CLOUD-BASED STORAGE FOR NON-TEACHING STAFF FOR KSA'S EDUCATIONAL INSTITUTIONS

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ABSTRACT— *As in the revolutionary world of growing and advanced scenario the technology, data has become one of the world's most desired and required items because of the productive and useful information which can be produced for the betterment of humanity. The concept of cloud computing becomes more and more popular in latest years hence playing a vital role in data storage and management. Cloud storage services are providing data storage services to users with various additional features that can be synchronized to provide a safe, secure, and in some cases nearly unlimited means of storing digital data online without depending on personal hardware or private data centers. For a particularly large scale higher educational institution, a high capability cloud service provider can provide the required solutions for storage and organization of stored data. This paper introduces how cloud technologies improve the productivity of the non-teaching departments with a concentration of higher level institutions i.e. Saudi universities mostly for not adopting the cloud storage instead of storing data in paper format. Moreover, level of security issues in cloud environments awareness had been investigated and the findings shows 68.3% are not aware of any security issues which yield to propose a periodical awareness workshop for the staff. Moreover, security issues in cloud environments are discussed and a proposed solution was introduced which is the usage of blockchain in the educational system as the data there are not as huge s a medical or a smart city environment which makes blockchain an optimal solution.*

Keywords—Cloud Storage; Computing; non-teaching; Education, Blockchain;

1. INTRODUCTION

In the late twentieth century, technology becomes the real guide to the human mind and human been which staff used old methods to accomplish their tasks, for example (previously when employees want to access work files they must be physically present in the workplace, currently the employees can using the technology to get the information about his tasks via online as long as he can download the exact information and save it on his machine for archiving issue.), so It was replaced by new technology methods that helped staff to accomplish their tasks easily, although the new technology methods are used instead of the old methods . The idea is to allow you to access your content from anywhere, not just on your computer. So if for instance, you happened to have a problem with your device you could still retain your data.

All educational institutions, both governmental and private, universities and institutions, are racing to provide effective working aids to help the users to get the knowledge and provide him with the ability to work to innovate and excel.

Future gateway program offered by the Ministry of education in Saudi Arabia a wide range of educational services: learning management system that provides interactive content for students and allows teachers to raise homework worksheets plus e-tests, question Bank, a quarterly plan and "circle Contact "with students and parents. It also provides electronic service gate set up through which the teacher can provide him. Weekly and daily program I can be accessed by teachers and students and the school administration. Schedule default categories for students. It also supports competitive entrance system log for the student to gauge interaction and use of the portal.

Nowadays we all understand the basic concept of the matter: cloud storage provides the user with an opportunity to avail of secure, safe and almost unlimited means of storing digital material on the web, without the necessity to depend on personal data centers and personal hardware

In tasking of admin, the staff is the ability to share, edit and evaluate the files and knowledge between all the users of the organization remotely by using the cloud storage. In addition, teamwork easily and synchronizes data and information.[Using cloud storage, users can remotely store their data and enjoy the on-demand high-quality applications and services from a shared pool of configurable computing resources, without the burden of local data storage and maintenance][1].

This paper is trying to study and promote the use of technology in government services supported by National Vision 2030.

Figure. 1: A sample of Cloud Storage.

2. LITERATURE REVIEW

The larger size is one of the benefit of using cloud storage system compared to the traditional file system that make a significant difference between these two systems as Tahirah Binti Mt Tahir , Sangeeth Ramalingam, Nurulhayati Binti Illias , Bisyaarh Binti Mohd Surur, [3] did a research on 2016 for students , particularly in higher learning institutions as the cloud services can solve most of their problems especially if they have difficulties in terms of handling their documents. A conceptual framework is developed based on the Theory of Planned Behaviour looking into the items such as attitude toward the behavior, subjective norm, perceived behavioral control, behavioral intention and factors such as safety and access. The findings of this study have revealed various perceptions of the students with regard to their application of cloud storage services. The advantages of using cloud storage services as to keep data safe and can be accessed anywhere become the reason for students to use it. It is based on the

result of positive behaviour among students towards the application of cloud storage services.

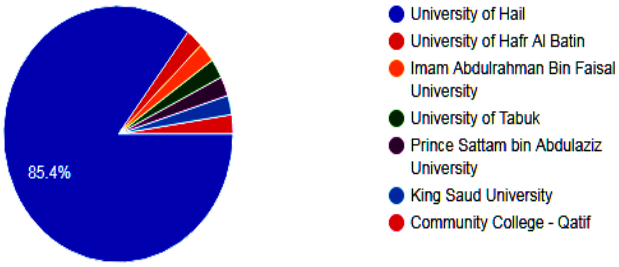
Meenaakshi N.Munjal,[4] in 2014 did a research on how cloud technologies and working practices associated with a virtualized data center can improve all areas of educational institutions IT departments. Discussants distinguished between three classes of computing capabilities: (1) services for campuses that overlap services provided commercially (like e-mail and VOIP telephone); (2) applications that campuses need to run for their institutions (ERP), and (3) research work that exhibits scale economies at the application level. The first area will very likely grow, perhaps quickly. The second area has particularly a strong policy, process, and control needs and will therefore likely shift slowly, if at all. The third area is already highly virtualized (grids, remote instrumentation, supercomputing, etc.) and will likely become increasingly virtualized. The people who participated in this discussion believe that public and private cloud services will come to market quickly and that the uptake of these services will occur more slowly and unevenly within higher education, depending on the severity and length of the current economic slowdown.

Cloud storage has several advantages over traditional data storage. Sushma Satpute, Bharat Singh Deora [5] did research on 2013 of Cloud-Based Storage for Education and found that it is essential for educational institutions to adopt cloud-based storage. The importance of data storage cannot be overstated and with the increasing use of technology by the school going population growing up with the latest technology and devices. Now schools can accelerate learning, increase flexibility, and cut costs using such new technology models. Not only the cost, but there are many other reasons why educational institutions of all sizes and types should adopt the model of cloud storage with on-device caching. Adopting new technology like cloud storage can help institutions in taking Green Initiatives by reducing the use of paper and help the environment. A faculty can use such a powerful feature of sharing, to easily share or publish assignments, homework and to distribute notes among the students without the use of any paper and in real time. Students can have access to the important curriculum and other educational content published by the faculty from any device like phones, tablets or laptops and from any physical location, any file saved to cloud storages can automatically be synchronized to all devices such as a desktop, laptop, and tablets. There are tools available to automatically sync all of the files to a number of devices in real time. The benefits of cloud-based storage and some of its challenges like usage cost, internet availability and access not only opens up an area for the scholars to research but also provides a huge opportunity for IT entrepreneurs to create applications on cloud-based storage model that could be used by educational institutions and students.

In general, this report brings to light that there are limits for institutions of higher education and research to legally safeguard the confidentiality and security of data once they engage in cloud storage.Dr. J.V.J. van Hoboken, A.M. Arnbak, LL.M. & Prof. Dr. N.A.N.M. van Eijk, with the assistance of N.P.H. Kruijsen, LL.M [6] did research on 2012 about cloud computing in higher education and research institutions and the USA patriot act, which is talking about the implications of the transition to cloud computing for access to data by foreign intelligence and law enforcement agencies, and what are the risks involved for institutions of higher education and scientific research in the Netherlands. Therefore any sensible discussion about the meaning and relevance for higher education and research institutions in the Netherlands of the possibility of the United States acquiring data should be based on an analysis of this broader framework. Looking at the legal framework in the United States from the perspective of Dutch users of cloud services. So the legal implications of cloud computing have been the subject of much debate in recent years. At the same time, one may expect that requests for information from cloud providers will become an increasingly important weapon in the arsenal available to intelligence and security agencies. In view of the lack of transparency about data access requests, the transition to cloud computing could lead to a lower degree of autonomy for higher education and research institutions.

3. RESULT AND DISCUSSION

The questionnaires have been distributed to the non-teaching departments of various higher educational institutions. The questionnaire was completed by 400 respondents of various educational institutions.



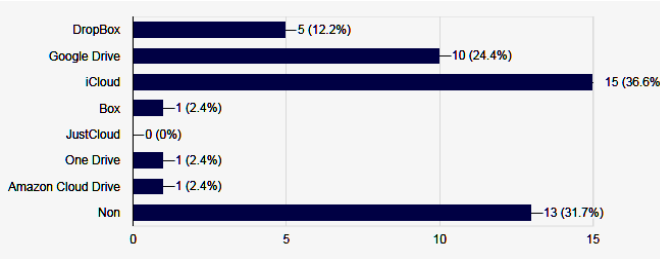
[Graph 1: Participating in Educational Institutions]

On the question "Which Application Programs Cloud Storage do you use?", Analysis showed that , DropBox 10%, Google Drive 22.5%, iCloud 35%, Box 2.5%, One Drive 2.5%, Amazon Cloud2.5%, Drive2.5%, other 5%, and 27.5% they not use any Application Programs Cloud Storage.

Through this questionnaire, the methodology has highlighted of the current administrative work in the universities of the Kingdom and with regard to the acceptance of administrators and their rejection of the system, had been resulting as that 45.9 – 36.6% they find difficult to return to paper dealings archived in file while 19.5% they did not, also for those who find a problem in modifying paper handling, this result showed for who had agreed 46.3 – 24.4% and this percentage was 24.4% for who had opposed and 58.5 – 34.1% of administrators has agreed with that paper dealings can be damaged over time, while 7.3% disagreed, in probability of losing the paper dealings and misplaced and lost it this result showed for who had agreed 41.5 – 36.6% while 17.1 – 4.9% disagreed. In order to be aware for the administrators to know about cloud storage, some questions were asked through the questionnaire.

The result was that 51.2 – 41.5% considered cloud storage better in terms of capacity and call data than manual

storage, while 7.3% preferred manual storage, 58.5 – 36.6% agreed that cloud storage makes it easy to search and access files and modify them, while 4.9% disagreed this idea, and 53.7– 31.1% agreed that file.



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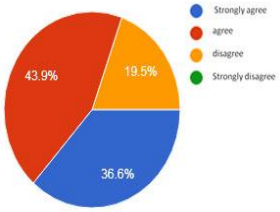

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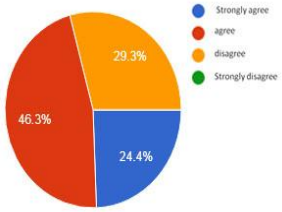

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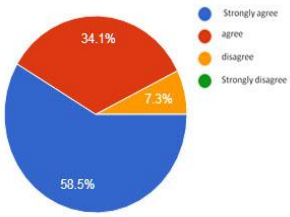
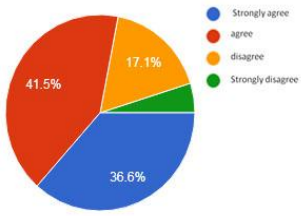
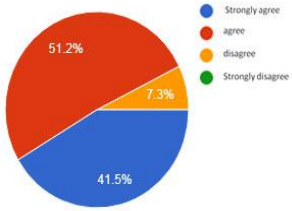


[Graph 5]



[Graph 6]

synchronization "access from any device at any time" in cloud storage makes it easy to access and take time and effort, while 9.8 – 2.4% rejected it, and 51.2 – 39% agreed that using cloud storage helps reduce the risk of data loss, while 9.8% rejected it. 48.8 – 41.5% agreed that cloud storage provides flexibility in granting file-sharing powers in a manner that ensures privacy and confidentiality, while 9.8% rejected it, at the end of the questionnaire, a question was asked about security in the cloud storage system. Is it secure or not? The result was that 68.3% answered that it was secure while 31.7% replied that it was not secure which highlight the level of awareness of the in cloud environment security issues.



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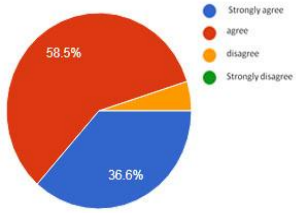

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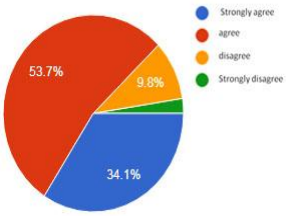

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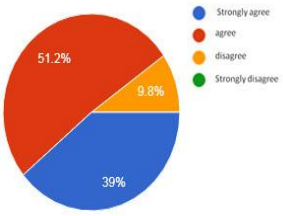

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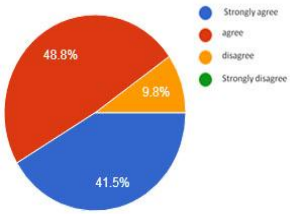

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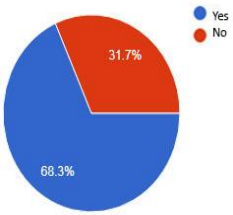

[Graph 12]

In this questionnaire, it was proved that the majority of administrators suffer from problems in the current system "paper system" where they are required to accomplish their administrative tasks in more time and effort, and this system can expose data to damage or loss, and the paper system is inflexible as the majority suffer from the problem of referencing and modifying the data. On the other hand, it has been proved that the cloud storage system has received the approval of the most administrators, as it provides them with all the features missing in the paper system, in terms of storage capacity and speed of data access and modification, and also access to data through any device at any time , It also reduces the risk of corruption or loss of data, also provides them with data sharing feature and ensures their privacy and security. Finally, a high percentage of administrators agree that the cloud storage system is secure, while a large proportion of them have never used any cloud storage software, and this shows us that the majority have no background to cloud storage. The need to educate them in this domain was intensified before the system has implemented.

4. Proposing Blockchain for Cloud Services Security Issues in Higher Educational

All devices and data connected to the network, such as the cloud, are subject to threats data leaks losses because the cloud is a multi-user environment when unauthorized access to third-party and cloud storage services are shared outside the organization. The cloud storage does not provide robust data privacy which data is not encrypted although data security and privacy is a significant task. In addition, bring your own device (BYOD) refers to employees who bring their own computing devices security this is the biggest concern, it is nearly impossible to track and monitor employee devices personal if appropriate precautions are not taken through the use of a dedicated data protection service [7]. The most important solutions that contribute to minimizing security risks in cloud storage areas following:

Firstly, protect the infrastructure by building a force in cyberspace like the U.S. Department of Defense where the cybersecurity strategy was adopted for 2018. [Data traversing over geographical boundaries are subjected to different federal laws. This is a prime threat which hinders the usage of cloud computing services][8]. Therefore, it is

necessary to build a force in the cyberspace that protects the privacy of data that crosses through the network.

Then, the use of blockchain which is considered to be the focus and destination of late researches as a solution for security issues in the cloud environment. Blockchain is a peculiar engineering design whose only advantage is in removing third-party intermediation[9]. The future of blockchain is as bright as the failure of the centralized system to provide users with privacy and data protection because confidentiality does not imply integrity such as Facebook. The central system loses the confidence of governments and individuals in cyberspace and the upcoming Cyber Wars So the government of Dubai announces it will be the first block chain powered government in the world. The diagram below shows how blockchain work of cloud storage in KSA base on adman faculty for KSA universities.

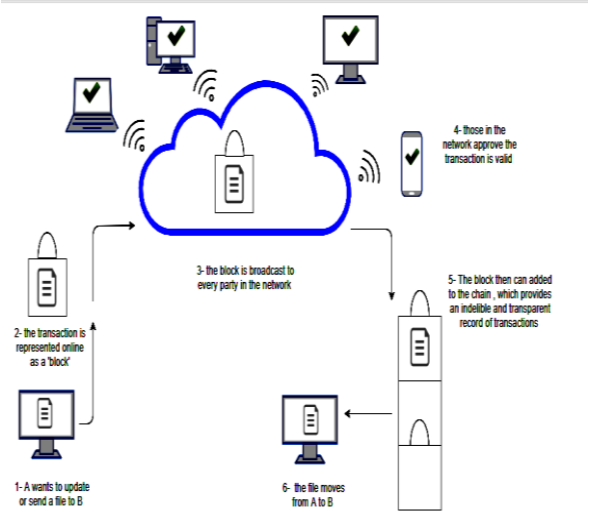

Figure 2. Proposing blockchain on Admin tasks in a University System

It is used for transparency, decentralization every transaction that is added to the blockchain is validated by multiple computers on the Internet and immutable which means the data can't be tampered with in cloud storage [10] and [11]. After that, staff awareness of information security, which is the weakest link in the informatics system. A periodical awareness workshops and lectures should be conducted to the staff members on cloud security issues, protection measures and latest updates and changes in it.

5. CONCLUSION AND FUTURE WORK

It has been proved through this study the extent to which administrators accept the concept of cloud storage as it improves the methodology of the administrative work. To implement this system, it requires from the universities to do a condensed study to accredit this system officially, and universities must spend a specific budget for the implementation of the system and holding courses on cloud storage to educate the administrative staff in relevant securities issues as that is major concern by proposing a relevant solution by implementing blockchain as well as conducting various awareness workshops and training sessions for staff.

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