Terna Engineering College

Computer Engineering Department

Program: Sem VI

Course: Software Engineering Lab

LAB Manual

PART A

(PART A: TO BE REFERRED BY STUDENTS)

Experiment No.02

A.1 Aim:

To prepare software requirement specification (SRS) documents in IEEE format for selected mini-project.

A.2 Prerequisite:

Knowledge about requirement engineering processes

A.3 Outcome:

After successful completion of this experiment, students will be able to:

- Analyze and define requirements from a set of preliminary requirements

A.4 Theory:

- **SRS (Software Requirement Specification)**

CASE STUDY: School Management System.

1. Introduction:

1.1. Purpose:

1.1.1. In most schools today, all the processes are done manually so the system has numerous drawbacks. The main drawback of the existing system is that many schools lack online payment and also extracurricular activities are not introduced. The schools do not provide online report cards, tutorials, and practice tests. The

system that we are proposing will be designed for better interaction between students, teachers, parents & management.

1.2. Scope:

1.2.1. The system that we are proposing will be designed for better interaction between students, teachers, parents & management. The parents of students are very busy nowadays, so they cannot monitor their children and their activities properly and regularly. This school management system helps the parents monitor their children from anywhere. They can check their children's academic performance from a remote location. Any problems related to school or students can be communicated online with the teacher or principal. And also any feedback if required can be provided.

1.2.2. This school management system will be providing online school notices, class timetable, student attendance, assignments, thought of the day, homework, and a list of suggested books and holidays. Also, the system will provide an online leave application and fees can be paid online.

1.3. Intended Audience:

1.3.1. This document is intended for developers, project managers, marketing staff, users, testers, and documentation writers. This project is mainly intended for the end-users who have a basic knowledge of computers

1.4. Benefits of the system:

1.4.1. The proposed system aims to address the limitations of the current system. The requirements for the system have been gathered from the defects recorded in the past and also based on the feedback from users of previous metrics tools. Following are the objectives of the proposed system:

- *Reducing time in activities*
- *Centralized data handling.*
- *Making it convenient and efficient for users.*

(Transfer the data smoothly to all the departments involved and handle the data centralized way).

1.5. Document Overview:

1.5.1. This document provides the details of functional and non-functional requirements of the proposed system under the headings of overall Description, System Requirement, and analysis, supplementary requirements, other non-functional requirements.

2. <u>Overall description</u>:

The proposed system is supposed to replace the existing School Management System.

2.1. Product Perspective:

2.1.1. In the existing School Management System, the admission and fee system has to be done manually which requires a lot of time, effort and is prone to errors. The management of a huge amount of data is difficult. To overcome the above problems this system is being developed which include all the steps in the admission with all its details in this procedure.

2.2. Product Function:

2.2.1. The following are the product functions for the proposed system:

- Secured login into the system.
- Secured online transactions.
- View course details for courses offered by the school and also the availability of seats & fees per course
- Apply for the course by filling in the enrollment and registration forms
- Providing class timetable, student attendance, assignments, thought of the day, homework, and list of suggested books and holidays. Recording and updating of the information entered into the system
- Advanced inquiry support to address student queries.

2.3. User characteristics:

2.3.1. The user should be familiar with the activities involved in the admission process to have a basic idea to operate the system.

2.4. Design Constraints:

2.4.1. The hardware limitation is that 2GB RAM is required. The language requirements are HTML, CSS, JavaScript, PHP, SQL. The content will be made non-editable so that the students cannot edit the marks or any other contents.

2.5. User Documentation:

2.5.1. This software is simple to use and easy to understand. Users having basic Knowledge of computers will be able to use this software.

2.6. Assumptions and dependencies:

2.6.1. The following are the assumptions and dependencies of the system:

- The database maintaining the details of courses offered by the university has already been created and information is available for use
- The central database managing the student's records is

managed and updated periodically

- Backups of the database are periodically taken to avoid any accidental loss of information

3. System Requirements and analysis:

The system requirements and analysis section introduce the numerous requirements of the system from the user's point of view. It also introduces many decisions that have been taken regarding the implementation of the system.

3.1. User Interface:

3.1.1. The user interface provided by the system should be user-friendly. The system is used by the students who would like to get enrolled in various courses offered by the university.

3.2. Hardware Requirements:

3.2.1. The personal computer of the registration department is used as the external hardware interface to access the online admission system. 2 GB RAM is required.

3.3. Software Requirements:

3.3.1. The system can be executed on a computer system having any version of the Windows operating system, macOS, Ubuntu. the language requirements are HTML, CSS, JavaScript, PHP, SQL.

4. Supplementary Requirements:

The system fulfils the following supplementary requirements:

- ***Immediate feedback:*** *Handles all student queries and provides immediate feedback after getting any request from users.*
- ***Reduces cost of admission process:*** *Reduces manual power needed to perform the entire task*
- ***Increase the quality of process:*** *Reduces the workload of the university and provides expected quality of work by reducing chances of mistakes that can usually occur during the manual process.*
- ***Reduce overall processing time:*** *Reduces the overall time needed to process an application for enrollment of students to a particular course.*

5. Other Non-functional Requirements:

5.1. Performance Requirements:

5.1.1. The system should allow you to add multiple student records to the central database.

5.2. Security Requirements:

5.2.1. The system should provide only authorized access to critical data

5.2.2. The system should check data integrity for critical variables

5.2.3. All fields should be validated before data is sent to the database

5.3. Portability Requirements:

5.3.1. The system can be executed on a computer system having any version of the Windows operating system, macOS, Ubuntu.

5.4. Maintainability Requirements:

5.4.1. The system should be maintainable and an authorized user should be able to reset all options to default settings.

5.5. Reliability Requirements:

5.5.1. After proper verification and validation, the data is committed to the central database.

5.5.2. Appropriate backup procedures should be applied to prevent corruption and loss of data.

5.6. Usability Requirements:

5.6.1. A logical and user-friendly interface helps the users to access the system easily.

5.6.2. Error prevention should be supported by providing proper validation mechanisms for the data before actual submission to the database.

5.7. Software system Attributes:

5.7.1. The system should be equipped with current and archive databases.

5.7.2. The system should present the information to the user clearly and precisely.

5.7.3. The system should allow the entry of numbers, operands, special symbols, and letters of the alphabet.

5.7.4. The system should send notifications to the user before committing user actions.

5.7.5. The authorized personnel should be able to update information and modify records.

6. Preliminary Budget:

Cost for the Project- 2-3 Lakhs (Approx)

7. Appendices:

7.1. References

7.1.1. The SRS document created in this appendix follows the IEEE Guide to Software Requirement Specifications.

7.1.2. Internet.

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PART B

(PART B: TO BE COMPLETED BY STUDENTS)

(Students must submit the soft copy as per the following segments within two hours of the practical. The soft copy must be uploaded on the Blackboard or emailed to the concerned lab in charge faculties at the end of the practical in case there is no Blackboard access available)

Roll No. 50	**Name:** AMEY THAKUR
Class: Comps TE B	**Batch:** B3
Date of Experiment: 03/02/2021	**Date of Submission:** 03/02/2021
Grade:	

B.1 Detail problem statement of selected mini-project.

Ans:

PROBLEM STATEMENT:

The software to be designed is for a bookstore that wishes to go online. It is to be developed to improve the efficiency for the customer.

The important features to be developed include:

- The Login/Registration module requires the customer to login into the system or he can create an account if he does not yet have one.
- Order module requires a customer to enter the book details that he/she wants to buy.
- Book detail(s) module allows the system to keep book information in detailed by name, genre etc.
- Stock management will tell you about the number of books left in the store.
- Payment module allows the customer to online payment like Paytm and credit/debit cards or cash on delivery.
- Delivery and tracking module gives information about tracking and by whom it is delivered.
- User feedback module.

Software Requirements Specifications (SRS)

1. Introduction:

1.1. Purpose:

1.1.1. The purpose of this Software Requirements Specification (SRS) is to fully document the specifications and requirements for the Online Bookstore. The audience of this SRS will be the clients who want the software to be built and the technical professionals developing the software.

- To shop while being in the comfort of your own home, without having to step out of the door.
- Sell at a lower rate due to less overhead.
- Provide home delivery free of cost.
- No wait to see the products if someone else is taking that.

1.2. Scope:

1.2.1. The objective of this project is to create and implement a website for the bookstore. The website will be used primarily by students. The website will allow users to create and maintain individual secured accounts, search the Online Bookstore database for textbooks, and make secured online credit card purchases. Users will also be able to contact site administrators. The website makes purchasing textbooks quicker, easier, and more convenient.

1.2.2. The Online Book Store is an easy to maintain, Ready to run, scalable, affordable and reliable cost-saving tool from Software Associates suited for small, medium, and large businesses.

1.2.3. The proposed system can be used even by the naïve users and it does not require any educational level, experience, and technical expertise in the computer field but it will be of good use if the user has the good knowledge of how to operate a computer.

1.3. Intended Audience:

1.3.1. This document is intended for developers, project managers, marketing staff, users, testers, and documentation writers. This project is mainly intended for the end-users who have a basic knowledge of computers.

1.4. Benefits of the system:

1.4.1. The proposed system aims to address the limitations of the current system. The requirements for the system have been gathered from the defects recorded in the past and also based on the feedback from users of previous metrics tools. Following are the objectives of the proposed system:

- *Reducing time in activities*
- *Centralized data handling.*
- *Making it convenient and efficient for users.*

(Transfer the data smoothly to all the departments involved and handle the data centralized way).

1.5. Document Overview:

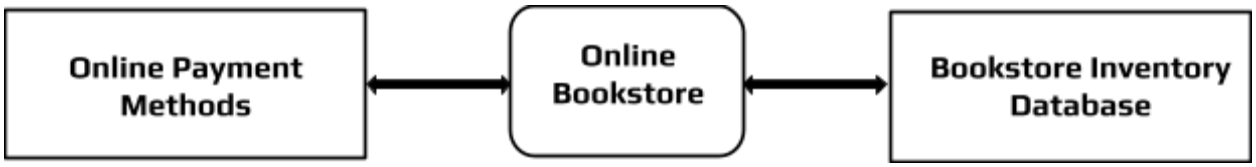
1.5.1. This document provides the details of functional and non-functional requirements of the proposed system under the headings of overall Description, System Requirement, and analysis, supplementary requirements, other non-functional requirements.

2. Overall description:

2.1. Product Perspective:

2.1.1. The Product is a web-based product, which will be used by multiple users i.e. the administrator, registered user and guest. An administrator will be provided with the Interface, with the help of which the administrator can manage accounts and UI. Registered users can edit their information using their login credentials. Customers can generate the cart according to his requirement. Guests can search the record according to requirement.

2.1.2. As far as the future perspective is concerned, the scope of improvement would be development in UI, better-searching facilities.



2.2. Product Function:

2.2.1. The "Online bookstore" software is an independent web-based application. There are various user interfaces related to this software. These interfaces help the user to interact with the software and provide the necessary information for online bookstores.

2.2.2. The entire functionality of this software can be subdivided into fields/modules. The names of the fields involved in the online bookstore are:-

- **A Home page with product catalogue:** This is the page where the user will be navigated after a successful login. It will display all the book categories It also includes some special sections like recent arrival, about us and contact us.
- **Book Description:** If the user would like to know details about a book he can click on the title from where he will be directed to a Book description page.
- **Shopping Cart:** The user can manage a shopping cart which will include all the books he selected. The user can edit, delete and update his shopping cart. A final shopping cart is a summary which includes all the items the user selected and the final total cost.
- **Managing User Accounts:** Each user should have an account to access all the functionalities of the website. Users can sign in using the login page and sign out using the logout page. All the user sessions will be saved in the database.
- **Administration:** The Administrator will be provided with special functionalities like
    - Add or delete a book category
    - Add or delete a member
    - Manage member orders.

2.2.3. This product is mainly designed to keep the information about the alumni and event organized for alumni. There will be 4 users of the system-administrator, counsellor, placement officer, and alumni. Each user will be provided with a login id and password to interact with the system.

2.3. User characteristics:

2.3.1. Users of the website must possess a minimum educational level which conforms to entrance standards. Users of the website must know how to navigate in a website. There are 3 types of users of this software:

- Customer
- Administrator
- Supplier

2.3.2. Customers are using it for viewing and buying books. Customers can also write feedback for books and services.

2.3.3. Administrators can add, edit and delete products and provide services to the customer. An administrator can see the daily sale of the books, and can also see the feedback given by the customers. The administrator maintains the deliveries.

2.3.4. Suppliers can use the system to see the product, their prices and quantity available profit and loss.

2.4. Design Constraints:

2.4.1. The hardware limitation is that 2GB RAM is required. The language requirements are HTML, CSS, JavaScript, PHP, SQL. The content will be made non-editable so that the users cannot edit the price or make any fraud purchase.

2.4.2. This Software can be installed on Personal Computers, Tablets or Smartphones. For security reasons, Login Id & Password must be provided.

2.5. General Constraints:

2.5.1. The "Online Bookstore" should run on all Internet Browsers and all processors which support the Internet Browser.

- The interface will be in English only.
- The system is working for a single server.
- GUI features available.

2.6. User Documentation:

2.6.1. This software is simple to use and easy to understand. Users having basic Knowledge of computers will be able to use this software.

2.7. Assumptions and dependencies:

2.7.1. The product does require a back-end database server MySQL for storing the username and Password for different types of user of the system.

2.7.2. ASSUMPTIONS:

- Users must be trained for basic computer functionality.
- Users must have a basic knowledge of English.
- The system must be able to respond to database software within a reasonable time.

3. System Requirements and analysis:

The system requirements and analysis section introduce the numerous requirements of the system from the user's point of view. It also introduces many decisions that have been taken regarding the implementation of the system.

3.1. User Interface:

3.1.1. Users of the system will be provided with the Graphical user interface, there is no Command-line interface for any function. The user interface provided by the system should be user-friendly.

3.2. Hardware Requirements:

3.2.1. Hardware requirement will be the same for both the parties which are as follows:

- Processor-Pentium I or above.
- Ram 128MB or above.

3.3. Software Requirements:

3.3.1. The system can be executed on a computer system having any version of the Windows operating system, macOS, Ubuntu.

3.3.2. Software required to make for the working of our online bookstore is:

- Operating system: Windows XP/Vista/7 or later version, Linux OS which supports Networking.
- Java Development Tool Kit.

3.4. Communication Interfaces:

3.4.1. There are no special communication interfaces requirements.

4. Supplementary Requirements:

4.1. A server will also be able to connect with more than one client at the same time to enable more access at a time.

5. Functional Requirements:

The system must provide the following functionality:

5.1. Order:

5.1.1. This module deals with the order of the books. It accepts book names, retrieves book details, calculates the price based on

selected books. After the payment process starts then the book is delivered to the customer.

5.2. Cancellation:

5.2.1. Once the order of the book has been done, it can be cancelled or seen by this module. It accepts an order ID and verifies it with the database. On successful confirmation by the customer, it can cancel the order. Further, it will update the bookstore database and the payment gateway to issue refunds.

5.3. Search:

5.3.1. This module retrieves the details of the books. It accepts book name or subject and course name and then retrieves the details of the particular book or all the books from a particular subject or course name.

6. Other Non-functional Requirements:

6.1. Performance Requirements:

6.1.1. **Availability:** Any number of users can access the system at any time and maintain speed at maximum. The server will be working 24x7.

6.1.2. **Security:** Users will be able to access only their personal information and not that of other users. Purchases will be handled through a secure server to ensure the protection of the user's credit card and personal information.

6.1.3. **Reliability:** The average time to failure shall be 30 days. If a server does crash, a backup server will be up and running within the hour.

6.1.4. **Maintainability:** Any updates or defect fixes shall be able to be made on server-side computers only without any patches required by the user.

6.1.5. **Portability:** Nothing required

6.2. Security Requirements:

6.2.1. There are different categories of users namely Customer, Administrator, Supplier who will be viewing either all or some specific information from the database. Depending upon the category of using the access rights are decided. It means if the user is an administrator then he can be able to modify the data, append etc. All other users only have the rights to retrieve information about the database.

6.2.2. The system should provide only authorized access to critical data.

6.2.3. The system should check data integrity for critical variables.

6.2.4. All fields should be validated before data is sent to the database.

6.3. Portability Requirements:

6.3.1. The system can be executed on a computer system having any version of the Windows operating system, macOS, Ubuntu.

6.4. Maintainability Requirements:

6.4.1. The system should be maintainable and an authorized user should be able to reset all options to default settings.

6.5. Reliability Requirements:

6.5.1. After proper verification and validation, the data is committed to the central database.

6.5.2. Appropriate backup procedures should be applied to prevent corruption and loss of data.

6.6. Usability Requirements:

6.6.1. A logical and user-friendly interface helps the users to access the system easily.

6.6.2. Error prevention should be supported by providing proper validation mechanisms for the data before actual submission to the database.

6.7. Software system Attributes:

6.7.1. The system should be equipped with current and archive databases.

6.7.2. The system should present the information to the user clearly and precisely.

6.7.3. The system should allow the entry of numbers, operands, special symbols, and letters of the alphabet.

6.7.4. The system should send notifications to the user before committing user actions.

6.7.5. The authorized personnel should be able to update information and modify records.

6.8. Safety Requirements:

6.8.1. The database may get crashed at any certain time due to virus or operating system failure. Therefore, it is required to take the database backup.

7. Preliminary Budget:

Cost for the Project- 1-1.2 Lakhs (Approx)

8. Appendices:

8.1. References

8.1.1. The SRS document created in this appendix follows the IEEE Guide to Software Requirement Specifications.

8.1.2. https://www.ieee.org/conferences/publishing/templates.html
8.1.3. https://web.cs.dal.ca/~hawkey/3130/srs_template-ieee.doc
8.1.4. Internet.

B.2 Conclusion:

(Students must write the conclusion)

A system requirements specification is a must when it comes to developing software. Some good practices lead to good documentation. Since SRS is useful for both customers and software development teams, it is essential to develop a complete and clear system requirements document.

SRS helps the customers to define their needs with accuracy, while it helps the development team understand what the customers need in terms of development. Investing time in writing the SRS document will lead to the successful development of the software the customers need.

Creating the SRS is a vital part of a project that helps to get a high-quality software product because:

- It gives a team an understanding of what exactly a client wants to get;
- It aims at passing the information on software to as many specialists as possible and must be written simply and clearly;
- It provides the characteristics of users, gathers all possible software usage scenarios and, thereby, predicts development risks;
- It describes software behaviour in different operating environments;
- It helps to scrutinize the issues of software safety and security and find ways to avoid accidents;
- It serves as a basic document to follow during software testing;
- It minimizes the need for a further redesign of the system since all possible risks are analyzed and defined;
- It contains plenty of detailed diagrams and other visual information to ease the development process;
- It regulates communication between clients, managers, and development staff.

Following the rule of clarity, consistency, and accuracy and sticking to the structure of the requirements representation will help you write a document that will make the work of professionals much simpler.

B.3 Question of Curiosity

(To be answered by the student based on the practical performed and learning/observations)

1. SRS refers to what?

Ans:

SRS

- ➔ A Software requirements specification (SRS) is a document that describes what the software will do and how it will be expected to perform. It also describes the functionality the product needs to fulfil all stakeholders (business, users) needs.
- ➔ A typical SRS includes:
    - A purpose
    - An overall description
    - Specific requirements
- ➔ The best SRS documents define how the software will interact when embedded in hardware — or when connected to other software. Good SRS documents also account for real-life users.

2. What is the main objective behind preparing an SRS?

Ans:

The objective of an SRS

- ➔ An SRS forms the basis of an organization's entire project. It sets out the framework that all the development teams will follow. It provides critical information to all the teams, including development, operations, quality assurance (QA), and maintenance, ensuring the teams are in agreement.
- ➔ Using the SRS helps an enterprise confirm that the requirements are fulfilled and helps business leaders make decisions about the lifecycle of their product, such as when to retire a feature.
- ➔ Besides, writing an SRS can help developers reduce the time and effort necessary to meet their goals as well as save money on the cost of development.

The goals of an SRS

Some of the goals an SRS should achieve are to:

- ➔ Provide feedback to the customer, ensuring that the IT company understands the issues the software system should solve and how to address those issues.

- ➔ Help to break a problem down into smaller components just by writing down the requirements.
- ➔ Speed up the testing and validation processes.
- ➔ Facilitate reviews.

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