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# Smart Voting System for Digital India

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## Abstract:

Technology is something without which an individual cannot exist now-a-days. We are surrounded by different technologies, among which one of the important part of one's life is Android or Smart phones. Android is an open source operating system which provides an easy and efficient way to carry out our day-to-day routines. The usage of Android in present era made us to present our thought of developing an application which can provide easier way of casting votes. In this paper we are introducing several promising directions for developing an application for voting process using Android and Visual Cryptology. This paper presents how an individual can cast their votes using their own Android phones or smart phones maintaining confidentiality and availability.

*Keywords* — **Android, E-voting system, Web services, One time password, QR Code, Visual cryptography.**

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## I. INTRODUCTION

The term 'vote' means to choose, to select or to elect an option from a list of options provided. Voting is a process of indicating one's preference or opinion for a proposed resolution of an issue. Voting for any issue is essential for any maintaining democratic society. So, it's important to make this process easier and comfortable.

The main reason behind developing this application is the ever increasing use of android phones. Android provides an easy way of developing an application by providing software development kit which includes various tools for development. In the designing of this application care is taken to provide user-friendly interface, remote voting, voter secrecy, reliability to the whole voting process.

This application helps to avoid the long-term and hectic way of voting which consumes significant amount of money. This application needs only few minutes of voters or users to record their opinions and it will require only one-time investment of money. This application provides a way of voting irrespective of voter's location. This paper will explain aim, features, various modules, and architecture methodology and security concepts.

### A. Aim

The main purpose behind development of this application is to increase the number of voters by providing easy and efficient framework to them. Through that they can cast vote irrespective of their location which in turn, will increase the number of voters.

## II. PROJECT PERCEPTION AND STUDY

### A. Current Scenario:

In current scenario of India, there are two systems developed for conducting the votes- Direct Recording Voting (DRE) Machine and Identical Ballet Boxes. A DRE voting system records votes by means of electronic displays provided with some electronic mechanism. It produces a tabulated data for casted votes and stores it into removable memory storage.

Identical Ballot Boxes hold the ciphered vote, encrypted with the PMA voting key and the ciphered Identification Card Number, encrypted with their personal 4 digit key. It is designed to accept connections from the vote distribution server, and ensures an acceptable level of security as far as remote vote manipulation is concerned.[4][7]

This traditional voting system is tedious and inconvenient. Voters have to wait in a long queue for several hours. This

may cause in degradation of voting percentage. Apart from this, this system has several issues such as – corrupt votes, fraud in voting system, discomfort to aged and handicapped people etc.[4][7]

**B. Previous Work:** [3]

With the advantage of technology many enhancements have been made in the voting equipment. Those include:

1)    Paper-Based Voting:

Here, the voter is given a blank ballot. Ballot includes the list of candidates. The voter can cast the vote with the help of pen or marker. This is a traditional voting system but is still very popular. These votes have to count manually. Hence it is labor and time consuming process.

2)    Lever Voting Machine:

In this system a lever machine is used. Each candidate is assigned a lever. Voter pulls the lever for the favorite candidate. This system can count the votes automatically but it is not user-friendly.

3)    Punch Card:

The name only indicates that this system includes punching mechanism for casting the votes. The voter has to punch a hole for the favorite candidate with the help of metallic hole-punch. If this punch is not proper, then the generated result may be wrong.

4)    DRE Voting Machine:

Direct Recording Voting (DRE) Machine and Identical Ballet Boxes. A DRE voting system records votes by means of electronic displays provided with some electronic mechanism. It produces a tabulated data for casted votes and stores it into removable memory storage.

**C. E-Voting Case Studies:**

Many countries have adopted E-voting systems. Following are some real time E-voting cases in some of the countries.

1)    Japan (June 23, 2002):

In Japan, the E-Voting is first used during Councilor election. According to the research, it was found that 83% people were satisfied with the e-voting and said that e-voting is reliable and secure.[3]

2)    Belgium (May 18, 2003):

In Belgium, the E-voting is used for Federal elections for guiding the voters. It is helpful for voters for finding their electoral centers. Now it is compulsory for the voters to use this E-voting. [3]

3)    Brazil (1998):

Voter is authenticated with the help of identity card. If the voter is authenticated, then only he/she gets the electronic ballot. This electronic ballot is immediately transferred to electoral centers to announce the result. [3]

4)    India (2012):

This is the first ever E-voting held in Ahmadabad city, Gujarat. In this system, voters use key to login to the website. Then the voter can cast the vote. The participants were happy using this system. [3]

5)    India (2015):

In Kerala, the Election Commission launched the "e-voter" app to help voters to electoral rolls, locate polling stations, obtain information about the candidates, and file complaints. This app was developed by state IT mission to achieve transparency and conduct a free and fair election.

## III.   PROPOSED SYSTEM

This application consists of various modules as follows:
•      Admin application
•      Client application
•      Server
•      Database

Initially, user need to register him using the admin application. The admin application can add user, add candidates, add parties, add party members. After registration with admin, user can use the client application to give vote using their login Id and password. Client application will be on the user android phones which will provide them to cast vote from anywhere. The client application allows users to view candidates, select candidate, send vote request, status checking. We will be using Visual Cryptography, QR code, OTP and SHA algorithms which will be allowing only authenticated users to cast the vote.[1][5]

**A.  Advantages of Proposed System**

•      No other external hardware is required except a Smartphone or android phone for this application.
•      This application can improve the participation of voters than that of traditional way of voting.
•      The data will be stored properly in database server, which will help in faster retrievals well as storage of information.
•      We are using android or smart phones for voting process as it is readily available with every human being today.
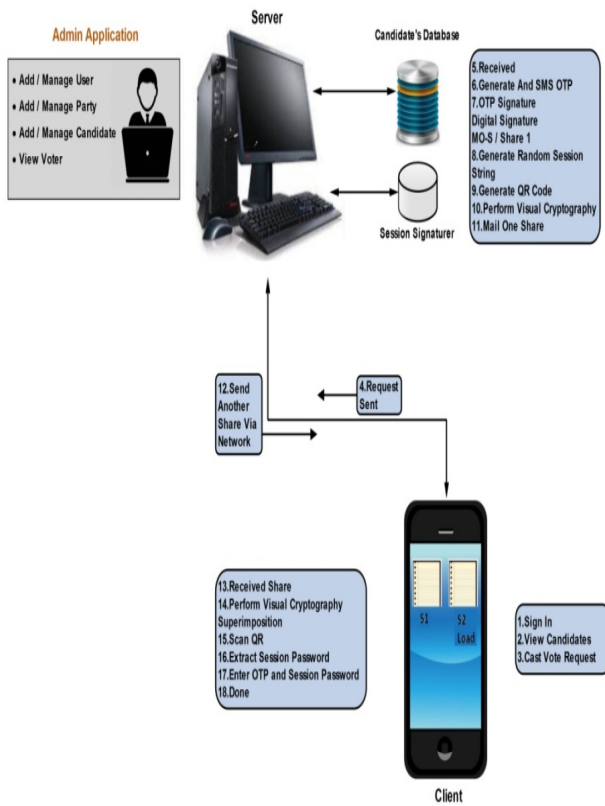
## IV.  SYSTEM ARCHITECTURE



Figure 1: System Architecture

### A. Functional Specifications

 ➢ Admin Module:

   1) Add/Manage Party

   2) Add/Manage Candidate

   3) Add/Manage Voter

   4) View Votes

 ➢ Client Module:

   1) Vote Casting

   2) Status Checking

 ➢ Server Module:

   1) Virtual Cryptography

   2) QR code

 ➢ Database:

   1) Storage of User Information

   2) Storage of Voting Information

## V. Algorithms

### A. Visual Cryptography :

Visual cryptography is a technique to hide the information in images and that information can be decrypted using the human vision if and only if the correct images are used.

There is a simple algorithm for visual cryptography that creates 2 encrypted images from an original unencrypted image. [1]

The algorithm is as follows:

   1. Create an image of random pixels the same size shape as the original image.

**SHARE1**

   2. Create a second image whose pixels are the AND of the first image and the original image.

**SHARE2=SHARE1 XOR ORIGINAL**

   3. The two apparently random images can now  be combined with XOR to re-create the original image. [2]



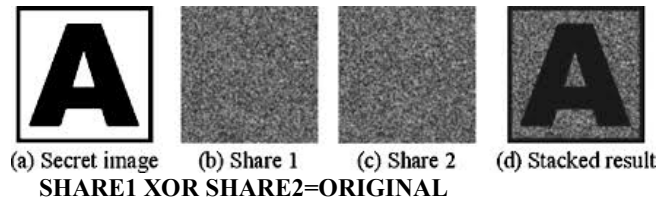**SHARE1 XOR SHARE2=ORIGINAL**

Figure 2: Example of Visual Cryptography

### B. QR Code :

A QR Code (Quick Response code) is a combination of black and white pixels. Black pixels represents the informational pixels whereas white shows empty pixels.

It is more readable and has greater storage capacity than barcodes. QR code can be scanned using camera to extract the information. Initially it was widely used in

industries but ,now-a-days it has increased to commercial, entertainment, marketing, transport ticketing.[6]



Figure 3: QR Code

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