Online Polling System using UML Methodology

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Abstract
It deals with Online Polling which facilitates the public to vote on the internet rather than going to the polling booths. So, this document provides all the necessary information regarding the ONLINE POLLING and tells the way through which one can understand the overall objective of the project and each module included in it. This documentation is meant for software developers and provides an ease of information by providing various tools to describe the functioning of the project. The developer can get an idea about the need of the project along with the hardware and the software demands of the project. Moreover, one can get a succinct idea about the project by only looking on various Diagrams used in online polling system. In order to fulfil these objectives, it is crucial to apply efficient methodologies to support ICT (Information and Communication Technology) implementation.

Keywords: UML, ICT, Voter ID, ECD, SSL, Code Generation, Forward Engineering and Reverse Engineering

1. INTRODUCTION

This paper concerning is for the ONLINE POLLING SYSTEM. The purpose of Online Polling system is to categorize all the technical aspects of our report and to provide a detailed description of the functional and performance characteristics of online polling system. The primary goal of this document is to facilitate the full understanding of the problem being solved by breaking down the online polling system in simpler components. Included in this discussion will be how we have decided to modularize our overall application, the organization of these modules, and how we plan to implement each component in terms of development and design. This allows for a more comprehensive verification and validation process.

1. 1 Introduction To Tool:

A UML tool or UML modeling tool is a software application that supports some or all of the notation and semantics associated with the Unified Modeling Language (UML), which is the industry standard general purpose modeling language for software engineering.

UML tool is used broadly here to include application programs which are not exclusively focused on UML, but which support some functions of the Unified Modeling Language, either as an add-on, as a component or as a part of their overall functionality.

1) 1.2 Kinds of Functionality

UML tools support the following kinds of functionality:

1.1) Diagramming

Diagramming in this context means creating and editing UML diagrams; that is diagrams that follow the graphical notation of the Unified Modeling Language.

1.12) Round-trip engineering

Round-trip engineering refers to the ability of a UML tool to perform code generation from models, and model generation from code (a.k.a., reverse engineering), while keeping both the model and the code semantically consistent with each other.

2) 1.3 Code generation

Code generation in this context means, that the user creates UML diagrams, which have some connoted model data, and the UML tool derives from the diagrams parts or all of the source code for the software system. In some tools, the user can provide a skeleton of the program source code, in the form of a source code template where predefined tokens are then replaced with program source code parts during the code generation process.
3) Reverse engineering

Reverse engineering in this context means, that the UML tool reads program source code as input and derives model data and corresponding graphical UML diagrams from it.

2. FUNCTIONAL MODULES

2.1.1 User Contact Information:
This subsection includes that part of system which will control the function of gathering the information from the user and it will be stored into the database.

2.1.2 Maintaining Logs:
Activities of the System Users can be tracked through the logs, which are maintained by the system. Such that, tracking the details of all those voters who have already voted.

2.1.3 Administrator:
Administrator is responsible for managing system and viewing logs. In this case, Election Commission officers (ECOs) are assigned the job of Administrator.

2.1.4 Manage System Users:
The administrator will create different users for the system which will perform their respective roles. Privileges can granted and revoked from the user any time by the Administrator.

2.1.5 Views Logs:
Other role of the administrator is to checking for the logs of auditing and hence enhances system security and integrity.

2.1.6 Provide Services:
The Administrator provides various system services like in this case Voter ID is allotted by the ECOs only.

2.1.7 Viewing Details:
Viewing the details of users stored in the database, updates in the polling and the information regarding candidates fighting for elections.

3. Use Case Diagrams

Validate ID:

The voter should enter his/her ID and Password to validate for his/her eligibility to vote. Other users should enter their respective IDs to validate and access their accounts.

User Contact Information:
This subsection includes that part of system which will control the function of gathering the information from the user and it will be stored into the database.

Maintaining Logs:
Activities of the System Users can be tracked through the logs, which are maintained by the system. Such that, tracking the details of all those voters who have already voted.

Get Information:
Voters can get the information about any candidate and about the previous results of the elections.

Manage System Users:
The administrator will create different users for the system which will perform their respective roles. Privileges can granted and revoked from the user any time by the Administrator.
Manage Groups: Field officer has to categorize the user according to some criteria. Like, group those who have already voted and those who have don’t separately.

View Status: User can view the status of the polling any time. Moreover, Users can check for their details already stored in the database so in case of any discrepancies, he/she can request for a change.

Maintaining Records: Field officer has to maintain all the necessary information regarding the elections. This will help in maintain a polling history and voter can also get the knowledge regarding any party.
4. Class Diagrams
5. State Chart Diagrams

Name of Use Case: Create System User
Description: Create a user and provide a unique user Id and password.
Preconditions: Election Commission Officer (Administrator) must be logged in.

Normal Flow of Events:
- New login name and password is provided to user. Also some privileges and permissions are provided.
- Save the details in database.

Alternate Flow of Events:
- Warning message is displayed if a duplicate name exists.
- Details have to be filled again.

Post Condition: A user is created with unique ID.

6. IMPLEMENTATION ISSUES:

1. Taking Requirements seriously: voting systems are like all other systems. In order to implement a successful system it is not only necessary to understand the requirements correctly; it is also necessary to respect them. In order to have success with voting technology, it has to be tailored to meet the requirements of election organizers and voters rather than those of the vendors.

2. Computer Knowledge: every user must aware about computer that how to operate it.

3. Deployment of a Private Key: Having the voters generate one-time key pairs on their web browsers and having certificates on those keys issued on-line. In practice we work with the model that each voter receives a cryptic user identity and a one-time password, based on which the certificate is issued on-line. The user identity and the password must be received through two different channels in order to provide a decent level of security. We consider two physical letters with some days in between as the most realistic option

4. Protection against Hackers: We will understand the word hacker in a broader sense so that it includes system administrators, who can completely legitimately observe and control computers of voters remotely, as well as hackers breaking in without permission. If a hacker observes the voting process, he will not gain any information about the candidate chosen, even if he has full control of the computer of the voter. Furthermore, if he tampers with the vote, the outcome will be uniformly distributed on all candidates.

5. Server Authentication: Server authentication is normally obtained by a SSL connection between a web server and a web browser. Technically, this works well, but in practice most web browsers are wrongly configured and most voters will be unable to tell, whether a server has been correctly authenticated or not. As a solution to this problem we propose that the paper ballot with permutations and one piece of authentication information shall also contain a piece of graphics, different for each voter. Furthermore, it will include instructions for the voter about how to verify that the same graphics appears on the web page from where he votes. When the voter enters the first piece of authentication means, he will be confronted with some graphics on the screen. If it is not identical to the graphics on his paper ballot, he will have instructions to exit the faked web server.

6. Long Term Privacy: The universal variability means that anybody can connect each voter to the cipher text. Security is based on the assumption that it is infeasible to decrypt the cipher text and see what the voter has voted. In order to protect the privacy of the voter, not just at the time of the election but also several years into the future, the keys used for the cryptosystem must be large.

REFERENCES


