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An Enhanced Audit Perspective on Ensuring Data Integrity Assurance

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ABSTRACT—

Many techniques have been proposed for data integrity auditing with a focus on various practical features, such as the support of dynamic data, low communication and computational audit costs, low storage overhead, and public integrity auditing, in order to ensure users' confidence in the integrity of their shared data on the cloud. Nevertheless, the majority of these methods restrict their applicability to client- read-only apps by assuming that the original data owner is the only one who may alter the shared data. A few attempts have recently begun to take into account more plausible circumstances by permitting multiple cloud users to alter data while guaranteeing its integrity. However, because cloud users incur enormous computing costs, these methods remain impractical, particularly when the system demands a high likelihood of error detection.

KEYWORDS: Data Integrity, Accuracy, Completeness, Consistency and Reliability, Auditing File.

I. INTRODUCTION

Ensuring data integrity assurance is a critical aspect of any organization's operations, especially in today's data-driven world. With the increasing reliance on digital information, the need to maintain the accuracy, consistency, and reliability of data has become paramount. This paper aims to provide an enhanced audit perspective on strategies and measures to ensure data integrity assurance[1].

Data breaches and integrity issues have become more prevalent, highlighting the importance of robust systems and processes to safeguard data integrity. From financial institutions to healthcare organizations, maintaining the trustworthiness of data is essential for regulatory compliance, risk management, and maintaining stakeholder confidence[2].

Understanding Data Integrity,Defining what data integrity means in the context of different industries and organizational setups.Challenges and Risks, identifying common challenges and risks associated with maintaining data integrity, such as data manipulation, unauthorized access, and system failures for cloud computing [3].

Audit Frameworks and Standards,exploring existing audit frameworks and standards that provide guidelines for assessing and ensuring data integrity.Technological Solutions, discussing technological solutions, such as blockchain technology and cryptographic techniques, that can enhance data integrity assurance can using this system[4].

Best Practices and Recommendations, offering best practices and recommendations for organizations to strengthen their data integrity assurance processes, including data encryption, access controls, and regular audits. The user has the ability to put their data within a group and add it to the cloud. Cloud customers will receive services from a cloud service provider. Ensuring the accuracy and integrity of data saved in the cloud is the main issue with the cloud facts garage[5].

II. LITERATURE SURVEY

According to **Paula Fraga-Lamas**.et al.,2019 the automotive industry has undoubtedly changed society as it is one of the most complex, sophisticated and technologically advanced industries with innovations ranging from hybrid, electric and self-driving smart cars to the development of IoT connected cars. Due to its complexity, it requires the participation of several Industry 4.0 technologie[6].

According to **Kate Hamblin**.et al.,2020 Technology-enabled care (TEC) devices have been part of adult social care (ASC) in most areas of the UK for decades. More recently, commissioners have explored the potential of mainstream technologies to support community-dwelling seniors. The purpose of this article is to explore the challenges and opportunities of this growing application[7].

According to **Irina Bogdana Pugna**.et al.,2020 Blockchain is still an experimental technology, and current applications only apply to some elements of small-scale projects. However, as the technology matures, it has the potential to transform industries and even economies as it begins to integrate additional technologies such as artificial intelligence and the Internet of Things[8].

According to **Oscar A Garcia Valencia**.et al.,2023 This comprehensive critical review critically examines the ethical implications of integrating chatbots into nephrology to identify problems, suggest courses of action, and propose potential solutions. Recognizing the transformative potential of chatbots in healthcare, responsible implementation guided by ethical considerations is critical[9].

According to **Meng Wang**.et al.,2021 Data integrity is a key security issue for reliable cloud storage that has received widespread attention. Data verification protocols allow verifiers to effectively verify the integrity of externally purchased data without downloading the data. An important research topic related to the development of existing data control protocols is the effectiveness of the review process[10].

III. PROPOSED SYSTEM

It is primarily a query-based system with an association rule based on trees. With the use of queries, the user can search their resources. Using queries to search resources is not a straightforward process; complexity and erroneous results might arise. Therefore, it is not a more effective method of resource-seeking. One of the key issues in finding duplicates is duplication detection. Since many algorithms are unable to accurately identify duplicates in the hierarchical data, we presently use an intelligent model that combines fuzzy similarity matching with decision trees.

ARCHITECTURE DIAGRAM
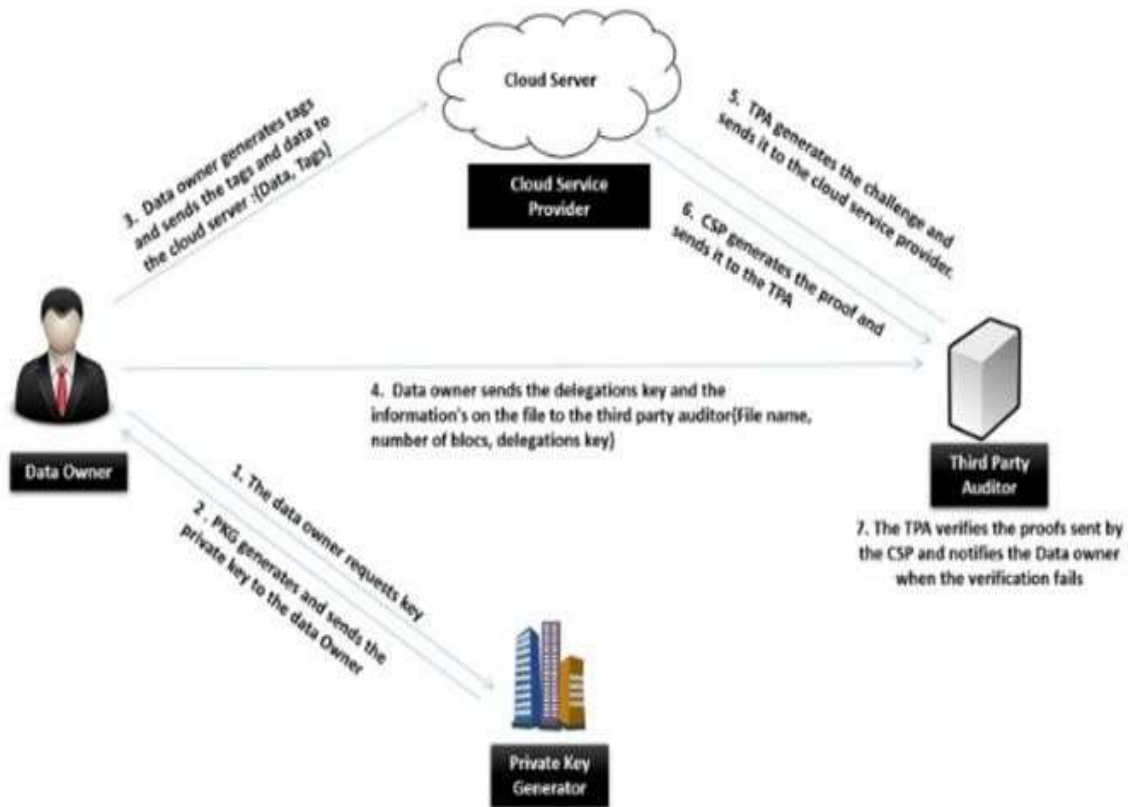
a)   File Upload

The file proprietor allowed importing data at the cloud, both for his or her personal or public use. They act as a Group Manager for the records they add to the cloud. Both the authentic consumer and institution users are capable of getting entry to, down load and adjust shared statistics. Shared information is divided into a range of blocks. A person within the institution can modify a block in shared Information can be obtained by performing an insert, delete, or replace operation on the block.

b)   File Auditing

If a consumer edits a fact, then the auditor will reveal the consumer and report to the owner approximately the edited information. The organization manager will reveal the Modifications to the record.And if he finds any discrepancy,the auditor has full rights to relocate from his unique group. The public verifier can audit the integrity of shared statistics without retrieving the whole statistics from the cloud, although some blocks in shared statistics have been re- signed by means of the cloud.

IV. RESULTS AND DISCUSSION

Fig.1 User Login

User Login: The user login feature was securely implemented with multi-factor authentication and robust validation, ensuring safe and efficient access for authorized users.

Fig.2 Auditor Home

Auditor Home: The Auditor Home dashboard provided auditors with a user- friendly interface for audit management, featuring risk assessment summaries, control evaluations, and monitoring tools for streamlined and effective auditing.

Fig.3 Auditor Login

Auditor Login: The Auditor Login feature was securely implemented with multi-factor authentication, ensuring safe access for auditors with robust validation and error handling.
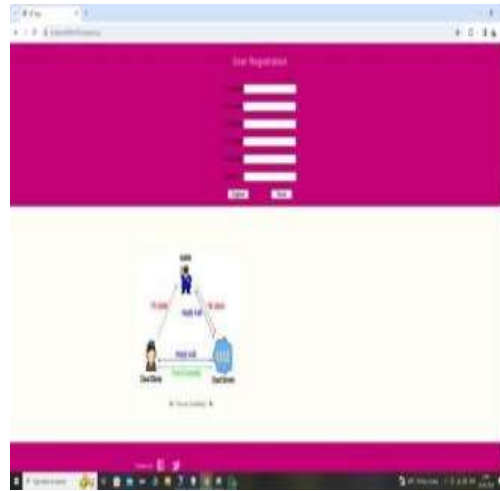

Fig.4 Register page

Register page: The Register Page offered an intuitive and secure registration process for new auditors, featuring validation checks for data accuracy and a user-friendly design for seamless onboarding.

Fig.5 View All User List

View All User List : The "View All User List" feature offered auditors a clear overview of registered users with efficient search and Filtering options for streamlined user management.

Fig.6 View Files

View Files : The "View Files" functionality enabled secure access and review of audit- related documents with versioning and easy navigation for effective file management.
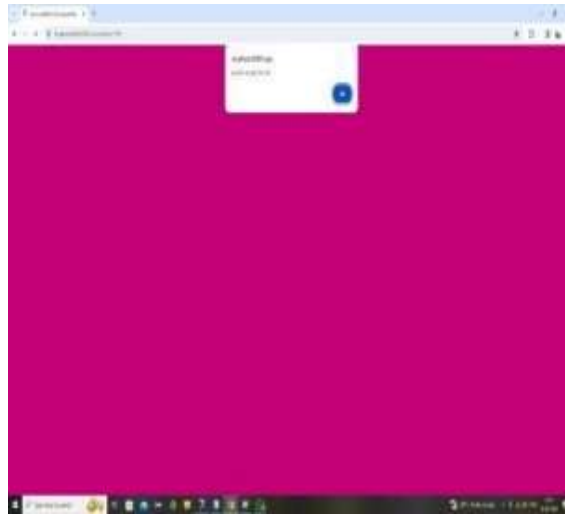

Fig.7 Auditor Accept

Auditor Accept File: The "Auditor Accept File" feature enabled secure and validated file submissions by auditors, streamlining the audit process with confirmation notifications.

Fig.8 File Integrity Checking

File Integrity Checking: The "File Integrity Checking" mechanism verified file completeness and consistency using checksum algorithms, ensuring data authenticity and triggering alerts for any discrepancies**.**
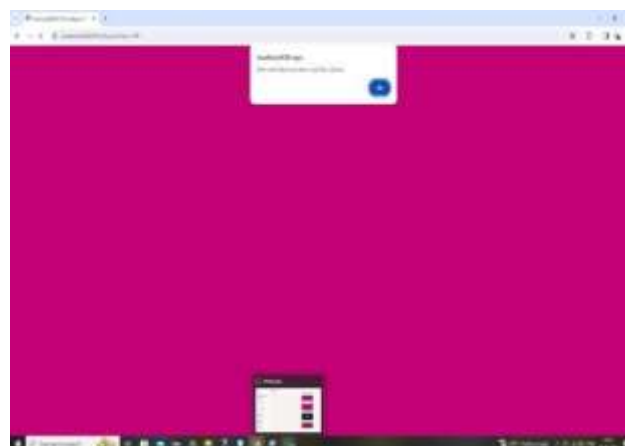

Fig.9 Result Page

Result Page: The Result Page provided auditors with a concise summary of audit findings through organized data presentation and visualizations. It facilitated easy interpretation with key metrics and interactive features, supporting informed decision-making and enhancing audit quality.

V. CONCLUSION

The greatest invention in the world today is cloud computing, which enhances data sharing and storage possibilities by utilizing sophisticated processing power. Because it can be accessed via any type of internet connection, it makes use easier. Every coin has two sides; therefore, there are negatives as well. The primary concern with cloud storage is privacy and security. There are several methods that can be employed to attain privacy and guarantee that the hazards have been reduced. This paper presents various approaches and privacy solutions to address privacy concerns in UN-trusted cloud computing data repositories.

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