UNIVERSIDAD DE LAS AMÉRICAS PUEBLA

Computer systems engineering

Diseño y gestión de sistemas P25-LIS4072-1

VoteChain Requirements specification

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Description

Voting is an action that has been part of the life of social communities for thousands of years, as it is critical for the opinion of all those involved to be considered and from this decisions are made, which is why there should be a tool with which this action can be carried out easily, quickly and reliably, taking advantage of the great technological advances of our time.

That is why with VoteChain we want to create a voting platform in which any person, institution, company or government can carry out votes guaranteeing privacy, faithful results, accessibility for everyone, avoiding fraud and the long lines that are common in massive votes. To ensure all this, the application will use blockchain technology to make voting safe, as well as user authentication to ensure that all people who vote are real people and are approved to participate in the vote.

The platform will cover a wide range of voting types, from governmental elections to social polls on popular topics. It will function as a social network where users can view and participate in polls created by other users and watch real time statistics. Additionally, there will be verified profiles to ensure the authenticity of certain votes, allowing the community to identify which ones are legitimate. For example, in the case of elections in Mexico, some users might create fake polls, but the community will be able to distinguish them and only respond to those published by the verified profile of the electoral authority.

Also, any user will be able to create their own polls configurating important parts, such as it being public or private, enable real time statistics or publishing the creator's name. At the end of the creation the user will be able to share the poll.

To guarantee transparency and security, the application will utilize blockchain technology, ensuring that each vote is immutable and verifiable. Furthermore, the platform will offer the option to contact specialized companies for managing high impact voting processes.

Target user

The target audience of this application is anyone who interacts in a context in which voting is useful, whether it is private organizations such as companies when electing positions or representatives, schools, governments or even a person who needs to vote with their friends. VoteChain is a tool that will adapt to any context, facilitating the creation of votes in an easy and secure way.

Technical approach

To develop the project, it was decided to use a cross-platform approach to ensure the accessibility of all the possible users of the application due to the possible interest of different sectors of the population. To do this React native was the technology selected to program the front end, Node js to program the backend and other needed technologies will be blockchain

in order to develop the core of the app, voting transactions, and use of databases probably a relational database such as postgresql or mysql will be needed, and depending on the level of scalability that the app could have a nosql database would be needed.

Goals

- Implement blockchain for a secure voting process and transactions
- Create a cross-platform mobile application for more accessibility, available for Android and iOS
- Create a scalable mobile application that could be capable of hosting national elections.
- Simplify and accelerate the voting process by avoiding queues and wait times.
- Preventing fraud and manipulation before, during and after the voting process
- Ensure compliance with legal and regulatory standards
- Support different voting use cases for different kinds of users.
- Support free expression of any user of the app.

Requirements

Functional requirements

- The user must be able to register using email and password.
- The user must be able to create and configure polls (title, description, image, end date, public or private, category, anonymous, and live results).
- The user must be able to participate in polls.
- The user must be able to share a poll.
- The user must be able to save a poll as favorite.
- The user must be able to view the results of public or private polls in which the user has participated, created or saved as favorite.
- The user must be able to filter polls by name or category.
- A user must be able to verify their profile.

Non-functional requirements

- The application should support Cross platform use in iOS and Android devices.
- The application should be responsive adjusting to any size of screen.
- The application must be easy to use and intuitive for any user with a quick learning curve.

- The voting system should work using blockchain ensuring the integrity of the votes.
- The code should follow the MVVM pattern.
- The application should charge in less than 3 seconds with 4G and wifi connections.
- The application should support at least 5000 concurrent users.

Work packages description

Deliverable	**Description**	**Due Date**
Requirements specifications	Define functional and non-functional requirements	February 13
UI/UX design	Create wireframes, prototypes, UI components	February 13
Backend Development	API development, database setup, using node js	March 20
Frontend Development	Mobile app UI and features implementation using react native	March 20
Testing and QA	Unit, integration and user testing using K6, lighthouse and BrowserStack	March 28
Deployment	Submission to Google Play / App store	~
Post-launch Support	Big fixes, updates, monitoring	~

Risk mitigation plan

Risk	Impact	Mitigation strategy
App store rejection	High	Check apple and android development guidelines to ensure acceptance in app store.
Data Security issues	High	Implement encryption on user data storage, follow OWASP best practices,
Delays in development	High	Implement development strategies like agile methodology. Have

		alternative solutions, rollback strategies, and a quick response team.

Expected outcome and impact

After the completion of this project, it is expected to have a successful development and deployment of a secure, transparent and accessible blockchain based voting system that can be used by individuals, organizations and government entities. With the help of blockchain technology the app will ensure tamper-proof, verifiable and anonymous voting while preventing fraud and double voting.

For governments, the app intends to modernize elections, reducing costs, waiting times, and human errors while increasing trust in digital voting. Other organizations like educational institutions or private enterprises can expect to use the app for secure decision-making, leadership elections, and shareholder votes. Individuals will benefit from an easy-to-use system that allows them to create and participate in reliable votes with verified authentication. Furthermore, with global accessibility, this project could expand civic participation, making voting more secure, efficient and fraud-resistant, by setting a new standard for digital elections.

UI Design

The flux of the application is presented in the following Figma:

https://www.figma.com/proto/UteE8yfw7W9RKSOM0qAvOi/VoteChain?t=hCpYarIeYX4B1xdh-1&scaling=scale-down&content-scaling=fixed&page-id=0%3A1&node-id=1-2