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DEVELOPING AN E-LEARNING BASED EDUCATION TECHNOLOGY PLATFORM BY EFFECTIVELY USING THE CLOUD PLATFORMS

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ABSTRACT

The motivation behind this paper is to correct the aspects that lead the acknowledgment of Cloud-based E-learning administrations and why it is tormented by security issues in spite of its various preferences and discover the potential answers for the issues. So this investigation features the security risk with Cloud-based e-learning and the precautionary measure procured as of late on those issues. This paper utilized both hypothetical and observational examinations. An experimental investigation is done by the data congregated utilizing various Cloud-based e-learning arrangement merchant's sites. Then again, the hypothetical investigation is made by inspecting a few research articles connected to our subject territories. In view of this investigation, it recognizes distinctive security dangers in the cloud administration conveyance model through the item to prescribe an answer in the system of safety efforts identified with the Cloud-based e-learning. Anticipated practice guarantees information accessibility and offers an answer for secure basic information from the intruders. The undertaking after the effect of this examination is to feature the indispensable security dangers and concerns involved when executing the distributed computing for e-learning frameworks. We do endeavour to misuse the security worries that e-students and the end-clients of Cloud-based e-learning arrangements want to obtain it from the Cloud-based e-learning arrangement. This examination finds various security issues in cloud administration by an article to advocate goals as security dealings connected to the Cloud-based e-learning. Conventional E-Learning methodologies are converged with distributed computing innovation to give tremendous advantages to the scholarly clients, yet it settles on security aspects. This investigation of E-Learning supporter's clients to obtain the information in the Cloud by means of a verified layer utilizing the web. Cloud-based E-Learning is an approach to reduce the cost and thickness of information recovering, which are dealt with by outsider administrations. The examination doesn't investigate negative viewpoints that may deject acknowledgment of cloud-based administrations. Nonetheless, we have recently examined distributed computing and its administration and have displayed ways by which the present security issues in distributed computing can be settled.

1. INTRODUCTION

E-learning is one of the far-reaching innovations, which reward the shortage of well-educated instructors in colleges and a few foundations, so distributed computing makes its fortune by the invigorating Cloud to the usefulness of E-learning arrangements. It is an essential example, with a critical potential for plunging charges through the advancement and developing monetary proficiency, which can genuinely, joint increment effort, spryness, and adaptability. Distributed computing empowers practical access to systems and applications, normal arrangement of configurable figuring assets, for example, systems, servers, and applications that can be given and unconfined straight away by slight exertion or contribution. The compact distributed computing is useful in discovering e-learning answers for cells and other the same hub, for example, Tablet PCs, advanced mobile phones, PDAs. Cloud-based E-learning arrangements reduce the expense in the customary E-learning innovation by it's across the board cloud source. Because of boundless vulnerabilities identified with web sources, individuals are cognizant about the security highlights of the innovation, and cloud-based E-Learning innovation is no chance an exemption from such security vulnerabilities. The software of E-learning that is provided by the educational services is accessible through the Internet and Website. It provides network system, and the result is a cloud-based service that is obtained through computing and the Internet. However, in order to maintain an effective and successful E-learning, we need to identify and resolve security cloud-based E-learning products. Through this work, an effort is made to explore the merits of this emerging technology, with a focus on security concerns, and with the possible outcome to ensure the safety of the cloud-based E-learning products and the safety of handlers and information stored on the server.

2. CLOUD SYSTEMS

The basic theme of this technology is to make a virtual pool with its main concern on large-scale computing resources link to the network resources, plus allowing Consumer scan share hardware resources, software dynamics, and data, and based on actual usage, pay. Therefore, we can easily purchase and vend this technology through the network in order to lower prices of commodities, such as water, the sale of natural gas, and electricity5. Now, you acknowledge and admit the key features of it; we have to aware of the development model and what is the right way to enjoy the service, plus how protection6. There are five main characteristics of its Calculated7,8, and Figure 1 illustrates the key models and key characteristics.

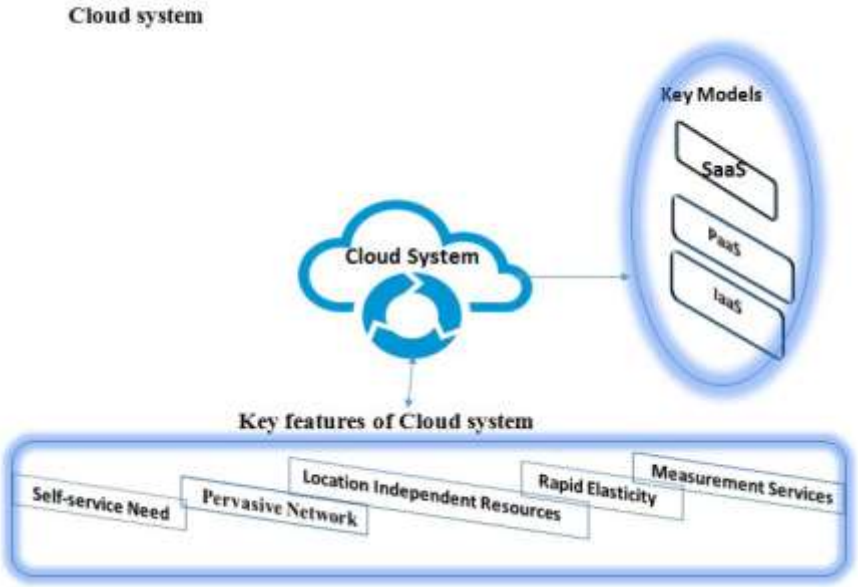

Figure 1. Cloud system.

2.1 Self-Service Needs Through this, customers do directly and automatically access online learning cloud computing, and more in any computer emphasizes safety facilities, such as servers, network storage suppliers, in no time.

2.2 Pervasive Network Entrance It means the device accessible on the network and does follow the standard approaches. This approach is useful for both professional and non-professional clients, such as laptops plus cell phones.

2.3 Location-Independent Resource Pool the Value Resource pools for the need of various customers in a dynamic place provider. Such resources indulged memory, storage, network bandwidth, and virtual machines.

2.4 Rapid Elasticity with this function, the facility does set quickly, and through great flexibility, it must Enlarge or quickly discharge. Similarly, the service may be continuously being updated and improved by visiting users.

2.5 Measurement Services This feature allows the monitor, Monitoring, and reportage of such resources, and can obviously, regulate plus echo on the number and amount of Resources and customer use infrastructure providers. Similarly, all of this feature, including consistency and Presence cloud7.There are some models of Cloud: public, private, and group, and hybrid cloud6,7. Public cloud provider's public can help by different tenants, including access resources, network

applications, and services by providing the Internet, can provide the necessary infrastructure, its implementation, by organizing help9. Although the second type of Cloud is just an Institute so that each person does interact inside the institute, Services, and applications, on the other side, no one from outside can interact with it. Cloud Infrastructure Organizations10. Therefore, private cloud Management organizations maintain user protection entirely by tissue7. Similarly, the group clouded signed for customers of a particular set of6 some organizations sharing infrastructure, Group support specific security needs, but share among multiple organizations involved in attention10. The latest model hybrid cloud must be a mixture of two or more clouds. This is the reality that its Atmosphere through inner and outer cloud services several vendorsusing9.There are three models of several cloud computing services; this is SaaS, PaaS, and IaaS.

3. E-LEARNING ENVIRONMENT

Through this, students over and done with online learning applications and by related tools Study. Virtualization and personal learning environments, the learning environment is the most important environmental; this presents a variety of E-learning environment through E-learning applications allow students the opportunity to Study10.Key Benefit of Virtual Learning Environment (VLE) is stored parallel a plurality of threads, it offers a very convenient environ for teachers plus Students who want to shift from one area to another also VLE offers many other opportunities Such as PLE is a user-network learning System that gives the permission to students to handle and progress their learning process. PLE supports many features, for mostusers10,12.Figure 2 highlights the overall pros and cons of a Cloud-based E-learning environment.

- Notice of the latest information about the courses page Problems.
- Students in any course required in your account Time plus it do interact from anywhere.
- Allow students which have any distinct demand plus constraints for such of e-learning systems.
- Provide preparation in a great geographical range.
- Through Internet (due to flexibility and cost Effective in helping students) to facilitate learning.
- There is no big choice to use of virtual learning environments curricular more selective provided to students for tiny schools.
- For contact among students and Teachers.

4. CLOUD-BASED E-LEARNING

Advantages

It is a part of cloud computing, through which It involves the education system and E-learning fields. Traditional cloud-based e-learning resources include all the necessary hardware and software infrastructure to improve network learning10.

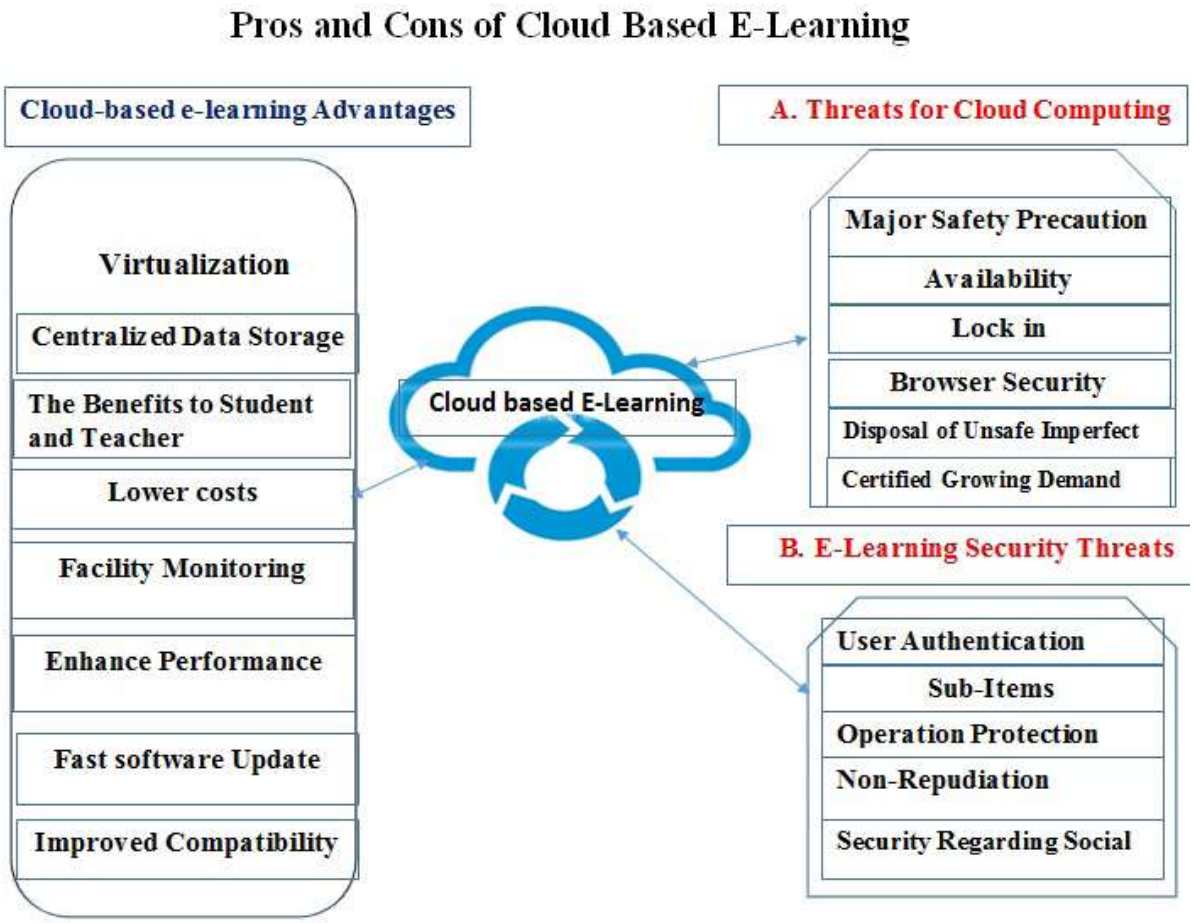

Figure 2. Pros and cons of Cloud-based e-learning.

4.1 Virtualization

It rapidly replaces the server in the Cloud guilty, with no high costs or losses. Lower Cloud greatly anticipated time. The reason is that it is simply creating a virtual machine13,14clones.

4.2 Centralized Data Storage

This is the most vital aspect of the application, while its information is saved in Cloud, lose serious incidents customer cloud is not a cloud in the Calculations. Therefore, the newcomer will link to that system13,14.

4.3 The Benefits to Students

cloud becomes a helping hand for a no of students. It provides a platform for students to take participate in online courses, testing, and get feedback in Teacher training plus send their project and works online to relevant teachers15.

4.4 Benefit of Teachers

Teachers especially get more and more E-learning based on the benefits of cloud computing. Teachers have the best facility for Online tests for students to prepare; they can prepare Students from the best content resources CM Scan assess plus reply to their work, project, and queries in

a timely manner because they communicate their students to online forums10,15.

4.5 Facilitate Watching

There should be one central place of Monitoring. Instead of a computer monitor is one hundred thousand a university to control data access Easier. In addition, Security can be changed testing and implementation deprived of any trouble Cloud computing represents a single point for all Customers entering13.

4.6 Lower Costs

User E-learning is not needed a PC hardware specification of powerful electronic learning applications. You can deploy he application running Cloud from your PC, Cell phone, tablet PCs, and Internet connectivity through the least configuration. The user no need to pay any extra charge if they want to save more data on Cloud than then local machine. So companies will rent an empty Cloud-based demand16.

4.7 Enhance Performance

The application E-learning is based on cloud computing, and there are plans applicator in cloud computing in many processes, so any problems can be Occurs, the client17is activated.

4.8 Fast Software Update

Since the application of cloud-based E-learning implemented, their software will be routine upgrades cloud sources. Then, the user will always be updated online learning Software10,17.

4.9 Improved Compatibility

Due to Format and source files, make the appropriate computer/phone, so all sizes cloud network learning Applications, so there is nothing to worry about. Since e-learning applications, cloud-based, open files through cloudenvironment10,17.

5. CONCERNS IN TERM OF SECURITY

in Cloud-based E-Learning in the security issues due to the latest technology, it is vital to sort out issues if your users will want it as a surety of Security. Since when this technology through web-based resources is not safe so that many threats in cloud computing are mostly Internet-based, which is faced by E-learning users. Although the cloud E-learning still has carried a lot of benefits, though uncertainty in cloud computing security has not been fully met, there is still security challenges plus problems in the digital world17.

5.1 Threats for Cloud Computing

5.1.1 Major Safety Precautions

Required Including knowledge or control of the standard Resource utility, as they are being shared Third-party client system. Therefore, I encountered some difficulties in the spell when it transfers utility services Cloud computing system, altered13 systems. In Cloud service, it has to keep encryption/decryption Keys through official person17.

5.1.2 Availability

As we know, Cloud has a no of application and data which is accessed through the different method and provide such services to its clients without any disturbance is critical. Both DOS attacks and DDOS attacks are the most famous attacks which compromise the availability of the service24/710.

5.1.3 Lock Information

Today, cloud service providers provide a lot of tools, applications, and standard data patterns to your clients. Then again, the problem faced by these services when the service client tries to use other suppliers10,17. There is compatible with cloud providers. Therefore, the client easily shifts from one side to another service. This issue has difficulty in obtaining cloud service providers18.

5.1.4 Disposal of Unsafe Imperfect Data

In most operations Systems, there is a chance to not fully remove the data, even if it is removed from physically. Clients have no idea if your data is completely eliminated after a delete command from all virtual machines Applications. This problem leads to unsafe cloud data. And the risk of this possible to use the Unauthorized data persons or hacker cloud10,18.

5.1.5 Certified Growing Demand

The providers have no advantages for its clients; first of all, it is providing software and access to applications inline. There is no need for a client to install all the software to get fully utilized in every aspect. No worry for the customers to care about the privacy of software because they are monitored by a centralized server through the Cloud. The service providers should be cautious about giving verifies its customer's access through certified personnel People. If the cloud operators cannot provide these the authentication process, which may result in increased Phishing or other vulnerabilities by threatening unauthorized access to these cloud applications10,16.

5.2 E-Learning Security Threats

Online learning technology concerns, in general, basic safety when we use it in traditional teaching applications Equipment. These problems give the following10,20:

5.2.1 User Authentication plus License

The user enters into the e-learning environment is a Necessary main permit. In overall, e-learning clients have various places, away from the user ID and password should be provided. Apprentice or student, according to Permissions, define the account can be accessed Installation. Billing on the way he/she can make the foundation under the rules of access to the level of Learning (learning regulations), or not21.

5.2.2 Sub-items

Tickets, a lot of terminals mean that there is a chance of security breach can happen in passive mode the case of e-learning. Because the number of clients, Use of e-learning servers in remote areas, makes Enter the two inputs will lead to security threats.

5.2.3 Operation Protection

Protection Processing is the most important task necessary Applied to the e-learning environment. Prevent other users through the use of such technology Digital signatures, firewalls, and other several similar measures should be taken to prevent tampering registered users.

5.2.4 Non-repudiation

At this level, information security, the pattern of data is damaged or destroyed by a virus. The system should provide multi-Capacity change data that is not attacked.

5.2.5 Security Regarding Social Aspect

Online E-learning varied from the traditional learning environment. The main difference in the event of Assigned to the student teachers raised. In the traditional learning environment, students Teachers directly in the print job in the classroom. In the online e-learning Environment, students must upload a soft copy of their task22.

6. PROPOSED SOLUTION

Figure 3illustrates, the solution provides a cloud-based system in order to secure the E-learning environment. Security awareness, mechanisms, methods, and Hacker techniques were discussed to strengthen this model.

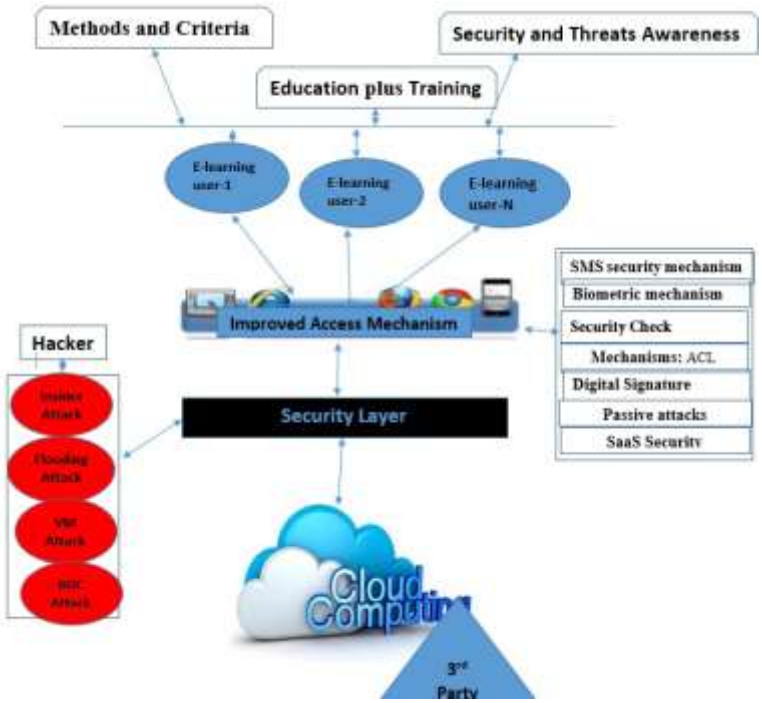

Figure 3. Secure model of Cloud-based e-learning.

6.1 The Security and Safety Awareness with the formation of the Organization for Security Committee Provide guidance and care for safety purposes, the company's development strategy. The

Commission will clearly define the roles and responsibilities of safety Function. Safety cognizance is a key Work to be done23.

6.2 Education plus Training

This portion indulged some basic training of security issues and crisis management capabilities (Risk), these issues for security teams and local partners. Yes, Definition has a basic introduction or safety. Providing skills training and mentoring team members Can be used as the basis of a certificate (Home Basic security) Security, it is also referred to as Data and Knowledge Management confidentiality.

6.3 Methods and Criteria

Do check the source Patterns and develop methods and standards cloud the computer system is an upright method. Firstly, and the most important safety device that should be considered Data security and businessneeds24,25.

6.4 Hacker

Hackers who represent the failure observed computer or computer network authorized/unauthorized access. There are a number of reasons, not the computer, such as benefits, protest, or challenge pirates. The hacker's different classification is white hat, black hat, grey hat, hackers elite Kiddi writing, Neophyte, blue lids.

6.5 E-Learning

Usually, it means using computers to provide part or entirely, of course, whether at school, part of the mandatory business training, or complete the course distance education. As it is already discussed.

6.6 Flooding Attack

In the system approach, cloud computing, all servers are service-oriented. If the server is overloaded or the maximum load, which shares some of his works to the nearby computer servers. This allocation method produces a cloud of skilful and fast execution. When the server receives an unauthorized request for a huge number, the service26will not be able to use a legitimate user. This attack is called a denial-of-service attack, which was requested by the floods. No legitimate application can be identified by examining the Use of CPU, memory, and hardware. In order to prevent server floods, organize all servers in the Cloud, and assign specific tasks to each server, for example one for the file system, the other is the memory management as well.

6.7 VM Attack

Virtualization is a key infrastructure is cloud technology services. This is a very difficult task for cloud service providers to ensure their customer's virtual machines. In this typical platform, available to users of the resource is virtual and physical. These resources are limited, related to real needs. In the cloud system, multi-tenant shared resources so that various virtual resources can be attached to the same physical resources. If there is a Cloud security vulnerability virtualization software platform, user data can be accessed by other users.

6.8 Insider Attacks

Have been, because they been allowed access to the system, you may be familiar with the structure of the network, and system policy/external attackers program has obvious advantages.

6.9 3rd Party Provider

The third-party service provider is responsible for transactions cloud security services because of some cloud service providers from outside sources. Prior to the adoption of cloud services, we must be aware of the roles of provider cloud third and clearly addressed in the contract responsibilities. Data owners should know if you outsource to cloud vendors another cloud provider or not. For example, data stored in the storage box (SaaS) Amazon Web Services (IaaS) data centre. At this stage, the customer can be detrimental to your privacy in the Cloud, poverty contract27.To avoid this risk, cloud providers should consider the following recommendations: It is clear that third parties mentioned names and identify their function. Other suppliers to follow security policies and procedures• this is followed by the cloud provider. If there is any fault, cloud providers need only responsible • direct support in all aspects of customer data.

6.10 Enhance Security Mechanisms

The listed methods should be improved and make it more user-friendly.

- SMS security mechanism
- Biometric mechanism
- Security Check
- Mechanisms: ACL Access Control List or Process is used to access the server or user-specific resources you can customize elements of the access mechanism.
- Digital Signatures
- Security due to passive attacks
- SaaS Security

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7. CONCLUSIONS

The main theme of E-learning is to facilitate and enhance educational services using the latest techniques and novel methods such as cloud-based technology. However, issues and challenges the ongoing processes in the field of Security. Any kind of threat is noted immediately, and effort is made to resolve it as soon as possible. The reason of which is the security issue of cloud applications as all the data can be transmitted over the Internet. Due to security concerns and slow resolutions of problems, the customers are doubtful about new technology. The customers access all their data through the Internet in the Cloud. These issues served as a barrier and to some extent, stopped the rapid growth of such technologies, especially in the field of cloud-based E-learning. In research views, questions, suggestions, service providers, and the government should strive for the new protocol and data transfer mechanism. Technical data of who is the user of insurance is the most important Benefit from cloud-based online learning users. In addition, one needs to consider the security infrastructure, such as servers and firewalls that can play an important role in it. Because the main concern this model is in the technical consumer server security the data server based on the server security, then it looks Necessary. To reduce these threats to the security of the server, disaster recovery, safety, and management standards of personal safety, you can use Security measures. A listed security challenge/proposed solution is a valuable new management and future design method of the Security of cloud-based e-learning. This work contributes to cloud computing data centres around the clock data availability and development of e-learning and e-learning methodology.