Block chain-based feedback form system for college management

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Abstract : **Feedback mechanisms are important for enhancing academic standards, faculty, and institutional efficiency in higher educational institutions. The traditional online feedback mechanisms are mainly centralized, giving rise to several drawbacks such as lack of transparency, data tampering, single points of failure, and lack of respondent anonymity. These factors create doubts among various stakeholders regarding the reliability of the feedback mechanisms, avoiding students from submitting authentic feedback. To address these lacunae, this study proposes the design of "Blockchain Based Online Feedback Form System for College Management," which uses the decentralized, immutable, and secure features of blockchain technology. The study examines how students' feedback can be submitted using web-based tools with the help of cryptography and hash processes for maintaining anonymity. Smart contracts are used to validate, record, and store the feed-back in a distributed ledger to ensure that no unauthorized party can modify or delete any feed-back data. The proposed model of data storage in a decentralized manner removes any middleman or supervisor control. Authorized personnel have access to authentic aggregate data without leaking individual identity. The experimental outcome shows efficient feed-back submission with a lag similar to those in academic settings. The proposed architecture promotes data authenticity, anonymity, as well as trust in a higher education institution based on data-driven decision-making.**

IndexTerms **-** Blockchain, Online Feedback System, Decentralization, Smart Contracts, Data Security, Anonymity, Distributed Ledger, Data Integrity, Cryptography, Higher Education Systems.

I. INTRODUCTION

With the advent of the digital age, education-related organizations adopt the use of online platforms to facilitate effective performance in their institutions. Feedback from students enables such institutions to assess the effectiveness of their teaching methods and curriculums and how their services contribute to the development of students. Such information will help them identify loopholes in their practices.

The common feedback systems used today have a centralization nature, whereby one institution holds all the data. Some of the problems resulting from centralization include data tampering, lack of transparency, breach in confidentiality and privacy, and the possibility of data theft in case there is an attack or malfunctioning of the system. The lack of anonymity will limit the level of participation in feedback giving, since some of the students would want to hide their identity for security reasons.

This paper recommends the creation of an online feedback system using the blockchain technology. In addition, the system can utilize smart contracts and cryptography to preserve user privacy and ensure data integrity.

Key Contributions

- Blockchain enabled feedback system online for college management.
- Decentralized data storage system for feedback to ensure no tampering.
- Anonymity of students in the process of feedback submissions.
- Smart contract based system for feedback validation and submission.
- Trust based and reliable system for efficient and data-driven decision making.

II. RELATED WORK

Blockchain technology provides decentralization, immutability, and cryptographic security, making it suitable for trustworthy data management. Nakamoto's work on Bitcoin [1] laid the foundation for blockchain systems, while later studies expanded its applicability beyond cryptocurrencies to secure and transparent data storage [2], [11]. Platforms such as Ethereum [10] and Hyperledger Fabric [9] enable smart contract execution and permissioned blockchain deployment, supporting a wide range of decentralized applications.

In educational domains, blockchain has been explored for managing academic records, certificates, and learning data. Sharples and Domingue [5] and Alammary et al. [3] highlighted the benefits of blockchain in improving transparency and trust in education systems. Research has also applied blockchain to surveys and feedback collection. Chen et al. [6] and Xu et al. [7] demonstrated that blockchain-based feedback and survey systems effectively prevent data tampering and improve data integrity when compared to centralized solutions.

Privacy and governance remain critical challenges in feedback systems. Studies integrating blockchain with cryptographic hashing and access control mechanisms provide improved privacy protection and resistance to unauthorized access [8], [14], [15]. However, most existing works focus on security or privacy in isolation and lack a unified framework for anonymized feedback collection, validation, and reporting. The proposed Blockchain-Based Online Feedback Form System builds on these studies by integrating smart contracts, decentralized storage, and privacy-preserving mechanisms into a single, user-friendly platform for academic feedback management.

III. PROPOSED WORK

The proposed framework incorporates a blockchain-based feedback form that seeks to address the constraints associated with centralized feedback forms. The feedback is recorded on the blockchain, which guarantees transparency, permanency, and trust. The smart contracts are utilized in validating and storing the feedback while cryptography ensures student anonymity. The use of a hybrid solution where sensitive information is recorded on the blockchain and non-sensitive information off the blockchain is adopted for efficiency. The administrators have the ability to gain insight into the feedback without exposing the students' identities.

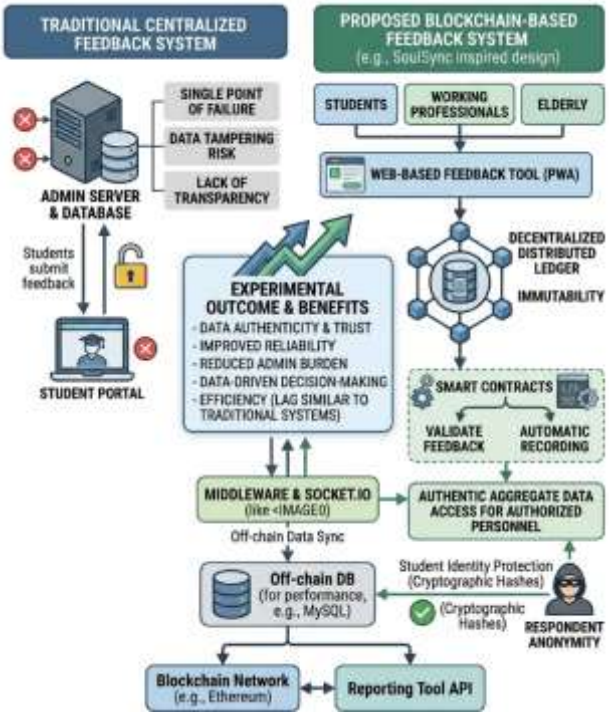

Fig 3.a: System Architecture

This architecture illustrates a **Hybrid Blockchain-Based Feedback System** designed to replace traditional, vulnerable centralized databases with a secure and anonymous ecosystem. The process begins at the **React-based frontend**, where users submit feedback that is immediately split between two paths: **non-sensitive data** is stored in an **off-chain MySQL database** for system efficiency, while **sensitive verification data** is processed by **Smart Contracts** and recorded on a **decentralized blockchain ledger**. By utilizing **cryptographic hashing**, the system ensures "Respondent Anonymity," allowing administrators to access authentic, aggregate reports via **APIs** without ever seeing individual student identities. Ultimately, this integration of **Socket.IO** for real-time updates and blockchain for **immutability** creates a transparent, tamper-proof environment that eliminates single points of failure while maintaining the performance speeds expected in a modern academic setting.

Key Features of the Proposed System

(a)Decentralized Storage:

Feedback records are maintained through a blockchain network. This means that there is no central control and the data cannot be altered illegitimately

(b)Immutability:
Because the feedback recorded on the blockchain cannot be modified or deleted, the information recorded is reliable.
(c)Student Anonymity:
Identities of students are anonymized via cryptographic hashing algorithms in order to ensure privacy and encourage honest feedback.
(d)Smart Contract Automation:
Smart contracts are capable of validating feedback entry and storing this data in a blockchain in a way that precludes human error.
(f)Hybrid Data Management:
The blockchain holds verification hashes, and an off-chain database holds metadata.
(g)Transparent Reporting:
Administrators can confirm the authenticity of feedback by means of blockchain transaction hashes.
(h)Reduced Administrative Workload:
The Automated Validation and Reporting reduce manual work and are more efficient.

IV. IMPLEMENTATION

The system design for the implementation of the proposed Blockchain-Based Online Feedback Form System uses a web-based system integrated with blockchain technology is shown in fig(1). It includes a frontend system for students and admins, a backend system for the application of the request, and a blockchain system for storing feedback data. The students use a web form for posting feedback, and it is processed at the backend by checking the feedback, making the student identity anonymous through hashing, and encrypting feedback data.
After the preparation of the feedback, the backend engages with the smart contracts present on the blockchain network. The smart contracts validate the submission of the feedback and make it a permanent transaction on the blockchain. Every transaction holds a unique hash and time stamp, and hence the feedback will not be deleted or altered after its submission. A hybrid model is used for storage, whereby the blockchain holds the verification data, and another database is used for non-sensitive data.
To achieve all this, the administrators use a secure dashboard where they retrieve feedback reports that are linked to blockchain transaction hashes. Using this system, the administrator is assured of the authenticity of the feedback without necessarily using the students' identities. With all this in place, the system is quite secure, transparent, and easy to use while reducing labor in the feedback management process.

Fig 1:System Implementation diagram

V. RESULTS

The developed SRK-IT blockchain-based academic feedback and governance system was successfully implemented and tested for various roles, such as Super-Admin, HOD, Faculty, and Students. The outcome of the experiment reveals that the system is capable of managing faculty nodes, governance authorization, and role-based access in a clean and consistent manner. The Super-Admin and HOD dashboard offer a clear view of faculty mappings, summaries, and audit controls in a structured manner. The login and access process for various roles functioned properly, thereby validating the design of role segregation and access control.

From the student's point of view, the feedback system allowed for anonymous and systematic feedback of the faculty members on clearly articulated feedback attributes. The application of voting that eliminated identities and blockchain validation ensured that the feedback was anonymous yet verifiable and tamper-proof. The successful submission and compilation of feedback indicate that the system is capable of collecting feedback that is not traceable and thus honest. The final feedback packages and secure submission process validate the integrity of the feedback collection process.

Fig: Student Feedback

Fig: Student Feedback Submission

Fig: Faculty Performance

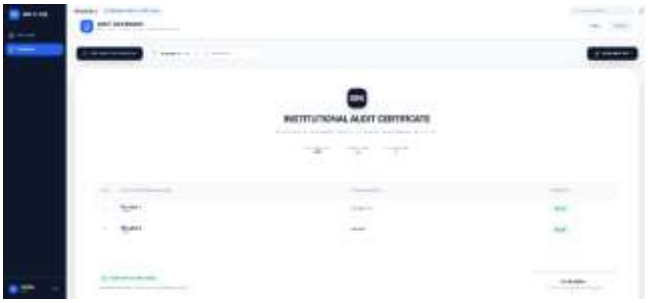

Fig: HOD Dashboard(a)

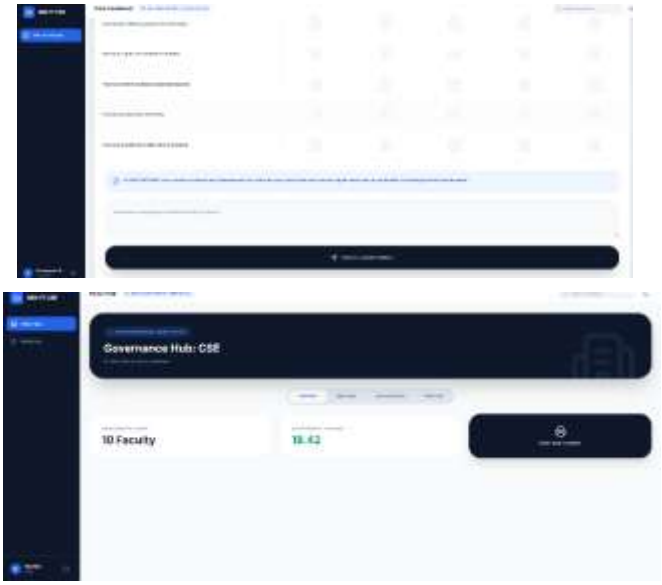

Fig 2.8: HOD Dashboard

On the analysis side, the performance dashboard for faculty members and the governance view for HODs had a clear representation of the results, strengths, and areas for improvement through visual representations and attribute-level details. The immutability of the data and the read-only audit view helped to ensure the integrity of the evaluation process. In general, the findings suggest that the proposed system enhances transparency, accountability, and reliability in academic feedback management while preserving anonymity and data security.

Fig: Admin Dashboard(a)

Fig: Admin Dashboard(b)

Fig 2.9: Admin Dashboard(c)

Fig 2.9: Admin Dashboard(d)

VI. CONCLUSION

This project aimed at offering a Blockchain-Based Online Feedback Form System that would address the shortcomings of the conventional feedback systems used in learning institutions. In conventional feedback systems, the systems are centralized, thereby showing a lack of transparency, which results in the privacy of students not being guaranteed. However, using blockchain technology, the system ensures that students' feedback information is stored safely, which cannot be modified later on.The system relies on the use of smart contracts. This is for the purpose of automating the processing of feedback. The student identities are anonymized. This is done through the use of cryptography.

The aim is to foster integrity in the process without the fear of being judged. The hybrid storage system that is used in the system is a combination of blockchain and off-chain storage systems.Experimentation results prove that the system is user-friendly, secure, and very efficient for students as well as administrators. As it helps in the provision of tamper-proof statements, this proposed system ensures better management of the quality of feedback by increasing the efficiency of the system. It can be adopted by contemporary educational institutions for secure online management.

Key Features:

- Provides Secure & Tamper-Proof Storage of Feedback
- Protects student anonymity
- Reduces Administrative Workload
- Increases trust and transparency
- Facilitates data-informed educational choices

Future Scope:

Although the proposed blockchain-based system effectively ensures the integrity and anonymity of academic feedback, several enhancements can be explored in future work. Machine learning and Natural Language Processing (NLP) models can be integrated to enable **sentiment analysis** and trend detection, allowing institutions to derive deeper insights from qualitative comments.

The system can be extended to support **Zero-Knowledge Proofs (ZKP)** to further harden respondent privacy while maintaining eligibility verification. Integration with real-time analytics dashboards can enhance transparency and support immediate data-driven decision-making for faculty and administrators. Additionally, the framework can be scaled into a **consortium blockchain** to facilitate standardized quality benchmarking across multiple higher education institutions. Future studies may also focus on **incentivization mechanisms**, such as digital tokens or micro-credentials, to encourage consistent and authentic student participation.

I. ACKNOWLEDGMENT

The authors would like to express their sincere gratitude to **Jyothsingh rajpurohit**, Department of Computer Science and Engineering, **SRK Institute of Technology**, for her valuable guidance, continuous support, and encouragement throughout the development of this project. Her insights and suggestions greatly contributed to the successful completion of this work.

The authors also extend their heartfelt thanks to the faculty members of the Department of Computer Science and Engineering for their support and for providing the necessary resources to carry out this research. Finally, the authors would like to thank their institution, **SRK Institute of Technology**, Andhra Pradesh, for providing a conducive environment and infrastructure to successfully complete this project.

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