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I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a marks of zero will be awarded.

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Introduction

For the final year project, I was willing to build online voting for election. While Internet voting has been utilized for national-level elections in only a few countries, it is a voting mechanism that is increasingly being explored to allow access to the election process for voters who may otherwise find it difficult to go to their polling location on Election Day.

In today's context, there are numbers of people living in abroad. They cannot participate in voting. They cannot choose and vote the party they like. Since, with the help of online voting system, people from abroad also can vote and express their view. Inside the country also, people from villages are living in Kathmandu valley. They have not return to their village to cast a vote. Many political issues are also there in voting area. Sometimes, the voting box keep missing and exchange with another voting box. Hence the online voting system is very useful in Nepal. Online Voting is a web-based voting system that will help you manage your elections easily and securely.

Project as a Solution:

Secure and reliable

Online Voting allows members to vote wherever they have access to a computer, smartphone or tablet. Our Smart Login system allows the member to login with their member number and securely log one vote and SSL encryption ensures each vote is transmitted securely.

Cost saving

Our online voting solution provides an online election pamphlet (no printing needed) that allows you to showcase candidate profiles and statements as well as pro/con statements for other items on the ballot. The solution is available 24/7 for the duration of your election.

Flexible and Easy to Use

Whether you need a fully managed election, or you want to import your list and create your own ballot, the Online Voting Solution by Profusion makes it easy! Upload your list, create your ballot and send the link out to your members. Voting has never been so simple.

(Online Voting Solution, 2019)

Aims and Objectives

- To reduce the human effort and saving time.
- To increase the voting accuracy.
- To reduce the threat for the people that can arise in voting area.
- The advantage of online voting is that the voters have the choice of voting at specific allocated time.
- It also minimizes vote counting error.
- People living in abroad also can caste a vote through online voting system.

Expected outcomes and Delivers

As the prediction, the final product would be the online voting system. Online Voting is a web-based voting system that will help you manage your elections easily and securely. This voting system can be used for casting votes during the elections. In this system the voter does not have to go to the polling booth to cast their vote. They can use their personal computer to cast their votes. There is a database which is maintained in which all the name of the voters with their complete information is stored. The System Administrator registers the voters by simply filling a registration form to register the voters. After registration, the voter is assigned a secret voter ID with which he/she can use to login to the system and cast his/her vote. If invalid/wrong details are submitted, then the person is not registered to vote. After the user successfully registers themselves, a link is message to their respective mobile number that are registered in citizenship card. The link is a key for the activation of the account of the user. The account is activated only after the user clicks on that link. The site will be activated only on the day of voting. The login ID for the people is citizenship number. Once the user logs in, they will be provided with a One Time Password which has to be entered by the user before casting his/her vote. The password will be destroyed after casting of their respective vote. A receipt of the vote will be message to their respective mobile number that are registered in citizenship card. The advantage of online voting is that the voters have the choice of voting at their own free time and there is reduced congestion. It also minimizes on errors of vote counting. The individual votes are submitted in a database which can be queried to find out who of the aspirants for a given post has the highest number of votes.

Project risks, threats and contingency plans

Discussing about the risks, people can vote twice with the system. People can also cast a vote in polling area and in online system also.

To overcome this problem, government should prepare a plan. First of all, outdoor voting system should be done before the online voting system. People who participate in outdoor voting, cannot login in online system as the system will check the ID and reject the IDs that are same. ID will be the citizenship number.

As this web application, People can also hack this system. So security must be high. There is also chance of DOS i.e. the attacker usually sends excessive messages asking the network or server to authenticate requests that have invalid return addresses. The server can be slow and even down.

Some process to protect online voting:

Single-vote verification

Single-vote verification is technical speak for preventing duplicate votes. When election season rolls around, member-based groups have plenty on their plates in addition to ensuring a smooth contest. Undue anxiety regarding secure vote tabulations can be avoided if eligible voters are properly cross referenced with actual participants.

For example, in practice, an election specialist would be able to see if an online ballot was processed. Once they have the name of the voting member, they'll cross that person off their formal list of eligible voters. As soon as that person has been marked as having voted, any subsequent vote from them won't be counted.

SECURE NOMINATIONS & BALLOTS

A secure site where members can select potential candidates and vote without any apprehension is key to any successful election experience. For security, the passwords are sent through the mobile number to the respective citizen.

BALLOT TRACKING

This feature is exactly as it sounds: Internet elections have an added layer of security with ballot tracking, which facilitates real-time voting monitoring by election specialists. This means they will be alerted at the exact moment a vote has successfully been processed.

24/7 MONITORING

While exceedingly rare, mistakes and/or technical problems *do occur* during elections. It's always helpful, therefore, to have support staff onsite or available via a quick phone call to resolve any unforeseeable issues. With 24/7 monitoring, election staffers can answer any and all questions about voting, potential network disruptions, or anything out of the ordinary.

Data privacy

Whether in your personal or professional life, data privacy is hugely important. The same goes for elections. Member-based groups make a point of protecting constituent data. A reliable election vendor should therefore be transparent about the collection of personal information. When interviewing potential election management agencies, don't forget to ask if they share data with third-party groups.

(YesElection, 2019)

Methodology

Rational Unified Process methodology is shortly known as an RUP is a one modern software development process. This methodology divides the development process into four distinct phases that each involves business modeling, analysis and design, implementation, testing, and deployment. This is an object-oriented and web-enabled program development methodology. This model also helps software developer for providing them guidelines, templates, and examples for all aspects and stages of software development.

Advantages of RUP Software Development Methodology:

- This methodology emphasizes on accurate documentation
- It is proactively able to resolve the project risks that are associated with the clients evolving requirements for careful changes and request management
- Very less need for integration as the process of integration goes on throughout the development process

(TatvaSoft, 2019)

Based on UML, RUP organizes the development of software into four phases, each consisting of one or more executable iterations of the software at that stage of development.

Inception

In this stage, the projects business case is stated, and the team decides if the project is worth doing or if it is even possible. It is important to the process to first formulate the scope of the project and also determine what resources will be needed.

Elaboration

In this stage, the developers take a closer look at the project to determine its architecture foundation and to evaluate the architecture in relation to the project. This stage is important to the RUP because it is here that developers analyze the risks associated with changing the scope of the project or adding new technologies along the way.

Construction

In this stage, the development of the project is completed. The application design is finished, and the source code is written. It is in this stage that the software is tested to determine if the project has met its goal laid out in the inception phase.

Transition

In this stage, any fine-tuning is performed. Any final adjustments can be based on user feedback, usability or installation issues.

(WebPedia, 2019)

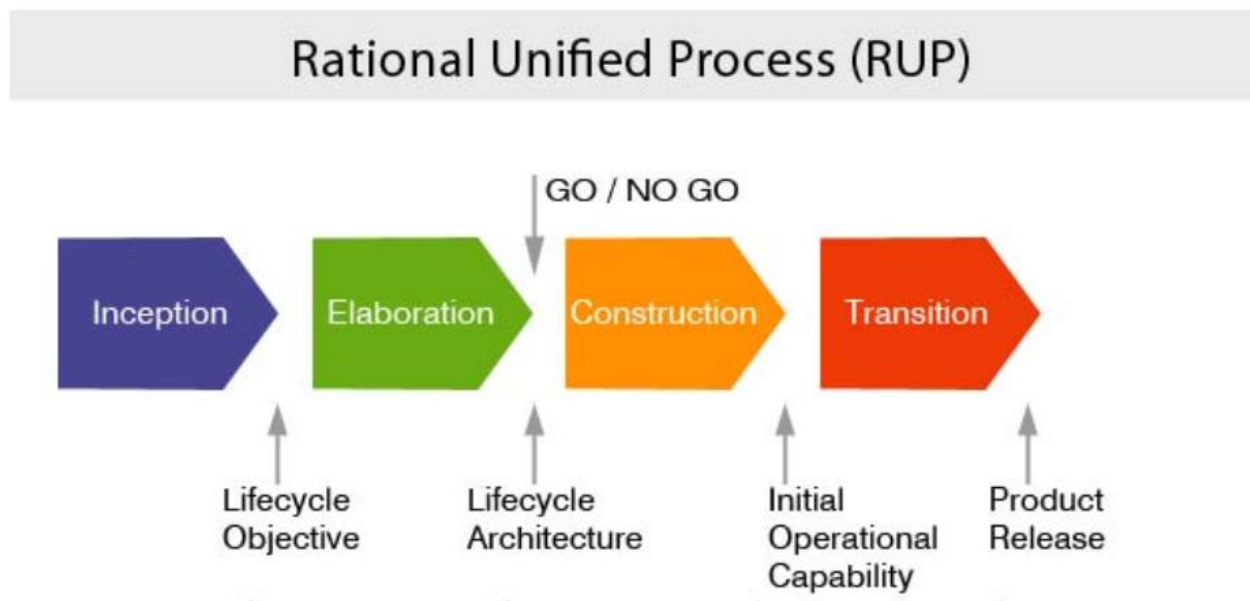


Figure 1: Phases of RUP model

Resource requirement

Software Requirement

Adobe Illustrator

Adobe Illustrator is a software application for creating drawings, illustrations, and artwork using a Windows or MacOS computer. Illustrator is widely used by graphic designers, web designers, visual artists, and professional illustrators throughout the world to create high quality artwork. Illustrator includes many sophisticated drawing tools that can reduce the time need to create illustrations.

Oracle database

Oracle database (Oracle DB) is a relational database management system. The system is built around a relational database framework in which data objects may be directly accessed by users (or an application front end) through structured query language (SQL). Oracle is a fully scalable relational database architecture and is often used by global enterprises, which manage and process data across wide and local area networks.

PhpStorm

PhpStorm provides an editor for PHP, HTML and JavaScript with on-the-fly code analysis, error prevention and automated refactoring for PHP and JavaScript code.

Language- Php

PHP is known as the general-purpose programming language. It is used as a server-side scripting language that is mainly used for the development of web sites. The PHP frameworks also make web development easier. This framework helps in reusing the same code and there is no need to write the lengthy and complex code for the web applications. PHP frameworks are mainly open source and can be used easily. The advantage of using php are as follow:

- PHP is open source and free of cost, which helps us to install it quickly and readily available for use.
- PHP is mainly supported by all the operating systems like Windows, Unix, Linux etc. The PHP based developed web applications can be easily run on any platform.

- It helps in saving a lot of effort and cost.
- PHP is easily connected with the database and make the connection securely with databases. It has a built-in module that is used to connect to the database easily.
- PHP based web applications can be easily tested. PHP unit uses to perform the unit testing quickly and easily. It also helps the programmers to write test cases and perform the testing smoothly.

(educba, 2019)

Framework- Laravel

Laravel is an open-source PHP framework, which is robust and easy to understand. It follows a model-view-controller design pattern. Laravel reuses the existing components of different frameworks which helps in creating a web application. The web application thus designed is more structured and pragmatic.

The advantages of using Laravel are:

- Laravel has a pre-installed powerful and lightweight template engine, helping developers in making some extraordinary layouts with intensive content seeding. Laravel template offers various solid widgets with robust CSS and JS coding.
- Laravel is the framework that facilitates you at best by being the only provider having dynamic pre-installed libraries. These libraries include Object Oriented libraries that cannot be found in other PHP frameworks.
- Laravel also assist in generating URLs which becomes very helpful for building links in your templates. All Laravel corridors are effectively laden by the framework which is delineated in the app/Http/routes.php file.
- Generally, a developer needs to interact with the Laravel framework using a command line that develops and manages the Laravel project environment. Laravel provides an integrated command line tool called Artisan. This tool helps to create skeleton code and database architecture as well as their migrations. Database management becomes easier as a result.

(Khalid, 2019)

Work breakdown structure

Work Breakdown Structure		
Topic	Duration	Description
GUI prototype	2 weeks	GUI will be developed in this phase
GUI with all feature's integration	2 weeks	Integration of all features in GUI
Database Integration	1 week	The database will be integrated into the application
Completion of the project	4 weeks	All features are integrated into the web application and reviewed.
Showcase	2 days	The project is shown to the supervisor for the review and feedback.
Testing and Debugging	2 weeks	The project is finalized, all features are included and, is approved by the supervisor.
Documentation	6 weeks	The documentation of the whole project is done.

Table 1: Table of work breakdown

Milestones

Structure	Description	Time
Inception	Start of the project where research will be conducted, and resources will be collected.	10 days
Deciding the Topic		
Research about the topic		
Securing code resources		
Elaboration	Analysis of the project, Scope, and model creation, timeline creating use cases.	11 days
Analysis		
Draft software specification		
Develop Models, Timeline and Strategies		
Finalize the Concept, Timeline and Strategies		
Construction	Designing and coding of the website, testing, completing website design, checking functionalities, testing is done in this phase.	74 days
Review software Specification		
Wireframe Designing		
Developing Codes		
Testing (Primary Debugging)		
Transition	Final Stages of the product and deployment of the website with last of testing and writing documentation.	53 days
Final Testing		
Documentation		

Table 2: Table of milestone

Project Gantt Chart

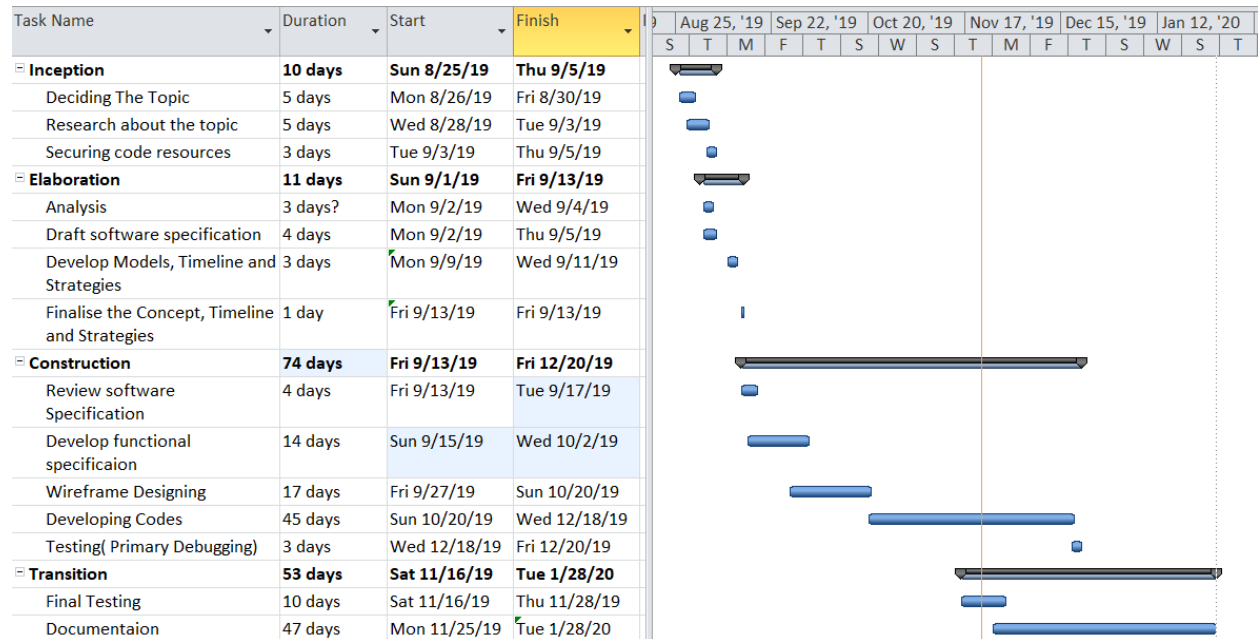


Figure 2: Gantt Chart

Conclusion

This is all about my project online voting. Online Voting is a web-based voting system that will help you manage your elections easily and securely. This voting system can be used for casting votes during the elections.

I am very grateful to be part of this project. As I had a great and useful experience while creating this project. To complete this project, lots of researches and hard work are going to be needed. I hope my respective supervisor will accept this proposal.

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