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1. Introduction
1.1 Purpose
1.2 Scope
1.3 Product overview
1.3.1 Product perspective
1.3.2 Product functions
1.3.3 User characteristics
1.3.4 Limitations
1.4 Definitions
2. References
3. Requirements
3.1 Functions
3.2 Performance requirements
3.3 Usability Requirements
3.4 Interface Requirements
3.5 Logical database requirements
3.6 Design constraints
3.7 Software system attributes
3.8 Supporting information
4. Verification
      (parallel to subsections in Section 3)
5. Appendices
5.1 Assumptions and dependencies
5.2 Acronyms and abbreviations

5.3 Miscellaneous
6. Prototype

1.1 **Purpose:** Define the reason(s) for which the system is being developed or modified

Today everything is so fast-paced and hectic. Systems whose main purpose is to optimize our time have been developing rapidly in the past decades. When it comes to the food industry, apps like Talabat or Deliveroo have been developed to help us get our food quickly and efficiently to our doorstep. Where they fall short is in helping users make good dietary choices that will help them achieve their goals. This is where our system comes in.

The purpose of developing "Abu Dhabi Eats" is to revolutionize the way residents of Abu Dhabi approach meal planning and nutrition. This AI-powered system aims to simplify dietary management by offering personalized meal recommendations and integrating nutritional information from local restaurants, tailored to individual goals and budget constraints. By automating the process of selecting balanced meals, "Abu Dhabi Eats" also seeks to enhance the overall well-being of its users and promote healthier eating habits through a seamless digital platform.

1.2 **Scope**: Define the scope of the system under consideration by:
a) identifying the system to be produced by name;

b) referring to and stating the results of the earlier finalized needs analysis, in the form of a brief but clear expression of the user's problem(s). It explains what the system will and will not do to satisfy those needs;

c) describing the application of the system being specified. As a portion of this, it should describe all relevant top-level benefits, objectives, and goals as precisely as possible.

1.2 Scope

a) **System Name**: "Abu Dhabi Eats"

b) **Needs Analysis Summary**: We conducted two online surveys within the NYUAD student community. Combined results of our surveys indicate that:

- 40% of respondents often struggle to decide what to eat.
- 60% of respondents spend a lot of time planning their meals every day.
- 55% expressed a high likelihood of interest in an app providing customized meal plans.

A substantial number of students face challenges with daily meal decisions. Our data suggests there is a significant demand for a service that would simplify this process. Which is exactly what our system will do - offer personalized meal recommendations that are based on users' preferences, restrictions, and goals.

c) **Application of the System**: "Abu Dhabi Eats" is intended to be a responsive web-based platform that:

- Offers personalized meal recommendations based on individual dietary needs and preferences.
- Provides links to food items on Noon Food to make the ordering process efficient, simplifying the user's experience.
- Utilizes AI and machine learning, specifically TensorFlow and Scikit-learn, to generate these recommendations accurately.
- Focuses on maintaining an up-to-date collection of information of the latest restaurant menus and their nutritional information.

Top-Level Benefits, Objectives, and Goals: The primary benefit of "Abu Dhabi Eats" is the empowerment of users to make smart, health-oriented meal choices without the stress of daily meal planning. The objectives include:

- Streamlining the process of adhering to a balanced diet through technology.

- Enhancing users' dietary habits by providing access to diverse and nutritious meal options.

Through "Abu Dhabi Eats," the goal is to establish a benchmark for diet and nutrition-focused digital platforms in Abu Dhabi, with a vision to expand features such as grocery list integration in future iterations. The scope of this project is defined to deliver a practical, user-centric service that addresses the clear needs identified in the community.

1.3.1 **Product Perspective**: Define the system's relationship to other related products. If the product is an element of a larger system, relate the requirements of that larger system to the functionality of the product covered by the SRS.
If the product is an element of a larger system, identify the interfaces between the product covered by the SRS and the larger system of which the product is an element. Consider a block diagram showing the major elements of the larger system, interconnections, and external interfaces. This is an excellent place to draw the context diagram that we introduced in Lesson 2.

"Abu Dhabi Eats" operates within the broader online food delivery ecosystem, aiming to enhance the meal planning and ordering experience by providing personalized meal recommendations. Instead of direct integration with Noon Food's platform through API connections, "Abu Dhabi Eats" employs web scraping techniques to gather up-to-date restaurant menus and nutritional information. This approach allows us to offer users tailored suggestions that align with their dietary preferences and health goals. Additionally, the system leverages the ChatGPT API for generating dietary advice and nutritional insights, ensuring users receive informed and reliable meal recommendations. This method ensures "Abu Dhabi Eats" can operate independently, focusing on delivering value through personalized nutrition guidance and meal planning.

The following context diagram illustrating these relationships and system interactions is included to visualize the connections of "Abu Dhabi Eats" showcasing how "Abu Dhabi Eats" fits into the broader system.
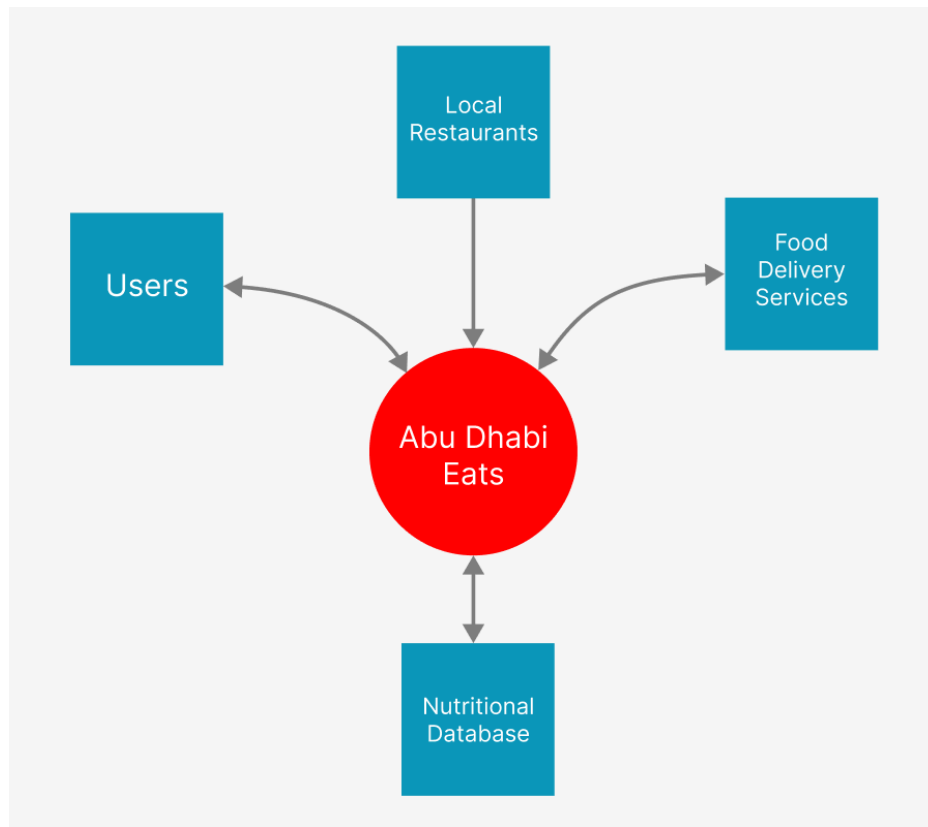
1.3.2 **Product Functions**: Provide a summary of the major functions that the software will perform. For example, an SRS for an accounting program may use this part to address customer account maintenance, customer statement and invoice preparation without mentioning the vast amount of detail that each of those functions requires.

"Abu Dhabi Eats" is designed to offer a comprehensive suite of features to streamline the meal planning and ordering process for users, focusing on health and nutrition. The major functions include:

1. **User Account Management**: Allows users to create, manage, and customize their profiles, including setting dietary preferences and health goals.

2. **Personalized Meal Recommendations**: Utilizes AI algorithms to analyze users' dietary preferences and goals to generate customized meal plans from a curated

selection of local restaurants.

3. **Meal Planning and Scheduling:** Enables users to plan their meals in advance, with options to schedule meal plans for the week, helping users stay aligned with their dietary goals and simplify their meal decision process.

4. **Meal Ordering via Noon Food**: Enables users to conveniently place meal orders by providing direct links to Noon Food's website, utilizing a database compiled from Noon Food's publicly available menu and restaurant information. This process is based on web scraping techniques to ensure users have access to the latest meal options.

5. **Nutritional Information Display**: Provides detailed nutritional information for each meal recommendation, aiding users in making informed dietary choices.

1.3.3 **User Characteristics**: Describe those general characteristics of the intended groups of users of the product including characteristics that may influence usability, such as educational level, experience, disabilities, and technical expertise. This description should not state-specific requirements, but rather should state the reasons why certain specific requirements are later specified

The intended user group for "Abu Dhabi Eats" encompasses a broad spectrum of individuals focused on health and nutrition within the Abu Dhabi community. Key characteristics include:

● **Diverse Dietary Needs**: Users may range from those with specific dietary goals, such as weight loss, muscle gain, or maintenance, to individuals with dietary restrictions including vegan, vegetarian, or gluten-free requirements.

● **Varied Technological Proficiency**: While the platform will be designed to be intuitive, users will have varying levels of comfort and experience with digital applications. The design will accommodate those with limited technological expertise.

● **Age Range**: Targeting adults of all ages, the platform will be accessible and

user-friendly for young adults, working professionals, and seniors, ensuring ease of use is a priority for all age groups.

1.3.4 **Limitations**: Provide a general description of any other items that will limit the supplier's options, including:
a) regulatory requirements and policies;
b) hardware limitations (e.g., signal timing requirements);
c) interfaces to other applications;
d) parallel operation;
e) audit functions;
f) control functions;
g) higher-order language requirements;
h) signal handshake protocols (e.g., XON-XOFF, ACK-NACK);
i) quality requirements (e.g., reliability);
j) criticality of the application;
k) safety and security considerations;
l) physical/mental considerations; and
m) limitations that are sourced from other systems, including real-time requirements from the controlled system through interfaces.

The development and deployment of "Abu Dhabi Eats" are subject to several limitations that may affect the supplier's options:

a) **Regulatory Requirements and Policies**: Compliance with UAE's data protection and privacy laws will limit how user data can be collected, stored, and processed. Additionally, food service regulations may affect the scope of meal recommendations.

b) **Hardware Limitations**: Being a web-based platform, the application's performance is contingent on users' hardware capabilities, including processing power and internet connectivity.

c) **Interfaces to Other Applications**: The reliance on API from ChatGPT for data exchange introduces dependencies on these external systems' availability and limitations.

d) **Parallel Operation**: The application must be designed to handle multiple users simultaneously without degradation in performance, which may limit the complexity of real-time features.

e) **Audit Functions**: Requirements for auditing user activities and system changes for

security and quality control purposes may restrict the system's design flexibility.

f) **Control Functions**: The need for administrative control over the application's content and user interactions may impose additional development requirements.

g) **Higher-Order Language Requirements**: The choice of development languages (e.g., JavaScript, Python) could limit certain functionalities or integration capabilities based on their inherent limitations or compatibility with other systems.

h) **Signal Handshake Protocols**: Dependence on standard communication protocols for data exchange with external APIs may restrict real-time data processing capabilities.

i) **Quality Requirements**: High standards for reliability and uptime necessitate robust infrastructure and error handling mechanisms, potentially limiting development speed or complexity.

j) **Criticality of the Application**: As a tool for health and nutrition, accuracy in meal recommendations and nutritional information is critical, placing a high priority on the quality and verification of data.

k) **Safety and Security Considerations**: Strong security measures are mandatory to protect user data, influencing the architecture and potentially limiting certain features to ensure compliance.

l) **Physical/Mental Considerations**: The application must be accessible to users with various physical and mental abilities, guiding the UI/UX design to accommodate a wide range of user interactions.

m) **Limitations from Other Systems**: Dependence on data from Noon Food and limitations in their system for menu updates or order processing will directly impact "Abu Dhabi Eats" functionality.

3.1 **Functions**: Define the fundamental actions that have to take place in the software/system in accepting and processing the inputs and in processing and generating the outputs. It may be appropriate to partition the functional requirements into sub-functions or sub-processes. This does not imply that the software/system design will also be partitioned that way.

Profile and Preferences Management

3.1.1 Profile Creation: The system shall enable users to create profiles where they can input personal, dietary, and health goal information. This includes preferences such as vegetarian, vegan, gluten-free, or specific calorie targets.

3.1.2 Profile Customization: The system shall offer users the ability to adjust their personal, dietary, and health goal information within their personalized profile.

Meal Recommendation and Planning

3.1.3 Personalized Meal Recommendation: Leveraging Python based AI libraries for machine learning, the system shall analyze user profiles to offer meal suggestions that align with their dietary preferences and nutritional needs.

3.1.4 Nutritional Tracking: The system shall track users' nutritional intake based on the meals they select.

3.1.5 Adaptive AI for Evolving User Preferences: The system shall adapt to users' changing preferences over time.

3.1.6 Comprehensive Search and Filter Options: The system shall include an advanced search functionality with multiple filtering options to help users easily find meals and restaurants.

3.1.7 Nutritional breakdowns: The system shall provide users with an option for nutritional breakdowns of each recommended meal option, including calorie count, macronutrient distribution, and key vitamins and minerals.

3.1.8 Scheduling meals: The system shall allow users to schedule meals plans for up to a week in advance with the help of the recommendation algorithm.

3.1.9 Saving meal plans: The system shall offer users the ability to save meal plans.

3.1.10 Reusing meal plans: The system shall offer users the ability to reuse saved meal plans.

Data Management and Integration

3.1.11 Data Collection: The system shall create a collection of information by using web scraping on restaurant menus, including ingredients, nutritional content, portion sizes, and pricing, from Noon Food.

3.1.12 Menu and Nutritional Information Updates: The system shall update its restaurant menu and nutritional information data every 2 days.

3.1.13 Linking to Noon Food: The system shall allow the user to order a proposed meal by establishing a smooth transition to an already existing food delivery service Noon Food.

3.1.14 Dining history: The system shall save the option the user selected to order into their past dining history.

3.1.15 Editing dining history: The system shall allow the user to enter meals they have eaten into their past dining history.

Alerts Customization

3.1.16 Setting up reminders: The system shall send reminders to users for meals based on their scheduled meal plans.

3.1.17 Customizing notifications: The system shall allow users to customize notifications and alerts according to their preferences.

3.2 **Performance Requirements**: Define static and dynamic requirements placed on the software/system or on human interaction with the software / system as a whole. Might include:

- the number of simultaneous users to be supported
- the numbers of transactions and tasks the amount of data to be processed within certain time periods for both normal and peak workload conditions

3.2.1 Simultaneous Users: The system should be scalable to support 1.45 million simultaneous users, considering the potential popularity of our product among Abu Dhabi residents. This requires efficient backend architecture to handle multiple requests without significant delays. However, initially, the system will only support as many users as our laptops can support (because our laptops will be our servers initially).

3.2.2 Transaction Volume: Given the use of Noon Food for menu access and the possibility of high user engagement with meal planning, nutritional tracking, and ordering functionalities, the system must efficiently process a high volume of transactions, especially during peak meal times.

3.2.3 Data Processing: The system will need to process significant amounts of data, including user profiles, nutritional information, meal recommendations, and order details. It must do so quickly to provide real-time feedback and updates to users.

3.2.4 Normal vs. Peak Workload Conditions: Performance under peak workload conditions, such as meal times or special occasions when users are more likely to

access the system for meal planning and orders, is critical. The system should maintain its responsiveness and reliability, without degradation in performance.

To ensure these performance requirements are met, our team would need to focus on robust system design, including efficient database management, caching strategies, load balancing, and possibly using cloud services that offer scalability and reliability. Additionally, continuous monitoring and performance optimization will be essential to maintain a high-quality user experience as the user base grows and usage patterns evolve.

3.3. **Usability Requirements**: define the requirements measuring the effectiveness in using the system's functionalities, efficiency, satisfaction criteria, and avoidance of harm that could arise from use in specific contexts of use. These kinds of requirements are hard to discover in novel systems or concerning new features. Prototyping can be helpful in discovering such requirements.

Efficiency in Task Completion:

3.3.1 The time required for a first-time user to select a proposed meal and order it should be less than 2 minutes and 20 seconds.

3.3.2 The time required for a non-first time user to select a proposed meal and order it should be less than 90 seconds.

3.3.3 The number of options the user goes through before choosing a meal should not exceed 5.

3.3.4 Error Handling and Help Functions: The system should provide clear feedback in the event of errors (e.g., when a meal choice does not meet nutritional goals) and offer help or support features for troubleshooting.

3.3.5 Adaptability to User's Needs and Contexts of Use: The system should be able to cater to a wide range of dietary needs, preferences, and restrictions, adapting to

users' changing goals and circumstances.

3.4 **Interface Requirements**: Interface requirements define all inputs into and outputs from the system. Each defined interface should include the following content:
- Name of item
- Description of purpose
- Source of input or destination of output
- Valid range, accuracy, and/or tolerance
- Units of measure
- Timing
- Relationships to other inputs/outputs
- Data formats
- Command Formats
- Data items or information included in the input and output

1. **User Profile Input Interface**:

    - **Name of Item**: User Profile Data
    - **Description of Purpose**: To capture and store user registration details, dietary preferences, and health goals.
    - **Source of Input**: User via Web Interface
    - **Valid Range, Accuracy, Tolerance**: Textual data must adhere to format validations; dietary preferences selected from predefined options.
    - **Units of Measure**: N/A
    - **Timing**: Real-time upon user submission
    - **Relationships to Other Inputs/Outputs**: Directly impacts Meal Recommendation Engine outputs.
    - **Data Formats**: JSON for API submissions
    - **Command Formats**: N/A
    - **Data Items Included**: UserID, Name, Email, DietaryPreferences, Goals

2. **Nutritional Information Display Interface**:

- **Name of Item**: Nutritional Data Display
- **Description of Purpose**: To present detailed nutritional information for each meal option.
- **Source of Input / Destination of Output**: Sourced from internal database; displayed to users.
- **Valid Range, Accuracy, Tolerance**: Accuracy critical for user health; data verified against reputable sources.
- **Units of Measure**: Calories (kcal), Macronutrients (grams)
- **Timing**: Displayed upon meal selection
- **Relationships to Other Inputs/Outputs**: Complements Meal Selection inputs.
- **Data Formats**: Displayed textually and graphically
- **Command Formats**: N/A
- **Data Items Included**: Calories, Proteins, Carbs, Fats, Vitamins, Minerals

3. **Noon Food Data Integration Interface**:
   - **Name of Item**: Noon Food Menu Data Integration
   - **Description of Purpose**: To gather meal options and restaurant information from Noon Food for display on "Abu Dhabi Eats" and to provide users with a seamless link to place orders on Noon Food's platform.
   - **Source of Input / Destination of Output**: Menu data is obtained through web scraping techniques from Noon Food; users are redirected to Noon Food for order placement.
   - **Valid Range, Accuracy, Tolerance**: The accuracy of the data is dependent on the current content of Noon Food's website. Regular updates are necessary to ensure data relevance.
   - **Units of Measure**: N/A
   - **Timing**: Data scraping occurs at scheduled intervals to ensure up-to-date

information; order redirection is in real-time.

- **Relationships to Other Inputs/Outputs**: The obtained menu data influences the meal recommendations provided to users; user selections lead to redirection for order completion on Noon Food.
- **Data Formats**: Data scraped may initially be in HTML format, processed into a structured format (e.g., JSON) for internal use.
- **Command Formats**: N/A, as direct API commands are not used; redirection to Noon Food is facilitated via hyperlink.
- **Data Items Included**: Scraped data includes MealID, Description, and NutritionalInfo for display; redirection involves providing a URL to Noon Food's ordering page relevant to the selected meal

4. **Nutritional API Integration Interface**:
   - **Name of Item**: ChatGPT Nutritional Information API
   - **Description of Purpose**: To access detailed nutritional information and dietary advice for meal recommendations.
   - **Source of Input / Destination of Output**: Queries sent to ChatGPT API; responses received and processed for user recommendations.
   - **Valid Range, Accuracy, Tolerance**: High accuracy required for health-related information.
   - **Units of Measure**: Calories, grams (macronutrients), milligrams or micrograms (vitamins and minerals).
   - **Timing**: Queries made in real-time during meal recommendation processing.
   - **Relationships to Other Inputs/Outputs**: Supports the generation of personalized meal recommendations.
   - **Data Formats**: JSON for API requests and responses.
   - **Command Formats**: RESTful API commands, typically GET for

information retrieval.

  ○ **Data Items Included**: Queries based on dietary preferences; Response includes detailed nutritional data.

3.5 **Logical Database Requirements**: Define Types of information used by various functions such as

- Frequency of use
- Accessing capabilities
- Data entities and their relationships
- Integrity constraints
- Data retention requirements

1. Data Entities and Their Relationships:
   - User Profiles: Including personal, dietary, and health goal information.
   - Meal Recommendations: Linked to user profiles and dietary preferences.
   - Restaurant Menus: Sourced from Noon Food and other partner databases, including nutritional information.
   - Nutritional Tracking: Daily intake logs related to user profiles and meal recommendations.

2. Frequency of Use:
   - High-frequency access for user profiles, meal recommendations, and restaurant menus due to daily meal planning and ordering activities.
   - Moderate to high-frequency access for nutritional tracking, depending on user engagement levels.

3. Accessing Capabilities:
   - Read and write access for users on their profiles, meal plans, nutritional logs.
   - Read-only access for users to restaurant menus and nutritional information.

- Admin access for system administrators to manage user data, update restaurant menus, and oversee system operations.

4. Integrity Constraints:
   - Ensuring data consistency and accuracy, especially for dietary information and user profiles.
   - Unique constraints on user email addresses and authentication credentials.

5. Data Retention Requirements:
   - User data and meal planning histories may be retained for the duration of the user's account existence to support personalized recommendations and historical analysis.
   - Legal and regulatory compliance for data retention, particularly regarding personal and health-related information.

6. Security and Privacy:
   - Encryption of sensitive user data, including personal and health information.
   - Implementation of secure access controls and authentication mechanisms.

3.6 **Design Constraints**: Define requirements related to standards compliance and hardware limitations.

Standards Compliance:

3.6.1 Data Privacy and Security: The system shall comply with UAE's Federal Law No. 2 of 2019 concerning the use of the Information and Communication Technology (ICT) in Health Fields and international data protection regulations like GDPR, ensuring secure

handling, storage, and transmission of user data.

3.6.2 The system shall adhere to Federal Law No. 10/2015 on Food Safety in the UAE to ensure all food recommendations and nutritional information meet the required safety and quality standards.

3.6.3 The system's recommendations shall align with United Arab Emirates Dietary Guidelines.

Hardware Limitations:

3.6.4 Server Performance Considerations: The system shall be designed to consider the performance and capabilities of the servers hosting the application, ensuring responsiveness and availability, especially under peak loads.

Reliance on Other Applications:

3.6.5 Web Scraping Considerations: The system shall be designed to accommodate the limitations imposed by web scraping Noon Food for restaurant information, ensuring ethical compliance with web use policies and avoiding negative impact on Noon Food's server performance.

Quality Requirements:

3.6.6 The system shall achieve a mean time between failures of at least 1000 hours, ensuring consistent operation and minimizing downtime to support the functionalities.

Safety and Security Considerations:

3.6.7 Health Risk Prevention: The system shall validate dietary information against recognized nutritional standards and user-specific health conditions to ensure

recommendations do not pose health risks to users.

3.7 **Software System attributes**: software or system attributes often can include reliability, availability, security, maintainability,
portability, and many others. In general, any such attribute is termed an "ility" because most end with an "ility." But other attributes, such as safety, timeliness, security, and others, are also ilities.

3.7.1 Reliability: The system is designed to provide dependable meal recommendations, nutritional tracking, and restaurant information. It aims to ensure a high degree of accuracy in dietary guidance and maintain consistency in performance, even under varying conditions and loads.

3.7.2 Availability: "Abu Dhabi Eats" is expected to offer continuous service availability, allowing users to access meal plans, dietary recommendations, and restaurant menus without significant downtime, thereby supporting users' meal planning routines at any time.

3.7.3 Security: Given the personal nature of user data, including dietary preferences, health goals, and potentially sensitive personal information, the system places a high priority on implementing robust security measures. This includes data encryption, secure user authentication mechanisms, and compliance with local and international data protection regulations.

3.7.4 Maintainability: The application's architecture and design consider ease of maintenance, allowing for regular updates, feature enhancements, and quick resolution of any identified issues or vulnerabilities. This ensures the system remains up-to-date with the latest dietary guidelines, restaurant offerings, and user needs.

3.7.5 Portability: While initially focused on a web-based platform, the system's design

considers future adaptability to other platforms or devices. This could include mobile applications, ensuring that the system can evolve to meet user demands and technological advancements without extensive redevelopment.

3.7.6 Safety: "Abu Dhabi Eats" considers user safety by providing dietary recommendations that align with general health guidelines and personal health goals. It aims to prevent harm by validating dietary information with certified professionals and integrating safety checks into the meal planning process.

3.7.7 Timeliness: The system ensures timely updates of restaurant menus, nutritional information, and user dietary tracking. This attribute is crucial for maintaining the relevance and accuracy of meal recommendations and supporting real-time decision-making for meal planning and ordering.

3.7.8 Usability: A key focus of "Abu Dhabi Eats" is on providing an intuitive, user-friendly interface that simplifies meal planning and dietary management. This includes responsive design, multilingual support, and features like progress tracking and milestone celebrations to enhance user engagement and satisfaction.

These attributes reflect a comprehensive approach to developing a reliable, secure, and user-centric system for personalized meal planning and nutrition management. "Abu Dhabi Eats" aspires to set a high standard for digital dietary solutions, prioritizing the well-being and convenience of its users in Abu Dhabi.

3.8 **Additional Information**: Additional supporting information that can be considered includes:
a) sample input/output formats, descriptions of cost analysis studies or results of user surveys;
b) supporting or background information that can help the readers of the SRS; c) a description of the problems to be solved by the software; and
d) special packaging instructions for the code and the media to meet security, export, initial loading or other requirements.

a) **Sample Input/Output Formats:** Users can manage dietary preferences and generate meal plans to achieve their health goals through a user-friendly interface. A few sample inputs and outputs are:

- **Input:** User enters personal information (name, age, dietary preferences such as vegetarian, and health goals like losing weight), along with specific dietary restrictions (e.g., gluten-free).
  Output: A confirmation screen showing the user profile has been created with options to edit or update information anytime.

- **Input:** User specifies a desire for low-carb dinner options.
  Output: A list of personalized meal recommendations (that can be regenerated), each with a brief description, nutritional information, and a link to order it from a local restaurant.

- **Input:** User logs a meal they've eaten, including dish name and portion size.
  Output: A summary of nutritional intake for that meal, including calories, macros, and how it fits into their daily nutritional goals.

b) **Supporting or Background Information**

Dietary Trends in Abu Dhabi: Abu Dhabi, like many cosmopolitan areas, is seeing an increasing interest in healthy living and dietary awareness. This trend supports the need for "Abu Dhabi Eats," which aims to simplify access to nutritious meals tailored to individual health goals and preferences.

Nutritional Challenges: Despite the abundance of food options, there is a recognized challenge in making healthy choices consistently. Busy lifestyles, lack of awareness, and the temptation of fast food contribute to dietary challenges that "Abu Dhabi Eats" seeks to address.

Sustainability and Food Waste: Our system also considers the broader impact on sustainability, aiming to reduce food waste by helping users plan their meals more effectively, and by promoting restaurants that share a commitment to sustainability practices.

c) **Description of the Problems to be Solved by the Software**

"Abu Dhabi Eats" addresses several problems faced by residents seeking healthier eating habits. Some of these include:

- **Lack of Personalized Meal Planning:** Many individuals struggle with planning meals that cater to their specific dietary needs, preferences, and health goals. "Abu Dhabi Eats" seeks to provide personalized meal recommendations, making it easier for users to adhere to their dietary plans without extensive research or planning.
- **Overwhelming Food Choices:** The abundance of food options available can make it difficult for individuals to consistently make healthy eating choices. "Abu Dhabi Eats" simplifies this decision-making process by filtering options based on the user's health goals and preferences.
- **Time Constraints on Meal Preparation:** With the fast-paced lifestyle in Abu Dhabi, finding the time to prepare healthy meals daily is a significant challenge for many. The software addresses this by recommending meals

from local restaurants that meet the user's dietary requirements, and providing links to place their orders, saving time while ensuring nutritional needs are met.

By solving these issues, "Abu Dhabi Eats" aims to make healthy eating more accessible and convenient.

d) **Export Compliance:** The software package will comply with all relevant export control laws and regulations. This includes ensuring that any encryption technologies used within the application meet the export control requirements of the United Arab Emirates and any other jurisdictions that may affect the deployment and use of "Abu Dhabi Eats."

Initial Loading and Deployment: The codebase will be structured to facilitate easy initial loading and deployment. This includes providing detailed documentation on the deployment process, environment setup, and any dependencies. Docker containers or similar technologies may be utilized to package the application and its environment, ensuring consistency across different deployment platforms.

Data Privacy Compliance: Packaging will also take into consideration compliance with data privacy laws, such as UAE's Federal Law No. 2 of 2019 an. This involves including mechanisms for data protection impact assessments and ensuring that data handling practices within the code and media assets are compliant.

Security Measures: All code and media files will be scanned for vulnerabilities and securely packaged with encryption where necessary. Sensitive data, including user information and transaction details, will be encrypted both in transit and at rest, adhering to industry-standard security protocols.

4. Verification: Briefly provide the verification approaches and methods planned to qualify the software/system.

1. **System Testing:** Testing the complete and integrated software to evaluate the system's compliance with its specified requirements. This encompasses all the functionalities offered by "Abu Dhabi Eats," including user registration, meal planning, and nutritional tracking.

2. **Usability Testing:** Gathering feedback from real users to assess the software's ease of use, user interface design, and overall user experience. This can help identify any issues or areas for improvement from a user's perspective.

3. **Performance Testing:** Evaluating the software's performance under various conditions, such as during peak usage times or when handling a large number of simultaneous requests. This ensures that "Abu Dhabi Eats" can operate smoothly and efficiently, providing a good user experience.

4. **Configuration Testing:** This type of testing assesses the system's performance and functionality under various configurations of software settings, user preferences, and system environments. It's crucial for identifying potential issues caused by differing user setups.

5. **Cross-Browser Testing:** Specifically targets the application's compatibility across different web browsers to ensure that users have a consistent experience regardless of their browser choice. This is vital for web-based applications like "Abu Dhabi Eats."

5.1 **Assumptions and dependencies**: List each of the factors that affect the requirements stated in the SRS. These factors are not designed constraints on the software/system but any changes to these factors can affect the requirements in the SRS. For example, an assumption may be that a specific operating system will be available on the hardware designated for the software product.

1. **Technology Stack Availability:** Assumes the availability and reliability of the technology stack chosen for development, including React, Node.js, Express,

MongoDB, TensorFlow, and integration with APIs like ChatGPT. Changes in these technologies or their support could affect system development and maintenance.

2. **Internet Connectivity:** Assumes stable and high-speed internet connectivity for users and the system to access real-time data, including restaurant menus, nutritional information, and user interactions.

3. **Noon Food Data Integration:** The project is heavily dependent on integrating data from Noon Food for accessing restaurant menus and placing orders. Any changes in Noon Food's data, data format, availability, or policy could directly impact the functionality of "Abu Dhabi Eats."

4. **User Adoption and Engagement:** Assumes a certain level of user adoption and engagement based on the market need for dietary management and meal planning solutions in Abu Dhabi. Changes in user preferences, competitive offerings, or market dynamics could affect the project's success.

5. **Regulatory Compliance:** Assumes the project will operate within the regulatory framework of Abu Dhabi, including data protection laws, health and safety regulations, and food service standards. Changes or updates in these regulations could necessitate adjustments in the system's functionality or operations.

6. **Data Accuracy and Availability:** Depends on the accuracy and availability of data regarding restaurant menus, nutritional information, and user dietary preferences. Inaccuracies or limitations in this data could impact the system's effectiveness in providing personalized meal recommendations.

7. **Hardware and Infrastructure:** While primarily a web-based platform, the system's performance is contingent on the underlying hardware and infrastructure, including servers, databases, and network capabilities, to handle peak loads and ensure availability.

8. **User Data Security:** Assumes the implementation of robust security measures to protect user data, including personal information, dietary preferences, and health goals. Any compromise in security could affect user trust and system integrity.

9. **Partnership and Collaboration**: Assumes ongoing cooperation with local restaurants, food delivery services, and possibly health professionals for content validation. Changes in these partnerships or collaborations could affect content quality and service offerings.

These assumptions and dependencies underline the importance of thorough planning, continuous monitoring, and flexibility in project management to adapt to changes that could impact the system requirements and overall project success.

5.2 **Acronyms and abbreviations:** Spell out or define all acronyms and abbreviations used in the documents.

5.3 Miscellaneous: In here, we'd like to address your feedback on Project Delivery 1. Professor Kassab mentioned that if we successfully address your feedback here, our grade for Project Delivery 1 can be improved.

1. **AI and Machine Learning Specifics**:
   ○ We plan to use TensorFlow for developing the machine learning models that will generate personalized meal plans based on users' dietary preferences and goals. TensorFlow provides the flexibility and robustness needed for our application's AI aspects. Additionally, Scikit-learn will be used for data processing and analysis to refine our recommendation engine further.
2. **Integration with Food Delivery Services**:
   ○ Given the complexities associated with direct API integration with various food delivery services, "Abu Dhabi Eats" will initially focus on web scraping for menu information from Noon Food and providing users with direct links to place their orders on the Noon Food platform. This method simplifies

integration challenges and avoids potential feasibility issues with direct API integration.

3. **Database Creation and Updates**:
   - The database for "Abu Dhabi Eats" will be initially populated through web scraping Noon Food's website to compile a comprehensive list of available restaurant menus and nutritional information. This database will be regularly updated through scheduled scraping processes to ensure menu information remains current and reflects any changes made by the restaurants.

4. **Integration Feasibility and Risk Mitigation**:
   - The feasibility of integrating with external entities like Noon Food through web scraping has been evaluated, with a focus on ensuring the sustainability and reliability of this method. Risks associated with data accuracy and timeliness will be mitigated through regular updates and quality checks. Legal and compliance aspects of web scraping will also be considered to ensure adherence to applicable laws and Noon Food's terms of service.

5. **Source for Dietary Suggestions**:
   - General dietary suggestions provided by our system will be based on guidelines from reputable health and nutrition organizations, ensuring reliability. Additionally, the integration of the ChatGPT API will support generating tailored dietary advice, with information validated against trusted nutritional databases.

6. **Project Scope and Domain Focus**:
   - Acknowledging the project's ambitious scope, we have prioritized core features that directly address user needs for personalized meal planning and simplified ordering. Future enhancements, such as grocery list generation and broader integration with other food delivery services, will be

considered as the system scales.

7. **Addressing Negative Stakeholders**:
   - ○ Competing meal planning apps like Talabat, Deliveroo
   - ○ Restaurants not featured on Noon Food.

8. **Strategies for Addressing Constraints**:
   - ○ Constraints related to technology, legal compliance, and market competition are addressed through careful planning, adherence to best practices in software development, and a phased approach to feature rollout. Continuous feedback loops with users and stakeholders will also guide iterative improvements and adaptations.

6. Prototype: here's the initial prototype of the system that is slated for implementation.
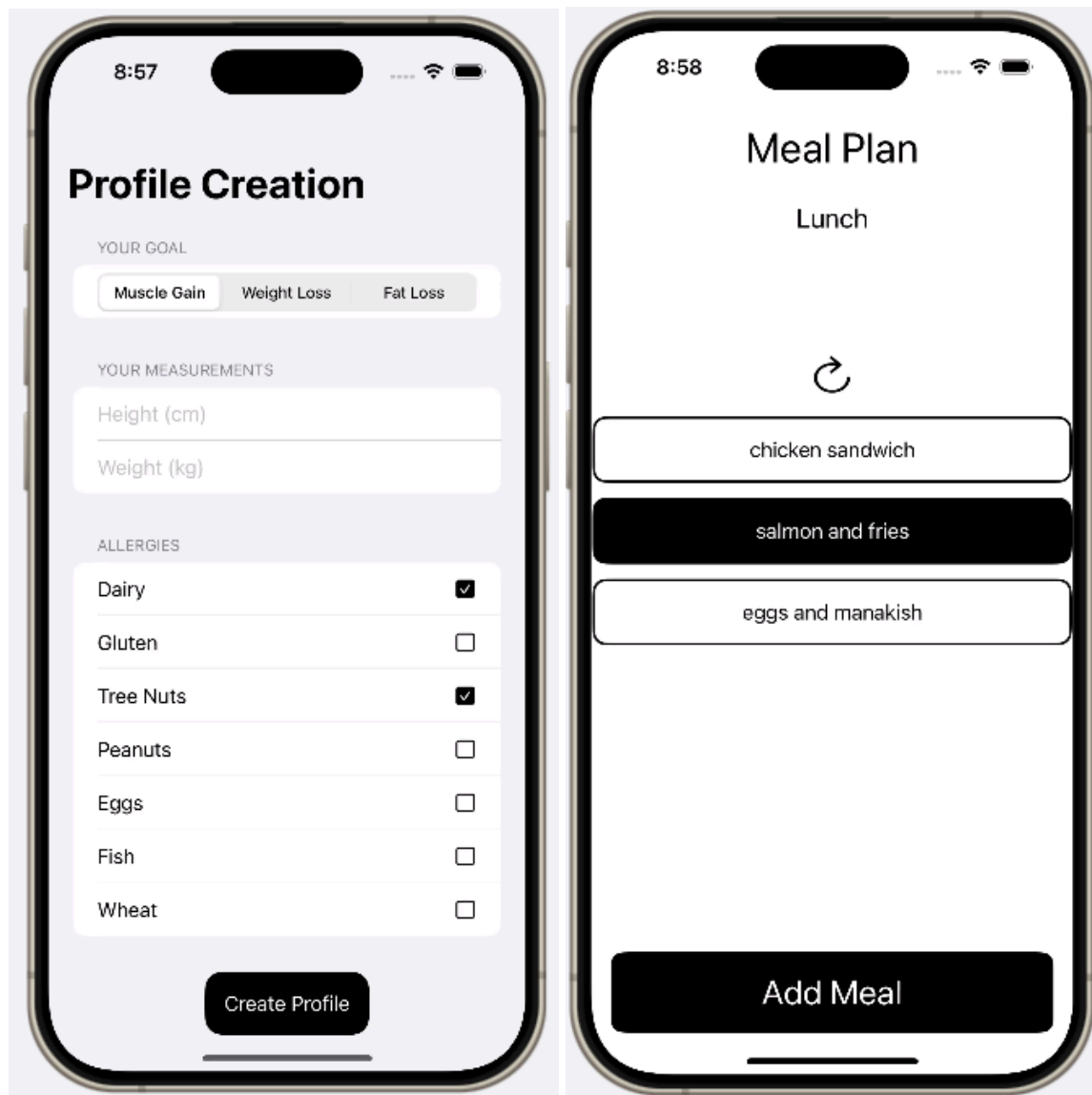
Please note that this represents a preliminary prototype of our user interface, designed to provide a conceptual overview of the layout. These prototypes are crafted with a mobile application perspective, due to availability of certain UI design tools, serving as a bare-bones skeleton to illustrate our user interface ideas and interaction flow.

We will be developing "Abu Dhabi Eats" as a web application. This decision is driven by the broader accessibility and ease of maintenance associated with web platforms, allowing users to access our service without the need for downloading a separate

application.