PARSHVANATH CHARITABLE TRUST'S

A. P. Shah Institute of Technology

Thane, 400615

Academic Year: 2023-24

Department of Computer Engineering

CSL605 SKILL BASED LAB COURSE: CLOUD COMPUTING

Mini Project Report

- **Title of Project** : **Recipe realm**
- **Year and Semester** : **3rd Year (VI Semester)**
- **Group Members Name and Roll No.** : **Amogh Dewanpelli(26)**
  Omkar Jadhav(43)
  Shreyas Jadhav(45)

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Problem Definition

The culinary world is vast and diverse, with an ever-increasing number of individuals seeking recipes, cooking tips, and culinary inspiration online. In response to this demand, there is a need for a robust and scalable recipe website that can accommodate the growing user base while ensuring a seamless browsing experience. However, the challenge lies in deploying and managing such a website efficiently to meet the demands of reliability, scalability, security, and performance.Currently, without a dedicated cloud infrastructure, hosting a recipe website can be cumbersome and costly. Traditional hosting methods often lack the flexibility to handle sudden spikes in traffic or the ability to automatically scale resources as needed. Moreover, managing databases for storing recipe data and user information can be complex and resource-intensive.To address these challenges, the proposed project aims to leverage Amazon Web Services (AWS) cloud services, specifically Elastic Beanstalk (EC3) for application hosting and Amazon RDS (Relational Database Service) for database management. By utilizing these services, the project seeks to achieve several key objectives:

1. Seamless Deployment: Utilizing Elastic Beanstalk, the website will be deployed effortlessly, with AWS handling the underlying infrastructure provisioning, load balancing, and auto-scaling based on demand.

2. Automatic Scaling: Elastic Beanstalk's auto-scaling feature will enable the website to dynamically adjust resources to handle fluctuations in traffic, ensuring optimal performance during peak times without manual intervention.

3. Efficient Database Management: Amazon RDS will be used to manage the relational database, providing features such as automated backups, replication, and scalability, while relieving the burden of database administration tasks.

4. Robust Security Measures: AWS offers a range of security features, including network isolation, encryption, access control, and monitoring, ensuring the confidentiality, integrity, and availability of user data.

Introduction

In today's digital age, the culinary world is not only about preparing meals but also about sharing experiences, discovering new flavors, and connecting with like-minded individuals. With the proliferation of smartphones, tablets, and computers, accessing recipes and culinary content has never been easier. As a result, there is a growing demand for online platforms that offer a rich repository of recipes, cooking tips, and culinary inspiration. In response to this demand, the proposed project seeks to develop a comprehensive recipe website hosted on the Amazon Web Services (AWS) cloud infrastructure, utilizing Elastic Beanstalk (EC2) for application hosting and Amazon RDS (Relational Database Service) for database management.

The internet has revolutionized the way people approach cooking and food culture. Gone are the days of dusty cookbooks and handwritten recipes; now, culinary enthusiasts turn to the web for instant access to a vast array of culinary resources. Whether it's a quick weekday dinner recipe, a gourmet dessert for a special occasion, or dietary-specific meals tailored to individual preferences, the internet offers a treasure trove of culinary knowledge at our fingertips. However, with this wealth of information comes the challenge of navigating through countless websites, blogs, and forums to find reliable and high-quality recipes.The proposed project aims to address this challenge by creating a centralized platform where users can discover, contribute, and share recipes with ease. By leveraging the scalability and reliability of AWS cloud services, the project seeks to ensure a seamless browsing experience for users, regardless of the volume of traffic. Elastic Beanstalk will be used to deploy and manage the application, allowing for automatic scaling of resources based on demand. This means that the website will be able to handle sudden spikes in traffic without compromising performance or user experience.

In addition to application hosting, efficient database management is crucial for the success of the project. Amazon RDS will be utilized to manage the relational database, providing features such as automated backups, replication, and scalability. This will streamline the management of recipe data, user accounts, and other essential information, ensuring data integrity and reliability.

Security is another paramount concern in the digital landscape, especially when it comes to handling sensitive user data. AWS offers a robust set of security features, including network isolation, encryption, access control, and monitoring, to safeguard user information and prevent unauthorized access.Overall, the proposed project aims to create a user-friendly, reliable, and secure recipe website that caters to the needs of culinary enthusiasts worldwide. By harnessing the power of AWS cloud services, the

Description

The project entails the comprehensive development and deployment of a recipe website on the AWS (Amazon Web Services) cloud platform. This website will serve as a dynamic platform for users to discover, share, and explore diverse culinary creations ranging from traditional dishes to innovative recipes tailored to specific dietary needs.

Cloud Services Used:

1. Elastic Beanstalk: Elastic Beanstalk will be at the core of the deployment strategy. It simplifies the deployment, management, and scaling of web applications and services by abstracting away the underlying infrastructure complexities. Leveraging Elastic Beanstalk will enable swift deployment of updates and seamless scalability to accommodate fluctuating user traffic.

2. EC2 (Elastic Compute Cloud): EC2 instances will be provisioned to host the web application. EC2 offers resizable compute capacity in the cloud, providing developers with the flexibility to launch virtual servers optimized for their specific application requirements. EC2 instances will be configured to run the web server and other application components efficiently.

3. RDS (Relational Database Service): RDS will serve as the backend database solution for storing and managing recipe data. By leveraging RDS, the project will benefit from a fully managed relational database service that automates routine database administration tasks such as backups, patch management, and scaling. RDS supports multiple database engines, allowing flexibility in choosing the most suitable option for the project's needs, such as MySQL or PostgreSQL.

Methodologies Used:

1. Agile Development: The project will adhere to agile development principles to foster collaboration, adaptability, and responsiveness to evolving requirements. Agile methodologies emphasize iterative development cycles, frequent stakeholder feedback, and incremental delivery of features. By embracing agility, the project team can prioritize user-centric functionality and swiftly respond to changing market demands.

2. DevOps Practices: DevOps practices will be integrated into the development and deployment workflows to streamline processes and enhance collaboration between development and operations teams. Continuous integration (CI) and continuous deployment (CD) pipelines will automate the build, test, and deployment phases, enabling rapid and reliable delivery of updates to the recipe website. Additionally, infrastructure automation

through Infrastructure as Code (IaC) will facilitate consistent and reproducible provisioning of AWS resources.

3. Infrastructure as Code (IaC): Infrastructure as Code principles will guide the provisioning and management of AWS resources. Infrastructure definitions will be codified using tools such as AWS CloudFormation or AWS CDK (Cloud Development Kit), enabling infrastructure configurations to be version-controlled, reviewed, and deployed alongside application code. IaC facilitates infrastructure repeatability, scalability, and auditability, while reducing the risk of manual errors and ensuring consistency across environments.

Software Requirements:

1. Programming Languages: The web application will be developed using a combination of frontend and backend programming languages. For frontend development, JavaScript and popular frameworks such as React.js will be utilized to create interactive user interfaces. On the backend, Python and frameworks like Flask or Django will power the server-side logic and API endpoints.

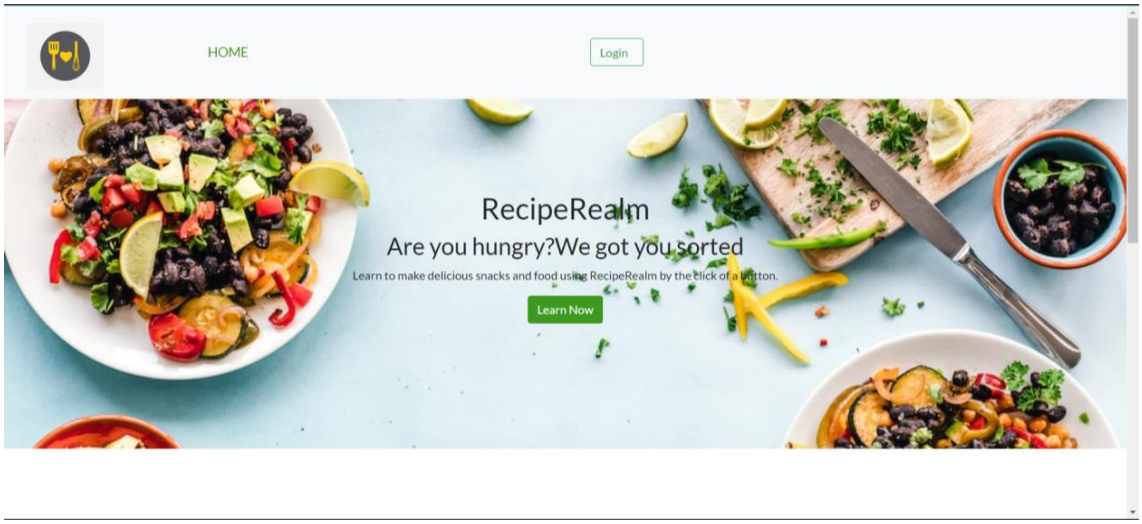
2. Database Management System: A compatible database management system will be required to interact with RDS and manage recipe data effectively. Options include MySQL, PostgreSQL, or other relational database engines supported by RDS.

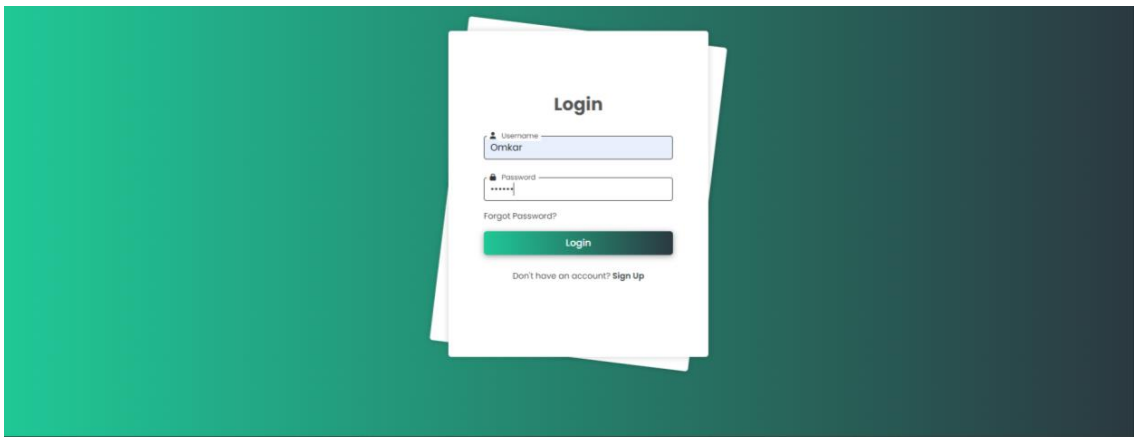
3. Development Tools: Development tools such as code editors (e.g., Visual Studio Code, Sublime Text), version control systems (e.g., Git), and package managers (e.g., npm for JavaScript, pip for Python) will be essential for writing, managing, and collaborating on codebase changes throughout the development lifecycle.

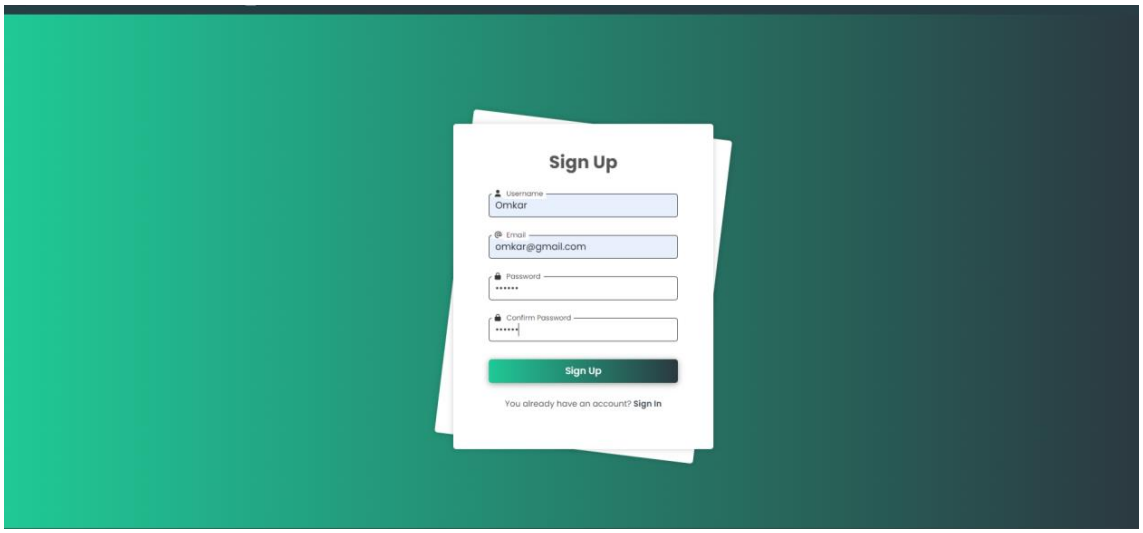
4. AWS Account: An AWS account with appropriate permissions and access credentials will be necessary to provision, configure, and manage AWS resources. The AWS Management Console and command-line interface (CLI) will be used to interact with AWS services and monitor the health and performance of the deployed application.

By meticulously implementing these methodologies and leveraging AWS cloud services, the project aims to deliver a resilient, scalable, and user-friendly recipe website that fulfills the needs and expectations of its target audience. Through agile development practices, DevOps automation, and infrastructure as code, the project endeavors to accelerate time-to-market, enhance operational efficiency, and continuously iterate and improve the recipe website to maintain its relevance in the competitive online culinary landscape.

Implementation



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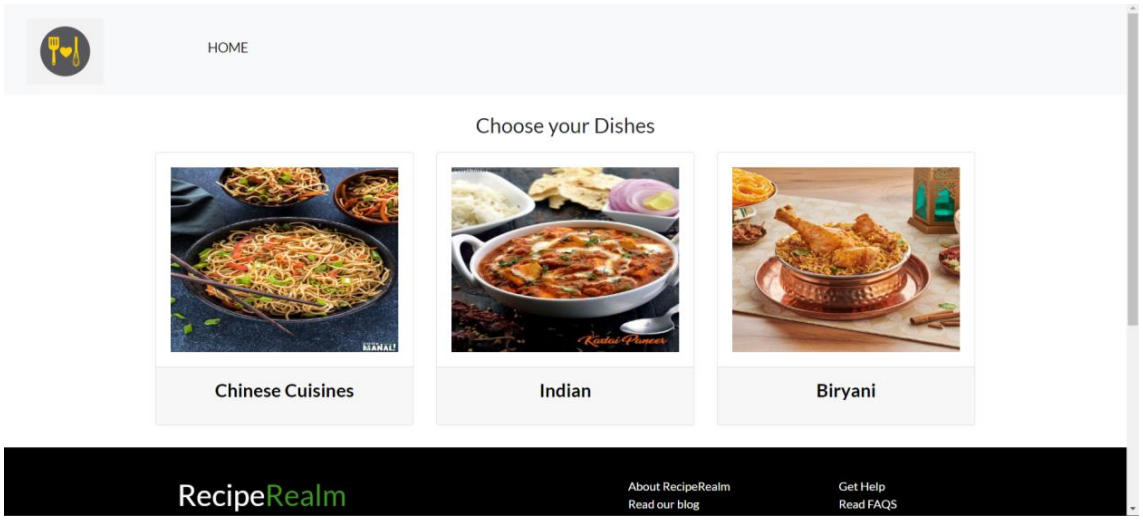
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Learning outcomes

Through developing and deploying the recipe website on AWS using services like Elastic Beanstalk, EC2, and RDS, several significant learning outcomes are expected. Participants will master cloud infrastructure by designing, provisioning, and managing it on AWS. Working with Elastic Beanstalk, EC2 instances, and RDS databases will deepen their understanding of deploying scalable, resilient, and cost-effective web applications.Engaging in DevOps practices like continuous integration, continuous deployment, and infrastructure as code will enhance proficiency in modern software development methodologies. Participants will automate build, test, and deployment pipelines, streamline collaboration between development and operations teams, and improve overall agility and efficiency.

Managing a relational database using RDS will strengthen database management skills. Participants will learn to design schemas, optimize performance, and implement data storage and retrieval mechanisms while ensuring security and compliance.Following an agile development methodology will cultivate essential skills in iterative development, stakeholder engagement, and adaptability. Participants will prioritize user stories, break down tasks into manageable increments, and deliver value incrementally, fostering a customer-centric approach.

Troubleshooting issues related to scalability, reliability, performance, and security will sharpen problem-solving skills. Participants will gain confidence in addressing real-world technical challenges.Collaborating with team members and stakeholders will enhance communication and collaboration skills. Effective communication, task delegation, and conflict resolution will foster a collaborative team environment.

Overall, the project offers a comprehensive learning experience encompassing technical skills, soft skills, and practical insights into cloud computing, software development, and agile methodologies. Participants will emerge equipped with valuable knowledge, experience, and confidence to tackle complex challenges in the technology landscape.