CHAPTER 1
INTRODUCTION

1.1 RESEARCH BACKGROUND

The use of Information and Communication Technology in higher education has totally revolutionized the way learning is being done. A new form of education has been discovered known as e-Learning where the digitized books, animations, video lectures have replaced the printed books and materials which subsequently is a superior experience to the end user. The major benefits are in terms of reduction in cost, upgraded learning and controlled use of paper.

With availability of Internet and WWW, the education domain started offering many educational contents to the learners. Some new cost effective trends are now in use like Cloud computing. It provides prominent adaptability in accessing and sharing as the service oriented computing platforms over the network but also sharing the assets such as digital libraries. E-Learning helps the user to access the learning material and contents. The SaaS (Software as a Service) model of Cloud computing is there to offer e-Learning contents as a service to the learners.

The traditional education system which focused on direct teaching, is changing because of the use of ICT, ICT has transformed education system into e-education form or e-learning form, that focus on creating a viable and productive online and all time available learning environment, to end users even of large distance.

“In Cloud computing technology based e-Learning system all the academic institutions of a Country or State are expected to be connected globally so that they can share the resources and e-contents for e-learning process”[63]. To connect the academic institutes for e-Learning system we can think e-Cloud model. The proposed e-Cloud gives the adaptability and in addition versatility to utilize assets on-request without physical purchasing or installation at user site. Rather than one service provider where the software has to install on each system, different providers utilize varied implementation technologies and architectures for University or Institutes. There may be management problem as different cloud providers may provide a common architecture. This research has a proposal to re-engineer the existing learning architectures and manage the resources of cloud computing.
During the last five years, e-Learning courses were based on the Learning Management Systems in the browser. With new trends of Web 2.0 and e-Learning 2.0, the content developers have moved to Rich Internet Applications. The multimedia based e-Learning materials stay as a backbone for several universities who have opted to become e-Universities like Asia e-University, UK e-University and several other e-Universities. The UKEU (UK e-University) project was started with the idea of bringing the best of British Higher Education to students around the world. In 2003, only 900 out of 5000 students were expected to join this e-University, but unfortunately, the e-University was shut down due to lack of sufficient funds [5][6]. Similar to this project, there were several e-Learning programs not picked up due to huge cost involved in delivering the e-Learning contents to the learners.

Even though, it is proved that simulations are increasingly being used as powerful and flexible educational devices [7], it is not yet fully successful because of the huge cost. It has been estimated that approximately 1 million dollars a month is paid by YouTube as bandwidth costs which is surely going to rise with the increase in the demand and higher-quality videos [64].

This study aims to propose an “ICT enabled e-Learning Service system based on cloud computing model”. It focuses on “e-Learning as an On Demand Service” stored in cloud environment i.e. Cloud Learning to benefit the learners worldwide. The concept gives a fundamental shift globally by providing a new way to store and host the e-Learning materials in the cloud environment. Learners in a cost effective way, get a better opportunity to enhance their skills and to attain hands on experience in various fields.

The main aim of our study is to propose an efficient and effective cloud based e-Learning model which uses the limited resources in such a path in order to adjust the current institutional assets in a conservative way [63]. The model proposed is for the nation like India to enhance nature of advanced education in exceptionally financially savvy way. Some practical implementation issues of our thesis approach are also discussed. The splurging technological developments and the new advances in cloud computing area will boost the user experience in e-Learning process.

Study investigates designing a new model issues. Various factors and administration models will defeat the major threats. Theoretical study by reading various research papers and articles on the data, information and text analysis on our subject is being done. Empirical study i.e. exact examination is performed by the data accumulated through different cloud based e-learning
arrangement crosswise over different sites. At last comparative method technique is suggested to contrast the observational discoveries and the deduction landed at from our hypothetical discoveries. Definite investigation about different planning issues in cloud based e-learning helped to propose our model.

1.2 RESEARCH PROBLEM STATEMENT

“Education is a main factor for sustainable development”[7]. “The importance of education, especially in developing countries like India, is increasing because of advancing pressure to catch up with global competitiveness”[65]. Typically, in India low quality of education and narrow possibilities in attending schools in rural areas leads to hindrance in the growth.

ICT in learning domain have many benefits, for example, students in rural or hilly areas of Uttarakhand, can attend classes as distance learners and thus motivates them to learn. Like the “One Laptop per Student” initiative Uttar Pradesh i.e. “Akash” Tablet will become more effective if it will link with cloud based servers offering easy e-Learning lessons to them in a very minimum cost. The potential of e-Learning though very promising, suffers because of gaps between developed and developing citizen of any country making knowledge transfer not only difficult but also expensive. E-learning consists of formal training, such as courses, online training and exams, selected learning objects, formalization through document collections and community formation which can be achieved via software and education resources using a cloud model [12].

Many upcoming cloud computing companies offer the cloud power in their products to be more cost effective. E-Learning as a widespread technology helps to compensate the shortage of faculties and the study material. In this thesis, we study some key issues that will help us to design and propose the best use of cloud computing in e-learning.

1.3 PURPOSE OF THE STUDY

The fundamental reason for this examination is to break down e-Learning concepts for regular and distance learning as well in traditional education and to find out the benefits of Cloud computing as an emerging concept and then to propose a new model of e-Learning for facilitating academic activities through e-Learning. It will add a new dimension to education for the generations to come. So, in the long run, most of the educational entities either big
(University), medium size (Institutes) or small (Schools) do not have to bear the overhead cost associated with running a large IT department as that IT section only works to sustain existing software application. Large partners can start using cloud computing immediately as offering versatile education or learning without owing so much. Several big companies are giving a big push for cloud computing services including Google, Microsoft and Amazon. Yahoo, IBM, Intel, HP and many more are in a process of implementing the cloud computing technology for their businesses. Some large universities are also engaged in research and development projects in the field of cloud computing. So in years to come, it is our firm belief that the cloud computing would definitely be providing a competitive edge to the e-Learning model over the existing technology of doing the same.

Easy and cost effectiveness of information in terms of maximum availability in minimum resources is one of the people’s main concerns when we work in ICT domain. E-Learning innovation consolidated with most recent advancements is giving more arrangement and is decreasing the unpredictability from customary e-learning philosophy. The main focus stays on Infrastructure, Operating platforms, Software and security before designing e-learning systems based on cloud model.

1.4 RESEARCH QUESTIONS

Main Question:

For this study, our endeavor is to highlight and bring out a new model of e-Learning where cloud computing may be utilized to offer a cost effective, easy operating and highly available platform.

Questions:

1) What conceivably are the Infrastructure related issues in cloud based e-learning?

2) What Software or Applications administrations related issues are in cloud based e-learning?

3) What are the Operating systems and other software Platform related issues in cloud based e-learning?

4) What other issues need to addressed before designing the propose model?

5) How we can design such a cloud based e-Learning model?
1.5 RESEARCH BENEFITS

a. Greater accessibility in lower cost and better learning outcomes
b. Increased Participation of academic institutes and Researchers

1.6 RESEARCH LIMITATIONS

The work mainly focuses on to study of the various e-Learning models and issues related to cloud computing based e-learning solutions and to propose a theoretical cloud based e-Learning model. The functional troubles and issues in cloud based e-learning programming advancement are not covered. Our thesis is only limited to theoretical presentation of our views based on literature review and survey in cloud based e-learning.

1.7 OUTCOMES OF THE RESEARCH

The outcome is to find out a novel approach after deep analysis of existing model to propose a cloud computing based e-Learning system. We also propose a prototype model for e-learners and the end-users.

1.8 THESIS STRUCTURE

The structure of our thesis is branched into seven chapters.

The first part starts with an Introduction about our work. We separated the primary research inquiries into some sub questions which together prompt propose and demonstrate our investigation.

The second chapter is on the Research Design and Methodology. The research and planning is discussed at length along with the various methods for data collection. Objectives of the thesis are critically discussed.

The third part constitutes the Literature Review of our investigation i.e. the hypothetical base. The point of view to examine and select the writing identified with our proposition keeping in mind the end goal to outline out the establishment for our work.

The fourth chapter gives the Strategic Analysis for proposed e-Learning model. Our work is well thought-out on relative analysis. The questionnaire of online survey conducted and its
analysis is covered. Various issues relating to cloud computing are discussed and analyzed to form the strategy.

The fifth chapter gives the proposed model of E-Learning using Cloud Technology and gives the result of researcherin view of the examination of both hypothetical and experimental outcomes gathered through sources in previous chapters. The design issues of proposed model will be discussed in this chapter and a detail framework of propose model discussed to design practical model of cloud based e-Learning system (eLC) to software vendors.

The sixth chapter gives the Research Outcomes of the proposed architecture of Cloud computing based e-Learning system and a sample prototype design and testing on cloud platform is done.

The seventh chapter finally presents the Research Findings and Conclusion. Further research scope of the study is discussed.