FORMATIVE ASSIGNMENT

Drop-shipping Ecommerce website for Freelancers in Rwanda

- **Description of the concept of their Mission;**

My mission is to create sustainable job opportunities by bridging the gap between skilled and unskilled labor forces in Rwanda. Through innovative tech solutions, I aim to empower entrepreneurs in Rwanda with modern software solutions. All this will be wrapped under my platform called KORA, an ecommerce platform for drop shippers in Rwanda connecting them to local wholesalers.

- **Problem statement:**
  (A little background and identify the problem, the problem statement should answer WHO, WHAT, WHEN, WHERE, WHY, and HOW)

Due: 31 January 2025, 23:59 PM

- Each student must design a software solution to a real-world problem. Each student shall be expected to present the problem and the suggested solution in a project proposal format.
- (be clear, be precise, and show that you identified a clear gap compared to existing solutions; what is unique in your solution)
- **Software development model**
  (do not describe the development model rather explain why it is relevant to your project and show a clear understanding of the selected model through the Software Development Model steps that you will use)
- **The hypothesis of their solution**
  (what do you anticipate will happen once you deploy a workable solution?)
- **References**
  (what do you anticipate will happen once you deploy a workable solution?)
  Use APA Referencing Style

KORA (an ecommerce platform for Rwandan drop shippers)

Prepared by Manzi Terry

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1. Introduction

1.1 Purpose

I aim to connect private entrepreneurs (especially youth) ready to drop-ship and sell products online in Rwanda by partnering with local suppliers who hold the inventory. My goal is to tackle and solve logistical systems, transportation networks, online payments problems for local e-commerce businesses and build customers' trust.

This software product will employ a combination of a Business-to-business (B2B) And a Business-to-consumer (B2C) type of e-commerce.

Below are the benefits of my online platform:

- Low startup costs
- Flexibility to operate from anywhere in Rwanda
- Easy scalability
- Diverse product selection

- Faster shipping times for local customers
- Better local market demand satisfaction
- Ease of entry and flexibility with less control over logistics and lower profit margins for both parties in their businesses.
- Promotion of local products (Made in Rwanda)

1.2 Document Conventions

1.3 Intended Audience and Reading Suggestions

This SRS caters to various stakeholders involved in developing and implementing the modern e-commerce dropping platform.

Developers,Wholesalers, Drop-shippers, Customers and Testers.

1.4 Product Scope

This website platform aims at solving the most pressing challenges faced by local e-commerce suppliers in Rwanda by providing a modern web app to link local suppliers to private dropshippers with ease to solve mainly the logistical problem.

The creation of this web app solution was greatly inspired by the following articles and studies on the Rwandan local e-commerce transition. They highly aligned with my vision and goal by bringing about the essence of drop shipping as a revolutionary solution to this matter.

1. https://www.minicom.gov.rw/news-detail/the-first-public-private-dialogue-on-e-commerce-in-rwanda-addresses-key-challenges-in-the-sector
2. https://www.trade.gov/country-commercial-guides/rwanda-ecommerce
3. https://www.giz.de/en/downloads/giz2022-en-supporting-ecommerce-rwanda.pdf
4. https://www.statista.com/outlook/emo/ecommerce/rwanda

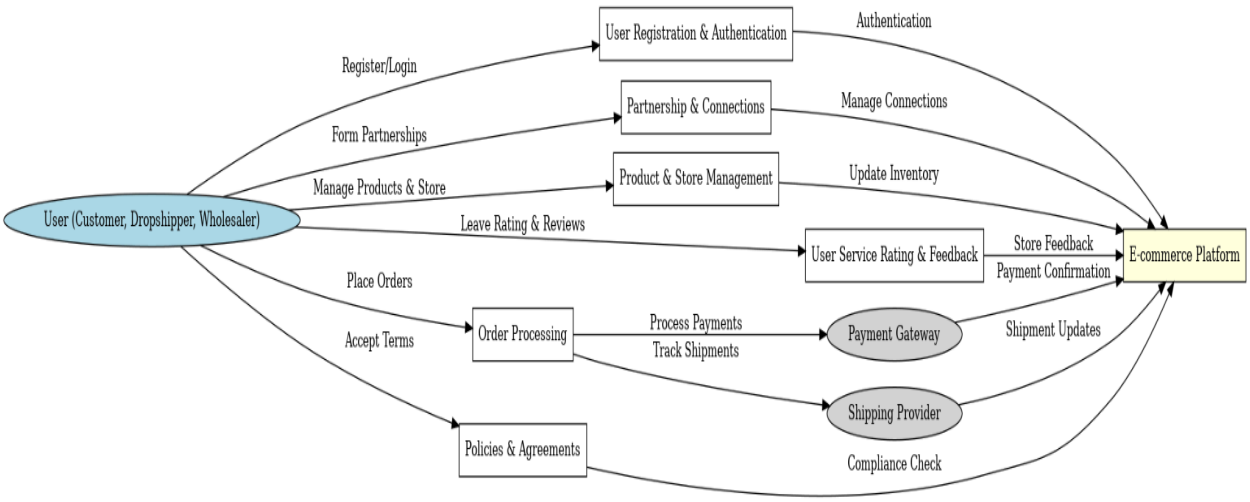
2. Overall Description

2.1 Product Perspective

This software product is a standalone web application system. This platform will not be any part of an existing product or intended as a replacement for any current existing system, it is a unique and self contained product.

2.2 Product Functions

1. User registration and Authentication
2. Partnership and Connections (wholesalers & Dropshippers)
3. User Service Rating and Feedback
4. Product Management
5. Store Management
6. Payment Tracking
7. Shipment Tracking
8. Policies and Agreements



2.3 User Classes and Characteristics

This software product is designed to cater for mainly 3 categories of users including **Product supplier (wholesaler), Dropshipper, Customers** and **Administrators**. They all have distinct roles and characteristics towards improving e-commerce in Rwanda.

They are differentiated based on their interests on the platform:

1. **Product Supplier**
   Characteristics:
   - They buy products in bulk and resell them in smaller quantities.
   - Own their inventories/stock

   Role:
   - Purchase of goods
   - Warehouse management
2. **Dropshipper**
   Characteristics:
   - Handles marketing and sales for their stores
   - Retails products from wholesalers
   - Establishes partnership with available suppliers

   Role:
   - Product logistics
   - Marketing
3. **Customer**
   Characteristics:
   - Searches for products through catalogues

   Role:
   - Product order placements
4. **Administrators**
   Characteristics:
   - Overseas and manages platform data from all parties/users

   Roles:
   - They ensure platform security, integrity and adherence to policies & agreements.

2.4 Operating Environment

The dropshipping e-commerce software is designed to operate in an environment that supports e-commerce activities such as product purchasing, product management, inventory management and more.
The operating environment includes:

Hardware components

- The software is designed to run on standard personal computers and handheld devices such as laptops,tablets and smartphones

Operating System components

- The software should support both Windows OS and Mac OS on personal computers.
- The software should support both Android and IOS on tablets and smartphones.

Software components

- The software should support commonly used web browsers (such as Chrome, Mozilla, FireFox, Opera and Safari on Windows OS, Mac OS, IOS and Android).

Internet connectivity

- Users will need internet connection to use the software product.
- Optimized for wired and wireless internet connections

Minimum Hardware requirements/specifications

- It should run smoothly on standard hardware but minimum specifications for Storage, RAM and Processor should be met.

Regulatory Policies

- It should comply with local e-commerce policies in Rwanda. These policy constraints will dictate this platform's product and services and their delivery.

Language requirements

- Since primarily the "dropshipping platform" software product targets local rwanda entrepreneurs, It should be available in local language "Kinyarwanda" and in English for global outreach on international standards.

Security considerations

- It should protect user's personal data with modern encryption techniques
- It provides measures against unauthorised access and ensures authenticity of all content.

Design and Programming Standards

- It should employ industry standard design conventions and programming practices to ensure software and content quality maintenance is met.

2.5 Design and Implementation Constraints

Technology Stack

- The platform shall be developed using **React.js** for the front end and **Node.js with Express.js** for the back end.

Regulatory Compliance

- The platform must comply with **Rwanda's e-commerce regulations** and **data protection laws**.
- Transaction records must be stored for a minimum of **6 months** for auditing purposes.

2.6 User Documentation

User manuals should be created before product deployment and should be included in the documentation section of the product in its entirety.

User manuals

- Complete user manual should be provided to users on how to use the software product

Online help

- An online help chat-bot will be implemented in the system to provide assistance to users

Tutorials

- Interactive videos on step-by-step procedures to solving common issues faced by users will be created

Knowledge base

- A knowledge base will be established on the platform to provide articles about FAQs and troubleshooting practices should be provided.

Community Forums

- Online forums and community spaces will be created for users of the platform to share ideas and feedback as well collaborations on their profiles.

2.7 Assumptions and Dependencies

1. **Availability of wholesalers and dropshippers**

- assumptions:
  The platform assumes there will be partnership between both local parties.
- Impacts:
  If the assumption is incorrect and there is a lack of interest and partnerships on both sides, it may affect the software adoption and impact as a whole.

2. **Internet connection**

- assumptions:
  Users have a reliable and stable internet connection for online operations.
- Impacts:
  Long response and loading times on the platform.

3. External Interface Requirements

3.1 User Interfaces

The platform will provide user-friendly interfaces tailored to different user roles, including wholesalers, drop shipping freelancers, and administrators.

Web-based User Interface:

- User registration and authentication forms with secure login mechanisms.
- Dashboard displaying analytics, sales reports, shipment tracking, and payment status.
- Feedback and rating section for users to review services.
- Policy and agreement acknowledgment pages for legal compliance.

Mobile App Interface (Future Consideration):

- A mobile-friendly UI with core features such as product browsing, order placement, payment tracking, and shipment monitoring.

3.2 Hardware Interfaces

The platform will be accessible through common computing and mobile hardware.

Supported Devices:

- Desktop and laptop computers (Windows, macOS).
- Smartphones and tablets (Android, iOS).
- Printers (for invoice and shipping label generation).

Mobile App Interface (Future Consideration):

- A mobile-friendly UI with core features such as product browsing, order placement, payment tracking, and shipment monitoring.

Hosting Infrastructure:

- Cloud-based hosting (will use free alternatives for testing i.e netlify) to ensure availability.

3.3 Software Interfaces

The platform will interact with various third-party software services for seamless operations.

Authentication & User Management:

- OpenID Connect for secure login via Google, Facebook, or email-based authentication.

Payment Processing:

- Integration with local and international payment gateways (e.g., MTN Mobile Money, Airtel Money).
- API access for real-time transaction tracking.

Database Management:

- MongoDB for storing user, product, order, and transaction data.

Product & Store Management:

- RESTful API for CRUD operations on products, orders, and stores.
- Integration with warehouse inventory management software for stock updates.

Shipment Tracking:

- APIs from local logistics companies if available (e.g., AGL, DHL) for tracking deliveries.

Rating & Feedback:

- Custom built-in review and rating modules.

Agreements & Policies:

- Digital signature and if available document verification APIs for legally binding agreements between wholesalers and drop shippers.

3.4 Communications Interfaces

The platform requires secure and efficient communication between users, services, and external partners.

Internet Protocols:

- HTTPS for secure data transfer and encryption.
- WebSockets for real-time updates on orders, messages, and shipment tracking.

Messaging & Notifications:

- Email notifications (SMTP or third-party services like SendGrid, Mailgun).
- SMS notifications (Twilio free plan for messaging for order updates and payment alerts).
- In-app chat/messaging system for real-time communication between wholesalers and drop shippers.

APIs & Webhooks:

- RESTful API for seamless integration with third-party logistics, payment, and product management systems.
- Webhooks for event-driven notifications (e.g., order status updates, payment confirmations).

4. Requirement Specification

User Registration and Authentication

Users (both wholesalers and drop shippers) must be able to create an account and log in securely to access platform features.

Functional Requirements

- The system shall allow users to register using email, phone number, and password.
- The system shall validate user input fields such as:
    - Email format validation.
    - Phone number format validation (Rwandan phone numbers).
    - Password strength validation (minimum 8 characters, including uppercase, lowercase, number, and special character).
- The system shall check if a username or email already exists before allowing registration.
- The system shall store registered user data securely using encryption.
- The system shall send a verification email/SMS for account activation.
- The system shall allow users to log in using email/phone number and password.

- The system shall enforce authentication using JWT.
- The system shall provide a "Forgot Password" feature with email-based password reset.
- The system shall lock user accounts after multiple failed login attempts (e.g., 5 attempts).

User Service Rating and Feedback

Drop shippers can leave reviews and ratings on wholesalers based on their services.

Functional Requirements

- The system shall allow users to submit ratings (1-5 stars) for wholesalers and drop shippers.
- The system shall allow users to submit text feedback for wholesalers.
- The system shall store and display average ratings for each wholesaler.
- The system shall allow administrators to moderate and remove inappropriate feedback.
- The system shall notify wholesalers when a new review is submitted.

Product Management

Wholesalers should be able to add, update, and manage their products in the system.

Functional Requirements

- The system shall allow wholesalers to add new products with details (name, description, price, stock, images, category).
- The system shall allow wholesalers to update or delete products.
- The system shall provide an inventory tracking system to update stock levels automatically.
- The system shall validate input fields (e.g., price must be a positive number, image formats must be valid).
- The system shall allow drop shippers to browse products and filter/search based on categories.

Store Management

Wholesalers must have a dedicated store page where their products and business details are displayed.

Functional Requirements

- The system shall generate a unique profile page for each wholesaler.

- The system shall display wholesaler details (business name, location, ratings, contact information).
- The system shall list all products belonging to the wholesaler.
- The system shall allow wholesalers to customize their profile (upload logo, business description).

Drop Shipper Profile Management

Drop shippers should have a profile page where they can track their orders and earnings.

Functional Requirements

- The system shall create a profile for each drop shipper upon registration.
- The system shall allow drop shippers to update personal information (name, phone, email).
- The system shall allow drop shippers to track their orders, completed transactions, and earnings.

Payment Tracking

Users should be able to track payments made for products.

Functional Requirements

- The system shall integrate with local payment methods (e.g., MTN mobile Money, Airtel Money, etc).
- The system shall validate transactions and display payment status (Pending, Completed, Failed).
- The system shall generate invoices and send email confirmations after successful payments.
- The system shall allow drop shippers to track their earnings and withdrawal history.

Shipment Tracking

Customers should be able to track shipments from wholesalers to customers.

Functional Requirements

- The system shall allow wholesalers to update order statuses (Processing, Shipped, Delivered).
- The system shall integrate with local logistics APIs for real-time tracking updates.
- The system shall notify users via email/SMS about shipment progress.
- The system shall provide a tracking number for each order.

Partnership and Connections

Description

The platform should facilitate partnerships between wholesalers and drop shippers.

Functional Requirements

- The system shall provide a networking feature where drop shippers can request partnerships with wholesalers.
- The system shall allow wholesalers to accept or reject partnership requests.
- The system shall enable wholesalers to set commission rates for drop shippers.
- The system shall allow drop shippers to view exclusive product deals from their partnered wholesalers.

Policies and Agreements

All users must agree to terms and policies before using the platform.

Functional Requirements

- The system shall display Terms and Conditions and Privacy Policy during user registration.
- The system shall require users to agree to policies before completing registration.
- The system shall allow users to access policies at any time from their account settings.
- The system shall enable administrators to update and publish new policies.

5. Other Nonfunctional Requirements

Performance Requirements

- The system shall have a response time of **less than 2 seconds** for 90% of user requests under normal load.
- The platform shall be able to **scale dynamically** to support up to **10,000 concurrent users** without significant performance degradation.
- The system shall maintain **99.9% uptime**, ensuring high availability and reliability.
- Data transfer between users and servers shall be **optimized to minimize latency**, using **CDNs and caching mechanisms**.
- The system shall handle peak loads efficiently, processing at least **1,000 transactions per minute** without failure.

Safety Requirements

- User data shall be securely stored and encrypted using **AES-256 encryption** to prevent unauthorized access.
- The system shall enforce **secure transactions** by integrating **SSL/TLS encryption** for all payment processing.
- All user-generated content (reviews, comments) shall be **moderated for inappropriate or harmful content** before public display.
- The platform shall implement **multi-factor authentication (MFA)** for additional security during login.
- The system shall comply with **Rwandan e-commerce regulations** and **GDPR-like data protection laws** to safeguard user privacy.

Software Quality Attributes

- **Usability**: The UI shall follow **responsive design principles**, ensuring seamless usage across mobile, tablet, and desktop devices.
- **Maintainability**: The codebase shall follow **modular architecture** and be well-documented to enable future maintenance and upgrades.
- **Security**: The system shall follow **OWASP best practices**, preventing threats like **SQL injection, CSRF, and XSS attacks**.
- **Performance Efficiency**: The system shall optimize database queries, use caching mechanisms, and minimize HTTP requests for faster performance.
- **Testability**: The platform shall undergo **unit, integration, and load testing** before deployment, with at least **90% test coverage**.

Business Rules

- Each user must have a **unique email or phone number** for account registration.
- Only **verified wholesalers** can upload and manage products on the platform.

- Drop shippers can only place orders from listed wholesalers, ensuring a controlled business model.
- A wholesaler cannot remove a product that has **pending orders** to ensure order fulfillment.
- Users must accept the **terms and conditions** before completing registration.

6. Appendix

[N/A]