**CASE STUDY**

The SE VLabs Institute has been recently setup to provide state-of-the-art research facilities in the field of Software Engineering. Apart from research scholars (students) and professors, it also includes quite a large number of employees who work on different projects undertaken by the institution. As the size and capacity of the institute is increasing with the time, it has been proposed to develop a Library Information System (LIS) for the benefit of students and employees of the institute.LIS will enable the members to borrow a book (or return it) with ease while sitting at his desk/chamber. The system also enables a member to extend the date of his borrowing if no other booking for that particular book has been made. For the library staff, this system aids them to easily handle day-to-day book transactions. The librarian, who has administrative privileges and complete control over the system, can enter a new record into the system when a new book has been purchased, or remove a record in case any book is taken off the shelf. Any non-member is free to use this system to browse/search books online. However, issuing or returning books is restricted to valid users (members) of LIS only. The final deliverable would a web application (using the recent HTML 5), which should run only within the institute LAN. Although this reduces security risk of the software to a large extent, care should be taken no confidential information (eg., passwords) is stored in plain text.

Identification of functional requirements:

New user registration: Any member of the institute who wishes to avail the facilities of the library has to register himself with the Library Information System. On successful registration, a user ID and password would be provided to the member. He has to use this credentials for any future transaction in LIS.

Search book: Any member of LIS can avail this facility to check whether any particular book is present in the institute's library. A book could be searched by its:

Title

Authors name

Publisher's name

User login: A registered user of LIS can login to the system by providing his employee ID and password as set by him while registering. After successful login, "Home" page for the user is shown from where he can access the different functionalities of LIS: search book, issue book, return book, reissue book. Any employee ID not registered with LIS cannot access the "Home" page -- a login failure message would be shown to him, and the login dialog would appear again. This same thing happens when any registered user types in his password wrong. However, if incorrect password has been provided for three time consecutively, the security question for the user (specified while registering) with an input box to answer it are also shown. If the user can answer the security question correctly, a new password would be sent to his email address. In case the user fails to answer the security question correctly, his LIS account would be blocked. He needs to contact with the administrator to make it active again.

Issue book: Any member of LIS can issue a book against his account provided that:

The book is available in the library i.e. could be found by searching for it in LIS

No other member has currently issued the book

Current user has not issued the maximum number of books that can

If the above conditions are met, the book is issued to the member.

Note that this FR would remain incomplete if the "maximum number of books that can be issued to a member" is not defined. We assume that this number has been set to four for students and research scholars, and to ten for professors.

Once a book has been successfully issued, the user account is updated to reflect the same.

Return book: A book is issued for a finite time, which we assume to be a period of 20 days. That is, a book once issued should be returned within the next 20 days by the corresponding member of LIS. After successful return of a book, the user account is updated to reflect the same.

Reissue book: Any member who has issued a book might find that his requirement is not over by 20 days. In that case, he might choose to reissue the book, and get the permission to keep it for another 20 days. However, a member can reissue any book at most twice, after which he has to return it. Once a book has been successfully reissued, the user account is updated to reflect the information.

Identification of non-functional requirements:

Performance Requirements:

This system should remain accessible 24x7

At least 50 users should be able to access the system altogether at any given time

Security Requirements:

This system should be accessible only within the institute LAN

The database of LIS should not store any password in plain text -- a hashed value has to be stored

Design Constraints:

The LIS has to be developed as a web application, which should work with Firefox 5, Internet Explorer 8, Google Chrome 12, Opera 10

The system should be developed using HTML 5.

**ONLINE QUIZ SYSTEM**

An online quiz system is to be designed to conduct online tests by various institutions. Unlike other online examination systems, this website should not be just for the students; instead, it should also provide facilities for Institutes to host online Tests/Exams.

Also like other online websites, it will help students by:

1. Saves time from going to a far away Exam Center.
2. Decreases the work with papers and shifts to computer mode.

After login as administrator :

1. They will enter exam details like the number of questions, total marks, +ve and -ve markings.
2. Then they will enter the questions along with the answers which can later be edited.
3. The list of eligible candidates with their id names can also be edited later.
4. Institutes will be able to view the students list along with their respective results.

Also for students or users :

1. They should be able to login with their id, name and institute. They should be able to give the exam as per the details entered by respective institutes.
2. Also, they should be able to view their score after the test finishes.
3. If already given the test then they should just be able to view their scores.
4. Other users can take sample tests to get a feel and look at how the online tests are conducted.

**IDENTIFICATION OF FUNCTIONAL REQUIREMENTS:**

1. The administrator will be able to add new questions or edit them.

2. The application will maintain a way of selecting questions for different students.

3. The system will have ways of managing different subjects.

4. The administrator will be able to select the start and end date and times for the quiz.

6. The application will be able to evaluate each question by comparing its correct answer.

7. The application will enable the quiz for users once the start date is active.

8. The administrator will be able to declare the result of the quiz which will be made available to the users after the declaration of the result.

9. The administrator will be able to set the attempt time for each question. If the question is not attempted in the time provided then the next question will automatically be uploaded.

10. Users will be able to login/logout.

11. Users will be able to start and end the quiz.

12. Users will be able to select a single option from the list and save the status of the quiz.

13. Users will be able to skip a question for a later attempt.

14. Users will be able to see the attempted and non-attempted questions.

**IDENTIFICATION OF NON-FUNCTIONAL REQUIREMENTS:**

1. Performance: No. of terminals to be supported is dependent on the server that we will use at the time of deployment. The web application server used should provide good performance and the ability to manage performance with techniques such as support for caching. After completing the exam, the entire score of the student will be calculated as per the rules in less than a second.

2. Availability: Online Examination site has 24\*7 availability. It can be accessed 24 hours a day. Students can take exams only during the previously allotted time slots, however, they can open sites anytime to access other information.

3. Reliability: It means the extent to which a program performs with the required precision. The website developed should be extremely reliable and secure so that information about any questions etc. is not leaked before the actual exam is held.

4. Usability: The website should be user-friendly and should require the least effort to operate. The web server used should provide services like session management to maintain sessions in the application.

5. Portability: The website is made using different text tags depending on the customer requirements which are platform-independent and can be transported to other servers with minimum effort.

6. Flexibility: It is an effort required to modify an operational program. The whole website should be made using independent modules so that any changes done in one module should not affect the other one and new modules can be added easily to increase functionality.

**RECRUITMENT SYSTEM**

The “Online Job Portal and recruitment system” is a package to be used by agencies to improve the efficiency of the business. The “Online Job Portal and recruitment system” to be developed benefits greatly the members. The system provides a job catalogue and information to members and helps them decide on the jobs to apply for. The admin can keep the jobs catalogue updated all the time so that the members (Job seekers and the agencies) get the updated information all the time. The main users are users: Admin, Members who are job seekers, and agencies.

This “Online Job Portal and recruitment system” provides online real-time information about the jobs available in the agencies and user information. The member should be provided with updated information about the jobs catalogue provisions for the members to apply for the job they want if all the other required rules hold good. The member is given a provision to check his account information.

Any time in the given validity period.

The members are provided with the jobs available roster and allowed to apply for jobs, which they want.

The admin can get information about the members who have advertised jobs.

**IDENTIFICATION OF FUNCTIONAL REQUIREMENTS:**

It is the primary requirement that is fulfilled by our job portal. It’s allowing the users, and employers to use our portal at the level of ease. The purpose of our portal is to provide the full information that is required of the user. Here is the following requirement that is fulfilled by our system.

**Users**

**User Login**

This feature is used by the user/admin to login into the system. A user/admin must log in with his user name and password to the system after registration. If they are invalid, the user is not allowed to enter the system.

A username and password will be provided after user registration is confirmed.

Password should be hidden from others while typing it in the field.

**Register New User**

A new user will have to register in the system by providing essential details in order to apply for the job. The admin must accept a new user.

The system must be able to verify and validate the information.

The system must encrypt the password of the user to provide security.

**Search Jobs**: The user can search for the desired jobs. He can view different jobs. After confirming the login in the search user can select it and apply by providing the necessary details.

**Upload Resume:** Job seekers can upload their resumes and provide the necessary details if they are interested in jobs.

**Admin**

**Manage Users and Employers:** The administrator can add users, delete users, and view users.

**Manage jobs:** The administrator can add jobs, delete jobs, hide jobs, and view jobs.

**Manage details:** The system must identify the login of the admin. Admin accounts should be secured so that only the owner of the portal can access that account.

**IDENTIFICATION OF NON-FUNCTIONAL REQUIREMENTS:**

**Efficiency Requirement:** When an “Online Job Portal and recruitment system” is implemented job seekers and employers can view and upload job vacancies respectively from their homes easily without any difficulty.

**Usability Requirement:** The “Online Job Portal and recruitment system” is designed for a user-friendly environment and ease of use.

**Reliability Requirement:** The system should provide a reliable environment for both employers and job seekers. All jobs should be reaching the admin without any errors and should be shown to the viewers.

**Implementation Requirement:** Implementation of the system using HTML, CSS, JavaScript, and Bootstrap in the front end with Python, and Django as the back end and it will be used for database connectivity. And the database part is developed by PostgreSQL. Responsive web designing is used for making the portal compatible with any type of screen.

**Delivery Requirement:** The whole system is expected to be delivered in four months of time with weekly evaluation by the project guide.

**Database Security:** An unauthorized person cannot access the panel and database, and does not read and write the information.

**Availability:** This “Online Job Portal and recruitment system” will be available online 24/7 a week.

**Table: Identifier and priority for software requirements**

| # | **Requirement** | **Priority** |
| --- | --- | --- |
| R1 | New user Registration | High |
| R2 | User login | High |
| R3 | Search jobs | Medium |
| R4 | Upload Resume | Low |
| R5 | Manage users & employment | Medium |
| R6 | Manage Jobs | Low |
| R7 | Manage Details | Low |