# NFC-Based Voting System Using Cloud Storage

**Samruddhi Borse[1], Pradnya Chaudhari[2], Abhijeet Debe[3], Dhiraj Kumar[4], Amol Potgantwar[5]**
[1, 2, 3, 4] Dept of Computer Engineering
[5]Head of Department, Dept of Computer Engineering
[1, 2, 3, 4, 5] Sandip Institute of Technology and Research Centre, Nashik, India

***Abstract-*** *Election is an extremely crucial and important eventin a modern democracy but most of the sections of society around the world do not trust the election system which is organized at their place, which is basically the major concern for the democracy and especially the democratic society. Sadly, the world's largest democratic countries like India, United States, and Japan still suffer from an awed electoral system. Rigging of votes, EVM (Electronic voting machine) hacking, manipulation of election, and capturing polling booths are the most devastating issues existing in the current voting system. In this paper, we are studying and investigating the problems in the election voting systems and trying our limits to propose the E-voting model which basically can resolve these kind of issues. Also through this article we aim to evaluate the applications of NFC as service to implement the system of distributed electronic voting machines. Through this section of paper we will try to highlight some of the popular usage of NFC as a frameworks that will offer NFC a service and associated electronic E-voting system which is based on NFC, addressing all limitations respectively, it will also assure to preserve participant's anonymity while still being open for public inspection.*

***Keywords***- Cloud Storage, E-Voting System, EVM, Internet of Things, NFC Technology, Web Technology.

## I. INTRODUCTION

NFC a being relatively a new technology, a representative sample of researchis presented, spanning over the last ten years, starting from the early work in this field. Different types of usage of NFC and other digital ledger techniques, their challenges, applications, security and privacy issues were investigated. Some countries have already taken the initiative to improve their voting system by using NFC a technology and decentralized peer to peer network accompanied by a public ledger. (Nakamoto, 2008). Sierra Leone became the first country in the world to use NFC a Technology to verify votes in an election in March, 2018. The inability to change or delete information from NFCs makes the NFC the best technology for voting systems.

NFC technology is supported by a distributed network consisting of a large number of interconnected nodes. Each of these nodes has their own copy of the distributed ledger (information) that contains the full history of all transactions the network has processed. There is no single authority that controls the network. If the majority of the nodes agree, they accept a transaction. This network allows users to remain anonymous. A basic analysis of the NFC a technology (including smart contracts) suggests that it is a suitable basis for e-voting and moreover, it could have the potential to make e-voting more acceptable and reliable.

Modern democracies are built up on votingsystem, whether traditional ballot based or electronic voting (e-voting). In recent years voter apathy (lack of interest) has been increasing, especially among the younger computer/techno savvy generation. E- Voting is pushed as a potential so functional and security requirements are specified including transparency, accuracy, audit ability, system and data integrity, secrecy/privacy, availability, and distribution of authority.

Existing works explore how NFC can be used to improve the e-voting schemes or provide some strong guarantees of the above listed requirements. However, these papers do not discuss the implementation challenges and limitations of the NFC (and smart contract) technologies at their current state to fully support a large scale votingscheme.

In this paper we explore both the possibilities of an e-voting scheme, along with the challenges and limitation of the NFC a technology in the e-voting context.

## II. LITERATURE SURVEY

1) Assimilation of non-functional requirements for electronic voting frameworks: A systematic mapping by this paper proposes a Today's democracy is the plan of ministry prevailing in the western world and voting is the pillar fundamental in the society. The Traditional voting framework uses the pen and paper and the election is done mutually. So to reduce this man power, time and maintain the care of voting framework this new technique is introduced.
2) Design a Secure Electronic Voting Framework Using Fingerprint Technique by Sanjay Kumar, Manpreet Sing. This Paper represents the protected e-voting framework

using fingerprint technique. The fingerprint is a biometric which is most widely worn to analyse the people. In this paper the mixture of biometric among electronic polling is require less manpower and save time of user.

3) Secured E-Voting Using NFC Technology Rutuja Nikam1, Monika Rankhambe2, Diksha Raikwar3, Atharv Kashyap4. This paper represent the technology which involves the voting. Here NFC Tag is used for providing security to e-voting framework. It Is Hardware Device in which voter Information Is stock and progress. This paper represent Framework Is executed on Android Phone. NFC Is Generated Technology which did information exchange. The advantage of NFC for the Validation and casting of vote. Application based on two verification OTP and voters contact number so that they can verify the voter.
4) E-Voting Framework for on Duty Person using RSA Algorithm with Kerberos Concept by Ms.Tanzila Afrin1, Prof.K.J.Satao. In Electronic polling framework in which election is stored, prepared as digital data. This framework is useful to people who are not able to come to voting booth due to the duty or they are physically handicapped. Kerberos concept is used for network verification. It is Network verification Protocol which works on `Tickets' to allow connection Over No-Secure Way. It Act as Client Server Model and Provide verification to User and Server.
5) Electronic Voting System that will automatically perform authentication validation and counting with the helpof UIDAI. Ashok Kumar, UmmalSariba. The proposed electronic voting system can be implemented along with the traditional election system. His generation on Biometric technology such as fingerprint. The fingerprints are more secured technology. Those are use in smart e-voting to secure e-voting process. Fingerprint are used to match the voter data otherwise voter cannot vote.
6) The information provided by UIDAI in smart voting system. Benjamin B., Bederson, Bongshin Lee., Robert M. Sherman., Paul S., Herrnson, Richard G.Niemi .The proposed system procedure is carried out in mainly few stages: registration, verification and validation. There are two fundamentally main goal that have risen from voting process. A person’s fingerprint will not change the structure naturally after about one year after birth and Fingerprints of individualsare different.

## III. GOALS AND OBJECTIVES

The main objective is to make votingfeasible for voters to vote from mobile cities by replacing the traditional voting system with an online voting system. Secondly increase the ease of voting so that maximum people can vote for the betterment of the country. As the technology is intervening, hence the goal is to reduce the manual work and improve the voting system to maximum extent by saving unnecessary time during the conduction of procedure. Providing Fast voting Result.

To get the exact count of voters who are voting from total eligible voters. Thirdly to make voting online to avoid manipulation of votes and avoid voters to cast multiple votes. Next is to enhance the security of the voting system to increase the accuracy of voting results.

The Software is designed to gather a huge record to be developed all over thecountry on the Election Day. The candidates all over the country can register at one place and will be voted form any corner of the country. Basically the project is allowing the voter to be able to vote for the candidate of his/her hometown irrespective of his/her job location Major inputs in the software would be aadhar details of each and every record whether he would be a candidate or he would be a voter, everyone should have his/her aadhar number registered there, hence it would be convenient for the system to distinguish the voter and the candidate, the voter's vote and the count of votes casted everything would be unique to particular user and would be recorded to the admin or election commission.

## IV. AREA OF PROJECT

- Web Technology
- Cloud Storage
- Internet of Things
- NFC Technology.

COMPUTER COMMUNICATION NETWORKS

Distributed Systems:

A. Client/server
B. Distributed applications
C. Distributed databases
D. Network operating systems
E. Distributed _le systems.
F. Security and reliability issues in distributed applications

## V. PROPOSED WORK

1. Project Identification and Selection In this project, we aimed todevelop a NFC based voting system using cloud technology which will focus on easy voting from mobile places. Anyone who is interested in casting of votes and is not

able to vote due to unavailability at the home location can cast vote with the help of this project.

2. Project Initiation and Planning to begin the project, we have gather user requirement of this system and prepare the scope and objective. The results from this phase are scope and limitation, objectives, cost and benefits, feature of the proposed system and user interface design.

3. Analysing System needs we have studied and identified problems of existing system, then we develop data flow diagram for the existing system. We also develop data flow diagram (DFD) and entity relation diagram (E-R diagram) for the proposed system.

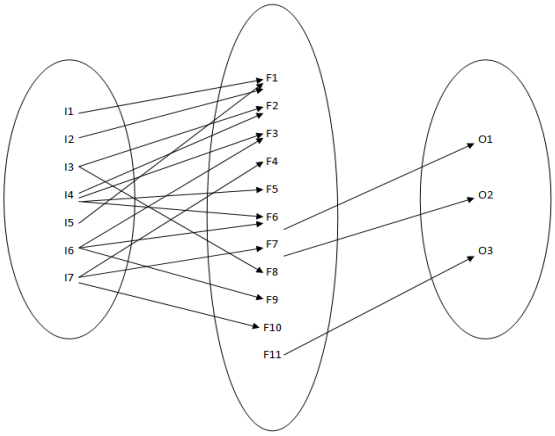
4. Designing the Proposed System Based on the analysis phase, we converted E-R diagram into relational database model and created data dictionary and DFD and user interface are designed in this process.

## VI. MATHEMATICAL MODEL ASSOCIATED WITH PROJECT

System Description:

S = I, O, F, DD, NDD, Success, Failure.
Where,

- I=Username, Password, Ward details,Election details, Booth details, Candidatedetails, Voter details.
- O= Candidate list, Vote, Election Result.
- F=login(), addWard(), addCandidate(),addVoter(), viewWard(), viewCandidate(),viewVoter(), deleteWard(),deleteCandidate(),deleteVoter(), viewResult().
- DD=null.
- NDD= Username, Password, Ward details,Election details, Booth details, Candidatedetails, Voter details , Candidate list, Vote,Election Result.
- Success= Vote Successfully.
- Failure= No Internet Connection.

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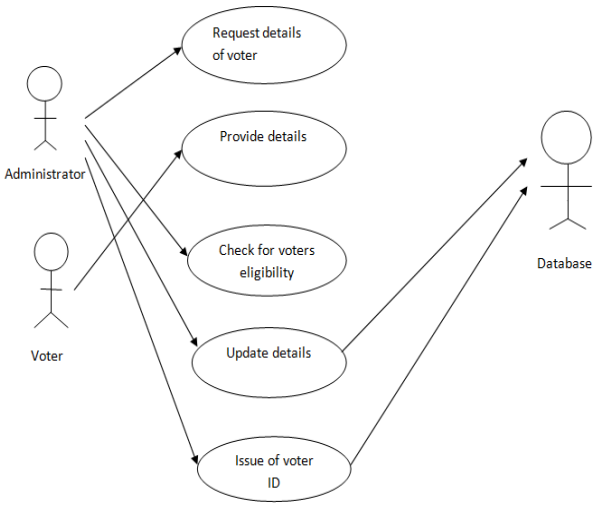
## VII. USE CASES

The system must provide a user interface for all types of users (administration and voters). A quick review of such an interface is given below:

| Sr. No | Use Case | Description | Actors | Assumptions |
|---|---|---|---|---|
| 01. | Use Case 0 | Welcome screen for the Administrator | Voter and Admin | Having valid identification |
| 02. | Use Case 1 | Creating the Voters Databases | Admin | FulfillingCriteria |
| 03. | Use Case 2 | Modify the voters databases | Admin | Voter Exists |
| 04. | Use Case 3 | Delete the Voters database | Admin | Duplication |
| 05. | Use Case 4 | Creating the Election Instance | Admin | Voting Session |
| 06. | Use Case 5 | Modify the Posts | Admin | Candidate Exists |
| 07. | Use Case 6 | Modify the Candidates | Admin | Error |
| 08. | Use Case 7 | Modify the Election Time | Admin | Issues Voting Session |
| 09. | Use Case 8 | Deletion of the election instance | Admin | End of Voting Session |
| 10. | Use Case 9 | Voting process on the voter's end. | Voter | Election Session |

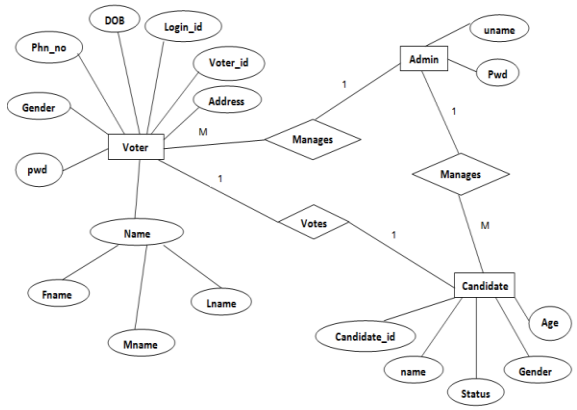
## USE CASE DIAGRAM



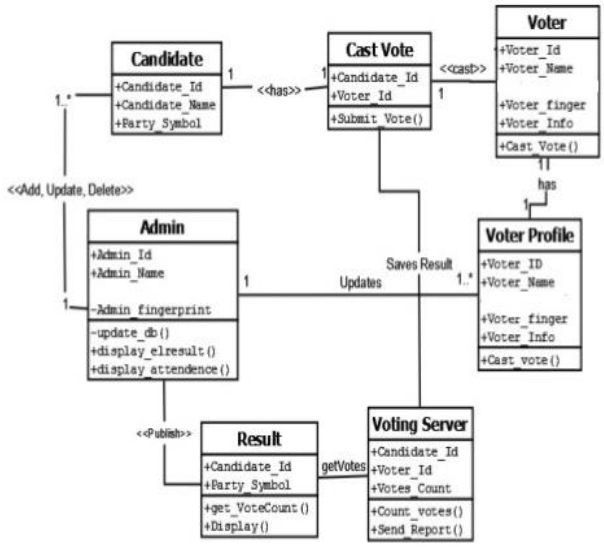

## DATA OBJECTS AND RELATIONSHIPS DIAGRAM

Voters,Admins and Candidates are the data objects whose database are stored in cloud.These databases are managed and modify by the election commission.Voter's information like Login Id, Name, and Phone number will be stored on the database.Also the information of Candidate like Candidate Id,Name,Age.

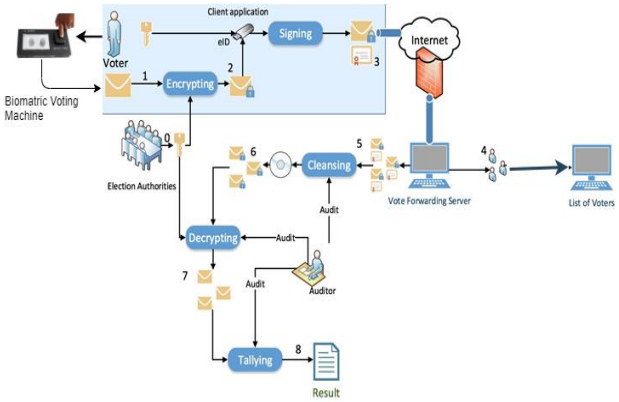
Following ER diagram shows the relationship of objectsand their entities.Also it shows whether it is one to one, many to one or one to many relation between the objects and entities.




## CLASS DIAGRAM




## ARCHITECTURAL DESIGN




## VIII. OUTCOMES

Talking about the Outcome, the project when completed would be something new in the field of voting and would revolutionize the orthodox system. The current voting system, the EVM machines are said to be altered, but the new systems will be giving results at the end of the Election Day, and hence would leave no chance of being altered as everything would be digitized and the systems installed would itself count and display the results at the end of the day.

Secondly, the voters would not be restricted to vote only from their hometown, they can vote form any corner of the country on the day of election.

Thirdly, the election commission can fully trust the system as there would be very less human interference throughout the process.

## IX. APPLICATIONS

This application can be used by the government to conduct the elections.

As well as this application can be used in colleges, company voting, public issue voting.

## X. SOFTWARE RESOURCES REQUIRED

- Operating System: Windows
- Database: MySQL
- Front End: HTML, CSS
- IDE: Eclipse IDE, Arduino IDE
- Programming Language: Java

## XI. HARDWARE RESOURCES REQUIRED

| Sr. No. | Parameter | Minimum Requirement |
|---|---|---|
| 01. | CPU Speed | 2 GHz |
| 02. | RAM | 3 GB |
| 03. | NFC Tag | 2-3 |
| 04. | NFC Reader | 1 |
| 05. | Arduino | 1 |

## XII. CONCLUSION

Till now the project includes the designing part of the project and the entire aspects that we are going to maintain throughout the project, its timeline chart, its plan everything is designed and is to be followed accordingly, the project covers the major section of the system ,which directly enters into the political field of the country , hence is crucial and very much important to maintain the best possible outcomes which will not only enhance the ongoing system, but will bring out the transparency of voting which basically every democratic country would wish to.

Hence the designing part concludes with the different charts to be followed and maintained, also the estimates of investments throughout the project, and hence that is surely going to be balanced and tried best to be minimized to its maximum limit.

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