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

Research Component: Procurement Management

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DECLARATION

I declare that the this project report or an part of it was not a copy of a document done by any organization, university any other institute or a previous student project group at SLIIT and was not copied from the Internet or other sources.

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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. Under this proposed solution here describes about Procurement Management .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 Procurement Management, 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 this research area. 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 research area 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 localized ERP web application 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 Procurement management. This application area covers Requisition to Receipt and invoicing parts of the Procure to pay business flow and Supplier returns business process.

Procure to pay business process

Procure to Pay workflow manages the life-cycle of a procurement process.

Due to its complexity and different roles involved it is convenient to split Procure to Pay down into two main sub-processes:

1. **Requisition to Receipt** process starts by the creation and management of purchase requisitions and corresponding purchase orders to the moment the warehouse staff receives the merchandise.

2. **Supplier Invoice to Payment** continues previous sub-process by registering the supplier invoices and closes it by paying supplier invoices.

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1.2.2 The research area capabilities and incapability's

Capabilities

- User can view Annual budget report
- User can create annual procurement plan
- User will be able to see suppliers details
- Opening community will be opened the bits.
- Inventory control
- User can view purchase order
- Details related to Items which are going to be store
- View and evaluate price details
- Payment details can be viewed and modify related to purchased items
- Predict the future transactions to the Admin

The system will analyze the past data and predicts what sort of transactions 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 sort of items should they purchased, 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 procurement details very easier manner.
- The requestor can create a new document in the Requisition window, enters a "Need by date" and then looks for the product or service needed.
  If the product does not exist it can be entered at that time in the Product window.
- The requestor continues by adding for each product needed a new line with the need by date, the product, the quantity, the price if known and if needed its attribute (size and/or color, etc).
  A preferred supplier can also be added if known.
- Once done, the requisition is saved in "Draft" status allowing it could be changed later on by the purchase staff if needed.
- Purchase staff manages requisitions in the Manage Requisitions window.
- Purchase staff can change any data of the requisitions created in draft status, and besides can look for the supplier to be used in the Business Partner field. if the Business Partner does not exist, it can be entered at that time in the Business Partner window.
- Purchase staff can also enter the purchase net unit price and discounts if any, once known.
- Once the requisition is ready, it is completed. The Document Status of the requisition changes to Completed and can then turn into a purchase order.
- Can massively create Purchase Order/s for the Completed Requisitions in the Requisition to Order window by searching and then adding requisition lines do not linked to an order yet.
  The purchase order/s created that way are shown in the Purchase Order window in Booked status.
- Also can directly create Purchase Orders in the Purchase Order window. Purchase lines are filled as in the case of the Requisition. Once the Purchase Order is ready, it is processed pressing on the Book button.
- To review past and present purchases of the supplier, purchase staff uses the Purchase Dimensional Report.

1.2.3.2 Objectives

- Satisfy the user with given requirements (Assist the procurement details on proper manner)
- Give a good idea about the current status like (whether items are delivering or payments is successful or not)
- Give the predictions for the future transactions

1.2.3.3 Goals

The main goal of this proposed solution is give a better procurement resource planning application in Sinhala language to the Procurement manager.

1.3 DEFINITIONS, ACRONYMS AND ABBREVIATIONS

LOERPS	Localized Openbravo Enterprise Resource Planning system into Sinhala
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

1.4 Overview

1.4.1 Overview of the Software

In Procurement Management the Procure to pay business process is executed as follows:

Any permanent staff member of the organization allowed to do so can directly issue a Requisition as a result of an organization or business unit need.

- The requestor creates a new document in the Requisition window, enters a "Need by date" and then looks for the product or service needed.
  If the product does not exist it can be entered at that time in the Product window.
- The requestor continues by adding for each product needed a new line with the need by date, the product, the quantity, the price if known and if needed its attribute (size and/or color, etc.).
  A preferred supplier can also be added if known.
- Once done, the requisition is saved in "Draft" status allowing it could be changed later on by the purchase staff if needed.

Requisitions notify the purchase staff of products to order, their quantity and the time frame for its delivery. Purchase staff is then in charge of managing already created purchase requisitions or even create new ones if required.

- Purchase staff manages requisitions in the Manage Requisitions window.
- Purchase staff can change any data of the requisitions created in draft status, and besides can look for the supplier to be used in the Business Partner field. if the Business Partner does not exist, it can be entered at that time in the Business Partner window.
- Purchase staff can also enter the purchase net unit price and discounts if any, once known.

Once the requisition is ready, it is completed. The Document Status of the requisition changes to Completed and can then turn into a purchase order.

Purchase staff:

- Can massively create Purchase Order/s for the Completed Requisitions in the Requisition to Order window by searching and then adding requisition lines do not linked to an order yet.
  The purchase order/s created that way are shown in the Purchase Order window in Booked status.
- Can also directly create Purchase Orders in the Purchase Order window. Purchase lines are filled as in the case of the Requisition. Once the Purchase Order is ready, it is processed pressing on the Book button.
- To review past and present purchases of the supplier, purchase staff uses the Purchase Dimensional Report.

Warehouse staff:

- Receives the merchandise as well as the delivery notes attached in 2 ways:
  - With the Goods Receipt window, Warehouse staff looks for the orders pending to be delivered one by one and the get corresponding order lines quantity located in a warehouse and storage bin.
    This window also allows to create a receipt in a manual way.
  - With the Pending Goods Receipt window. Warehouse staff can massively select the purchase order lines being delivered and locate the quantity receipt in a warehouse and storage bin.
- Allocates landed cost if any to the products included in a receipt by:
  - selecting a landed cost type and entering an "estimated" landed cost amount which will be distributed among receipt lines
  - or by selecting a landed cost type and entering a landed cost amount already invoiced which will also be distributed among receipt lines.
- Completes the receipts.
  - Completed receipts updates stock information (product levels go up) and can be posted to the ledger therefore product assets accounting is being increased.
  - A Goods receipt can only be posted if the cost of the products being receipt has been calculated. For doing so Costing Background process needs to be run.
- Matched Invoices window helps to manage and post the discrepancies if any between the accounting of the receipt and the accounting of the corresponding invoice later on, due to purchase price differences.
- Goods Receipts Dimensional Report is used to review past receipts of the Business Partner.

Finance staff:

- Registers supplier invoices in different ways:
  - With the Goods Receipt window, Finance staff can generate an invoice from a Receipt in status Complete.
  - With the Purchase Invoice window, Finance staff can enter supplier invoices:
    - in a manual way
    - or by retrieving purchase orders or receipts lines pending to be invoiced
    - or by copying invoice lines from existing purchase invoices.

- Registers landed cost invoices and match those "invoiced" landed costs with the landed costs:
    - booked directly in a receipt(s)
    - or booked through a landed cost document.
- Processes and Posts landed cost matching.

- Once a Purchase Invoice is processed a Payment Plan of the invoice is created based on the payment terms agreed with the supplier and the purchase invoice can be posted to create the accounting entries of the invoice. Afterwards, the payment plan can be modified.

Additionally:

- The Matched Purchase Orders view helps Finance staff to have a look at the order or receipt lines which have not been invoiced yet by a supplier.
- Finance staff is able to review past supplier invoicing information in the Purchase Invoice Dimensional Report

Purchase expenses can be recognized in different ways:

- In most cases companies would recognize the expense as soon as the purchase is made. For instance a company buying consumable products that are not capitalized. In Openbravo, in this situation, the expense is generated as part of the accounting of the purchase invoice corresponding to the transaction.
- Under some circumstances, however, it is required to defer the expense recognition. For instance a company purchasing a business insurance for the duration of a year would want
  to distribute that expense over 12 months.
  In Openbravo, in this situation, the expense can be deferred within a given number of periods by entering an expense deferred plan in the purchase invoice lines.
  For a full description of this functionality please review the How to manage deferred revenue and expenses article.

Finally, the finance staff is in charge of making and managing the supplier payments:

- Supplier payments can be made in the Purchase Invoice window by using the Add Payment button. It is also possible to make a prepayment against a Purchase Order. Detailed payment management documentation is available in the Financial Management Receivables & Payables application area and in the payables article.

Suppliers' returns business flow

This workflow manages the return of purchased goods back to the supplier. Due to the consequences of returning it is convenient to split Supplier Returns down into two main sub-processes:

Supplier Return to Debit: This process manages the return of goods back to the vendor and the request of a debit.

Supplier Return to Replacement: This process manages the return of goods back to the vendor and the request of a goods replacement

In Procurement Management the Return to Vendor business process is executed as follows.

Procurement staff:

- Creates a new document in the Return to Vendor window and looks for the vendor name in the Business Partner field.
- And continues by adding lines clicking the button Pick/Edit lines
    - It is possible to pick goods receipt lines and edit the quantity you want to return, price
- Once the Return Material document is accepted by the Vendor you can process it clicking the button Book. The status of the document changes from Draft to Booked
- Only Booked documents can be shipped to the vendor

Warehouse staff:

- Creates a new document in the Return to Vendor Shipment window and looks for the vendor name in the Business Partner field.
- And continues by adding lines clicking the button Pick/Edit lines
    - Return to Vendor lines are picked
    - It is possible to edit the quantity to be shipped
- Once the document is ready process it by clicking the button Complete. The status of the document changes from Draft to Completed
- Completed shipment updates stock information (product levels go down)

Finance staff: To invoice these documents go to Purchase invoice window. All scenarios are covered:

- If the vendor sends an invoice just for that specific document you need to select a Reverse purchase invoice document type and then select the lines through the Create lines from button
- If the vendor sends an invoice with the original purchase order plus the return materials order you need to select a Purchase invoice document type and then select the lines through theCreate lines from button
- If the vendor doesn't send an invoice for the return materials order but wants to keep it as credit so you can use it later you have to:
    - Create a Reverse purchase invoice for this return materials
    - Leave it as credit to be used later through the Payment out window
    - A new purchase invoice based on the original purchase order can consume that credit.

1.4.2 Organization of this SRS

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 procurement 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 procurement management such as financial 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.

2.1.3 Hardware interfaces

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 bugfix 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
Chrome	46	47 or higher
Internet Explorer	9	11 or higher
Safari	8	9 or higher

In the PR15Q4 release, the list of supported/recommended browsers is:

Web browser	Minimum required	Recommended version
Firefox	38	38 or higher

Chrome	44	45 or higher
Internet Explorer	9	11 or higher
Safari	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

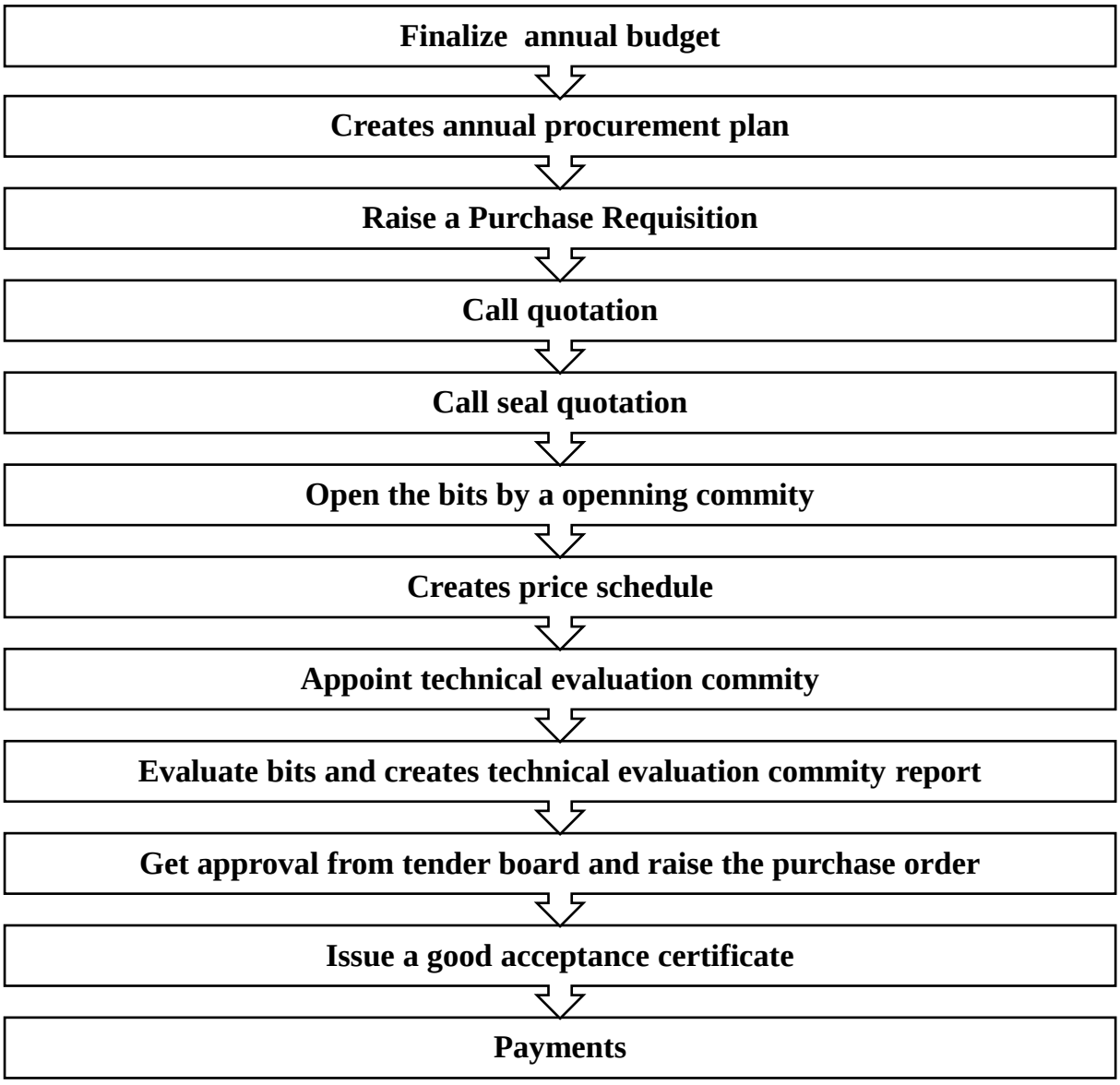

Figure 1-Product Function

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-Interface1

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

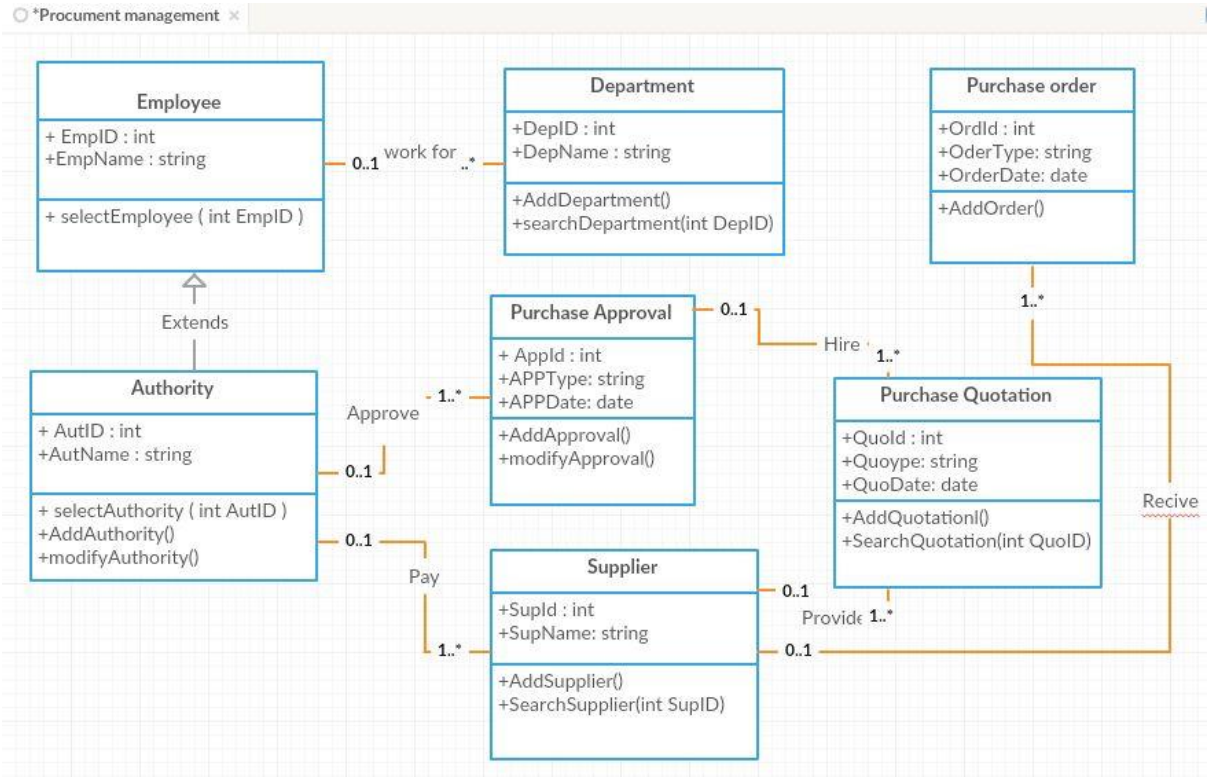

Figure 4- Class diagram

3.3 Performance requirements

For the efficient performance for the system following hardware is required

- Windows XP 64 bit OS or above
- Intel 2.2GHz Corei3 due processor or above
- 4GB RAM or above
- 250GB hard disk or above
- display with a 1680x1050 resolution

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 disabling 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 case 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.

Chapter 4

4 Supporting information

4.1 Appendices

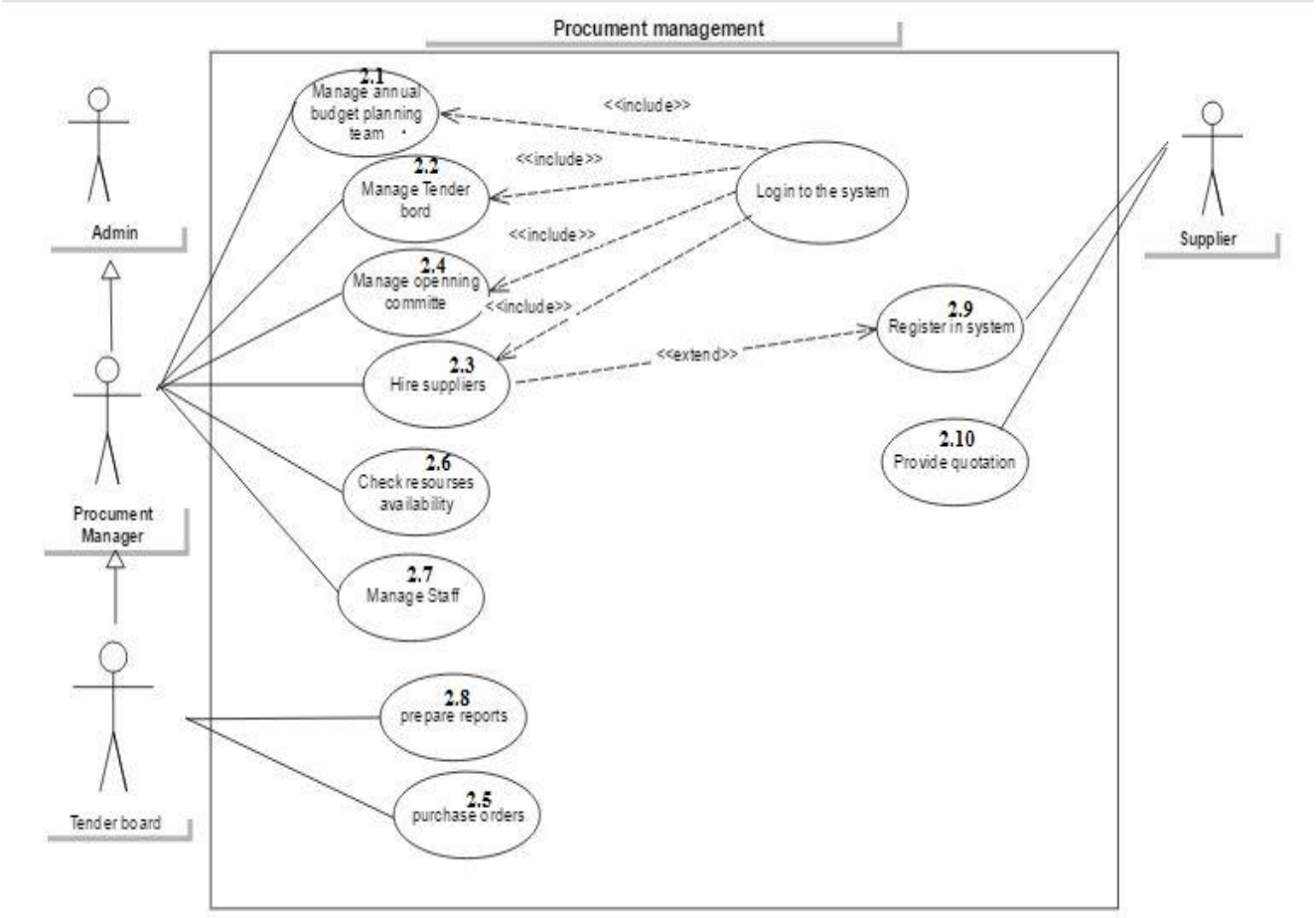

Figure 5-Use case diagram

Use case Name	Manage budget planning team	
Index Number	2.1	
Primary Actors	Procurement Manager	
Secondary Actors	Team leader	
Description	Step	Action
	1 2 3 4	Logging to the system Check team resources Check team works Get the daily success report
Extension	Step	Action
	1.1 2.1	If user not logging to the system, redirect to the main logging page. If team has less resources, full fill those spaces immediately.

Figure 6-Use case Scenario -1

Use case Name	Hire suppliers	
Index Number	2.3	
Primary Actors	Procurement manager	
Secondary Actors	Assistant manager	
Description	Step	Action
	1 2 3 4	Logging to the system. Check availability of the suppliers. Collect quotations. Identify suitable suppliers.
Extension	Step	Action
	1.1 3.1	If user not logging to the system, redirect to the main logging page. If available quotations are not applicable collect again new quotations.

Figure 7-Use case Scenario-2

Use case Name	Manage tender board	
Index Number	2.2	
Primary Actors	Procurement manager	
Secondary Actors	Team leader	
Description	Step	Action
	1 2 3 4	Logging to the system Check team resources Check team works Get the daily success report
Extension	Step	Action
	1.1 2.1	If user not logging to the system, redirect to the main logging page. If team has less resources, full fill those spaces immediately.

Figure 8-Use case Scenario-3

Use case Name	Manage opening committee	
Index Number	2.4	
Primary Actors	Procurement Manager	
Secondary Actors	Committee leader	
Description	Step	Action
	1 2 3 4	Logging to the system Check team resources Check team works Get the daily success report
Extension	Step	Action
	1.1 2.1	If user not logging to the system, redirect to the main logging page. If team has less resources, full fill those spaces immediately.

Figure 9-Use case Scenario -4

Use case Name	Purchase order	
Index Number	2.5	
Primary Actors	Procurement manager	
Secondary Actors	Team leader of tender board	
Description	Step	Action
	1 2 3 4	Logging to the system. Get tender board committee report. Get evaluating report. Purchase order.
Extension	Step	Action
	1.1	If user not logging to the system, redirect to the main logging page.

Figure 10-Use case Scenario-5

4.2 Reports

1. Annual procurement plan
2. Purchase order report
3. Vender invoice report
4. Seal quotation details
5. Price schedule
6. Technical evaluation committee report
7. Good acceptance note certificate

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