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## Campus E-Voting for Android and Web Based Application

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**Abstract:** *Voting for any social issue is essential for modern democratic societies. So it is becoming very important to make the voting process more easy and efficient. E-voting should be technically implemented in such a way that ensures adequate user requirements. The proposed system is implemented to allow each and every student to actively participate in the college election process irrespective of the place. This is done by the android application which will accept the votes of different students using the application and also through web application. The rapid development in operating system of the mobile phones gives rise to the application development on the large scale. Campus E-voting will make the voting process very easy and efficient. This system allows each and every student to actively participate so that they can get acquainted with the candidates and select the college representatives. The aim is to provide convenient, easy and safe way to capture and count the votes in college elections. Campus E-voting can be a cost effective way for conducting a voting procedure and for attracting students to participate and also provides the facility of interaction between the voters and the candidates. The purpose of the project is to denote a voting process, which enables voters to cast a secure and secret ballot over a network as the manual voting process is time consuming and prone to security breaches.*

**Keywords:** *Electronic voting, Secured voting, android, information societies, college elections, democratic societies*

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### 1. INTRODUCTION

Technological revolutions in computer and communication are enabling the deployment of mobile communication, based on handheld computing devices and wireless networking. Connection capabilities are manifold, and performances of new generation machinery become better and better in terms of computing power and memory size. Their software is able to offer elaborate and complex services, and mobile systems may be exploited for novel applications spread out in a variety of directions. In the past few years the IT industry has witnessed exponential rise of mobile based and web-based softwares. Such softwares are in demand because they are next to flexible step data access and networking, anytime and anywhere. With operations becoming mobile based one does not have to carry around or depend on PC internet access to perform routine jobs and access online documents and meetings. With the appearance of cell phones with programmable platform, it is possible the development of application for worldwide popular participation, by the digital vote using mobile phones. The voting process by cell phones gives some decision power to the students, which can actuate directly on decisions of their concerns. The main objective of the system is to develop a web based and android based application to help students to vote for the desired candidates and choose their college representatives in a very easy and efficient manner. The project is implemented to allow each and every student to actively participate in the college election process irrespective of the place. Administrator will register all the students with their permanent registration no. and roll nos. It will be the task of the admin to register the candidates. The student will login through the permanent registration number and password. On the date of election the students can vote for the desired candidates through the application. Students not having android phones can vote through the web application. Result evaluation will take place on the server side and will be posted. The most important benefit of our application over other voting applications is the use of the latest technologies which makes it faster and easy to use.

### 2. LITERATURE SURVEY

#### 2.1. Election Buddy

Election buddy allows to run class elections, are voting to elect an executive team for your association or club. Election buddy is the complete online voting platform for running elections, polls, or

referendums for boards, associations, schools, or anyone. Featuring a secure and convenient way of sending and collecting email and printed ballots, email notifications and multiple voting methods, it's both a practical and flexible way to manage elections from your browser. With Campaign Monitor integration, you can import one or more lists from Campaign Monitor into Election Buddy and email ballots to your subscribers. Ballot emails are sent via Election Buddy as part of your pricing plan. Election buddy also features a range of competitive pricing plans, based on the number of voters you wish to have to participate.

## 2.2. My Voter Profile

Registered voters in Alameda County now have access to a new mobile phone application designed to educate voters about voting procedure. The Mobile Voter Profile App is provided by the Alameda County Registrar of Voters and gives residents access to key aspects of their voting status. Voters can now quickly find out in which county they are registered to vote as well as their designated polling location by looking up an individual's "Voter Profile" a feature the Alameda county made available online earlier this year. The profile also clarifies to voters their preferred medium for voting, be it by mail or in person, as well as the status of their vote-by-mail ballot. Voter profile includes:

Voter registration information (address, party affiliation, vote by mail status, and registration date)

- Polling place
- Sample ballot
- The status of vote by mail ballot
- Preferred language
- Whether you have chosen to receive your sample ballot by mail
- Which districts you are eligible to vote in

You can also update your registration information, change your preferred language, and opt in / opt out of receiving your sample ballot by mail.

**Table I.** Comparison of existing voting systems

Parameters	Election buddy	Voter profile application	Campus E-voting
1. Type of Application	Web + Mobile based application	Mobile based application	Web + mobile based application
2. Developed in	Python	Objective C, Android	Java, Android
3. Server used	Apache/2.2.14 (Ubuntu)	Not available	Apache tomcat v7.0.23
4. Languages	Available in English	English, Chinese, Spanish, Tagalog and Vietnamese	Available in English

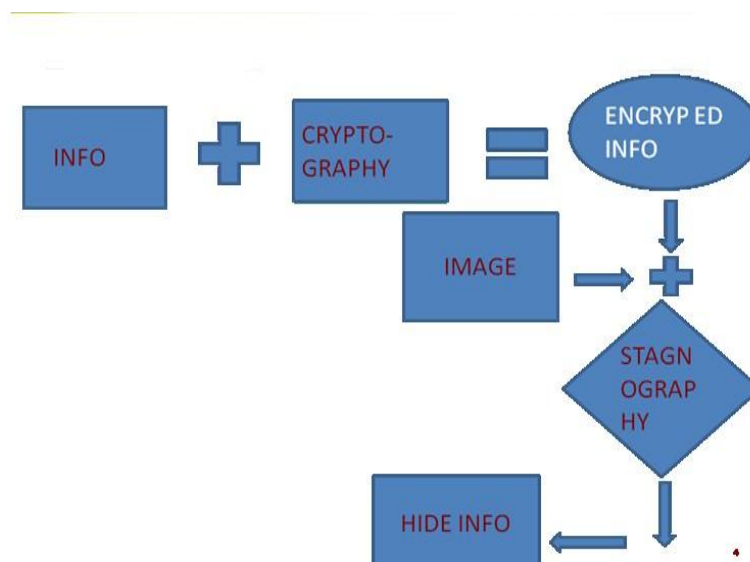
## 3. THE PROPOSED E-VOTING SYSTEM

In this paper, we propose client/server web and android application software. Various social factors/values largely determine the rules and regulations that govern the different voting process. For different college level elections there are manual paper based elections that take place. There is a possibility of manipulation of votes and one of the important challenges that an e-voting system faces is some students might vote more than once. For this purpose our system uses the permanent registration numbers that is unique for every student. Another requirement is the transparency in the electronic voting process. The voter votes using either a computer or android mobile phone and the voter does not have the insight of how the votes are being translated or counted. We are making easy and efficient use of communication mediums like e-mails and sms service for ensuring that the votes are delivered successfully. The manual and paper based election process carried out in colleges can be time consuming and prone to security breaches. This project is implemented to allow each and every student to actively participate in the college election process irrespective of the place. This is done by the android application which will accept the votes of different student using the application. Administrator will register all the students with their permanent registration no. and roll numbers. and

the candidates may apply for any desired post. The student will login through the permanent registration number and password. On the date of election the students can vote to the desired candidates through the application. Students not having android phones can vote through the web application. Result evaluation will take place on the server side and will be posted. Other functionalities are:

- Candidates can promote themselves through videos and other students can view and like them.
- There will be a query section available for students where they can ask queries to any particular candidate and the candidates will answer the queries.
- Polling will be done by asking different type of questions about different candidates.
- Work done for college by candidates can be posted to make students acquainted about the candidates of the elections.
- Authentication will be done through permanent registration no. and passwords.
- Notification messages will be sent to the students about the election date and timings
- Photo gallery for candidates to upload election activity photos.
- A separate page for suggestions. Students can like or dislike them
- Voting is possible through web application.
- Message box for the elected candidate where messages can be sent by students only to a particular candidate.
- Searching for a particular candidates profile can be done.
- Result evaluation will take place on the server side and will be posted
- Steganography will be used for secured data transmission so that manipulation of votes can be avoided
- User-id and password to every user through mail
- Any student can check the status of the ballot through a graphical representation.

The ballot through a graphical representation. In order to reach the desired level of security in our system we propose the use of steganography. Steganography is a technique that allows hiding binary data within an image while adding few changes that are noticeable. While cryptography provides privacy, steganography is intended to provide secrecy. Our system makes use of the LSB algorithm for ensuring better security of transmission of votes. Following figure shows the implementation diagram:



**Fig1.** *Steganography implementation process*

The algorithm used for Encryption and Decryption in this application provides using several layers of using only LSB layer of the image. Writing the data starts from last layer i.e. the LSB layer, because significance of this layer is least and every upper layer has doubled significance from its bottom layer. So for every step when we go to upper layer image quality decreases and image retouching transpires. The encryption is used to hide information into the image so that no one can see information or file. The decryption is used to get the hidden information from an image file. It takes the image file as an output and gives two files at destination folder, one is the same image file and another is the message file that is hidden in that image. LSB (Least Significant Bit) substitution is the process of adjusting the least significant bit pixels of the carrier image. It is a simple approach for embedding message into the image. The Least Significant Bit insertion varies according to number of bits that are present in an image. For an 8 bit image, the least significant bit i.e. the 8th bit of each byte of the image is changed to the bit of secret message. For a 24 bit image, the colors of each component like RGB (red, green and blue) are modified. LSB is effective in using BMP images since the compression in BMP is lossless compression technique. But for hiding the secret message inside an image of BMP file using LSB algorithm it requires a large image. LSB substitution is also possible for GIF format, but the problem with the GIF image is whenever the least significant bit is changed the whole color palette is changed. JPEG, the direct substitution of steganographic techniques is not possible since it uses the lossy compression technique. So it uses LSB substitution for embedding the data into images.

## 4. TECHNOLOGY

### 4.1. Java

Java is a general-purpose, concurrent, class-based, object-oriented computer programming language that is specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another. Java applications are typically compiled to byte code (class file) that can run on any Java virtual machine (JVM) regardless of computer architecture. Java is, as of 2012, one of the most popular programming languages in use, particularly for client-server web applications, with a reported 9 million developers. Java was originally developed by James Gosling at Sun Microsystems (which has since merged into Oracle Corporation) and released in 1995 as a core component of Sun Microsystems Java platform. The language derives much of its syntax from C and C++, but it has fewer low-level facilities than either of them. The original and reference implementation Java compilers, virtual machines, and class libraries were developed by Sun from 1991 and first released in 1995. As of May 2007, in compliance with the specifications of the Java Community Process, Sun relicensed most of its Java technologies under the GNU General Public License. Others have also developed alternative implementations of these Sun technologies, such as the GNU Compiler for Java (byte code compiler), GNU Class path (standard libraries), and Iced Tea-Web (browser plug-in for applets)

### 4.2. JSP

Java Server Pages are an extension to the Java servlet technology that was developed by Sun. JSPs have dynamic scripting capability that works in tandem with HTML code, separating the page logic from the static elements --the actual design and display of the page --to help make the HTML more functional (i.e. dynamic database queries). A JSP is translated into Java servlet before being run and it processes HTTP requests and generates responses like any servlet. However, JSP technology provides a more convenient way to code a servlet. Translation occurs the first time the application is run. A JSP translator is triggered by the .jsp file name extension in a URL. JSPs are fully interoperable with servlets. You can include output from a servlet or forward the output to a servlet and a servlet can include output from a JSP or forward output to a JSP.

A JSP page is a text document that contains two types of text: static data, which can be expressed in any text-based format (such as HTML, SVG, WML, and XML), and JSP elements, which construct dynamic content. The page can be composed of a top file that includes other files that contain either a complete JSP page or a fragment of a JSP page. The recommended extension for the source file of a fragment of a JSP page is .jspx.

The JSP elements in a JSP page can be expressed in two syntaxes, standard and XML, though any given file can use only one syntax. A JSP page in XML syntax is an XML document and can be manipulated by tools and APIs for XML documents.

### 4.3. Android

Android is a comprehensive software stack of mobile devices that includes an operating system, middleware and key application. This rich source of software bunch is used in Mobile Technology through its innovation module of The Android Software Development Kit (SDK). Android can be considered as a unified software package. This software package includes an operating system, middleware and core applications. Android SDK provides some tools and API's which are required to develop Android applications using the programming language of Java. Android is built on open Linux Kernel. This particular software for Mobile Application is made to be open source, thereby giving the opportunity to the developers to introduce and incorporate any technological advancement. Build on custom virtual machine android gives its users the addition usage and application power, to initiate an interactive and efficient application and operational Software for your phone

### 4.4. Apache Tomcat Web Server

Apache Tomcat is an open source web server and servlet container developed by the Apache Software Foundation (ASF). Tomcat implements the Java Servlet and the Java Server (JSP) specifications from Sun Microsystems, and provides a "pure Java" HTTP web server environment for Java code to run in. Apache Tomcat includes tools for configuration and management, but can also be configured by editing XML configuration files.

## 5. CONCLUSION

In this paper, we have proposed an online e-voting system which can tackle all earlier issues that were encountered in a conventional voting system. Our system maintains integrity of the voting process from the minute the voter casts his/her vote until the cast vote is registered. While observing fully-fledged voting transparency, the system is capable of denying access to any unauthorized voter and also prevents multiple votes from same voter. Due to option of viewing candidate profile the voters get easily acquainted with the candidates. The system also facilitates the communication between candidate and voter. While carefully observing the security needs of the system by using steganography in the voting process the design of the system also caters for a number of important functional and non-functional requirements. With the use of the e-voting system, as the one proposed in this paper, many of the issues that have challenged traditional voting systems in the past are thus resolved.

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