
Software Requirements Specification

for

RawConnect

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1. Introduction

1.1 Purpose

This Software Requirements Specification (ERS) document details the software requirements for RawConnect, a marketplace platform designed to connect raw material producers (mining, industrial, etc.) with direct buyers (industries, distributors or manufacturers).

Range: This ERS covers the entire RawConnect system, including its web and mobile (Android) applications. It describes the functionalities required for both producer and buyer users, covering the entire cycle from account creation to product publication, order management, payment processing and logistics coordination. This includes, but is not limited to, the user interface, authentication and security, product catalog management, direct communication and negotiation between users, and shipping and order tracking options. This document does not describe any subsystem in isolation, but rather provides a comprehensive view of the system as a whole.

1.2 Document Conventions

Format and Fonts:

- **Main Title:** Times New Roman font, size 18, bold.
- **Subtitles:** Times New Roman font, size 14, bold.
- **Normal Text:** Times New Roman font, size 12.

Highlighted:

- **Bold type:** Used to highlight key terms and headings.
- **Italics:** Used for examples and technical terms.
- **Code:** Any code fragment will be displayed in a monospaced font and enclosed in a code block.

Numbering and Lists:

- **Numbered Lists:** Used for sequential steps.
- **Bulleted Lists:** Used to list elements in no specific order.

Identification of Requirements:

- Each requirement is identified with a unique code (e.g. REQ-001) for easy tracking and reference.

1.3 Intended Audience and Reading Suggestions

This Software Requirements Specification (ERS) document is intended for the following types of readers, each with specific interests and needs regarding the content of the RawConnect project:

1. **Developers:**
 - **Interests:** Understand the technical and functional requirements for system implementation.
 - **Reading Suggestion:** Detailed sections on functional and non-functional requirements, user interfaces, and technical specifications.
2. **Project Managers:**
 - **Interests:** Monitor project scope, deadlines, and team coordination.
 - **Reading Suggestion:** Introduction, project objective, scope, and implementation plan.
3. **Personal de Marketing:**
 - **Interests:** Understand the key features and value of the product for its promotion and market strategies.
 - **Reading Suggestion:** Executive summary, main features, and benefits of the project.
4. **Users:**
 - **Interests:** Know how the system will work and what benefits they will obtain.
 - **Reading Suggestion:** Section of main functionalities, usage examples, and user flow.
5. **Testers:**
 - **Interests:** Define and execute test cases to ensure product quality.
 - **Reading Suggestion:** Functional and non-functional requirements, acceptance criteria, and test plans.
6. **Documentation Writers:**
 - **Interests:** Create user manuals and technical documentation.
 - **Reading Suggestion:** Detailed descriptions of functionalities, user interfaces, and operating procedures.

1.4 Product Scope

Software Description: RawConnect is a marketplace platform that facilitates the connection between raw material producers (mining, industrial, etc.) and direct buyers (industries, distributors or manufacturers). The application is available on mobile (Android).

Purpose: The purpose of RawConnect is to eliminate middlemen and optimize the supply chain by allowing producers to sell their products directly to buyers. This not only improves transaction efficiency but also promotes transparency and sustainability in the commodities market.

Relevant Benefits:

- **For Producers:**
 - Access to a broader and more diversified market.
 - Increased income by eliminating intermediaries.
 - Greater visibility and promotion opportunities.

- **For Buyers:**
 - Direct access to quality products with transparent information.
 - Comparison of prices, ratings and certifications of suppliers.
 - Cost reduction by negotiating directly with producers.

Objectives and Goals:

- **Supply Chain Optimization:** Facilitate direct access from buyers to producers, reducing costs and delivery times.
- **Transparency in transactions:** Provide detailed information about products and their origins, ensuring quality and reliability.
- **Producer Empowerment:** Allow producers to have full control over the marketing and sale of their products.
- **Sustainability:** Promote fair and sustainable trade practices, encouraging the certification of organic and ethical products.

Relationship with Corporate Objectives:

- **Market Expansion:** RawConnect is aligned with the corporate strategy of expansion in emerging markets and diversification of the service portfolio.
- **Innovation and Technology:** Promote the use of advanced technologies to improve efficiency and transparency in commercial transactions.
- **Social Responsibility:** Support sustainable and fair trade practices, contributing to balanced and ethical economic development.

2. Overall Description

2.1 Product Perspective

Context: RawConnect is developed in response to the need for a platform that facilitates direct connection between raw material producers and industrial buyers. Currently, commodity markets rely heavily on intermediaries, which can increase costs and reduce transparency. RawConnect seeks to address these challenges by providing a digital ecosystem where transactions can be carried out efficiently and directly.

Origin: RawConnect is a new, stand-alone product, designed from the ground up to meet the specific needs of raw material producers and buyers. It is not a member of an existing product family, nor a replacement for current systems. It was developed with the aim of integrating advanced order management, negotiation, payments and logistics functions in a single platform.

Relationship with Broader Systems: Although RawConnect is a standalone product, it integrates with various external services and systems to maximize its functionality and reach. The broader system requirements regarding RawConnect include:

- **Payment Services:** Integration with payment gateway APIs such as Stripe, PayPal, and Mercado Pago to process transactions securely.

2.2 Product Functions

RawConnect must perform and allow users to perform the following primary functions:

- **For Producers:**
 - **Producer Registration and Profile:** Create and manage your profile, including company information, certifications and production capacity.
 - **Product Publication:** List products with photos, descriptions, prices and conditions of sale.
 - **Order Management:** Accept, reject or negotiate orders and track payments and shipments.
 - **Promotions and Offers:** Create and manage special offers and product promotions.
- **For Buyers:**
 - **Explore and Search Products:** Search and filter products by type of raw material, location, prices, etc.
 - **Supplier Comparison:** Compare prices, delivery times, supplier ratings and certifications.
 - **Order Management:** Create and manage orders, receive notifications and track their status.
 - **Direct Negotiation:** Direct communication with producers to negotiate specific prices and conditions.

- **General Functionalities:**

- **Ratings and Reviews System:** Qualify transactions and guarantee the quality and reliability of producers and buyers.
- **Payment Gateway:** Process secure payments using cards, bank transfers or platforms such as PayPal.
- **Product Traceability:** Follow the origin and certification of the product to ensure transparency in the supply chain.
- **Integrated Logistics:** Coordinate shipments with logistics providers and provide cost and delivery time estimates.
- **Legal Compliance:** Manage electronic billing and mandatory certifications depending on the type of raw material.

2.3 User Classes and Characteristics

Producers:

- **Frequency of Use:** Registration, daily use to manage products and orders.
- **Functions Used:** Product publication, order management, producer profile, promotions and offers.
- **Technical Expertise:** It varies, from basic to advanced depending on the size of the producer.
- **Security Level:** High, you need secure access to product and payment management.
- **Features:** Focused on the sale of raw materials, they seek to optimize their reach and efficiency.

Buyers:

- **Frequency of Use:** Moderate to high, frequent use for searching and ordering.
- **Functions Used:** Product search, supplier comparison, order management, direct negotiation.
- **Technical Expertise:** Generally intermediate, comfortable with advanced searches and online order management.
- **Security Level:** High, especially for managing payments and shipping data.
- **Features:** Industrial companies or distributors that need quality raw materials.

System Administrators:

- **Frequency of Use:** High, constant use to monitor and maintain the system.
- **Functions Used:** User administration, dispute resolution, system maintenance and updates.
- **Technical Expertise:** Tall, with advanced knowledge in systems and security.
- **Security Level:** Very high, access to all data and system functions.
- **Features:** Technical personnel in charge of the proper functioning and security of the platform.

2.4 Operating Environment

Hardware Platforms:

- Cloud-based servers for backend (e.g. AWS, Google Cloud).
- Mobile devices (smartphones and tablets) and desktop computers for end users.

Operating Systems:

- **Mobile Applications:** Android 8.0 or superior.
- **Web Application:** Compatible with the latest web browsers (Chrome, Firefox, Safari, Edge).

Software Components:

- **Backend:** Node.js or Django for the server.
- **Frontend:** React.js for the web and React Native for the mobile application.
- **Databases:** Firebase or DynamoDB in the cloud.
- **External Services:** APIs for payment gateways, logistics services and authentication.

2.5 Design and Implementation Constraints

Corporate or Regulatory Policies:

- Compliance with GDPR for the management of personal data.
- Local and international regulations related to electronic commerce and payment security.

Hardware Limitations:

- Time and memory requirements to ensure optimal performance on mobile devices and servers.

Interfaces with Other Applications:

- Integration with external APIs of payment gateways (Stripe, PayPal).
- Connection with logistics services (DHL, UPS).

Specific Technologies and Tools:

- Use of specific technologies such as React.js and React Native for frontend development.
- Security tools such as two-factor authentication.

2.6 User Documentation

Documentation Components:

Online Help: Help sections accessible from the application, offering answers to frequently asked questions.

Tutorials: Step-by-step documentation to help users get familiar with the main functions.

2.7 Assumptions and Dependencies

Assumed Factors:

- Use of external services for payments and logistics that must be kept available and updated.
- Reliance on cloud platforms for data storage and management.
- Need for continuous updating and maintenance to comply with new regulations and technological improvements.

3. External Interface Requirements

3.1 User Interfaces

- **Logical Features:** Intuitive and easy-to-use screens, with clear and accessible navigation.
- **GUI standards:** Follow user interface style guides to maintain consistency.
- **Common Features:** Standard buttons such as "Help", "Back" and "Confirm".

3.2 Hardware Interfaces

Logical and Physical Characteristics: Compatibility with mobile and desktop devices, support for label printers and scanning devices.

3.3 Software Interfaces

- **Connections:** Communication with databases and external services through APIs.
- **Data Elements:** Identification and management of product, user and transaction data.

3.4 Communications Interfaces

- **Requirements:** Support for communication protocols such as HTTPS to secure data transmission.
- **Security:** Implementation of SSL/TLS encryption to protect data in transit.

4. System Features

This section organizes the functional requirements of the product based on the main features offered by the RawConnect system. These features are designed to meet the main needs of users.

4.1 System Feature 1

Order Management

Description and Priority:

- Allow users to manage orders from creation to delivery. High priority.

Stimulus/Response Sequences:

- The user creates an order -> The system saves the order and notifies the seller.
- The seller confirms the order -> The system updates the order status.
- The order is shipped -> The system notifies the buyer and updates the shipping status.
- The buyer receives the order -> The system updates the status to "Delivered" and allows the buyer to rate the transaction.

Functional Requirements:

- REQ-1: The system must allow buyers to create and manage orders.
- REQ-2: The system must notify sellers about new orders.
- REQ-3: The system must allow sellers to update order status.
- REQ-4: The system must notify buyers of order status updates.
- REQ-5: The system must allow buyers to rate the transaction once the order has been delivered.

4.2 System Feature 2

Product Publication

Description and Priority:

- Allow producers to publish and manage their products. High priority.

Stimulus/Response Sequences:

- The producer uploads information about a new product -> The system saves and displays the product in the catalog.
- Producer updates product information -> System updates product details in real time.
- The producer deletes a product -> The system deletes the product from the catalog and notifies interested parties.

Functional Requirements:

- REQ-6: The system must allow producers to publish and edit products.

- REQ-7: The system must display products in the catalog in an organized manner.
- REQ-8: The system must allow producers to delete products and update the catalog in real time.

4.3 System Feature 3

Direct Negotiation

Description and Priority:

- Facilitate communication and negotiation between buyers and producers. Medium priority.

Stimulus/Response Sequences:

- The buyer sends a message to the producer -> The system delivers the message to the producer and notifies the buyer of the delivery.
- The producer responds to the message -> The system delivers the response to the buyer and updates the conversation.

Functional Requirements:

- REQ-9: The system must allow direct communication between buyers and producers.
- REQ-10: The system must notify users about new messages.
- REQ-11: The system must store and display conversation history.

System Feature 4: Ratings and Reviews System

Description and Priority:

- Provide a rating and review system to evaluate the quality and reliability of producers and buyers. High priority.

Stimulus/Response Sequences:

- The buyer completes an order -> The system invites the buyer to rate the transaction.
- The buyer leaves a review -> The system saves the review and displays it in the producer's profile.

Functional Requirements:

- REQ-12: The system must allow users to rate and leave reviews on transactions.
- REQ-13: The system must display ratings and reviews on user profiles.
- REQ-14: The system must allow the moderation of inappropriate or fraudulent reviews.

4.4 System Feature 4

Ratings and Reviews System

Description and Priority:

- Provide a rating and review system to evaluate the quality and reliability of producers and buyers. High priority.

Stimulus/Response Sequences:

- The buyer completes an order -> The system invites the buyer to rate the transaction.
- The buyer leaves a review -> The system saves the review and displays it in the producer's profile.

Functional Requirements:

- REQ-12: The system must allow users to rate and leave reviews on transactions.
- REQ-13: The system must display ratings and reviews on user profiles.
- REQ-14: The system must allow the moderation of inappropriate or fraudulent reviews.

4.5 System Feature 5

Product Traceability

Description and Priority:

- Offer tracking of the origin and certification of the product to ensure transparency. High priority.

Stimulus/Response Sequences:

- The producer uploads product traceability information -> The system saves and displays the information associated with the product.
- The buyer consults the traceability of the product -> The system shows the details of the origin and certification of the product.

Functional Requirements:

- REQ-15: The system must allow producers to upload product traceability information.
- REQ-16: The system must display traceability information associated with each product.

4.6 System Feature 6

Product Listing

Description and Priority: Allow producers to publish and manage their products on the platform. High priority.

Stimulus/Response Sequences:

- The producer enters the product information -> The system saves and publishes the product information.
- The producer edits the product information -> The system updates and displays the edited information.
- The producer deletes a product -> The system deletes the product information from the platform.

Functional Requirements:

- **REQ-5:** The system must allow producers to add new products with name, description, price, available quantity, and images.
- **REQ-6:** The system must allow producers to edit their product information.
- **REQ-7:** The system must allow producers to remove products from the list.
- **REQ-8:** The system must show the available products to the buyers.

4.7 System Feature 7

User Registration and Login

Description and Priority: Allow users to register and access the platform. High priority.

Stimulus/Response Sequences:

- The user enters their registration data -> The system saves the data and creates an account.
- The user enters their access credentials -> The system verifies the credentials and allows access.

Functional Requirements:

- **REQ-1:** The system must allow users to register with their name, email, password, and phone number.
- **REQ-2:** The system must allow users to log in with their email and password.
- **REQ-3:** The system must verify the authenticity of the email during registration.
- **REQ-4:** The system must provide an option to recover the forgotten password.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- The platform must handle at least 1000 concurrent users without significant performance loss.

5.2 Safety Requirements

These requirements address potential loss, damage, or harm that could result from the use of the RawConnect platform. They outline necessary safeguards, actions to be taken, and actions to be prevented. Additionally, they refer to external policies or regulations impacting the product's design and use, as well as any safety certifications required.

Potential Risks:

1. **Data Breach:**
 - Possible unauthorized access to sensitive user data, leading to identity theft or financial loss.
2. **Fraudulent Transactions:**
 - Risk of buyers or producers engaging in fraudulent activities, causing financial loss or delivery issues.
3. **Unsafe Products:**
 - Potential for products sold on the platform to be unsafe or not meeting industry standards, leading to harm.

Safeguards and Actions:

1. **Data Encryption:**
 - **Action:** Implement end-to-end encryption for all user data transmissions.
 - **Purpose:** Protect user data from unauthorized access during transit.
2. **User Authentication:**
 - **Action:** Require multi-factor authentication (MFA) for all user accounts.
 - **Purpose:** Enhance security by verifying user identities during login.
3. **Transaction Monitoring:**
 - **Action:** Implement real-time monitoring and anomaly detection for transactions.
 - **Purpose:** Identify and prevent fraudulent activities promptly.
4. **Product Verification:**
 - **Action:** Require producers to provide certifications and compliance documents for their products.
 - **Purpose:** Ensure that products meet safety and quality standards.
5. **Regular Audits:**
 - **Action:** Conduct regular security audits and vulnerability assessments.
 - **Purpose:** Identify and mitigate potential security risks proactively.
6. **Incident Response Plan:**
 - **Action:** Develop and implement a comprehensive incident response plan.
 - **Purpose:** Ensure swift and effective action in case of security breaches or other incidents.

Preventive Actions:

1. **Prohibit Unsafe Products:**
 - **Action:** Disallow the listing of products that do not meet safety standards or lack proper certifications.
 - **Purpose:** Protect users from purchasing unsafe products.
2. **Restrict Unauthorized Access:**
 - **Action:** Prevent access to sensitive data and system functionalities by unauthorized users.
 - **Purpose:** Minimize the risk of data breaches and misuse of the platform.
3. **Compliance with Regulations:**

- **Action:** Ensure compliance with relevant data protection and e-commerce regulations (e.g., GDPR, CCPA).
- **Purpose:** Adhere to legal requirements and safeguard user rights.

Safety Certifications:

1. **ISO/IEC 27001:**
 - **Requirement:** Achieve certification for information security management.
 - **Purpose:** Demonstrate commitment to maintaining a robust information security management system (ISMS).
2. **PCI DSS:**
 - **Requirement:** Comply with Payment Card Industry Data Security Standard (PCI DSS).
 - **Purpose:** Ensure the secure handling of payment information.
3. **FDA Compliance (if applicable):**
 - **Requirement:** Ensure that any products requiring FDA approval meet all relevant standards.
 - **Purpose:** Guarantee that regulated products are safe for use.
4. **Other Industry-Specific Certifications:**
 - **Requirement:** Obtain and maintain certifications relevant to the specific industry sectors represented on the platform (e.g., USDA Organic, Fair Trade Certification).
 - **Purpose:** Assure buyers of the quality and safety of products.

5.3 Security Requirements

Protection of Personal Data:

- **REQ-S1:** The system must **comply with personal data protection regulations**, such as the **General Data Protection Regulation (GDPR)** and the **Federal Law on Protection of Personal Data Held by Private Parties (LFPDPPP)** in Mexico.
- **REQ-S2:** Implement **encryption of sensitive data** both in transit and at rest, using secure protocols like **SSL/TLS** for transmission and **256-bit AES encryption** for storage.

User Authentication and Authorization:

- **REQ-S3:** Require **user authentication** using secure credentials (email and password).
- **REQ-S4:** Implement **two-factor authentication (2FA)** to enhance security.
- **REQ-S5:** Manage **user privileges according to their role** (Producer, Buyer, Administrator, etc.), ensuring access only to pertinent functions and data.

Password Management:

- **REQ-S6:** Store passwords using **secure hashing algorithms**, such as **bcrypt** or **Argon2**.
- **REQ-S7:** Enforce **strong password policies**, requiring a minimum length and a combination of characters (uppercase, lowercase, numbers, and symbols).

5.4 Software Quality Attributes

- **Adaptability:** Ability to integrate new functions without interrupting service.
- **Availability:** Maintain 99.9% annual availability.
- **Ease of Use:** Intuitive interface that minimizes the learning curve for new users.

5.5 Business Rules

- Only authenticated users can make transactions.
- Promotions can only be created by verified producers.

6. Other Requirements

- **REQ-DB1:** Data must be stored in a secure and structured manner, allowing efficient queries and guaranteeing the integrity of the information.
- **REQ-I18N1:** The system must correctly handle international date, time, currency and number formats depending on the user's location.
- **REQ-L1:** The system must comply with all **applicable laws and regulations** in the jurisdictions where it operates, including e-commerce regulations, consumer protection and tax laws.
- **REQ-R1:** The code and components developed must be **modular** and **reusable**, facilitating its use in future projects or expansions of the platform.

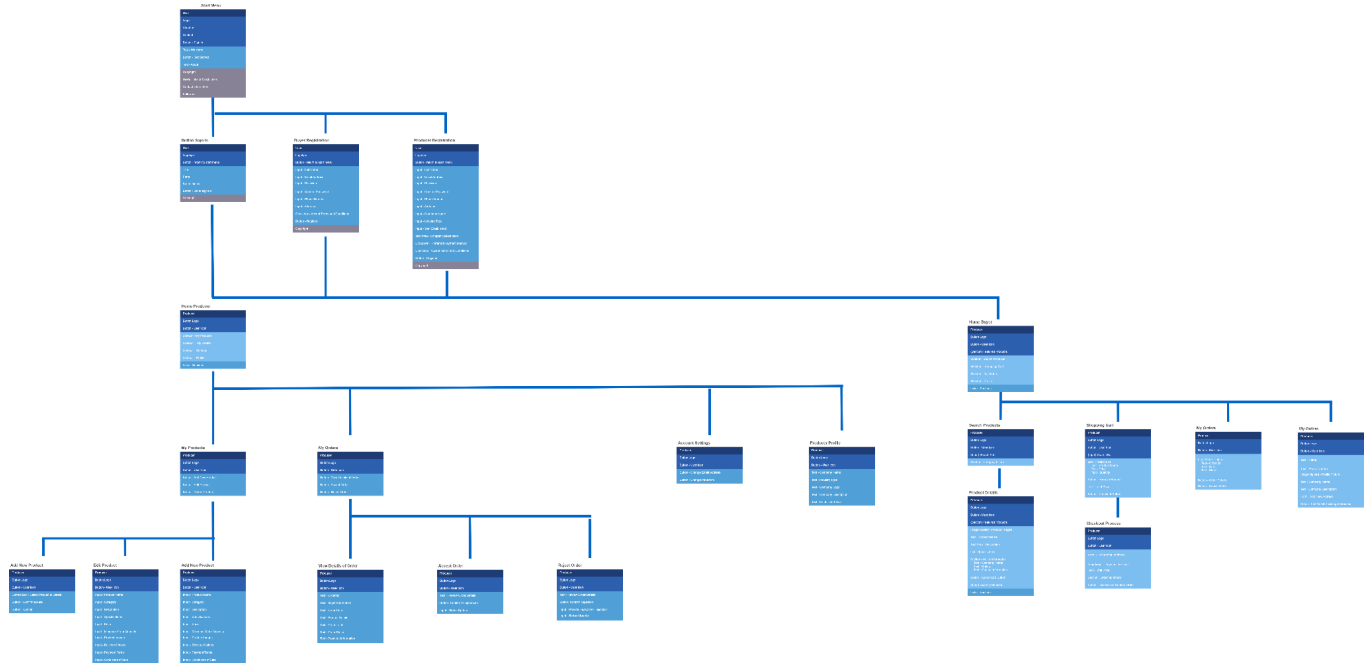
Appendix A: Glossary

1. **API:** Application Programming Interface.
2. **GDPR:** General Data Protection Regulation.
3. **SSL/TLS:** Security Protocols for Transport Layer.

Appendix B: Analysis Models

1.1 Information Architecture Diagram

Description: An Information Architecture Diagram (IAD) is a visual representation of the structure and organization of information within a website, application, or system. It is a crucial component of user experience design, aimed at facilitating the assimilation of information, ensuring easy access to various content blocks, and maintaining consistency and scalability of the content structure.



1.2 Mock-ups for the RawConnect Project

