Cloud Computing Enabled Virtual Learning Environment: Strengths and Opportunities

Rabindra Ku Jena, Institute of Management Technology, Nagpur, India

ABSTRACT

Recent advances in Information and Communication Technology (ICT) provide an opportunity to build a self-growing and sharing virtual environment for teaching and learning. Cloud computing is one of the latest technological advancements in ICT domain. Cloud computing technologies have changed the way applications are developed and accessed. A Virtual Learning Environment (VLE) is a system for delivering learning materials to students via the web. Cloud computing provides one of the most emerging cost-effective solutions for virtual learning and teaching environments. This paper discusses how cloud computing has been contributing to virtual learning environments and an overview of the current state of the structure of Cloud Computing based e-learning is discussed. The readers will also find a brief overview of cloud computing and the different efficient cloud-based virtual learning models. Towards the end, different offers from different cloud vendors are discussed.

Keyword: Cloud Computing, e-Learning, Information and Communication Technology (ICT), Teaching Environment, Virtual Learning Environment (VLE)

1. INTRODUCTION

During the last few years, the nature of the internet use was constantly changing from merely webpage’s read to an environment that allows end-users to run software applications. Interactivity and collaboration have become the keywords of the new technology. There is no doubt the future belongs to the intelligent Web (DeCoufle, 2009). Intelligent web supports the creation of a new generation of applications that are able to run on a wide range of hardware devices, like mobile phones or PDAs. On the other hand, the need for education is increasing day by day, so the development and the improvement of the existing learning environment are required.

In coming decades, the education system will embrace cloud-based technologies more than today. In a global economy, cloud-based virtual learning is not only convenient, it is highly required. As demand for this type of technology increases, software providers offer training systems with advanced functions and features that promote collaboration and customization at the client end. Experts predict these systems have the power to change business services, products, and organizational structures.
of the future computing. This is why many organizations choose Learning Management Systems (LMSs) as their cloud-based virtual learning environment.

1.1. Cloud Computing

Cloud computing is a relatively new concept, first introduced and generally credited to Amazon and the introduction of Amazon EC2 public cloud services in 2006. Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction (National Institute of Standards and Technology) (Mell & Grance, 2011). The cloud computing term was derived from the way the internet is often derived from network diagrams. The cloud can be seen as a unique access point for all the requests coming from the worldwide spread clients (Figure 1). Cloud computing comprises of three layers (Creeger, 2010):

- **Software as a service (SaaS):** Software as a service (SaaS) was one of the first concepts in cloud computing. In this arrangement, the application hosting by a cloud service provider can easily accessed through the

*Figure 1. Cloud environment*
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