

# M-Polling with QR-Code Scanning and Verification

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## Abstract

Voting is the vital part of democratic process to ensure one's decisions to elect the leaders in a transparent way. So it's becoming very important to make the voting process more easy and efficient. Traditional voting process includes hand counted paper ballots and then the electronic voting machines. These traditional methods have many drawbacks. In order to overcome these drawbacks, an android based M-Voting system, which gives the privacy in expressing the voter's decisions to elect the representatives. The android platform gives the portability to the application. In the M-Voting system, the voter votes using the android application which can be downloaded over the internet. The voter is given the facility to view the history of the previous elections and come to a conclusion of the state's fate. The voter registers by giving the personal details and AADHAR ID which contains the QR-code. Once the election date and time is announced, the voter gets notification via SMS or E-mail. Only then the voter is allowed to enter into the poll by entering the OTP (One Time Password) and scanning the QR-code. If the voter is validated then, permitted to enter into the poll. If not, then the app exits automatically from the poll.

**Keywords: Android, Polling, QR-code, etc**

## I. INTRODUCTION

Since it's a 21<sup>st</sup> century and there were more advancement in the field of technology, yet there is no solution to people standing in long queues to cast the vote and elect the leaders. This is a drawback in a developing nation. The earlier methods like hand-counted paper ballots and electronic voting system many a times irritate the people to perform the national duty. In many countries even now women are not allowed to go outside for a social cause. Senior citizens, women and transgendered find it very difficult to go to the polling booths and cast the vote. In-order to find a solution for these drawbacks an android application for the voting process should be introduced by the electoral board in the society. The M-Polling android application gives an independent platform to the citizens of the county to perform the national rights without any struggle and inconvenience. To validate the voters the AADHAR-ID plays a major role in the application. The android platform gives the portability to the application. In the M-Voting system, the voter votes using the android application which can be downloaded over the internet. The voter is given the facility to view the history of the previous elections and come to a conclusion of the state's fate. The voter registers by giving the personal details and AADHAR ID which contains the QR-code. Once the election date and time is announced, the voter gets notification via SMS or E-mail. Only then the voter is allowed to enter into the poll by entering the OTP and scanning the QR-code. If the voter is valid then, permitted to enter into the poll. If not, then the app exits automatically from the poll. The security constraint is maintained keenly in the application.

## II. RELATED WORK

In earlier method, voter has to cast the vote by putting the stamp in front of the favourite candidate name [2]. And then by folding that ballot paper, it is inserted into the ballot box. This is very time consuming. So during the next election, Election Commission of India, has introduced a new method of polling i.e., EVM (Electronic Voting Machine). The Electronic Voting Machines (EVM) consists of 2 components:

- 1) Control Unit.
- 2) Ballot Unit.

Control unit stores and assembles votes. And the Ballot Unit is used by Voter and it is placed at the election booth. These both units are connected via a five meter cable [2]. In the proposed system a battery pack is present inside the control unit. It is a six volt alkaline battery, which means they can easily be used in rural areas where there is no electricity. [3] Making use of the AADHAR-ID. A voter has to simply press a button in front of the favourite candidate to cast vote [2]. Only six votes in a minute can be accepted by the machine, and after each vote, machine locks itself and can be unlocked using a new ballot number. The polling booth is always presided by a government officer who is the in charge of the controlling unit of the EVM. To accept another ballot the machine is unlocked by the in charge officer. [4] Implements the usage of the AADHAR card. This system is tamper-proof and a person won't be able to cast more than one vote. One machine is able to accept up to 3,840 votes, and cater to 16 candidates each. [6] Usage of minutiae algorithm. Using Blind signature by D. Chaum, it mainly lies on simplifying the

algorithm used in the voting process and it can secure voting data during the transmission. When in this Proposed system use blind signature in the election, its intractability is the major issue as voters might not be able to track the votes [1]. Fig 1 represents the architecture of E-Voting application using android smart phone.

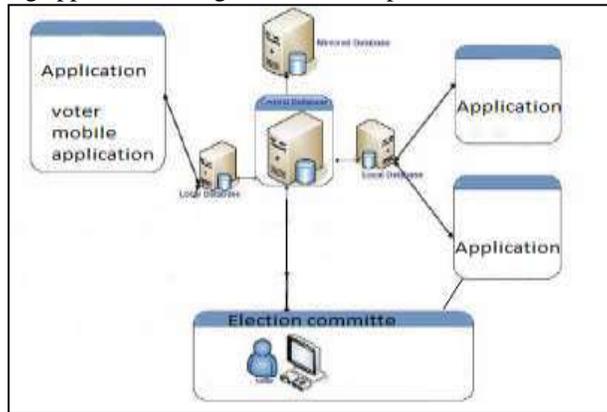


Fig. 1: Architecture of E-Voting application using Android smart phone.

### III. ARCHITECTURE

The application has two stages which is pre-election and election. The pre-election stage has two modules that is History of TN elections and the Candidate list. Then election has one module which is vote casting that will open on the day of the election that too only once after the election date and time has announced. The user registers and login into the application and has the rights to view the pre-election modules and after that once the election has been announced the app generates OTP to the voter and then the AADHAR-Id is scanned after which the vote casting is done. Fig 2 represents the M-Polling application.

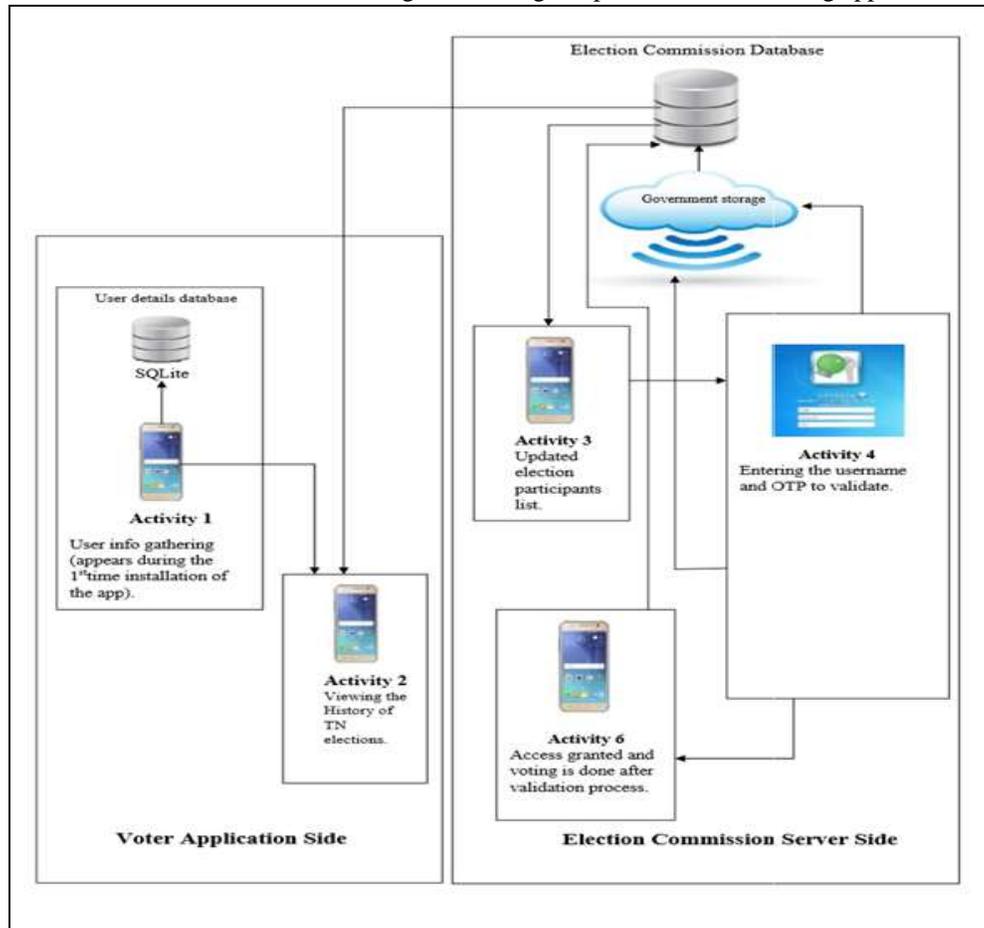


Fig. 2: Architecture of M-Polling application.

## IV. QR CODE

A QR code is any code that users find on most of any items that they buy from the store. QR codes have come a long way and now that they are integrated into the online world it's a true phenomenon. Fig2 is the description of the QR code. It makes searching for online products, shopping and buying much easier. Now, users are going to use it for buying tickets. Creates an image in real world and acts like a web link for the smart phones. It actually grabs the code scans the item and goes online searches for the item which then give users so many details about the product. The user gets specific details as per user choice and reviews about the product that has been just scanned from the scanner. When user scans a QR code a magazine, a newspaper or wherever the iPhone or Android will to go to a website where the user will find much of promos, coupons, maps and many more information. QR codes now are used in a much broader context, including both business tracking applications and convenience-oriented applications aimed at mobile phone users, to open a Uniform Resource Identifier (URI), or to compose an e-mail or text message. Users can generate and print their own QR codes for others to scan and use by visiting one of several paid and free QR code generating websites or applications. It has then become one of the most-used types of two-dimensional barcode.

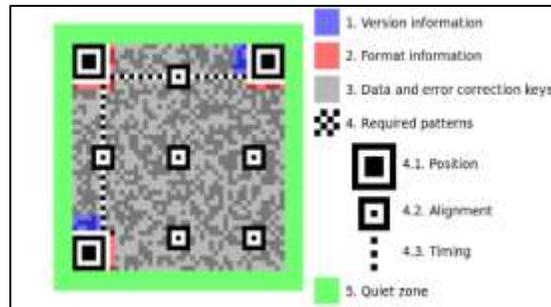


Fig. 3: Structure example of QR code

### A. Encryption

Encrypted QR codes, which are not very common, have a few implementations. An Android application, for example, manages encryption and decryption of QR codes.

### B. Encoding

The format information records two things: the error correction level and the mask pattern used for the symbol. The mask patterns are displayed as a grid that is repeated as necessary to cover the whole symbols. Modules corresponding to the dark portion of the mask are inverted.

### C. Risks

Malicious QR codes combined with a permissive reader can put a computer's contents and user's privacy at risk. This practice is known as "attagging". They are easily created and can be affixed over legitimate QR codes.

## V. PROPOSED SYSTEM

The following are the modules of the M-Polling application.

- 1) User details
- 2) History of TN elections.
- 3) Candidate list.
- 4) Vote casting- OTP generation, AADHAR-ID scanning.

### A. User Details:

This is the first module of the application wherein if the application is installed for the first time, the voter has to register and then login has to be done. Fig 4 represents the user details module of the M-Polling application.



Fig 4: Registration Screen

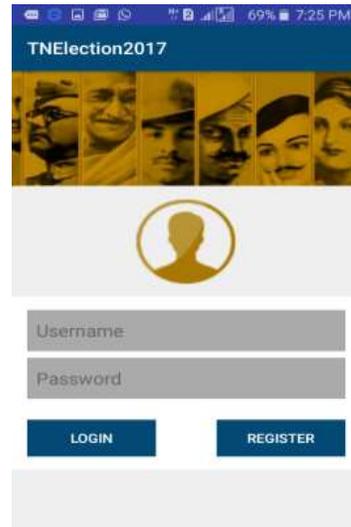


Fig 5: Login Screen

### B. History of TN Elections

History of TN elections is the second module which gives a detailed description of the previous election and the good and bad done to the people of Tamil Nadu by the elected parties. Fig 6 represents the History of TN elections. This module was developed to bring awareness to the voters of Tamil Nadu about the elected leaders.



Fig. 6: History of TN Elections

### C. Candidate List:

This module contains the candidate list of parties lining up in the election according to the area and city. Fig 7 represents the candidate list module. It is used to alert the voters about the parties and the candidate to whom the vote has to be casted.



Fig. 7: Candidate list

#### D. VOTE CASTING:

Once the election date is announced the voter can click the vote casting button. An One Time Password (OTP) will be sent to the voter. After entering the OTP the mobile IMEI number will be retrieved from the mobile and stored in the election side database. After entering the OTP, the voter has to scan the AADHAR-ID. If the voter is validated then only vote casting can be done. Else the app exists automatically. Fig 8,9,10,11 represents the vote casting module.

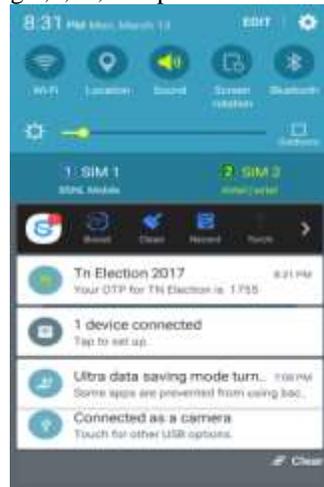


Fig 8: OTP

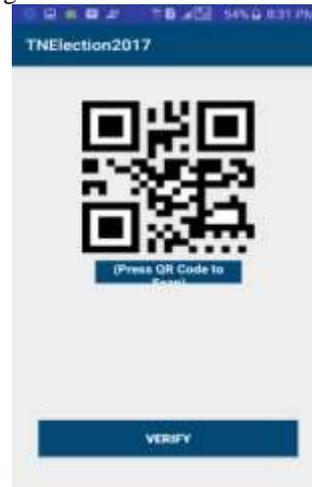


Fig 9: QR code scanning



Fig 10: Verification

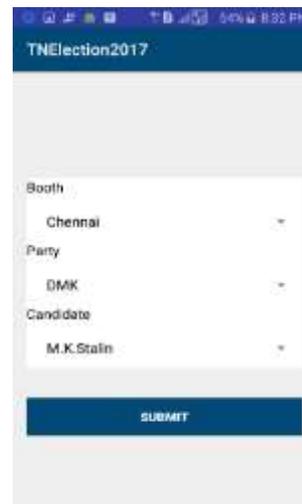


Fig 11: Vote Casting

## VI. IMPLEMENTATION

Generally implementation of the software is considered as the actual creation of the software. Since system design stage usually suggest that the interface, data and actual output are created, the implementation stage brings them all together. Once the three different types of designs are complete, it is time for the developers to put place them together. Although it has been tested while the designs were created, it is the final construction of the designs as they are combined by the project manager or the assigned developers. From this point, developers have to stand with what they work for. In the previous stages, developers can freely make some changes in their software design plans simple because it is still in the designing phase. In this stage however, there is no going back as everybody's effort will now be tested. The project manager or the supervisor will take a responsible role during this stage since the project manager decides when to get them all together. In systems design, project managers oversee the project. Since they have practically seen everything about the application, they know when the correct time is to get them all together. It is not all about getting them all together that is important. It is also the time during which developers have the first glimpse of their actual work making it a perfect moment for evaluation. During this time, developers become users as they try out the software to determine if it is up to their expected performance and output.

This stage becomes an important phase of the application since it will be the first time that bugs and errors in the system are determined. Of course everyone has been working on the plans and design for sometimes and their familiarity guarantees they have created something as planned. However, bugs will always be there since each design is created.

## **VII. RESULTS**

Finally the vote is casted which is stored in the electoral database. This makes the counting process and result analysis process easier.

## **VIII. CONCLUSION**

A mobile voting application is developed for Android 1.5 using Java, SQLite, MySQL, and XML on the server side which can change the way people casting the votes in future. This kind of application can be applied to any kind of election system. The android app is one of the huge applications to cast votes from a single application.

## **IX. FUTURE IMPLEMENTATION**

This application can be enhanced in the future by connecting it with a person's google account, so that if the mobile has been stolen unfortunately, then with the help of the mobile phone's google location the lost mobile can be tracked very easily. This in-turn prevents the misuse of this application by a third person. Fingerprint authentication can be used to provide more security to the application.

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