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**Department of Computer Engineering**

## **CSL605 SKILL BASED LAB COURSE: CLOUD COMPUTING**

### **Mini Project Report**

- ❖ **Title of Project** : Online Voting System
- ❖ **Year and Semester** : T.E. (Sem VI)
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## ❖ Problem Definition :

In today's digital age, the need for efficient and accessible methods of decision-making is paramount. Traditional voting systems are often cumbersome and time-consuming, requiring physical presence and manual tabulation of votes. To address these challenges, there is a growing demand for an online voting platform that facilitates quick and convenient voting processes. The problem at hand is to develop a simple yet robust online voting website that allows users to participate in polls created by administrators.

The challenge is to create an intuitive online voting website allowing administrators to add new topics (with options A to D) for voting, while enabling users to securely cast their votes. Key features include user authentication, topic creation, real-time vote counting, data security, scalability, user feedback mechanisms, and comprehensive reporting. The system must ensure secure user authentication, real-time vote counting, and robust data security. It should also be scalable to accommodate a large user base and provide administrators with valuable insights through comprehensive reporting.

## ❖ Introduction

In the ever-evolving landscape of technology, the need for streamlined and accessible methods of decision-making has become increasingly apparent. Traditional voting systems, entrenched in physical ballots and manual tabulation, often prove cumbersome and inefficient, hindering the democratic process. Recognizing this gap, there arises a compelling opportunity to develop an innovative solution that leverages the power of the digital realm to facilitate seamless and inclusive voting experiences.

The problem at hand lies in the creation of a robust and user-friendly online voting platform. This platform must serve as a conduit for administrators to effortlessly introduce new topics for voting, while empowering users with the ability to securely cast their votes from the comfort of their digital devices. The envisioned system aims to bridge the gap between administrators seeking efficient means of gauging public opinion and users yearning for a convenient avenue to express their preferences.

At its core, the proposed online voting platform is designed to be intuitive and accessible to users of all backgrounds. Through a sleek and user-friendly interface, administrators will have the capability to create and manage voting topics seamlessly. These topics will feature predefined options, typically denoted as A to D, allowing users to select their preferred choice with ease. The system will further empower administrators by providing them with the flexibility to set the duration of each voting session, ensuring timely and efficient decision-making processes.

Central to the success of this endeavor is the integration of robust security measures to safeguard the integrity of the voting process. User authentication mechanisms will be implemented to verify the identity of participants and prevent unauthorized access.

Additionally, stringent data encryption protocols will be employed to protect sensitive user information and mitigate potential security threats.

Real-time vote counting mechanisms will serve as the cornerstone of transparency within the platform. Users will be able to witness the dynamic tallying of votes as they are cast, instilling confidence in the accuracy and fairness of the voting process. Furthermore, the platform will be designed with scalability in mind, capable of accommodating a burgeoning user base and ensuring optimal performance even during periods of peak activity.

In essence, the proposed online voting platform endeavors to redefine the paradigm of decision-making in the digital age. By harnessing the transformative potential of technology, it aspires to democratize the process of opinion gathering, fostering greater engagement and participation among diverse communities. Through this endeavor, we embark on a journey towards a more inclusive and democratic society, where the voices of all individuals are not only heard but valued in shaping the course of collective action.

## ❖ **Description**

The development of an Online Voting Platform represents a significant endeavor aimed at revolutionizing the traditional methods of decision-making. Leveraging the power and scalability of cloud services, particularly Amazon Web Services (AWS), this project endeavors to create a robust and user-friendly platform that facilitates seamless voting experiences. In this endeavor, AWS Relational Database Service (RDS) and Elastic Beanstalk serve as foundational pillars, providing scalable and reliable infrastructure to support the platform's operations.

Furthermore, by utilizing AWS RDS, the platform ensures data integrity and reliability, crucial for maintaining the trust and confidence of users in the voting process. Elastic Beanstalk complements this by automating deployment and scaling tasks, allowing the development team to focus on enhancing features and user experience. This innovative approach not only modernizes decision-making processes but also fosters greater inclusivity and accessibility, empowering individuals from diverse backgrounds to participate in shaping collective outcomes. By leveraging AWS's global infrastructure, the platform can withstand potential hardware failures or regional outages, ensuring uninterrupted service availability for users worldwide.

In summary, the integration of AWS RDS and Elastic Beanstalk elevates the online voting platform to new heights, enabling it to deliver unparalleled reliability, scalability, and security. By embracing cloud-native technologies and best practices, the platform sets a new standard for modern decision-making processes, empowering users to engage meaningfully in shaping collective outcomes.

## → Cloud Services Used:

### **1. Amazon RDS (Relational Database Service):**

Amazon RDS offers a managed relational database service, eliminating the complexities of database management tasks such as provisioning, patching, and backups. In our project, RDS serves as the backbone for storing critical data including user authentication details, voting topics, options, and vote counts. By utilizing RDS, we ensure data integrity, scalability, and high availability, essential for a mission-critical application like an online voting platform.

### **2. AWS Elastic Compute Cloud (EC2):**

Amazon Elastic Compute Cloud (Amazon EC2) provides on-demand, scalable computing capacity in the Amazon Web Services (AWS) Cloud. Using Amazon EC2 reduces hardware costs so you can develop and deploy applications faster. You can use AmazonEC2 to launch as many or as few virtual servers as you need, configure security and networking, and manage storage. You can add capacity (scale up) to handle compute-heavy tasks, such as monthly or yearly processes, or spikes in website traffic. When Usage decreases, you can reduce capacity (scale down) again. You can add capacity (scale up) to handle compute-heavy tasks, such as monthly or yearly processes, or spikes in website traffic. When usage decreases, you can reduce capacity (scale down) again. We have connected our RDS database instance to an EC2 instance. This helps to manage and query the database. By connecting to the EC2 instance, we can easily query the MySQL database for any data and manipulation.

### **3. Amazon Elastic Beanstalk:**

Amazon Elastic Beanstalk provides an easy-to-use platform for deploying and scaling web applications and services. Leveraging Elastic Beanstalk, we can deploy our application seamlessly, without the need to manage the underlying infrastructure. Elastic Beanstalk automatically handles the deployment, load balancing, scaling, and monitoring of our application, allowing us to focus on development and enhancing user experience. Additionally, Elastic Beanstalk integrates seamlessly with other AWS services, facilitating streamlined deployment and management workflows.

## → Software Requirements:

### 1. Programming Languages and Frameworks:

PHP (version 7.x): PHP will serve as the primary backend scripting language for server-side logic and data processing.

HTML/CSS: HTML and CSS will be used for structuring web pages and styling the user interface, ensuring a visually appealing voting platform.

### 2. Database Management System (DBMS):

MySQL (version 5.x): MySQL will be utilized as the relational database management system (RDBMS) to store and manage voting-related data, including user accounts, voting topics, options, and vote counts.

### 3. AWS Services Integration:

Amazon RDS: Amazon RDS will provide managed database services for MySQL, ensuring scalability, reliability, and automated backups for voting-related data.

Amazon Elastic Beanstalk: Amazon Elastic Beanstalk will automate the deployment, scaling, and management of the web application, facilitating seamless deployment on AWS infrastructure.

### 4. Development Tools and IDEs:

Code Editors: Development can be facilitated using code editors such as Visual Studio Code, Sublime Text, or PhpStorm, offering features like syntax highlighting, code completion, and version control integration.

## ❖ Implementation Details :

### 1. Setting Up AWS Services:

Set up Amazon RDS for MySQL database hosting.

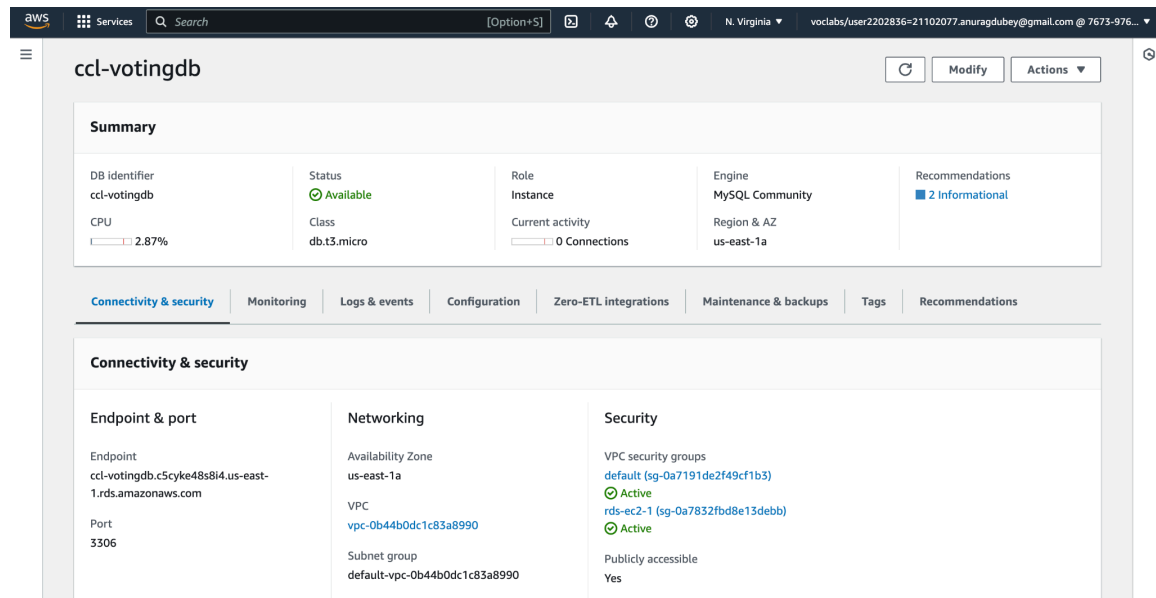


Fig: 01 : RDS Database in AWS

### 2. Develop the Online Voting Website:



Fig: 02 Landing Page

# ONLINE VOTING SYSTEM

(Welcome to admin login pannel)

[BACK](#)

ADMIN LOGIN PANNEL

Login id:

Password

Fig. 03 : Admin Login Page

# ONLINE VOTING SYSTEM

[LOGOUT](#) | [BACK](#)

RESULTS LIST									
Topic id	Topic discription	option 1	Total vote of op 1	option 2	Total vote of op 2	option 3	Total vote of op 3	option 4	Total vote of op 4
5	Best Cricket player	Virat	1	Rohit	0	Rahul	1	Anurag	0
4	Which of the following is the best political party for India?	Bhartiya janta party	4	Jan kalyan party	0	Aam admin party	1	Jan adhikar party	2
1	Which is the most important thing for our country?	Development	0	Education	2	Good governance	1	Health	0

Fig. 04 : Results Page



# ONLINE VOTING SYSTEM

(Welcome to Admin dashboard)

[LOGOUT](#) | [BACK](#)

PLEASE FILL THIS FORM TO ADD TOPIC

Enter topic discription:	<input type="text" value="Enter topic discription"/>
Enter first option:	<input type="text" value="Enter your first option"/>
Enter second option:	<input type="text" value="Enter your second option"/>
Enter third option:	<input type="text" value="Enter your third option"/>
Enter fourth option:	<input type="text" value="Enter your four option"/>
<input type="button" value="SUBMIT"/>	

Fig.05 : Page For Adding New Topics For Voting

### 3. Deploy Application to Elastic Beanstalk:

The screenshot displays the AWS Elastic Beanstalk console for an environment named 'Ccl-voting-env'. The top navigation bar shows the AWS logo and various account details. The breadcrumb trail indicates the path: Elastic Beanstalk > Environments > Ccl-voting-env. The main content area is divided into several sections. The 'Environment overview' section on the left shows the environment's health as 'OK' with a green checkmark, the domain 'cclvoting.us-east-1.elasticbeanstalk.com', and the application name 'ccl-voting'. The 'Platform' section on the right shows the platform as 'PHP 8.2 running on 64bit Amazon Linux 2023/4.1.1' with a 'Supported' platform state. Below these sections are tabs for 'Events', 'Health', 'Logs', 'Monitoring', 'Alarms', 'Managed updates', and 'Tags'. The 'Events' tab is selected, showing a list of events with a filter bar and a table of recent events. The table has columns for 'Time', 'Type', and 'Details'. The first event listed is from April 9, 2024, at 16:21:18 (UTC+5:30), with a type of 'INFO' and details stating 'Environment health has transitioned from Severe to Ok.'

Fig.06 : Elastic Beanstalk

## ❖ **Learning Outcome:**

The implementation of an online voting website on AWS RDS and Elastic Beanstalk provides a rich learning experience encompassing various aspects of cloud computing, web development, and database management. Through this project, participants can expect to achieve the following learning outcomes:

1. **Cloud Infrastructure Mastery:** Participants will gain a deep understanding of cloud infrastructure concepts and best practices by deploying and managing an application on AWS. They will learn how to provision and configure resources such as RDS database instances and Elastic Beanstalk environments, optimizing performance, scalability, and cost-effectiveness.
2. **Database Management Proficiency:** Through the utilization of MySQL on AWS RDS, participants will enhance their database management skills. They will learn how to design, create, and maintain relational databases, implement efficient data storage and retrieval mechanisms, and ensure data integrity and security. Additionally, participants will gain insights into backup and recovery strategies, scaling options, and monitoring techniques for database instances.
3. **Deployment and DevOps Skills:** By deploying the application on Elastic Beanstalk, participants will gain hands-on experience in deployment automation, scalability management, and monitoring in a production environment. They will learn how to set up continuous integration and deployment pipelines, automate testing and deployment workflows, and ensure high availability and fault tolerance of the application.

In summary, the implementation of an online voting website on AWS RDS and Elastic Beanstalk offers a comprehensive learning experience encompassing cloud infrastructure, database management, web development, deployment automation, security, and project management skills. Participants will emerge from this project with a solid foundation in cloud computing and web development, equipped with the knowledge and skills necessary to design, deploy, and manage scalable and secure applications in the cloud.