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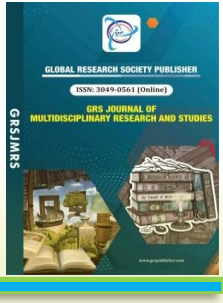

A Cost-Effective Contribution of Cloud Computing in ERP based Learning Management System

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Abstract: This research article encounters the cost-effective contribution of cloud computing ERP, for planning and underpinning the contemporary in the learning management system. Some relevant studies are correlated to appreciate the core concept of this study and also for the readers, especially in the learning management aspects. The domain of cloud computing ERP service can be explained and also with its model and characteristic, and the differences of traditional and cloud computing ERP with its suitability. For the methodological purpose both primary and secondary data are accessed with well tested structured questions (100) with Likert scale. The objectives should be properly framed, and it should be satisfied with a null hypothesis in the part of discussion and conclusion as demonstrating the cost effectiveness of cloud computing in ERP based learning management systems.

Keywords: *cloud computing ERP, learning management system, cloud and traditional ERP.*

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Introduction

A learning Management System (LMS) is generally denotes a software for educational sector, which is assisted with programs related to training, report tracking, automation of courses, delivery of courses, learning and development programs, maintain classroom related activities, monitoring records, create syllabus, teaching plan and ultimately online assessments to enhance student's assessments. There are distinct types of ERP systems that exist, they are traditional, cloud-based, on premise or hosted. Cloud based (computing) ERP elucidations are becoming more gorgeous with escalating features and the overall resources of any learning management system can be integrated in the course of cloud based ERP. Consequently, numerous learning management systems have accepted these systems [1]. Cloud based ERP management systems are institutional wide software packages that provide a totality of integrated learning management processes using a widespread database and contribute visibility in data and information in an assortment of perspectives. Creating a cloud computing ERP based learning management system in an educational system with many advantages, some of them includes automated admissions, simplification system in record management, engaging faculty, managing resources and strengthening decision making [2]. Conversely cloud based ERP includes lots of advantages, initially it leads to cost efficiency, on service demand, almost undefined storage, rapid elasticity, speedy deployment, pooling of resources, broad network access and measured services [3]. In this research paper the initially mentioned concept "cost efficiency" in cloud computing ERP based learning management system can be analyzed based on some undertaken facts. Thus cloud computing in ERP can be demarcated as organized systems that manage the administration chains in all aspects such as operations, reporting, and human resources and so on. Moreover, in this digital community, learning relies profoundly on the cloud technology prior tractability to create, update and erase virtual resources. When the cloud based ERP system gains various commitments here for making superficial as the learning management system and support to be more effective.

Review of Literature

Some attempt is done to cover the related general concepts cloud computing ERP through the review of literature. The implementation of ERP over SaaS is elaborated comprehensively in their studies. Innovative applications are designed to take over the various advantages of the scalable cloud storage, servers and middleware communications components. They conclude that cloud computing is a specific exemplary for enabling continent, on-demand network accesses. Also findings provide meaningful guidance for managements that require adopting cloud based ERP, government that supports digitalization and vendors who put up for sale cloud based ERP systems [4]. The concept of the effect of cloud based management systems in the domain of Learning Management System (LMS).The perception in learning develops rapidly over the years to comprise not only the learning in management systems, but also advanced tools such as games, simulation and virtualization. As a result, the cloud based learning management system is being flaunted as the next evolution of the traditional learning management system. The authors concluded

that cloud based learning management systems will resolve some conflicts associated with the process of traditional learning management systems [5]. A skeleton system to integrate the functionalities of ERP planning with university academic and management functionalities at the British university in Egypt is studied by the corresponding authors. They reported that in order to construct University Resource Planning (URP) that integrates education and management processes. Therefore, ERP should be enabled with learning and facilitated with automated admission, records management, managing resources, engaging faculty and strengthening decision making [6].

On concentrating the ERP layers, the below mentioned authors assisted the three-layer approach for the cost benefit analysis and illustrate insight on profitability when the institution or administration shifts to cloud computing in each layer. Data has been collected from small scale and large scale data centers, and it has established that cloud computing is profitable for small and start-up firms that contrast to well-established firms. Large scale management does not benefit from shifting to cloud architecture [7]. The authors studied the tradeoff equation on cloud computing. They moreover presented a trade-off equation for appraising the profitability on adoption of cloud computing which has been used to derive some model of the cloud computing ERP based on learning management system. Also this study is expected to share some experience on the progress of the ERP sector as well as the cloud based learning management. Some recommendations will be given to SMEs to support them on their journey towards cloud-based ERP [1].

Cloud Computing

The initial stage in cloud computing ERP is when the learning management system decides to select the domain of the cloud system. Basically a learning management system accesses a private cloud system instead of a public system to start up with the ERP service. Since public cloud services are hosted by provider's systems like Amazon, Microsoft etc. Cloud Computing has four divergent deployment models. Those models are private cloud, public cloud, community cloud and hybrid cloud. Private cloud ERP service is hosted by organizations and accumulates their management data on clouds. The reason for these types of systems can be undertaken by the learning management system is that no other from other management can occupy the cloud. The data maintained, which is highly regulated by the management to meet the compliance standards. In the public cloud the service provider agreements as the general claims, storage and supplementary resources to the general community.

In community cloud patterns, the substructure is communal by several organizations with comparable services and common benefits such as compliance, safety etc. Finally, the hybrid cloud is self-possessed into two or more clouds to be dragged whose bodiesendure unique thendevoted to each former. But some deemed intuition or learning management adopts hybrid cloud environments, and can place their data in a sensitive or regulated manner. Whatever may the cloud category, the basic criteria be behind is the fact that contribution in the cost effectiveness should be transposed by the learning management system.

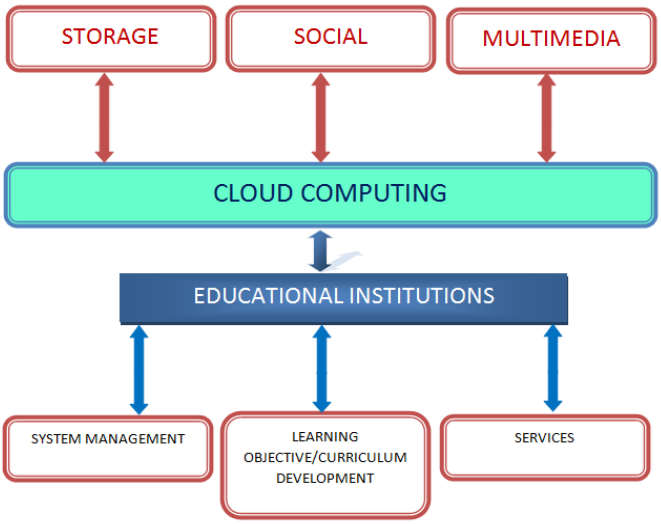

Figure: 1 Pictorial representation of domain of Cloud computing in learning management

Cloud Model and its Characteristics

Model	Characteristics
Public Cloud	• The services are manageable by internet • This model is suitable for small and mid-size management • Applied with SaaS in order to reduce investment expenditure

Private Cloud	• Used only properly by the organization • The services are available in a corporate system and contact can be limited to a single department to afford control. • This model is preferred by multidivisional enterprises or corporations for educational applications similar to the CC ERP systems. • Cannot be cast off to distribute application in the SaaS model
Community Cloud	• Is cast-off by multiple establishments and provisions communities which have common objectives • Assisted for communication between associates of a project squad (application in groupware)
Hybrid Cloud	• Is the grouping of double model cloud to form exclusive units connected by a single or prescribed technology? • Choose a distinct model of cloud computing technology in command to use innumerable software groupings.

Table: 1 Comparison of ERP (Traditional and Cloud Computing)

Quality	Traditional ERP	Cloud Computing ERP
Deployment	Local Server	Cloud Server
Defining Flow	Organization Specified	Flow specified
Implementation Cost	High	Low
Ongoing Cost	Relatively high	Low
Control over ERP	Easily controllable	Relatively rough to control
Customization	Not open for business organization	open for business organization
Support Cost	Relatively high	Low
Integration	Dependent on vendors	Same exists, and can support centrally.
Licensing Cost	High	Low
Updating ERP	Costly	Low cost, central maintenance
Internet Dependency	No	Yes
Audit and Trail	From an organizational perspective, it is easy.	Relatively complex
Version Controlling	Relatively complex	Easy

Learning Management Systems

In this investigation, ERP based learning management systems are introduced with cloud computing systems to increase the potentiality of the management system, and also to enhance the scalability, flexibility and availability. Here the representation between role entity and cost-effectiveness can be considered as important advantages. The total system will be maintained by the process of content management, education system, system building components, maintenance and development etc. The cloud computing ERP learning management system can be affordable for a management system as expanded horizontally, vertically and carrying the relevant data conferring to the quantity of servers that be contingent upon the manipulators.

Structural Design

Learning Management is a system generated exclusively to manage, trace and appraiseconstant management systems in learning and the entire it's activities in the management conclude with the World Wide Web or among some homegrown network. This network is more than a tool and activities related to communication to monitor users. In these the learning organization is distinguished by the skill of the educational institutions to accomplish, establish, and advertise courses and sequences designed for educational institutions. LMSs is defined as "integrated software packages that are a system for handling the e-learning progression and attain announcement between the bashes of the enlightening system at any period and from any abode through the internet or local network in demand to expand the

procedure of education [8]. The specification of a learning management system will include the following tasks. ACloud Computing ERP-LMS should

- Prepare and record learners schedule for online/offline courses
- Upload and save data files of learners
- Introduce e-content courses
- Track and survey the progress of learner in a precise course
- Manage classroom activities
- Provide resources for learning overseers, laboratories and schoolrooms
- Funding the assistance of learners
- Identify pathway for career development and performance development
- Progress and succeed examination
- Provision for credentials
- Simulated classrooms are interconnected, learning gratified and innovativenessthe claims

Comparison

The traditional technique based on internet learning depends on the coordination, which exists within institutions, resulting in amplification of numerous problems such as large investment also resulting in increased deficiency of sources of development. In disparity the cloud computing ERP based model is used to build the learning management system, enabling service providers to receive higher benefits. Ultimately the cloud computing ERP system can be expanded horizontally and precipitously similar.

Effective Contribution (Advantages)

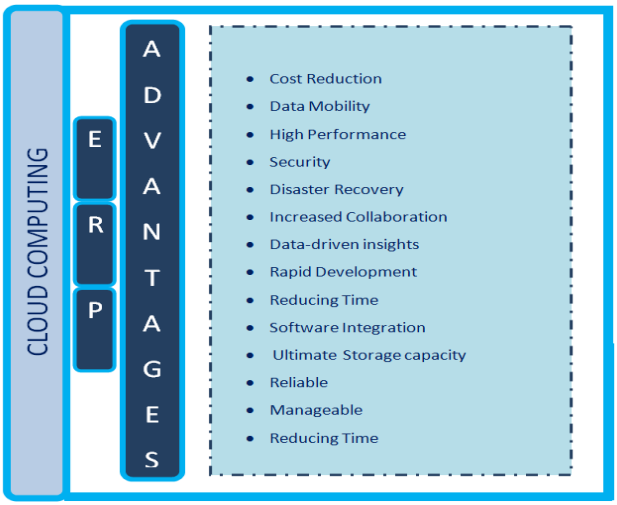

Figure: 2 Pictorial representations of advantages of CCERP

Objectives of the Study

- To explore the foremost issues owed to implementation of cloud computing ERP at work place
- Responsible key factors to be investigate from ERP system to cloud computing ERP system
- To identify the multiple and major advantages of cloud computing ERP in terms of identifying the lane for cost effective contribution to the learning based management system.

Methodology

For the investigation purpose of this current topic, both primary data and secondary data are utilized. The primary data were collected using a well-tested and structured questionnaire consisting of 100 questions. The questions are assisted with five point Likert scale and all items are measured by the response in agreement with statements. The questions are in the perception about the usage of cloud computing ERP for learning management purposes and it should correlate the objectives of the study. To satisfy the specific purpose, the researcher undertakes purposive sampling technique in the study. And the secondary data are the published research articles that are relevant to the study. Samples are limited to 200 in the relevant field, in these total samples, only 130 samples are answered completely in all aspects. Since the above set of data are used for the study. The data were tabulated and by assisting the Cronobach alpha test the reliability of the response was found to be 0.71. Descriptive statistics was utilized to appreciate the response regarding the adaptation of the cloud computing ERP based learning management.

The secondary data are the opinions of the published research papers in the concerned field.

Hypotheses

H_{01} – There are no significant differences in the perception concerning learning management systems adopted with traditional ERP and Cloud Computing ERP.

H_{02} – There is no significant influence of the experience of respondents in assisting Cloud Computing ERP in learning management.

Result and Discussions

F-test ANOVA was used to analyze the difference in the perception regarding the adaptation of cloud computing ERP based learning management systems.

H_{01} – There are no significant differences in the perception concerning learning management systems adopted with traditional ERP and Cloud Computing ERP.

Table 2: Interpretation of the data that is important for choosing cloud computing ERP learning management system (One way ANOVA-1)

S. No	Factors for Cloud Computing ERP	SS	df	f	Sig
1.	Reduce front expenses	16.49	129	1.09	0.356
2.	Automatic upgrade	15.74	129	7.71	0.000
3.	Modern user experience	15.53	129	1.41	0.24
4.	Easy and fast deployment	15.3	129	0.91	0.438

5.	Pay Per Usage	8.29	129	1.99	0.119
6.	Scalability	14.49	12	0.72	0.539
7.	Pooling of resources	13.692	129	1.32	0.270
8.	Quick accesses	16.308	12	0.52	0.669
9.	Others	10.400	129	3.18	0.026

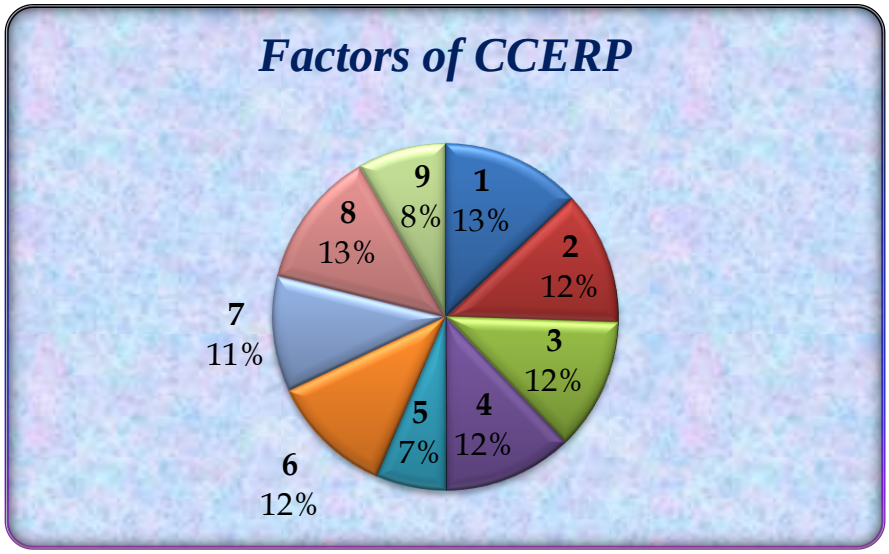

Figure: 3 Percentage Levels of Factors of CCERP

In almost all variables the significant value as found to be 0.05, there by rejecting the null hypothesis "There is no significant differences in the perception concern with learning management system adopted with traditional ERP and Cloud Computing ERP", indicated a significant difference is observed towards with the learning management system assisted with cloud computing ERP. It could be concluded that not all samples feel that the reduction in the expense like cost of maintenance, pay per usage, resource pooling, quick access from anywhere any time, and easy and fast deployment enterprises to switch from traditional ERP to cloud computing ERP in learning management systems. Though most of the individuals from the undersigned managements strongly agreed with the advantages of the emerging technology learning management systems they differed in their perceptions. From the overall reaction of respondents, it is understood that the above factors are responsible for transition from ERP systems to the Cloud Computing ERP in terms of learning management systems.

H_{02} – There is no significant influence of the experience of respondents in assisting Cloud Computing ERP in learning management.

Table 3: (One way ANOVA-2)

S. No	Cloud Computing ERP	SS	df	F	Sig
1.	Support socially and user experiences	80.72	129	1.118	0.345
2.	Provide management needs	60.08	129	1.107	0.170
3.	Provides freedom to innovate and offer automate	90.10	129	3.340	0.022

The above data reveals that the experiences of respondents had a significant influence on their perceptions that their cloud computing ERP make available with an autonomy to innovation and offer automatic upgrades. In the cases responded, it was found that the experiences of the respondents had no influence on the perception that practice with the cloud computing ERP system on the learning management. This system deliberately supports the modern users with almost experience and socially enabled management needs. This technology made it easier for learning management to acquire with cloud computing ERP to manage software and hardware and upgrades while reducing up-front expenses.

Conclusion

The adoption of cloud computing ERP in learning management had significantly enhanced the effect, and simultaneously reduced the cost of its implication in the learning management system. Even if there was difference in opinion and perception on the payback of the application of cloud computing ERP, clear signs are reflected that the management in the learning domain is interested in the adaptation of this ERP. In this investigation, direct and indirect aspects of cloud computing ERP are addressed and integration of information regarding the improved affiance for better decision making, faster response and timeline work

completion. In a whole, apart from effectiveness of cost reduction "it means, the most vital benefits of the cloud computing system are reducing the cost and shortening the providing of educational services". In management perspective, the outcome of the study is beneficial for students, scholars, and other learners by increasing their knowledge level by cloud computing ERP by its currents and future opportunities. In similarly, cloud computing enables learners at different levels about the world to obtain contemporary and advanced skills, and provide them with most necessary and relevant data to absolute and be successful in the total awareness and enlightening culture.

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