**Report 1 – Introduction**

1. Project Information

* Project name: **Just Walk Out Library**
* Abbreviation: **JWL**
* Product Type: **Web Admin & Mobile App**
* Start Date: **January 5, 2017**
* End Date:

1. **Introduction**

For a long time, library has been a reliable place for people to study and borrow books. However, almost every library system nowadays still uses a traditional way for their borrowers to obtain books: a borrower has to bring all the books that he/she wants to the librarian, so that the librarian can record which books that the borrower will borrow; after that, the borrower signs in each form to commit that he/she is borrowing those books. Only after these steps, the borrower can take back his/her library card and bring the books home. Because one librarian can only manage one borrower at a time, these traditional steps can be very painful if the library is currently crowded with borrowers.

Therefore, we build a system to help libraries and their borrowers to solve those problems. Applying this system, they can not only save a huge amount of time in book-borrowing process, but they can also have a way to manage books better.

1. **Current Situation**
   * For borrowing book in a library, the borrowers usually end up queueing in a long line and hence waste much time when checking out with the librarians.
   * In case a borrower borrows many books, he/she needs to bring it with him/her and wait for turn. It is ever worse when the borrower has to wait for a long time with a pile of heavy books on his/her hand.
   * Borrowers have no mean of quick searching for books by title, category, or topic. They usually have to search for the books they want on the shelves, or ask the librarians.
   * In some libraries, librarians still have paper records of books.
   * Librarians often have to send mail to borrowers about deadline of returning books.
2. **Problem Definition**

Because of current situation, we found that the traditional process has many advantages and disadvantages below:

* Advantages:
* Take advantage of human communication.
* No technical skills needed.
* No need to bring smartphone along.
* Disadvantages:
* Borrowing books need to go through complicated steps, thus on the rush hour, it might take too much time to wait for checking out.
* The librarian has to work very hard when having many borrowers, and it is difficult to manage borrowed books.
* Paper records are hard to manage and easy to be damaged.
* Librarians may forget to remind borrowers about their deadline.
* It is hard for borrowers to quickly search for their needed books.

1. **Proposed Solution**
   * Near Field Communication (NFC): is a form of contactless communication between devices like smartphones or tablets. Contactless communication allows a user to wave the smartphone over an NFC compatible device to send information without needing to touch the devices together or go through multiple steps to set up a connection. NFC utilizes electromagnetic radio fields while technologies such as Bluetooth and Wi-Fi focus on radio transmissions instead. NFC is supported in card or the smartphone.
   * Quick Response Code (QR Code):
   * Rfid:

Our proposed solution is to build a system named Just Walk out Library(JWL), which use NFC, QR Code, RFID technologies for borrowing book easily and efficiently. In addition, our solution also helps librarian manage book easier. For borrowers, they only need to use smartphone to check in and out when borrowing book, the system will detect automatically and notify librarian. Furthermore, borrowers can manage their borrowed books. For librarian, no need spend time to serve borrower when they come to borrow book, just manage the computer.

* 1. Feature Functions
  + Using NFC code for borrower to check in: borrower will use JWL application on his/her smart phone to scan on the emulator. The emulator will then record that the specific borrower is in the library.
  + If the borrower’s smartphone does not support NFC, he/she will make use of the QR code generated by JWL application. After scanning the QR code, the system will record that the specific borrower is in the library.
  + When the borrower takes the wanted books out, he/she will use his/her smart phone again to scan NFC/QR code to the emulator. At the same time, the RFID reader will scan all the books that the borrower is bringing. The emulator will validate the borrower with all the books he/she wants to borrow, and record it if valid.
  + In case of invalid situations, such as the borrower’s id is not correct, or the borrower borrows too many books, the RFID device will ring the alarm.
  + Search
  + Manage books
  1. Advantages and Disadvantages
  + Advantages:
    - Reduce the management time.
    - Make the book-borrowing process faster and easier.
    - Store the borrower’s record at ease.
    - Get rid of paper records.
  + Disadvantages:
    - Cost more to: install the RFID tags to books, deploy the system.
    - Scanning issues: there maybe cases that prevent the RFID reader to scan to tags correctly.

1. **Functional Requirements**

Borrower component:

* Edit information/password.
* View borrowing/borrowed books.
* Borrow books.
* Get notifications when borrowing books are about to be returned.
* Make wish list about an unavailable book, so that borrower can receive notification when the wanted book is back on shelf.
* Search for books (by name, author, category, topic).
* Deactivate account.

Librarian component:

* Manage books’ information: insert, update and delete information.
* Manage borrowers: insert, update, activate, deactivate accounts.
* Tracking which books a borrower are borrowing.
* Search for books (by name, author, category, topic).

1. **Role and Responsibility**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Full Name** | **Role** | **Position** | **Contact** |
| 1 | Kiều Trọng Khánh | Project Librarian | Supervisor | [khanhkt@fpt.edu.vn](mailto:khanhkt@fpt.edu.vn) |
| 2 | Võ Hồng Hà | Developer | Leader | [Havhse61394@fpt.edu.vn](mailto:Havhse61394@fpt.edu.vn) |
| 3 | Nguyễn Tuấn Anh | Developer | Member | [Anhntse61476@fpt.edu.vn](mailto:Anhntse61476@fpt.edu.vn) |
| 4 | Đặng Nhật Thiên | Developer | Member | [Thiendnse61357@fpt.edu.vn](mailto:Thiendnse61357@fpt.edu.vn) |

*Table 1: Roles and Responsibilities*