



# International Journal of Innovative Research in Computer and Communication Engineering

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## Study of Metadata Management in Learning Objects using Cloud E-Learning

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**ABSTRACT:** Everything stored on the cloud could potentially be a knowledge source used for e-learning. Given learners' profiles, desires and feedback on what they have already learned, a new form of personalized e-learning emerges, namely Cloud E-Learning (CeL). CeL should be able to choose from structured to totally unstructured learning material but needs to make them useful for each individual. Existing metadata standards cannot facilitate composition of personalized learning paths as a series of learning objects. In this paper, we present the structure of CeL Learning Objects (CeLLOs), which include an additional set of metadata suitable for each phase of CeL development.

**KEYWORDS:** Cloud E-learning, computing for Education, Electronic Learning

### I. INTRODUCTION

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 [1]. 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 [2].

E-learning in recent years, the flood of information, successive change and the growth of knowledge at a fast rate which resulted from the information revolution in which we live now. The world is living large scientific and technological revolution; it had an impact on various aspects of life, the education one of these aspects. The concept of web-based learning and the use of Internet in teaching and learning have received increasing attention. People use the Internet and new technologies every day for information, communication, entertainment, obtaining goods and services, and learning. With the increasing availability of the Internet, we are now able to change what and how we deliver the learning experience to students across time or space, which has led to the evolution of E-learning. Therefore, the education is became demanding to search for new methods of teaching and models to meet the many challenges at the global level. These methods including the increased demand for education. With the shortage of educational institutions, and increase the amount of information in all branches different knowledge. It's clear the E-learning model help the learner to learn in right place and time through interactive content based on multimedia (text – image – audio – video) that offers through E-learning is a new type of Education patterns imposed by the scientific and technological changes taking place in the world to this day. Traditional methods and techniques are not able to keep pace with this development, so there is a need to adopt another kind of education which is the E-learning [3, 4]. Cloud Computing is a technology that is fully dependent on the Internet [5] which provides many of computational resources via the network and provides the end users many important services such as processing and storage. Cloud Computing is a computing platform that offers computing power for scientists when they are exceeding institutions' local computing capabilities [6]. Cloud Computing has moved the user from being attached to a single machine to the Internet [7] therefore, the user is freed from thinking about the file's physical location.

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

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multimedia based e-Learning materials stay as a backbone for several universities who have opted to become e-Universities like Asia eUniversity, UK e-University and several other e-Universities [7].

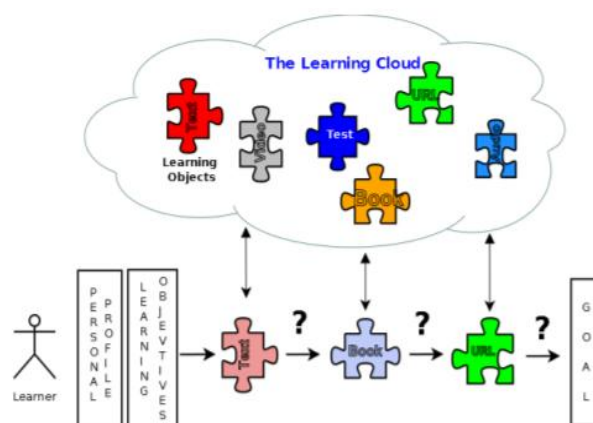


Figure 1: Learning material coming from the learning cloud fail to form a coherent learning path

Cloud e-Learning (CeL) is a new paradigm for e-learning in which learners are presented with an automatically generated learning path that utilizes anysuitable sources from the cloud [1]. CeL is considered as an advancement of e-learning and aims to provide personalized services that will increase interaction between users who share a pool of experiences and knowledge. CeL should suggest structured courses that match learner's preferences and cognitive level. The Learning Cloud comprises of different sources for CeL and everything stored in it can potentially be used for learning purposes. The main goal is to automatically generate a personalized learning path of learning objects that reasonably meets the profile and desires of the learner. Before any personalization is even considered, the main problem CeL needs to address is the heterogeneity of electronic resources that form the Learning Objects (LOs). Candidate LOs suffer from: (a) no or little semantics/annotation, (b) variety of granularity, and (c) no means for gluing them together in adaptive order to create a coherent course. Such learning materials can hardly fit together[2] in a sensible learning path because of their different standards (Fig. 1). For instance, an LO may not fit with another LO directly, because of different metadata standards or different learning objects standards or inconsistent intended learning outcomes and desired cognitive level.

## II. LITERATURE SURVEY

“Education is a main factor for sustainable development” [1]. “The importance of education, especially in developing countries like India, is increasing because of advancing pressure to catch up with global competitiveness”[2, 3]. Typically, in India low quality of education and narrow possibilities in attending schools in rural areas leads to hindrance in the growth [4]. 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 Utter 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 [5, 6]. 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, on line 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 [7, 8]. Many upcoming cloud computing companies offer the cloud power in their products to be more cost effective [9, 10]. 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 [11, 12].



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## III. CLOUD E-LEARNING

Cloud e-Learning (CeL) is a new paradigm for e-learning in which learners are presented with an automatically generated learning path that utilises any suitable sources from the cloud [1]. CeL is considered as an advancement of e-learning and aims to provide personalised services that will increase interaction between users who share a pool of experiences and knowledge. CeL should suggest structured courses that match learners' preferences and cognitive level. The Learning Cloud comprises of different sources for CeL and everything stored in it can potentially be used for learning purposes.

The main goal is to automatically generate a personalized learning path of learning objects that reasonably meets the profile and desires of the learner. Before any personalization is even considered, the main problem CeL needs to address is the heterogeneity of electronic resources that form the Learning Objects (LOs). Candidate LOs suffer from: (a) no or little semantics/annotation, (b) variety of granularity, and (c) no means for gluing them together in adaptive order to create a coherent course. Such learning materials can hardly fit together[2] in a sensible learning path because of their different standards. For instance, an LO may not fit with another LO directly, because of different metadata standards or different learning objects standards or inconsistent intended learning outcomes and desired cognitive level. In CeL, we envisage a process that takes these unstructured learning materials and adapts them for being able to create a coherent sequence. In current e-learning approaches, structured LOs are stored in repositories (LORs) and they can be used within the context of their repositories to create personalised learning paths. On the contrary, in CeL, the heterogeneity of unstructured or semi-structured electronic sources makes customised learning a challenging task.

## IV. METHODOLOGY

Lately, developers and computer engineers have created and developed different systems of learning, like the systems of learning management that meets the needs of the users are inexperienced. In any case, those created or developed systems of learning management have a great deal of problems. For instance, there is a difficulty in manage process for distributed management on the web to cover all user's requirements in the same time. Hence, we need to build up and develop a system of learning management as well as our own programs. The most imperative issue is the high cost of improvement. The cost of expanding (adding) system requires greater investment.

Service and maintenance needs are one of the most costs problems. Therefore, we offer a new model of e-learning that depends on caching and cloud computing concepts to solve those problems. The proposed model utilized crawling process and caching replacement policy algorithms. We used Precision and Recall method to evaluate the efficiency of the proposed system. The comparison between the proposed system and existing systems is required to prove its efficiency. As well as, the testing of proposed systems is important to prove its efficiency, reliability and usability. In this module, it consists of two steps that employ three algorithms. The first Step, crawling process of URLs from World Wide Web to find files about queries based on most frequently used. Because of need to reduce the amount of data retrieved, the file crawling algorithm where used along with filtration process sending results to the database the Fig. 2 and Fig. 3 show this process.

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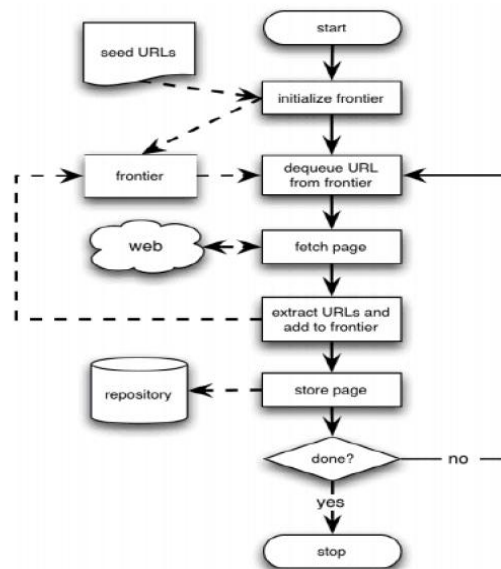


Figure 2: Show the steps of crawling algorithm

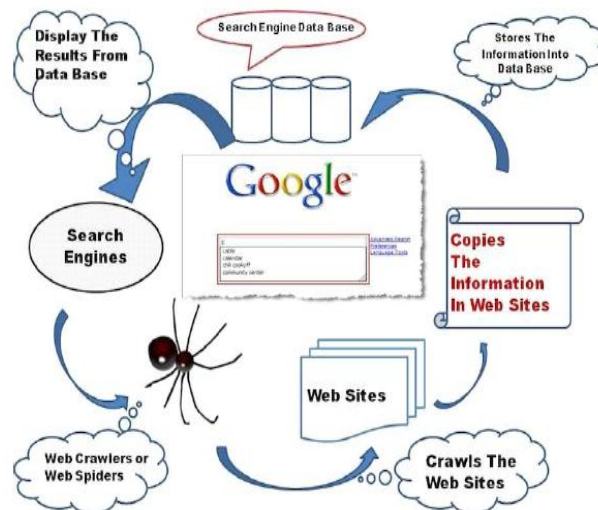


Figure 3: Show web crawler process

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



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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.

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.

## V. CONCLUSION

We have proposed in this paper a new system to solve some problems or a challenge that faces the e-learning through build an efficient e-learning system in many terms such as accuracy, data retrieval, availability, reduces development cost. And when applying the system (the proposed system) is got the best results compared to other systems, especially in terms of speed in the retrieval of files and relevant results ratio (Precision), low irrelevant results (error). Moreover, it is flexible and adaptable from user's perspective when creating profiles and the accessibility for all E-learning materials regardless of where they are, flexibility from system's perspective where the local management, maintenance and control of hardware and software.

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