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Trade

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1. Introduction

1.1 Purpose

The purpose of this Software Requirements Specification (SRS) is to define the requirements for a Trading Application called Trade, a platform designed to facilitate the exchange of items under a specific category. This document outlines the functional and non-functional requirements of the system, including the user interactions, system features, and constraints. The SRS serves as a reference for developers, testers, project managers, and stakeholders to ensure that the application meets the intended goals and user needs.

The scope of this document covers the entire system, client-side application, administrative interface and interaction with external components.

1.2 Document conventions

This document follows the IEEE SRS template for structuring software requirements. Requirements are categorized by priority (High, Medium, Low).

- ***High Priority:*** *Critical feature that must be implemented.*
- ***Medium Priority:*** *Important feature to enhance experience but are not critical.*
- ***Low Priority:*** *Optional feature that can be implemented.*

1.3 Intended Audience and Reading Suggestions

This document is intended for the following audiences:

- ***Developers:*** *To understand the system's functional and non-functional requirements.*
- ***Testers:*** *To create test cases based on the specified requirements.*
- ***Project Managers:*** *to track progress and ensure that the project development aligns with the documented requirements.*
- ***Stakeholders:*** *To review the system's capabilities and ensure that it meets business objectives.*

1.4 Product Scope

The trading Application (Trade) is designed to facilitate the exchange of items under a specific category, for example books category. Users can list items (books) they wish to trade and browse

available trades. If a match is found, users can participate in a trade. Category admin/s verify transactions and ensure fair exchanges.

The trading application (Trade) aims to separate and control the exchange process in order to create a fair and safe exchange process, also provide a secure, efficient, and user-friendly platform for item exchanges, reducing waste and promoting sustainable trading.

1.5 References

- *IEEE Software Requirements Specification Standard*
- *Trade Application (Trade) Brief Description*
- *Team experience*

2. Overall Description

2.1 Product Perspective

The trading application (Trade) is a standalone platform designed to facilitate the exchange of items under a specific category. It operates as an independent service but may integrate with third-party providers. The application is designed to provide a structured, moderated trading system where users can exchange items in a secure manner under the supervision of category-specific administrator/s.

The system is divided into two main components:
Client-side Application: this is the user interface where users can create an account, search for trades, participate and comment on the trades, create trades, add them to interested in list and check trades history.

2.2 Product Functions

The main functionalities of the application include:

- ***User Management**: Registration, login, and account management.*
- ***Trade Management:** Users can create, edit or delete, search, and participate in trades.*
- ***Trade Moderation:** Admins verify and approve successful exchanges and then set time limits to deliver items and check them to deliver them to the trade participants also the ability to manage categories and add new admins(if authorized).*
- ***Search and Filtering:** Users can search for trades in each category and also filter and order them for easy reachability.*

- ***Notifications and Alerts:*** *Users receive updates on trade status participated in or trades in the interested list also receive updates after admin actions.*
- ***Social Features:*** *Users can interact by commenting on trades and users can share trades with others via external platforms.*
- ***Trade History:*** *Users can track successful, unsuccessful, and ongoing trades.*

2.3 User classes and Characteristics

Client Users: Users who will use the application frequently to create and participate in trades. They also manage their trads, comment, and receive notifications.
Admin Users:
They are the category administrators (shop owners) responsible for managing, verifying and approving trades, setting delivery time limits and managing categories (*if authorized*).

2.4 User Stories

- As a user I will be able to create an account using the Google authentication services.
- As a user I will be able to create a trade, set my item and the item/s i want to trade with, a title, image/s and description for it and also see all the trade participants with their items and choose one of them.
- As a user I will be able to choose the trades location.
- As a user I will be able to edit my trade information (items, title, image/s, descriptions, location)
- As a user I will be able to participate in trade (also choose the item I have to trade with if there are multiple options) and also provide title, image/s, description.
- As a user I will be able to comment in any trade with text or images.
- As a user I will be able to add any trade to my interest in a list.
- As a user I will be able to check the history of my trads (successful, canceled or ongoing)
- As a user I will be able to search for trade by the items title.
- As a use I will be able to receive a notification on any changes happened to my rades (new participants, new comments, admin changes)
- As an admin with authorization I will be able to create, edit and delete a category.
- As an admin I will be able to select a trade to manage(set final delivery time limit) cancel or finish successfully.

2.5 Operating Environment

The trading application (Trade) will be deployed as a mobile based application accessible through the modern app store for both Android and IOS.

2.6 Design and Implementation Constraints

- *The application must be designed to handle a growing number of users and trades without performance degradation.*
- *The application must implement security measures to protect stored user data and user authentication to prevent unauthorized access.*
- *The application interface must be responsive to ensure usability across smartphones and tablets, interface should b e intuitive and easy to navigate.*
- *The application must be designed to allow for future updates and integrations.*
- *Every trade must be moderated by admin before completion.*
- *Users must follow trade category constraints.*

2.7 User Documentation

User Manual: *A guide tutorial video for client users covering account creation, trade management, and how to connect with the support.*

Admin Guide: *A guide for admins explaining how to manage, verify, approve, setting delivery time limits and how to create and manage categories (if authorized).*

2.8 Assumptions and Dependencies

- *Users are expected to have basic familiarity with mobile applications.*
- *Users are expected to provide accurate item details and follow trading category guidelines.*
- *Admins are expected to have the necessary technical and knowledge about trade items to ensure fair exchange.*
- *Admins will actively monitor trades to ensure fair exchanges.*
- *The application will rely on a third-party authentication provider which is google.*
- *The application assumes that users will comply with the platform's terms of service and community guidelines.*

3. External Interface Requirements

3.1 User Interfaces

The application will feature an intuitive, simple, easy to use and user-friendly interface designed for mobile devices (IOS or Android).

Application will include clear navigation, search functionality, management tools and other essential functionalities for the application to operate as specified for both the client and the admin interfaces.

Visual elements will be consistent and follow platform-specific design guidelines.

3.2 Hardware Interfaces

The application will support any mobile device with internet connection.

3.3 Software Interfaces

The mobile device must have either IOS or Android as its operating system in order to operate also the system will use external service for authentication.

3.4 Communications Interfaces

Communication between interfaces must be secured and done safely, this helps to improve overall security of the application internally and externally.

4. System Features

4.1 User Authentication and Login

4.1.1 Description and Priority

Description: Allows users to create or log in to their account using Google authentication services.

Priority: High

Benefit: 8.

Penalty: 7.

Cost: 4.

Risk: 3.

4.1.2 Stimulus/Response Sequences

1. User Action: Clicks "Sign in with Google."
   System Response: Redirects to Google authentication, creates/locates accounts, and initiates a session.

2. User Action: Enters invalid credentials.
   System Response: Displays error message, increments failed attempt counter.

4.1.3 Functional Requirements

REQ-1: The system shall integrate with Google OAuth2 for authentication.

REQ-2: The system shall store Google-provided user data (e.g., email, UUID) securely.

REQ-3: The system shall handle authentication errors (e.g., revoked Google access) gracefully.

4.2 Trade Creation and Management

4.2.1 Description and Priority

Description: Allows users to create trade listings by specifying their offered item(s), desired item(s), title, images, and description. Users can view all participants in a trade and select a counterparty to finalize the exchange.

Priority: High

Benefit: 9.

Penalty: 9.

Cost: 7.

Risk: 5.

4.2.2 Stimulus/Response Sequences

1. **User Action:** “Creates a Trade”

System Response: Displays a form with fields for title, description, item selection, and image upload.

2. **User Action:** Submits a trade with valid items and details.
   System Response: Saves the trade, publishes it to the marketplace, and notifies relevant users.

3. **User Action:** Uploads invalid image format (e.g., PDF).
   System Response: Rejects upload and displays supported formats (JPEG, PNG, etc.).

4. **User Action:** Attempts to submit a trade without specifying items.
   System Response: Highlights missing fields and blocks submission.

5. **User Action:** Edits an ongoing trade.
   System Response: Updates trade details and notifies participants.

4.2.3 Functional Requirements

REQ-1: The system shall validate that items exist in the user's inventory.
REQ-2: Users can upload up to 5 images (max 5MB each, JPEG/PNG).
REQ-3: The system shall enforce title (3–50 chars) and description (500 chars) limits.

4.3 Trade History

4.3.1 Description and Priority

Description: Enables users to view past trades (successful, canceled, ongoing) and filters the trades by date or status (successful, canceled, ongoing).

Priority: Medium

Benefit: 7.

Penalty: 5.

Cost: 4.

Risk: 3.

4.3.2 Stimulus/Response Sequences

1. **User Action:** Clicks on “View Trade History”
   System Response: Displays a list of the trades participated in by the user. ordered by date (default) with their status (successful, canceled, ongoing).

2. **User Action:** Filter trades by date or status.
   System Response: Displays the trades participated in by the user in the filtered order option.

3. **User Action:** Clicks on a specific trade.
   System Response: Shows trade details, participants, and admin decisions.

4.3.3 Functional Requirements

REQ-1: The system shall store trade history for each user.
REQ-2: Users can filter trade history by status (Completed, Canceled, Ongoing).
REQ-3: The system shall allow users to view trade details.

4.4 Trade Participation

4.4.1 Description and Priority

Description: Users can browse existing trades and participate by offering their own items in exchange by commenting on an active trade with text and image of their offered items. Users can also withdraw from a trade before it is finalized.

Priority: High
Benefit: 9
Penalty: 6
Cost: 7
Risk: 6

4.4.2 Stimulus/Response Sequences

1**. User Action:** Selects a trade and submits an offer by commenting on trade.
System Response: Validates the offer, notifies the trade owner, and marks the user as a participant.

2**. User Action:** Cancels trade participation.

System Response: Removes the participant and notifies the trade owner.

4.4.3 Functional Requirements

REQ-1: The system shall allow users to participate in trades by offering items of their own.
REQ-2: The system shall notify the trade creator when a new user participates.
REQ-3: The system shall allow users to withdraw from a trade before it is set and approved by an admin.

4.5 Trade Moderation by Admins

4.5.1 Description and Priority

Description: Admins verify, approve, or cancel trades to ensure fair exchanges. They also set delivery time limits.

Priority: High

Benefit: 10

Penalty: 9

Cost: 6

Risk: 5

4.5.2 Stimulus/Response Sequences

1. **User Action:** Admin reviews a trade and approves it.
   System Response: Marks the trade as "Approved," sets a delivery deadline, and notifies participants.

2. **User Action:** Admin cancels a trade due to rule violations.
   System Response: Marks trade as "Canceled," notifies participants, and logs the reason.

3. **User Action:** Admin extends the delivery time limit.
   System Response: Updates the deadline and notifies participants

4.5.3 Functional Requirements

REQ-1: The system shall allow admins to approve, cancel, or modify trades.
REQ-2: The system shall require admin approval before a trade is marked as successful.
REQ-3: The system shall send notifications to users when an admin takes action on their trade.

4.6 Notifications and Alerts

4.6.1 Description and Priority

Description: Users receive real-time notifications about trade updates, new participants, admin actions, and important deadlines.
Priority: High
Benefit: 9
Penalty: 2
Cost: 4
Risk: 2

4.6.2 Stimulus/Response Sequences

1. **User Action:** Another user participates in their trade.
   System Response: Sends a notification to the trade creator.

2. **User Action:** An admin approves or cancels a trade.
   System Response: Sends notifications to all participants.

3. **User Action:** A trade reaches its delivery deadline.
   System Response: Sends a reminder notification.

4.6.3 Functional Requirements

REQ-1: The system shall notify users of trade updates, admin actions, and deadlines.
REQ-2: Users can enable/disable notifications in their settings.
REQ-3: Notifications must be delivered in real-time.

4.7 View a category

4.7.1 Description and Priority

Description: Users can look into or view trade categories i´m interested in.
Priority: High
Benefit: 9
Penalty: 9
Cost: 4
Risk: 5

4.7.2 Stimulus/Response Sequences

1. **User Action:** User clicks on a trade-category.
   System Response: displays the category for the users to view trades.

4.7.3 Functional Requirements

REQ-1: The system shall display a list of all available trade categories to users.
REQ-2: When a category is selected, the system shall display all active trades within it, sorted by posting date (newest first).
REQ-3: The system shall display a user-friendly error message if no trades currently running in the selected category.

4.8 Search by Item-Title

4.8.1 Description and Priority

Description: Users can search in a trade category by item-title of an item they are interested in trading for.
Priority: High
Benefit: 9
Penalty: 8
Cost: 4
Risk: 5

4.8.2 Stimulus/Response Sequences

1. **User Action:** User uses the search bar to find an item by its title.
   System Response: Auto-suggest items that match what the user searched for.

2. **User Action:** User submits a search.
   System Response: System displays a list of trades with titles matching the query.

4.8.3 Functional Requirements

REQ-1: The system shall provide a search bar within each trade category for users to input item-title keywords.
REQ-2: The system shall display real-time auto-suggestions of item titles after 2+ characters are typed, limited to 10 suggestions.
REQ-3: The system shall prioritize exact matches in results, followed by partial matches.
REQ-4: The system shall show a "No results" message with the searched term if no matches exist.

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- **Response Time:** the application should respond to the user actions quickly under normal load conditions.
- **Scalability:** the application should handle a large number of concurrent users without significant performance drop.
- **Availability:** the application must be available most of the time with minimal downtime only for maintenance or updates.

5.2 Safety & Security Requirements

- **Data Protection & Encryption:** the application must ensure security,safety and encryption for all users' data and personal information.

- **User Privacy:** the application guarantees implementing all data protection regulations and ensures that the user data and personal information is not shared or accessed unauthorisedly.
- **Fraud Prevention:** admins of the application are responsible for detecting and preventing fraudulent activities.
- **Authentication & Authorization:** users must authenticate themselves using a secure login mechanism which is in this case using Google authentication services, also preventing all unauthorized access to sensitive data and features.

5.3 Software Quality Attributes

- **Usability:** the application should be intuitive and easy to use, with a clean, simple and responsive interface.
- **Reliability:** the application must be reliable, with minimal crashes also the errors should be handled and provided with clear error messages.
- **Maintainability:** the codebase of the application should be modular, well-documented and follow coding standards to facilitate future modifications and bug fixes.

5.4 Business Rules

- Users can only trade items within the same category.
- Trades must be approved by an admin before they are finalized. Adminse have authority to cancel trades that violate the category or platform terms.
- Users must comply with the platform guidelines.
- Admins can set time limits for trade participants to deliver items. If the limit is exceeded, the trade will be canceled.