AWS-Integrated Nutrition Guidance Application with S3 and EC2

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ABSTRACT:

The AWS-Integrated Nutrition Guidance Application is a web-based application developed to digitalize and simplify nutrition planning and dietary guidance using cloud computing technologies. The system enables secure user registration, personalized diet recommendation, and efficient data storage through AWS services. It provides separate dashboards for users and administrators, ensuring role-based access and smooth data flow. Users can enter personal health details such as age, weight, height, and dietary preferences to receive customized nutrition plans through a user-friendly interface. Administrators can manage nutrition datasets, update dietary guidelines, and monitor user activity efficiently. Developed using HTML, CSS, JavaScript, Node.js, and AWS cloud services, the system ensures scalability, security, and data reliability. Amazon EC2 hosts the application, while Amazon S3 serves as centralized storage for nutrition data and user records. Secure authentication mechanisms safeguard user information. The system significantly reduces manual consultation effort and improves accessibility to nutrition guidance. Overall, it enhances accuracy, transparency, and efficiency in digital nutrition management.

KEYWORDS:

Nutrition Guidance Application, AWS, Amazon EC2, Amazon S3, Web Application, Cloud Computing, Data Security.

INTRODUCTION:

Nutrition management is an essential aspect of maintaining a healthy lifestyle and preventing lifestyle-related diseases. Traditionally, nutrition guidance is provided through manual consultations and physical records, which are often time-consuming, inconsistent, and difficult to track. Such conventional approaches lack

scalability and accessibility, especially for individuals in remote areas. Therefore, there is a growing need for automated digital solutions that provide reliable and personalized nutrition guidance. The proposed AWS-Integrated Nutrition Guidance Application is a web-based platform designed to digitalize nutrition planning and dietary recommendation processes. It allows users to register, log in securely, and access personalized nutrition plans based on their health parameters. Administrators can manage nutritional data and update diet plans efficiently. The system is developed using HTML, CSS, JavaScript, Node.js, and AWS cloud services such as EC2 and S3, ensuring scalability, flexibility, and data reliability. By leveraging cloud infrastructure, the system improves accessibility, minimizes manual errors, and provides a transparent, user-friendly digital platform for nutrition management.

LITERATURE SURVEY:

Research indicates that traditional nutrition consultation methods rely heavily on manual tracking and physical interactions, which limits accessibility and scalability. Several studies emphasize the role of cloud-based health applications in improving personalized healthcare delivery. Smith et al. (2020) proposed a cloud-based diet recommendation system that improved user engagement through automated feedback. Kumar and Rao (2021) highlighted that cloud-hosted nutrition platforms enhanced data availability and reduced operational costs. Patel et al. (2022) explored the use of AWS services for scalable health applications and demonstrated improved reliability using EC2 and S3. Another study by Sharma et al. (2023) focused on secure authentication in healthcare applications using token-based access control. Collectively, these studies validate that cloud-integrated nutrition systems provide a secure, scalable, and efficient alternative to traditional nutrition management methods.

RELATED WORK:

Nutrition guidance systems have evolved from manual diet charts to intelligent web-based platforms. Earlier systems relied on offline records and lacked personalization. Researchers such as Verma et al. (2019) reported that digital nutrition platforms improved adherence to dietary plans. Commercial health applications offer diet tracking features but often lack transparency and customization. Recent research emphasizes cloud-based systems that use scalable infrastructure and secure authentication mechanisms. However, many existing solutions are costly and

complex. The proposed system addresses these challenges by offering a lightweight, cost-effective, and secure AWS-based nutrition guidance application suitable for educational and healthcare environments.

EXISTING METHOD:

In traditional nutrition management, diet planning and guidance are mostly handled manually through consultations and physical records. Users must rely on dieticians for updates, and there is no centralized system for tracking dietary history. Data storage is often unstructured, leading to inconsistencies and difficulty in retrieval. Security and privacy of health information are weak due to lack of encryption and controlled access. Existing mobile applications provide limited personalization and are not scalable for large user bases. Therefore, there is a need for a secure, cloud-based solution to automate nutrition guidance effectively.

PROPOSED METHOD:

The proposed AWS-Integrated Nutrition Guidance Application is a cloud-based system designed to automate diet planning and nutrition guidance. It provides role-based access for users and administrators. Users can securely log in, enter health parameters, and receive personalized nutrition recommendations.

Administrators can manage nutrition datasets and update dietary plans. The frontend is developed using HTML, CSS, and JavaScript, while Node.js handles backend operations. Amazon EC2 hosts the application, and Amazon S3 stores user and nutrition data securely.
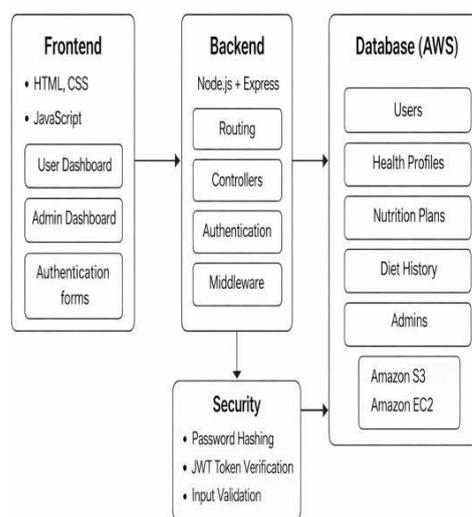
SYSTEM ARCHITECTURE:

Fig: System Achitecture of AWS-Integrated Nutrition Guidance Application with S3 and EC2

Fig. 1: System Architecture

METHODOLOGY DESCRIPTION

Front End: The AWS-Integrated Nutrition Guidance Application consists of a user-friendly front end developed using HTML, CSS, and JavaScript. The front end provides separate dashboards for users and administrators. Users can register, log in securely, enter personal health details, and

view personalized nutrition plans. Administrators can manage user data and nutrition-related information through the admin dashboard. Authentication forms are provided to ensure secure access to the system.

Back End: The backend of the system is developed using Node.js and Express. It handles all application logic and acts as an interface between the front end and the cloud database. The backend includes routing for handling user requests, controllers for processing nutrition data, authentication modules for validating users, and middleware for request handling and security enforcement. The backend application is hosted on Amazon EC2, ensuring scalability and reliable performance.

Database (AWS): The system uses AWS cloud services for data storage and management. Amazon S3 serves as the centralized storage for user profiles, health data, nutrition plans, diet history, and administrative records. The cloud-based storage ensures high availability, data durability, and easy retrieval of information. Amazon EC2 supports database access and application hosting within the AWS environment.

Security: Security is a critical component of the system. Password hashing techniques are implemented to protect user credentials. JSON Web Token (JWT) authentication is used to verify user identity and maintain secure sessions. Input validation mechanisms are employed to prevent unauthorized access and ensure data integrity. AWS security policies further enhance protection of sensitive nutrition and health data.

RESULTS AND DISCUSSION:

The home page of the AWS-Integrated Nutrition Guidance Application provides a simple and secure interface for both users and administrators. It contains login and registration options that allow users to access the system using valid credentials. The page ensures smooth navigation and acts as the entry point to the application.
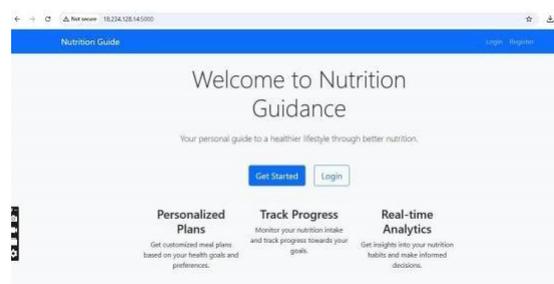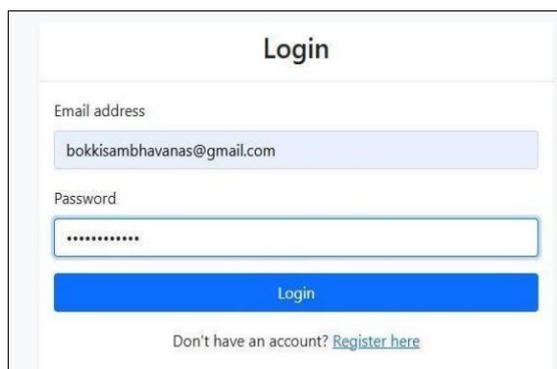

Fig. 2: Application Home Page
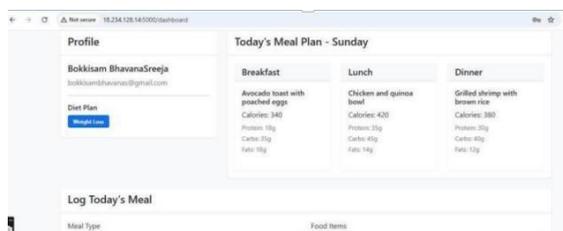
Fig. 3: Login Page

Fig. 4: Meal Plan Page

The update page allows users and administrators to modify existing nutrition and health-related information efficiently. After successful authentication, users can update personal details such as weight, dietary preferences, health goals, and activity levels. These updated inputs are processed by the backend to regenerate accurate and personalized nutrition recommendations.
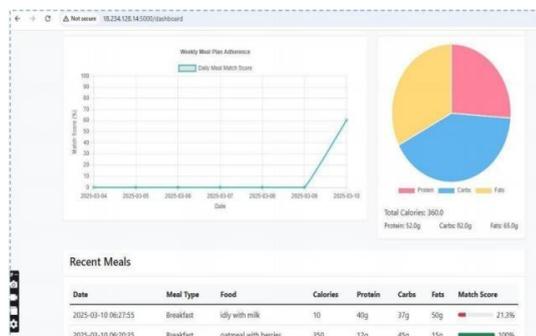

Fig. 5: Result:

Admin Dashboard: The admin dashboard enables administrators to manage user accounts and nutrition-related data efficiently. Administrators can add, update, or remove nutrition plans and monitor user activity. The dashboard also allows administrators to maintain diet guidelines and ensure data consistency across the application.

CONCLUSION AND FUTURE ENHANCEMENT:

The AWS-Integrated Nutrition Guidance Application effectively automates nutrition planning and dietary guidance using cloud technologies. It reduces manual effort, improves data accuracy, and ensures secure access to health information. By utilizing AWS EC2 and S3, the system achieves scalability and reliability. Overall, the application provides a cost-effective and efficient solution for digital nutrition management.

FUTURE SCOPE

In the future, the system can be enhanced by integrating AI-based diet recommendations and real-time health monitoring. Mobile application support can improve accessibility. Integration with wearable devices and cloud analytics can further personalize nutrition guidance.

Additional features such as multilingual support and health progress tracking can make the system more comprehensive.

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