Analysis of Security Issues and Effectiveness for Adoption of E-Learning Management System

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Abstract: Learning Management Systems using cloud computing technologies are a growing and they are addressing the University and Institution need for access to the study material and courses to raise the standard of education system within the educational system. The purpose of this paper is to evaluate the two factors that can influence the Universities and/or Institution decision to adopt e-learning management systems as a part of their facilities. Factors related to e-learning being considered include its effectiveness and its security. This paper addresses these factors from the viewpoint of decision maker of the Institute who determine the adoption of e-learning system in their Institute. The two independent factor that is cost effectiveness and security issues was analyzed in comparison to the management interest in adopting e-learning systems. A positive relationship was found between the independent variables: cost-effectiveness and the dependent variable the management interest in adopting e-learning systems for the Universities and/or Institution. And no significant relation was seen between security and adoption of e-learning systems.

Keywords: Online Learning, E-Learning, Learning Management System

I. INTRODUCTION

E-learning based on cloud is one of the growing technologies in Information technology field which brings powerful Learning Management System products using the power of the cloud. Cloud computing technology has various benefits over the existing traditional Learning Management Systems but also, effectiveness and security are vital topic in cloud based e-learning. Developing an e-learning system doesn't fulfill the task we need to study two things before adoption of e-learning system:

1.   How effective is the e-learning?
2.   What are the security issues we need to overcome in the e-learning system?

E-learning was adopted basically for three main reasons:
•   It has proven to be cost-effective method of knowledge delivery
•   It provides global access
•   Access by audiences is reasonably significant
E-learning is spreading around the world with leaps and bounds with growing importance of internet.E-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means. E-learning is a concept in which user can teach as well as learn through electronic media. Nowadays e-learning is a very new and innovative technique, and has a great future due to its credibility and extra ordinary efficiency. E-learning is a new education system in which different types of technologies and tools are integrated and play a major role to make e-learning such a powerful system.

II. PROBLEM STATEMENT

Determine if the e-learning systems based on cloud is suitable for an Institute or not. The research takes into consideration two factors:
1.   Security
2.   Effectiveness
This research helps to whom want to make decision to adoption of e-learning systems for their institute.

III.RESEARCH QUESTIONS

Questions that relate to the focus of study include: -
Ques 1:   What is the impact of security issues of e-learning on Institute's decision to adopt the e-learning systems?
Ques 2: What is the impact of effectiveness of e-learning on Institute's decision to adopt the e-learning systems?

IV. HYPOTHESES

Hypotheses 1: Factor influencing the effectiveness of e-learning systems has a positive and significant effect on Institution decision to adopt e-learning systems.
Hypotheses 2: Security measures have a positive and significant effect on Institution decision to adopt e-learning systems.

V.LITERATURE REVIEW

Cloud computing plays an important role in the field of information technology since its computing process and

progress are very rigorous. It supports lots of businesses. The key advantage of the cloud computing technology is the cost of investment is minimal and benefits are more.

To provide this type of service oriented operations such as the real time world now deals with pay per utility concept. The software which the company needs to have for their current ongoing project, they don't want to buy an entire package. Instead they can use the service of the software on the basis of pay per usage concept as far as the cost of information technology as the current world knows regarding this concept. A user on the internet can communicate with many servers at the same time and these servers exchange information among themselves. [1].

Huge infrastructure is not needed for setup of cloud computing, it requires system with CPU, input devices and output devices, hard drives with high capacity, higher end memory unit, anti-virus to control the virus and worms to safe guard the system, well-structured and organized local area network, wireless area network like board band connections and platform required for achieving virtualization for the entire process.

Grossman et. al. (2009) worked on infrastructure that was cloud based and that was optimized for wide area, supported essential applications of data mining and performance network. Cloud computing infrastructure accelerated the adoption of different technological innovations in academia and its facilities and resources could be accessed byInstitutes on demand.

VI. METHODOLOGY

The method applied is a non-experimental research method that needs vivid examination approach. Survey could be functional when the researcher is willing to collect data on phenomena which cannot be observed. Figure below shows the proposed model of study:
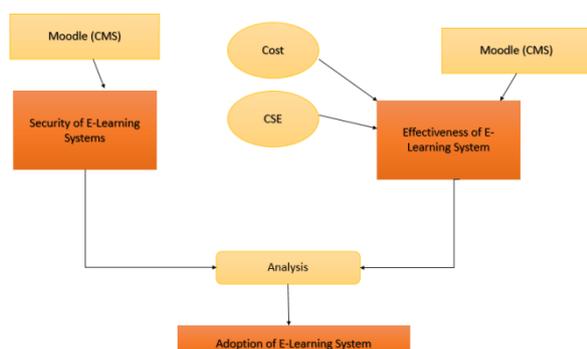

Fig. 1 Methodology

This research adopts two approaches for conducting the study of effectiveness and security factors of e-learning systems.

In the first approach an intense literature survey was done to gauge the two factors under consideration. Required data was collected from intense survey of literature on the internet and various research papers for measuring the security and effectiveness factor of the research.

In the second approach, blog was gone through to evaluate the two factors in order to further identify effectiveness and security risks in e-learning system. A blog is a discussion or informational sites published on the World Wide Web and consisting of discrete entries called posts. A typical blog combines text, images and links to other blogs, web pages and other media related to the topic [2].

To track search interests of users regarding online learning security and e-learning security in recent years, I used Google Trends, a search tool that is web based and provides the frequency of some specific keywords or keyword queried over a specific period of time.
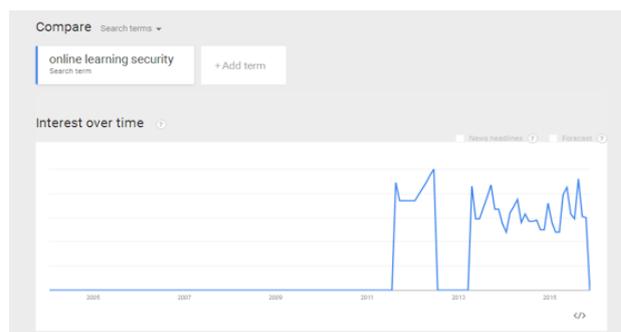

Fig. 2 Result Generated by Google Trends

The result generated by Google Trends (Figure 2) indicated that although the search frequency of online learning security has fluctuated in a narrow range since 2013, the overall attention paid to it has not changed much.
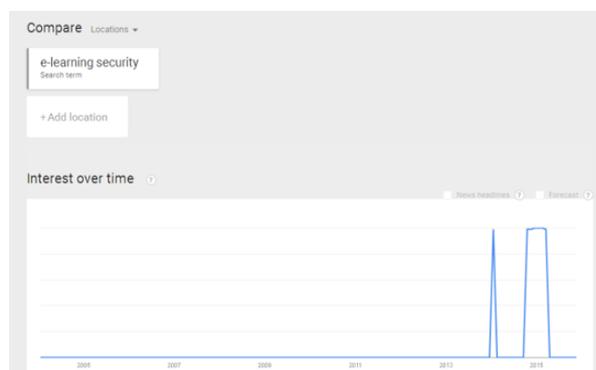

Fig. 3 Result Generated by Google Trends

When I analyzed the frequency of the keyword "online learning security" by filtering the location to India, the result so obtained was not enough search volume to show graph.
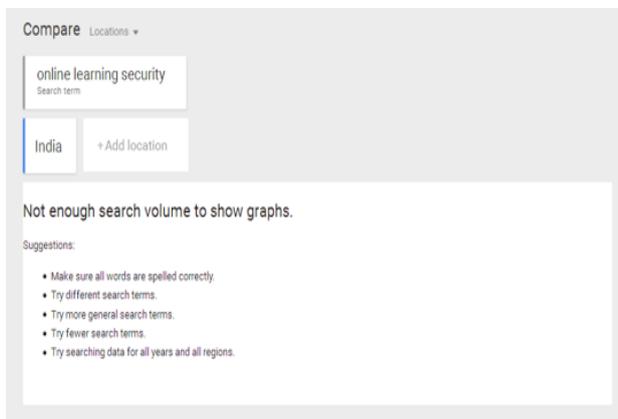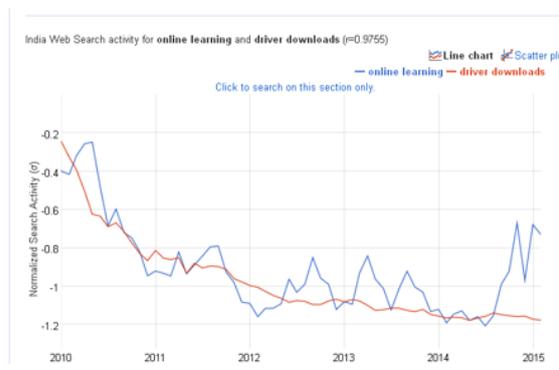
Fig. 4. Result Generated by Google Trends

Fig. 6 Line Chart Showing Online Activity of the Keyword Online Learning

Trends of query data in online web based search have been proven useful in giving models of real world. Moreover, most results will rely on the smart choice of queries that are based on prior knowledge and must correspond with the phenomenon.

An automated method for query selection is needed which do not need such knowledge. Instead, given a spatial or temporal pattern of concern, we can define which queries will mimic the data in the best way. Then these search queries could serve to find an estimation of the correct value of the given phenomenon. The purpose of using Google Correlate is to plot the queries given using database whose temporal or spatial pattern are most highly correlated (R^2) with a target pattern. It employs a unique algorithm called approximate nearest neighbor (ANN), over millions of queries in an online search tree to produce the final result. Google Correlate is a web based system that can plot its result in real time.
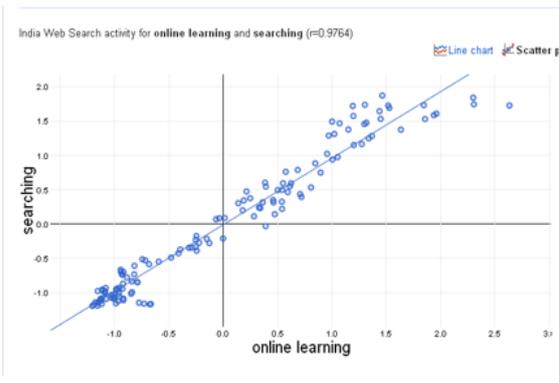

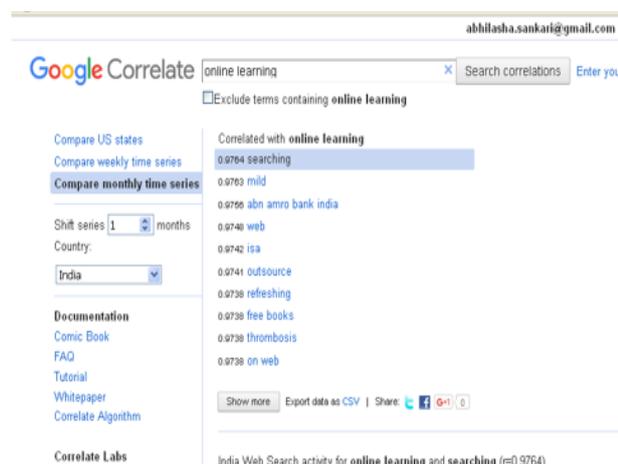Fig. 7 Scatter Plot Showing Online Activity of the Keyword Online Learning

VII. ADOPTION OF E-LEARNING SYSTEMS

Shurville and Browne (2006) asserted that several factors such as global competition, environmental sustainability, personalized learning, reduced cost and personalized learning are the drivers for Universities and Institutions to adopt e-learning systems. Therefore, for creating a well-defined, effective, easily accessible, interactive and distributed learning management system the Universities and Institutes have to consider factors that influences the e-learning systems before its adoption.

Till now many factors have been revealed by throw study of literature that had influence the adoption of learning management system. Some of the factors are related to human behavior and attitude while many others were related to learning management system itself. There are other factors too that were found in the literature review such as cultural factors, factors related to instructor and students and technical issues.

Selim [3] has categorized the factors into four categories university support, instructors, students and information technology. Papp [4] found out three critical success factors of e-learning systems:

Fig. 5 Result Generated by Google Correlate

Figure below shows online activity of the keyword online learning using line chart and scatter plot.

1. E-learning course content
2. Course suitability of the LMS environment and
3. Intellectual property and maintenance

Ndubisi [5] identified four factors attitude, perceived ease of use, perceived usefulness and subjective norms.

For the purpose of model development of this current research two factors namely security of learning management system and it effectiveness. These factors were used to find whether the intension of e-learning system adoption was influenced by these factors or not.

Following are the ten steps that universities can follow that could help maintain security while adopting an e-learning system [6]:

- Audit business and operational process
- Ensure proper protection of data and information
- Manage people, roles and identities
- Ensure effective governance, risks and compliance process
- Ensure privacy policies.
- Evaluate security control on physical infrastructure and facilities
- Assess the security provision for cloud applications
- Ensure cloud networks and connections are secure.
- Proper management of security of the exit process.
- Management of security terms in the Service Legal Agreement (SLA)

VIII. CONCLUSION

Applications of internet technologies in e-learning could cause many risk to security, such as the exposure of critical data and loss of confidentiality and availability. It is observed that security has been the main topic in the domain of e-learning system from quite some time and several articles were published.

Institutes and Universities today are in precarious economic positions with high emphasis given to cost reductions in all possible manner. The prospect of e-learning systems becomes a lucrative optionfor this reason, given that it does not need extensive travel costs and allows learners to participate in spite of their geographical location.

The objective of this research was to measure institutes and universities attitude towards adoption of e-learning system. The study revealed that adoption of e-learning depends on effectiveness of the e-learning systems but not fully depends on the security component of the system. The research recommends the adoption of e-learning system as an economical approach of widening opportunities in educational system.

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