanese library and the Arabian library through searching for vital and modern management.

Significance

The study significance is represented in:

1- It dealt with a modern administrative topic that has had a great interest in many environments and its concepts investigated in many sectors including higher education sector.
2- Studies and researches rareness regarding the application of knowledge management in Sudanese higher education institutions.
3- Study tendency towards applying and investigating concepts in services sector, higher education domain, consistent with the tendencies of management researches nowadays.
4- The need to this kind of studies to find solutions for these big challenges that face higher education sector in Sudan.

Population and sampling

The study population consists of all faculty members in Economics and Administrative Science Colleges in Public and Private Sudanese Universities. From this population, a stratified random sample will be selected and the tool will be distributed to its participants.

Method

The study utilized the descriptive approach to identify the reality of knowledge management application in Economics and Administrative Science Colleges in a number of Sudanese Universities.

Tool

In the light of reviewing relevant literature, a questionnaire designed for collecting data and investigating study concepts. It consisted of three parts. The first part is related to personal data of sample participants. The second part is related to the reality of applying knowledge management with its four processes which are (Knowledge generation, knowledge sharing and distribution, knowledge storage and organization and knowledge application). (10) Questions were assigned to each domain. The questionnaire answer choices designed according to Likert five-point scale (very high, high, medium, low, very low) according to degrees (1, 2, 3, 4, 5) respectively. The study adopted three levels identified according to the following equation: the highest range mince the lowest range divided by three levels, these levels resulted in:

a) 1-2.33 low application level.
b) 2.34-3.67 medium application level.
c) 3.68-5 high application level.

limitations

Temporal limitations: The study data was collected in 2016-2017.

Spatial limitations: This study was applied to a sample of Economics and Administrative Science Colleges' faculty members in different Sudanese Universities.

Objective limitations (academic): the reality of applying Economics and Administrative Science Colleges in

Sudanese Universities.

Human limitation: faculty members in Economics and Administrative Science Colleges in Sudanese Universities.

Tool validity:

The study tool (questionnaire) was presented to a group of examiners specialized in management, statistics and scientific research methodologies. They expressed their notes about the tool, some questionnaire paragraphs were modified and others were omitted.

Statistical processing

The arithmetic means were calculated to identify the tendencies of sample participants within the answer scale. The standard deviations also were calculated to explain the answers' degree of dispersion from the arithmetic mean. In addition, T-test was utilized to analyze the study questions.

Questionnaire reliability

The questionnaire reliability was measured by calculating Cronbach's Alpha for each domain and for the questionnaire as a whole. Table (2) shows that reliability coefficient is (0.880), indicating that the questionnaire has a high degree of reliability. Also, it indicates that the tool validity, as Cronbach Alpha's coefficient is considered statistically accepted and particularly in humanity research when they equal or bigger than (60%) (Sekaran, 2015).

Table (2) Values of Cronbach Alpha's coefficient for the study domains

Knowledge domain	Paragraphs number	*Cronbach's Alpha coefficient*	Validity*
Knowledge generation and acquisition	10	0.789	0.888
Knowledge sharing and distribution	10	0.931	0.965
Knowledge storage and organization	10	0.908	0.953
Knowledge application	10	0.847	0.920
Average		0.869	0.931

*Validity= Positive square root of *Cronbach's Alpha coefficient.*

Sample characteristics:

Table (3) shows the sample distribution according to universities. The questionnaire was distributed to (171) participants. The sample consisted of (136) faculty members from (10) Sudanese universities including (7) public universities, which are Omdurman Islamic University, Kassala University, University of Kordofan, Red Sea University, Africa University, Neelain University and Sudan University of Science and Technology, and (3) private universities which are Garden City University, University of Medical Sciences and Technology and The National Ribat University. The total number of Sudanese universities reached (40) universities during the study including (30) public universities and (10) private universities. It means that the current sample represented (25%) of the total Sudanese universities. Neelain University formed the biggest component of the sample with (13.97%), then Omdurman Islamic University with (13.24%) which was followed by Sudan University of Science and Technology with (12.50%). These three universities are the biggest in Sudan. Whereas Kassala University had a low representation in the sample with (7.35%), it was followed by Garden City University with (6.62%) and University of Medical Sciences and Technology which had the lowest representation of the sample components with (5.88%).

Table (3) sample distribution according to universities

S.	University	Gender		Total	percentage	Ranking
		Male	Female			
1	Omdurman Islamic University	18	0	18	13.24	2
2	Kassala University	8	2	10	7.35	8
3	University of Kordofan	10	4	14	10.29	6
4	University of Medical Sciences and Technology	7	1	8	5.88	10
5	Red Sea University	8	3	11	8.09	7
6	The National Ribat University	12	3	15	11.03	4
7	Africa University	11	4	15	11.03	5
8	Neelain University	15	4	19	13.97	1
9	Garden City University	4	5	9	6.62	9
10	Sudan University of Science and Technology	11	6	17	12.5	3
	Total	104	32	136	100%	

Table (4) refers to the percentage of male faculty in the study sample which reached (76.47%) whereas female percentage reached (23.53%). It also indicates that most of the sample participants are assistant professors with (44.12%) and demonstrators representing (41.91%), while associate professors represent (9.56%) and professors represent (4.41 %). It is clear that most of sample participants have good experiences as the percentage of participants who have more than (10) years of experience reached (41.18%). They are followed by

participants who have from (5) to (10) years of experience with (36.76%) and finally participants who have less than (5) years of experience with a percentage estimated by (22.06%).

Table (4) The percentage of faculty in the study sample

Variable	Variable domains	Number	Percentage
Gender	male	104	76.47
	female	32	23.53
	total	136	100%
academic position	demonstrator	57	41.91
	Assistant professor	60	44.12
	Associate professor	13	9.56
	professor	6	4.41
	total	136	100%
Years of experience	Less than (5)	30	22.06
	(5)- (10)	50	36.76
	More than (10)	56	41.18
	total	136	100%

Results and discussion:

Knowledge generation domain

Table (5) shows that the level of implementing knowledge generation was low with an average of (1.56), and relative weight (0.40). Paragraph (college participates in conferences and seminars held by community institutions) got the highest rank in this domain with a relative weight (0.67). It may be attributed to the fact that it is inexpensive and requires only the attendance and participation of the colleges' representatives. Paragraph (faculty members participate in knowledge research) was ranked as the second with a low relative weight (0.48). It may be attributed to faculty members' personal efforts to get knowledge. Both paragraphs (colleges have mechanisms to receive opinions and proposals of productive and service organizations which may benefit from knowledge provided by the college) and (college has a suitable budget to support knowledge management and scientific research projects) got the last two ranks. It can be explained that the mentioned mechanism do not exist in Sudanese universities and lack of a budget allocated for developing knowledge management in these universities.

Table (5) Averages and standard deviations of knowledge generation domain

S.	paragraphs	Average	Standard deviation	Relative weight	Rank
1	College supports faculty members' new and creative ideas	2.22	1.89	0.37	7
2	College continuously updates its available knowledge.	2.30	1.99	0.40	6
3	Scientific dialogue for exchanging ideas is encouraged among faculty members (employees & students)	2.31	1.44	0.41	5
4	College encourages faculty members to produce e-courses.	2.07	1.21	0.30	8
5	Faculty members contribute to searching for knowledge.	2.61	1.28	0.48	2
6	College shows interested in buying knowledge related to its activities from different sources (internal and external)	2.22	1.89	0.37	3
7	College participates in conferences and seminars held by community institutions	2.91	1.56	0.67	1
8	Colleges have mechanisms to receive opinions and proposals of productive and service organizations that may benefit from knowledge provided by the college.	2.01	1.23	0.27	9
9	College has a suitable budget to support knowledge management and scientific research projects.	2	1.72	0.26	10
10	College trains individuals in consistence with their renewable knowledge needs.	2.4	1.65	0.44	4
	Average	2.31	1.55	0.40	

Knowledge sharing and distribution domain

Table (6) shows that the first paragraph in this domain is (college holds meetings, seminars, workshops and lectures related to knowledge), with a relative weight (0.32), followed by (college has databases that contain names and addresses of expertise to refer to them when a consultation is needed) with a relative weight (0.27). Despite the relative preference of these two paragraphs, their values are very low. The two lowest paragraphs in

this domain are (college contributes to publishing distinguished faculty members' research and grants them incentive financial rewards) and (college honors faculty member who contributes to building and sharing knowledge). They got the ninth and tenth ranks, respectively, with a very low relative weight (0.16). It may be attributed to weak incentive and weak honors allocated for knowledge sharing and distribution.

Table (6) averages and standard deviations of knowledge sharing and distribution domain

S.	paragraphs	Average	Standard deviation	Relative weight	Rank
1	College encourages knowledge and information sharing culture among faculty members	1.86	1.32	0.19	7
2	College's knowledge bases are accessible for faculty members.	1.99	1.77	0.25	4
3	Faculty members can access the internet and obtain any information they need in the college.	2	1.55	0.26	3
4	College has internal network that enables exchange of knowledge among faculty members.	1.85	1.28	0.18	8
5	College takes a lead in the delivery of available knowledge to faculty members.	1.98	1.56	0.24	5
6	College has databases that contain names and addresses of expertise to refer to them when a consultation is needed	2.01	1.44	0.27	2
7	College honors faculty member who contributes to building and sharing knowledge	1.79	1.19	0.16	10
8	college holds meetings, seminars, workshops and lectures related to knowledge	2.11	1.66	0.32	1
9	college contributes to publishing distinguished faculty members' research and grants them incentive financial rewards	1.79	1.22	0.16	9
10	College knowledge sharing relies on the reports and different periodical internal publications of its activities.	1.88	1.74	0.20	6
	average	1.93	1.46	0.22	

Knowledge Storage and organization domain

Table (7) indicates that paragraphs that got the highest ranks are (colleges uses specialists in information technology to store and retrieve knowledge) with a relative weight (0.59), followed by (college uses modern media in addition to traditional means in storing knowledge) with a relative weight (0.56). Despite the relatively low weights of these paragraphs, they indicate college interest in knowledge storage and retrieval. The lowest paragraphs of this domain are (there is an interest in documenting and registering college previous experiences in specific fields that can be utilized in problem solving and decision-making) with a very low relative weight (0.20), followed by (college registers the previous experiences and experiments of faculty members and keeps them in knowledge databases). These two paragraphs indicate decline in college interest in documenting experiments and experiences of the study sample, which could have be an inexhaustible source of knowledge.

Knowledge application domain

Table (8) shows that paragraph (colleges use specialists in information technology to store and retrieve knowledge) was distinguished among other paragraphs with an average (2.50) and with the highest relative weight (0.71), followed by (faculty members have sufficient freedom to apply knowledge they acquire) with an average (2.18) and a relative weight (0.63). The two lowest paragraphs in this domain are (there is an authority (administration) specialized in knowledge management applications in college) with an average (1.44) and relative weight (0.07), and (there is a clear plan for applying knowledge in college) with an average (1.40), and a relative weight (0.04), respectively. The low relative weights of these two paragraphs indicate lack of a plan to apply knowledge management to the investigated universities, in addition to lack of and administrative unit responsible for applying knowledge management in these universities. As previously mentioned, knowledge application domain is the most prominent and important stage of knowledge management processes, since it represents the goal of knowledge processes' domains because it relates to knowledge management implementation of the actual practice in reality.

Table (7) averages and standard deviation of knowledge Storage and organization domain

S.	paragraphs	Average	Standard deviation	Relative weight	Rank
1	College is concerned with maintaining knowledge, keeping it and protecting it from damage and loss.	2.71	1.89	0.53	3
2	College organizes and classifies available data and information, then stores them to be easily compiled.	1.89	1.66	0.30	8
3	College uses modern media in addition to traditional means in storing knowledge	2.78	1.88	0.56	2
4	College stores and organizes knowledge in an accessible way.	2.01	1.50	0.26	7
5	College registers the previous experiences and experiments of faculty members and keeps them in knowledge databases	1.89	1.65	0.21	9
6	College has clear instructions for retrieval of its stored knowledge.	2.43	1.16	0.45	4
7	College has e-library available for faculty members.	2.20	1.52	0.36	5
8	There is an interest in documenting and registering the college previous experiences in specific fields that can be utilized in problem solving and decision-making.	1.88	1.71	0.20	10
9	Colleges use specialists in information technology to store and retrieve knowledge.	2.85	1.56	0.59	1
10	College relies on the internal documents and bulletins to keep the knowledge.	2.13	1.79	0.34	6
	Average	2.28	1.63	0.38	

Table (8) averages and standard deviations of knowledge application domain

S.	Paragraphs	Average	Standard deviation	Relative weight	Rank
1	College has a clear plan for knowledge application.	1.40	1.88	0.04	10
2	College follows up applying new knowledge ideas.	1.66	1.66	0.11	6
3	College has the suitable technology for applying knowledge.	1.74	1.24	0.14	3
4	College holds periodical conferences concerned with student excellence and creativity.	1.73	1.42	0.13	4
5	Faculty members have sufficient freedom to apply the knowledge they acquire.	2.18	1.86	0.63	2
6	College has e-courses on the internet.	1.52	1.56	0.08	8
7	Sufficient authorities are given to faculty members to solve problems they may face.	2.50	1.99	0.71	1
8	There is an authority(administration) specialized in knowledge management applications in college	1.44	1.15	0.07	9
9	College's prevailing organizational culture help apply knowledge.	1.65	1.39	0.10	7
10	College makes use of new knowledge in developing its performance, especially in decision-making and problem solving.	1.70	1.68	0.12	5
	Average	1.75	1.58	0.21	

To answer the first question, 'What is the reality of knowledge management from faculty members' perspective in Economics and Administrative science colleges in Sudanese universities?' Likert scale utilized. Table (9) shows that the arithmetic average of the sample responses to the application of the domains of knowledge management processes in Sudanese university environment is (2.07) with a standard deviation (1.56) and a relative weight (0.30). These results indicate that application of knowledge management processes in Sudanese university is very low. The domain of knowledge generation ranked first with an average (2.32), a standard deviation (1.56) and a relative weight (0.40). Despite the low values of this domain, its first rank is consistent with universities function as research institutions. The domain of knowledge Storing and organization was ranked second with an average (2.27), a standard deviation (1.63) and a relative weight (0.22). The domain of knowledge application ranked fourth and last rank with an average (1.75), a standard deviation (1.58), and a

relative weight (0.30). Perhaps the domain of knowledge application was given the fourth and last rank because of the lack of material and human requirements necessary for this domain.

Table (9) Frequencies, standard deviations and relative weight of knowledge management domains

Knowledge domain	Average	Standard deviation	Relative weight	Rank
Knowledge generation	2.32	1.56	0.40	1
Knowledge storage and organization	2.28	1.63	0.38	2
knowledge sharing and distribution	1.93	1.46	0.22	3
Knowledge application	1.75	1.58	0.21	4
Average	2.07	1.56	0.30	

This result is consistent with Abu Hashish (2011) in Palestine, Al-Barasi (2015) in Libya and Hameed and Badii (2012) in Pakistan. However, it is inconsistent with Altahayna & Alkhaledy (2015), khabash (2009) and El-Mosaada and El-Zaidyeen (2012) applied in Jordan which found a high level of knowledge application in the investigated universities. It is also inconsistent with Al-Agha and Abu Al-Khair (2012) in Palestine, Alaydarose (2012) and Al-Othman (2013) and Al-Ghamdi (2017) in Saudi Arabia, Abdulrahman and Tadros (2014), Elzaboon and Elsheikh (2015) and Kharabsha (2016) applied in Jordan and Gubran & Al-Mansouri (2015) applied in Sultanate of Oman which concluded that level of knowledge management application is medium.

To answer the second question, ‘Are there statistically significant differences in the reality of applying knowledge management processes from faculty members' perspective in Economics and Administrative Science Colleges in Sudanese Universities due to gender, academic position and years of experience?’ T-test applied to independent samples, averages and standard deviations to the sample responses.

Gender variable

Table (10) shows that there are no statistically significant differences among participants due to gender variable according to variance analysis and level of statistical significance, as (T) values are not statistically significant in knowledge management processes.

Table (10) Averages, standard deviations and (T) values of knowledge management processes according to gender variable

Domain	Gender	Number	Average	Standard deviation	"T" value	Significance level
Knowledge generation	Male	104	1.93	1.24	0.156	Insignificant
	Female	32	1.87	1.56	0.222	Insignificant
Knowledge storage and organization	Male	104	1.58	1.40	0.-442	Insignificant
	Female	32	1.34	1.52	0.011	Insignificant
knowledge sharing and distribution	Male	104	1.70	1.31	0.756	Insignificant
	Female	32	1.44	1.48	0.-231	Insignificant
Knowledge application	Male	104	1.66	1.50	.0.656	Insignificant
	Female	32	1.42	1.45	0.-489	Insignificant

The tabulated "T" value at freedom degree 134 and significance level (0.05) =1.96

Academic position variable

Table (11) shows that there are no statistically significant differences among participants due to academic position variable, because the tabulated "F" values were less than the calculated "F" values for all the knowledge management processes. It may be attributed to the similarity of university environment reality to participants in general.

Table (11) Variance source, Sum of squares, freedom degrees, square average, "F" value and the significance level according to the academic position variable.

Domain	Source of variance	Freedom degree	Sum of squares	Average squares	"F" value	Significance level
knowledge generation	Among groups	2	2.098	0.733	11.86*	Insignificant
	Within groups	134	24	0.812	2.321	Insignificant
	Total	136	26.098			
Knowledge storage and organization	Among groups	2	0.589	0.475	0.974	Insignificant
	Within groups	134	11.357	0.112	3.015	Insignificant
	Total	136	11.946			
knowledge sharing and distribution	Among groups	2	0.278	0.267	0.745	Insignificant
	Within groups	134	12.716	0.546	1.886	Insignificant
	Total	136	12.994			
Knowledge application	Among groups	2	1.024	0.356	2.418	Insignificant
	Within groups	134	14.359	0.802	3.166	Insignificant
	Total	136	15.383			

The tabulated "F" value at freedom degree 134.4 and significance level (0.01) =02.5

Table (12) shows that there are no statistically significant differences among participants due to years of experience, because the calculated "F" values were less than the tabulated "F" values of knowledge management processes.

Table (12) variance source, sum of squares, freedom degrees, square average, "F" value and the significance level according to the experience years variable.

Domain	Source of variance	Freedom degree	Sum of squares	Average squares	"F" value	Significance level
knowledge generation	Among groups	2	1.314	0.922	2.654	Insignificant
	Within groups	134	18.002	0.745	3.741	Insignificant
	Total	136	19.316			
Knowledge storage and organization	Among groups	2	0.816	0.475	0.801	Insignificant
	Within groups	134	14.978	0.112	0.077	Insignificant
	Total	136	15.794			
knowledge sharing and distribution	Among groups	2	0.932	0.281	1.133	Insignificant
	Within groups	134	11.335	0.651	3.256	Insignificant
	Total	136	12.267			
Knowledge application	Among groups	2	0.775	0.711	2.112	Insignificant
	Within groups	134	14.259	0.322	3.666	Insignificant
	Total	136	15.034			

Tabulated "F" value at freedom degree (134.4) and significance level (0.01) =5.02

Conclusion

The study sample consisted of ten public Sudanese universities that represent 25% of the overall Sudanese universities. Male assistant professors represented the majority of the sample and were of good experiences. The average arithmetic of the sample responses to the domains of applying knowledge management processes in Sudanese university environment was (2.07), with a standard deviation (1.56), relative weight (0.30). The results show that application of knowledge management processes in Sudanese universities is very low. The domain of knowledge generation ranked first with an average (2.32), a standard deviation (1.56), and a relative weight (0.40). despite the low values of this domain, its first rank is consistent with universities functioning as research institutions. The domain of knowledge Storage and organization ranked second with an average (2.28), a standard deviation (1.63) and a relative weight (0.38). The domain of knowledge sharing and distribution ranked as third with an average (1.93), a standard deviation (1.46) and a relative weight (0.22). The domain of knowledge application ranked fourth and the last with an average (1.75), a standard deviation (1.58), and a relative weight (0.30). There were no statistically significant differences among participants attributed to gender, academic position, and years of experience.

Recommendations

1. Developing the infrastructure of Sudanese universities, providing basic factors of knowledge management to improve the status of these universities, developing their performance and promoting its rank among international universities, improving their ability to distinguish and attract more students and providing more university programs.

2. Developing the domain of knowledge generation through allocating a suitable budget to support knowledge management and scientific research projects, encouraging the college teaching staff members to produce electronic courses and providing mechanisms to receive opinions and proposals from productive and service organizations that may benefit from knowledge provided by Sudanese universities.
3. Developing the domain of knowledge sharing and distribution through paying attention to incentives and honors related to achieving excellence in building and sharing knowledge, and Sudanese universities contribution to the publication of distinguished faculty research and granting them financial rewards. In addition to providing an internal network that enables exchange of knowledge among faculty members in these universities.
4. Developing the domain of knowledge storage and organization through paying attention to documenting and registering, the universities' previous experiments in specific fields that can be utilized in problem solving and decision-making process. Faculty members' previous experiences and experiments should be recorded in knowledge databases, in addition to, organizing and classifying the available data and information to be stored and thus can be easily compiled.
5. Developing the domain of knowledge application through preparing a clear plan for applying knowledge in Sudanese universities and establishing a knowledge management unit within the existing organizational structures of the universities. It would be entrusted with the task of proposing and implementing activities related to knowledge management processes, in addition to, uploading universities' e-courses on the internet.

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