

A FRAMEWORK TO INTEGRATE CLOUD SERVICES IN HIGHER EDUCATIONAL INSTITUTIONS

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Abstract:

Educational Institutions has to facilitate updated knowledge according to the current trends in Technology and Education. Innovations are required to provide quality of education. Smart learning is essential in today's competitive world. Cloud Computing facilitates various services to provide to implement in education sector. This paper presents the framework to provide the secured, efficient and collaborated environment in the Higher Educational Institutions.

Key words: ICT, Cloud Computing, HEI's.

INTRODUCTION

In 21st Century, there is a substantial growth in Information Technology. In earlier days education is restricted to only physical classrooms. Information Technology is introduced in Education. It has changed the approach of education in an efficient manner. After covid-19, there are so many challenges are there in front of education sector. covid-19 has changed the face of education system. Educational Institutions are unable to provide sufficient Infrastructure in Education and research which is very important in any country development.

ICT plays a pivotal role in the education sector. The count of student enrollment towards online education in India has a substantial growth to 4.14core in 2021 year. Cloud computing provides various opportunities in order to provide educational tools. Now a day's cloud computing has been treated as 6th Utility in their life.

II. Literature Review:

Cloud computing is a mechanism that provides shared pool of data over the Internet. Cloud computing Provides new services, rather than describing a technology. An Objective of the application of cloud services is to provide data center for next generation [1]. There is various platforms are available for free access such as Google and Microsoft. They provide the students and staff such as creation of the documents and ability to create websites (sclater,2009).

Barriers of CC Adoption in Higher Educational Institutions

Technological Barriers:

- i) **Privacy Concerns:** Data must be protected in order to gain trust by the users such as students and staff. The Universities must provide 100% secured information to the research also. Some HEIs reluctant to utilize cloud technologies.[6][10].
- ii) **Compatibility:** Complexity is perceived difficulty by a firm to understand and use an innovation (Klug,2014)
- iii) **Vendor lock:** Vendor-lock in refers to restricting the user to migrate from one to other vendor due to cost or technical barriers. (Taweel,2012 Alshwaieretal2012.)

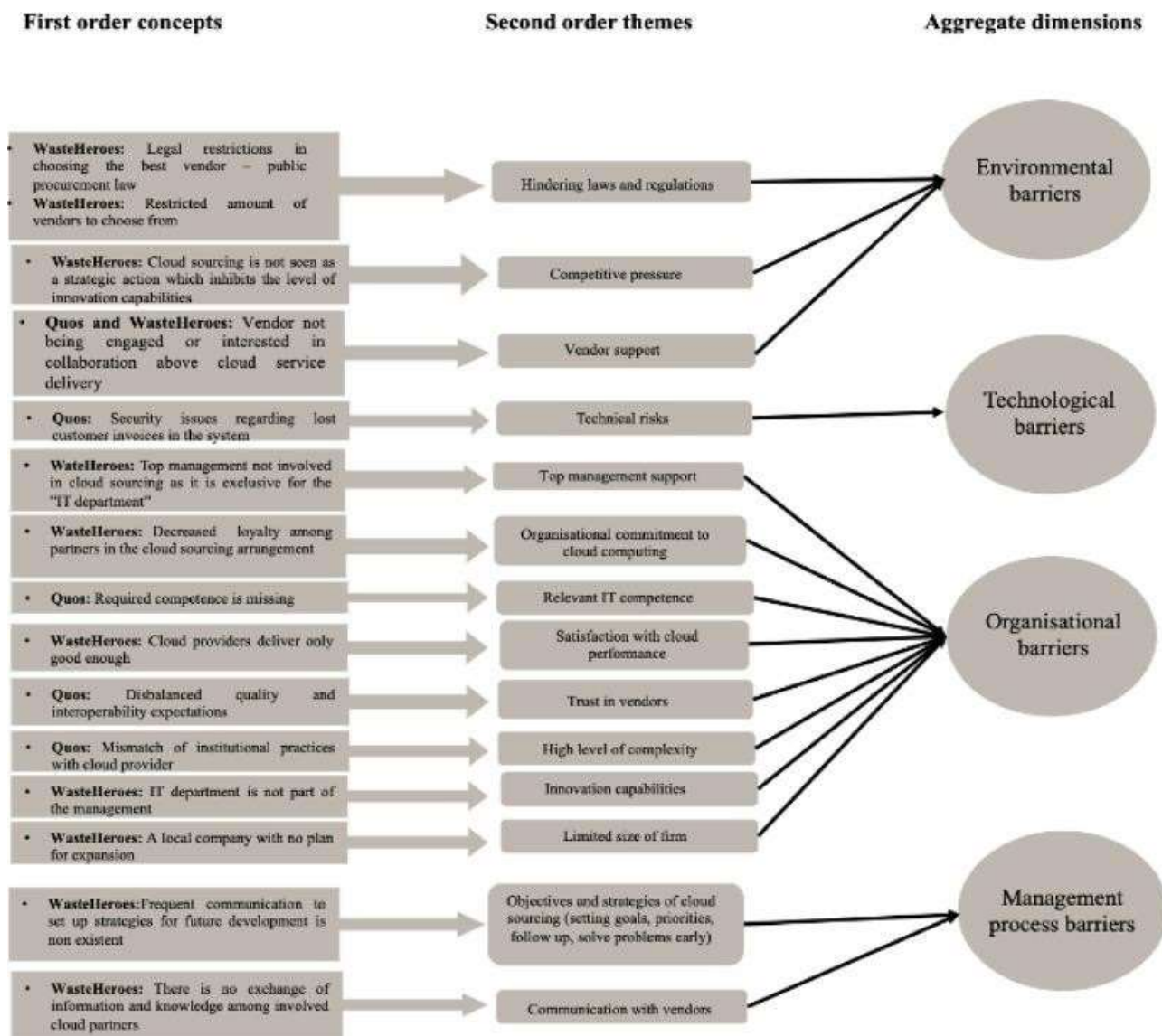
Environmental Barriers:

- i) **Government Polices:** The Government must support to facilitate the adoption of cloud computing in Higher Educational Institutions. Because cloud computing offers various services with minimal budget. In various countries government has supported for cloud computing in Educational Institutions. In India, there is a need to implement cloud computing in Higher Educational Institutions because there is a lack of higher educational institutions in our country. Hence a cloud may a solution for them.

Organizational Barriers:

Management Barriers: Cloud Based applications are reliable but sometimes system can go offline then there is a problem of accessing from cloud. A study at Malaysian University in 2013 has mentioned that 89% of university researchers mistrust cloud services [3],[4],[5].

IT Readiness: We should make our self updated to access the network so training is necessary to the stakeholders of cloud such as students ,admin,staff etc.Firms should be prepare regarding budget and infrastructure. Organizations also need skilled persons to move cloud. The above mentioned arrangements are needed to migrate to cloud in Higher Educational Institutions.

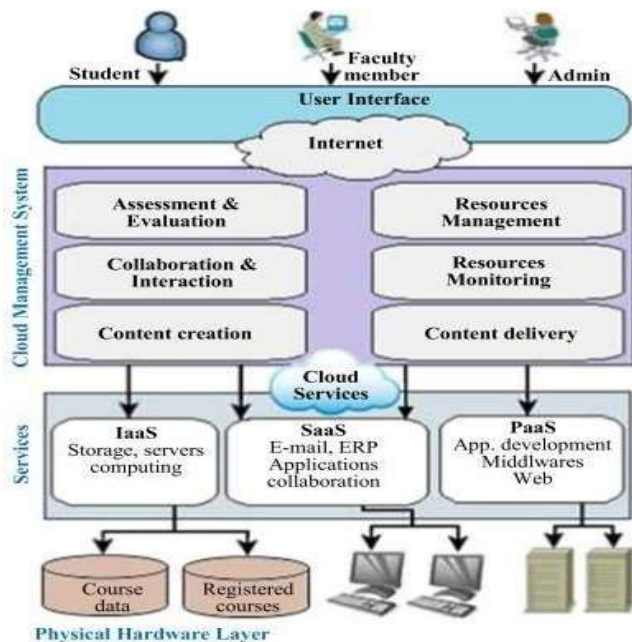


III.Objectives

The objective of this study to understand the necessity regarding deployment of cloud services in HEI based on the following ideas:

- We need to find out the barriers of education with respect to economic and environmental barriers.
- Surveying the basic criteria on educational institutions.
- Requirements of students, staff and administration in online education
- Motivation to adopt cloud services in Educational Institutions

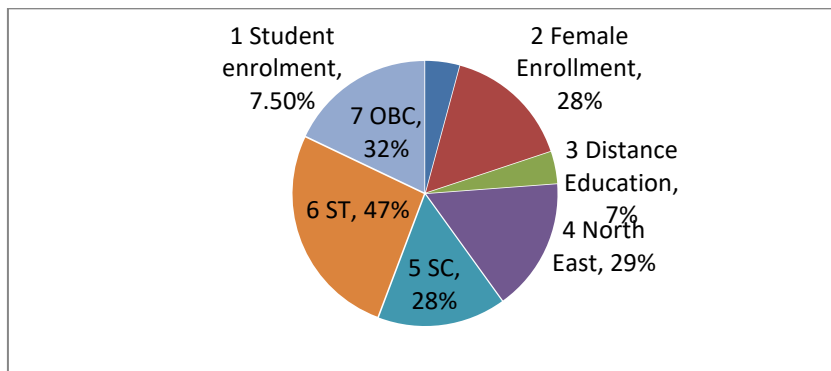
The following is an architecture of cloud computing. These architectures shows that the IaaS and SaaS platforms are used for content accessing and maintains communication with the students. PaaS platform provides Resource management and delivery of the content. In



the above architecture students, faculty and admin staff is working in a collaborated environment. The following is a survey in Higher education sector. In that survey enrollment of students in higher educational Institutions has improved. The analysis shows that there is a drastic improvement in higher education because of online learning. The students from various places are preferred to study because there are so many tools available in Education sector.

The following table shows the statistical analysis on Student Enrollment in India in various factors such as female, OBC, SC &ST etc.

| SNO | category | 2014-15 | 2019-20 |
|-----|--------------------|---------|---------|
| 1 | Student enrolment | 7.5% | 4.14 |
| 2 | Female Enrollment | 28% | 38% |
| 3 | Distance Education | 7% | 20% |
| 4 | North East | 29% | 34% |
| 5 | SC | 28% | 38% |
| 6 | ST | 47% | 63.4% |
| 7 | OBC | 32% | 39% |



I have done significant analysis on distance education, where It has the substantial growth in a period of 5 years. Hence students are approached towards distance mode because they are interested to do job while pursuing their education. The students prefer to “earn while you learn.” So according to the students interest Government also introduced many courses in various Universities such as IGNOU, AMBEDKAR, SDLCE KU etc .Among those universities, some are providing online

evaluation for their exams. Some are providing the content through online. Student may not come to the college but he can learn from home using Internet.

IV. Online Learning Platforms:

NPTEL: It is an online program for Engineering and science students. It is collaborated with IIT.

The class can be taught by the professors of IIT so many students can attend classes from NPTEL.

SWAYAM: It is a collaboration of government of India and NPTEL. It is an online portal to provide many courses for UG and PG students.

SWAYAM PRABHA: It is a Government initiative to provide quality education through DTH. It has 80 channels that provide class from direct to home

Google Classroom: Google class rooms is an effective tool for students and staff. This tool is designed in such a way that it is collaborated to provide assessment, classes and mock tests etc.

COURSERA: It is an online education platform; it is collaborated with Indian Universities and worldwide Institutions.

BYJU'S: It is a learning platform for competitive examinations.

UNACADEMY: It is an online learning platform to learn many languages and also useful for competitive examinations. It is collaborated with efficient educators.

V. Limitations:

In this paper we focused on barriers of cloud computing in Educational Institutions such as Technical, organizational and management barriers. We need to overcome these barriers to provide cloud services effectively. Government should take initiatives to facilitate the students in Higher Educational Institutions. Management of particular organization should support in such a way that economically and technically.

Conclusion:

This study is focused on how the Cloud Computing technology has to change the nature of work in education sector. In the literature review is to analyze the parameters which are required to take immediately to provide quality education to the students of Higher Education. Thus some investigations are to be taken place in the organizational perspectives. This paper also revealed on how CC is an efficient technology and how it should reach to the students of education sector. New HEIs with emerged technology changes the face of education system in an effective way.

BIBLIOGRAPHY:

- [1] Yousuf A.M. Qasem, Rusil Abdullah, Yasmadi Yah Juhos Cloud Computing Adoption in Higher Education Institutions: A Systematic Review
- [2] J. Ritchie, J. Lewis, G. Elam Designing and selecting samples Qual. Res. Methods (2003), pp. 77-87.
- [3] A. Dubois, L. E. Gadde Systematic combining: an abductive approach to case research J. Bus. Res., 55 (7) (2002), pp. 553-560
- [4] S. Hosseini, G. Fallon, V. Weerakkody, U. Sivarajah Cloud computing utilization and mitigation of information and marketing barriers of the SMEs from the emerging markets: evidence from Iran and Turkey
- [5] S. F. A. Razak, "Cloud computing in Malaysia universities," in Proc. Innov. Technol. Intell. Syst. Ind. Appl., Jul. 2009, pp. 101-106.
- [6] D. A. Gioia, K. G. Corley, A. L. Hamilton Seeking qualitative rigor in inductive research: notes on the Gioia methodology.
- [7] S. A. Mokhtar, S. H. S. Ali, A. Al-Sharafi, and A. Aborujilah, "Cloud computing in Academic institutions," presented at the 7th Int. Conf. Ubiquitous Inf. Manage. Commun., Kota Kinabalu, Malaysia, 2013.
- [8] S. Manro, J. Singh, and R. Manro, "Cloud computing in education: Make India better with the emerging trends," in Proc. Int. Conf. High Perform. Archit. Grid Comput. (HPAGC), Chandigarh, India, A. Mantri, S. Nandi, G. Kumar, and S. Kumar, Eds. Berlin, Germany: Springer, Jul. 2011, pp.

131–139.

- [9] A. Alharthi, F. Yahya, R. J. Walters, and G. B. Wills, “An overview of cloud services adoption challenges in higher education institutions,” in Proc. 2nd Int. Workshop Emerg. Software. Service Anal.(ESaaS),2015,pp. 102–109.
- [10] Sclarer.N.2009.Cloudworks,elearning in the cloud.
- [11] A. Ezenwoke, N. Omoregbe, C. K. Ayo, and M. Sanjay, “NIGEDU CLOUD: Model of a national e-education cloud for developing countries,” IERI Procedia, vol. 4, pp. 74–80, Jan. 2013.
- [12] G. Molto and M. Caballer, “On using the cloud to support online courses,” in Proc. Frontiers Educ. Conf. (FIE), Oct. 2015, pp. 1–9.
- [13] N. Selviandro, M. Suryani, and Z. A. Hasibuan, “Open learning optimization based on cloud technology: Case study implementation in personalization e-learning,” in Proc. 16th Int. Conf. Adv. Commun. Technol., Feb. 2014, pp. 541–546.
- [14] Ş. A. Rădulescu, “A perspective on e-learning and cloud computing,” Procedia-Social Behav. Sci., vol. 141, pp. 1084–1088, Aug. 2014.
- [15] T. Newhall, A. Danner, and K. C. Webb, “Pervasive parallel and distributed computing in a liberal arts college curriculum,” J. Parallel Distrib. Comput., vol. 105, pp. 53–62, Jul. 2017.
- [16] C. Chao and Z. Yue, “Research on the M-learning model based on the cloud computing,” in Proc. Chin. Autom. Congr., Nov. 2013, pp. 806–811.
- [17] P. Veni and R. Masillamani, “Resource sharing cloud for University clusters,” in Proc. IEEE/ACM Int. Conf. Cyber, Green Comput. Commun. Phys. Social Comput. (CPSCom), Dec. 2010, pp. 873–878.
- [18] M. Moh and R. Alvarez-Horine, “A successful graduate cloud computing class with hands-on labs,” in Proc. IEEE Frontiers Educ. Conf. (FIE), Oct. 2013, pp. 1156–1162.
- [19] Neeraja J Yadwadkar, Bharath Hariharan, Joseph E Gonzalez, Burton Smith, and Randy H Katz. Selecting the best vm across multiple public clouds: a data-driven performance modeling approach. In Proceedings of the 2017 Symposium on Cloud Computing, pages 452–465. ACM, 2017.
- [20] Makrani, Hosein Mohammadi, et al. "Evaluation of software-based fault tolerant techniques on embedded OS's components." Proceedings of the International Conference on Dependability (DEPEND'14). 2014.
- [21] Njenga K, Garg L, Bhardwaj AK, Prakash V, Bawa S (2019) The cloud computing adoption in higher learning institutions in Kenya: Hindering factors and recommendations for the way forward. Telemat Inf 38:225–246.
- [22] Alshamaila Y, Papagiannidis S, Li F (2013) Cloud computing adoption by SMEs in the north east of England: a multiperspective framework. J Enterp Inf Manag 26(3):250–275
- [23] Baker J (2012) The technology–organization–environment framework. Integrated series in information system: information system theory, vol. 28, Springer. pp 231–245. https://doi.org/10.1007/978-1-4419-6108-2_12
- [24] Bhardwaj T, Kumar M, Sharma SC (2018) Megh: a private cloud provisioning various IaaS and SaaS. Adv Intell Syst Comput 584:485–494
- [25] Davis FD (1989) Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Q 13(3):319
- [26] Hassan H, Herry M, Nasir M, Khairudin N, Adon I (2017) Factors influencing cloud computing adoption in small and medium enterprises. J ICT 16(1):21–43