• Software Engineering Assignment 1

1. Consider the library management of Sahyadri College of Engineering and management. Identify the functional and non-functional requirements for the same.

The Sanyadri College of Engineering And Management - Library being the most important part of the education system is the nub of all the activities in the campus. Apart from the scholars(students) out there, even the professors and employees show some enthusiasm in finding, researching and seeking more knowledge.

As the size and capacity of the institute is increasing with the time, it has developed a Library system for the benefits of students and professors of the institute. It allows the members to borrow a book (or return it) with ease while sitting at his desk/chamber of library. This system aids the easy handling of transactions of the book day-by-day. The librarian, who has to keep a record of the ones who issue the books on a daily basis, not just that even the date for which the return has to be made and with their contacts. This combersome job needs to be replaced by some suffice and efficient ways by making the process of issue of book easier and reliable to all the people in the institution.

• Functional Requirements:

The above problem statement gives a brief description of the proposed system. From the above, even without even doing deep analysis, we can easily catch out the basic functionalities of the system:

(i) New user registration:

Any member of the institute who wishes to avail the facilities of library has to register himself/herself by scanning their respective identity cards. On doing it, he shall be provided with a unique ID and password which can be used as his credentials for any future transactions.

- User login:

Since the unique ID and pass is given to him/her, we can have a significant website containing the homepage with login ID and password where in the person can search books that are available in the library without making it to library. The books in library shall be packed and listed on the site as the user enters and makes his/her move! The seaech can be based on Title, edition, Author's name or publisher's name. Not just seaech but feed in their date of issue and return date and can have a reminder to inorder to avoid fines!!!

- Maximum number of books to be issued by one:

The count for one person to have a book for this amount of time span shall be set in the site and if the book isn't returned, he/she shall not be permited to borrow one more.

- The return time:

A book being issued only for finite time; assume to be a time period of 15 days, i.e., ones the book has been borrowed, it has to retomed in next 15 days (or within it). After this succesful return, the update shall be done on to the site.

- Process of Reissue:

If one wants to have that book for more than time period allocated, viz, 15 days. In that case he/she can reissue it again and this can be done only twice, as it would be recquired by the other ones in the institution.

- Non-Functional Requirements:

Having talked about functional requirements, let's try in identifying some of the non-functional requirements.

- Security:

The site shall be accessible only in and within the campus LAN. The passwords need not be stored in plain text rather salting or hashing could be done for more safety of one.

- Software Quality Attributes.
- Database Requirements.
- Performance Requirements:

This system should be accessible 24*7. Making it control over the no. of users using the site at a particular instance and not crashing up!

- Design constraints:

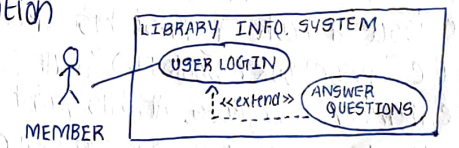
The software shall support and be compatible to firefox, Google Chrome, Explorer, Opera and developed with HTML 5.

once all the functional and non-functional requirements have been identified, they are documented formally is SRS, which then serves as a legal agreement to be seen and approved.

2. Consider the library management system of Sahyadri College of Engineering and Management.

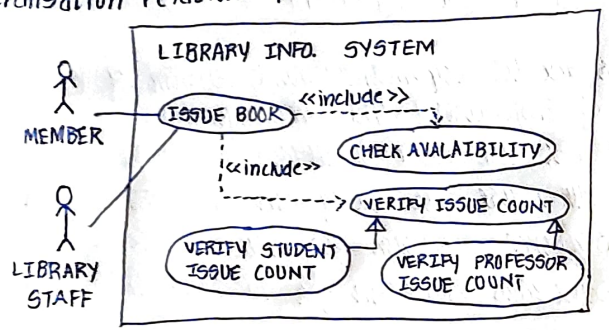
(i) Draw a use case diagram showing "New user reg"
(ii) Draw a use case diagram showing issue book.
(iii) Sequence diagram for issue book
(iv) Data flow Diagram for Library info. system.

(i) The new user registeration is done, when you are visiting or borrowing the book from the library and this cycle goes on as you visit next time on the basis of your unique ID and pass given initially. If the the credential of login is incorrect, an error message is displayed. Below, we have depicted the use case of new user registration



The above figure also depicts extension of a use case. "Answer security question" is not a use case by itself, and is not invoked in a "normal" flow. However if the user tries to enter user Id and pass more than three times, the actuall holder of that user is sent a mail and he/she can report.

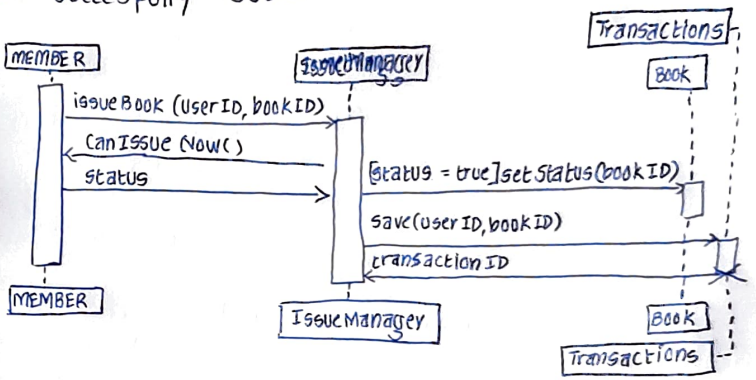
(ii) In order to issue a book, the availability of the book has to be checked. Also, the system needs to verify whether another book could be issued to the current user. These are shown in fig. 2 by the << include >> relationship among the use cases. The maximum number of books that can be issued to a user depends on whether he is a student or a professor. So, "Verify issue count" is a general use case, which has been specialized by "verify student issue count" and "verify professor issue count" use cases. These have been represented by the generalisation relationship below.



In the above scenario "Member" is the primary actor who triggers the issue book use case. Library staff is a secondary actor here.

(iii) Let us consider the "issue book" use case and represent the involved steps in a sequence diagram. We assume that the book to be issued is available. An user makes a request to issue a book against his account. This is shown by the "issueBook(bookID)" call from "member" to "issue member" objects. At this point the system checks whether that particular user can issue another book by invoking "canIssue()" method on the "member". As a result of this call, a response is sent back to the "IssueManager" class. If the status is "true" status of the concerned book is set to "issued".

A new transaction is saved corresponding to the current issue of book by the user. Finally, a success message is sent back to "member" indicating that the book was succesfully issued.



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