

Digital voting pass - Project plan

Bachelor project

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1 Introduction

To ensure a smooth collaboration with all the stakeholders involved in this project, we will describe our vision about the process of this project in this document. Also the questions we will investigate during research and requirements of the prototype are listed here.

2 Client

The project is an assignment provided by the company Milvum, based in The Hague. Milvum is a software development company, focused on developing apps in corporate environments. They start in July with developing a prototype for digital voting as a pilot for several municipalities in the Netherlands. This bachelor project will cover one part of the digital voting system. The results and problems encountered during the process are of interest to Milvum in their efforts to develop a prototype for digital voting later this year. Milvum provides a work area, lunch, and two developers, who can provide access to their IT-infrastructure and share insights on minor struggles during development.

3 Problem description

This project forms one part of digitizing the entire voting process: the voting pass. Currently people get a paper voting pass in their mail, with this pass, in combination with identification papers, they can vote. Instead of a paper voting pass, people should be able to show their voting eligibility using their phone. This project creates a full replacement for the paper voting pass. The solution should ensure that the right people vote and that they can only vote once. Furthermore the solution needs to ensure that no external parties can influence the voting system. The device needs to get a security check to ensure no malicious software is present, and the created app has not been altered by a third party. This check and the activation of the device as a voting pass needs to be done at the town hall.

Digital voting solutions are often met with misgiving, therefore trust in the system is a key issue. The project results in a prototype android app which acts as a digital voting pass. The entire system will make use of blockchain technology.

4 Team members

In Table 1 all team members are listed. Most of the production will be covered by the students from Delft University of Technology. They are required to use their skillset and expertise to work to an end product in a structured way.

Name	Role	Organization
Daan Middendorp	Student - Analysis and production	TU Delft
Wilko Meijer	Student - Analysis and production	TU Delft
Jonathan Raes	Student - Analysis and production	TU Delft
Rico Tubbing	Student - Analysis and production	TU Delft
Johan Pouwelse	TUD Coach	TU Delft
Salim Hadri / Arvind Jagesser	Product owner / Coach	Milvum
Michiel Hegemans	Development support	Milvum
Maarten van Beek	Development support	Milvum

Table 1: Team members

4.1 Required skills

- Java development the Android ecosystem
- Python for the backend
- Git for version control
- LaTeX for documentation

5 Product Requirements

Initial requirements can be found below, these requirements are derived from the project description and the first meeting with the client. More elaborate product requirements will follow from the research phase.

5.1 Functional requirements

- The app must keep track of the identity of the voter.
- The system must ensure that a voter does not vote more than once, either digitally, physically or both.
- The app and system must be secure.
- The app and system must be trustworthy.
- The app should allow proxy-voting to be possible.

5.2 Non-functional requirements

- Android app must be developed in Android Studio.
- Android app must use API 21+ (Lollipop).
- Blockchain technology must be developed in Python.

6 Workflow and collaboration

Below we define some agreements about the workflow and general collaboration in the project.

Meetings with coaches

- Weekly with Milvum coach

- Weekly with TU coach

Work location

- Milvum, Regulusweg 5, Den Haag

Working hours

- Normally 5 days per week 9h00-17h00

Technology supporting the workflow

- Github with Gitflow
- Waffle.io

Agile methodology characteristics

- Two-week iterations
- Daily stand-up meeting
- Meeting for iteration plan on Monday morning
- Retrospective meeting on Friday afternoon

The use of the agile methodology ensures a good overview of the state of the project. Each two-week sprint results in a working project and a chapter of the final report. Working agile creates a flexible workflow in which problems can be addressed quickly. On the first Monday of an iteration, a plan is made for how to reach the goal in the next two weeks. In the daily stand-up meetings, every group member pitches what they have done, what they are going to do, and if they encountered any problems that need to be addressed. Because of these meetings, every group member knows what the state of the project is and what his tasks are. By reflecting on the work process in the Friday retrospective meetings any issues in this regard can be dealt with swiftly so they don't hold back the project.

Gitflow and Waffle.io support the agile methodology by providing a structured way to assign tasks to group members, keep track of the state of tasks, and allow for easy collaboration between group members. Github allows for easy version control of the code, keeping track of issues with code and mapping tasks to results in code.

7 Code Quality

Good quality code is easier to maintain, to extent, and is less bug-prone. With trust as a key issue in this project, secure and easy-to-understand code is essential. To ensure good quality code, tests will be written for the system. Continuous integration by using Travis CI helps to detect problems with code early on. A pull-based development process with code reviews ensures understandable and qualitative code. Code submissions to SIG (Software Improvement Group) will give a good indication of the code quality compared to other systems and highlight areas where improvement is needed. The code will be written by keeping the definitions for maintainability by ISO 25010 in mind. SIG analyzes code according to these standards as well.

8 Research questions

From the problem description and the requirements we derived we define the following research question with sub questions that we will answer in the research report.

How can the paper voting pass in the Dutch voting system be replaced by a secure, trustworthy, and easy-to-use digital system?

- How does the current Dutch (paper) voting process work?
- What are existing digital voting systems?
- How to keep track of the identity of the voter?
- How to ensure that an individual cannot vote more than once?
- How to ensure the process cannot be manipulated by external parties?
- How to allow proxy-voting?
- How can we make the process trustworthy to sceptics?

9 Timeline

Deliverable	Description	ETA
Research report	Report about design decisions and an explanation why these decisions were made	8 May
Technical architecture	Architecture of all components and design choices	15 May
GUI Design	Design of the user interface made by external party	29 May
SIG upload	Code submission to SIG	Before 1 June
Prototype	Prototype showing a working digital implementation of the voting pass	19 June
SIG upload	Code submission to SIG	Before 26 June
Final report	A complete description of the whole process from begin to end according to the guidelines of the manual	26 June
End presentation	A final presentation with a description of the problem, solution, demo and afterwards questions.	Beginning of July (3-5)

Table 2: Timeline of the project