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DISTRIBUTED E-VERIFICATION SYSTEM USING CLOUD COMPUTING

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ABSTRACT

"Distributed e-Verification System using Cloud Computing" is an idea (web portal) which provides facility to overcome the issue of very long and manual process of document verification. Using this e-verification system document verification will become a very smooth exercise because this system provides functionality to verify any document on a single click. While traditional way of document verification was a very long and a tired process but e-verification gives opportunity to verify documents of any student or employee for admission or job with very simple steps. Using "Distributed e-Verification System using Cloud Computing" government agencies and authorized private recruiters can verify any certificate (mark sheet), degree, diploma issued by any board of school education (under education ministry (MHRD)) or university recognized by university grant commission UGC.

Keywords: Verification System, Document verification, degree verification, certificate verification, academic verification, online verification, distributed verification system, cloud computing, university verification

I. INTRODUCTION

Distributed e-Verification System using Cloud Computing provides facility to verity documents (certificates (mark sheets), degrees, diplomas issued by Boards of school Education (under ministry of education MHRD) and universities (under University Grant Commission, UGC).

According to this e-verification system UGC has right to register any university (all universities) to this e-verification system after submission all required details, a separate unique ID and a security code is issued by web portal to every added university. MHRD has right to add Boards of school Education to the portal, after submission required details a separate unique ID and a security code will be provided to added board of school education same as universities.

This e-verification is mainly having five different modules namely:

A. MHRD.
B. UGC.
C. Universities.
D. Boards of School/Technical Education.
E. Verification.

Each of above mentioned module has their own separate functionality as discussed below.

A. **MHRD**: Ministry of Human Resource and Development will assign a person or a department to handle this department of document verification. This e-verification system will allow the authorized person or department to:

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a. **Create a New User**: using this option you may create a new user or you can say that you are assigning a person to operate this MHRD account.
b. **Add Board of school Education**: using this option any board of school education can be added to this portal. After submission a unique Id and a security code will generate, this code will required to register a new user for School board department.
c. **View Added Board of school education**: this is simply used to view all added board of school education of this portal.
B. **UGC**: same as MHRD, UGC is the governing body allowed by MHRD to control document verification for the document issued by universities. UGC can handle this task to any internal department or can assign a person to do this work. e-verification system will give permission to UGC to:
a. **Create a New User**: UGC can create any number of users to upload and handle university record.
b. **Add University**: university will be added to this portal using this option. After submission a unique ID and security code will generated automatically for every added university. This unique id and security code will send to official email id of concerned university.
c. **View Added Universities**: all added universities can be viewed by this option.
C. **Universities**: to use this module of portal you have to register yourself using SignUp option. Unique ID and security code is compulsory to create a user account for university. Alter registration portal will allow you to:
a. **Add Record**: this option is use to student record one by one.
b. **Upload Multiple Records**: using this option user can upload complete file result instead of a single record.
c. **View Added Records**: this option is used to view added universities on this portal.
D. **Boards of School/Technical Education:** same as university module you have to register yourself first then you will be able to use functionality provided by portal. Portal will allow you to:
a. **Add Record**: this option is use to student record one by one.
b. **Upload Multiple Records**: using this option user can upload complete file result instead of a single record.
c. **View Added Records**: this option is used to view added universities on this portal.
E. **Verification**: this module is for recruiters and government bodies which is want to verify documents. Portal allow you to verify student details using following steps:
a. Select university or Board of school education.
b. After selection of university all course of concerned university will be displayed next to university.
c. You have to select course name then certificate type will appear in dropdown list box next to course dropdown list box.
d. Select certificate type and then serial number of that certificate.
e. After select of all fields complete detail of concern person or student will be displayed on the screen now you can match all detail mentioned on hardcopy of certificate and on screen.

As I discussed in my review paper in India we have wide number of schools, colleges and universities. A brief note on all institutions as I discussed in review paper is: The latest statistics from the website of HRD ministry of India as of 2014, there are 677 universities and 37,204 colleges and 11443 stand-along institutions in India.

India has mainly four board of school education, namely CBSE, ICSE, IB and state boards. Brief introductions about these boards are given below:

CBSE Board: Central board of secondary education (CBSE) is the most popular school board in India with over 9000 CBSE affiliated schools in the country and presence in 21 nations across the globe. The stress in this board is on application of Science and Maths related subjects. Main benefits of going for a CBSE affiliated school are:

- Easy to find new schools in any area, even abroad, due to wide prevalence of the board
- Wide recognition of board results across all colleges in India, as compared to other boards
- Recent overhaul of teaching approach and curriculum has made the content relevant
- Easy to find tutors, books and activities for all classes
- Focus on Science and Mathematics as well as application based subjects. [6]

ICSE Board: It is a private body that was founded in year 1956 to set and adapt University of Cambridge's examination system to India. This body now conducts 3 examinations, namely

- ICSE (Indian certificate secondary education) exam for class 10
- ISC (Indian school certificate) exam for class 12
- CVE (Certificate for vocational education) exam for class 12. [6]

IB: International Baccalaureate (IB) is a non-profit educational foundation that was founded in 1968 and now works with over 3000 schools in 141 countries. The board is gaining prevalence in high end new schools in India. Currently limited to the metro and large Tier-I cites in India. As per them, their vision is on all round development of the student into an inquiring, caring and knowledgeable young individual. IB offers innovative learning program and teaching approaches to achieve its stated objective. The main benefits of this are

- Innovative curriculum
- Very different and stress free teaching methods
- Focus on all round development rather than pure academic performance
- Wide acceptance across the world

State Board: As the name suggests, each state has its own board of education that conducts certificate examination for class 10 and class 12. Some state boards, such as Rajasthan board also conduct exams in class 8. The benefits are:

- Reasonably prevalent within the state
- Topics and content of local relevance
- Usually cheaper schools [6]

As we know that a large number of universities and educational board are working in India and a lot of students passed out every year. Currently manual verification has been done in all of these universities and boards except some universities which are using a "direct verify system". This system is working only for 9 states in India [according to website - https://www.directverify.in]. [7]

Therefore "Distributed E-Verification System using Cloud Computing" will provide the facility to verify documents all over India and globally. It will completely free of cost and it will cover all the institution of India.

Privacy of student is most important for us therefore only registered or authenticated user can verify the academic details.

According to current system a number of employee of university and educational boards are engaged every day to verify the documents manually. But "Distributed E-Verification System using Cloud Computing" will overcome this problem. Because universities and boards have to entered data only once and this will be very easy task for them because this system will provide the simple format in MS Excel where from universities and board and upload their existing data through a single click.

II. DISTRIBUTED SYSTEM

Generally a distributed system is a network that consists of autonomous computers that are connected using a distribution middleware. They help in sharing different resources and capabilities to provide users with a single and integrated coherent network.

When we come to our web portal in term of distributed system: you may say to this a distributed system because data used to verification system can be accessed by multiple computer systems or users at a time to verify any record.

Data (used for verification) can store on a single database server or on multiple servers or we can use cloud computing to do this task.

- Components in the system are concurrent. A distributed system allows resource sharing, including software by systems connected to the network at the same time.
- The components could be multiple but will generally be autonomous in nature.
- A global clock is not required in a distributed system. The systems can be spread across different geographies.
- Compared to other network models, there is greater fault tolerance in a distributed model. [8]

III. CLOUD COMPUTING

Cloud computing is the delivery of computing services—servers, storage, databases, network- king, software, analytics and more—over the Internet ("the cloud").

The first cloud computing services are barely a decade old, but already a variety of organizations - from tiny startups to global corporations, government agencies to non-profits—are embracing the technology for all sorts of reasons. Here are a few of the things you can do with the cloud:

- Create new apps and services
- Store, back up and recover data
- Host websites and blogs
- Stream audio and video
- Deliver software on demand
- Analyses data for patterns and make predictions

Benefits of Cloud Computing:

- Cost
- Speed
- Global scale
- Productivity
- Performance
- Reliability [10]

IV. REVIEW OF LITERATURE

Some published research papers of related topics with their objectives and literature reviews are given below.

✓ ***A Web Services-Based Distributed Information Retrieval Model:***

J. Meng et al provided information that how a website works on distributed system in his paper in a IEEE conference held in Dalian, China in 2008. According to this paper distributed computing model allows applications to communicate with each other, regardless of where or how they are implemented. Thus, Web services-based distributed systems technology facilitates the development of distributed service-oriented information retrieval system over the heterogeneous Internet. This paper presents a Web services- based model for information retrieval across different platforms. [1]

✓ ***Scheduling algorithms for distributed Web servers:***

M. Colajanni et al (2002) explained that a distributed Web system, consisting of multiple servers for data retrieval and a Domain Name Server (DNS) for address resolution, can provide the scalability necessary to keep up with growing client demand at popular sites. However, balancing the requests among these atypical distributed servers opens interesting new challenges. Unlike traditional distributed systems in which a centralized scheduler has full control of the system, the DNS controls only a small fraction of the requests reaching the Web site. This makes it very difficult to avoid overloading situations among the multiple Web servers. We adapt traditional scheduling algorithms to the DNS, propose new policies, and examine their impact. [2]

✓ ***Cloud Computing: Distributed Internet Computing for IT and Scientific Research:***

M. D. Dikaiakos et al described that Cloud computing is a disruptive technology with profound implications not only for Internet services but also for the IT sector as a whole. Its emergence promises to streamline the on-demand provisioning of software, hardware, and data as a service, achieving economies of scale in IT solutions' deployment and operation. This issue's articles tackle topics including architecture and management of cloud computing infrastructures, SaaS and IaaS applications, discovery of services and data in cloud computing infrastructures, and cross-platform interoperability. Still, several outstanding issues exist, particularly related to SLAs, security and privacy, and power efficiency. Other open issues include ownership, data transfer bottlenecks, performance unpredictability, reliability, and software licensing issues. Finally, hosted applications' business models must show a clear pathway to monetizing cloud computing. Several companies have already built Internet consumer services such as search, social networking, Web email, and online commerce that use cloud computing infrastructure. Above all, cloud computing still unknown "killer application" will determine many of the challenges and the solutions we must develop to make this technology work in practice. [3]

✓ ***Enhancement of Cloud Computing Security with Secure Data Storage using AES:***

Vishal R et al explained that Cloud computing makes the major changes in computing world as with the assistance of basic cloud computing service models like SaaS, PaaS, and IaaS an organization achieves their business goal with minimum effort as compared to traditional computing environment. On the other hand security of the data in the cloud database server is the key area of concern in the acceptance of cloud. It requires a very high degree of privacy and authentication. To protect the data in cloud database server cryptography is one of the important methods. Cryptography provides various symmetric and asymmetric algorithms to secure the data. This paper presents the symmetric cryptographic algorithm named as AES (Advanced Encryption Standard). [4]

✓ ***Cloud Computing: A Survey on Cloud Simulation Tools:***

Kiran Gupta et al described that Cloud computing is the trendy topic all over the world. As there are so much service providers of the cloud are available in the competitive world. A decision has to be taken that which service provider's services are more advantageous to the organization. The conceptual cost for buying the services of different services providers may lead to increase in budget or wastage of money and time. So the solution to this problem is trying out the simulation tools. these tools may include the different algorithms used by different service providers. The use of simulation tools leads to decrease in overall conceptual or operational cost of the organizations. There are different simulation tools available in the market. [5]

V. PROPOSED WORK

After study of "directverify.in" (a system which provides online verification for some universities of six state of India) we would provide the system which will be able to provide facility of online document verification. It will cover all the educational boards, independent institutions and universities of India. It will help the government recruitment agencies as well private recruitment agencies and other private firms (should be member of concerned education board and university).

This System will works as a centralized system which store information (record of certificates, provisional degrees and degrees) of all the educational board and university using cloud computing.

"Distributed e-Verification System using Cloud Computing" will complete the proposed work with complete functionality to verify documents (certificates (mark sheets),

diplomas and degrees with in a very easy way as discussed in introduction.

VI. SOFTWARE AND TECHNOLOGY USED

This e-verification developed using Dot Net platform with SQL Server Database. All technologies used in this web portal are as below:

1. **Visual Studio 2010**: Microsoft Visual Studio is an integrated development environment from Microsoft. It is used to develop computer programs, as well as websites, web apps, web services and mobile apps.

Visual studio generally known as .Net is used to develop this web portal. ASP.NET is primarily used to design and develop this web portal. C# is language which is used to code for this system.

2. **SQL SERVER 2012**: Microsoft SQL Server is the relational database management system which is developed by Microsoft. It gives you flexibility, built-in intelligence, and confidence you need to know the full potential and performance of your data.

SQL Server 2012 is used as a database for this web portal.

3. **CSS**: cascading style sheets (CSS) is used for formatting with ASP.Net.

Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language like HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

4. **JAVA Script**: Java Script is a client side scripting language is used to client side programing for this web portal with ASP.Net and CSS.

5. JavaScript, often abbreviated as JS, is a high-level, interpreted programming language that conforms to the ECMA Script specification. JavaScript has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

6. **Ajax controls**: Ajax controls such as Update panel, calendar extender.

AJAX stands for Asynchronous JavaScript and XML. This is a cross platform technology which speeds up response time. The AJAX servercontrols add script to the page which is executed and processed by the browser.

VII. CONCLUSION

A system **"Distributed e-Verification System using Cloud Computing"** is developed and it works to verify documents issued by boards of school education (under MHRD) and universities (under University Grant Commission, UGC). As I discussed (in review paper) the issues in manual document verification such as human efforts and lengthy time consuming process are resolved by this new e- verification system.

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