STP

Software Test Plan for a School Library Software

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	Name	Date	Position	Signature
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Version Control

Version	Change log	Content	By	Date
1.0	First draft	STP	N/A	22.07.2024
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1. General Information

1.1. Documents Purpose

The purpose of this document is to define a framework test plan. This framework plan will include all relevant topics for test planning and execution:

- The planned work methodology for system testing.
- The theory of dealing with the data repositories required for testing.
- A compilation of the interfaces that will be tested as part of the system testing.
- A hierarchical "breakdown" of all the functional topics in the system (test subjects).
- The document will be reviewed and approved by the system's product managers.

1.2. System Description

This system is a modular information system for managing multiple library branches. The management includes book inventory management, customer database management, account management, fines and payments, queries, and batch processes.

The system will be based on an ERP (Enterprise Resource Planning) System, which is a system for enterprise resource planning and data processing that handles all the organization's data processing needs as a single unit, unlike other systems that force the user to use multiple systems for data processing.

Among the systems based on this system are companies such as SAP, Oracle, and QAD. ERP systems are used by over 200,000 companies and over 10,000,000 users worldwide.

Managing library databases requires organization and order, from managing items in the database to managing customers and managing payments. The above system solves the problem of resource

fragmentation into multiple systems and consolidates all the organization's needs in one place.

1.3. Applicable Documents

Name	Version
School Library Software - FD	2017
Email exchanges	N/A

1.4. Terms and Definitions

- **QA (Quality Assurance):** Quality Assurance is an umbrella term for all the methods and means intended to ensure the quality of a product or service provided to a customer or consumer. It is designed to minimize damage during the development process at all its stages.
- **System Requirements:** A description of a feature or function required from the developed system to implement the organization's business activity.
- **Work Environment:** A software work environment for testing purposes (production environment, testing environment, or development environment).
- **Site:** The physical location where the tests will be performed.
- **Database:** The system's data repository.
- **STP (Software Test Plan):** A document for planning the test framework.
- **STD (Software Test Description):** Planning and writing test scenarios (Test Cases).
- **STR (Software Test Report):** A summary document of each test phase. This document will include a quantitative summary of the test findings, the test team's recommendations regarding the system's transition to the next stage, including risk assessment.
- **Sanity Tests:** Basic tests that allow quickly and efficiently identifying if the basic functionality of the product works as required, and the product is in a stable state.
- **GUI (Graphical User Interface):** The graphical user interface.
- **Entry & Exit Criteria:** These are the threshold conditions that the system must meet, success metrics for version transitions between development, testing, and production stages.

- **Smoke Test:** Tests designed to quickly identify the product's stability by early detection of faults indicating a severe system failure.
- **Test Case:** A test scenario. The scenario consists of test execution conditions, test steps, expected result, and actual result.
- **Batch:** An automated process that takes place behind the scenes.
- **Interfaces:** An interface is a state of information or data transfer within the system (internal interface) or between different systems (external interface).
- **Input / Output:** Entering information into the system, either by data entry or through a defined interface, is defined as Input. Receiving data from the system is defined as Output.
- **N/A (Not Applicable):** A section that is not relevant to the system.
- **Compatibility:** Compatibility between systems (for example, between computer software and a website or application).
- **Risk Analysis:** A process of identifying potential risks, assessing the probability of risk and the expected impact if the risk occurs. Additionally, the process is intended for hedging or monitoring.
- **Hedging:** Hedging refers to a strategy aimed at reducing or eliminating potential risks.
- **Monitoring:** A consistent process of tracking, evaluating, and adjusting identified risks to identify potential changes and take corrective actions to maintain organizational goals.
- **CRUD (Create, Read, Update, Delete):** A test that includes creating, reading, modifying/updating, or deleting data according to the permission granted to the user.

2. Test Strategy

2.1. General Strategy

The tests will be performed at several sites: in the system's production environment and in the system's work environment, i.e., at all network branches.

Before performing the tests, sanity and functionality tests will be performed.

Tests that can be performed:

- **GUI tests** – display tests.
- **Usability tests** – usability and user experience tests.
- **Functionality tests** – tests that ensure the system's functionality works correctly.
- **Security tests** – authorization and authentication tests.
- **CRUD tests** – a test that includes creating, reading, modifying/updating, or deleting data according to the permission granted to the user.

2.2. Work Method

Resources: Team leader, 4 testers. Total of 4 team members, including the team leader as one of the testers.

The testing team will pass the requirements to the development team based on the tests it plans to conduct. The development team will work according to those requirements, in order to maximize time utilization.

This document, STP, will be approved by the test team leader and the project manager. After its approval, and based on it, the STD document will be created, which will also receive the approval of the test team leader.

After the STD document is approved, at least two rounds of testing will be performed, with the aim of meeting all the criteria for moving the system to the next stage, as defined later. The number of test rounds will be decided by the test team leader after consultation with the relevant parties.

At the end of the tests, the STR document will be written and presented, reporting the results.

The tests that will be performed:

- **Usability tests –** to check that the system is simple to use and accessible to all types of users.
- **GUI tests** – for all screens, to ensure that the screens themselves are correct, uniform, clear, and that all the functions that should be on the specific screen are indeed present.

- **Compatibility tests** – compatibility between the shelf software, and the websites and the application. To ensure that the software does run on the defined operating system and does not run on other operating systems. To ensure that the website runs properly on all defined browser types, but does not work on other browser types. To ensure that the application works properly on its defined operating systems and does not work on other operating systems.
- **Performance tests** – to check system response times.
- **Survival and Recovery tests** – to check the system's response in case of system crash and internet "downtime."
- **Internal interface tests (Integration)** – to check that all modules within the system communicate properly.
- **External interface tests (Interface)** – testing interfacing with external systems, such as the SHVA system or a printer.
- **Load tests** – to check if the system can withstand any type of load.
- **Security tests** – each system user has permission to certain functions. We need to check that the system requests authentication details, for security purposes and correct user routing within the system, and that the permissions work correctly.
- **CRUD tests** – creating new customers, updating customer details, deleting the customer. Updating an item in the system, creating a new item, deleting the item.
- **Boundary Values tests** – date tests for orders.
- **Maintainability tests** – maintenance tests throughout the system's life.
- **Accessibility tests** – the system must also be accessible to people with certain disabilities, so that the system is accessible to all types of users, and to avoid being exposed to a lawsuit.

2.3. Planned Schedule

Project stage	Starting date	Finish date
Analyzing the FD	23/02/2024	27/02/2024

Writing the STP	27/02/2024	15/03/2024
Writing the STD	15/03/2024	05/04/2024
Test cycle 1	06/04/2024	26/04/2024
Test cycle 2	26/04/2024	15/05/2024
Test cycle 3	20/05/2024	02/06/2024
Writing the STR	05/06/2024	12/06/2024

2.4. Test Scope

2.4.1. Included Subjects

The tests will be performed for user processes, namely librarians, readers, and the administrator.

3. General Maintenance

3.1. Entry Criteria

The following criteria define the conditions for receiving the system for testing, and they are based on the results of previous execution stages prior to testing. Their purpose is to ensure that the system is indeed ready for testing, and thereby prevent situations of instability and duplication of work.

The Criteria:

Phase	Criteria
Sanity tests	All planned tests were executed.
Sanity tests	All planned tests were successfully executed.

3.2. Exit Criteria

The following criteria define the 'red line' for moving the system to the next stage of work. The 'red line' is defined by:

* The number of open (unresolved) bugs and their severity levels.
* The percentage of tests executed out of the planned tests.
* The percentage of tests that passed successfully out of the tests executed.

Bugs discovered during testing are documented and marked with a 'severity level.' The possible severity levels are:

* **Critical level bug** – a bug that causes a system 'crash.'
* **Major level bug** – a bug that does not cause a system 'crash' but does not allow continued proper system operation.
* **Mid level bug** – a bug that does not cause a system 'crash' and allows continued proper operation.
* **Minor level bug** – A GUI bug or something similar.

Definition of the criteria for approving the transfer of the system to production, at the level of the number of bugs from the completed tests:

Criteria	Critical level bug	Major level bug	Mid level bug	Minor level bug
Open bugs	0	0	10>	15>

Definition of the criteria for approving the transfer of the system to production, at the level of testing:

Criteria	%
Percentage of tests executed out of planned tests	90%
Percentage of passed tests out of executed tests	80%

4. Tests Subjects

See Appendix No. 1 - MMQA02 - Requirements Tree.

5. Interface Mapping, Data Conversions, and Batch Processing

5.1. External Interfaces

Identification	Description	I/O	Batch/Online
Mailing System	The system needs to be able to send Email alerts to customers who didn't return books/have a debt	O	Batch

Payment System	The system will need to connect to a banking system/SHVA system	O	Batch
Ministry of the Interior	The system will need to connect with the Ministry of Interior, when received an ID number	O	Online

5.2. Internal Interfaces

Identification	Description	I/O	Batch/Online
Logging into the system	Logging in the system using a password and a user name	I	Online
New Book Acquisition	Adding new books into the database	I/O	Online
Update/Delete a book	Update/Delete a book from the database	I/O	Online
New Reader Acquisition	Adding new readers into the database	I/O	Online
Update/Delete a Reader	Update/Delete a reader from the database	I/O	Online

Book Lending and Returns	Book lending and Returns by the reader	I/O	Online
Books Tracking	Book tracking by the reader	I/O	Online
Queries	The system will provide the librarians and readers queries for help	I/O	Online
Calculating Debts and Fines	The system will automatically calculate the fines and debts of customers	O	Batch
Status Marking, Readers, and Books	Reviewing all the readers in the database, and checking the book lending dates and the outstanding debts of the readers	O	Batch
Receiving monthly payments	Uploading the payment file received from the post office, with a record of payments made for the previous month and crediting the	I	Batch

	reader with the amount of the payment made		
Issuing monthly payment slips	Issuing payment slips for sending to readers for the new month	O	Batch

6. Test Data

The data that will be used for testing will be retrieved from a dynamic database. The item and customer databases will change and be updated during work. The data we will use is real data retrieved from the existing databases (migration).

7. Work Requirements

Requirement type	Requirement	No.	Reason
Hardware	3 regular workstations	1	To perform parallel testing on multiple workstations
Interface	Working connection with the Ministry of the Interior	1	To test the authentication of the customers ID

	Working Connection with SHVA system/Banking system	2	To test payment processing
HR	3 additional testers	1	Work distribution
Other	A connection to the Internet and a working router and modem	1	For the purpose of testing online operations
	An active credit card	2	To test payment processing
	A canceled credit card	3	To test payment processing- (Negative functional testing)
	Lunch	4	
	Employee transportation	5	For employees without cars

8. Risk Management

1. **Risk:** Internet Connectivity
   P (Probability): 0.3

D (Damage): 7
S (Severity): 2.1
Damage Description: We will not be able to test online activities
Action: Monitoring
Person In Charge: Bezeq contact person – Avi Ben Abo 0525200158

2. **Risk:** New Testers
   P (Probability): 0.3
   D (Damage): 8
   S (Severity): 2.4
   Damage Description: Low and slow tests quality
   Action: Fencing
   Action Description: Finding a tester/expert to accompany the project
   Person In Charge: Benny Benjamin, Human Resources Manager,
   bennyb@gmail.com

3. **Risk:** Server Crashing
   P (Probability): 0.3
   D (Damage): 10
   S (Severity): 3
   Damage Description: We will not be able to enter the system and test
   it
   Action: Monitoring
   Person In Charge: Infrastructure team, contact person – Turn
   0547896541

4. **Risk:** Vacations
   P (Probability): 1.0
   D (Damage): 6
   S (Severity): 6
   Damage Description: One of the employees is going on a vacation to
   Greece
   Action: Fencing

Action Description: Holiday deferral/sourcing a substitute employee for the project duration
Person In Charge: Benny Benjamin, Human Resources Manager, bennyb@gmail.com

5. **Risk:** An Employee is Quitting
   P (Probability): 0.4
   D (Damage): 7
   S (Severity): 2.8
   Action: Monitoring
   Action Description: Finding a replacement
   Person In Charge: Benny Benjamin, Human Resources Manager, bennyb@gmail.com

6. **Risk:** Failure to Meet Deadlines
   P (Probability): 0.4
   D (Damage): 8
   S (Severity): 3.2
   Damage Description: The system cannot be released, the client is unhappy
   Action: Fencing
   Action Description: Proper task distribution among team members, motivational talks for the team
   Person In Charge: Moshe Michael – QA Team Leader

7. **Risk:** The Clients Requirements Keep Changing
   P (Probability): 0.4
   D (Damage): 8
   S (Severity): 3.2
   Damage Description: Causes delays in work and system understanding by the testing team
   Action: Monitoring

Action Description: A meeting must be scheduled with the client to clarify the company's position regarding numerous changes in requirements

Person In Charge: The CEO

9. Coverage Table

Number in FD	Name in FD	Number in Requirements Tree	Name in Requirements Tree
1.2	כניסה למערכת	1.1	כניסה למערכת
2.1.1	הוספת ספר לספריה	1.2.1.1.1	קליטת ספר חדש
2.1.2	עדכון/ביטול ספר בספריה	1.2.1.1.2	עדכון ספר
2.1.2	עדכון/ביטול ספר בספריה	1.2.1.1.3	ביטול ספר
2.1.3	קליטת קורא חדש	1.2.1.2.1	קליטת קורא חדש
2.1.4	עדכון/ביטול קורא	1.2.1.2.2	עדכון קורא
2.1.4	עדכון/ביטול קורא	1.2.1.2.3	ביטול קורא
2.1.5	השאלה/החזרה של ספרים על-ידי הקורא	1.2.1.2.4	השאלה של ספרים ע"י הקורא
2.1.5	השאלה/החזרה של ספרים על-ידי הקורא	1.2.1.2.5	החזרה של ספרים ע"י הקורא
2.1.5	איתור ספרים	1.2.2.1	איתור ספרים
3	שאילתות במערכת	1.3	שאילתות

4	טבלאות/מאגרים במערכת	2	טבלאות/מאגרים במערכת
4	טבלאות/מאגרים במערכת	1.2.3	אדמיניסטרטור
5	תהליכי Batch	3	תהליכי Batch
5.1	חישוב קנסות	3.1.1	חישוב קנסות
5	סימון סטטוסים קוראים וספרים	3.1.2	סימון סטטוסים קוראים וספרים
5.1	קליטת תשלומים חודשיים	3.2.1	קליטת תשלומים חודשיים
5.2	הפקת תלושי תשלום חודשיים	3.2.2	הפקת תלושי תשלום חודשיים

עץ דרישות

1.2.1.2.1.2.   מס. ספרים

1.2.1.2.1.2.1.   רשימה נפתחת

1.2.1.2.1.2.1.1.   2

1.2.1.2.1.2.1.2.   4

1.2.1.2.1.2.1.3.   6

1.2.1.2.1.3.   בחירת סוג קורא

1.2.1.2.1.3.1.   בוגר

1.2.1.2.1.3.2.   ילד

1.2.1.2.1.3.3.   חייל

1.2.1.2.1.3.4.   פנסיונר

1.2.1.2.1.4.   חישוב תשלום

1.2.1.2.2.   עדכון קורא

1.2.1.2.2.1.   הקשת ת"ז

1.2.1.2.2.1.1.   הקשת תעודת זהות תקינה

1.2.1.2.2.1.2.   הקשת תעודת זהות לא תקינה

1.2.1.2.2.2.   עדכון לפי סטאטוס

1.2.1.2.2.2.1.   פעיל

1.2.1.2.2.2.2.   מוקפא

1.2.1.2.2.2.3.   מבוטל

1.2.1.2.3.   ביטול קורא

1.2.1.2.3.1.   ביטול לפי סטאטוס

1.2.1.2.3.1.1.   פעיל

1.2.1.2.3.1.2.   מוקפא

1.2.1.2.3.1.3.   מבוטל

1.2.1.2.4.   השאלה של ספרים ע"י הקורא

1.2.1.2.4.1.   הקשת ת"ז

1.2.1.2.4.1.1.   הקשת תעודת זהות תקינה

1.2.1.2.4.1.2.   הקשת תעודת זהות לא תקינה

1.2.1.2.4.2.   קורא עם ספרים מושאלים

1.2.1.2.4.3.   קורא בלי ספרים מושאלים

1.2.1.2.4.4.   קורא עם מספר ספרים מושאלים הקטן יותר למספר הספרים המותרים להשאלה בו זמנית.

1.2.1.2.4.4.1.   קורא עם מספר ספרים מושאלים הגדול יותר למספר הספרים המותרים להשאלה בו זמנית.

1.2.1.2.4.5.   קורא עם מספר ספרים מושאלים השווה למספר הספרים המותרים להשאלה בו זמנית.

Executive Summary

Document Code: MMQA03

Gaps and Issues in the Specification?

1. In section 1.1, it is not explained what the stations are.

2. The rental prices for the books are not specified.

3. The penalty amounts are not specified.

4. In section 1.2, the screen for system login is not shown.

5. In section 1.2, it says that the stations for readers will be "marked," but it was not specified or shown how.

6. In section 1.2, it is not clear what the first screen in the system looks like, so it is not clear how the readers get to the screen for selecting the function they want.

7. In section 1.2, it is not mentioned how the librarian creates a username and password for themselves.

8. Why does the "Back" button clear the screen and not return to the previous screen? This is somewhat misleading.

9. In section 2.1.1, the titles of the fields "book name", "publisher", "subject", "location", "author", "year", and "language" are not aligned with their input fields.

10. In section 2.1.1, the words "Confirm", "Back", and "Finish" on the buttons at the bottom of the screen are not centered within their boxes.

11. In section 2.1.1, why does the status "Available" not appear on the screen, like the book code?

12. How does the system know which branch the book was entered into?

13. In section 2.1.1, it is not specified how the system will alert, if at all, when trying to register two books at the same location.

14. In section 2.1.2, again, the titles are not aligned with their input fields.

15. In section 2.1.2, once again, the words on the buttons at the bottom of the screen are not centered within their boxes.

16. In section 2.1.2, there is a "Cancel" button, which is not mentioned in the standards for the page, and we don't know what it does.

17. In section 2.1.2, it is possible to change the book code, even though the previous section states that the code is assigned to the book.

18. In section 2.1.2, is it possible to update the book's status? If so, why is the field blocked? If not, how is it done?

19. In section 2.1.2, the message "Are you sure you want to cancel?" does not appear, so we don't know what it looks like or how it appears on the screen.

20. In section 2.1.2, the input fields on the right side of the screen are not aligned with each other.

21. In section 2.1.3, what is considered a valid ID number by the system?

22. In section 2.1.3, the dropdown list that is supposed to be next to the book count field, to display the number of books, is not placed near its title.

23. Throughout the specification, the word "חודש" (month) appears as "חדש" (new), so instead of "monthly payment", it says "new payment".

24. In section 2.1.3, the title "New Payment" is not aligned with its input field.

25. In section 2.1.3, again, the words on the buttons at the bottom of the screen are not centered within their boxes.

26. In section 2.1.3, it is not specified what happens if the same ID number is entered twice.

27. In section 2.1.3, why is it not possible to borrow only one book?

28. In section 2.1.3, why is it not possible to borrow books in odd-numbered quantities, only even numbers?

29. In section 2.1.3, why is there no title for the "reader type" section?

30. In section 2.1.3, the title "ID:" should be written as "ת"ז:".

31. In section 2.1.4, the titles "Reader Status" and "Amount to Pay" are not aligned with their input fields.

32. In section 2.1.4, there is a "Cancel" button which is not mentioned in the standards, and we don't know what it does.

33. In section 2.1.4, the "Finish" button is smaller than the others, and the word "Finish" is not centered within its box.

34. In section 2.1.4, what happens if I try to update/cancel a reader with an "Active" status?

35. In section 2.1.4, the radio buttons for selecting the reader type are unclickable and all already marked with a black circle.

36. In section 2.1.4, the title "ID:" should be written as "ת"ז:".

37. In section 2.1.4, the input field for the title "Number of Books" should be a selection list showing numbers, similar to the previous section.

38. In section 2.1.4, there is an "Update" button which is not mentioned in the standards, and in section 2.1.2, there is a radio button for updating, not a regular button.

39. In section 2.1.5, the title "ID:" should be written as "ת"ז:".

40. In section 2.1.5, the input field for the title "ID:" should be closer to the title.

41. In section 2.1.5, the output field for the title "Number of Books:" is too large and not aligned with its title.

42. In section 2.1.5, more space should be given between all the text as everything looks a bit crowded and very busy.

43. In section 2.1.5, the titles "Book Code" are not aligned with their input fields.

44. In section 2.1.5, there are 6 input fields under the "Book Code" title, while only 5 are needed.

45. In section 2.1.5, the input fields under the "Book Code" title are not aligned with each other.

46. In section 2.1.5, the checkboxes are not aligned with each other.

47. In section 2.1.5, the radio buttons for "Borrow" and "Return" should be moved down slightly so they are not inside the previous section.

48. In section 2.1.5, the radio buttons are not aligned with each other.

49. In section 2.1.5, the titles "Borrow" and "Return" are not aligned with each other, and "Borrow" is too far from its radio button.

50. In section 2.1.5, the titles "Book Name" are not aligned with their output fields.

51. In section 2.1.5, the output fields for the titles "Book Name" are not aligned with each other.

52. In section 2.1.5, the title "Penalty Amount" is very far and not aligned with its output field.

53. In section 2.1.5, the titles within the buttons at the bottom of the screen are not centered within their boxes.

54. It is not specified what number indicates the limit for borrowing books.

55. In section 2.1.5, the title "Subject" is missing a colon.

56. In section 2.1.5, the titles "Book", "Author", "Status", and "Location" in the second row should be aligned to the center of the field below them.

57. In section 2.1.5, the titles on the buttons at the bottom of the screen are not centered within their boxes.

58. In section 2.1.5, the ENTER button is not displayed on the screen.

59. In section 2.1.5, the ENTER button is not mentioned in the screen standards.

60. In section 2.1.5, the list of books is not displayed, so we don't know how it will appear.

61. Nowhere is the monthly fee for library registration mentioned.

62. The query screens and databases are not shown.

63. In section 4, it is stated that the book details displayed are "Book Code, Name, Location, and Other Identifying Details", but what are "Other Identifying Details"?

64. Does the administrator have login credentials? Nowhere in the document is it mentioned about the administrator, only in section 4.

65. We are not shown the administrator's update screens.

66. In section 4, under "Librarian Permissions Table", it is not specified that the table will include the type of permission.

67. In section 5, it is stated that there are BATCH processes that occur every night, but it is not specified at what time the process occurs.

68. In section 5, what does the warning letter that is sent to a late client look like and what does it say?

69. In section 5, how is the letter sent? Does the system send an email to the client or is a physical letter sent?

70. In section 5, what happens when you try to send the same letter twice to a client?

71. In section 5, under "Monthly BATCH Processes", it says the process will take place at the beginning of each month, but it is not specified the exact date or time of the process.

72. The subjects of the books, catalogue numbers, shelf code numbers, and serial numbers were not mentioned. Are there any publisher names that are invalid?

73. It is unclear where to enter credit card details or how the payment process works.

Suggestions for Improvement and Optimization?

o   It is recommended to add an option for tracking dynamic debts in real time, meaning the system would update the debt amount during borrowing and returning, and not just through the BATCH processes. This would allow library managers to view debts in real time and respond accordingly.

o   The system should allow for the return of books even if the reader has an outstanding debt from previous books. This will prevent situations where debts are not reconciled.

o   Add daily/weekly alerts for books that are due to be returned soon (3-5 days before return). This will notify readers to return books on time.

o   Add an interface that allows librarians to automatically request the purchase of new books when a book is more than a year overdue and marked as "Lost."

o   Ensure that when a book is entered into the system, a mechanism checks if a duplicate book already exists, at least by the book title/author.

o   It is recommended to add a feature for managing alerts for readers before they are moved to "Suspended" or "Cancelled" status, for example, sending early alerts to readers who are 2 weeks to a month overdue.

o   Instead of automatically updating the reader's status in case of debt, add a librarian confirmation process. This way, mistakes can be avoided, and the action will be conducted under supervision.

- Add a feature to track the most popular books at each branch so that library managers can be aware of which books are in higher demand.

- When readers search for books, add an option to manage demand in real time and respond accordingly. For example, if a specific book is searched frequently, it might need additional copies or need to be highlighted in popular categories.

- Add not only queries for book statuses but also options to search by book type (e.g., children, history, science fiction) or difficulty level (children/teen/adult).

- Search for debts not only by reader but also by reader type (e.g., child, soldier, pensioner) to view the relevant debt status for each reader type.

- Allow system administrators to define additional parameters for updating software (such as allocating books according to additional criteria, managing lost books, etc.) in a more flexible manner.

- Add automation to automatically update the number of books a reader can borrow based on their reader type (e.g., a child can borrow fewer books, a soldier can borrow more).

- It is recommended to allow different penalty calculations based on book type (children's books vs professional books) so that professional books with higher value are penalized more heavily.

- Implement a mechanism that checks if a process has already been completed (e.g., penalty calculation or payment entry) to prevent unnecessary double actions.

- Create a more intuitive UI that can provide clearer feedback during the book checkout/return process. For example, when returning a book, show the penalty amount clearly at the top of the screen.

- Make sure the system provides meaningful alerts and warnings when a librarian is about to enter or modify key information (like book code, reader details, etc.), preventing accidental data loss or errors.

- Introduce quicker processes for tasks with frequent repetition, such as issuing library cards or registering new books.