

**Project Proposal**

E-voting Blockchain

Version 1.0

**Group members:**

Nguyen Trong Tri – 1459053 – 16943739

Pham Huynh Tri Minh – 1459036 – 16942517

**Supervisor:** Mr. Le Hoang Son

**Client:** Mr. Le Hoang Minh

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# **Term of Reference:**

Bosch of Engineering and Business Solutions Vietnam Co. LTD (Bosch) is one of the world’s leading global supplier of technology and services, offering end-to-end engineering, IT and business solution. The company has its main office in Ho Chi Minh City, a regional office of Bosch Group in Vietnam. Bosch is creating opportunity for students who want to develop their skills, therefore many project has been raised for many universities in Ho Chi Minh City. As our client, Bosch offers a 6-month project of E-voting Blockchain for the students to have a chance to approach with one of the most promising technology which is blockchain. The project is introduced for the student whose major is Service Science, which is one of international education program of Ho Chi Minh University of Science associating with Auckland University of Technology.

Thanks to Bosch associates and teachers from the HCMUS-AUT support and assistance, the project is available for the students looking forward to enhancing their skills. The students, who have responsibility for the project, commit to accomplish the project goals flawlessly.

# **Rationale for the Project:**

## 2.1. Statement of Need

Democratic voting is a significant occasion in any country. At the time being, the most common way that a country or an organization organizes a voting event is by paper based system. However, since the technology is increasingly developing, it could be the time to bring the voting to the next level. Voting system using electronic devices, referring to e-voting, including voting via web browser on the computer, applications on smart devices such as phone and tablet.

The initiation of blockchain is the underlying technology of cryptocurrency bitcoin. It is a distributed databased where the transactions are recorded within a block. However, the potential of blockchain is much more than cryptocurrency. Blockchain is a secured and robust system that could be suitable for a secured voting system.

As a result, Bosch want to exploit the potential of blockchain technology and bring its possibility into E-voting system. This could solve many issues that is related to the existing E-voting system.

## 2.2. Issues

There have been upraising issues that associate with the online voting system and one of the them is integrity and trust. It is essential to keep the votes secured and all the decisions and the ballots of those who participate in the voting event remain unchanged. The current digital voting system bases on server-client. That means the voters submit their vote from their personal devices to a server, the server receive the votes and then generate the result. The voters are only informed the counted result, but the process of counting on the server remains unknown. That is to say, the process is in the server and the voters has no authorized to access so there are questions have been raised: how the voters could tell that their votes are counted or not? Does the server add a clone vote? And the big issue is does the result reliable?

Another issue is robustness. It is no guarantee that the server could be broken or not. Since the all votes are in the server database, the voting event has to be done again on another server. Then the result might not be the same as the first time due to edited votes.

The issue of anonymity is also in the table. Because of the authorized restriction, the voters do not have the right and cannot get access to the database. The information of the voters is not announced to public. Otherwise, the detail is in the server database which those who are authorized to access may take to exploit for their personal uses. As a result, the information of the voters is not as secured as they thought.

All the issue is brought to consider the characteristic of E-voting compared to the traditional voting. It may be more convenient for the voter, otherwise, it could loss the significance of a voting event.

## 2.3. Opportunities

The initiation of blockchain is the underlying technology of cryptocurrency bitcoin. It is a distributed databased where the transactions are recorded within a block. All the blocks are shared to those who are in the network. That means everyone who join the system has a copy of the ledger (database). That makes it impossible to hack or change the data in the ledger. However, the potential of blockchain is much more than cryptocurrency. Blockchain is a secured and robust system that could be suitable for online voting system.

The issues are addressed using technology of blockchain for the E-voting system. Firstly, the trust is ensured. Since blockchain is an immutable and shared ledger, all the voters are able to see each other votes, yet know each other identification due to encryption of blockchain and the number of voters. Secondly is robustness. The ledger is shared to the network so that it can be recovered since there is at least 2 nodes remained.

# **Scope and objectives:**

## Objectives

The project is about how to apply a Blockchain technology to change the way of current voting which is more secure, truthful, anonymous and robust. After discussing with a client, a mentor and team members, we are highlight some objectives:

* **Objective 1:** The user can define a form for the vote (Free – Paid, Duration, Yes – No or Submit text, ...)
* **Objective 2:** Each user can only have 1 account to be able to vote without any cheating.
* **Objective 3:** All of the network can see the process and result of the vote in real-time after they voted, but can’t see the information of other users.
* **Objective 4:** The user can only change their vote 1 time in 2 hours (in case they make a wrong decision or have any technical problem during the vote).

## Scope

This is a new technology and our team only have 2 members to work with this E-voting system in 6 months. The expectation of the client is this system can work smoothly and correctly in the internal. At the beginning, it should have around 2-10 node can connect and work together, it should be extendable if needed. We will try to achieve the scope and make an easy-to-use system so that all user can use it effectively.

## Assumptions and Constraints

|  |  |  |  |
| --- | --- | --- | --- |
| Description | Impact | Required By | Status |
| Hardware availability | Schedule | At least 1 week before sprint Start. | Continuous |
| Software availability | Schedule | Before project start date | Continuous |
| Team works as full-time internship in 6 months in Bosch Office to complete the project | Schedule, Cost, Quality | Project Requirement | Continuous |
| We have to be attendance about 40 hours per week and no more than 10 hours per day. (Client suggests 20 hours per week) | Schedule, Cost | Bosch Policy | Continuous |
| In the morning of Tuesday and Friday, have to take half day leave to study at University | Schedule, Quality | School reason | Continuous |
| Have to take some days off to participate class in University | Schedule, Quality | School reason | Continuous |

# Project Approach:

## Project Approaches Information:

|  |  |
| --- | --- |
| **Project Approaches** | |
| **Methodologies** | |
| - Process | Agile |
| - Team Management and Control | Scrum |
| **Front-end** | |
| - UI/UX | Under Researching. Suggest AngularJS 4, Bootstrap 3, JavaScript… |
| **Back-end** | |
| - Blockchain Technology | Under Researching. Suggest Etherium, Quorum, Multichain, Openchain, … |
| **Tools and Software** | |
| - Communication Tool | Skype for Business |
| - Source Code Management Tool | SourceTree (Confidential) |
| - Document Version Control | DocViewer (Bosch) |
| - Development Environment | Eclipse IDE |
| - Designing | Adobe Photoshop |
| - Office Tool | Microsoft Office |

## Project Approaches Description:

* + 1. **Methodologies:**

**Agile process** is recommended.

- E-voting Blockchain is a new project, additionally our team is from university and new the software business so the tasks need to be adjusted continuously.

- The blockchain technology is also new to our knowledge so it takes more time to research than implement the project.

- The sprints are directly under observation of client to ensure no significant misunderstanding.

**For Team Management and Control:** The sprint of the project is commonly 2 weeks long.

- The members have to work together to complete tasks in the sprint. This helps the members understand each other. Using one strength to cover the other weaknesses.

- Due to working full-time (40hours/week) is required, the working time is not necessary to show for the proposal at school.

* + 1. **Tools & Software:**

**Communication Tool:** The company only provide Skype for Business due to ISO Standard. Therefore, it would be our main communication tool in office. Besides texting, it allows video and voice call which are essential for the communication purpose. Documents can also be sent and received vie Skype for Business.

**Source Code Management Tool:** The SourceTree is recommended.

**Document Version Control:** We will use Bosch ILM to manage versions of all documents.

**Development Environment:** Eclipse IDE.

**Designing:** Adobe Photoshop

**Office tools:** Microsoft Office.

# Configuration Management:

## Baseline Description:

According to Bosch Guideline, the Baseline is described by:

• Every first version of the document should always be 1.0.

• If the document need to be stored for further review purpose, it can be saved as v1.0r1 (first review), v1.0r2 (second review) etc.

• At the time of baselining, it should be baselined as version v1.0 and the document history should indicate that it is the initial version.

• After a document is baselined, the changes to the "baselined document" can be implemented only through change request handling process.

• After the implementation of changes, version number should be changed to v1.1.

## List of Configuration Items:

|  |  |  |  |
| --- | --- | --- | --- |
| No | Configuration Item | Trigger | Responsibility |
| 1. | Project Plan | After reviewed / approved | Product Owner |
| 2. | Requirement document | After reviewed / approved | Product Owner / Reviewer |
| 3. | Design document | After reviewed / approved | Product Owner / Reviewer |
| 4. | Prototype | After reviewed / approved | Product Owner / Reviewer |
| 5. | Source code | After development finish. | Product Owner |

## Storing and Retrieving Configuration Item:

All Configuration Items except Source code are stored on the DocViewer of Bosch.

Source code is store on Source Tree.

The access right will follow the company conventions and approved by Product Owner.

Ex: Project Management Performance Testing Dashboard version 1.0.docx

* 1. **CM Tool:**

For CM Tool our project will use DocViewer, provided by Bosch to manage documents.

## Naming Convention:

|  |  |  |
| --- | --- | --- |
| No | Configuration Item Type | Filename |
| 1. | Documents   * Proposal * SRS * Use cases * Time tracking Spreadsheet   Guidance | * [ProjectName]\_<DocumentName>\_v<Number> |
| 2. | Task | * [Category] –TaskNameStartWithVerb. |
| 3. | Issue | * [Issue] – IssueName |

# Project Plan:

## Project Deliverables

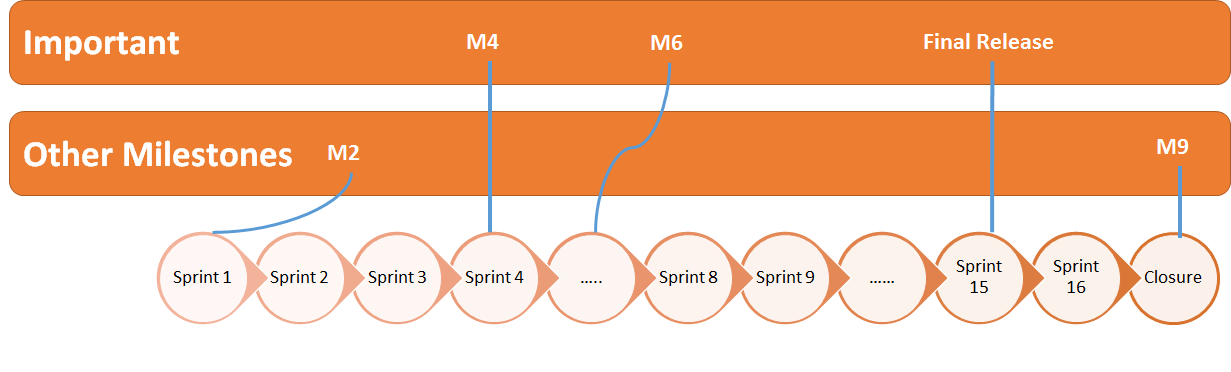
### Deliverables for HCMUS

* Proposal
* Design
* UI/UX
* System process
* Customer process
* Use cases
* System functionality
* Test cases
* Standards
* Clean code
* Maintainability
* Time Tracking Spreadsheet
* Tracking development team tasks
* Estimate time and the actual time spending on each task.
* Tracking percentage and time of completed tasks in order to keep on the schedule.

### Additional Deliverables for the company

* Voting Blockchain System.
* Technical documentation.

## Timeline summary



### Milestones

|  |  |  |
| --- | --- | --- |
| Key Milestone | Description | Planned date |
| M1 | Gathering Requirements | 24/10/2017 |
| M2 | Proposal approved | 3/11/2017 |
| M3 | Agenda approved | 6/11/2017 |
| M4 | Platform for blockchain | 17/11/2017 |
| M5 | Design UX/UI | 22/12/2017 |
| M6 | Implement blockchain | 25/12/2017 |
| M7 | Prototype/Demo | 16/3/2018 |
| M8 | Final release | 4/6/2018 |
| M9 | Project end | 4/6/2018 |

### Timeline for Deliverables

|  |  |
| --- | --- |
| Deliverable | Time |
| Proposal | 3/11/2017 |
| Agenda | 6/11/2017 |
| SRS | 10/12/2017 |
| Prototype | 16/3/2018 |
| Use Cases | 11/12/2017 |
| Code | 15/1/2018 |
| Test plan | At the beginning of each sprint |
| Go live | 3/3/2018 |
| Technical Document | 8/1/2018 |
| Final Report | 8/1/2018 |
| Time Tracking Spreadsheet | 10/11/2017 |
| Final Presentation | 4/6/2018 |

### Definition of Done (DOD)

#### Creation of the DOD

Team members create their own “Definition of Done” for each sprint:

- User stories

- Sprints output

- Research document (if necessary)

- Report document (if necessary)

##### Review of the DOD

The team along with supervisor will review DOD at the end of each sprint.

## Roles and Responsibilities

|  |  |  |  |
| --- | --- | --- | --- |
| Role | Responsibilities | Person in charge | Contact |
| Product Owner | * Provide vision for the team * Represent the users of the system. * Manage stakeholders and their requirements * Prioritize work for the team * Set the acceptance criteria | Le Hoang Minh | Bosch internal emails,  Skype for Business |
| Scrum Master | * Recommend face to face communication * Review team tasks continuously * Resolve conflicts * Track team performance on Tracking Spreadsheet | Pham Huynh Tri Minh  Nguyen Trong Tri  (change after each sprint) |
| Development Team | * Be full-stack developers (Design UI/UX, front-end, back-end). * Prioritizing the sprint tasks * Complete tasks (give output) * Daily meeting to review status of working process | * Pham Huynh Tri Minh |
| * Nguyen Trong Tri |

## Meetings

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Meeting | Attendees | Time | Duration | Purposes |
| Sprint Planning | Development team  Scrum Master  Product Owner | Beginning of each sprint | 1 hour | * Prioritize product backlog * Evaluate effort to complete tasks * Create backlog |
| Daily Scrum | Development team  Scrum Master | Every morning | About 10 minutes | * Review * Update status of each task * What to do today * Facing issue |
| Sprint Review | Development team  Scrum Master  Product Owner | End of each sprint | 30 minutes | * Review completed function of the product * Get feedback |
| Sprint Retrospective | Development team  Scrum Master  Product Owner | End of each sprint | 60 minutes | * Review what have been done to complete a task * Review the method of doing a task * Recommend improvement. |

## Critical Computer Resource

- The development of the application is in Window environment

- The primary language is Java

The Company RBVH has provided two computers running Window operation and software including facilities needed for the project.

# Skills and knowledge involved:

## Professional Skills

* Analyzing
* Leadership
* Time management
* Teamwork
* Presentation
* Planning
* Project management
* Writing document and report

## Interpersonal Skills

* Conflict solving
* Communication skill
* Decision Making
* Negotiation
* Researching

## Technical Skills

* **Programming skill**

Under researching. Recommend:

* Java
* AngularJS 4
* Blockchain technology

### Testing

Under researching. Recommend:

* Unit Test and Unit Root Test
* Designing test cases
* Manual testing

## Knowledge

* Get to know Blockchain technology
* Current E-voting process
* The process of making a software
* Get requirements, analyze, develop, test and deliver product.

# Estimated all costs incurred:

**Client supports:**

|  |  |  |
| --- | --- | --- |
| **Hardware** | **Software** | **Training** |
| * Computer (keyboard, mouse, …) * Workplace * Internet connection | * Internal server * Software/Service provided by BOSCH * Internal network (social, library, wiki…) * Document | * Technical training |

BOSCH policy provide an internship program with allowance, estimated total cost for the project:

|  |  |
| --- | --- |
| Number of member | 2 |
| Project duration | 6 |
| Salary (person/month) | 3.000.000 VND |
| Total cost | 36.0000.000 VND |

# Risk Management:

Our proposal for risk management in this project are:

* Identify the risk might occur and evaluate the impact.
* Plan to mitigate and solve the potential risk.
* Review after each sprint to identify potential risk.
* Since risk occurs, it would be recorded and managed based on the priority of the risk.
* The risks are listed on a Risk Management Spreadsheet.