**HARAMAYA UNIVERSITYCOLLEGE OFCOMPUTING AND INFORMATICSDEPARTMENT OF SOFTWARE ENGINEERING**

## ****Software requirement specification****

## ****For****

## ****Web based milk contract and****

## ****delivery management system****

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**1.0 Introduction**

**Web-based milk and delivery management system develop software that enable supplier of milk to manage their milk supply in very efficient way. This system will provide the way to handle the milk contract, the delivery milk to the customer . The way which gets information about customer , their need and interest .**

**The customer need to sign-up first to the system then they filling the form that the system provide to will be is easy for manage the customer**

**Information and security the system then they use the features that the system provide.**

**The system will simplify the entire to the distribution process , the way delivery ensures smooth operation and help the farmer to ensure their milk distribution productivity .**

* 1. **Purpose**

**This System aims to customer simple and easy way register for contract to get service or client simply sign up to system .The System improve the customer satisfaction and create relation between client and offers mainly this system reduce the inefficiency of traditional milk contract and delivery system and maximize the technological system .However minimize the time customer at any time and any place can get service at this reason customer or client save time and money. Additionally this system give opportunity to for retailers; householders ; disturbers get this service .**

* 1. **Scope**

**The overview of this software does give solution to many real time problems; which includes effective set up of milk supply and reduce manual error. Mainly speed up the ordering process,scheduling and monitoring deliveries,renewal their contract and provide an efficient , transparent and user-friendly platform that enhances collaboration between all stakeholders in the milk supply chain.With beautiful user-interface that have interactive feature.**

**Before this software has been developed the problem was late delivery(if it exists) ,highly paper based system that lead to error and prone to destruction , no well defined structure between the supplier and consumer, mainly depended on manual labor which lead to ineffective energy and time .**

**This software provide the solution for the above mentioned problems by**

**Improving the delivery time, reducing paper work, and modernize the previous system.**

* 1. **Definition,acronyms, and abbreviation**

|  |  |
| --- | --- |
| **GPS** | **Globalpositioningsystem** |
| **PC** | **Personalcomputer** |
| **DBMS** | **DatabaseManagementSystem** |
| **SMS** | **ShortMessageService** |
| **E-Wallet** | **electronicswallet** |
| **API** | **Applicationprogramminginterface** |
| **3NF** | **Thirdnormalform** |
| **GDPR** | **Generaldataprotectionregulation** |
| **AES** | **advancedencryptionstandard** |
| **TLS** | **TransportLayerSecurity** |
| **RBAC** | **Role-BasedAccessControl** |
| **MFA** | **Multi-FactorAuthentication** |
| **AWS** | **Amazon Web Service** |

* 1. **Reference**

1. [**www.techtarget.com**](http://www.techtarget.com)
2. [**www.scribd.com**](http://www.scribd.com)
3. [**www.w3.org/standards**](http://www.w3.org/standards)

**1.5Overview**

**Overview of the Web-Based Milk Contract and Delivery Management System the web-based milk contract and delivery management system is designed to provide a seamless experience for customers looking to subscribe to milk delivery services.**

**Upon registration, customers can complete an agreement that outlines their delivery preferences and select a payment plan that suits their needs—whether daily, weekly, or monthly. The system automates the entire process, from contract management to payment processing, ensuring efficiency and accuracy. It also allows customers to easily track their deliveries and manage their accounts online. Overall, this system aims to simplify the milk delivery process, making it convenient for customers while supporting the operational needs of the business.**

**2.0 The overall description**

**The overall description of this system is that it addresses many issues regarding to milk contract and delivery management system using advanced technology and researches to implement the system software. The end goal is to solve problems provided to it;**

**2.1product perspective**

**The Milk Contract and Delivery Management System aims to streamline the process of managing milk contracts and deliveries, enhancing operational efficiency, improving customer satisfaction, and providing real-time insights into inventory and delivery logistics.**

**2.1.1 system interface**

System interface is designed in milk delivery and management system to be user friendly allowing Navigation for customer and milk supplier . In system there is dashboard for register to fill the information like full-name, phone number and any other information and also there is another dashboard for contract agreement this page contain the date we start the contract and the last data the contract finish and there is payment method .

**Interface**

Customer Portal: A web interface where customers can place orders, manage subscriptions, view delivery schedules, and make payments.

Delivery Personnel App: A mobile application for delivery personnel to receive order assignments, navigate to delivery locations, and update delivery statuses.

Admin Dashboard: A web interface for administrators to manage contracts, monitor deliveries, handle customer inquiries, and generate reports.

**Hardware Interface**

Devices: smartphone, tablet or PC used by customer to order and manage their delivery.

GPS devices: hardware integrated into delivery vehicles to provide real time location tracking and navigation assistance.

**Software interface**

Database management system (DBMS): manages data storage and retrievalfor customer information,orders, deliveries and contracts.

**Communication interface**

Customers can use the messaging system to communicate questions or comments straight through the portal.   
  
Notifications: Provides email or SMS updates on order status, delivery dates, and payment confirmations.  
  
  
Push Notifications: Notifies delivery staff of urgent admin messages, new orders, or modifications to delivery schedules.   
  
An internal messaging system allows administrative staff to communicate with one another about orders, delivery problems, or consumer concerns.   
  
Notifications and Alerts: When important events like unsuccessful deliveries or client complaints occur, administrators are notified.

**Memory constraints**

* Customer Data: Information such as customer names, addresses, contact details, and order history needs to be stored efficiently.
* Order Management: Details of each order, including products, quantities, delivery schedules, and payment statuses, must be managed in memory.
* Inventory Management: Real-time data about stock levels, product details, and supplier information would be readily accessible.
* User Sessions: Memory should accommodate active sessions for customers and delivery personnel to ensure smooth interaction with the system.
* User Load: The system should handle multiple concurrent users (customers placing orders, delivery personnel accessing their tasks) without running into memory bottlenecks.
* Thread Management: Efficient use of threads and proper synchronization techniques can help manage memory usage while ensuring responsiveness.
* Archiving Old Data: Implementing policies for archiving or deleting old orders and customer data can help manage memory usage over time.
* Temporary Data Storage: Use temporary storage for session data or transient information that doesn’t need to be retained long-term.
* Monitoring and Alerts: Implement monitoring tools to track memory usage and set up alerts for high memory consumption scenarios.

**Operation**

In a Milk Contract and Delivery Management System, various operations are essential for managing the entire life-cycle of milk contracts, order processing, delivery scheduling, and customer interactions. Main operations are listed below:

* Registration: Allow customers to register on the platform.
* Authentication: Implement user login/logout functionality with secure authentication methods.
* Profile Management: Enable users to update their personal information, including contact details and delivery addresses.
* Create Contracts: Allow customers to create milk contracts specifying quantities, delivery frequency, and duration.
* View Contracts: Enable users to view active contracts, including details like start/end dates, quantities, and payment terms.
* Modify Contracts: Provide functionality for users to modify existing contracts (e.g., changing delivery frequency or quantities).
* Terminate Contracts: Allow customers to terminate or cancel contracts as needed.

**Site adaptation requirement**

Adapting a Milk Contract and Delivery Management System to a specific site or region involves several considerations to ensure the system meets local requirements, user preferences, and operational needs. We describe mesure site adaptation requirements here:

* Health and Safety Standards: Ensure compliance with local health regulations regarding milk production, storage, and delivery.
* Language Support: Our software will provide multi-language support based on the predominant languages spoken in our country.
* Local Payment Methods: We Integrate payment gateways that support popular local payment methods (telebirr,mobile banking and e-wallet).

**2.2 Product function**

**2.3 User Characteristices**

**User characteristics for the Web-Based Milk Construct and Delivery Management System are essential for creating an effective and user-friendly platform. The primary users include customers, milk disturber, Retailer, Food service provider , Consumers etc. Additionally, they will have diverse payment preferences, necessitating options for daily, weekly, or monthly payments, and some may have specific accessibility needs that require features like screen reader compatibility or larger text.**

**Administrators play a crucial role in managing the system, overseeing user registrations, costumer contract agreement;order processing, and payment management.**

**2.4 Constraints**

**The Web-Based Milk Construct and Delivery Management System,to the limitations or conditions that must be considered during the development and implementation of the system. Significant constraint is the requirement for customers to sign up and complete an agreement before accessing the platform's features. This ensures that all users are verified and agree to the service, which is basic for operational compliance**

**Additionally, the system must accommodate various payment options, including daily, weekly, and monthly , which faced complexity in payment processing and requires robust financial handling capabilities**

**However involves the need for the system to be user-friendly, considering the diverse tech knowledge of the customer base. The interface must be intuitive enough to cater to users with varying levels of technological proficiency, ensuring accessibility for all.**

**Furthermore, the system should comply with relevant regulatory standards concerning data privacy and security, especially since it will handle sensitive customer information and payment details.Performance constraints also play a role; the system must be capable of handling peak loads during busy periods, such as weekends or holidays**

**Overall, these constraints must be carefully managed to ensure the successful development and deployment of the Web-Based Milk Construct and Delivery Management System.**

**2.5 Assumptions and dependency**

**The system we build is access By customer through internet and Have resource such a smartphones or computer to interact with the system . This assumption underpin the milk deliveries and Management System**

**This means customer register first and complete agreement that is provided by milk supplier. So our system successfully implemented when user understand basic online navigation, allowing the system utilize effectively by provided necessary information. The system assumed that milk producers and distributors will maintain consistent supply chains,allowing for timely deliveries and inventory Management by recognize these assumption and dependency The development team can provide smooth implementation Of the web based milk construct and delivery management system.**

**2.6 Apportioning of requirement**

**Apportioning of requirements for the Web-Based Milk Construct and Delivery Management System involves categorizing and prioritizing the various functionalities and features based on their importance and implementation complexity. This process ensures that the development team can effectively allocate resources and focus on delivering the most critical components first. Initially, high-priority requirements include customer registration and agreement completion, as these are essential for user on-boarding and establishing a legal framework for service usage. Following this, the payment processing system must be developed to support flexible payment options—daily, weekly, and monthly—ensuring that customers can choose a plan that fits their needs.Subsequent requirements may include order management functionalities, such as placing and tracking orders, which are vital for enhancing user experience and operational efficiency.**

**3.0 Specific Requirements**

**Specific requirements for the Web-Based Milk Constract and Delivery Management System detail the precise functionalities and features necessary for the system to operate effectively.**

**First and foremost, the system must facilitate customer registration, requiring users to provide personal information and complete an agreement before accessing services. This ensures that all users are verified and legally bound to the terms of service.**

**Order management is another critical requirement, enabling customers to place, modify, and track their milk orders seamlessly. Furthermore, the platform must have an intuitive user interface to cater to users with varying tech skills, ensuring ease of navigation.**

**3.1External Interface**

**The External Interface requirements for the Web-Based Milk Construct and Delivery Management System outline how the system will interact with external entities and services. First, the system must provide a user-friendly web interface that allows customers to register, complete agreements, and manage their accounts seamlessly.**

**This interface should be accessible across various devices, including desktops, tablets, and smartphones, ensuring a responsive design for optimal user experience.Additionally, the system will need to integrate with third-party payment gateways to facilitate secure processing of daily, weekly, and monthly payment options.**

**Finally, AP's may be needed for potential future interrogations with marketing tools or customer feedback systems, allowing for enhanced user engagement. By clearly defining these external interfaces, the system can ensure smooth interactions with essential services and provide a comprehensive and efficient user experience.**

**3.2 Functions**

**The functional requirements for the Web-Based Milk Construct and Delivery Management System define the core functionalities that the system must provide to meet user needs effectively.**

**Following registration, customers should have the ability to select and manage their payment plans, choosing between daily, weekly, and monthly options, with secure processing of transactions.The system must also support order management functionalities, allowing customers to place, modify, and track their milk orders easily.**

**3.3 Performance Requirements**

**The performance requirements for the web-based milk contract and delivery management system are basic to ensure efficiency and user satisfaction. This system is handle a more concurrent customer , without significant delays .**

**It should support real-time processing of customer agreements and payment transactions, with a response time of no more than three seconds for customer actions such as registration, contract completion, and payment processing.**

**Scalability is also essential, allowing the system to accommodate an increasing number of customers and delivery requests as the business grows.**

**3.4 Logical database of requirement**

**Manager**

**Delivery Person**

**Supplier**

**Supplies manages Delivers**

**Milk**

**Recieves**

**Customer**

## ****3.5 Design Constraints****

The **Design Constraints** outline the necessary conditions and limitations that guide the creation and development of the milk contract and delivery management system, ensuring high performance, reliability, and scalability.

### ****3.5.1 Standard Compliance****

To ensure the system adheres to recognized standards, the following compliance requirements will be implemented:

* **Database Standards**: The database must follow **third normal form (3NF)** to ensure minimal redundancy, which optimizes storage and data consistency.
* **Security Standards**: The system will comply with the **General Data Protection Regulation (GDPR)** for handling personal user data, ensuring data privacy.
* **Scalability**: The system will be scalable and capable of supporting increased user load and data growth without compromising performance.

## ****3.6 Software System Attributes****

The **Software System Attributes** section outlines the non-functional characteristics that define the overall quality, robustness, and usability of the system. These attributes ensure the system is reliable, secure, available, and maintainable while ensuring its portability across various environments.

### ****3.6.1 Reliability****

Reliability is a critical attribute of the Web-Based Milk Contract and Delivery Management System. The system will be designed to ensure minimal downtime and maximum availability of the services to the users.

* **Error Handling**: The system will have mechanisms in place to detect, log, and handle errors gracefully without crashing. For example, the database connection failures will be captured, and the system will notify the administrator with the necessary logs.
* **Redundancy**: Redundant systems, such as backup servers and load balancing, will be used to ensure the system remains operational in case of hardware failures.
* **Testing**: Comprehensive **unit tests** and **integration tests** will be performed to ensure the system works reliably under various conditions and edge cases.

### ****3.6.2 Availability****

Availability refers to the system's ability to remain operational and accessible to users at all times.

* **Uptime Target**: The system is expected to have an uptime of **99.9%**, ensuring that it is available for use nearly all the time.
* **Fail over Mechanisms**: The system will implement fail-over techniques, where a secondary server automatically takes over if the primary server fails, ensuring minimal service interruption.
* **Scheduled Maintenance**: Regular maintenance windows will be scheduled, and the system will provide users with notifications in advance to minimize disruptions.

### ****3.6.3 Security****

Security is a top priority for protecting user data and preventing unauthorized access.

* **Authentication**: The system will implement **multi-factor authentication (MFA)** to ensure that only authorized users can access their accounts.
* **Data Encryption**: All sensitive data, including user credentials, orders, and contracts, will be encrypted using **AES-256 encryption** for data at rest and **TLS encryption** for data in transit.
* **Access Control**: The system will enforce **role-based access control (RBAC)** to ensure that users only have access to the data and functions relevant to their roles (e.g., admin, supplier, consumer).
* **Compliance with Regulations**: The system will adhere to security best practices and comply with regulations like **GDPR**, ensuring user data protection.

### ****3.6.4 Maintainability****

Maintainability refers to the ease with which the system can be updated and managed.

* **Code Moldularity**: The system will be built using modular components, making it easier to modify or add new features without affecting other parts of the system.
* **Documentation**: Comprehensive technical documentation will be provided, including setup instructions, system architecture, API documentation, and user guides. This ensures that the development team can easily maintain and upgrade the system over time.
* **Automated Testing**: The system will include automated tests to detect bugs early during the development process and reduce maintenance costs.

### ****3.6.5 Portability****

Portability ensures that the system can be run on various platforms and environments.

* **Cross-Platform Compatibility**: The system will be designed to be compatible with various browsers (Chrome, Firefox, Edge, Safari) and mobile devices (Android and iOS).
* **Cloud Deployment**: The system will be cloud-agnostic, allowing it to be deployed on popular cloud platforms such as AWS, Azure, or Google Cloud. This ensures scalability and flexibility in deployment.
* **Containerization**: The system will be packaged using **Docker** containers, making it easy to deploy across different environments (e.g., local, staging, production) without compatibility issues.

**3.7 organizing the specific requirement**

**3.7.1 Web-Based Milk Contract and Delivery Management**

**System System Mode**

This section describes the various System modes available for the web-based milk contract and delivery management system, outlining the features accessible in each mode to facilitate seamless operation and effective management.

**System Modes**

**Customer Mode:**

* **Home Dashboard:**Summary of active subscriptions, upcoming deliveries, and recent orders.
* **Subscription Management**: Review and adjust current subscriptions, renew, upgrade, or terminate plans.
* **Order Placement**: Place new orders, choose delivery dates, and review order history.
* **Profile Management**: Modify personal details, delivery addresses, and preferences for communication.
* **Payment Management**: Handle payment methods, check invoices, and complete payments

**Mode of Delivery Personnel:**

* **Delivery Dashboard**: A summary of the day's assigned deliveries, along with customer information and delivery locations.
* **Route optimization**: Based on current traffic and delivery locations, recommended routes for effective delivery.
* **Real-time delivery status** updates, such as "out for delivery,""delivered," or "failed attempt," are available.
* **Communication**: Get in touch with clients regarding delivery confirmations or problems.

**Mode of Administration:**

* **Admin Dashboard**: A summary of subscriptions, delivery data, active users, and system performance.
* **User management:** oversee the accounts of delivery workers and customers, including role distribution and access restrictions.
* **Contract Management**: Draft, revise, and oversee agreements with suppliers and consumers for milk supply.

**Description:**

This use case describes the process of managing milk subscriptions, including subscribing, renewing, upgrading, and terminating subscriptions. It covers interactions between customers, delivery personnel, and administrators.

**Prerequisites**:

1.The client has to have a system account.  
2.The appropriate delivery routes must be assigned to the delivery staff.   
3.The administrative dashboard must be accessible to the administrator.

**Primary Flow:**

* Customer logs into the system:
* Customer views the Home Dashboard:
* Customer manages subscriptions:
* Customer places new orders:
* The customer confirms the order.
* Customer updates profile and payment information:
* Delivery personnel views the delivery dashboard:
* Administrator manages the system:

**Postconditions:**

1. The customer's subscription status is updated.

2. New orders are recorded in the system and prepared for delivery.

3. Delivery status is updated in real-time.

4.User accounts and contracts are effectively managed by the administrator.

Purpose: To efficiently manage milk subscriptions, deliveries, and customer interactions online.

Core Objects:

1. **Customer**:

- Name, address, contact details.

-Subscribe, renew, upgrade, terminate subscriptions, place orders, update profile.

**2.Subscription:**

- Subscription type, start/end date, renewal status.

- Create, view, update, terminate.

**3.Order:**

-Order ID, product details, delivery date.

-Actions: Place, view, modify, cancel.

**4.Delivery Personnel:**

- Name, assigned routes, delivery status.

- View deliveries, update status, communicate with customers.

**5.Administrator:**

-Admin ID, role, permissions.

- Manage users, oversee subscriptions, handle contracts.

**5.Contract:**

-Supplier/customer agreements, terms, renewal dates.

-Create, review, update, manage.