

Localize the Openbravo ERP system into Sinhala language and Implement it with the university system.

**Project ID: 16-071**

## **Software Requirements Specification**

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## DECLARATION

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## Chapter 1

### 1. Introduction

#### 1.1 Purpose

This Software Requirements Specification document provides a detailed description of the behavior of “Localize the Openbravo ERP system into Sinhala language and Implement it with the university system” which is to be developed, with reference to both its internal and external operations and its capabilities. Mainly all the users requirements, system requirements (Defining what should be implemented), functional and non-functional requirements that are meant to be implemented in the product are specified in this document. Since a complete description of the function to be performed by the proposed software is provided in this document, this will help out the readers and users to determine whether the software specified really addresses the current problem context and whether it meets the needs of the targeted community. Then it discusses how the proposed system differs from those approaches. This is written with the purpose of providing a better understanding about the system, its feature, its sub modules, how each sub modules work and the relationship between those sub modules to the end users developers and those who are interested about the project. In this document the system is graphically represented as so as to make the readers find it convenient to understand and it is presented in a simplified manner in order to address an audience with different levels of technical capabilities and relevant knowledge.

#### 1.2 Scope

This project focuses on giving a better resource planning experience in Sinhala language to the users, who are struggling with current Enterprise Resource Planning (ERP) methods. This document tends to cover the user requirements and system requirement of the proposed solution website and localized ERP which is going to be developed under the before mentioned research idea. As well as it contains related to research information collected from the literature review together with goals, objectives of the intended system and a diagrammatical overview of the system to guide the developers and to give an overall idea of the system to the users.

##### 1.2.1 The software product to be produced by name

LOERPS is an ERP system which gives a reality resource planning system for users. Through this system here explains details related to how the resource planning and localization is done under Examination management. This application area covers details related to students continues assessments marks, exam registration details, payments details for exams and so on.

## 1.2.2 The research area capabilities and incapability's

### Capabilities

- User can view Examination registration details
- User can add examination details to the system
- User will be able to see registered and applied students details for the exams
- Entrance exam details can be modified and add
- Database control
- View and evaluate examination fee details
- Payment details can be viewed and modify
- Predict the future transactions to the Admin

The system will analyze the past data and predicts what sort of registration will happen. The techniques of data mining will be used to analyze and to predict. After predicting, an e mail will be generated and will be sent to the admin .The content of the email, will help the management when taking decisions for the future. The management can decide what amount of students should be taken per year, and what to not.

### Incapability's

- The system is not capable of identifying words of other languages other than Sinhala language.

## 1.2.3 The application of the software

### 1.2.3.1 Benefits

- By using this application user can handle Examination details very easier manner.
- Using this system user can check whether that student valid for the sit for the exam or not.
- User can see all the information regarding exam such as how many candidates are sit for the exam what are the available examination halls.
- User can assign available examiners to the exam.

### 1.2.3.2 Objectives

- Satisfy the user with given requirements (Assist the student registration details on proper manner)
- Give a good idea about the current status like (whether student registration is done or payments is successful or not)
- Give the predictions for the future registration

### 1.2.3.3 Goals

The main goal of this proposed solution is give a better students registration planning application in Sinhala language to the Student registration division.

## 1.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

ERP	Enterprise Resource Planning
JDK	Java Development Kit
SRS	Software Requirement Specification
IDE	Integrated Development kit
OS	Operating System
MB	Mega Byte
GB	Giga Byte
OOP	Object Oriented Program
JDK	Java Development Kit

## 1.4 Overview

*Chapter 1:* This gives a widespread introduction of the research component on the whole. This contains the purpose of the SRS and the scope of the research area. This chapter also includes capabilities and in capabilities of the research component, main goal, objectives and user benefits of the system.

*Chapter 2:* This chapter introduces the limitations, constraint and various software, hardware and communication requirement of this product. At the same time, the product is compared with other similar products that are available currently to provide a better perspective of the product to the user.

*Chapter 3:* This chapter represents the High Level Architecture of the overall system and gives a detailed description about the all sub systems related to the application for non-technical users.

*Chapter 4:* System requirements are describe here. This section goes with the technical users and External interface requirements, Performance requirements, Design constraint and Software system attributes which are non-functional requirements. Also class diagram that list classes pertaining to the domain of the application and are adequate for organizing all of the requirements are included.

## Chapter 2

## 2 Overall Descriptions

### 2.1 Product perspective

There are many resources planning system all around the world. But many of them are in English language and implemented cost is very high. By using this application can do a better resource planning system relates to the student registration management in Sinhala language. System interfaces will be very familiar with users and it is very useful and by going through these can do better resource plan.

This web application is a cloud base web application. So it is very useful to keep relation with other details which are related to Examination management such as registered student details. So user can easily access other relevant details also.

#### 2.1.1 System interfaces

To use web interface of Openbravo 3 any modern office system would work. Since Openbravo is a web application it can be used on any device that is capable of running current web browser. As with most web based applications, a faster CPU and more RAM makes the GUI snappier and more pleasant to use. Larger displays also make users more productive using wide grids, forms and multiple tabs.

For the system interface it is essential to have some system interface such as

- Operating System.
- PostgreSQL server 9.5.x
- Apache Tomcat 7
- Ant server
- Java development Kit (JDK)

#### 2.1.2 User interfaces

All interfaces are user friendly, very useful and easy to use.

#### **Personal sable Workspace and Widgets**

Enjoy an easily customizable portal-style home page from which users can directly access all recently visited windows and documents, and administer the available widgets. Widgets are user interface elements that can be either placed in any users' workspace tab or be part of a generated window. They can be used to display a wide range of different information ranging from static content, dynamic database data in list form, custom html content, or complete external URL's.

### **Spreadsheet-style Familiarity**

Conduct order taking and execution of other time-critical tasks with an editable spreadsheet-style grid that's familiar and fast to learn for users. Enjoy advanced grid functionality like column sorting, sizing and freezing, records grouping, add formula and summary columns or exporting grid content to a spreadsheet.

### **Powerful Tree-Navigation**

Facilitate data navigation through hierarchical data structures with powerful tree navigation capabilities.

#### **2.1.3 Hardware interfaces**

The system will be able to run on a general personal computer ,The keyboard will be the main hardware used by the user to input details and values when interacting with the system also the mouse and the display device which is the monitor will be used. It has estimated that the software will run on very low hardware requirement. It would however require at least 100GB of hard drive space to implement the centralized knowledgebase containing the information on the server.

Recommended hardware interfaces such as:

- A computer with an i3 processor or higher
- 4GB RAM or higher
- Display with a 1680x1050 resolution

#### **2.1.4 Software interfaces**

##### **Java based = multiplatform**

Openbravo runs wherever the Java JDK works. This currently means:

- **Operating systems:** Windows, any Linux distribution, FreeBSD, Mac OSX, Solaris and more.
- **Architectures:** x86, x86\_64, IA64, Sparc, PowerPC, AIX.

Either PostgreSQL or Oracle should also be supported by your target system

##### **Software stack**

If a new major version is not listed here it means it is not yet tested and it's not officially supported.

Stack component	Supported versions	Recommended version	Notes
Java 2 SE	6, 7, 8	Latest 7.x	OpenJDK, Sun JDK and IBM JDK supported  Java8 support got an important <a href="#">bugfix</a> in PR16Q1
PostgreSQL	9.1.x, 9.2.x, 9.3.x, 9.4.x, 9.5.x	Latest 9.3.x	With UUID support enabled (contrib)  PostgreSQL 9.5 supported starting with PR16Q1
Oracle	11g, 12c	11gR2	Oracle XE not supported - Oracle 12c supported starting with PR15Q3
Apache Tomcat	6.0.x, 7.0.x, 8.0.x	Latest 7.0.x	Tomcat 7 supported starting with PR15Q1  Tomcat 8 supported starting with PR15Q4
Apache Ant	1.7.1, 1.8.x, 1.9.x	1.9.x	-
Apache HTTP Server	2.2.x, 2.4.x	Latest 2.4.x	Optional but recommended
Apache mod_jk connector	1.2.x	Latest 1.2.x	Optional but recommended
Apache Tomcat Native	1.1.x	Latest 1.1.x	Optional but recommended

## 2.1.5 Communication interfaces

### Web browsers

It is strongly recommended to use at least the recommended versions of the mentioned browsers to ensure a better user experience as Openbravo 3 does benefit greatly from the improved performance in those versions.

In the [PR16Q2](#) release, the list of supported/recommended browsers is:

Web browser	Minimum required	Recommended version
Firefox	38	45 or higher
Chrome	48	49 or higher
Internet Explorer	9	11 or higher
Edge (EdgeHTML)	12	13 or higher
Safari	8	9 or higher

In the [PR16Q1](#) release, the list of supported/recommended browsers is:

Web browser	Minimum required	Recommended version
Firefox	38	38 or higher

<b>Chrome</b>	46	47 or higher
<b>Internet Explorer</b>	9	11 or higher
<b>Safari</b>	8	9 or higher

In the [PR15Q4](#) release, the list of supported/recommended browsers is:

<b>Web browser</b>	<b>Minimum required</b>	<b>Recommended version</b>
<b>Firefox</b>	38	38 or higher
<b>Chrome</b>	44	45 or higher
<b>Internet Explorer</b>	9	11 or higher
<b>Safari</b>	7	8 or higher

### **Network connectivity**

Here there are example configurations, depending on the number of concurrent users to be supported. These assume the server is hosted with a fast connection so it's network is not a limiting factor.

#### **Downstream bandwidth**

#### **Concurrent users**

3Mbit/s

<=10

10MBit/s

<=20

100MBit/s

<=100

As every usage scenario is different and there's no standard the real bandwidth usage in practice may differ from those given above.

### **2.1.6 Memory constraints**

A computer with an i3 processor, 4GB RAM and display with a 1680x1050 resolution is a comfortable setup for the Openbravo 3 web client.

In the case of a virtualized solution (VMware, VirtualBox, Xen, etc), the **Host system** on which the virtual machine is running should have at least 3GB of RAM for 32bit instances and 4GB for 64bits, to ensure that in addition to the virtual machine the host system is not continuously swapping to ensure a smooth operation.

### 2.1.7 Operations

All normal and special operations required by the user are listed below

- User should enable the internet access from his computer.
- Download the ERP system from openbravo repository.
- Open the application to connect the server
- To proceed with the system procurement should create an account.
- Login to the system using username and password
- Admin can handle other users' login details.

### 2.1.8 Site adaptation requirements

- User interfaces should be in Sinhala language
- User have to provide procurement details in Sinhala language only



## 2.2 Product functions

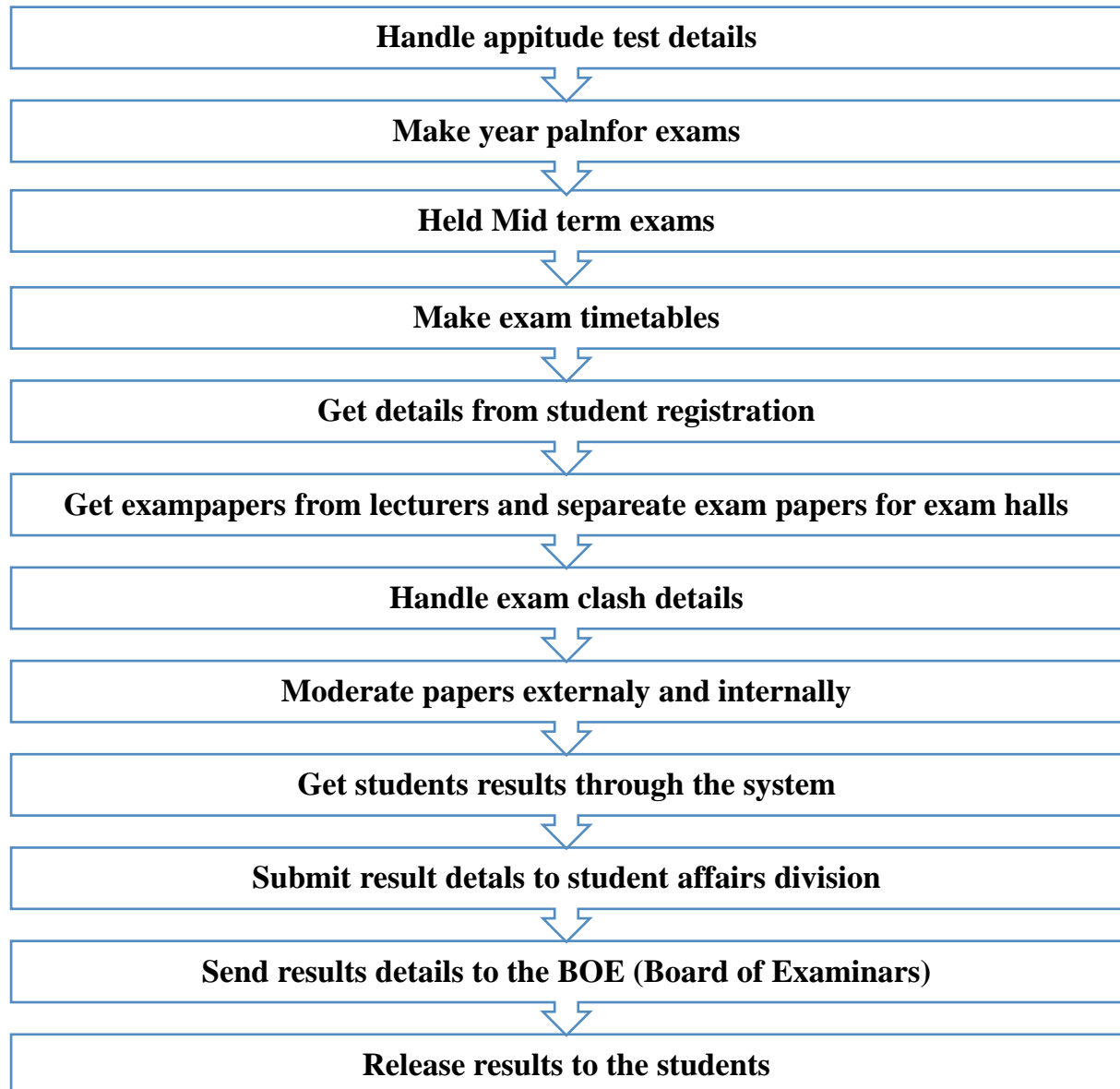


Figure 1 –Product function

## 2.3 User characteristics

User must have computer usage experiences and internet usage experiences. Also this is not very complex system and can do the resource planning easily in Sinhala language.

## 2.4 Constraints

- Should have a computer with an i3 processor or higher
- Should have 4GB RAM or higher
- Should have display with a 1680x1050 resolution
- Other constraints are mentioned in Software interface recommended version column

## **2.5 Assumptions and dependencies**

When suggesting the items which are related to the items searched by the user, the suggestions will be working only for Sinhala words.

## **2.6 Apportioning of requirements**

When predicting about the future transactions, rather than helping the Management the system can be developed in order to give predictions to the suppliers.

## Chapter 3

### 3 Specific requirements

#### 3.1 External interface requirements

##### 3.1.1 User interfaces

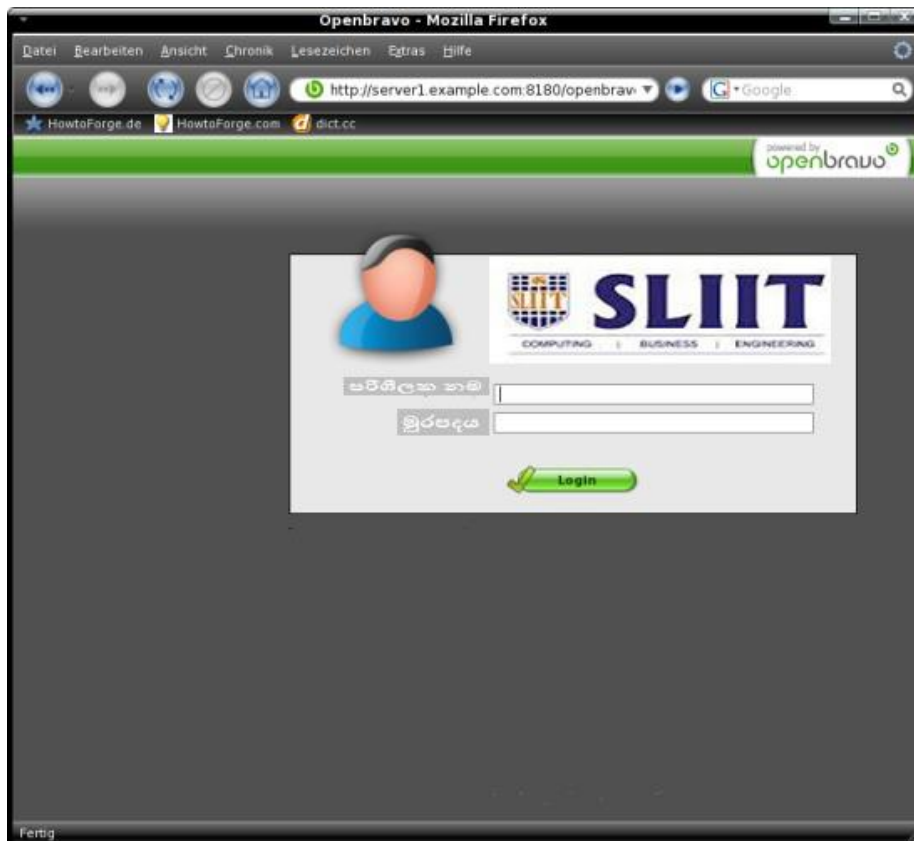


Figure 2- Interface 1

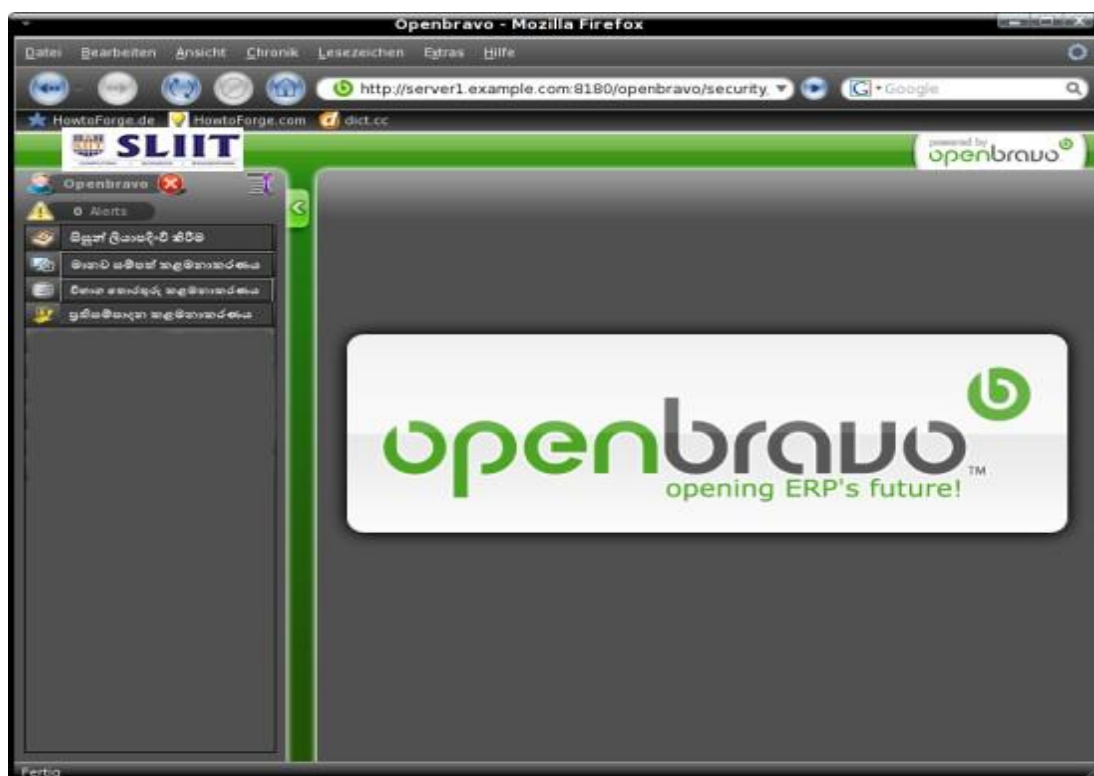


Figure 3- Interface 2

### 3.1.2 Hardware interfaces

- Wi-Fi router- The computers can connect with the server using Wi-Fi coverage and when performing development and testing tasks.
- Service providing server- Predict the future transactions in done inside the server. It will connect with website and send an email to the management section.

### 3.1.3 Software interfaces

- Operating System.
- PostgreSQL server 9.5.x
- Apache Tomcat 7
- Ant server
- Java development Kit (JDK)

### 3.1.4 Communication interfaces

High bandwidth technologies should be used for better experience (Good internet Connection).

The computers which are used for the testing purposes during the application development should be supported with a high speed data communication method such as 3G, 4G, and Wi-Fi.

### 3.2 Classes/Objects

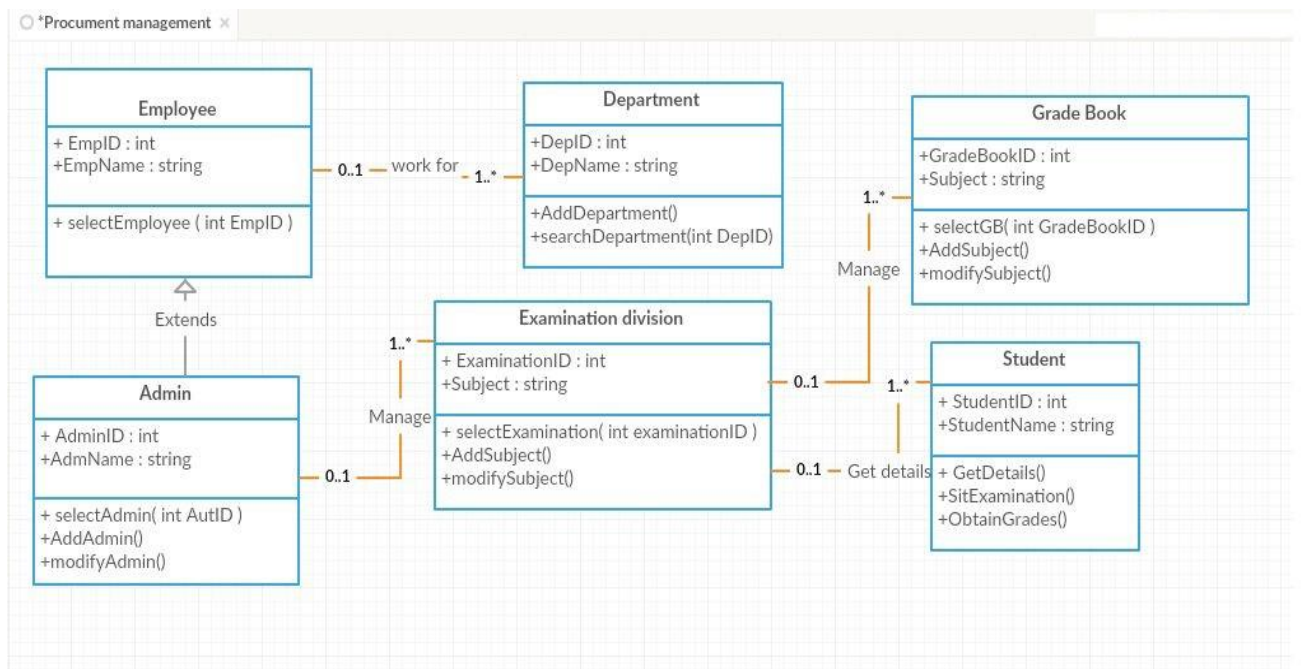


Figure 4-Class diagram

### 3.3 Performance requirements

For the efficient performance for the system following hardware is required

- Windows XP 32 bit OS or above
- Intel 2.2GHz Core 2 due processor or above
- 2GB DDR 2 RAM or above
- 250GB hard disk or above

To have the efficient performance of the system it's better to have more user friendly interfaces and should display appropriate error messages.

### 3.4 Design constraints

During the design stage the major constraint that will be faced is the limitation of available time. The project group expected to complete this project during ten months of period.

## 3.5 Software system attributes

### 3.5.1 Reliability

The system will perform according to the specifications mentioned in this document. This is developed according to the standards so it will not fail the customer

### 3.5.2 Availability

System will always be available at the all the time after application is started. System should be able to operate continuously without the need of regular system restart.in the case of system crash ,system should be able to auto recover in more than two minutes.

### 3.5.3 Security

Top managers only have all the assess permission in the system others can only work with the system. Some functions are disable for the other user so system is secure.

### 3.5.4 Maintainability

Maintainability is defined as the probability of performing a successful repair action within a given time. In other word maintainability measures the ease and speed with which a system can be restored to be operational status after a failure occurs .when we want to make a change in the program we do not need to change its each part in OOP (Object Oriented Program) change in one place make automatically change other place, which provide component reusability.

## 3.6 Other requirements

### ➤ Backup Requirement

- 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.

### ➤ Usability Requirements

- The system will be easy to use
- The system will be easy to understand
- Simple and user friendly interfaces

### ➤ Maintainability Requirements

- The system will be easily update for fixes
- The system will create logs of all changes, updates, or fixes changes

## Chapter 4

### 4 Supporting information

#### 4.1 Appendices

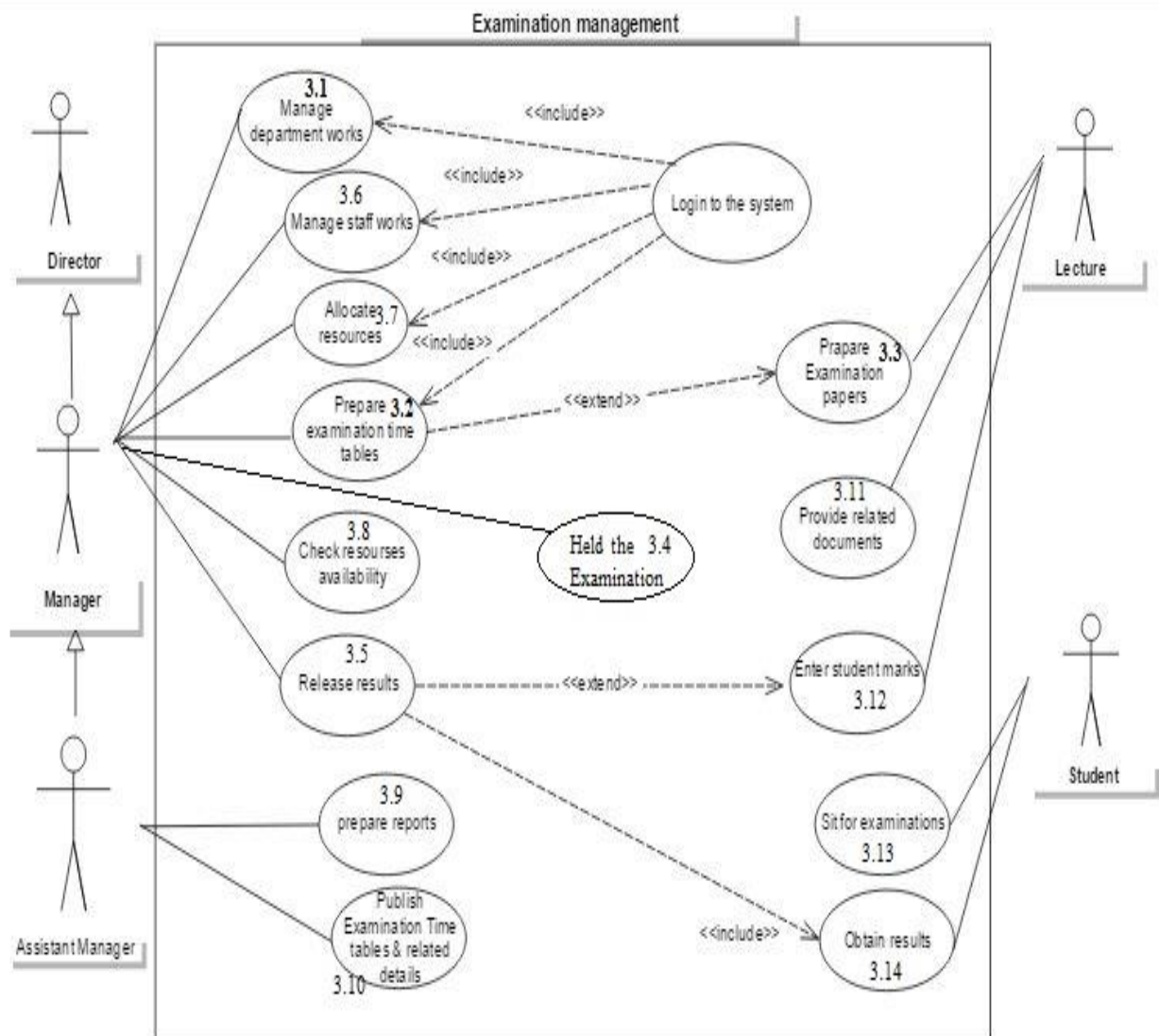


Figure 5-Use case diagram

Use case Name	Manage department works	
Index Number	3.1	
Primary Actors	Department managers	
Secondary Actors	Assistant managers	
Description	Step	Action
	1	Logging to the system.
	2	Check resources details.
	3	Allocate work for staff.
	4	Generate report.
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.
	2.1	If department has less resources, full fill those spaces immediately.

Figure 6-Use case Senario-1

Use case Name	Prepare Examination time tables	
Index Number	3.2	
Primary Actors	Department manager	
Secondary Actors	Faculty Heads	
Description	Step	Action
	1	Logging to the system
	2	Check student registration details
	3	Check related parties are available
	4	Prepare Time tables
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.
	3.1	If department has less resources, full fill those spaces immediately.

Figure 7-Use case Senario-2

Use case Name	Prepare Examination papers	
Index Number	3.3	
Primary Actors	Lecture	
Secondary Actors	Assistant lecture	
Description	Step	Action
	1	Logging to the system
	2	Refer module outline
	3	Prepare Examination papers
	4	Proof reading and checking
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.

Figure 8-Use case Senario-3



Use case Name	Held the examinations	
Index Number	3.4	
Primary Actors	Department manager	
Secondary Actors	Faculty Heads	
Description	Step	Action
	1	Logging to the system
	2	Check student examination registration details
	3	Check related parties are available
	4	Prepare working process
	5	Held the examination
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.
	3.1	If department has less resources, full fill those spaces immediately.

Figure 9-Use case Senario-4

Use case Name	Release Results	
Index Number	3.5	
Primary Actors	Department manager	
Secondary Actors	Faculty Heads	
Description	Step	Action
	1	Logging to the system
	2	Check student registration details
	3	Group the result according to the subjects or registration order.
	4	Publish results.
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.

Figure 10-Use case Senario-5

## 4.2 Reports

1. Semester time table
  - Mid-term time table
  - Final time table
2. Recourse allocation list
  - Hall arrangement
  - Invigilators
3. Student marks list
  - Mid marks
  - Final marks
  - CA mark
4. Student name list
5. Examination paper confirmation report
6. Fail student list

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