**Chapter 3: System Features**

**3.1** **Description and Priority :**

**\*User Registration and Authentication (Priority: High):**

**Description: Users can create accounts on the NutriFit platform, providing essential details such as name, email address, and password. Additionally, robust authentication mechanisms ensure secure access to user accounts.**

**\*Product Browsing and Search (Priority: High):**

**Description: The platform enables users to effortlessly browse through a vast array of products categorized according to various health goals, dietary preferences, and product types. A robust search functionality facilitates quick and precise product discovery.**

**\*Product Details and Reviews (Priority: High):**

**Description: Detailed product pages furnish comprehensive information about each item, including nutritional facts, ingredients, pricing, and customer reviews. Users can make informed purchase decisions based on these insights.**

**Shopping Cart and Checkout (Priority: High):**

**Description: Users can add desired products to their virtual shopping carts for subsequent checkout. The checkout process is streamlined, allowing for secure payment transactions and multiple delivery options.**

**\*User Account Management (Priority: Medium):**

**Description: Registered users can manage their profiles, update personal information, view order history, track shipments, and manage subscriptions seamlessly.**

**\*Promotions and Discounts (Priority: Medium):**

**Description: The platform offers periodic promotions, discounts, and loyalty programs to enhance user engagement and incentivize purchases. Users can redeem coupon codes during checkout for discounted purchases.**

**\*Customer Support and Feedback (Priority: Medium):**

**Description: NutriFit provides various channels for users to seek assistance and provide feedback, including live chat support, email inquiries, and a dedicated feedback form. Customer inquiries and feedback are promptly addressed to ensure a satisfactory shopping experience.**

**\*Mobile Responsiveness (Priority: Low):**

**Description: While the primary focus is on desktop browsing, the NutriFit website features responsive design elements to ensure optimal user experience across mobile devices, albeit with a lower priority than core functionalities**

**\*\*These system features delineate the core functionalities of the NutriFit platform and prioritize them based on their significance in delivering a seamless and enriching user experience.**

**3.2 STIMULUS/RESPONSE SEQUENCES :**

\*User Registration and Authentication:

Stimulus: User navigates to the registration page and provides necessary details (name, email, password).

Response: System verifies the provided information, creates a new user account, and sends a confirmation email for account activation.

\*Product Browsing and Search:

Stimulus: User enters search queries or navigates through product categories.

Response: System retrieves relevant products based on the search criteria or category filters, displaying them in a visually appealing manner for user selection.

\*Product Details and Reviews:

Stimulus: User clicks on a product to view its details or scrolls through customer reviews.

Response: System displays comprehensive product information, including nutritional details, pricing, availability, and customer reviews fetched from the database.

\*Shopping Cart and Checkout:

Stimulus: User adds products to the shopping cart and proceeds to checkout.

Response: System updates the shopping cart contents in real-time, calculates the total order value, and guides the user through the checkout process, collecting shipping and payment details.

\*User Account Management:

Stimulus: User accesses the account settings or order history page.

Response: System authenticates the user's identity and grants access to the relevant account management functionalities, such as updating personal information, viewing order history, or managing subscriptions.

\*Promotions and Discounts:

Stimulus: User applies a coupon code during checkout.

Response: System validates the coupon code, applies the corresponding discount to the order total, and recalculates the final price accordingly.

\*Customer Support and Feedback:

Stimulus: User clicks on the live chat support widget or submits a feedback form.

Response: System initiates a live chat session with a customer support representative or records the user's feedback for further analysis and response.

\*Mobile Responsiveness:

Stimulus: User accesses the NutriFit website using a mobile device.

Response: System dynamically adjusts the layout and design elements to ensure optimal viewing and interaction on smaller screens, maintaining usability and functionality.

\*\*These stimulus/response sequences illustrate the user interactions and system responses for each core feature of the NutriFit platform, facilitating a seamless and intuitive user experience.

**3.3 FUNCTIONAL REQUIREMENTS :**

**-User:**

* View products.
* Search for order in a specific category.
* Order by select the product, order confirmation.
* Displays a detailed list of available items and make a “Order”.
* Make payment.

- **Admin:**

* Add new item.
* Contact with customer.
* Switch the product state.

-**System:**

* Grant login permissions to the correct account by checking authorization and authentication.
* The system request the username and password and imposes restrictions on each of them so that the username is not repeated and the password is not less than 8 characters.
* The system includes products suitable for all ages.
* Payment is made via bank account.
* Sending a text message to the user's mobile phone when the order arrives.

Other system features include:

DISTRIBUTED DATABASE (DDB):

1. **Data Distribution and Replication:**

**The system shall employ distributed database techniques to distribute data across multiple nodes for improved performance and fault tolerance.**

**Data replication mechanisms shall ensure redundancy and data consistency across distributed nodes.**

1. **Scalability and Load Balancing:**

**The distributed database shall support horizontal scalability to accommodate growing data volumes and user traffic.**

**Load balancing algorithms shall evenly distribute incoming requests across database nodes to optimize resource utilization and maintain system responsiveness.**

1. **Data Partitioning and Sharding:**

**The database shall implement efficient data partitioning and sharding strategies to evenly distribute data subsets across distributed nodes based on predefined criteria such as product categories or user regions.**

**Data partitioning shall facilitate parallel query processing and enhance overall system performance.**

CLIENT/SERVER SYSTEM:

1. **Client-Side Interactions:**

**The client-side application shall provide a user-friendly interface for seamless interaction with the NutriFit platform, allowing users to browse products, add items to the cart, and proceed with checkout.**

**Client-side scripts shall handle dynamic content rendering, user input validation, and asynchronous communication with the server for improved responsiveness.**

1. **Server-Side Processing:**

**The server-side application shall manage user sessions, process incoming requests, and orchestrate interactions with the distributed database.**

**Business logic components shall execute complex operations such as order processing, inventory management, and promotion evaluation in a scalable and efficient manner.**

1. **Data Retrieval and Manipulation:**

**The server-side application shall retrieve and manipulate data from the distributed database based on user requests, ensuring data consistency and integrity.**

**CRUD (Create, Read, Update, Delete) operations shall be implemented securely, adhering to access control policies and transaction management protocols.**

1. **Concurrency Control and Transaction Management:**

**The server-side system shall enforce concurrency control mechanisms to prevent data conflicts and ensure transaction isolation in a multi-user environment.**

1. **Security and Authentication:**

**The server-side application shall implement robust authentication and authorization mechanisms to validate user identities and enforce access controls.**

**Secure communication protocols (e.g., HTTPS) shall be employed to protect sensitive data transmission between clients and servers.**

These functional requirements delineate the key capabilities and interactions of the distributed database and client/server components within the NutriFit platform, ensuring scalability, performance, and security across the system architecture.