# Election Voting using SMS

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**Abstract**

Voting in general, is an essential and necessary activity that is implemented in various different sectors and levels of society, ranging from national level (government elections) to the more basic selection of class monitor in schools. All the tasks of selecting a leader/representative are mostly accomplished with the help of voting as it requires the consensus of all the people involved in the activity. But voting can be a tedious procedure and the motive of this project in general is to resolve this issue by conducting a voting session with the help of an Android/Web based application to make it easier to access and conduct the voting procedure. An application like this helps digitizing the traditional voting system and thus helps in overcoming the possibility of fraudulent voting helping in the conduction of a fair and reliable voting session. We hope to accomplish this by the use of Firebase, in which we allocate each member participating in the voting with a distinct ID corresponding to their phone number, so that no violations are made during the process. The use of such system can efficiently be used to increase the vote count and completely mobilize and digitize the voting mechanism.

## 1. Introduction

Voting involves the process of picking a candidate among a group for a particular position. The position may be of a national post, such as ministers in government, or as local as our class monitors in school, in both these cases, the basic idea is to let the people decide a particular candidate which they feel is the most apt for the given post for which the voting is taking place. In other words, voting lets the people decide what's best for them and who do they want in charge of the post. However, as many pros as voting has, there are bound to be certain restrictions and cons in the voting process due to which conducting elections becomes a problematic issue. Voting has evolved over the course of time, from simple manual voting where the voter had to go to the voting booths to cast their vote to the stage of internet voting systems where the systems requires the voter to easily cast their vote from the comfort of their personal workstations/computers. These are the difficulties in casting the vote, but they aren't the only problems faced by the organizing committee, as the cast votes must not be altered or tampered with. An election system should be able to overcome such issues instantly and also be capable in detecting and overcoming various hacking attempts on its own. Voting is comparatively better suited to be implemented in a digital manner as it allows to be accessed by everyone much faster and easily as compared to the traditional way where the voter had to go to the voting centre to vote, which was a tasking and at times, not feasible action for the people involved and eventually resulted in less people showing up for the voting. Therefore, it is advisable to shift all voting activities, big or small, to be conducted digitally and our hopes are that our project is the answer to this need.

In this research paper, we propose a voting system that emphasizes on SMS for its working using Firebase, where we device a way for people to not just vote, but at the same time, maintain their confidentiality and security as well. We have looked into the previous models aimed at accomplishing the same task, aggregating the pros of

those models, and at the same time, eliminating the drawbacks of those models and as a result, creating a new, error-free and implementation of model focusing on achieving the problem hand. The system is designed in a manner to be readily accessible to anyone with a basic mobile handset and ensures integrity by allocating distinct ID corresponding to the phone number and the name registered along with that phone number.

## 2. Related Work

According to Himanshu Agarwal et.al in IEEE conference on 2013, This paper was the first which proposed the voting system relying on the AADHAR ID of its voters. This proposed model had many advantages over its predecessors as it emphasized a greater sense of security to the voters by providing them with a highly secured password which is confirmed before the vote is caste and accepted in Election Commission of India's main database. This model of voting system does not restrict a person to vote from certain specific location or constituency and allows them to access the voting process from anywhere. The process of declaration of results is fairly easier than the traditional method as it is an automated process and thus enabling us to save both time and efforts and this system has both greater security and efficiency as compared to the penultimate one.

According to Mohammed Khasawneh et.al in IEEE Conference on 2008, a two sided solution can be provided for both server and user side by using biometric security in an E-voting system. After the casting of the vote, a unique number and hardcopy is generated for the voter. These values (unique number, voter name and identification number) are secured. These values are stored in a special secured box which can be accessed and used for the verification of the vote before the final assessment. A separate side copy is generated with distinct barcode which are machine readable which can be scanned to choose a random copy which is tested for its verification and correctness by the system in a two side process.

According to S. V. Prasath et.al in International Journal of Advanced Research in Electronics and Communication Engineering on December 2014, the design of the proposed voting system is accurate and highly reliable. The model was such that it functioned properly under normal circumstances The voting mechanism of the model was designed in a manner where the votes were cast with the help of mechanical switches and detected with the help of infrared sensors. The vote count is matched with the previously existing records stored in the register to avoid any discrepancies making the system more protected and reliable. The result can be viewed by accessing the system via a valid password.

## 3. Existing System

There exist many ways to cast vote and held elections. These involves traditional means of voting which includes manually voting process which can take a lot of time and money to conduct. Also, we can vote online through webpage. Security is an important part of voting. They also don't provide real-time updates of the results. These issues of cheat in voting and slow update of results leads to difficulties and many challenges. There exist many challenges to voting system which need to overcome.

## 4. Proposed System

The proposed system First, both the admin and the voter needs to register on the website where they will be asked for their information and will be verified by OTP send on their phone number. They will also be provided with a unique voter id/admin id which they will have to use to cast their vote.

All this information will be stored in Firebase database and even the authentication will be done through Firebase.

During voting period, the information regarding candidates will be provided through website along with the admin phone number where the voter needs to send SMS to cast his/her vote. The voter will need to send candidate's unique id along with his voter id to the admin phone number through SMS. Our Voting app will then read the SMS and process the data to the Firebase database.

Both admin and voter can check the real-time result of the election on the web application/android app.
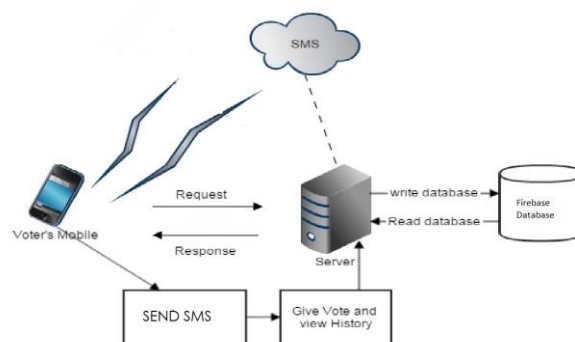


Figure 1: Block Diagram

## 5. Methodology

### 5.1 Firebase Database

Firebase is a mobile and web app development platform that provides developers with a bundle of tools and services that allows them in developing rich or superior quality apps, and further enhance their user base. It uses Firebase Real-time Database is a NoSQL database that gives the capability to the system enabling it to store the data between interconnected lying across the various platforms.
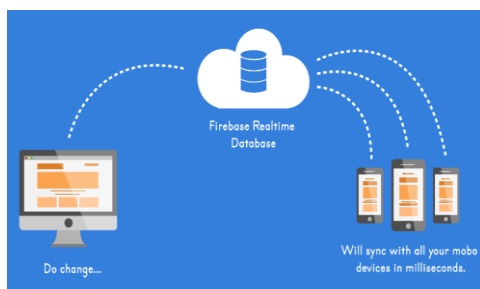
Figure 2: Firebase Real-time Database

## 5.2 Firebase Authentication

Firebase Authentication is another feature provided by Firebase to allow back end services, minimalistic SDKs, and pre-defined UI libraries to verify and authenticate users to your application.



Figure 3: Firebase Authentication by various methods.

## 5.3 Login

The login details are saved in firebase database and keeps track of the voters and admins. The voters' credentials are auto generated by applications during registration and are verified by OTP. This averts the undesirable credentials created by the cyberpunk or cyber-terrorist. Only after the verification of details, the credentials are created and further process is done. Encryption is done over the credentials to prevent attacks from hackers. This database comes into play when the voter or administrator tries to login into the mobile application. The database can be modified or altered if required.
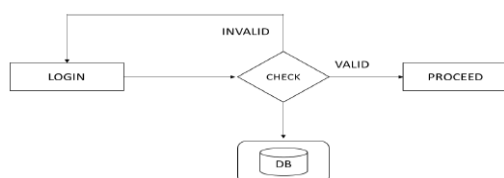


Figure 4: Login Process

## 6. Advantages

1) Paperwork is not required.

2) Encourages maximum percentage of voting.

3) Saves time and reduces human intervention.

4) Information is sustained over the Internet.

5) Ability to cast vote from anywhere and anytime.

6) It enhances the flexibility of the system and its security.

7) No fraud vote can be submitted.

## 7. Future Scope

There exists various method to make a voting application. Ours use Firebase technology to secure and authenticate the voters. In future we can add face recognition using machine learning to make it more secure and more reliable.

## 8. Conclusion

The Election systems through online voting has supremacy over the traditional voting system. It is cheaper in implementation, leads to quicker results, provides trouble free access, authenticity and less exposure of human and mechanical errors. It is a very troublesome task in developing voting system which allows security and privacy with real-time update. This method of development focuses on designing a system which is convenient in terms of usage, providing better security, authentication and implementation.

Thus, by implementing this digital system, Softcopy of the information can be sustained and prevents the loss of data since the documents are more prone to be lost or manipulated as compared to stored memory.

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