Cloud Computing Paradigm for Indian Education Sector

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ABSTRACT

The Indian education sector is constrained by cost but demand has been rising for cost-effective, robust software applications to deliver services for learning and administration. Existing systems are not scalable and require huge capex (Capital Expenditure) and IT staff to maintain the system, which has shifted the focus from the core education business to managing the overheads of IT operations. The Cloud Computing paradigm has emerged as the optimal solution to meet the requirements of cost effective, scalable, and secure systems. In this paper, the author examines how the deployment of cloud computing in the education sector in India can meet these challenges.

Keywords: Cloud Computing, Education System Support, Faculty Feedback System, Google Apps, Platform-as-a-Service (PaaS)

1. INTRODUCTION

The web platform has opened the door for the students of today, to a world of services that enable easy access to information, platform to socialize, and collaborate. The educators need understand how to efficiently tap the potential of the web to create, store and share learning resources among their peers and students so that the resources are available easily, anywhere, anytime. The infrastructure should be scalable to accommodate the ever growing data. Also, the educational sector in India is constrained by cost containment, and compliance with regulations pertaining to security, puts added strain on the educational infrastructure and staff. The system should have the capability to protect the privacy and confidentiality of the student’s records. This study is an effort to understand how the cloud computing can be leveraged to meet the demands of the Indian Education sector. Monitoring the quality of education imparted is as integral part of education system administration; this is normally done by conducting faculty feedback. Since this is collected from all the students at the college level, it involves a lot of data which keeps growing every year. It requires the time and effort of staff to collect this feedback periodically. This paper explores the details of how Cloud computing paradigm can be leveraged as a cost effective solution for implementing an education system support. To prove the point, a web based Faculty Feedback system was designed and implemented using Google Apps - a Platform-as-a-Service (PaaS) hosted on the public cloud. This system was
implemented at SIES (Nerul) College of Arts, Science and Commerce. The study concludes with exploring the benefits of implementing a Cloud Computing PaaS based Faculty Feedback system and how this can be extended to the Indian education system support for the Indian Education Sector.

2. PROBLEM DEFINITION

To develop a cost effective, web based user friendly, scalable, secure system for education system support.

3. RESEARCH METHODOLOGY

This paper is based on a combination of explorative and experimental research. The explorative part involves in literature review of cloud computing and to understand and analyze how cloud computing paradigm can benefit the for Indian Education sector. This helped in understanding how to leverage cloud computing to design a cost effective, secure web based system for education system support. The experimental part involved in actual design and development of a system to achieve the objective. This concept will be applied to design a faculty feedback system and study the benefits of implementing this system.

4. CLOUD COMPUTING

“Cloud computing is an emerging computing paradigm where data and applications reside in the cyberspace, it allowing users to access their data and information through any web-connected device be it fixed or mobile” (Horrigan, 2008). Cloud computing is a model for delivering Internet-based information and technology services in real time. It allows users to see the services while the infrastructure that delivers these services remains transparent (that is it remains in the cloud) Cloud computing has a strong focus toward service orientation. It encompasses a wide range of heterogeneous services that can be categorized into delivery models and built into solutions. The most common categorization comprises of Software-as-a-Service, Platform-as-a-Service and Infrastructure-as-a-Service model. The cloud could be deployed in a public or private cloud (IBM Developer Works, 2009; Bair & Rhoton, 2010; Chou, 2008; Ashraf et al., 2010; IBM, n.d.).

5. LEVERAGING CLOUD COMPUTING SERVICES FOR INDIAN EDUCATIONAL SECTOR

Cost Containment: The cloud computing will replace legacy software installed on campus computers with applications delivered through the web. Legacy systems called for huge capex but the power of the cloud will enable to “Serve more for less cost”. Upfront expenditure is low, as infrastructure is owned by the provider and does not need to be purchased for one-time since it is pay as you go it is converted to opex. This will help for cost containment.

Flexibility (Chou, 2008): The Cloud powered education institutions have an advantage of significant flexibility and agility. Flexible as it offers a range of flexible services to choose right from infrastructure, platform or software and all this happens at such a fast pace ensuring the agility.

Overhead of Data Centers set up (Chou, 2008): The sensitive data is migrated into remote, worldwide data centers, which saves the overhead of setting up of data centers in the campus.

Scalable & Self-Provisioning (Chou, 2008): The cloud infrastructure is scalable and is self-provisioned to enable rebalancing of allocation when needed. It provides facility to monitor and meter the utility of resources. This way it reduces the overhead for system administrators in the campus.

Efficiency (Chou, 2008): Efficiency is improved by Sandboxing. This technique helps in reducing the overhead per virtual
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