Challenge Facing Sudanese higher education institutions for implementing the Knowledge Based Systems

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Abstract

Knowledge based Systems (KBS), is IT tools focuses on systems that use knowledge-based techniques to support human and has become one of the basic tools of the current society. KBS is a major bottleneck in the development of any institutions. KBS helps in increasing productivity, effectiveness and efficiency in operations. Overlooking KBS can critically get in the way the growth and prosperity of education Institutions specifically. A comprehensive literature study was undertaken. This paper focuses on what are the main challenges faces Sudanese High Education Institution (HEI) for implementing KBS and its tools. The research was conducted by using quantitative questionnaire from some Sudanese Higher institutions as methods to get user response and opinion about the main questions. The main challenges that may affect the implementation of KBS were identified by the users in different levels of the institutions. The researcher collected data from Different universities in Sudanese HEI. The research questionnaires were distributed to 400 questionnaires in the three selected universities, only 164 usable questionnaires were returned, yielding a response rate of 51%. Descriptive Statistics and multiple regression analysis were used to analyze the data collected.

Challenges for Implementing KBS in Sudanese HEI includes: Lack of KBS tools and techniques, Relative, low level of awareness and understanding of the topic, Lack of implementation of research based system in term of KBS.

Keywords: knowledge Based System, Challenges of KBS, Sudanese Higher Education.
1. **Introduction**

Nowadays we are living in knowledge based society controlled by current Knowledge revolution. In the society of the future, higher education will be key factor in the method of life specifically to this knowledge-based education society.

Knowledge engineering is the task of gathering and inputting information for use in knowledge-based computer systems. These systems can solve problems or answer questions without the help of a human expert. Knowledge engineers use a variety of acquisition techniques tailored to collect specific types of information.

Knowledge based system and experience at the proposed phase provides the best opportunity to improve overall HEI performance. In short, the KBS is able to support professionals by providing precise and timely knowledge for decision making for Sudanese Higher Education Institutions. Despite these advantages still the use of knowledge based systems in Sudanese Higher educational institutions is very few; perhaps it is due to the several challenges facing the use of knowledge bases in Sudanese Higher educational institutions. This paper presents challenges that may face the Sudanese Higher Education Institutions from the uses of knowledge-based system.

2. **Knowledge-based System**

According to Gonzalez and Dankel (1993), Knowledge based system is a computerized system that uses knowledge and its tools to achieve a solution to a problem. This solution is basically the same as that achieved by a person knowledgeable about the area of the problem when faced with the same problem knowledge Based System. To design a computer programs that performs at high levels of capability in cognitive responsibilities.

3. **Sudanese Higher Education**

The growth of higher education within the context of Sudan development faces the failure to nurture conditions in which the individuals with high education qualifications can be productively employed.

In view of the comprehensive advances in KBS and the emerging concept of knowledge based-society, the vitality and evolution of new educational institutions are essential to address the development needs of the society. The creation of new institutions for knowledge based-society are viewed as critical in identifying problems ahead of time, generating the information required to properly understand the nature of these problem, analyzing the gathered information with the requisite speed using the most appropriate tools and using the results to formulate the most appropriate policy alternatives. Nowadays, KBS make extensive use of ICT, especially the knowledge base and Internet because of its potential in advancing interactivity between users.

4. **The importance of knowledge based system for Higher Education**

Smith and Reid (1985), mentioned that KBS will reduce the whole cost or Increase Quality of education Services and magnify Availability of Expertise, provide expertise to less experienced people, keep away from delays when proficiency is needed, provide expertise in locations where it is not available, combine different sources of Knowledge, encode institution Knowledge, offer stability and accessibility over time, maintain proceedings of Decisions and procedures, offer a consistent knowledge based system for afterward analysis.

5. **Challenges in the use of KBS in Higher Education Institutions KBS Limitations:**

Despite the importance of the knowledge based systems to the society there are some challenges that limit the use of KBS includes:

5.1. **ICT technology Issues**

As the KBS is a computer technology system so the implementation of information and communication technology is a multifaceted
method that is based on a number of alternatives including technological options, perceived benefits, cost based models and managerial strategies (Ergazakis, 2006). Chaw (2002), argue that the most challenging issues revolve in the uses of KBS is how to increase the quality of knowledge. In fact, the revolution in computer technology blocked so much to the turning point regarding the use of knowledge base systems.

5.2. Lack of common sense
Lake of common sense is a huge issue; there is the problem of not realizing the importance of rules and basics of knowledge management, knowledge based and its tools for the most people in the education field (Jennex, 2006).

5.3. Globalization
Today, one of the most significant movements that has implications for KBS is that of globalization . The globe is becoming an interdependent global promote place, globalization is one of the most important trends today that has extensive implications for the uses of KBS (Floyd, 1999).

5.4. The knowledge based resource costs
Efforts to develop knowledge based systems can be analyzed from the viewpoint of the resource of knowledge, the cost of transmitting knowledge and opportunistic actions of people. Knowledge resource costs will affect the decisions of institutions that make codified knowledge and then store the encoded knowledge in the knowledge base and documents. Due to the high up-front costs and large recurrent costs, countries and communities typically make use of a great variety of financing and cost recovery mechanisms (Shin, 2004).

5.5. Lack of Training
The lack of staff training and failure to in the KBS filed will cause failure in modifying the institutions processes to be responsible for the problems encountered during KBS implementation. In order to expand recommendations for structuring a successful KBS there are some recommendations include: Train users on use and content of the KBS applications and Employee training on the new system must be considered to ensure successful implementation Jennex (2006).

6. The Problem
Despite the growing in the area of knowledge-based systems, it is not known why the implementation of knowledge based systems is still very low, especially in current Sudanese higher educations institutions. Could it be a reflection of some issues and challenges facing the current Sudanese HEI for the uses of KBS? Based on the problem raised the following research question is posed:

What are the challenges faces Sudanese Higher Education’s institutions for implementing the Knowledge Based Systems?

7. Research Model
The following research model (Figure: 1) was developed based on literature of Challenges in the use of KBS in Higher Education Institutions identified in the literature in order to assist this study in answering the above questions.

![Figure 1: Challenges Facing of Implementing KBS](image-url)
8. Methodology and Sampling

Descriptive statistics techniques will be used to analyze the data. The questionnaire technique of data collection will be used. Inferential statistics techniques will be used to try to infer from the sample data what the population thinks and to make inferences from the data to more general conditions. A multiple Sudanese universities/Colleges will conduct purposively to select the participant of the questionnaire. The selection of these participants was based on their specialization. Statistical Package for the Social Sciences (SPSS) will be used to answer the research question.

There are approximately 90 university/College in Sudan with a target population of approximately 500,000 students and 5300 academic staff. The purposive sampling method was used to select the field and the convenient sampling method (availability) was used to distribute the questionnaire.

Even though 400 questionnaires were distributed to the participants, 190 (47%) were not collected; only 164 (41%) questionnaires copies were completely answered. The remaining of 46(12%) questionnaires could not be included in the study due to incomplete data or poor responses (see Figure 2).

![Figure 2: Response Rate](image)

9. Data Analysis

Quantitative approach was used to answer the question about the challenges faces Sudanese Higher from the participants’ point of view. This will include data has been collected from multiple Sudanese universities/Colleges to select the participants of the questionnaire.

9.1. Demographic Profile of the Respondents

The first part of the questionnaire collected information on gender, age, nationality, education type, and the education specialist in the selected Sudanese HEI. Table 1 presents the demographic profile of the participants who responded to the questionnaire and the frequency distributions.

<table>
<thead>
<tr>
<th>Category</th>
<th>Response</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>95</td>
<td>57.9</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>69</td>
<td>42.1</td>
<td></td>
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<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16–25</td>
<td>34</td>
<td>20.7</td>
<td></td>
</tr>
<tr>
<td>26 – 39</td>
<td>86</td>
<td>52.4</td>
<td></td>
</tr>
<tr>
<td>Above 40</td>
<td>44</td>
<td>26.8</td>
<td></td>
</tr>
<tr>
<td>Nationality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sudanese</td>
<td>153</td>
<td>93.3</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>11</td>
<td>6.7</td>
<td></td>
</tr>
<tr>
<td>Education Type</td>
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<td></td>
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<tr>
<td>Diploma</td>
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<td>11.59</td>
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<tr>
<td>Bachelor’s Degree</td>
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<td>62.20</td>
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<tr>
<td>Master’s Degree</td>
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<td>15.2</td>
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<td>Information Technology</td>
<td>81</td>
<td>49.4</td>
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<td>Social Science</td>
<td>19</td>
<td>11.6</td>
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<td>Medicine</td>
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<td>5.5</td>
<td></td>
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<tr>
<td>General Science</td>
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<td>11.0</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>7.3</td>
<td></td>
</tr>
</tbody>
</table>

9.2. Respondent feedback

An appropriate usable sample size of responses from 164 questionnaires was collected. The purposive sampling method was used to select the field and the convenient sampling method (availability) was used to distribute the questionnaire. Table 1 shows the respondents feedback results regarding the challenges faces Sudanese Higher Education Institutions from the participants’ point of view.
10. Conclusion

The survey shows the interrelated challenges of KBS on institutions for several views. The KBS in Sudanese Educational fields faces many. However, as has been confirmed in numerous of the studies reviewed, this paper discover different issues.

Of the overall challenges, ICT technology Issues discovered as the most importance challenge with the use of KBS in Sudanese HEI because more than 94% participant agree with that, and this refers to the importance of ICT in the use of KBS in Sudan and there is a big problem with ICT infrastructure/ tools uses and permissions due to some political and others procedures’ issues.

The second challenge is Lack of common sense in the area of with 89% response they agree with that and it is due to the novelty of the field in Sudan, most of Sudanese people they do not have more idea about the importance of especially in Education field.

The Third challenges is Lack of Training with 85% response agree, they realized the importance of training, but unfortunately, in reality, they did not take advantage of the training for many reasons including: shortage of training itself, the type of training course– staff undertake training in areas which are totally different to those they actually need in order to use the institution system, or the course is either too advance.

The Fourth challenges is the knowledge based resource costs with 84% response rate agree with that, the cost of knowledge based system should always be considered in the context of the entire of any institution because now a days the ICT and KBS tools prices is very expensive and it is not easy to find suitable infrastructure with reasonable cost.

The last challenge is Globalization with 77% response rate agree with that, globalization is the releasing up of work and activities in education institutions, so globalization is one of the major trends today that has extensive implications for KBS.

11. References


