**LIBRARY MANAGEMENT SYSTEM**

**1. PROJECT SCOPE:**

This project is only about the most basic things a library does, like searching for a book, lending  a book, and returning a book within a certain amount of time.

• It can be used in more than one library. It can be used in more than one library.

• Users can find the book they want in a single second.

• Users can look at their profiles to see if they still owe money on their IDs.

• A librarian can also search for a user's name to see their profile.

**2. PROJECT GOALS AND OBJECTIVES:**

The Library Management System was made so that people don't have to spend as much time  keeping records by hand on physical or tangible materials. It gives the users different options  and makes the system safe and free of mistakes. It cuts down on work and does the same  things as the manual system, but it does them faster and wastes less time.

This project was made so that tasks can be done quickly and easily, which can't be done with  manual systems. The features of this Project will save the user time by making it easy for them  to find the books they want. Its goals are:

⮚ Urgent books will be classified in three business days.

⮚ Ensure that no client will wait more than five minutes to be serviced.

⮚ Ensure that annually x percent of undergraduate students receive training in

information skills

⮚ To enhance the User Education program by x% annually

⮚ At least x percent of reference-related enquiries are addressed.

⮚ Enhance client service

⮚ Enhancing safety culture and risk consciousness

**3. TEST PLAN:**

A test plan is the first step in the testing process. During the unit's testing, this plan outlines all  of the testing activities that must be carried out, as well as the timelines, resources, and  instructions for each one. A set of predefined test cases is run, and the results are compared to  what was expected. After the testing step is complete, a test report is produced as the final  result.

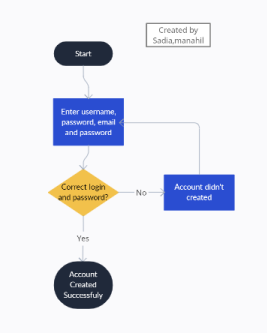
**TEST CASES:**

**TEST SUIT 1(FUNCTIONALITY TESTING).**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST  ID** | **DATE** | **PURPOSE** | **PRE**  **REQ** | **TEST**  **DATA** | **STEPS** | **Expected  result** | **Actual**  **result** | **STATUS** |  |
| 1 | 5-07-  2022 | The goal of  this test is  to verify  that the | none | There  isn't  any  (test is | The following steps  will be performed  during the test: | User should  be  successfully  registered | Same as  expected. | **Pass** |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | user has  properly  registered. |  | just  visual  test) | 1. The User's  entire name  must be  entered.  2. Enter your  e-mail  address.  3. Enter your  password.  4. Confirm  password | by providing  valid  information**.** |  |  |  |

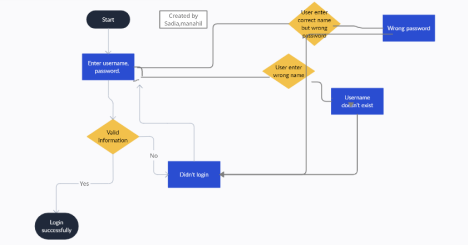
**FLOWCHART:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST  ID** |  | **DATE PURPOSE PRE** | **REQ** | **TEST**  **DATA** | **STEPS** | **Expected  Result** | **Actual**  **Result** | **STATUS** |  |

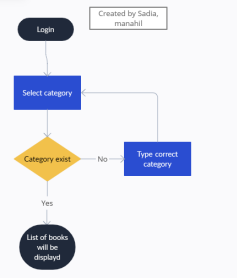
|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 2 | 5-07-  2022 | This test is  to ensure  that a user's  id may be  used to  access the  system. | For a  successful  login, the  user must  enter the  right  username  and  password. | name,  password | Below are the  steps.  1. First, go  to the  Login  Page.  2. the  username  that you  want to  use  3. The  password  must be  entered  4. click on  "Login" | The user  successfully  logged in. | The user  successfully  logged in. | **Pass** |  |
|  |  |  |  |  | **User enters**  **wrong name:**  **Action:**  Display that the  wrong name is  entered. |  |  |  |  |
|  |  |  |  |  | **User enters**  **wrong**  **password:**  **Action:**  Display that  password is  incorrect. |  |  |  |  |
|  |  |  |  |  | **User enters**  **valid name and  password:**  **Action**  User login  successfully |  |  |  |  |

**FLOW CHART:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST  ID** | **DATE** | **PURPOSE** | **PRE**  **REQ** | **TEST**  **DATA** | **STEPS** | **Expected  Result** | **Actual**  **result** | **STATUS** |  |
| 3 | 5-07-  2022 | This test asks  the  administrator  to choose a  category,  after which a  list of books  is displayed  on the  screen. | Logged  in | There  isn't  any  (test is  just  visual  test) | Following are steps  to be followed:  1. The "Shows"  button  should be  clicked.  2. Decide on a  subcategory.  3. A list of  books  flashed on  the screen. | A list of  books  should be  displayed  when a  user  chooses a  category. | Same as  expected. | **Pass** |  |

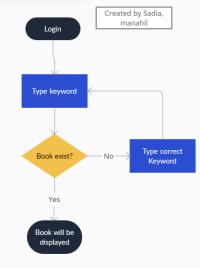
**Flowchart:**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST  ID** | **DATE** | **PURPOSE** | **PRE-REQ** | **TEST**  **DATA** | **STEPS** | **Expected  result** | **Actual  Result** | **STATUS** |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 5-07-  2022 | This test's  objective is  to search a  book using  a keyword. | The  administrator  should be in  the search  box. | None | Following are  steps to be  followed:  1. Type a  keyword.  2. Click on  "Search"  button.  3. A notice  will be  displayed  if the  book  cannot  be  located. | Book will  be found  when a  keyword is  entered. | Same as  expected | **Pass** |  |

**Flowchart:**

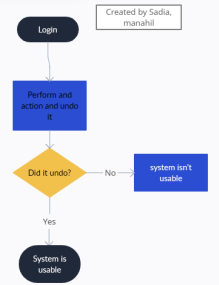
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**TEST SUIT 2(USABILITY TESTING):**

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| --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST**  **CASE  ID** | **DATE** | **Purpose** | **Requirement** | **Preconditions** | **Steps** | **Expected  Result** | **Actual**  **Result** |
| 1 | 5-07-  2022 | Reverse  the  actions  taken. | Inspect if  You can  quickly go  back and  undo any  actions  you've taken. | You've done  something  and are now  attempting to  reverse it  because you  believe it was  the wrong  thing to do. | Following are the  results to be  taken.  1. Open the  application.  2. Perform an  action.  3. Then undo  that action. | The  action  will be  easily  undone. | Same as  expected |

**Flow chart:**

**Status** Pass 



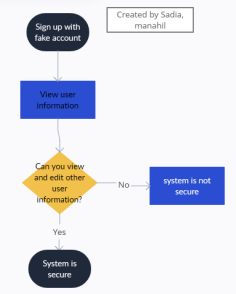
**TEST SUIT 3(PERFORMANCE TESTING):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST**  **CASE  ID** | **DATE** | **Purpose** | **Preconditions** | **Steps** | **Expected  Result** | **Actual**  **Result** | **Status** |
| 1 | 5-07-  2022 | Check to  see if the  intended  application  is able to  manage  the  expected  loads. | Doing  multiple  actions at the  same time,  for example  logging in  account,  reading the  book,  searching the  book,  uploading the  book etc. | Following are the  results to be  taken.  1. Open the  application.  2. Login the  application.  3. Read the  book.  4. Search the  book.  5. Upload the  book. | The  website  should  work  properly  and  should  respond  fast. | Same as  expected | Pass |

**TEST SUIT 3(SECURITY TESTING):**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **TEST**  **CASE  ID** | **DATE** | **Purpose** | **Preconditions** | **Steps** | **Expected**  **Result** | **Actual**  **Result** | **Status** |
| 1 | 5-07-  2022 | Make sure  that the  personal  information  of user’s  are safe. | Any user  can’t access  the  information  of other  user’s. | Following are the  results to be taken.  1. Open the  application.  2. Sign up  with fake  account.  3. See the  information  of other  users. | Users can’t  see and edit  other user’s  information. | Same as  expected. | Pass |

**Flow chart:**

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**TEST REPORT:**

**We have four test suits:**

⮚ Test suit 1(Functionality testing):

⮚ Test suit 2(Usability testing):

⮚ Test suit 3(Performance testing):

⮚ Test suit 4(Security testing):

|  |  |
| --- | --- |
| **Test ID** | **Status** |
| **1** | **Pass** |
| **Output:** | **Sign up:**  **https://lh3.googleusercontent.com/lyzqqcaRuUQZPrSCxWFo-KhKaGnaS898aX2_OeTNVrhCgdewMle6Vig0FR9BiVcBoseHV3eTLuXAvi5uVBRfHU7A0OjnpJKgJQAWiZ9WYd6OZ8eQFKHZPrq3lwHOTnb9fsnXkaXSlQCHpkQtQql1zww**  **https://lh6.googleusercontent.com/RSz8naPe8mjeOv9dWmfyU5br2DF6vD3nz0h5ZeEc-jJUEEIqLwK5NQxJQaVokmB2GplGu-moFXGG29W3uXoUN45uW1Vi-OvEY7NIskYegXVyTkNPW2MyGb-66vIFqiY2EzSeNKnNtQUOwaqR5J1hkbo** |
| **2** | **Pass** |
| **Output:** | **Login** |

|  |  |
| --- | --- |
|  | https://lh5.googleusercontent.com/l7SvQo4lmg42weGoZLtTSQZHWgRZgNiZ0YZ2_MPrEw3ToA7i6AWtd0Dv2rW22HsvJKqxBf5e2xMrKWOL-QC9xz9-fLwx_PnEzpqUscAX_HhWmloc6cvm_MxNkxaHwfVeTXQ1GVydZRGdd8Tnn5DVbqg |
| **3** | **Pass** |
| **Output:** | **Display books by categories:**  **https://lh5.googleusercontent.com/iThULpQS-jcQ0KKORhkX0aoi__u8c8s4NzKXKBoj_JdZuwYgltfAD3kaXzQsIdFOny1eIbqK5ca47LbO9ryYSIk49eIfMQ5BSH93T3aNtCU3p42BzL8Mf66YVONRdbJ4-fUxjWq_oce2huEnnIe7x-4** |
| **4** | **Pass** |
| **Output:** | Search books: |

|  |  |
| --- | --- |
|  | https://lh4.googleusercontent.com/Xi2yyhY7VTOAupB33hiYd1s6CAVj5WQswpDWhvGsCqiT408a2ki6iZ1ICrU-f3EsV0mpkAPBglI1_pLU2qoaeOsKngouMpyGxHTLOLxA1aDEEyE4ESWq1E3h-HyhNMUI8pjfH62ySf35RVFQ2ekFx7M |

**In short:**

|  |  |
| --- | --- |
| **Test Activity** | **Count** |
| **Test Executed** | 7 |
| **Test Passed** | 7 |
| **Test Failed** | 0 |
| **Total Executed** | 7 |

**Testing strategy:**

We have used bottom testing for our library management system because:

∙ From very start we are doing testing in our LMS projects and we have identified errors  at the start and have improve our performance according to it.

∙ Moreover, it was simple and straightforward to construct and generate test conditions. ∙ We have also observe test results using bottom- up testing that make the observation  easier.

∙ In bottom up testing, it is not important to know about the structure's details. **4. Process improvement management**

**a. Examine the process model for weaknesses. List them down.**

We have adopted incremental model for our library management system because  requirements of our project are clearly defined. Moreover, in this model Testing and debugging  is simpler with shorter iterations. Using this model risk management is simplified since

dangerous components are detected and addressed throughout each cycle. Client’s feedback is  also taken. Some of the weakness in library management system are:

**Speed of access**: The speed of access to the web often slows down to a noticeable degree as  more and more computers are linked to it. In the not-too-distant future, if the problem is not  solved by the development of new technologies, the internet will be clogged with error  messages.

**Changing one module influences the other:** When we make the adjustment in one component  of the system, all of the other components of the system will require modifications as well.  Because of this flaw, making modifications to any module will take a significant amount of time.  For instance, when we are adding a new record to the system, it is necessary to update the  record in the database, as well as the management system of an administrator, and so on. This  will take up a lot of time.

**Data updation:**

The library management system has a large library or substantial collection that will be  challenging to keep up to date. If the program is compromised, the data will be lost in its  entirety.

**b. List down all possible solutions to overcome the weaknesses** Following are the solution for the weaknesses:

**Solution for speed of access:**

1. The administration should do everything possible to increase the number of users who may  access the system at the same time.

2. The management needs to determine the time limit and set a time restriction. For instance,  between the hours of night from 2 to 6, the system is accessible to two hundred users; but, if  that number is exceeded, the user will receive a notice asking them to wait a few minutes  before using the system.

**Solution for changing one module influences the other:**

1. Either the system should improve its performance such that anytime there is a change made  in any module, it automatically recognizes the change and stabilizes it in the environment  without impacting any of the other modules, or the system should not have any modules at all.

2. The development should take place in such a manner that it incorporates separate modules  that operate in isolation from one another and do not interfere with one another in any way.

**Solution for Data updation:**

Server should be upgraded and should be efficient enough, so that large database of library will  be easily updated. Administrator should also remove useless books.

**c. Choose one best solution. Provide rationale for your selection.**

We have discussed the many options available to fix each of the system's problems that have  been found. In this part of the discussion, we will settle on the one most effective approach to  solving the problem.

**Best solution for Speed of access**:

Instead of specifying a time limit and a user limit, the best solution for this issue is for  management to increase the capacity of users who can access the system at the same time.  Doing so will prevent a negative impact on the reputation of the system, which could occur if  users are informed that they must wait, and it will also cut down on the number of people who  use the system while it is in use.

**Best solution for changing one module influences the other:**

Instead of generating separate reports for each user at every function performed by the user,  the best solution for this problem is for the system to have a proper database that is managed  by a separate database team. This will allow the backup of each user's data to be stored in an organized database. This is preferable to generating separate reports for each user at every  function performed by the user because it is difficult to maintain separate reports for each user  and it also takes a lot of time. While the user is able to track its desired data thanks to the  proper backup being made in the database, the system will not have to make separate reports  because every function will automatically store in the database, which will be managed by the  database team. In addition, the user can track its desired data.

**Data updation:**

The best solution for this to upgrade the server and use more efficient server.

**d. Write down the steps that you would need to take in order to transform the  existing process to the refined/improved process.**

**Steps for Speed of access**:

1. Set a day and time for the meeting with the developers.

2. Explain to them the nature of the issue.

3. Have a discussion about the resources or money that will be used to expand the capacity of  the system.

4. Provide the developers with a timeframe for adding the module that will enhance the  capacity of the system.

5. Put the solution into action and ensure that it is ready for usage

**Steps for changing one module influences the other:**

1. Create a record of the issue.

2. Set a day and time for the meeting with the developers.

3. Explain the situation to the programmers.

4. Have a conversation about the resources or money that will be used to improve the  performance of the system.

5. Provide the developers with a timetable for addressing the weaknesses. **Steps for data updation:**

1. Set a day and time for the meeting with the developers.

2. Explain to them the nature of the issue.

3. Have a discussion about the resources or money that will be used to upgrade the server.  4. Do a meeting with the supplier of server.

5. Provide the developers with a timeframe for adding the module that will enhance the  capacity of the system.

**e. CMMI, Trillium and Spice can facilitate you in improvement.**

We have used CMMI model. Our library management system is at CMMI level 2(Defined). We  have planned schedule that meets its deadline. The software process competence of Level-2  businesses may be characterized as disciplined since planning and tracking of the software  project are consistent and previous successes can be duplicated. Our project's process is  effectively managed by a project management system, in accordance with realistic plans based  on the success of past initiatives. We have keep track of software costs, timetables, and  functionality; issues with meeting commitments are highlighted as they emerge. The group  defines standards for software projects and guarantees that they are adhered to. The software  project establishes a strong customer-supplier connection with any subcontractors.

We are not at Level 0 or 1, as in those level processes are generally unplanned, it is not clear  that which process will be adopted and organizations don’t meet deadlines.

Our procedures are not yet according to the policies defined, so we are not at Level 3. But we  are trying to meet level 3.