MILITARY INSTITUTE OF SCIENCE AND TECHNOLOGY

Department of Computer Science and Engineering

SYSTEM REQUIREMENTS SPECIFICATION(SRS)

Group No- 08(SEC B),CSE-17

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TEAM SOFTWARE CHASERS

Contents

1. Purpose

1.1. Preface

Optical Mark Recognition (OMR), also called mark sensing, is a technique to sense the presence or absence of marks by recognizing their depth (darkness) on sheet [1,4]. A mark is a response position on the questionnaire sheet that is filled with pencil or ballpoint pen. The way of marking is simple to everyone and OMR device can process mark information on sheets rapidly. Thus OMR has been widely used as a direct input device for data censuses and surveys and is fit for handling discrete data, whose values fall into a limited of values.

In the field of education, OMR technique was firstly used to process objective questions in the examination, such as College Boards Scholastic Aptitude Test (SAT), the Graduate Record Examination (GRE) in the United States, and the College English Test (CET) in China. However, there are a few distinct drawbacks which limit the application of OMR technology.

In this paper, Correcting multiple questions using OMR technique is presented. Besides implementing all the functions of the traditional OMR, our system will support both server based questions distribution and manual input and digitally storing of information is also done.

1.2. Introduction

Mark Recognition (OMR) is a traditional data input technique and an important human computer interaction technique which is widely used in education testing. Aimed at the drawbacks of Optical current OMR technique, a new image-based and server manipulated low cost OMR technique is presented in the paper. The new technique is capable of processing the system through a server based input as well as the manual input. The system key techniques and relevant implementations, which include the image scan, tilt correction, scanning error correction, regional deformation correction and mark recognition, are presented. This new technique is proved robust and effective by the processing results of large amount of questionnaires.

Our project works will mainly focus on-

- Theoretical CS and Algorithms
- Information Security
- Pattern Recognition
- Digital Image Processing
- Database and Data mining

Our first objective plan is to develop the basic features of OMR machine into our project. Later on we will be emphasising on server based input system. Data mining in the central database will be a benchmark of our project.

There will be some scopes of developing a mobile based server control application. The whole system will be controlled by mobile application where Admin channel and User channel will be separated. We have considered the fact And planned to develop the project gradually.

1.3. Glossary

1.3.1. Acquisition process . This process obtains the personnel and resources necessary for project work. Acquisitions are closely coordinated with project budgets and schedules.

1.3.2. **Adaptive project framework (APF)** - An approach to project management that rejects traditional, linear project management and instead accepts changing requirements and allows projects to be affected by external business environments.

1.3.3. **BOSCARD** - This method details and considers the background, objectives, scope, constraints, assumptions, risks, and deliverables of new projects.

1.3.4. **Budgeted cost of work performed (BCWP)** - The portion of the budget allocated to scheduled work actually performed in a period of time.

1.3.5. **Budgeted cost of work scheduled (BCWS)** - The portion of the budget allocated to work scheduled to be performed in a period of time.

1.3.6. **Estimate to complete (ETC)** - At a given point in a project, the estimate of the cost of the work that still needs to be completed.

1.3.7. **Fixed price contract (FPC)** - A fixed price contract pays an agreed-upon fee and does not incorporate other variables, such as time and cost.

1.3.8. **Requirements** - A set of stipulations regarding project deliverables. They are a key element of the project scope and explain in detail the stakeholders' expectations for a project.

1.3.9. **Resource calendar** - A resource calendar indicates resource availability, usually by shift, over a period of time.

1.3.10. **Stakeholder** - In project management, a Stakeholder is any party with an interest in the successful completion of a project.

1.3.11. **Use case -** In software development, a use case is a step-by-step list of actions that end users would take to achieve specific goals.

1.4. User requirements definition

1.4.1. Process of collecting user requirements.

Interview. As our project is mainly concerned in education testing, during collection of user requirements we mainly emphasised over some educational Institutions and coaching centre where demand of our project is more. We also took interviews of various individuals asking for their desires and demand for our project and we found out below requirements.

Questionnaires. We asked to extract information from number of people. While developing this project, numbers of questions were asked to Individual about current situations.

Questions where like-

1. What problem teachers got while using OMR machine?
2. How they insert the hardcopy values?
3. How much time it take to count a single sheet attendance data?
4. What happens if the system get crash or the file is affected by virus?

and so on.

1.5. User requirements.

- OMR machine application should have some login options for different users. A separate user panel will be there to control the process centrally.
- OMR machine system will be user friendly. The overall monitoring system can be conducted through a computer.
- A server will be responsible for sending the corrections to every branch.
- The system has to contain some arrangements to store the results of individuals in a separate database.

2. Overall Description

2.1. System Architecture

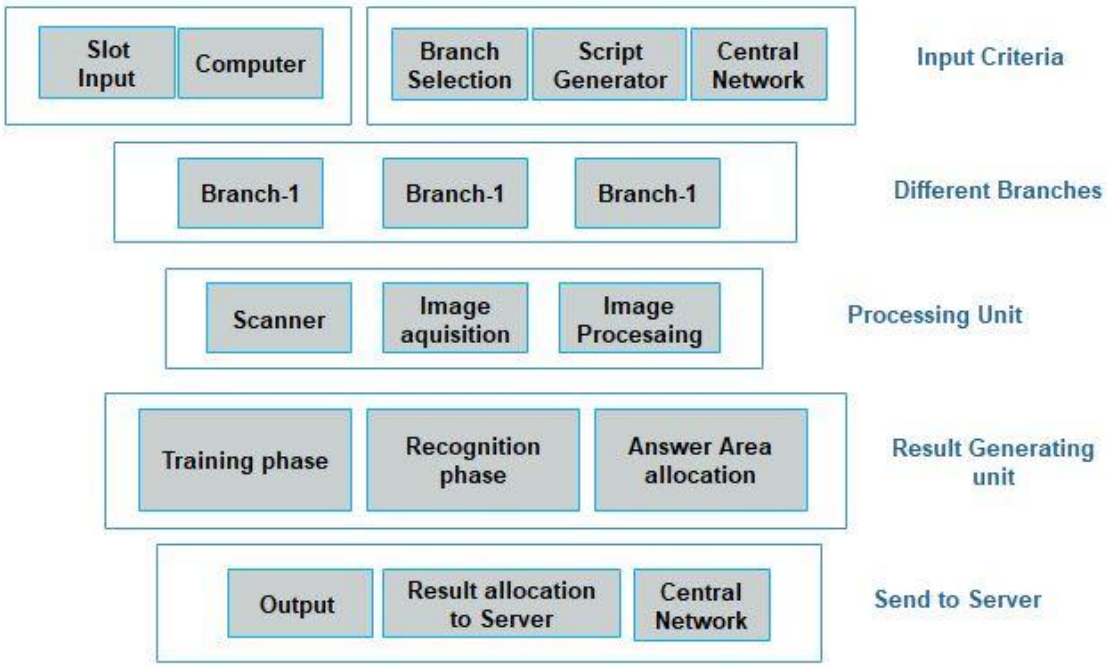


Fig-1. Architectural Model.

Our overall system architecture is based on five different sub-system which are interlinked to each other.

2.1.1. Input Criteria. Mainly deals with the sub-system of sending input variable for different cases. We will consider manual input and server based input in this case.

2.1.2. Different Branches. Different branches will be there in the central system. So that server can send data to those branches and also for storing result of individual.

2.1.3. Processing Unit. This sub-system consists of various hardware and software (Such as Scanner, Image acquisition etc).

2.1.4. Result generating unit. Basically this sub-system is responsible for generating result value of individuals.

2.1.5. Send to server. Our generated result will be stored in the server through a central network.

2.2. System Requirement specifications.

2.2.1. System Requirements.

1.5.1.1. System should have a database inside the computer with information of all the students.

1.5.1.2. System should be able to record the mark of the particular student inside the database.

1.5.1.3. System should be able to record the mark of the particular student inside the database.

1.5.2.1. System should have the provision to be used without the computer.

1.5.2.2. System should be able to take input manually in binary form.

1.5.2.3. System should have an LED display show the result.

1.5.3.1. System should have an application which will have proper security features to enter into the database.

1.5.3.2. System should have application from where the whole operation will be monitored.

1.5.4.1. System database should be accessible to only the teachers/admin personnel's.

2.3. Requirement Classification.

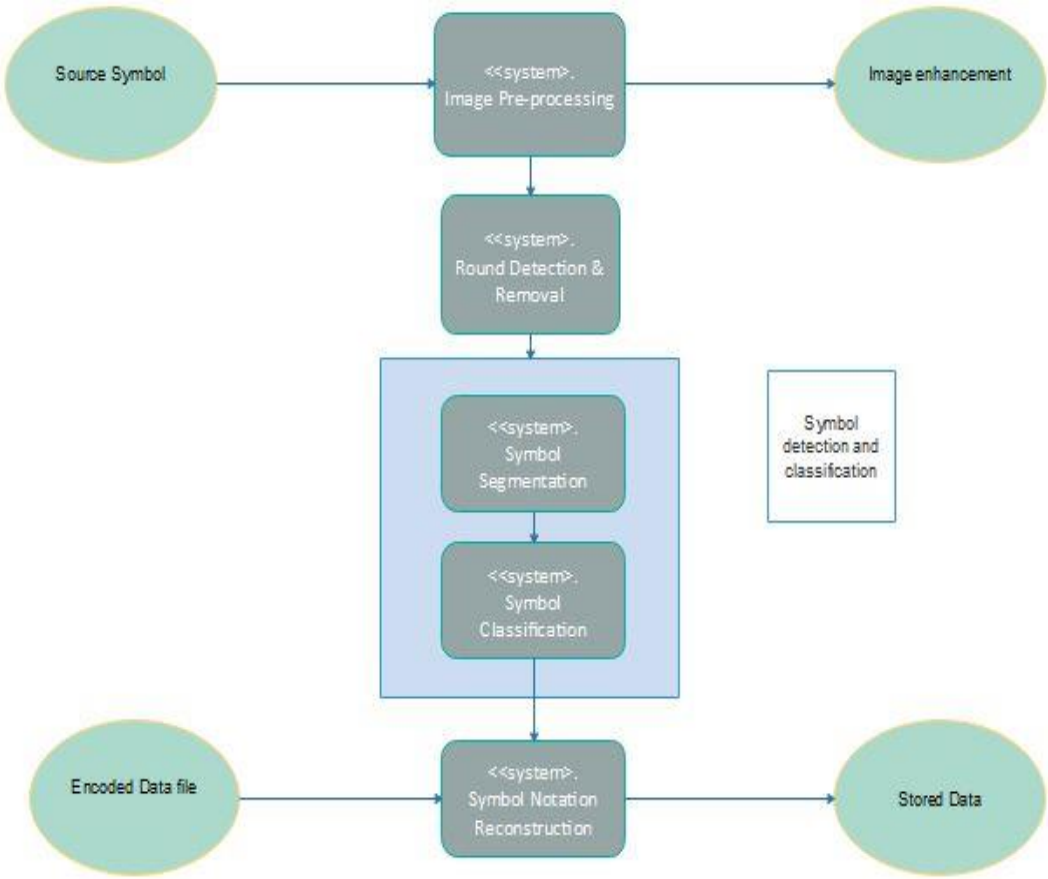
Serial	User Requirements	Type of Requirement		Remarks
		Functional	Non-Functional	
1	System should be able to evaluate the answers automatically with the help of computer.	✓	X	
2	System should be able to input the mark of a student automatically inside the database.	✓	X	
3	System should be able to be operated without the help of the computer also.	✓	X	
4	System should be able to take input manually.	✓	X	
5	Time	X	√	

2.4. References:

a. https://www.youtube.com/watch?v=Ugo6ZiHp31o
b. https://en.wikipedia.org/wiki/Optical_mark_recognition
c. https://www.techshopbd.com/

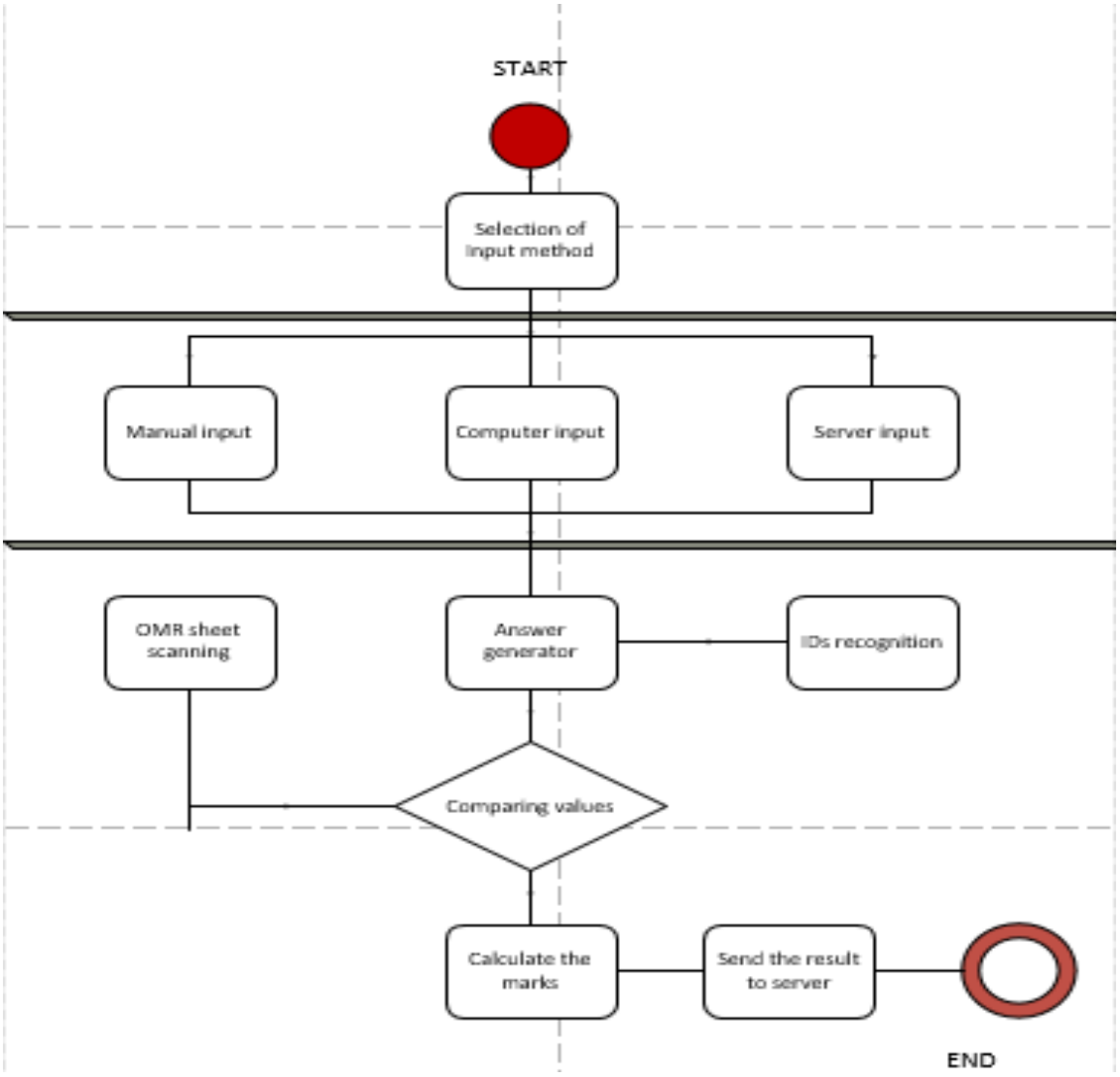
3. System Models

3.1. Context Model

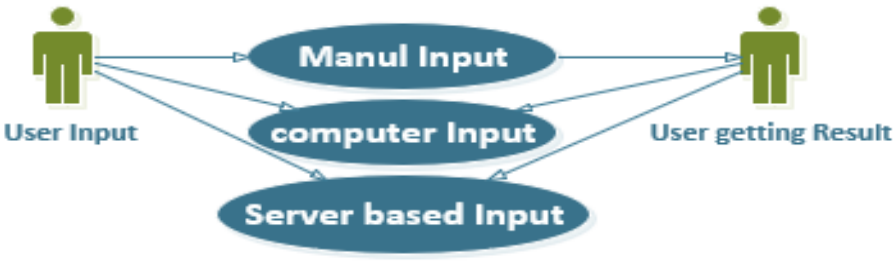


- The whole system will be containing 5 sub-system modules.
- Source Symbol is the symbol on answer script. Image enhancing allows to save the result.
- Encoded data is mainly the correct answer from different source (Database, Manual input etc).
- Symbol segmentation and symbol classification are mainly for detection of the image.
- Unwanted and unauthorized marks will be considered.

3.2. Activity Diagram



3.3. Use case Diagram



Use case: Computer Input.

Primary actor: User.

Secondary actor: Computer, Mobile phone.

Pre- condition: Answers should be generated from computer system.

Post-condition: -

Main-flow:

1. The answers will be stored in computer previously.
2. User will only select the respective corrective data.
3. Comparing the image values marks will be analysed.
4. Marks will be sent to respective IDs.

Use case: Database Input

Primary actor: User.

Secondary actor: Server, Database.

Pre- condition: Answers should be generated centrally from server.

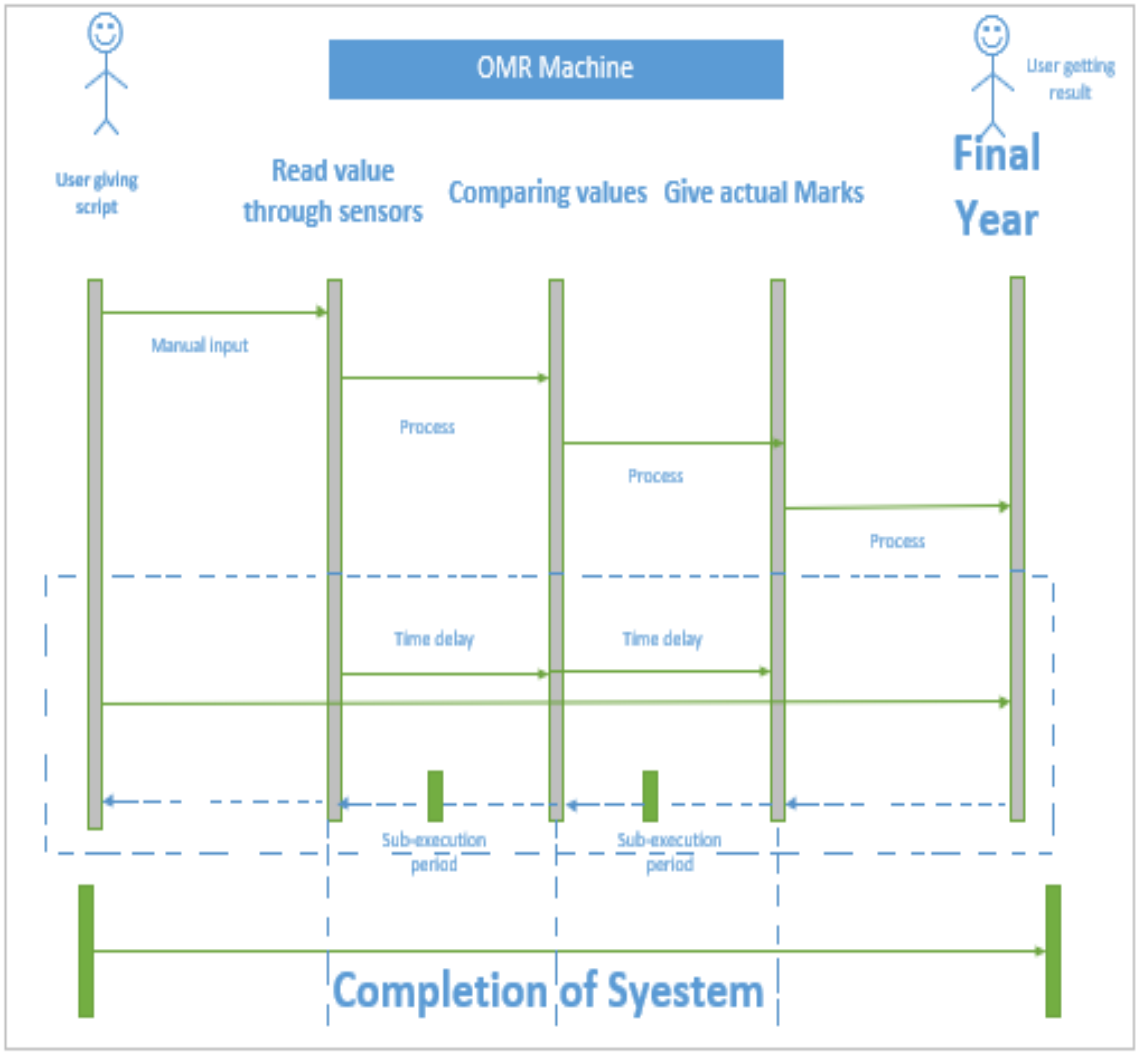
Post-condition: -

Main-flow:

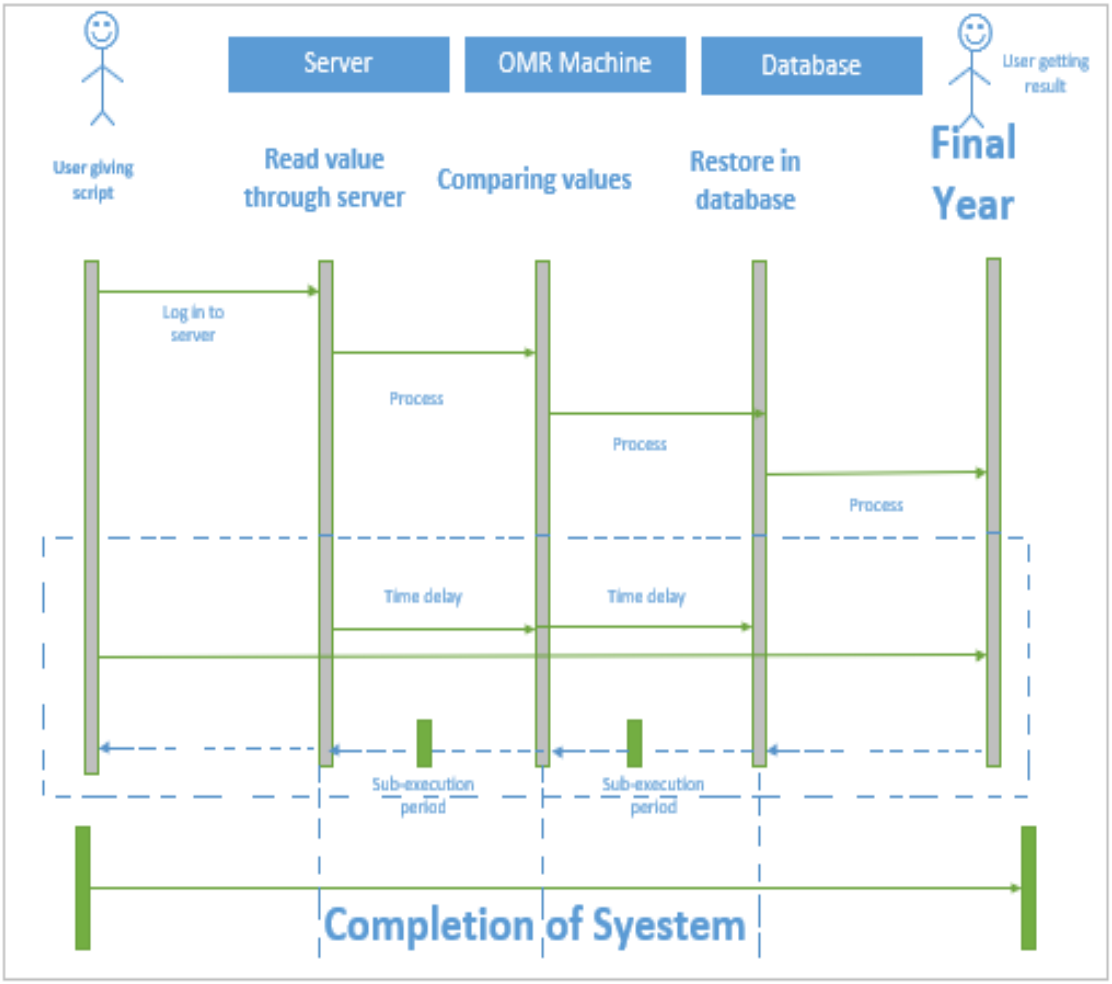
1. The answers will be stored in server.
2. Answers will be centrally dispatched to each branch.
3. Comparing the image values marks will be analysed..
4. Marks will be sent to respective ID**s.**

3.4. Sequence Diagram

3.4.1. Manual-user input.



3.4.2. Server Based Input.



4. System Evolution

To face evolutionary challenges our system might be considered to have a mobile based control system. We have also thought of implementing Internet of things (IoT) domain in our system architecture.

4.1. Mobile Control system UI.

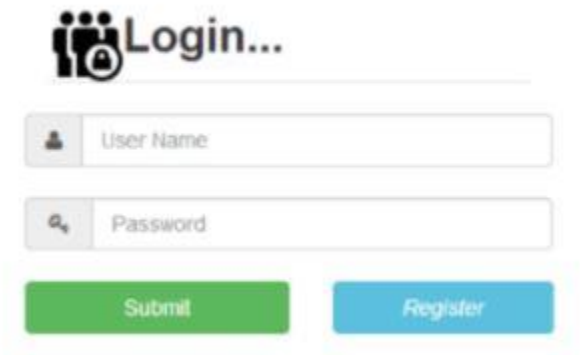


Fig. Login Interface.

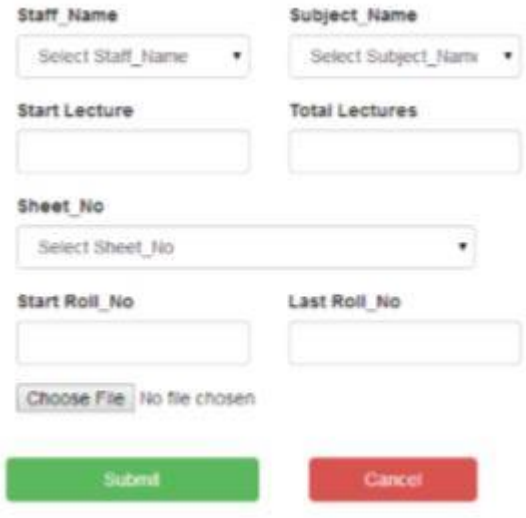


Fig. Manual Window.

5. Appendix A

Project Hosting

The project is hosted at Google Code. The complete source code along with the manual to operate the project and supplementary files are uploaded.

Project link:
https://docs.google.com/document/d/1VHQkMivOcUk7dBy7KvUjI1mrxldgchTkgu7NC3Ll6hA/edit

QR Code:

6. Index