***Enhancing the Book Exchange platform***

**Group members: Liu Ruoyang A23MJ4022,**

**Kahlan Sultan Mohammed A23MJ4021,**

**Bu Guoshun A23MJ4019**

**STARTING THE PROJECT**

1. **Project Overview :**

We found that users face significant difficulties when trying to exchange books due to the complexity of the current system. The issues include difficulty in searching for specific books, challenges in contacting the other party, and lack of real-time updates on book availability. Furthermore, there is no system in place to keep exchange records, which leads to disputes when returning books. To address these problems, we plan to build a new online book exchange platform. This platform will offer a streamlined, one-step process for book exchanges.

**2. Problem Statement**

We are planning to create an online book exchange platform to address the shortcomings of the current system. The main issues with the current platform are as follows:

**1.Difficulty in Finding Specific Books:** Users struggle to find specific books due to inadequate search functionality.

**2.Communication Barriers:** It is challenging for users to contact each other to arrange exchanges.

**3.Lack of Real-Time Updates:** The current system does not provide real-time updates on book availability, making it difficult to know if a book is available or already lent out.

**4.No Exchange Records:** The absence of exchange records makes it difficult to resolve disputes when returning books.

**3. Proposed Solutions**

To address the identified problems, we propose the following solutions:

**1.Enhanced Search Functionality:** Implement a robust search feature that allows users to filter books by keywords such as category, title, author, etc., making it easier to find specific books.

**2.Direct Communication Channels:** Provide a dedicated communication page for borrowers and lenders, enabling them to send messages and arrange exchanges directly.

**3.Real-Time Availability Updates:** Ensure real-time updates on the availability of books. When a book is borrowed, the system will automatically mark it as lent and close its public exchange link.

**4.Exchange Records:** Maintain exchange records containing the personal information of both parties on the platform. This record will be accessible through the dedicated communication page until both parties mark the exchange process as completed. In case of disputes, users can seek help through the platform. The records will be destroyed once the exchange process is finalized.

**INFORMATION GATHERING**

**4.1 Gathering Information from the Current System**

AS-IS Analysis The current book exchange system has several inefficiencies:

**Difficulty in Finding Specific Books:** The search functionality is inadequate, making it hard for users to find the books they are looking for.

**Communication Barriers:** Users face challenges in contacting each other to arrange exchanges, leading to delays and misunderstandings.

**Lack of Real-Time Updates:** The system does not provide real-time updates on the availability of books, requiring manual checks to see if a book is available.

**No Exchange Records:** The lack of a record-keeping system leads to difficulties in resolving disputes when books are returned.

This analysis highlights the key issues that need addressing in the new system.

**4.2 Methods Used to Gather Information**

**1.Questionnaires**

**a.Process:**

**Design:** Create a structured questionnaire with a mix of multiple-choice, Likert scale, and open-ended questions.

**Distribution:** Distribute the questionnaire to a large sample of users via email and online survey platforms.

**Collection:** Collect responses over a specified period, ensuring a high response rate by sending reminders.

**b.Data Characteristics:**

**Quantitative Data:** Responses to multiple-choice and Likert scale questions provide numerical data that can be statistically analyzed to identify common issues and trends.

**Qualitative Data:** Open-ended responses offer detailed insights into specific problems and suggestions for improvement.

**2.Interviews**

**a.Process:**

**Selection:** Select a diverse group of participants, including users, librarians, and administrative staff, to gain multiple perspectives.

**Preparation:** Develop a semi-structured interview guide with key questions and topics to cover, allowing flexibility for in-depth exploration.

**Conducting:** Conduct one-on-one or small group interviews, either in person or via video conferencing, and record the sessions for accurate transcription.

**b.Data Characteristics:**

**Qualitative Data:** Detailed, narrative data that provides deeper insights into user experiences, pain points, and suggestions for improvements.

**Contextual Information:** Rich, contextual information that helps understand the underlying reasons behind user challenges and preferences.

Using a Mixed-Method Approach Using both questionnaires and interviews offers several advantages:

**Comprehensive Data:** Combining quantitative and qualitative data provides a more complete picture of the current system's issues and user needs.

**Validation:** Cross-verifying information from questionnaires with in-depth interviews ensures the reliability and validity of the findings.

**Flexibility:** The mixed-method approach allows for both broad trend analysis and detailed exploration of specific issues, leading to more effective and targeted solutions.

**5.0**

Requirement analysis based on an As-is analysis, includes understanding the current state of a the book exchange platform and determining what needs to be developed or changed.

**5.1 current business process (scenarios, workflow)**

Scenarios:

**• Registration:** User A registers on the book exchange platform by inputting his/her name, email address, and choosing favorite genres, including fiction and non-fiction.

**• Listing a Book:** User A chooses to recommend a book that was recently read; The Silent Patient by Alex Michaelides. They input information such as the title of the book, author, genre (psychological thriller), and its condition before labeling it as excellent.

**• Search and Discovery:** User A searches through other listings and discovers that User B has put up a copy of Tara Westover’s memoir “Educated”.

**• Requesting an Exchange**: User A requests User B to swap “The Silent Patient” with “Educated”. They use the platform’s internal messenger to organize everything and decide to swap books during one of the meetings in a coffee shop.

**• Confirming the Exchange:** As a result, User A and User B acknowledge the exchange through the platform. They both put a check on the transaction indicating that they are content with the exchange.

**Workflow:**

• Recipients register for the platform with basic information including name, email, and the creation of a profile. They may also state which specific types or genres of books they would like to get.

• Book Listing:

• Users share the books they are willing to swap. This includes inputting such information as title, author, genre, new/used and optionally additional description of the item.

• Search and Discovery:

• Other users read the available books on the platform. They can search using parameters such as title, author, type, or location to get a list of books that they want.

• Requesting an Exchange:

• If a user has come across a book they would like to borrow, they make a request for an exchange to the owner of the book. They may exchange messages over the platform regarding the exchange details including the meeting place or shipping.

 Negotiation and Agreement:

• Since they are exchanging books, the terms and conditions of the exchange have to be worked out in some cases such as the condition of the books being exchanged, time of meeting to exchange the books or the delivery option. They enable these via platform communication tools before such particulars are gotten to a conclusive notation.

**5.2 Functional requirements (input, process and output)**

**. input:**

Students registration information

Input:

Email.

Name.

password.

institution.

**process:**

. Students gives their information during registration.

**Output:**

. Profiles created based on information provided.

Details for the list of books

**Input:**

book title

book author

book condition

**process:**

students enter books details when they list books for exchange

**output:**

search outcomes meet the student’s query.

**. process:**

1.User Authentication and Authorization:

**Input:**

student name

password

**process:**

test student certificate during login to allow access to the platform.

**Output:**

Access accepted or denied base on the authentication

Book listing management

**. input:**

book details.

**. process:**

Prove and store book listings in the platform's database.

**Output:**

The list of books displayed on the platform for students to view.

**Output:**

Book listing:

**Output:**

Book title

Book author

**Process:**

Show book listing for students to view

Search outcomes:

**Output:**

List of books meet the search standard

**Process:**

Present search results based on the user's query

**5.****2 Non-functional Requirement (performance and control)**

**Performance requirements**

. Response time: the system should reply to students request within specified time.

**. Throughput:** The platform should handle a certain number of concurrent users or transactions per minute without significant degradation in performance, ensuring smooth operation during peak times.

**. Scalability:** The system should be able to manage increased load by scaling resources such as servers, databases, and network bandwidth automatically.

**. Reliability:** The platform should be available and dependable , with minimal downtime or service interruptions, aiming for at least 99.9% uptime.

**Control Requirements:**

Access control: students authentication and authorization procedure should make sure that only legal students can access some attributes or data

**Privacy and Compliance:** The platform should adhere to information security rules.

Error Handling: strong error procedure should be in place to gracefully handle unexpected errors or exceptions.

These requirements will help ensure that your book exchange platform not only performs well under various conditions but also maintains control over access, data integrity, and security

**5.3 Non-functional Requirement (performance and control)**

Performance :

1.Response Time: Determine response time for key operations such as searching for a book, adding a book to an exchange, or completing a transaction.

2. Throughput: Determine the maximum capacity of each transaction

3.Fault tolerance: Defines how a system behaves in the event of a failure, including recovery procedures and data integrity measures.

Control requirements:

1.Access control: Set different permissions for different types of users (e.g. administrators, moderators, ordinary users) and ensure that access to sensitive functions or data is restricted.

2. Identity authentication and authorization: Implement identity authentication, such as account password or specific Pin, to ensure that the account can access its relevant permissions.

3. Compliance: Ensure compliance with relevant regulations and standards (e.g. GDPR, PCI DSS) involving data protection, privacy and security requirements.

**5.4**

A paper with writing on it

Description automatically generated

A diagram with writing on paper

Description automatically generated

**6.0 Summary of demand analysis for book exchange platform:**

**1. Overall goals and scope of the project: Students**

Issues that the platform needs to consider:

platform security and reliability, operating costs and expected outcomes.

**2. Current business process analysis (As-is analysis):**

**Student registration and profile creation:**

Students register using an email or social media account and create a profile that includes information about their college, major, and more.

Book list management:

Students can list the books they want to exchange and provide details such as title and condition of the book.

Book searches and requests:

Students can search for available books by title or author and directly request book exchanges with other students.

**3. Functional requirements:**

enter:

Student input information:

- Student registration information (email, name, password, school)

- Book details (title, author, book status)

deal with:

- User authentication and authorization (verify login information)

- Book list management (store and display book details)

Output:

- Create and display student profiles

- List and display exchangeable books

- Provide search results based on query conditions

Non-functional requirements for the exchange platform:

**Non-functional requirements:** Performance requirements, reliability, availability, security and other quality attributes of the system. Contains performance requirements and control requirements