



FUNCTIONAL REQUIREMENTS DOCUMENT

Note: This FRD Document is created based on GrowMassket BRD

Overview

The functional requirements document (FRD) is a formal statement of an application's functional requirements. It serves the same purpose as a contract. The developers agree to provide the capabilities specified. The client agrees to find the product satisfactory if it provides the capabilities specified in the FRD.

Quality is meeting requirements. For that reason, the FRD is the central document in system development. It is used for the following:

1. Designing and developing a tile application system.
2. Evaluating the product in all subsequent phases of the life cycle.
3. Determining the success of the project.

1 General

1.1 Project Description

The GrowMassKet Online Vegetable Delivery Application is an innovative digital platform designed to provide users with a convenient and seamless experience in purchasing Organic Vegetable Items.

The goal is to create a user-friendly mobile and web application that offers a wide range of Organic Vegetables by leveraging Artificial Intelligence features to enhance user engagement and satisfaction.

1.1 Background

The market conditions have the demand for Online Organic Vegetable Delivery. An application like GrowMassKet will definitely help their needs. This application aims to bridge the existing gap by providing a specialized, trustworthy, and AI-driven platform catering specifically to consumers seeking convenient access to high-quality organic vegetables while ensuring transparency and personalized experiences.

1.1.1 Purpose

Describe the business objectives and business processes from the CONOPS document and the CBA that this application supports.

Business Objectives: Specialized Market Niche: GrowMassKet aims to establish a specialized presence in the market by focusing solely on the delivery of high-quality organic vegetables, catering to health-conscious consumers seeking sustainable and nutritious produce.

AI-Driven Personalization: Leveraging AI technology, the application intends to provide personalized experiences through tailored recommendations, inventory optimization, and user-specific content, enhancing customer satisfaction and retention.

Business Processes from CONOPS (Concept of Operations): Sourcing and Supply Chain: GrowMassKet streamlines sourcing processes by partnering with certified organic farms and managing the supply chain efficiently, ensuring the authenticity and freshness of organic vegetables.

AI-Powered User Experience: The application employs AI algorithms to analyze user preferences and behaviour, providing personalized recommendations and optimizing inventory based on demand forecasts.

Secure and Efficient Transactions: Seamless and secure transactions ensure trust and reliability in the platform, contributing to an efficient delivery process

Cost-Benefit Analysis (CBA) Supported: Cost Efficiency: By optimizing inventory and reducing wastage through AI-driven analytics, GrowMassKet aims to minimize operational costs while ensuring fresh produce for users.

Customer Retention and Acquisition: Providing personalized experiences and reliable services contributes to enhanced customer retention and acquisition, justifying investments in marketing and customer engagement.

1.1.1 Assumptions and Constraints:

Assumptions:

A reliable and consistent supply of organic vegetables from certified farms and suppliers.

The AI-driven recommendation system will effectively analyze user preferences and behaviour to generate accurate and relevant recommendations.

Users will have consistent internet connectivity and access to mobile devices or computers to use the application.

Availability of necessary certifications and compliance with organic standards and data protection laws in the regions where the application operates.

Assuming a consistent and growing interest among consumers in purchasing organic vegetables online.

Constraints:

Initial rollout is limited to specific regions or countries due to logistical and supply chain constraints.

Technological advancements or limitations that might affect the full implementation of certain AI features or functionalities.

Budget limitations for marketing, development, and operational expenses may impact certain feature enhancements or expansions.

Limited availability of skilled resources or expertise in specialized areas like AI development or organic supply chain management.

Constraints associated with evolving regulatory requirements, potentially affecting certain operations or data handling processes.

1.1.1 Interfaces to External Systems

- ☐ Payment Gateway Integration
- ☐ Geolocation Services
- ☐ Supplier and Inventory Management Systems
- ☐ Regulatory Compliance Services
- ☐ Marketing and Communication Tools
- ☐ Analytics and Reporting Platforms
- ☐ Cloud Services and Hosting Platforms
- ☐ Customer Support and Helpdesk Systems
- ☐ API Integrations for AI Algorithms

1.1 Points of Contact

Project Manager, Product Manager, Technical Lead/CTO, Marketing Manager, Supply Chain Manager, AI Specialist/ Data Scientist, Compliance Officer, Customer Support Manager, Finance Controller, External Partners or Consultants: End Users (Customers)

2. FUNCTIONAL REQUIREMENTS

1. User Data Entity

Attributes: Usernames, Passwords, Contact details, and preferences for personalised experiences.

.

2. Product Data Entity

Product Catalog: Information about available organic vegetables (Product names, product descriptions, product prices, product images).

3. Geolocation Data Entity

User Location: Capturing user addresses for delivery purposes.

4. AI Algorithm Data Entity

User Behavior Data: Gathering user interactions, preferences, and feedback for AI-driven recommendations.

5. Transaction Data Entity

Attributes: Order Details, Items purchased, Quantities, Delivery preferences, Transaction IDs, Payment methods, and Order payment status.

6. Regulatory and Compliance Data Entity

7. Analytics and Reporting Data:

User Engagement Metrics: Tracking user interactions, app usage statistics, and behaviour analytics.

8. Customer Support Data:

User Queries and Tickets: Recording customer inquiries, feedback, and support-related issues.

9. Backup and Recovery Data:

Data Backup: Regularly backing up user data, order history, and critical application information.

10. Compliance and Audit Trails:

Audit Logs: Tracking system activities, user access, and changes made within the application for compliance and auditing purposes.

2.2 Functional Process Requirements

1. User Registration and Authentication: Allow users to create accounts with personal details and preferences.

Authentication: Secure login functionality to authenticate user credentials.

2. Product Browsing and Selection: Displaying a comprehensive list of available organic vegetables.

Search and Filter Option: Implement search and filter options for easy browsing and selection.

Product Details: Provide detailed information about each vegetable, including descriptions and images.

3. Ordering and Checkout:

Add to Cart: Allow users to add selected items to the shopping cart.

Order Modification: Enable users to modify or remove items before checkout.

Checkout Process: Secure and user-friendly payment gateway integration for order completion.

4. AI-Driven Recommendation System:

Personalized Recommendations: Implement AI algorithms to suggest vegetables based on user preferences and behaviour.

Real-time Suggestions: Provide dynamic suggestions for complementary or seasonal items.

5. Order Management and Tracking:

Enable users to track the status of their orders in real-time.

Allow users to schedule delivery times according to their convenience.

6. Inventory Management:

Demand Forecasting: Use AI for demand prediction and inventory optimization.

Stock Alerts: Notify when stock levels are low or when products are about to expire.

7. User Profile Management:

Profile Customization: Allow users to manage their profiles, preferences, and delivery addresses.

Order History: Provide access to past orders and order details for users.

8. Payment Integration:

Multiple Payment Options: Integrate various secure payment gateways for user convenience.

Payment Security: Ensure encryption and secure transactions.

9. Customer Support and Feedback:

Live Chat/Support: Offer real-time assistance for user queries or issues.

Feedback and Ratings: Enable users to provide feedback and ratings for products and services.

10. Admin Dashboard and Control:

Order and Inventory Management: Centralized control for managing orders, inventory, and delivery logistics.

Content Management: Ability to update product listings, prices, and promotional content.

11. Reporting and Analytics:

Sales Reports: Generate reports on sales trends, user behaviour, and app performance.

Analytics Integration: Integrate with analytics tools to track user engagement and app usage metrics.

12. Accessibility and Multilingual Support:

Accessibility Features: Ensure the app is accessible to users with disabilities.

Multilingual Support: Offer the app in multiple languages for wider accessibility.

3. OPERATIONAL REQUIREMENTS:

1. System Reliability and Availability:

Uptime: Maintain at least 99.9% system uptime to ensure continuous accessibility for users.

Fault Tolerance: Implement measures to handle system failures without disruption to users.

2. Scalability:

Design the application to handle an increased user base and transaction volume without performance degradation.

Ensure scalability in servers, databases, and resources to accommodate growth.

3. Performance:

Response Time: Aim for the application to respond within 2 seconds for user interactions.

Load Balancing: Implement mechanisms to distribute the workload and prevent performance bottlenecks.

4. Security:

Data Encryption: Utilize encryption protocols to protect sensitive user data and transactions.

Access Control: Implement robust authentication measures to prevent unauthorized access.

5. Backup and Recovery:

Regular Backups: Perform regular data backups to prevent data loss in case of system failure.

Recovery Procedures: Establish recovery procedures for quick restoration in the event of a failure.

6. Maintenance and Updates:

Scheduled Maintenance: Plan regular maintenance windows for system updates and improvements.

Patch Management: Ensure timely application of security patches and updates.

7. User Support:

Helpdesk Services: Provide customer support for user inquiries, feedback, and issue resolution.

Documentation: Offer comprehensive user manuals and FAQs for guidance.

8. Regulatory Compliance:

Data Protection: Ensure compliance with relevant data protection laws (GDPR, CCPA, etc.).

Organic Certification Standards: Maintain adherence to organic certification requirements.

9. Disaster Recovery Plan:

Contingency Planning: Develop and document a disaster recovery plan outlining steps to recover from system failures or data breaches.

Redundancy Measures: Implement redundancy for critical components to minimize downtime.

10. Monitoring and Reporting:

Performance Monitoring: Utilize monitoring tools to track system health, performance metrics, and user activity.

Incident Reports: Generate reports on incidents, their resolution, and system performance.

11. Training and Knowledge Transfer:

Employee Training: Conduct regular training sessions for the operational team to ensure proficiency in handling system operations.

Knowledge Sharing: Maintain documentation and knowledge base for seamless knowledge transfer.

3.2 SECURITY

1. System Reliability and Availability:

Implementing measures such as redundant systems and failover mechanisms to ensure continuous uptime while maintaining security protocols.

2. Scalability:

Capacity Planning and Scalable Infrastructure:

Ensuring scalability while maintaining security measures across expanded server resources and databases to accommodate growth without compromising data security.

3. Performance:

Implement load balancing in a way that doesn't compromise security measures, ensuring that increased user interactions don't compromise response times or data security.

4. Security:

Utilize strong encryption methods for sensitive data and implement robust access control mechanisms to prevent unauthorized access to critical information.

5. Backup and Recovery:

Ensure encrypted backups and establish secure recovery procedures to prevent data breaches during restoration.

6. Maintenance and Updates:

Applying security patches promptly during maintenance windows to protect against vulnerabilities and ensure ongoing protection.

7. User Support:

Training support staff on security protocols and offering guidance in user documentation about security best practices to prevent user-related security risks.

8. Regulatory Compliance:

Ensuring that all security measures align with data protection laws and organic certification standards, maintaining data integrity and security throughout.

9. Disaster Recovery Plan:

Including security protocols in the disaster recovery plan and implementing redundancy with security measures to avoid vulnerabilities during system failures.

10. Monitoring and Reporting:

Monitor security-related metrics alongside performance metrics and generate incident reports that include security-related incidents and resolutions.

11. Training and Knowledge Transfer:

Conduct regular security training sessions and maintain documentation related to security protocols for seamless knowledge transfer, ensuring all operational staff understand and implement security measures effectively.

3.3 Audit Trail

3.4 Data Currency

3.5 Reliability

If the System had a Failure:

Loss of Revenue: Interruption in system operation can lead to financial losses due to failed transactions and customer dissatisfaction.

Loss of Productivity: Inability to perform tasks efficiently due to system downtime or errors can hamper productivity.

Loss of Customer Trust: System failures can erode customer trust and confidence in the platform.

Minimum Acceptable Level of Reliability:

Mean Time Between Failure (MTBF): Set a high MTBF to ensure extended periods of continuous operability without system failures.

Mean Time To Failure (MTTF): Calculate MTTF by dividing the total operational time by the number of failures within that period, aiming for a longer MTTF.

Mean Time To Repair (MTTR): Keep MTTR as low as possible to swiftly address and resolve system failures, reducing downtime.

Required Reliability Measures for GrowMassKet:

(All the below values are taken randomly as I was unsure what the actual value would be like)

MTBF: Target a minimum MTBF of 10,000 hours of continuous operability before the first failure occurs.

MTTF: Aim for an MTTF of at least 2,000 hours of system operability between failures.

MTTR: Strive for an average repair time of fewer than 2 hours for system repairs.

Keep MTTR as low as possible to swiftly address and resolve system failures, reducing downtime.

3.4 Recoverability:

Restoration Time After System Failure Detection:

The function should be restored promptly after system failure within 30 minutes and making minimal disruption to users.

Database Corruption and Currency of Restoration:

Restoration of the database to a recent and accurate state in case of corruption.

The database must be restored to its state no more than 30 minutes before the corruption occurs.

Restoration Time After Process Site Destruction:

Recover the application swiftly in the event of process site destruction to minimize downtime.

Aim to restore the application within 24 hours if the process site, including hardware, data, and onsite backup, is destroyed.

3.5 System Availability

General Availability Time:

The application must be available to users seven days a week.

Time Zone: Indian Standard Time (IST).

Availability Window: Monday to Sunday between 6:00 a.m. and 11:59 p.m. IST

Peak Usage Times:

Weekdays: The busiest usage hours are expected between 9:00 a.m. and 7:00 p.m. IST from Monday to Friday.

Weekends: Moderate to high usage is anticipated between 10:00 a.m. and 8:00 p.m. IST on Saturdays and Sundays.

Least Acceptable Unavailability Periods:

The least acceptable unavailability periods are during peak usage hours, particularly from 9:00 a.m. to 7:00 p.m. IST on weekdays, as user activity is highest during these times.

3.7 Fault Tolerance:

Functions Not Required at All Times:

Non-Essential User Interface Features:

Some secondary or non-core user interface functionalities (e.g., certain aesthetic features or non-essential navigational elements) might not need continuous availability.

Functions that Must Remain Available Despite Component Failure:

Order Placement and Checkout:

Ensure the ability for users to place orders and complete transactions even if certain non-essential interface features are temporarily unavailable.

Maintain the ability for users to log in, authenticate, and access their accounts.

3.8 Performance

Response Time for Queries and Updates:

Target Response Time: Aim for queries and updates to have a response time of fewer than 2 seconds to provide a seamless user experience.

Maintain high throughput to handle simultaneous user interactions.

Support a minimum of 1000 concurrent user sessions without significant performance degradation.

Expected Volume of Data:

Expect a database size of up to 100GB within the first year of operation.

Expected Volume of User Activity:(Assumptions)

Number of Transactions:

Hourly: Expect around 500 transactions per hour during peak hours.

Daily: Anticipate approximately 10,000 transactions per day.

Monthly: Aim for approximately 300,000 transactions per month as a baseline, with scalability for growth.



4. REQUIREMENTS TRACEABILITY MATRIX

Person	[Stakeholder]	[Stakeholder]	[Stakeholder]	[Stakeholder]	[Stakeholder]
Deliverable					
Deliverable 1:					
Deliverable 2:					
Deliverable 3:					
Deliverable 4:					
Deliverable 5:					

Code	Stands for	This is the person who
R	Responsible	Is the primary Subject Matter Expert (SME) who will take responsibility for ensuring that the requirements are expressed correctly.
A	Accountable	Makes the final decision or approves the specifications.
C	Consult	Provides the requirements. These SMEs can be consulted by the business analyst or the responsible SME.
I	Inform	Is informed after the final decision is made and can include stakeholders such as designers, testers, project steering committee, etc.

