Private Cloud based Document Repository System

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Abstract

Building a centralized private cloud-based Document Repository is the challenge posed by the R V College of Engineering (RVCE) community. Wherein the complete system is restricted only to the members of the RVCE Organization to enhance the security. This article presents a planned model of Document within the cloud-based document repository. It is a foundation for handling multiple operations like creating, maintaining, navigating, and managing the Dashboard. It also deals in Populating, Teaching and Learning resources, providing security using Multi-factor Authentication, creating a Back-up and recovery mechanisms, and generating an automatic based archival to the cloud platform.

Keywords – archival, back-up, document repository, private cloud, security.

1.   Introduction

A Private cloud-based Document Repository System is a private cloud storage space that can be accessed by the RVCE community. It is managed by the admin with the rights of creating, maintaining, and managing the dashboard. This system is organized to ensure in making the best usage of resources available within the organization for the RVCE community.   Most universities have multiple legacy systems which are limited in functionalities. Generally, the level of the programming language used for them is not much robust, and the methods to communicate and protocols used are different. So, keeping all the documents in one centralized repository structures the frames easing in building a better community. This system solves most of the problems, but it is challenging for most of the other universities such as:

A.   Accessibility: the systems are built for educational purposes but are provided with the least number of resources. Managing those resources is required when complex data is to be handled and the complete system is hosted on the cloud.

B.   Variety: the users tend to dump all the data into an individual repository this would result in data clumsiness and the user may find difficulty in navigating to the resources required.

C.   Archival: data needs to be archived when the timeline specified for the document is reached. Keeping thedocument within the repository for a prolonged period would decelerate the user experience.

D.   Back-up: most universities rely upon cloud storage as data is mobile and needs quick access to the resources. Though the cloud storage is secured a periodic backup of the resources stabilizes the problems.

E.   Recovery: allows the admin to recover the documents that are trashed.

The need for building this application arose during the development of NoteStore – a web-based application to make students and faculty interact with each other during Major Project in the 6th semester of the MCA degree. During this, a web-based application was developed with a few features like uploading the document of various formats within the application wherein the data get stored onto the local storage. The local storage would not allow the whole set of communities to access the documents. Also storing the documents onto then local system would not provide any security and ubiquity. So, to ensure ease of access for the community a private cloud-based document repository is required that facilitates the faculties and students to get access to various resources through a dashboard. The faculty and students can only get authorized to use the resources if they belong to the RVCE Organization. Our study has found that existing systems are not flexible to provide better resources for the organization. So, a private application was a necessity to aid the efficiency.

This article presents a system of a private cloud document repository. This system aims to provide structural and well-organized documents for the communities to be used within the dashboard. To avoid loss of data, a periodic data backup would be taken and recovered when required. To enhance the navigation rate of documents and the User Interface the documents would periodically be archived.
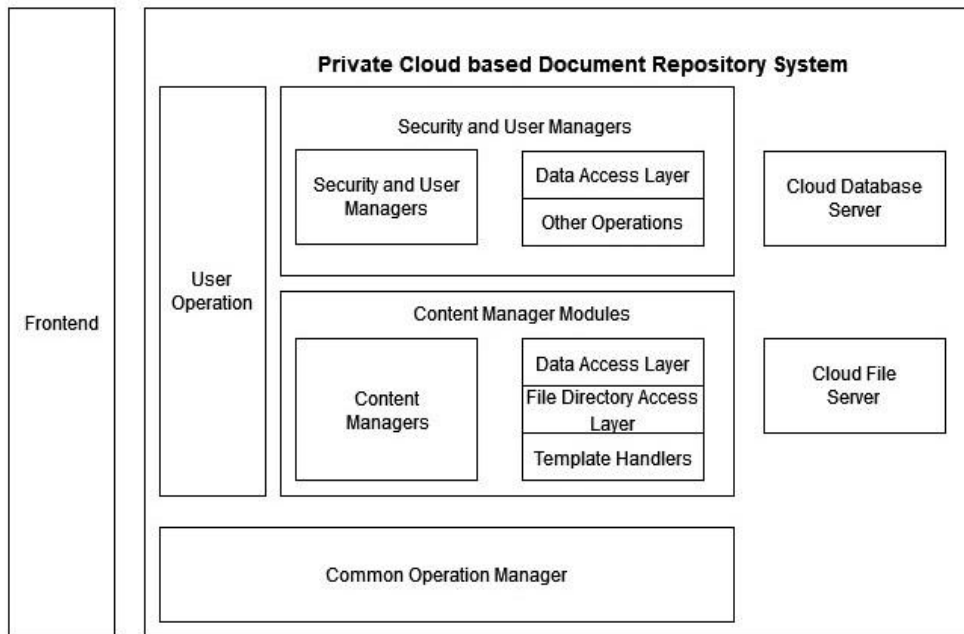

Fig. 1 Block Diagram of Private Cloud based Document Repository System.Note how various modules are bind to the system and connected to the cloud.

2.   Literature Review

There are already many solutions available forbusiness meetings.This Application is a design for creating a web

application that is extremely interactive and formulates in removing the gapbetween formal meeting by enabling end-users to work together virtually. Individuals would be able to connect safely on a single platform in this way, without the need to concentrate on the meeting's setting. The Message service facilitates building a bridge between the users to have interaction for data transfer [1]. The users can easily be interactive with the faculty or within the students to get cleared with any doubts, this enhances the users to improve on their skills and brings a competitive advantage throughout.

Framework for an image and file system for mobile devices with the help of two separate open-source forensic tools, we created a case study utilizing the forensic software framework, which investigates the potential picture and file system kinds that a forensic tool should be able to support. This system involves creating a system and handling the files to be uploaded as images in the format of JPG, PNG, and JPEG [2]. In our system this can be handled to upload files of various other format along with the mentioned above file types.

The creation of a centralized university document repository will allow users and programmers with various levels of access to create and use a variety of documents [3]. It enables diversified metadata that makes it easier for users and other systems to find and use documents, as well as for automated document retrieval to meet the requirements of diverse institutional procedures. The web framework that maintains to provides better documents required for the institution by organizing them collectively to safeguard the user's data and information.

E-learning is a method of instruction that uses contemporary communication tools, either remotely or in the classroom. The key is to employ technology of all kinds to give the studentinformation in less time, with less effort, and for more value. The power of e-learning to change what and how we give learning experiences to students across time and distance has accelerated its development [4].The present change in users moving towards building better communication through Message Service to create a community of users to have a better involvement.

Depending on where they are in the hierarchy, the application allows users to create files and distribute them to other users. This programmer combines several security features with the freedom to effortlessly share files with one or more people without using "email."This programmer is straightforward, user-friendly, and safe [5]. The implementation of cryptography invarious file modes results in the security of files. The system is built with User Management and handles the files upon logging into the system.

Building a web application to reduce the paperwork and improvise the system to operate through an online platform would be an era of change in the future [6]. The users get aid to learn through online mode the better way as it would facilitate in creating a better User involvement and Experience.

The development of secured hash algorithms includes a thorough analysis of the hash functions' contributions, applications, and brief history. Through several techniques, the protected hash functions are used in many different

domains to offer secure data transfer andmessage and other user-related information authentication. Since the invention of the first hash function, MD5, which was followed by SHA 1, this data encryption technology has experienced numerous advancements and advanced to SHA 2 and SHA 3 [7]. This involves storing the user data with high privacy as JSON Web Tokens (JWT), which is another way to hash the password in an encrypted format to avoid unauthorized access to the system. The users who forget the password need to recover by resetting it.

3.   Design

In recent years, various systems have been developed that have controlled access to resources. Most of the resources developed are Role-based access, Organization-based which are implemented using Content Management Systems (CMS) or web frameworks like HTML, CSS, JavaScript, etc.

A private cloud-based document repository system must be able to perform various operations: Communities are authorized to access the dashboard based on the credentials. Admin and other senior faculty members will have multifactor authentication. The default repository created cannot be deleted and managing a private repository is allowed. The faculty creates, maintains, manages, and navigates the resources within their profile. Faculty can access all the other faculty's documents but cannot manage them. Students can navigate to the resources and download them, which are uploaded by the faculty. Periodically remind admin to take backup of the system. Automatically archive the documents.

For a better understanding of this article, we define some of the basic concepts:

A.   *Maintain*: Keeping all the documents within the repository up to date.

B.   *Categorize*: This allows the faculty to directly upload the document to the specified category.

C.   *Manage*: Handling the documents by checking whether the document uploaded is reflected within the repository.

D.   *Navigate*: This enables the user to click on the search bar and type the name of the documents to be searched.

E.   *Archival*: This is to make the application navigate to the resources quickly based on the First In First Out (FIFO) mechanism to push down the documents that are beyond the timeline.

F.   *Multifactorauthentication*: The Admin and Senior faculty members need to log in to the system which contains secured information. To avoid unauthorized access to the system, amultifactor key will be sent to the registered organization's mail ID, and to the registered contact number.

In addition to this, a document may belong to any type so some of the common repositories added will be: -

3.1   Teaching & Learning Resources

3.2   Conferences

3.3   Journals-

i.   International Journals

ii.   National Journals

3.4   Notifications

4. Access of Control to Documents

Faculty and the students of RVCE Organization are the users of this system. So, this follows Organization Based Access Control (OBAC). This allows the admin to define some of the security policies to safeguard the system by introducing an abstract level. All the Students share the same level of access. All the Faculty members share the same level of access. Faculty with a position of Professor and Head of the Department (HoD) is authenticated based on multifactor authentication.The users who do not belong to the Organization will be restricted to access. The students have the accessibility to only view and download the resources. The faculty can perform the CRUD operations with their personal repository and manage them.

5. Conclusions

This paper proposes a model for a private cloud-based document repository system that facilitates a better way to access the resources that are hosted on the cloud. Only the members of the RVCE Organization are authorized to access to bind the security of the system. Some of the impressive elements of the system are: - Archival of resources, backing up, recovery of the resources and managing the resources.

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References

[1] A. Chakravarty, K. Jibhakate, M. Jadhav and N. Kulkarni, "File-Share App - A Collaborative Tool," 2021IEEE Pune Section International Conference (PuneCon), 2021, pp. 1-6, doi: 10.1109/PuneCon52575.2021.9686539.

[2] Ş. Şentürk, T. Apaydın and H. Yaşar, "Image and File System Support Framework for a Digital Mobile Forensics Software," 2020 Turkish National Software Engineering Symposium (UYMS), 2020, pp. 1-3, doi: 10.1109/UYMS50627.2020.9247055.

[3] E. Hadzhikolev, S. Hadzhikoleva and D. Orozova, "Digital Model of a Document in a University Document Repository," 2018 20th International Symposium on Electrical Apparatus and Technologies (SIELA), 2018, pp. 1-4, doi: 10.1109/SIELA.2018.8447089.

[4] M. K. Hussein and M. A. Mohammed, "Efficient and accuracy of retrieval files in E-learning system based on click method," 2018 1st International Scientific Conference of Engineering Sciences - 3rd Scientific Conference of Engineering Science (ISCES), 2018, pp. 34-38, doi: 10.1109/ISCES.2018.8340524.

[5] A. Sarkar and N. Prakash, "File sharing system encapsulated with customized social networking and learning management system [Abstract]", 2018 International Conference and Workshop on Computing and Communication (IEMCON)., December 2018.

[6] M. Gupta and S. Jetty, "Library in Everyone's Pocket With reference to Bundelkhand University App," 2018 5th International Symposium on Emerging Trends and Technologies in Libraries and Information Services (ETTLIS), 2018, pp. 79-82, doi: 10.1109/ETTLIS.2018.8485206.

[7] S. Debnath, A. Chattopadhyay, and S. Dutta, "Brief review on the journey of secured hash algorithms," 2017 4th International Conference on Opto-Electronics and Applied Optics (Optronix), 2017, pp. 1-5, doi: 10.1109/OPTRONIX.2017.8349971.

[8] Veeranki, S. R., & Varshney, M. (2022). *Comparative analysis of thyroid disease and predict them using machine learning techniques.* International Journal of Health Sciences, 6(S3), 11005–11014. https://doi.org/10.53730/ijhs.v6nS3.8459

[9] Veeranki, S. R., & Varshney, M. (2022). *Application of data science and bioinformatics in healthcare technologies.* International Journal of Health Sciences, 6(S4), 5394–5404. https://doi.org/10.53730/ijhs.v6nS4.10728

[10] Sreenivasa Rao Veeranki, Manish Varshney. (2022). *Trends and Application of Data Science in Bioinformatics.* Design Engineering, (1), 3541 - 3555. Retrieved from http://www.thedesignengineering.com/index.php/DE/article/view/950

[11] Sreenivasa Rao Veeranki, Manish Varshney, "*Role of Bioinformatics In Biotechnology Concerning AI*", IJRAR - International Journal of Research and Analytical Reviews (IJRAR), E-ISSN 2348-1269, P- ISSN 2349-5138, Volume.6, Issue 2, Page No pp.8-17, June 2019, Available at : http://www.ijrar.org/IJRAR19K9397.pdf

[12] Sreenivasa Rao Veeranki, Manish Varshney,"*Bioinformatics and Data Science in Medical Research*", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.6, Issue 1, page no.204-214, January-2019, Available :http://www.jetir.org/papers/JETIR1901G29.pdf

[13] Sreenivasa Rao Veeranki, "Metagenomics and Single-Cell Technologies for Microbiome Big-Data Mining: Precision Medicine in the Making" , International Journal of Mechanical Engineering, https://kalaharijournals.com/journals.php,ISSN: 0974-5823 Vol. 7 (Special Issue, Jan.-Mar. 2022)

[14] Sreenivasa Rao Veeranki and Manish Varshney, "Intelligent Techniques and Comparative Performance Analysis of Liver Disease Prediction", International Journal of Mechanical Engineering , https://kalaharijournals.com/ijme-vol7-issue-jan2022part2.php , ISSN: 0974-5823 Vol. 7 No. 1 January, 2022,

[15] Sreenivasa Rao Veeranki, "Bioinformatics and Data Science in Industrial Microbiome Applications: A Review", ISSN: 0974-5823 Vol. 7 (Special Issue 5, April-May 2022) International Journal of Mechanical Engineering, https://kalaharijournals.com/journals.php

[16] Sreenivasa Rao Veeranki, Manish Varshney,"Bioinformatics and Data Science in Medical Research", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.6, Issue 1, page no.204-214, January-2019, Available :http://www.jetir.org/papers/JETIR1901G29.pdf

[17] Sreenivasa Rao Veeranki, "Revolutionary Transform of Supply Chain Design & Management Using Artificial Intelligence and Bigdata Analytics" , International Conference on Recent Development in Engineering Sciences, Humanities and Management, ISBN : 978-81-943584-9-7, 24th-25th January 2020

[18] Sreenivasa Rao Veeranki, "The Method for Pharma Growth Throughout The Drug Lifecycle With Artificial Intelligence In Life Science, International e-Conference on   Innovation and Emerging Trends in Engineering, Science and Management, ISBN: 978-93-91535-38-4, 24th and 25th June 2022