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Online School and College Election Management

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ABSTRACT - Making choices and choosing from options are always part of life and everyone wants options to choose from. Similarly, when it comes to voting and elections, it gives power of making choices to the people. Voting is a democratic way of making decisions. Counting Ballots takes a long time that causes delayed results. Furthermore, calculating results could be biased and time consuming which causes voters to wait for the results. In today's scenario as everything is pacing up and new ideas and inventions are always appreciated, our mobile app "MyVotes" is also one of them. This Android voting app is more efficient and convenient to conduct and manage elections as compared to traditional manual methods. The app has a simple and interactive GUI for voting system and maintains its database using Google Firebase platform. Firebase is a Backend-as-a-Service—BaaS that lets users build more powerful, secure and scalable apps. MyVotes enables user to cast their vote from anywhere, anytime without waiting in long queues. This app is purely eco-friendly since no paper is required. Election results are calculated automatically and declared instantly thus reducing human effort and chances of human errors.

KEYWORDS: Google Firebase, Android Studio, Mobile app, Online e-voting, College Election, Ballots.

I. INTRODUCTION

Voting is one of the most crucial ways that allow students and teachers to participate in decision-making. It is a method that allows electorates to actively participate in decision making or express their opinion. The method of using paper ballots is often more cumbersome, time-consuming and prone to human biases. These factors often result in decrease of voters' participation in the election process. Online e-Voting is a critical step for the evolution of democracy. It is an ideal means for elections of associations, councils, clubs, trade unions, educational institutions and other organization's etc. Our goal is to develop a mobile-based app that allows users to vote online via mobile phones. In this paper, a mobile app titled MyVotes is developed with an aim to improve the voting procedure and make it more efficient. This app provides a novel method of casting votes and managing elections thus helps in reducing time and human effort. MyVotes is developed for college students to cast their votes anytime and from anywhere using android devices. The aim of this app is to provide convenience to voters as well as faculty members who monitor the voting process. The app gives election results accurately and instantaneously.

1.1 APPLICATION FEATURES

MyVotes is a real time e-voting mobile app. It has been developed using Android Studios (minimum android version supported is Jellybean) and Firebase platform. Firebase is a next-generation app-development platform on Google Cloud Platform . This platform allows programmers to develop web and mobile applications without using any server-side programming language [3]. Firebase allows storing user's data on its real-time database and also syncing data among other users in no time.

Some distinguished features of the app are discussed below:

1.Remote Voting: One of the biggest drawbacks of secret ballot-based voting system is that a voter has to be physically present to cast vote. This might lead to low voter turnout for any election. With MyVotes app a voter can directly cast his/her vote from any location by using an Android mobile. So, there is no need for any voter to visit the polling booth to cast their vote.

2. Real Time Results: With MyVotes app, final results of any election are available just after the expiry of allotted voting time slot configured by the system administrator of the app. This app provides the real-time results of an election in tabular form as well as in easy to understand graphical display. As there is no need of physical counting of votes, so the complete voting process executes without any manual intervention, hence making it a very efficient procedure.

3. Security: For any online app, security of users' data is always an important design consideration for developers. To prevent security vulnerabilities in the app, Google Sign-in feature has been used for user verification. All valid users need to sign-in using their Gmail id to get voting access in app.

4. One User one Vote: MyVotes has been designed to allow a user to cast vote only once. Once an election date and time has been scheduled by system administrator in app then all valid voters are allowed to vote online as per the election schedule. If a voter has already exercised his voting right using MyVotes app then he/she will not be allowed to vote again as the voting interface will be disabled. This feature will help in mitigating risk of fake voting in an easy and efficient manner.

1.2 METHODOLOGY

1. Conducted an exhaustive survey to understand the current scheme of election in various colleges, schools and other institutions.
2. Identified various limitations and short comings in conventional voting systems used in elections and prepared a requirement specification document for a more advanced, efficient and convenient alternate solution.
3. Analysed various open source databases available at present. Performed a strategic comparison with the traditional databases and finally Google Firebase database was selected to store app's data. Firebase is an efficient platform to build mobile backend services [4].
4. Collected required student's data for app in a spreadsheet. Only college roll number and Gmail id of a student required to be stored for voting procedure. Also populated a spreadsheet having data for all candidates who have filled their nomination against various posts to be elected.
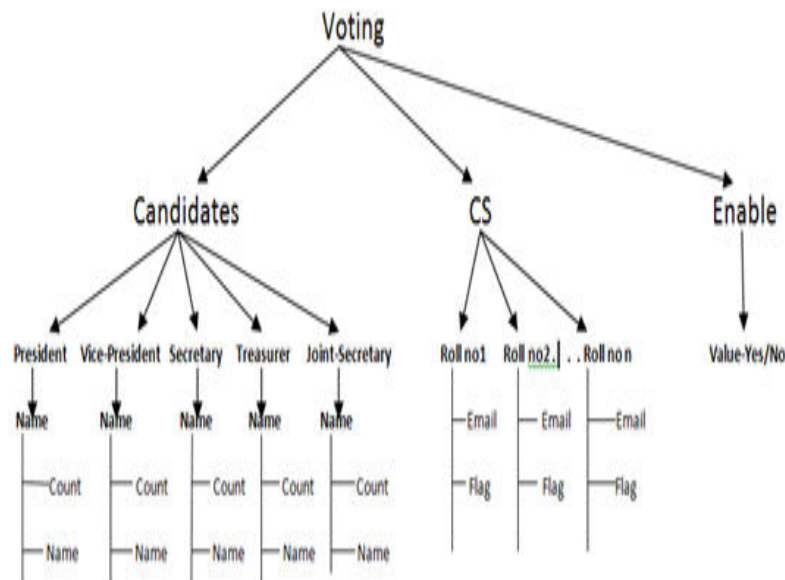

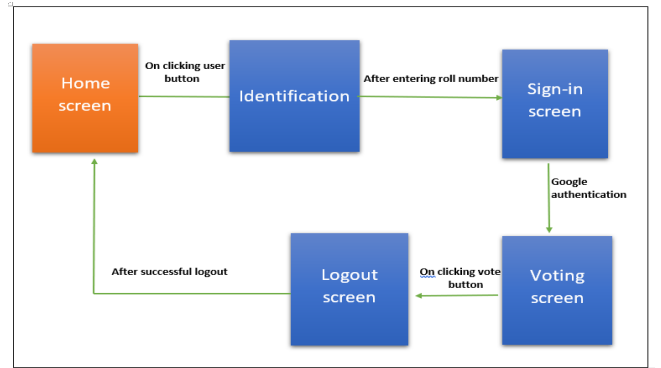**Fig 1:** Nested structure of data in Firebase
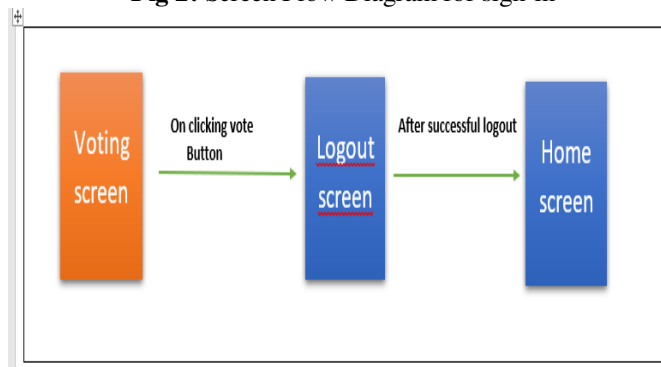
II. FLOW LAYOUT

Fig 2: Screen Flow Diagram for sign-in

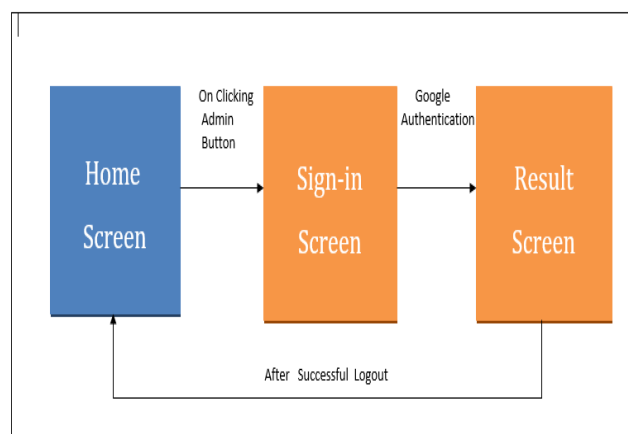**Fig 3:** Screen Flow Diagram for Voting
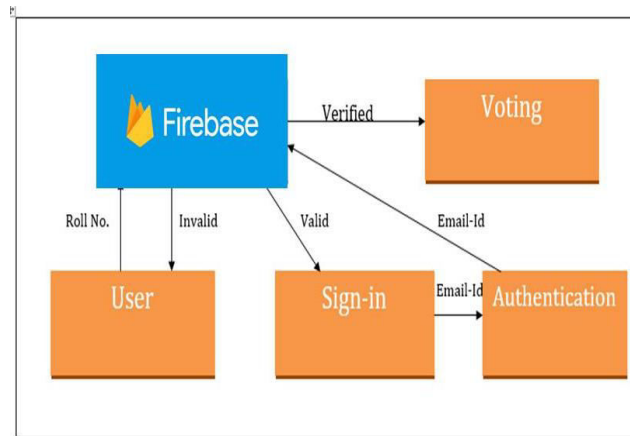

Fig 4: Screen Flow Diagram for Admin

Fig 5: Screen Flow Diagram User verification

III. ADVANTAGES

- Fast and Easy way of conducting election.
- Voter can view background of each Candidate
- Admin can verify the documents and details of Candidates.
- During election candidates can view the votes.
- Appropriate data processing and handling.

3.1 DISADVANTAGES

- Every voter does not have smart phone or internet connection so voter can even go to their respected departments and can vote there.

IV. IMPLIMENTATION

The app can be installed in the Android enabled smart phones of voters by sharing the Android Application Package (APK) file [8]. The application provides two separate interfaces for :1) system admin 2) voters

I.   Interface of System Admin:

 Authentication-For authentication of system admin, Gmail id is used. After successful sign-in, admin can choose to enable or disable the election voting or can view the result on the result screen.

 Result-Results are displayed in the sorted order which is calculated automatically by the app. Thus, it is less time-consuming, more cost effective and less prone to human errors.

 Control duration of poll-Admin can restrict the duration of voting by enabling or disabling the voting lines. Voters can vote only when the voting lines are enabled on the polling day.

 Sign out-A sign out button is provided for signing out from the application.

II.   Interface for Voters/Electorate:

 Authentication –Voter authentication is done with the help of unique college roll number. Voters have to use their Gmail id to sign in to the app. After successful sign in, voter is directed to voting screen.

 Cast Vote-This is the main functionality of the application. Voting screen is presented to voters consisting of names of all the candidates contesting in the elections along with the name of the post. Voter is prompted to cast his/her vote and the final response is submitted.

Sign out- After successful voting, voter can sign out from the app.
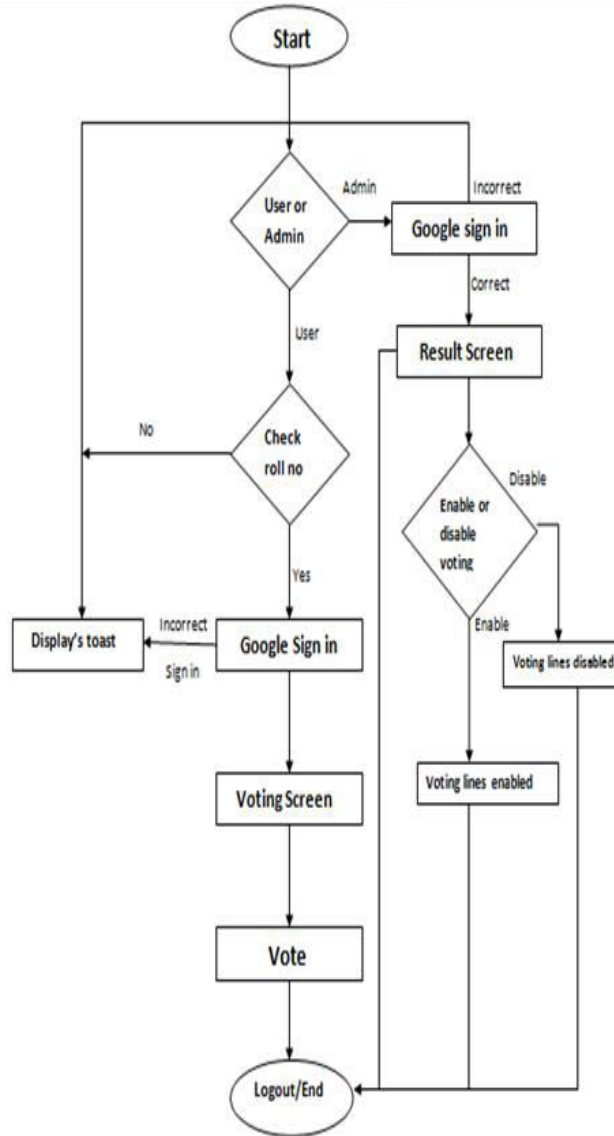

Fig.6: Flow Chart of Proposed System

V. RESULT

MyVotes was used in the departmental elections of our college. App was installed on Android mobile phones of target students [9]. In order to evaluate the effectiveness of the app, some students cast their votes from the college campus and some from outside or their home. Fig 9 shows the results in the form of pie chart-
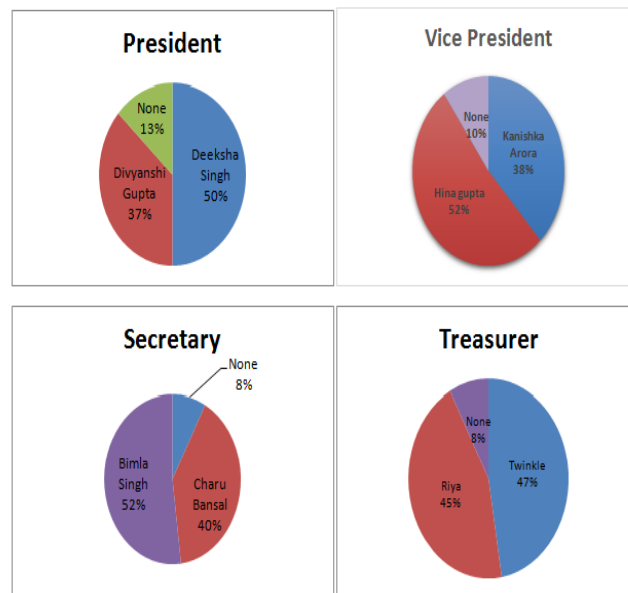
Fig 7: Graphical representation of the final results

VI. INOVATION SHOWN BY PROJECT

This initiative is in the direction App is designed to reduce overhead of its user and admin and ensures that each and every student of the college gets a chance to of smart and eco-friendly elections. The innovative features of the application are as follows:

> 1. The application has a unique feature of restricting the time duration of voting. Admin can enable/disable voting lines in accordance to the schedule of voting. User can vote only when voting lines are enabled.
> 2. The results are calculated and announced instantaneously. It has overcome the overhead of calculating result manually which saves a lot of time and human effort.
> 3. User identification is done on the basis student's roll number and Gmail id registered in Firebase so that only a valid student can vote. Each student can vote only once.
> 4. Students can cast their vote from anywhere and physical presence at college is not a constraint.
> 5. Interface of app is highly customized keeping in mind the need and ease of its user.

VII. CONCLUSION

Physical presence is the biggest challenge of traditional booth-based voting system as that leads to stumpy voter turnout. Everyone should be allowed to vote despite of geographical distances, work commitments, critical health concerns or adverse weather conditions etc. MyVotes allows voters to vote directly from their Android enabled smart phones without sacrificing their home comforts within few seconds. Thus it ensures increased voting turnout %, improved over all security, reduces cost of conducting elections, and reduces time and manpower needed to conduct elections.

VIII. FUTURE SCOPE

This project is an initiative towards a new way of conducting elections. The following features may be integrated in future for extending the functionalities of the app-

1. The app can be personalized as per user requirements (Post, candidates, user identification).
2. For securing the database application, we can use algorithms for data encryption/decryption while storing or retrieving data from database.

3. We may restrict voters from participating in the voting process with the help of geo-fencing. Geo-Fencing is a functionality that allows admin to restrict voters from certain geographical areas only to be able to vote. People outside that geographical area would not be able to expertise their franchise.

4. To incorporate better result visibility, admin may authorize others also to view the results. He can make it visible to all including the voters or he can decide that results would be visible to him only.

IX. ACKNOWLEDGEMENT

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