Lock Chain - A System for Internal Security of Nation Using Machine Learning

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Abstract— **This research paper presents a complaint management system developed for a nation's internal security affairs. The system allows for secure and anonymous reporting of concerns and complaints by citizens, with a focus on improving transparency and organizational performance. Utilizing machine learning techniques and a NoSQL database (MongoDB), the system evaluates and assigns a trust score to each complaint based on its content and the history of the user submitting it. An auto-generated report is then sent to the relevant local authority with the trust score and other relevant information. The system also includes a search function for authorized users to access all complaints in a specific area. The use of this system aims to combat corruption and improve the overall security of the nation.**

I. INTRODUCTION

The Lock Chain solution is designed to specifically address the security needs of the country. In order to utilize the platform, users are divided into two categories: Tip-Providers and Authority Access.

Tip-Providers are individuals who submit anonymous tips or reports to the Lock Chain platform. In order to become a Tip-Provider, users must undergo a quick one-time registration process to verify their identity and nationality using documents such as an Aadhaar card or Pan card. Once registered, Tip-Providers can sign in using an OTP-based system and are assured that their personal data will not be linked to any tips or reports that they submit.

Authority Access is provided to government departments and local law enforcement bodies. These authorities have complete access to the tips and reports submitted to the Lock Chain platform, including detailed reports and an ML-based search system. The search system allows authorities to sort and prioritize cases and events by relevant keywords and trust scores. This helps authorities to efficiently investigate and address the most pressing issues and concerns reported through the platform.
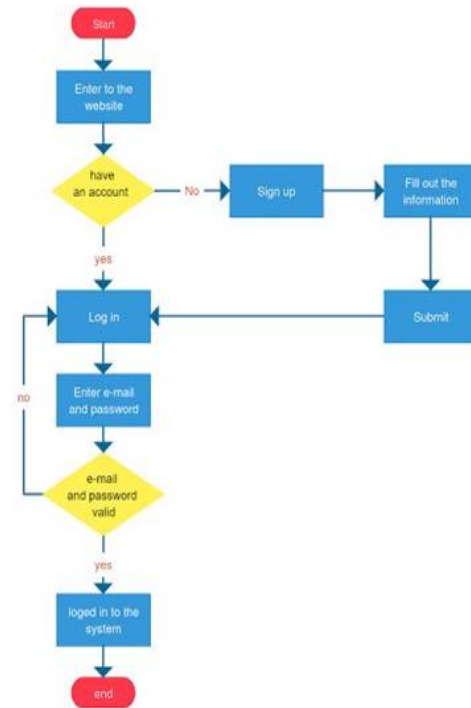
Login Process Flowchart

II. LITERATURE REVIEW

For our literature review, we looked at several similar systems employing techniques to build a complaint management system.

A. Survey Existing System

The government initiative in the implementation of smart city concept is an effort in the management of a city. In this study, Puspa Miladin, Nuraida Safitri explained the process of designing module for geotagging and geofencing-based e-complaint system. Several experiments were conducted to find out the accuracy of these techniques. With 94% accuracy, geofencing was a suitable technique to apply. In addition, geotagging techniques using EXIF of a digital image was considered the most suitable

technique for the e-complaint system rather than other geotagging techniques.

B. Limitation Existing system or research gap

Puspa Miladin, Nuraida Safitri have cited that the main problem however, is it is difficult to apply webservice for geotagging. Using webservice for geotagging will take longer processing time because one should delete the EXIF information attached to the images and add the coordinates. In conclusion, EXIF is considered the more suitable method for geotagging of the e-complaint system.

The system is heavily dependent on third party application like Telegram and Twitter. So, the security of user data is dependent on security features available on third party application. It can lead to data breach.

### C. Main advantage of MongoDB

With a centralized point of access, no user needs to expend resources to register complaints. There is also no possibility of manipulation via majority attacks, while at the same time, privacy and security is maintained because MongoDB stores user data after using the MD5 hash algorithm, which is irreversible, and infinitesimal collision rate.

III. METHODOLOGY

The complaint management system will utilize the NoSQL database MongoDB to store and manage the anonymous complaints submitted by users. The system will be built using the JavaScript library React, which will allow for a user-friendly interface and efficient management of the data. Machine learning will be utilized to evaluate the trustworthiness of the complaints, using historical data such as the user's previous submissions and similar complaints from other users. The location of the complaint will also be taken into consideration, allowing authorities to prioritize and address issues in specific areas. Overall, this methodology will provide a secure and efficient platform for citizens to voice their concerns and bring attention to issues within the government and regulatory bodies. *MongoDB*
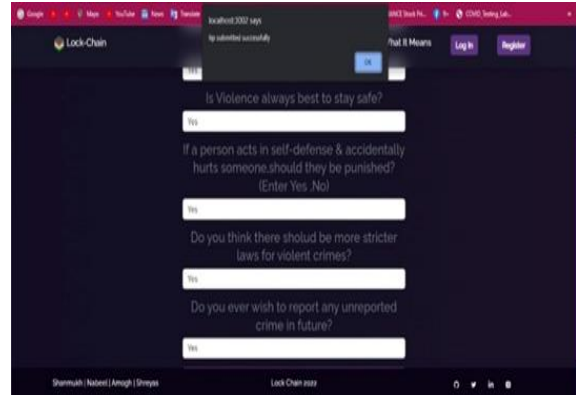

It is an open-source document database built on a horizontal scale-out architecture that uses a flexible schema for storing data. Founded in 2007, MongoDB has a worldwide following in the developer community. Instead of storing data in tables of rows or columns like SQL databases, each record in a MongoDB database is a document described in BSON, a binary representation of the data. Applications can then retrieve this information in a JSON format.
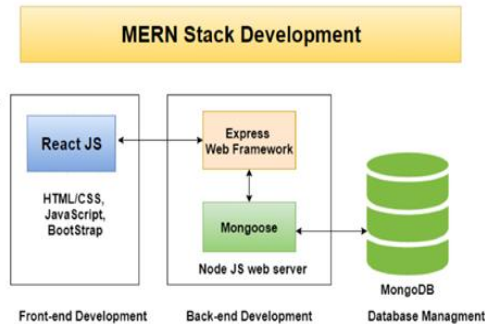
MERN Stack

IV. RESULTS
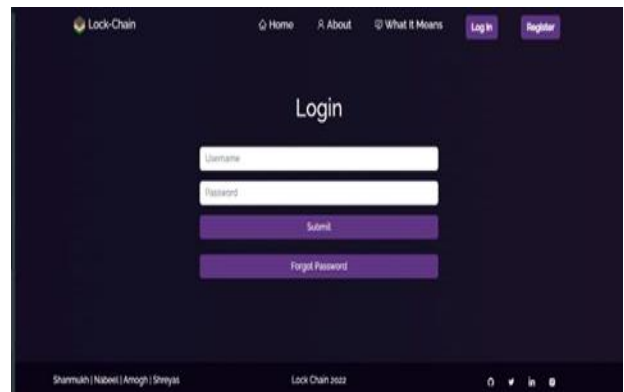
Login Page

Tip-off declaration

Mental Health Check using Survey Form Submission of tip along with complaint hash

V. CONCLUSION

The complaint management system utilized the NoSQL database MongoDB to store and manage the anonymous complaints submitted by users. The system was built using the JavaScript library React, which allowed for a user-friendly interface and efficient management of the data. Machine learning was utilized to evaluate the trustworthiness of the complaints, using historical data such as the user's previous submissions and similar complaints from other users. The location of the complaint was also taken into consideration, allowing authorities to prioritize and address issues in specific areas. Overall, this methodology provided a secure and efficient platform for citizens to voice their concerns and bring attention to issues within the government and regulatory bodies.

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