



**Daffodil**  
*International*  
**University**

Title of The Project

**Smart ERP system**

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## **APPROVAL**

This Project titled “Smart ERP System”, Submitted by Abdullah, ID No: 183-16-373 to the Department of Computing & Information Systems, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computing & Information Systems and approved as to its style and contents. The presentation has been held on- 21-11-2022.

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### **Declaration**

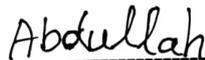
I hereby declare that; this project has been done by me under supervision of Abdullah Bin Kasem Bhuiyan, Lecturer, department of Computing and Information System (CIS) of Daffodil International University. I am also declaring that this project or any part of there has never been submitted anywhere else for the award of any educational degree like, B.Sc., M.Sc., Diploma or other qualifications.

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## **Acknowledgement**

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## **Dedication**

This project is dedicated to my parents and my brother-in-law **Heal Uddin**. Without my parents' devotion, ambition, and encouragement, I am nothing more than an empty shell. My brother-in-law acted as my mentor and inspired me to pursue a career in computer science, thus I want to dedicate this to him.

## **Executive Summary**

**Smart ERP system** is an academic project and also a usable product for a Textile company **SHAFIULLAH DYEING AND PRINTING** at Putia Bazar Rd, Narsingdi, Bangladesh. Not only for this company but also for all medium Textile companies that can use this software easily. I have prioritized the accounting system module in this software over other modules as per the client's requirement. The creative, flexible, and cost-efficient Smart ERP system is business management software that enables users to carry out daily tasks intelligently and accurately. For any medium-sized organization, it is the best business management software available since it offers proper process transformation, allowing users to save time, increase business productivity; lower operating costs, and maximizes return on investment. By providing overall superior service and performance, this software significantly contributes to enhancing customer satisfaction and owner satisfaction. A smart ERP system is made up of a number of integrated functions, including those for managing inventory, purchases, sales, accounting, point-of-sale systems (POS), manufacturing and stock control, distribution management, providers, and financial management. These characteristics diminish the manual procedures' involved time, budget, effort, confusion, and grief... Small and medium-sized businesses and startups both utilize this software.

## Table of Contents

Contents	Page No
Board of Examiners	i
Declaration	ii
Acknowledgement	iii
Dedication	iv
Executive Summary	iv
Table of Contents	v
List of Tables	ix
List of Figures	xi
<b>Chapter 1 – Introduction .....</b>	<b>1</b>
1.1 Introduction.....	1
1.2 Document Contents.....	2
<b>Chapter 2 – Initial Study .....</b>	<b>4</b>
2.1 Project Proposal .....	4
2.2 Background of the project.....	20
2.3 Problem Areas.....	21
2.4 Possible Solutions .....	23
<b>Chapter 3 – Literature Review .....</b>	<b>24</b>
3.1 Discussion on the Problem Domain.....	24
3.2 Discussion on the Problem Solution .....	25
3.3 A comparison of the key differentiators .....	27
3.4 Standard Procedure .....	30
<b>Chapter 4 – Methodology .....</b>	<b>32</b>
4.1 What to Use.....	32
4.2 Why to Use .....	38
4.3 Sections of Methodology .....	38
4.4 Plans toward Deployment.....	39

<b>Chapter 5 – Planning</b> .....	<b>40</b>
5.1 Project Plan .....	40
5.1.1 Work breakdown Structure .....	40
5.1.2 Resource Allocation.....	41
5.1.3 Time Boxing .....	42
5.1.4 Gantt Chart.....	43
5.2 Standardized test .....	43
5.2.1 Measuring Again against Time Boxes .....	44
5.2.2 Required Test .....	44
5.2.3 Test Case.....	48
5.2.4 User Acceptance Test Plan .....	49
5.3 Risk Management .....	50
5.3.1 Risk Identification.....	51
5.3.2 Risk Assessment .....	52
5.3.3 Risk Precaution/Action Plan .....	53
5.3.4 Steps Taken for Attainable Risk .....	54
5.4 Change Management .....	55
5.4.1 Prospective Change-Inducing Factors .....	55
5.4.2 DSDM welcome Change .....	55
5.4.3 Considering Business Priority.....	56
5.4.4 Change Workshop.....	56
5.4.5 Changes that are allowed .....	57
5.4.6 Key Decision Taker of Change .....	57
5.5 Quality Management.....	57
5.5.1 Rules used to preserve quality .....	58
5.5.2 DSDM Standard Quality Measures .....	60
5.5.3 Plan for Quality and Measuring Meter .....	61
<b>Chapter 6 – Feasibility</b> .....	<b>62</b>
6.1 All Possible Types of Feasibility .....	62
6.2 Cost-benefit analysis .....	67
6.3 Is DSDM Good or Bad for this Project.....	69
<b>Chapter 7 – Foundation</b> .....	<b>70</b>
7.1 The Assessment of the Area Of the study.....	70
7.1.1 Interview .....	70
7.1.2 Observations .....	71

7.1.3 Questionnaires.....	72
7.2 Rich Picture.....	74
7.3 Specific Problem Area Identification.....	76
7.4 Possible Solutions .....	76
7.5 List of All Prerequisites .....	77
7.6 Technology to be implemented.....	78
7.7 Recommendation and Justification .....	81
<b>Chapter 8 – Exploration.....</b>	<b>82</b>
8.1 Old System Use Case.....	82
8.2 Activity Diagram .....	83
8.3 Full system use case diagram.....	84
8.4 Full System Activity Diagram .....	85
8.5 Requirements Catalog.....	87
8.6 Prioritized Requirements List (PRL) .....	92
8.7 Prototype of the new system .....	93
<b>Chapter 9 – Engineering .....</b>	<b>102</b>
9.1 New System Modules .....	102
9.2 Use Case Diagram of the Smart ERP system .....	106
9.3 Class Diagram of the BBSMS .....	107
9.4 Entity Relationship Diagram.....	108
9.5 Sequence Diagram .....	109
9.6 Component Diagram of the BBSMS .....	110
9.7 Deployment Diagram.....	111
9.8 System Interface Design .....	112
<b>Chapter 10 – Deployment.....</b>	<b>117</b>
10.1 Core Module Coding Sample.....	117
10.2 Possible Problem Breakdown .....	124
10.3 Prioritization while Developing the Solution .....	125
<b>Chapter 11 – Testing.....</b>	<b>127</b>
11.1 Test Plan Acceptance.....	127
11.2 Test case.....	128
11.3 Unit testing.....	130
11.5 Integration Testing .....	135
11.6 Acceptance Testing.....	138
11.7 Security Testing .....	139

11.8 Accessibility Testing.....	140
<b>Chapter 12 – Implementation .....</b>	<b>142</b>
12.1 Training.....	142
12.2 Implementation Scheme.....	143
12.3 Scaling.....	143
12.4 Load Balancing .....	144
<b>Chapter 13 – Critical Appraisal &amp; Evaluation .....</b>	<b>145</b>
13.1 Objective Could be Met .....	145
13.2 Objective that totally don't meet of touched.....	147
<b>Chapter 14 Lessons Learned.....</b>	<b>148</b>
14.1 Pre-Project-Review-closing .....	148
14.2 What I have learnt.....	148
14.3 The problems I have faced .....	149
14.4 What Solution Occurred .....	149
<b>Chapter 15 – Conclusion .....</b>	<b>150</b>
15.1 Summary of the Project .....	150
15.2 Goal of the project .....	150
15.3 Success of the Project .....	151
15.4 What I have done in the documentation .....	151
15.5 Value of the Project .....	152
15.6 My Experience .....	152
<b>Appendix A.....</b>	<b>153</b>
<b>Appendix B .....</b>	<b>156</b>
<b>References.....</b>	<b>160</b>

## List of Table

Table 1: Estimated cost of the Web-based Application.....	8
Table 2: Estimated cost of the Mobile Program .....	8
Table 3: Estimated cost of the Desktop Program.....	9
Table 4: Important task of the reaching objectives .....	14
Table 5: Benefits of ERP system .....	15
Table 6: Prioritize requirements of MoSCoW .....	16
Table 7: Iterative development of Time boxing .....	18
Table 8: List of resource allocation .....	41
Table 9: List of time boxing.....	42
Table 10: Demo of time box testing .....	44
Table 11: Demo of time box against testing .....	44
Table 12: Demo of test case.....	48
Table 13: Demo of user acceptance test plan.....	49
Table 14: List of risk identification .....	52
Table 15: List of risk assessment .....	52
Table 16: List of risk precaution plan .....	54
Table 17: List of attainable risk .....	55
Table 18: List of business consideration priority.....	56
Table 19: List of Web-based application cost.....	63
Table 20: List of Mobile-application cost.....	64
Table 21: List of Desktop-application cost.....	65
Table 22: List of cost benefit analysis .....	67
Table 23: List of total earning.....	68
Table 24: List of total revenue .....	68
Table 25: User authentication requirement.....	88
Table 26: Proposal requirement catalog .....	88
Table 27: Stock and managed products .....	89
Table 28: Double entry details .....	89
Table 29: Stock and managed products .....	90
Table 30: Eligibility transaction history .....	91
Table 31: Budget plan management .....	92
Table 32: List of must have requirements.....	92

Table 33: List of should have requirements.....	93
Table 34: List of could have requirements .....	93
Table 35: List of login modules .....	102
Table 36: List of banking modules .....	103
Table 37: List of booking proposal modules .....	104
Table 38: List of budget plan modules .....	105
Table 39: List of double entry modules .....	106
Table 40: List of user training.....	142

## List of Figures

Figure 1: Gantt chart of Smart ERP system.....	19
Figure 2: Home webpage of Smart ERP system.....	28
Figure 3: Home webpage of Business ERP BD.....	29
Figure 4: Home webpage of Smart Business 24.....	30
Figure 5: DevOps Phases.....	33
Figure 6: DSDM Phases.....	35
Figure 7: SSADM Stages.....	36
Figure 8: Work breakdown structure of project.....	40
Figure 9: Gantt chart of project.....	43
Figure 10: Functional testing phases.....	45
Figure 11: Risk management processes.....	50
Figure 12: Rich picture of Smart ERP system.....	74
Figure 13: Legends of rich picture.....	75
Figure 14: Application technology of client-server.....	78
Figure 15: Architecture of Two-Tier client server.....	79
Figure 16: Architecture of Three-Tier client server.....	80
Figure 17: Use case of Old ERP system.....	82
Figure 18: Activity diagram of Smart ERP system.....	83
Figure 19: Use case diagram of Smart ERP system.....	84
Figure 20: Activity diagram of Vendors.....	85
Figure 21: Activity diagram of Admin.....	85
Figure 22: Activity diagram of Staffs.....	86
Figure 23: Activity diagram of Customers.....	86
Figure 24: Activity diagram of Company.....	87
Figure 25: Prototype of create new product.....	94
Figure 26: Prototype of manage products dashboard.....	94
Figure 27: Prototype of manage proposal dashboard.....	95
Figure 28: Prototype of product & services.....	95
Figure 29: Prototype of proposal detail.....	96
Figure 30: Prototype of manage chart of account.....	97
Figure 31: Prototype of budget planner.....	98
Figure 32: Prototype of ledger summary.....	98

Figure 33: Prototype of income vs expense summary .....	99
Figure 34: Prototype of balance sheet.....	100
Figure 35: Prototype of bill summary .....	100
Figure 36: Prototype of profit & loss summary .....	101
Figure 37: Use case diagram of Smart ERP system .....	106
Figure 38: Class diagram of Smart ERP system.....	107
Figure 39: ERD diagram of Smart ERP system.....	108
Figure 40: Sequence diagram of Smart ERP system .....	109
Figure 41: Component diagram of Smart ERP system .....	110
Figure 42: Deployment diagram of Smart ERP system.....	111
Figure 43: Dashboard of Smart ERP system .....	112
Figure 44: Manage roles of Smart ERP system.....	113
Figure 45: Prototype of new transfer amount .....	113
Figure 46: Prototype of trail balance .....	114
Figure 47: Prototype of admin dashboard.....	114
Figure 48: Prototype of profit by year .....	115
Figure 49: Prototype of transaction.....	115
Figure 50: Prototype of proposal requests .....	116
Figure 51: Phpstorm project code of users .....	117
Figure 52: Phpstorm project code of plans .....	118
Figure 53: Phpstorm project code of proposal.....	118
Figure 54: Phpstorm project code of service .....	119
Figure 55: Phpstorm project code of managing proposal .....	119
Figure 56: Phpstorm project code of bank account .....	120
Figure 57: Phpstorm project code of bank account .....	120
Figure 58: Phpstorm project code of invoice.....	121
Figure 59: Phpstorm project code of invoice.....	121
Figure 60: Phpstorm project code of expenses .....	122
Figure 61: Phpstorm project code of expenses .....	122
Figure 62: Phpstorm project code of journal .....	123
Figure 63: Phpstorm project code of journal .....	123
Figure 64: Unit testing of price.....	130
Figure 65: Unit testing of user email .....	131
Figure 66: Unit testing of customer login .....	133

Figure 67: Module testing of basic info .....	134
Figure 68: Module testing of company info .....	135
Figure 69: Integration testing of user login.....	136
Figure 70: Integration testing of dashboard .....	136
Figure 71: Integration testing of new product.....	137
Figure 72: Acceptance testing of proposal detail.....	138
Figure 73: Security testing of proposal login.....	139
Figure 74: Accessibility testing of proposal detail .....	140
Figure 75: Accessibility testing of proposal detail .....	141

## **Chapter 1 – Introduction**

### **1.1 Introduction**

ERP is a thorough business information system that simplifies information flow and unites all departments and operations inside the organization. SHAFIULLAH DYEING AND PRINTING can do crucial tasks including production, inventory management, shipping, distribution, accounting, etc. ERP is a resource planning system that combines and manages all of the organization's technology and business activities, according to its most basic definition. According to Chung & Snyder (2000), an integrated corporate software system known as ERP "enables a corporation to manage the efficient and effective use of resources (materials, human resources, finance, etc.) by offering a holistic, integrated solution for the organization's information-processing needs." Utilizing a single database, this program enables the consolidation of all organizationally broad functional information flows. As a result, it makes it possible to quickly and simply obtain information about the inventory, customer or product data, historical behavior, space availability, surveillance, and access control. It is the best business management software for SHAFIULLAH DYEING AND PRINTING, ensuring proper business process transformation, enabling users to save time, boost company productivity, lower operating expenses, and optimize return on investment. The outcome is It permits quick and simple access to data about commodities. Inventory, customer or product data, past behavior, space availability, surveillance, and access control. It is the best business management software for SHAFIULLAH DYEING AND PRINTING, ensuring proper business strategy, transformation, consumers are able to save years of consumption, enhance economic productivity, lower operating expenses, and optimize return on investment. Through all-around efficient service and functionality, this software is essential to ensuring customer and owner satisfaction. Smart ERP system will help SHAFIULLAH DYEING AND PRINTING to convert paper-based work to cloud base, they can save their time, expenses and will grow.

## **1.2 Document Contents**

The project work will be covered in the following chapters of this document.

### **Chapter 1: Introduction**

A brief overview of the project and system is being presented Sequence.

### **Chapter 2: Initial Phase**

This chapter contains information on the preliminary analysis of the proposed system, including major areas and objectives, the concern area, prospective solutions, and scheme history.

### **Chapter 3: Literature Review**

This chapter includes a thorough explanation of the issue area, solutions, an assessment of current solutions, and recommendations.

### **Chapter 4: Technique**

This chapter will examine the significance of using methodology, several ways that may be used, the proposed procedure, and its execution.

### **Chapter 5: Planning**

This chapter discusses multiple project plans, including risk and change management, test plans, project plans, and more.

### **Chapter 6: Feasibility**

Here, I'll provide the comprehensive viability study description and cost-benefit analysis.

### **Chapter 7: Foundation**

This chapter will include information on the identification of the issue area, a broad requirement list, recommended technology, and reasoning.

## **Chapter 8: Exploration**

Along with the prototype, it includes some basic UML diagrams for both the old and new systems.

## **Chapter 9: Engineering**

This chapter covers the logical and behavioral models for the proposed system.

## **Chapter 10: Deployment**

The coding samples and development challenges are broken down by development priority here.

## **Chapter 11: Testing**

This chapter includes a number of test plans and results.

## **Chapter 12: Implementation**

The implementation strategy, training model, and other associated issues are covered here.

## **Chapter 13: Critical Appraisal and Evaluation**

The evaluation of the initial objectives that were met and those that were not met in detail.

## **Chapter 14: Lessons Learned**

The pre-project-closing review primarily comprises the project's learnings and problems.

## **Chapter 15: Conclusion**

The project summary, goals, success, and experience will be documented here.

## Chapter 2 – Initial Study

### 2.1 Project Proposal

#### Introduction

In today's world Any corporation that operates currently depends a great deal on technology., Businesses built on technology may easily grow anytime, anyplace. Enterprise resource planning in business management allows an organization to efficiently manage heavy workloads (ERP). An organization's whole and integrated information system, or ERP system, is used to handle all departments and divisions, including marketing, operations, administration, finance, human resources, and research and development. Cooperation between internal divisions will increase production and offer additional benefits. To systematically meet an organization's overall business needs, an ERP system must be implemented over a period of years. For the organization, the first phase of the ERP system's deployment is crucial. Most businesses utilize the ERP system to obtain a competitive edge in the market. To completely install an ERP system in a business, a significant investment is necessary. However, for improved business administration, small, medium, and large businesses alike throughout the world are investing in ERP. The effect of ERP systems on organizational business management is the main topic of this study.

#### Background Study

**SHAFIULLAH DYEING AND PRINTING** is fully papers-based Textile Company that's why they are facing some problems like Inaccessibility, Lower quality data, Limited flexibility, Lengthy process, High cost, and longtime process. Their traditional system of SHAFIULLAH DYEING AND PRINTING firstly the marketing manager has completed marketing with their proposal system after that the sales manager to visit the market many times in order to place a booking order or proposal. So, this requires a long wait and takes time to book or propose. They already used a Smart Business 24 (Business Management Software) – [www.daffodil-bd.com/smart-business-24](http://www.daffodil-bd.com/smart-business-24) by Daffodil online ltd. Smart Business 24 is server-based software that's why SHAFIULLAH DYEING AND PRINTING's marketing manager and sales manager are not satisfied with server-based software. Their first requirement was simple interface and cloud-based software with Bangla which I fulfilled through Smart ERP Software. Marketing managers and sales managers can take orders and manage proposals from anywhere,

eliminating the need to handle multiple orders. In addition, their superiors can see the overall status of the organization and all types of reports from anywhere in the world, thereby increasing the profitability of their organization. Bengali input and output is very important for them as their organization has various types of jobbers who are IT related or not very proficient in English and their clients can easily understand their software client base. The DCL software they were using used to be managed through a monthly fee but by creating Smart ERP cloud base software they will have their own software that they can maintain after a certain period of time.

### **Description of the proposed system**

Smart ERP is business management software that keeps track of all the business's accounting issues, making it simple to compute income. This accounting software, which is based on Laravel 8, will streamline and facilitate the operations of your company. The SHAFIULLAH DYEING AND PRINTING will be able to make wise decisions for their business with the aid of a graphical and tabular depiction of the various components. Create plans utilizing a super admin login with a SaaS version.

An analytical dashboard for tracking business activities It is a useful tool on international platforms due to restrictions on employee permissions, the curation of distinct roles for users by selecting permissions in different modules, and its availability in numerous languages. Settings for adding money as necessary, Trial balance, general ledger, income statement, and chart of accounts constant creation for taxes, payment methods, and other parameters, bank administration through account formation, transfer, and transaction management are all examples of dual entry. Inventory management on invoices and receipts, income and payment management, customer/supplier statement reports, thorough listing of your product and service offers multiple taxes and interaction with the payment system.

They are able to give duties to every employee thanks to their multi-user accounting tool. Manage their rights to restrict their access to certain parameters.

They are able to specify responsibilities for each employee using the SHAFIULLAH DYEING AND PRINTING multi-user accounting application. By configuring your permissions, they may take charge of their access to particular characteristics. By allocating SKUs, taxes, units, categories, sales prices, purchase prices, and descriptions, you may manage the inventory of

goods and services provided by third parties. In accordance with the moment of change, they can also amend this list. They won't need to visit elsewhere to check for product specifics because they will have a thorough tab on account-related issues thanks to this.

By making unique email addresses, you can keep track of their consumers in a database. Customers can log in at any time to monitor the status of their shipments and transaction information. Their shipping and billing addresses may be recorded, which makes doing business simple. Similarly, by giving merchants their own email accounts, vendors may view their invoices and transactions.

Never before have creating and submitting proposals been so simple. By choosing clients and then adding goods and services to that list, you may create new offers. Existing offers can be modified by adding or deleting goods. They can submit these recommendations and track their progress at the same time. With one click, make duplicates of these proposals and convert them into invoices. Just consider how much time at work this will save them.

## **Feasibility Study**

### **❖ Operational Feasibility:**

Since the usability, simplicity, and necessary functionality of the proposed system are referred to as operational feasibility. **Smart ERP system** is a usable product for **SHAFIULLAH DYEING AND PRINTING**. By monitoring all firm accounting-related issues, smart ERP will make it easier to calculate income. This accounting software will streamline and facilitate the operations of your company. They may make well-informed decisions for their organization with the aid of a graphical and tabular display of the many components. Create plans utilizing a super admin login with a SaaS version. A visually appealing dashboard for business activity understanding, limitations on employee permissions, choice of various user roles by selecting permissions in various modules, and accessibility in several languages the establishment of constants for taxes, payment methods, and other factors, a global platform, settings to add currencies based on requirements, and bank management establishing accounts, carrying out transfers, and managing transactions; producing bills and invoices, as well as managing receipts and payments listing precisely what goods and services will

provide, keeping track of inventory on bills and invoice and generating vendor/supplier statement reports.

❖ **Technical Feasibility:**

Contrary to older manual processes, the technological feasibility test shows that users of intelligent ERP systems can easily manage their activities. I've made an effort to use cutting-edge technology so people can use the web and mobile devices from anywhere and operate the software invisibly. This software's design makes it relatively simple to update the version if improvements are needed in the future due to advancements in technology. I'll utilize the Android 12.0 operating system, the Apache web server, the MySQL database server, the Laravel 8 web framework, Google Analytics, and PHP programming. Laravel 8 increases the security of the PHP core using libraries that provide validated and secure code out of the box. Additionally, it offers security features like a system for authentication, tokens to thwart assaults from outside parties, and SQL protection. cross-scripts site injection Microsoft Office is used for development and documentation. The system can function on any web browser with restricted internet connectivity because it was created and constructed utilizing the most recent and well-liked internet- and mobile-based technology. The system has a hierarchy of access restrictions set up to offer secure access to system data. Because it is platform and development platform independent and has suitable and expensive resources, the web-based application will work. These most recent technologies enable software and websites to function correctly, precisely, and quickly while using the least amount of data possible.

❖ **Economic Feasibility:**

The proposed system may be developed using a variety of methods, such as desktop, mobile, and web-based applications.

- **Web-based Application:** No installation is required; the complete Documents and data are preserved on a local server. and are accessible at any time, from anywhere, through the Internet. Users of SHAFIULLAH DYEING AND PRINTING can access the system by entering the system's uniform resource location in the browser. This approach is most appropriate for a web-based response. Because the system may be accessed from a mobile, laptop, desktop,

and other devices if it is web-based. Therefore, this approach will be used by all users.

Equipment	Price per unit	Charge
Desktop pc (core i9 10 generation, 5.0 GHz processor, 32 GB DDR4 RAM, 2 TB HDD)	₹1,20,000	₹1,20,000
Web, email, file Servers.	₹5000	₹5000
Extranet network with VPN	₹1000	₹2000
<b>Cumulative</b>		<b>₹1,27,000</b>

*Table 1: Estimated cost of the Web-based Application*

- **Mobile program:** Mobile Application is the most important part of SHAFIULLAH DYEING AND PRINTING. Marketing manager, sales manager can manage processes when they visit in market and booking order, taking payments and also report due or other entries. Smart ERP systems are designed to run smoothly and be responsive on every device.

Equipment	Price per unit	Price
Desktop pc (core i9 10 generation , 5.0 GHz processor, 32 GB DDR4 RAM, 2 TB HDD)	₹1,20,000	₹1,20,000
Web, email, file Servers.	₹5000	₹5000
<b>Total</b>		<b>₹1,27,000</b>

*Table 2: Estimated cost of the Mobile Program*

- **Desktop Program:** Smart ERP system desktop application setup is too easy because a non-technical person can install the smart ERP system very easily. It is not portable and requires a distant server to store data, which is far more expensive than web-based options. The application must be installed on each desktop computer to monitor the whole application. Smart ERP installation wizards help to manage databases easily.

Equipment	Price per unit	Price
Web, email, file servers.	₹6,000 each month	₹7,000
Desktop pc (core i9, 5 GHz processor, 16 GB DDR4 RAM, 1 TB HDD)	₹1,20,000	₹1,50,000
<b>Total</b>		<b>₹1,57,000</b>

*Table 3: Estimated cost of the Desktop Program*

The hosting service and domain name are required for the system to work. Smart ERP systems will allow both the owner or employee and the customer to know the status of the proposal from the customer's proposal to the invoice. The customer can view the proposal and place the next order or proposal, and specific modules are made for each proposal so that the customer can take the product in an orderly custom. The server they run their hosting on will instead have a backup server to keep their data safe

#### ❖ **Market Research Analysis Considering Feasibility Issues to consider**

Many small companies undervalue the value of wasting cash on hardware and software for business technology. Except if a change is completely essential, most businesses are going using their basic accounting solutions, integrated solutions, or outdated ERP software. Any firm needs a good Enterprise Resource Planning (ERP) system since it forms the basis of any business or organization. The seamless exchange of information across multiple departments and functions is made possible by a fully integrated ERP system. It assists in streamlining company procedures and enhancing all aspects of business operations. Financial management, human resources, warehousing,

manufacturing, customer support, order management, marketing, sales, project management, and other areas are frequently covered by an ERP solution. **Smart ERP system** is very user friendly and has an easy interface. It is especially made for mid-level companies in Bangladesh and all categories of professional people can use this software as it is fully Bengali language. There are many mid-level companies in **Narsingdi district** who are currently working through paper pages making it difficult for them to do their daily work and need a long time to prepare monthly and annual reports. Smart ERP helps these Mid companies to automate and generate reports in the fastest way and streamline the activities of various departments.

## **Foundations**

- Scope, Aims, with Objects
- Aims of the proposed project

Aims of the “**Smart ERP system**” projects are:

- An increase in productivity
- Improved interaction between customers and providers.
- Enhanced internal communication
- Better order fulfillment and customer service.

## **Objectives of the proposed project**

- Integrating numerous functional domains to ensure efficient, productive, and successful communication
- How to make the product optimally
- From acceptance through fulfillment, order tracking
- From invoicing to cash collections, the revenue cycle
- Managing a complicated process' interdependencies bill of materials.
- Tracking triple matches between inventory receipts (what is received), expenses, and purchase orders (what was ordered) (what the seller invoices)
- Accounting for each of these tasks: precise detailed tracking of sales, expenses, and profits.

- Reduce all organization costs while producing quality work.
- Real-time data to improve services and hasten data processing across all departments.
- Making timely strategic plans and carrying them out successfully are simple tasks.
- Centralized operations and global shared processes.

### **Main Goals**

- The ERP system in manufacturing automatically assures the accuracy of information on the production batch, the date of production, the product's expiry date, etc.
- Ensure both the producer and the consumer may easily trace their purchases.
- Improved supply chain management performance for both suppliers and clients.
- To provide better customer service and track client retention, after-sales services are now incorporated.
- Through mail servers, ERP systems help with corporate communication.
- Increased information accessibility for arranging and management of all organizational units.
- Through ERP, human resource management is able to retain and maintain all personnel records from hire through retirement.

### **High-level characteristics and needs for fulfilling the project's aims and objectives**

- Admin, Staff, User can log in and create users manually.
- Admin can manage access according to the role for staff.
- Staff can manage product and services lists by assigning SKU, tax, units, categories, sales price, purchase price, and descriptions.
- View a summary of all customers, suppliers, bills, and invoices. With numerical graphs showing the most recent income and spending, see Income VS Expenses.
- An individual's graphical display of cash flow, income categories, expense categories, and an income and expense chart will provide a visual representation of the state of the business's numerous accounting information.

- Customers can log in at any time to check on the progress of their orders and transaction information.
- Suppliers can manage who has access to their transactions and invoices by allocating them specific email addresses.
- By choosing customers and adding products and services to that list, staff can manage new deals.
- Existing deals can be modified by admins and employees by adding or deleting products. The status of these suggestions may be checked and submitted by employees.
- The name of the account holder, the bank, the account number, the opening balance, and the contact details may all be modified.
- admin manage quickly and flexibly create new accounts. Edit the necessary data as necessary.
- Maintain records and simply transfer funds across bank accounts using a variety of methods. Through easy filtering, the admin may manage the search for certain transfers.
- Employees can manage invoices by adding new products or commodities. With one click, they may download, print, or forward invoices. Send reminders for payments and add payments quickly.
- By producing new income, staff can manage previously created cash. Change the revenue source and include references. Additionally, staff members have control over revenue filters based on accounts, clients, categories, etc.
- The staff creates new payments to cover the newly incurred expenses. Add references and change the categories. Additionally, they separate the income into different categories, accounts, and clients.
- Admin can manage budgets on a monthly, quarterly, semi-annual, or annual basis according to their needs and company objectives. The two primary categories are "Income" and "Expenses," where subcategories can be edited, updated, or deleted.

- For a set amount of time, employees can review the filtered information about that customer or supplier. This account status report covers the customer/transaction supplier's history, including start and finish dates, order information, and payment information.
- Staff can use a simple filter to obtain a transaction report. Get the necessary account statement in Excel, CSV, or PDF format.
- Employees receive well-written reports on their earnings, costs, taxes, bills, and summaries of each bill. Sort them by clients, categories, and accounts. Additionally, a graphical representation of the revenue against expense chart together with a thorough profit and loss calculation can aid in their decision-making. Filter the income vs. expense graph and tax summary by tax year.
- The administrator can set deadlines and budgets for goals they put up for particular activities. The dashboard's graphical display will make it easier to carry out these duties.
- Assets can be added, edited, or removed from asset listings by company employees. By specifying the number, details, and duration, staff may generate new assets.
- By adding and creating tax rates, categories, units, and payment methods, create tabs for constants. This will make creating and sending bills easier.

### Important tasks for reaching the objectives

Process	Explanation
Project Start-Up	I have developed this project for SHAFIULLAH-DYEING-AND-PRINTING to change their paper base activity to software based.
Feasibility Study	Technical, operational, and financial feasibility the project is evaluated to see if it qualifies as one.
System Analysis	I Chose the functional and priority needs from the necessary catalog.
System Architecture	Various technical architectures such as DBMS, web servers, Interactions with other apps measured in this section.
System Design	Models are developed for both structural and behavioral aspects. This section's system design.
Implementation	This section outlines the development process and the necessary tools. Additionally, the programming language has been chosen, and the development architecture is being trimmed.
Testing	System will undertake testing at every stage of development.
Other Project Matters	Risk management, configuration management etc.
Documentation	This section will contain a record of the project's documentation.

*Table 4: Important task of the reaching objectives*

## Benefits of ERP systems in various aspects

Dimensions	Sub dimensions
1.Operational	Cost savings (1.1), cycle time reduction (1.2), and 1.3 Improving output, 1.4 increasing quality 1.5 Greater consumer services
2.Managerial	2.1 Improved resource allocation, 2.2 Better planning and decision-making 2.3 Enhanced performance
3.Strategic	3.1 Assistance with company expansion 3.2 Encouragement of business alliances 3.3 Fostering commercial innovation  3.4 Cost-effective construction Producing product distinctiveness, 3.5% 3.6 Establishing external connections
4.IT Substructure	4.1 Increasing business adaptability to recent and upcoming developments 4.2 A decrease in IT expenses 4.3 Greater capabilities of the IT infrastructure
5.Organizational	5.1 Altering work schedules 5.2 Promoting business education 5.3 Independence  5.4 Creating shared visions

*Table 5: Benefits of ERP system*

### Prioritized Features according to MoSCoW

A well-liked prioritizing method for requirements management is MoSCoW analysis, sometimes referred to as MoSCoW methodology. The four types of initiative are must, should, could, and won't and are denoted by the abbreviation MoSCoW.

**Prioritized requirements, according to MoSCoW methodology, are:**

SL	Requirement	Requirement
01	Login (all users)	Must have
02	Manage Dashboard	Must have
03	Create and accomplish Staffs, Customers, Suppliers.	Must have
04	Manage Products and services	Must have
05	Manage proposal	Must have
06	Manage Banking account and transactions	Should have
07	Manage income, invoice, revenue, expenses, bill, payment	Must have
08	Manage budget plan	Should have
09	Inventory management in invoice and bill	Could have
10	Manage reports	Must have
11	Manage goal	Should have
12	Manage Assets	Must have
13	Manage Constant	Could have
14	Manage accounting system	Must have

*Table 6: Prioritize requirements of MoSCoW*

## **Research & Engineering**

**The final needs are determined by the Prioritized Requirements List (PRL) as follows:**

- Customer and vendor login
- Multi Languages
- Invoice, Billing, and Transaction
- Multi users and permission
- Reports and charts
- User Friendly Invoice Theme
- Make own setting
- Double Entry Features
- Invoice module with QR code
- Budget plan and set goals.
- Accounting and billing system.
- Proposal system

### **Iterative development – Time boxing**

Iterative development methods call for segmenting tasks and predicting the amount of time needed for each segment. The project will take 50–60% of the total time for the actual development, 15-20% for the documentation, and 15-20% for the foundation and feasibility stages. In four months, or around 420–450 hours, the project must be completed. Seven time chunks, each lasting 20 to 40 hours, make up the project. In this instance, I'm going to estimate time boxes using the "t-shirt" estimating technique. Story points will be implied by grouping t-shirt sizes like XS, S, M, L, and XL. The larger sizes will require more time and effort to manufacture.

Time box	Start Date	Finish Date	Period	Tasks/Deliverables	Estimating
TB1	01-06-2022	12-06-2022	8-9 days	Feasibility and foundations.	XL
TB2	13-06-2022	20-06-2022	5-6 days	Requirements analysis and database design.	XL
TB3	21-06-2022	05-07-2022	10-11 days	Developing Invoice, Billing, and Transaction summary	L
TB4	06-07-2022	12-07-2022	5-6 days	Developing Users Login , Multi users and permission	L
TB5	13-07-2022	25-07-2022	9-10 days	Implementing accounting and billing system, Double Entry system	XL
TB6	26-07-2022	05-08-2022	9-10 days	Implementing Banking account and transactions , Inventory management system	M
TB7	06-08-2022	12-08-2022	5-6 days	Developing product management and warehouse system	XL
TB8	13-08-2022	23-08-2022	7-8 days	Implementing Reports and charts	L
TB9	24-08-2022	31-08-2022	6-7 days	Developing invoice, revenue , credit note system	L
TB10	01-09-2022	13-09-2022	12-13 days	Developing proposal and retainers	XL
TB11	14-09-2022	22-09-2022	7-8 days	Developing budget plan and goal system	L
TB12	23-09-2022	30-10-2022	6-7 days	Developing accounting and billing system	XL
TB13	01-10-2022	15-11-2022	32-33 days	Documentation of the development.	XI

*Table 7: Iterative development of Time boxing*

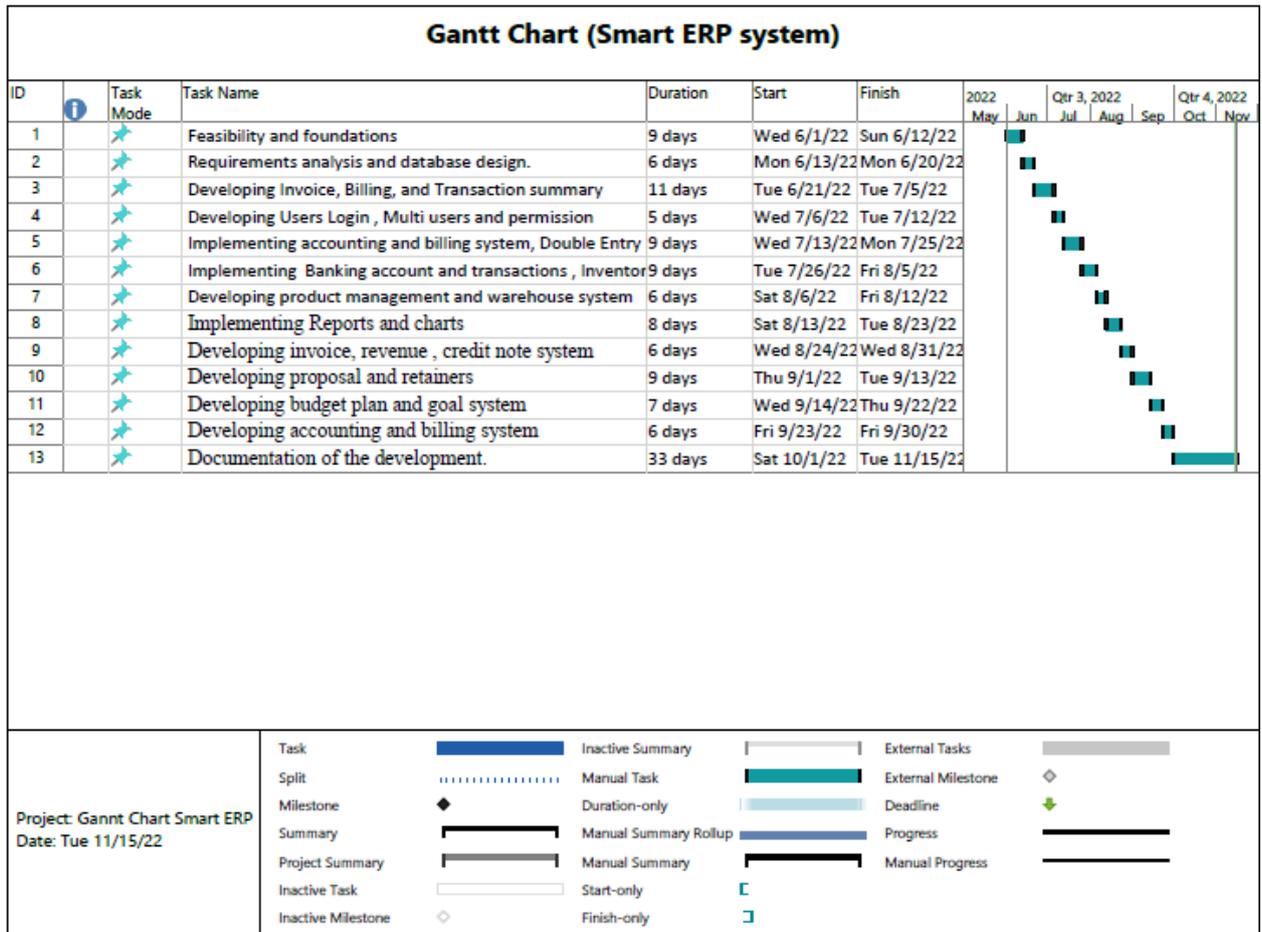


Figure 1: Gantt chart of Smart ERP system

## Deployment

At this point, the recommended cure will be implemented. I will design and implement the system's database, internet application, and Android mobile application. Using the DSDM Atern technique, I'll construct the system iteratively. With the use of the PHP/Laravel 8 framework, Bootstrap, and Java Scripts for the front end, I intend to create an online application. Android was chosen for mobile application development, and MySQL was chosen for database implementation.

## Conclusion

The connection between ERP system deployment and company advantages was also investigated. It has been discovered that with the aid of ERP architecture, operational level operations may be performed more smoothly. Several themes were covered, including why ERP is required in businesses, why corporations invest in ERP systems, and ERP models. As a result, management specialists, global corporations, the relevance and influence of ERP systems and their installation on companies, ERP purchasers, and other hosts who are using ERP systems to achieve improved and competitive performance in many organizational activities are significant. A smart ERP system streamlines a company by eliminating all communication bottlenecks. However, through the organization's central database, it also makes doing business easier and smoother inside. To develop a full ERP system, the firm must invest more, which is quite challenging for firms that are small and medium-sized. However, small and medium-sized businesses are now investing in ERP systems alongside large corporations. ERP is used by all international corporations, financial institutions, and the major organizations in Bangladesh, and its use is growing with time. To manage the national database, the Bangladeshi government additionally emphasized and implemented the ERP system in various public sectors.

## 2.2 Background of the project

I have developed a Smart **ERP system** not only for **SHAFIULLAH DYEING AND PRINTING** but also for all small and medium printing and dyeing companies. Smart ERP systems will give businesses the ability to merge and simplify the crucial sections of business operations, exchange common information and activities throughout the whole organization, and access data in a real-time environment. Most businesses using ERP systems to boost organizational competitiveness because they may raise business productivity and efficiency. Manufacturers currently require improved methods for managing, tracking, and controlling their inventories. To fulfill your demands, fundamental software programs called as MRP or material requirements planning systems were created. These systems provide fundamental production, purchasing, and distribution tasks as well as inventory control and balance reconciliation for firms. MRP systems were used by an increasing number of industries in the 1970s, and the systems themselves developed in complexity. Manufacturing resource planning systems, often known as MRP II systems, were first introduced in the 1980s. The capabilities

of these MRP II systems were enhanced, and they were able to more effectively handle scheduling and production operations in addition to the additional manufacturing processes that were introduced to the original MRP systems. In 1990s saw the use of the first real ERP systems. These systems now include other departments and tasks including accounting, finance, and sales in addition to the fundamental inventory control and production procedures of earlier generations. Through the consolidation of several processes and departments into a single system, these systems paved the way for contemporary ERP solutions. This is the reason the Smart **ERP system** will make revenue computation easier by keeping track of all corporate accounting issues. This accounting software will streamline and facilitate the operations of all companies. SHAFIULLAH DYEING AND PRINTING and other businesses will be able to make wise decisions for your company with the aid of a graphical and tabular display of the main components.

### **2.3 Problem Areas**

Following all of a business's procedures when it expands beyond a certain point becomes tiresome and difficult. Not only is it challenging to monitor organizational business operations like accounting and inventories, but it also is quite challenging to monitor activities like manage business and company revenue generated. Through surveillance and access control, the activities occurring within the organization may be monitored. An ERP system based on events must be used in this situation. It is a system that manages a variety of internal operations, including staff access and parking. This project's objective was to develop such a system.

#### **Difficulties consolidating information**

Dealing with disparate, ineffective systems will be prevented with an ERP system. A company can't connect if it uses various business solutions. Without tools like ERP, it is simple for activities to take longer than necessary, which lowers productivity and results in missed opportunities. No delays in departmental communication are a result of an ERP product.

- **Struggles accessing data**

**SHAFIULLAH DYEING AND PRINTING** may find it difficult to report company success in real time without an ERP system. They may examine and export reports based on the most recent company data by investing in a system. They can be confident that your reports are accurate and current since ERP systems maintain all of their cost, marketing, and sales data in one system. An ERP system might be helpful since disconnects within a firm can rapidly result in lost opportunities and sluggish decision-making.

- **Not Centralized Processes**

While accounting teams use different software solutions and human resources uses a different solution, organizations frequently utilize an intelligent ERP system to manage and record information. Organizational processes are hence disjointed and disconnected. A single source of data and interactions results from the centralization of operations using an ERP solution. ERP solutions offer a single source for information, reporting, and analytics while doing away with the requirement for various front-end and back-end systems.

- **Faulty Decision Making**

Data processes in many businesses make it difficult for other elements of the business to access the information. Organizations cannot successfully exchange information or communicate without a collaborative approach. A system that fills the gaps and provides you with the most recent information is necessary for manufacturing and distribution in order to make the best judgments. When making decisions, ERP software enables greater data exchange and communication, resulting in more wise and effective choices.

- **Difficult Accounting & Financial Processes**

They probably waste hundreds of hours a year on manual data input for paper invoices and sales orders. In terms of client connections with sales, discounts, bills, and late payments, it's also possible that their accounting and sales divisions frequently operate out of sync. Their accounting staff can automate several laborious operations thanks to ERP. If ERP features are not deployed, financial reporting may also suffer. Comparing financial records from different spreadsheets and apps makes it much harder to get a clear picture of the financial status. All of your financial data is combined by ERP software into a single database, which may improve the accuracy, productivity, and transparency of your accounting team while also enabling easy information access.

- **Mobile access to information is irregular**

There is a requirement to access information remotely as more and more workers work from home, which necessitates having a way to connect to mobile devices running various operating systems while using both domestic and public Wi-Fi networks. Make sure your ERP solution has apps that perform properly on smartphones, tablets, and non-business networks.

## **2.4 Possible Solutions**

To solve all the problems, one needs to develop an application so that they can solve all their problems. This application is Smart ERP systems where all problems can be recovered easily with an easy interface using web or mobile. Firstly, I need to study the current system so that the current problems can be solved very easily and the system can be completely updated. The actions involved in carrying out a business process, such as order fulfillment, which include accepting an order from a client, sending it, and billing for it, are automated by ERP. With ERP, a customer service agent has all the data necessary to fulfill an order upon receiving one from a client. Everyone else in the business accesses a single database that contains all of the customer's new orders and clients while viewing the same computer screen. An order is automatically forwarded to the following department by the ERP system whenever a department has completed it. You merely need to enter into the ERP system and track the order to always know where it is. through the organization quickly and

## Chapter 3 – Literature Review

The development of ERP systems and some of its aspects are initially explained in the following section. Additionally, it examines the various ERP software modules that are offered. Analysis is also done on the adoption of ERP systems and their knowledge-intensive character. Finally, it examines the crucial success elements for implementing an ERP system as well as the advantages of doing so. Smart ERP systems gather information through a solitary, sizable construct of a database and expose it through approaches that are modular and support all of the SHAFIULLAH DYEING AND PRINTING's business units, and geographical zones. By usage of a data dictionary, ERP systems use the same data definitions. All within almost every module. Users have general data access because they offer the simplicity of single set data maintenance throughout all business processes. Internet use, middleware, and client-server technology the organization's dynamic business needs cannot be configured by the ERP systems. Any ERP System module may be linked to or unlinked from the system without affecting other modules thanks to open system network architecture.

### 3.1 Discussion on the Problem Domain

Smart ERP system is a business accounting solution in which small and medium sized organizations can do their work every day and can generate reports very easily with web or mobile base. Regardless of its size, a business must handle a number of functions, including purchasing and sales management, material management, payroll, etc. It would be a headache to administer each of these functions with a separate system. Smart ERP system boosts productivity and corporate success by managing all commercial requirements in a single system. Multiple business functions are connected in a single database by business resource planning systems (ERP). **Smart ERP systems** can streamline, automate, and enhance **SHAFIULLAH DYEING AND PRINTING's** operations. Personalized ERP software may boost productivity and promote ongoing expansion. Sadly, by selecting this kind of haphazard software, they run the danger of wasting money without growing their firm. In this post, we'll look at the key advantages of adopting customizable ERP solutions and provide readers with some advice on how to choose the best one. Key performance indicators (KPI) may be tracked in real time, and ERP systems can also link business units, monitor workflow, find duplication, and verify data integrity. This is one of the primary qualities of Smart ERP systems that may aid businesses in saving money.

There are many companies in Bangladesh who provide ERP software with a lot of unnecessary functionality, all of them can be operated only through computers not cloud base.

- ✓ Lack of Right Information to the Right People at the Right Time.
- ✓ Ineffective monitoring and management of implementation progress.
- ✓ The system that is being created generates unnecessary costs as a result of the frequent adjustments that users want.
- ✓ Management's lack of commitment.
- ✓ Lack of professional resistance management.
- ✓ Avoid altering or changing some of the current practices to meet ERP requirements.
- ✓ Implementation and Maintenance Costs.
- ✓ Not added to the Bangla language.
- ✓ Reporting Challenges

### **3.2 Discussion on the Problem Solution**

An ERP system effectively combines a company's financial management, human resource management, sales, and manufacturing facilities to provide benefits like increased productivity and efficiency. The process of organizing, implementing, and using an ERP is known as ERP implementation. Since an ERP system oversees a wide range of functions, the procedure normally lasts a few months and is difficult.

The company must carefully identify its requirements, decide how to reorganize operations to make use of the system, design the ERP system to support those processes, and adequately test it before making it available to users in order to assure a successful installation. The successful completion of each of those tasks requires careful preparation and a well-organized business strategy.

**Provides Single Source of Real-Time Accurate Data:** The ERP implementation builds the organization's digital framework. ERP digitizes data, compiles information from various places, systems, and processes, saves it in a database, and makes it conveniently available from any location, at any time. Mobile apps allow real-time data entry into the ERP from the field and access ERP data. As a result, ERP establishes a single source of precise, real-time data for trend analysis and trend interpretation. Additionally, it makes company operations more transparent.

- **Enables the implementation of Business Discipline & Standard Processes:** Enables establishing corporate policies that are adhered to by all departments, functions, and business processes. Facilitates adopting standard processes and business discipline. ERP makes it simple to establish standardized business practices across several locations. For controls, approval workflows, manufacturing, purchasing, inventory, sales, plant maintenance, and other processes, they may establish and enforce business flow, rules and guidelines, validation, and notifications and alerts.
- **Simple, accurate reporting in real-time with in-depth trends and analysis:** The KPIs for each function, such as purchasing, inventory, quality, sales, finance, etc., are defined with the use of ERP. By inputting the relevant queries and settings, ERP simplifies reporting. It offers accurate reports and saves a good deal of time. Analytics and business intelligence solutions offer profound insights into every part of the business. On the basis of departmental reports that are released as appropriate on a weekly or monthly basis, stakeholders may examine data and statistics for each department and monitor performance. Establishes a culture of rapid, data-based decision-making that is informed.
- **Security:** SHAFIULLAH DYEING AND PRINTING's all data is protected by Smart ERP system security. It includes a number of provisions to safeguard all personal data, including:
  - ✓ Operating system security,
  - ✓ Network security,
  - ✓ Infrastructure security,
  - ✓ Database Protection.

A secure ERP system includes features for safe server configuration, security logging capabilities, system-wide communications security, and data security. Authorizations

and users are equally important. It is crucial to ensure system compliance through ongoing monitoring, audits, and the development of emergency ideas. Data security is the act of defending digital data against tampering, theft, and illegal access throughout its lifespan. It encompasses everything, hardware, software, storage, user devices, access and administrative controls, organization policies, and procedures.

- **User Identity Verification:** Admin of the system only have the access to create user & he provides the specific username & email address to the user. Without that username & email address no one can login the system.

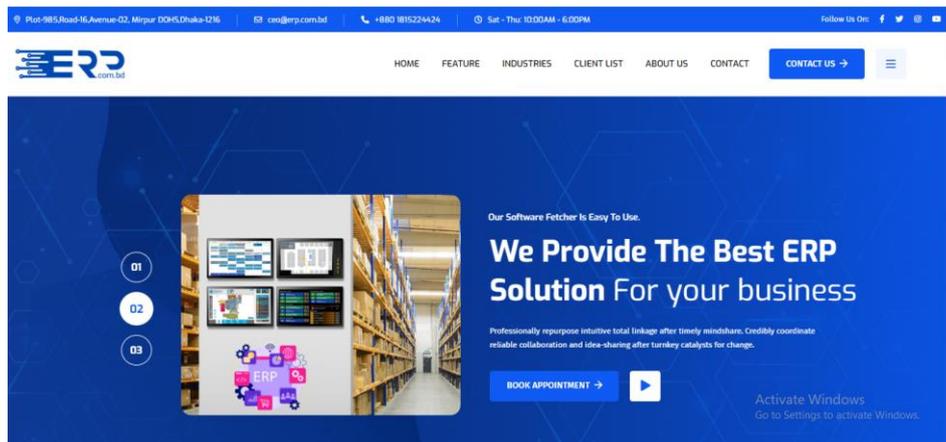
### 3.3 A comparison of the key differentiators

New technologies are invented to keep up with sustainable changes and streamline lifestyle. The Internet has made the era far too small, like a municipality. For the same issue, there are countless approaches that may be taken. Even though the Smart ERP system is a novel solution, other systems already exist and function in the same industry. The famous and well-known websites of today will be compared in this area, along with their greatest qualities, points of strength, and points of weakness. Which are:

- ❖ <http://erp.com.bd/web/>
- ❖ <https://businesserpbd.com/>
- ❖ <https://daffodil-bd.com/smart-business-24>

#### **ERP.com.bd**

ERP.COM.BD has extensive expertise in non-core banking application development as well as enterprise resource planning (ERP) for the industries raw material sourcing, financial institutions, fabrics, real estate, institutions, and hospitals. Aside from its own solutions, ERP.COM.BD has successfully completed several significant IT installation projects for groups of firms in the nation. ERP.COM.BD established a business hub joint venture and collaboration with a different company's product in order to strengthen the business and meaningfully serve the nation.



*Figure 2: Home webpage of Smart ERP system*

### **Best Features**

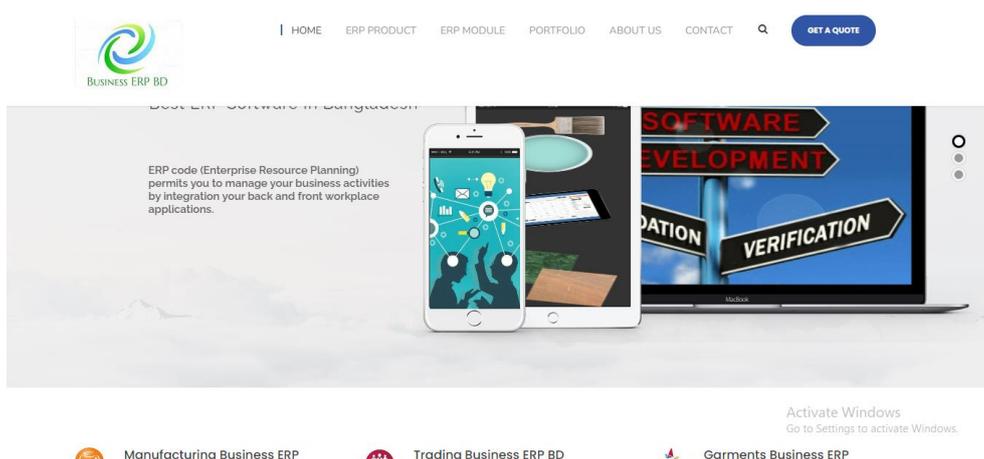
- ✓ Accounts Management
- ✓ Inventory Management
- ✓ Payroll, Salary & Management
- ✓ Product/Service Sales Management

### **Limitations**

- ✓ Lack of data privacy and security
- ✓ Only Web based.
- ✓ Too much maintenance Costs

### **Business ERP BD**

The leading supplier of software development firms is Business ERP. Business ERP is an easy-to-use, scalable, web-based ERP solution framework that can be tailored to match the demands of small and medium-sized business organizations, bringing cutting-edge ERP solutions into your company. It is a full and effective program that can be used to streamline and organize an organization's operations. The solution is special, individualized, and built to meet the demands of small and medium-sized organizations. It is an enterprise resource management system that is completely integrated, browser-based, and online in real time.



*Figure 3: Home webpage of Business ERP BD*

### **Best Features**

- ✓ Accounts Management
- ✓ Purchase Order Management
- ✓ Production Management (Bill of Materials)
- ✓ Sales Order Management
- ✓ Inventory Management

### **Limitations**

- ✓ Only for large organization
- ✓ Divided different section
- ✓ Setting up costs too much.

### **Smart-business-24**

An innovative, adaptable, and reasonably priced company management tool called Smart Business 24 aids users in carrying out everyday tasks effectively and without mistakes. Inventory, purchasing, sales, accounting, POS, production and Some of the numerous built-in features that Smart Business 24 offers include inventory control, supply chain, suppliers, hrm, and financial administrative structure. Time, money, effort, confusion, and physical work are all reduced by these qualities. Both large corporations and small and medium-sized businesses (SMEs), can use this software. The top IT and software provider in Bangladesh, Daffodil Computer Limited, provides this fantastic program.



*Figure 4: Home webpage of Smart Business 24*

### **Best Features**

- ✓ Point of Sale (POS)
- ✓ Management Information System
- ✓ Manufacturing Management

### **Limitations**

- ✓ Not cloud based
- ✓ Complicated installation
- ✓ No back up data

### **3.4 Standard Procedure**

The discussion above demonstrates clearly that the current websites do not offer the necessary functions. It also makes it very clear the characteristics and elements the new system has to consider. The updated system should include the support a variety above.. Since this website will be used by all kinds of people, the design and functionality should be very simple. If it is a complicated system then users may face various problems as it will run from both mobile device and computer device.

- ✓ A visually attractive dashboard for business activity understanding
- ✓ Customer and vendor login access
- ✓ Invoice, Billing and Transaction

- ✓ Multi User and Permission
- ✓ Invoice Module with QR code system
- ✓ Restricted access to outside user
- ✓ Creation of various user roles through the selection of module permissions
- ✓ It's a tool that can be used on staff or market sellers because it's available in Bangla languages.
- ✓ Journal entry, capital structure, balance sheet, ledger accounts, and chart of accounts.
- ✓ emergence constants for the parameters taxes, payment method, and other
- ✓ Creation of accounts, transfer of funds, and transaction management in banking
- ✓ Making invoices and paying bills, managing income, and processing payments

## **Chapter 4 – Methodology**

The software team decides on the software development strategy and works to ensure the project's success and effective management. Each system has unique advantages and disadvantages, and they all fail for various reasons. The strategy employed to achieve development objectives frequently affects the project's likelihood of success. The approach that was adopted and the justification for it will be thoroughly detailed in this chapter along with pertinent research and data (Alliance Software, 2017).

A linear process or a mix of methods can be used as a scripting strategy. It is still in the design phase, which is a stage of development, even though it is broad once more. It represents a way of approaching non-recursive processes like cascading. Usually, it takes the form of discrete phases. The life cycle of a piece of software is described. Furthermore, the communication is safe. Therefore, by sharing knowledge with one another in this manner, whether it be through documentation, discussion, or drawing on paper, you are effectively forming a rule within a group that specifies how you are going to behave.

### **4.1 What to Use**

The software architecture heavily relies on software development methodologies. The spiral model, iterative development, quick application development, and the nonlinear dynamics development model are a few of the strategies that used develop software. waterfall model, prototype model, and agile software development (synopsys, 2018). The methodology for software development describes the organized procedure followed when working on a project. Design philosophy and pragmatic realism have been combined since the very beginning of computers. The objective is to offer a methodical strategy for software development. Here, I'll outline three techniques along with their benefits and drawbacks.

#### **Deployment strategies using DevOps**

DevOps is the name given to a group of activities that support both a company culture and the design phase. DevOps implementations put a lot of emphasis on structure changes that promote communication among the departments responsible for different phases of the development lifecycle, such as development, quality assurance, and operations. The DevOps technique strives to enhance operations across the board throughout the whole software development

lifecycle. A DevOps process includes the phases of planning, coding, building, testing, releasing, deploying, operating, monitoring, and feedback. The cycle is reset by this. According to DevOps, an IT team should write software that entirely meets user needs, installs quickly, and works well right away. To do this, organizations use a mix of culture and technology. While working on minute modifications that are triggered independently of one another, developers consult with stakeholders to make sure the program satisfies expectations.



*Figure 5: DevOps Phases*

### **Benefits of DevOps**

- Fast growth relying on feedback
- Through builds, validations, and deployment, the entire application delivery pipeline may indeed be optimized.
- Development, testing, and deployment may all contribute to improving the software delivery pipeline overall.
- Continuous deployment is handled by DevOps corporations to assure that everything goes off without a hitch and with consistency.

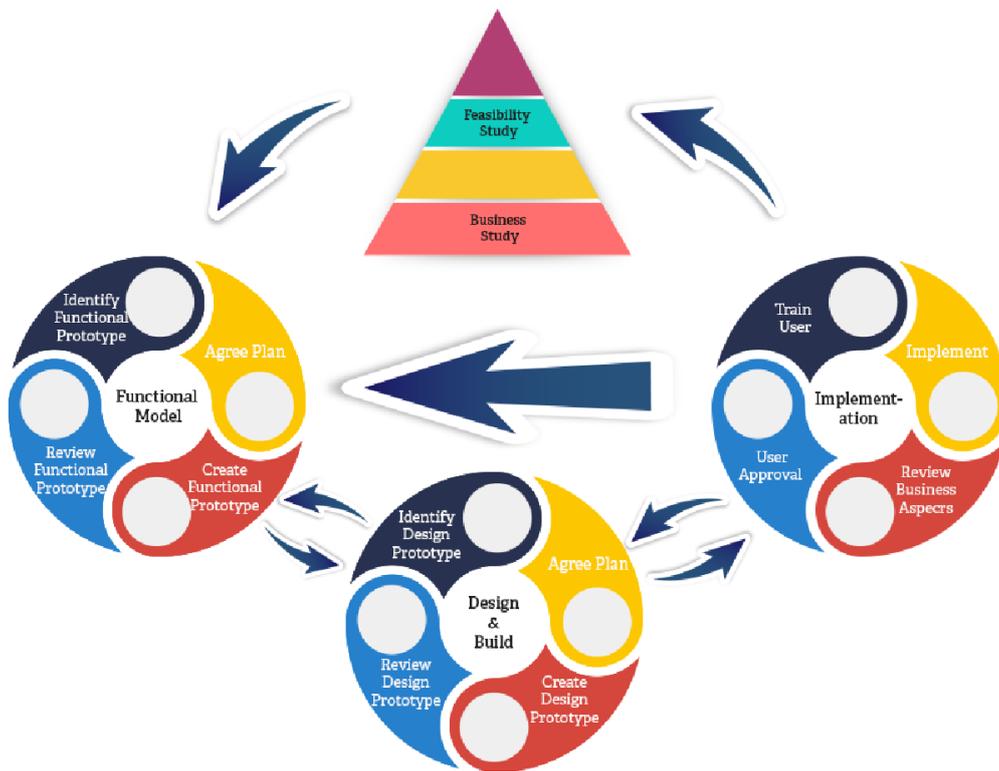
- Businesses that use the DevOps approach greatly reduce time to market, while also improving worker productivity, client satisfaction, and product quality.

### **Drawbacks of DevOps**

- Some consumers are against having their systems updated routinely.
- Before a project can go on to the operations phase, certain entities have stringent restrictions that demand laboratory tests.
- Separate departments using special features might allow undetected issues to creep into the fabrication.
- Some exceptional qualities need human interaction, complicating the sector.

### **Dynamic System Development Method (DSDM)**

Fast application development is the main purpose of the developing dynamic systems technique. Simultaneous user engagement throughout the whole iterative and incremental process is the main goal of this technique. 2014 (tatvasoft) DSDM always chooses the best approach when creating fantastic projects with ongoing client feedback. Systems creation and maintenance are supported by the dynamic systems development methodology (DSDM), a collaborative agile code development approach. The sociological notion that 80% of an application is commonly provided in 20% of the time when 100% of the program is requested is the foundation of the DSDM idea. DSDM is an iterative coding method that adheres to the 80% rule, which states that each iteration should complete enough work for each increment to make the subsequent iteration simple to accomplish.



*Figure 6: DSDM Phases*

### **Benefits of DSDM**

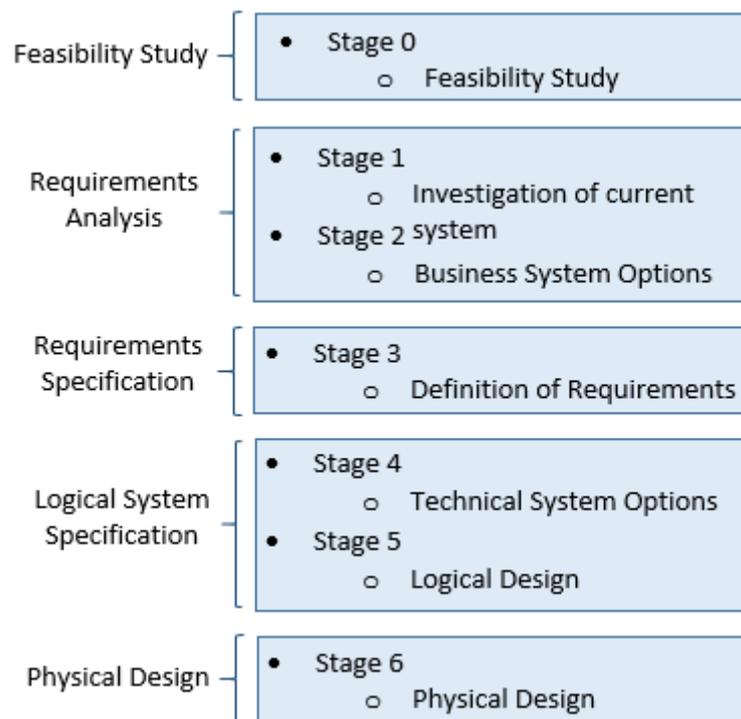
- The organization in its entirety can quickly understand how the project is progressing.
- For any initiatives that are incorporated, the DSDM strategy focuses on business cases to ensure that they have essential economic value.
- Developers and their final consumer may easily start communicating.
- Progression and developments occur sharply.

### **Drawbacks of DSDM**

- There are occasionally significant increases in price. Due to the high installation expenses, small businesses may find it impracticable.
- The DSDM does not encourage developer uniqueness.
- Projects stick to a specific standard even when more extensive circumstances exist.

## The structured system analysis and design method or the waterfall model (SSADM)

SSADM uses the waterfall life cycle model, starting with the feasibility research phase and continuing through the development of the architectural design. One of SSADM's key features is the substantial user involvement it offers during the requirements analysis stage. Users must certify that the requirements have been met at each level by signing off. Clear documentation is provided to users, along with numerous system diagrams. SSADM is used to segment a development project into parts, components, phases, and tasks. The first and most significant model produced by SSADM is the data model. It is a stage of requirements gathering that has clearly defined phases, techniques, and products. SSADM uses techniques for modifying entity behavior, simulating sequence diagrams, and doing logical predictive analysis.



*Figure 7: SSADM Stages*

## **Benefits of SSADM**

- By designating a verbatim at the outset and regularly reviewing the system, SSADM can minimize the errors rate of IS.
- well-written process co-operation of the user
- conserving time and rendering job tracking simpler.
- This technique is ideal for larger projects where the demand is obviously distinct.
- Using the situations from the earlier stage as references makes the testing portion of this procedure quicker.

## **Drawbacks of SSADM**

- Not the finest for a job of this magnitude.
- Turning back to the earlier stage is not permitted, which indicates that revisions are not encouraged.
- This concept is best suited for little tasks; unfortunately, it is not suitable for large, continuous plans.

## **Choosing Methodology**

Considering the aforementioned factors, I have decided to use the DSDM technique for the Smart ERP system project. DSDM technique is always It will be the ideal option and solution for the Smart ERP system project because it guarantees project quality and on-time delivery and is relatively suitable for usage in any enterprise or organization. During the development process, a client or customer may change their requirements if they feel that the project needs to be modified. DSDM makes use of the deeper level of expertise to make sure the Deployed Solution satisfies the actual business demand. Through iterative development and frequent reviews to make sure the output is meeting the business's needs, DSDM facilitates change. DSDM has a larger emphasis than other agile methodologies because it works with projects rather than developing and delivering a product (usually software). Given the context of the

project, it is essential to concentrate on every aspect of the larger business demand and the solution developed to satisfy it.

## **4.2 Why to Use**

To successfully execute the tasks within the allowed time and budgetary restrictions, the system must stick to a methodology. By following its A methodology aids in reaching the project's main goals by providing tried-and-true advised approaches. Even if selecting the best approach for this type of academic assignment is difficult, doing so will significantly improve project completion and output. The entire project lifecycle is covered by DSDM, which is vendor-neutral and provides best-practice guidance for completing projects on time and on budget. It has been demonstrated to be scalable in order to manage projects of all sizes and for all business sectors. Numerous tried-and-true techniques, such Facilitated Workshops, are encouraged by DSDM.

## **4.3 Sections of Methodology**

A few predetermined DSDM rules must be followed by the development team. The pre-project phases are those.

During this phase, the project's length, cost, and requirements are produced along with the basic project concept.

### **Phase of a Feasibility Study**

In this section, the project's operational, technological, and financial viability are examined.

### **Phase of Gathering Requirements**

The functional and nonfunctional demands of the project are identified using a variety of techniques in this section.

### **Phase of Exploration and Engineering**

The methodology's main iterative component examined the requirements and gradually developed the solution.

## **Analyze Phase**

In this stage, the users review the finished products, and if any measures if necessary, they are returned to the previous stage.

### **4.4 Plans toward Deployment**

The project's final phase, when the finished application is made usable. Any problems related to this must be for the new system to work, these issues must be found and fixed. The release criteria, configuration, and approach are decided upon in this section. The new system is introduced in section.

## Chapter 5 – Planning

### 5.1 Project Plan

The project completion planning process is demonstrated in this explanation. The project is essentially divided into a few major pieces. Everything is in order following that and after careful planning all tasks will be performed in the time frame determined during this phase. This sector covers arrangements for how the extension will be finished. In essence, the project is divided into a few distinct portions, and following the arrangement, within a predetermined time range that may be agreed at this stage, all of the work will be completed.

#### 5.1.1 Work breakdown Structure

In order to accomplish the project within the allocated time period and more quickly and efficiently, this part includes for the project to be chopped down into manageable tasks. Based on this structure, we may infer information about the work and the time. Without this structure, it can be more difficult to complete the project. As a result, the suggested method by the WBC has been divided into sections and subsections, as shown in the chart below:

Task Mode ▾	Task Name ▾	Duration ▾	Start ▾	Finish ▾
★	Introduction	9 days	Wed 6/1/22	Sun 6/12/22
★	Initial Study	7 days	Mon 6/13/22	Tue 6/21/22
★	Literature review	11 days	Tue 6/21/22	Tue 7/5/22
★	Methodology	5 days	Wed 7/6/22	Tue 7/12/22
★	Planning	9 days	Wed 7/13/22	Mon 7/25/22
★	Freasibility study	9 days	Tue 7/26/22	Fri 8/5/22
★	Foundation	6 days	Sat 8/6/22	Fri 8/12/22
★	Exploration & Engineering	25 days	Sat 8/13/22	Thu 9/15/22
★	Deployment	15 days	Wed 8/24/22	Tue 9/13/22
★	Testing	9 days	Thu 9/1/22	Tue 9/13/22
★	Implementation	7 days	Wed 9/14/22	Thu 9/22/22
★	Critical Appriasal & Evaluation	6 days	Fri 9/23/22	Fri 9/30/22
★	Lessons Learned	10 days	Sat 10/1/22	Thu 10/13/22
★	Conclusion	5 days	Sun 11/13/22	Thu 11/17/22
★?	<b>Totals</b>	<b>122 days</b>		

Figure 8: Work breakdown structure of project

### 5.1.2 Resource Allocation

To ensure the successful completion of the new thoughts and recommendations, all resources and assets are assigned and handled logically. The distribution of resources during project planning is one of the most important factors. Since there isn't a team working on this academic issue, I will take on various duties as they come up. The following resources have been allocated for the Smart ERP system project in order to meet the pre-scheduled job delivery deadline:

SL	Task	Duration	Resource
1	Introduction	7	Analyst, User
2	Initial Study	7	Analyst
3	Literature Review	4	Analyst
4	Methodology	7	Analyst, User
5	Planning	7	Analyst, Team Leader
6	Feasibility	5	Analyst, User
7	Foundation	3	Analyst, Designer, Developer
8	Exploration & Engineering	17	Analyst, Designer, Developer
9	Deployment	13	Designer, Developer
10	Testing	4	Developer, Tester, User
11	Implementation	3	Analyst, Developer, User
12	Critical Appraisal & Evaluation	1	Analyst
13	Lessons Learned	1	Analyst, Designer, Developer, Tester
14	Conclusion	1	Analyst

*Table 8: List of resource allocation*

### 5.1.3 Time Boxing

To achieve the objectives before the deadline, DSDM splits the tasks into time boxes. It is yet another critical component of the DSDM project planning in this section, all jobs are assembled into timescales with a specified period of time. These tasks must be completed by the infinite series within the given time range... Timeboxing is an agile paradigm that provides a defined and maximum unit to an activity, known as a timebox, within which the scheduled actions are carried out. It is used for Agile project management techniques and personal time management.

Timebox	Task	Resource
TB1	Introduction	Analyst, User
	Initial Study	Analyst
	Literature Review	Analyst
TB2	Methodology	Analyst, User
	Planning	Analyst, Team Leader
	Feasibility	Analyst, User
TB3	Foundation	Analyst, Designer, Developer
TB4	Exploration & Engineering	Analyst, Designer, Developer
TB5	Deployment	Designer, Developer
	Testing	Developer, Tester, User
TB6	Implementation	Analyst, Developer, User
TB7	Critical Appraisal & Evaluation	Analyst
	Lessons Learned	Analyst, Designer, Developer, Tester
TB8	Conclusion	Analyst

*Table 9: List of time boxing*

### 5.1.4 Gantt Chart

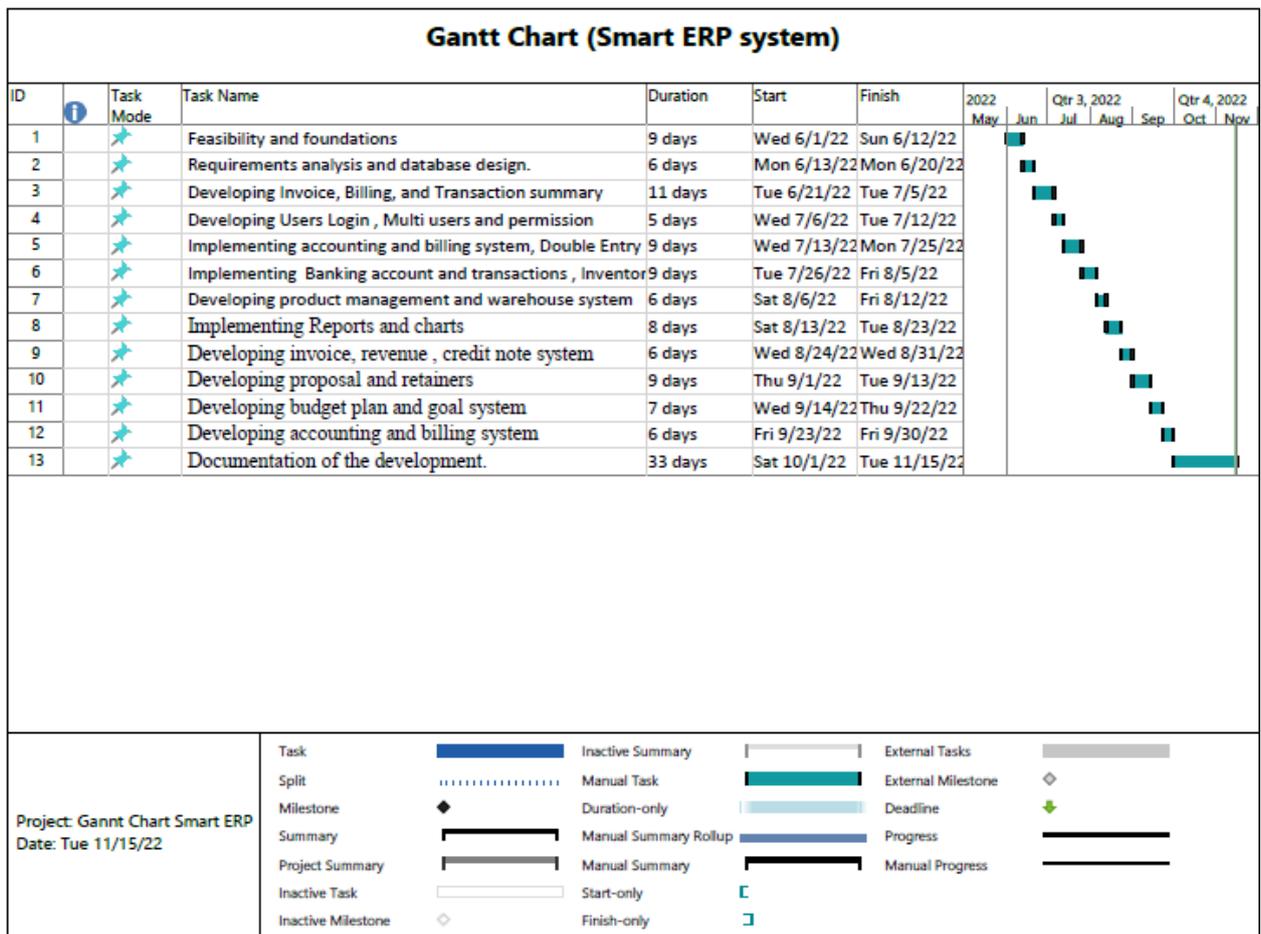


Figure 9: Gantt chart of project

### 5.2 Standardized test

A test plan is a detailed document that outlines the objectives, schedule, hypotheses, deadlines, and resources required to complete a particular project. Think of it as a manual for conducting the necessary tests to ensure that the program performs as planned. The test method was created in response to discrepancies between the supplied input and the system's anticipated output. The verification and validation stage of the software development process was not exempt from testing. (browserstack.com, 2022)

### 5.2.1 Measuring Again against Time Boxes

A fixed and consistent unit of time was anticipated for a specific section using the time box concept. tests with time constraints.

User name	Example	Role	Example
Time box ID			
Time box content			

*Table 10: Demo of time box testing*

Test type	Test steps	Expected result	Actual results	Comment
Unit test				
Integration test				
System test				
Acceptance test				
Security test				
Usability test				
Reliability test				

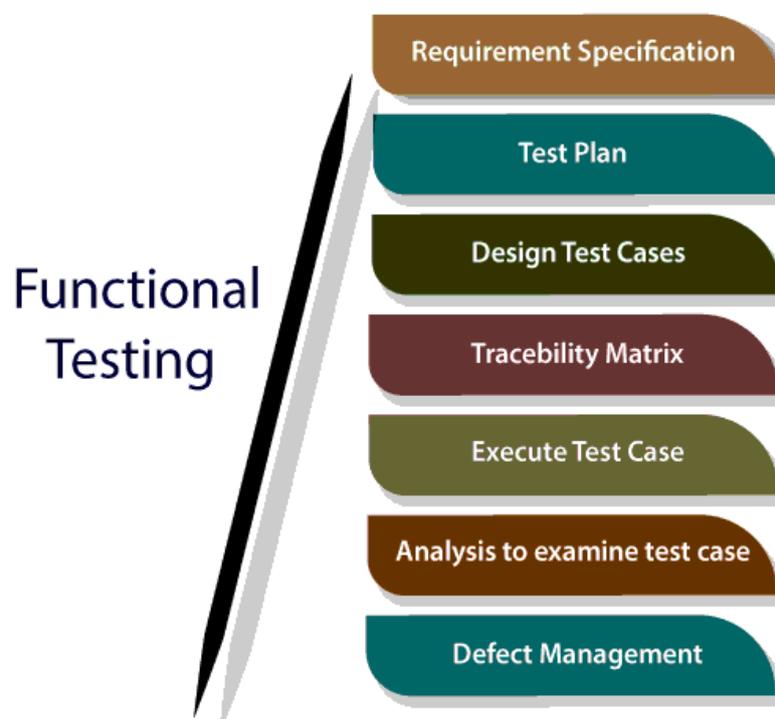
*Table 11: Demo of time box against testing*

### 5.2.2 Required Test

Although there are many testing modules, functional and non-functional testing are the two most popular kinds of system testing:

## Functional Testing

Extremely equivalent to software testing that determines if a software application's functionality operates in accordance with the requirements specification. Functional testing involves giving a value, figuring out the output, and comparing the actual output to the expected value for each function. To make sure that an application or system's functionality acts as we anticipate, functional tests are run as "black box" tests. This is done to ensure that the application is working. Since they concentrate on the application specification rather than the actual code, functional tests are often known as "black box" tests. Only the software must be tested by the tester; not the system.



*Figure 10: Functional testing phases*

➤ **Unit testing:**

Unit testing is a method of software testing that involves assessing individual software units or a group of software modules to determine whether the operational procedures and use guidelines are appropriate. It is a testing technique in which every individual module is examined to see whether the developer is suffering from any issues. It has to do with how accurately the individual components function. A kind of software testing known as unit testing involves testing individual program components. During

the creation of an application, unit testing is performed on software products. A distinct component might be a distinct method or function. Developers typically do unit tests. In the SDLC Testing unit testing comes first, followed by integration testing, in the testing hierarchy. One sort of testing methodology frequently used by developers is unit testing. Unit testing is also done by QA engineers, despite developers' reluctance to test. 2022 (geeksforgeeks.com)

➤ **Integration Testing:**

the process of determining how two software modules or components interact is known as integration testing. Its major objective is to evaluate the interface's accuracy. Integrity testing is done to look for issues with how integrated units interact with one another. The integration tests are run following the testing of every module. When testing software at the integration level, several modules and components are combined and tested as a whole. This kind of testing is carried out to identify problems with the interactions among embedded components. Test endpoints and test snippets are important for integration testing. 2022 (geeksforgeeks.com)

➤ **System Testing:**

To ascertain if a fully integrated system complies with the pertinent criteria, the system is put through system testing, a form of software testing. System tests are run on components that pass integration tests. Finding any differences between the interconnected pieces is the goal of integration testing. During system testing, both the integrated drives and the entire system are found to have problems. The observable behavior of a system or component during testing is known as a system test outcome. Within the parameters of the system requirements specification, the functional requirements specification, or both, system testing is conducted on the complete system. System testing also looks at consumer expectations, system behavior, and design. Beyond the limitations mentioned in the software requirements specification, the system is tested (SRS). System testing is often carried out by a test team that is independent of the development team in order to impartially evaluate the system's quality. There are both functional and non-functional tests offered. An evaluation that

is closed-loop is system testing. System tests come after integration tests and before acceptance tests. 2022 (geeksforgeeks.com)

➤ **Acceptance Testing:**

In order to provide users, clients, or other authorized entities the choice of accepting the system, it is done in order to ascertain if a system fulfills acceptance criteria based on user expectations, needs, and business procedures. Acceptance testing comes last in the software testing process, coming after system tests and before the system is made available for actual usage. 2022 (geeksforgeeks.com)

**Non-Functional Testing:**

Non-functional software testing verifies the application's non-functional requirements is carried out. Verify the system's functionality. All aspects are examined, which the functional tests do not. Software testing called "non-functional testing" examines the system's non-functional components. Examining a software application's non-functional features is a component of non-functional software testing. Its objective is to assess a system's readiness using never-changing non-functional standards put to the test during functional testing. It is necessary to test, both functionally and non-functionally. (geeksforgeeks.com, 2022)

➤ **Security Testing:**

Security is a type of software testing called testing looks for system faults and calculates if data and system resources are safe from potential hackers. It guarantees that software programs and computer systems are secure from potential threats or hazards. When a system is placed through security testing, the goal is to find any flaws or openings that might endanger data loss or the reputation of the financial institution. (geeksforgeeks.com, 2022)

➤ **Usability Testing:**

Usability testing, a non-functional order to test the validity, gauges how easy a system is for users to use. The following criteria may be used to evaluate it even if it is difficult to gauge and quantify: The program's required skill level must be balanced among

novice and expert users. The program needs some time to become second nature. Usability Testing is measurement of any increases in user productivity. It's an evaluation of user attitudes about the use of software.

➤ **Reliability testing:**

Reliability testing is a type of testing that looks at how well software performs under various environmental situations in order to find problems with software performance and design. It is described as a kind of software testing that assesses whether the program can run faultlessly for a predetermined amount of time in a predetermined setting. This guarantees that the product is dependable for its intended use and free from flaws.

### 5.2.3 Test Case

The test case contained the test case number, test type, test description, and test procedures.

Test Case No			
Test Type			
Test Description			
Test Steps	Expected Result	Actual Result	Comment

*Table 12: Demo of test case*

### 5.2.4 User Acceptance Test Plan

The final step is in the user acceptance test segment. It specifies and tests the effectiveness of the test by the user in concern.

Test Case No			
Test Type			
Test Description			
Precondition of testing			
User's name			
Act as			
Test Steps	Expected Result	Actual Result	Comment

*Table 13: Demo of user acceptance test plan*

### 5.3 Risk Management

Risk management includes the identification, evaluation, and response to a firm's inherent risk characteristics. By adopting a proactive rather than a reactive strategy, effective risk management means making every attempt to affect future occurrences as little as possible. Therefore, good risk management provides the opportunity to lower the risk's chances of occurrence as well as its potential impact. Risk management frameworks are intended to do more than merely detect present dangers. In order to anticipate uncertainties' effects on a company within a competent risk management framework, uncertainties must also be taken into consideration. The decision between accepting risks and rejecting them is the result. A corporation's level of pre-determined risk tolerance is what determines.



*Figure 11: Risk management processes*

- ❖ Risk identification
- ❖ Risk assessment
- ❖ Risk precaution / action plan
- ❖ Steps taken for possible risks

### 5.3.1 Risk Identification

Brainstorming is the primary method for identifying risks. A business gathers its staff so they may discuss the many risk factors. The next stage is to rank all of the hazards that have been found. Since it is impossible to completely eliminate all risks, prioritizing makes sure that the risks that have the potential to have the biggest impact on a company are taken care of first. Risk identification is a crucial step and procedures in risk management planning. The first steps in the risk identification process include assuring and identifying risks that may develop and having an effect on the project also recognizing and originating document characteristics with its properties. The following risk identification criteria will be justified based on this project:

- Identifying and documenting possible risks while tracking risk
- The real truth is included in the specifics of the indicated danger.
- implications, including risk factors and potential consequences.

**The following provides information on how this project's risks were identified and tracked:**

Type of Risks	Causes	Impact and consequence
Scheduling	There are several reasons to occur programing risks included- Unintentionally delay reason behind Corona Pandemic scenario Specific portion failure includes information loses of user and admin. Specific portion failure includes machine and stop production.	Project late submission
Database Error and Destroy	In this project two major panel here, admin and users. So sometimes it's tough to manage If a customer book proposal but delivery not possible. User could not get access to the system because of database error.	User could not find their expected proposal for orders.
Unauthorized Access	A person attempting unauthorized access to this system. This may make including risks challenging. User may change information By this unauthorized user, consumer and staff data may be changed.	Confidential information can be hacked as well as changed

Technical problem hardware	Lacking of required speed Lacking of required performance Lacking of required configuration	Proposal may failure
Project Backup	Lack of project backup on GitHub or another platform	Effects on costs Lost whole project
Network Failure	Lack of access to some integrated API and Internet connection required for information update.	User fails to get information on time.

*Table 14: List of risk identification*

### 5.3.2 Risk Assessment

The quantitative or qualitative impact of threats to a project's dangers is taken into account throughout the risk assessment process, including:

Types of risks	Likelihood	Impact	Restore time
Scheduling	4	6	8
Database Error and Destroy	5	5	5
Unauthorized Access	6	6	6
Technical Problem	3	4	4
Project Backup	5	6	4
Network Failure	4	4	8

*Table 15: List of risk assessment*

### 5.3.3 Risk Precaution/Action Plan

- Risk action is planned after risk evaluation and risk identification. There are a number of activities that may be made to kick off the mediation preparation phase.
- occurred and possible hazards were avoided
- occur and minimize possible dangers
- addressing possible hazards and those that may have happened

Types of risks	Action	Action Taken By	Action Required
Scheduling	to use a Gantt chart to accurately estimate the amount of time.  Utilizing technology: Prediction, Pollen, etc.	administrator affiliated	Prior to beginning the project development
Trouble in mysql	to achieve the necessary normalization To foster the necessary sociability around the conference table	administrator affiliated	Information include, upgrade, and wipe at the moment
Unauthorized Access	to keep the multi-verification framework for this project's code clean while doing coding.	involved developer	During authentication segment setup

Technical problem	Hardware		
Standby Projects	Lacking of Standby Projects on GitHub or Similar to this	involved developer	Update frequently
Network Failure	access to integrated APIs for information change but not the required Internet connection	involved developer	On time of project development

Table 16: List of risk precaution plan

### 5.3.4 Steps Taken for Attainable Risk

After identification and evaluation of potential risks, the responsible person takes the necessary steps. These are:

Types of risks	Description	Likelihood	Impact	Steps Taken
Scheduling	One of the most common risks is the possibility of missing project schedules and deadlines.	Rare	High	During the time Boxing and Gantt chart created and work breakdown structures.
Database Error	Possibility of duplicate entry, invalid relationship.	Likely	High	Data dictionaries have been developed, together with entity relationship images and normal form normalization.

Unauthorized Access	Unauthorized access to the system.	Unlikely	High	Implement proper authentication system and access authorization.
Technical Problem	Hardware crashes can cause unresponsiveness.	Frequent	Medium	Backup and regular maintenance and monitoring have been ensured.
Network Failure	Failure of the internet or a connection difficulty.	Frequent	Low	The backup server is configured and high-speed bandwidth is allocated.

*Table 17: List of attainable risk*

## 5.4 Change Management

### 5.4.1 Prospective Change-Inducing Factors

There are unit many varieties of changes required for this method that area unit included:

- Modifications to the programming portions
- changes to the practical requirements
- alterations made to an entirely separate computer program module
- Improvements in the areas that deal with security

### 5.4.2 DSDM welcome Change

Depending on the project's requirements, the project management life cycle may occasionally need to be adjusted. For this reason, we've got to follow some procedures which may take up differing types of challenges supporting the specified system. For this, here DSDM is one among the applicable, suitable, reliable & correct workable strategies. during this system we've got to follow the procedure to keep up & perform changes throughout development.

It will add many approaches:

- ❖ It develops a structure for monitoring any module updates.
- ❖ It gathers feedback from several users simultaneously for dynamic roles like student information attending automated updates.
- ❖ When adjustments are complete, it operates.
- ❖ It guarantees the defense mechanisms.
- ❖ It assures transparency in a way analogous to measurability.

### 5.4.3 Considering Business Priority

The alterations take into account fulfilling both the business objectives and the anticipated aims and objectives. Since the users involved expect huge benefits from the change, we must give priority to both the change's efficacy and the needs that will lead to those results.

Priorities included

Area if topic	Priority Level
Scheduling segments	5
Functional requirements	7
User interface	5
Automated attendance segments	6
Security handling segments	7

*Table 18: List of business consideration priority*

### 5.4.4 Change Workshop

Communication amongst team members will be strengthened by having a solid understanding of their profiles. Developers can organize a workshop with the creation of a questionnaire to determine what modifications and additions to this system are necessary based on the required changes and additions.

Knowing the profiles of various user kinds, such as customers, employees, and administrators, through experience will allow for more normal discussions to be had. This change workshop will also sustain any implementations that have been made based on user experience and review.

The need for a change workshop-

- To describe the modification and the participating team
- to develop a strong user and team member profile.

#### **5.4.5 Changes that are allowed**

Depending on the priority of the modification, acceptance of the change was required. Accepting changes has been necessitated by various resource, cost, scheduling, quality, and risk considerations. We must allow for changes in terms of priority during the development phase of a certain system component.

#### **5.4.6 Key Decision Taker of Change**

Change-making decision-makers will rely on their various areas of competence. There is a distinct decision-maker for modifications in this project.

- Requirements Analyst
- Developer
- Tester

If necessary, the analyst can alter the functional specifications, and the developer can decide whether or not to alter the pertinent code.

### **5.5 Quality Management**

Maintaining the standard that the user approved at project inception is the process of quality management. The following factors have an impact on quality management:

- To track staff, customer, supplier
- users and team members can communicate

- Continuous requirements change
- Changing version of software.

### **5.5.1 Rules used to preserve quality**

Various factors have an impact on intelligent ERP systems. Quality assurance and control are essential components of an effective ERP system. ERP system quality control includes finding and fixing system flaws, while quality assurance entails systematic planning and technique to ensure ERP system procedures. ERP quality assurance is undoubtedly an issue. about the caliber of the data. Data quality is a measurement used to assess how well a certain collection of data is used to achieve a particular objective. ERP differs from this because of the growing volume and diversity of data. data's major factor in the performance of ERP systems. Because successful and efficient ERP systems do not have this problem.

### **ERP Risks and overcome**

The risks that ERP systems confront nowadays are various. Risks associated with ERP installation fall into six categories. These include dangers to organizations, businesses, technology, contracts, and finances. The success and failure of ERP systems are significantly influenced by technical hazards. Technological danger Operating systems, database management systems, client/server technology, and the network, which are all related to information processing technologies, are crucial for administering ERP systems. In terms of these hazards, database administration rates quite highly when ERP system procedures are taken into account. Implementing data warehouse or data management solutions is often how many businesses attempt to resolve data quality problems. Failures in data storage have a significant impact on an organization's performance. It is necessary to approach data quality in an integrated manner in order to respond to both organizational and IT-related points of view.

- **Data Quality Definition**

The simplest definition of data quality is the assessment of a given collection of data's worth when employed in a certain context to advance a predetermined objective. Data quality is a broad and multidimensional idea. Database data is just potentially valuable;

it has no actual quality or worth. This potential value can only be realized if someone uses the data for a meaningful purpose.

- **Security Risk**

Web applications increase in volume and lower software quality Web applications are sensitive to cross-site scripting (XSS) and SQL injection without adequate protection. By altering an existing SQL request, an attacker can publish secret data, delete crucial values, or execute instructions that could be harmful to the database for the smart ERP system. This technique is known as SQL injection. when applicable in order to produce a SQL request, it directly analyzes the data that Internet users have supplied. An attack known as cross-site scripting (XSS) takes advantage of a website's weakness of not validating user-inputted parameters. Users of XSS have a variety of ways to inject (and execute) code into programs written in languages like JavaScript.

- **Dirty Data**

Transaction information is required to the planning and decision-making processes in ERP for daily operations. Both manually and electronically entering this data is possible. The process of making decisions is then organized, controlled, and exhausted. The production, shipping, and dispatch of items may be facilitated by input data, and the success of the factory and sales force can be assessed in the near-term using output data. utilization of data over a long period of time to manage and make business-related choices, such as the level of operation efficiency or the preservation of data integrity.

- **ERP Failures**

The most crucial element in every successful company sector is "quality." Companies must take into account its excellent quality since it cannot fix flaws once the product is delivered to the client. Corrections made just after submission are more expensive and harm the business's reputation. Additionally, companies cannot afford to lose clients as a result of these issues. Companies need to adhere to the product quality management system to solve issues like these. As all firms advance toward automation, maintaining product quality is essential for ERP installation enterprises. Real-time software system failures, like those in ERP, can have negative effects.

## ERP Risks overcome

- **Quality Assurance**

Software quality assurance (SQA) is a methodical, organized approach to ensuring that software processes and deliverables adhere to predetermined criteria. SQA keeps a close eye on the software and the development cycle in an effort to improve the quality of programs. Methodology To combine quality and productivity, software programs like ERP, which require improvements in normative quality control, must find a happy medium. Software quality assurance shouldn't be limited to one level. To ensure that any issues can be found and resolved using the defined protocols, you must complete each stage of the software development process. It places a strong emphasis on lowering the generation of errors and increasing the output of software of superior quality. High-quality software is developed using a process called software quality assurance.

- **Quality Control**

Software problems are found (tested for) and eliminated through the process of quality control (QC). Functional testing, regression testing, and load testing are all software verification techniques that check whether an application behaves correctly or appropriately for a single user. If it can operate well with several concurrent users, thousands of tasks may be performed.

### 5.5.2 DSDM Standard Quality Measures

**Solution quality:** User requirements have been tracked in order to guarantee solution quality based on anticipated business demands and user expectations. Two alternate types must be used to finish this procedure of prioritizations have been used. As SQ, we guarantee the top caliber of every IT delivery. On a variety of subjects and projects, we create and carry out a wide range of tests. We regularly monitor industry developments in the QA sector and employ new tools for test automation and test management processes. Our key asset is a motivated workforce with expertise in applying test process standards, particularly in agile settings.

- Time Boxing
- MoScow

Both of these strategies have been finished while keeping the schedule.

**Process quality:** A focused organization has been used to assure process quality. Two different sorts of approaches have been developed and utilized to complete these process quality steps. Process Excellence Process quality describes how well a procedure is carried out and adhered to in order to generate standards, including quality metrics and criteria. A complicated network of sequential and parallel stages is necessary for software development. To handle the project's complexity, new phases must be added as the project's scope expands. Product activities and general activities make up every process. Product activities lead to observable advancements toward the finished product. Many planning, management, and assessment tasks depend on general activities, which have an indirect effect on the ultimate result.

- CMMI
- DSDM

### **5.5.3 Plan for Quality and Measuring Meter**

- Scheduling and resource allocation were appropriately handled in this stage, among other forms of quality plans that have been maintained.
- Every portion underwent testing when the modules were finished.
- Before proceeding with execution, all alterations must be meticulously tracked and recorded.

## Chapter 6 – Feasibility

### 6.1 All Possible Types of Feasibility

#### **Operational Feasibility:**

Aside from an inventory system, a book proposal system, an accounting and billing system, and other systems that would make the proposed Smart ERP system much simpler and easier to use, it also includes very easy and smooth navigation. This is because the usability, simplicity, and necessary functionality of the proposed system raise operational feasibility difficulties. Administrators, employees, clients, and suppliers may all easily access the website and do their tasks promptly with the proper login information.

#### **Technical Feasibility:**

Aspects of technological viability include: The Smart ERP system's users can easily manage their operations compared to the prior manual procedure, according to technical feasibility testing. The system is suitable to run in any web browser with a slow Internet connection since it was created and developed utilizing the most recent and well-liked web and mobile technologies. To ensure safe access to the system data, there is an access control hierarchy. Platform independence, a cost-effective development environment, and platform independence make web-based applications technically possible. Therefore, it is apparent that the technical parts of this project are described below:

#### **Hardware:**

- DCL laptop (Configuration)
- Wi-Fi Router
- Xampp
- Microsoft office
- Google chrome browser
- Windows 10(operating system)
- PHP storm

#### **Database:**

- MySQL

**Technology:**

Clint Slide:

- Html
- CSS
- Java Script
- Bootstrap
- JQuery
- Ajax
- Android 10(for mobile user)

**Server Side:**

- PHP
- Laravel 8.54

**Economic Feasibility:**

There are several options for developing the proposed system, including web-based App, mobile app, desktop app etc.

**Web based application cost:**

All application and data is hosted on a remote server and can be accessed anytime from anywhere over the Internet, no installation required.

Equipment	Cost per unit	Cost
Extranet network with VPN	2000 BDT per month	2000 BDT
Desktop pc (core i9, 3.6 GHz processor, 16 GB DDR4 RAM, 1 TB SSD)	120000 BDT	120000 BDT
Web, File and Email Servers	20000 BDT per month	20000 BDT
Total:		142000 BDT

*Table 19: List of Web-based application cost*

**Mobile Application cost:**

Three distinct applications must be created for the SHAFIULLAH DYEING AND PRINTING (SHAFIULLAH DYEING AND PRINTING), blood donor, and blood seeker. The application comprising the system must be installed on each device. which, when compared to other options, can be a little pricey.

Equipment	Cost per unit	Cost
Web, email, file Servers.	20000 BDT per month	20000 BDT
Desktop pc (core i7, 3.6 GHz processor, 32 GB DDR4 RAM, 1 TB SSD)	120000 BDT	120000 BDT
Total		140000 BDT

*Table 20: List of Mobile-application cost*

**Desktop Application cost:**

Equipment	Cost per unit	Cost
Web, email, file Servers.	20000 BDT per month	20000 BDT
Desktop pc (core i7, 3.6 GHz processor, 32 GB DDR4 RAM, 1 TB SSD)	120000 BDT	120000 BDT
Total		140000 BDT

*Table 21: List of Desktop-application cost*

The system needs a domain name and hosting service to function. I'll develop a mobile application to follow the position of the donor and provide urgent notifications since the system has to continually track the order to discover the location of the order. The system's remaining components will be created as web applications.

### **Market Research Analysis Using Feasibility Considerations:**

Smart ERP systems are used by businesses to manage their operations and procedures more effectively. Up until now, an ERP solution's business operations have progressed from simple planning and support tasks to complete business process integration, covering crucial duties like hiring and decision-making. Numerous software components make up an ERP software system. Each module focuses on a certain area of business, such as finance, accounting, inventory management, human resources, and material purchasing. These modules can be modified to meet the organization's unique needs. The expansion in sales of the worldwide ERP software market is anticipated to be driven by the several advantages that enterprise resource planning offers between 2021 and 2031, according to the estimate. (transparencymarketresearch.com)

The component, deployment model, firm size, business function, vertical industry, and geographical categories are used to segment the market for ERP software. The market is divided into services and software in terms of components. Based on the deployment model, the market is split into three groups: hybrid, cloud, and on-premises. Depending on the size of the organization, the market is segmented into small, medium, and big enterprises. Manufacturing, inventory management, customer management, supply chain, human resources, finance, and other modules make up the business function section. Aerospace & Defense, Construction, IT & Telecommunications, Government & Utilities, Retail & Distribution, Healthcare, BFS, Manufacturing, and Others are additional categories for industry verticals. (transparencymarketresearch.com)

## 6.2 Cost-benefit analysis

Cost-benefit analyses typically concentrate on obtaining the income and expenditure assumptions. The benefit is calculated by comparing the total cost and income. The following cost-benefit analyses are provided for this project:

SL no	Equipment	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Web based application cost	152000 BDT	-	-	-	-	152000 BDT
2	Desktop Application cost	150000 BDT	-	-	-	-	150000 BDT
3	CC camera	9000 BDT					9000 BDT
4	Domain and hosting Cost	20000 BDT	20000 BDT	20000 BDT	20000 BDT	20000 BDT	100000BDT
5	Employee Expenses	40000 BDT	40000 BDT	40000 BDT	40000 BDT	40000 BDT	200000BDT
6	other cost	20000 BDT	20000 BDT	20000 BDT	20000 BDT	20000 BDT	100000BDT
7	Total Cost	463000 BDT	80000 BDT	80000 BDT	80000 BDT	80000 BDT	7830000 BDT

Table 22: List of cost benefit analysis

**Total Earn:**

SL No	Earn Sector	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Company Earn 1	2,50,000 BDT	1,90,000 BDT	2,20,000 BDT	2,50,000 BDT	2,80,000 BDT	1,060,000 BDT
2	Company Earn 2	2,50,000 BDT	2,20,000 BDT	2,50,000 BDT	2,70,000 BDT	3,10,000 BDT	1,220,000 BDT
	Total	500000 BDT	320000 BDT	470000 BDT	520000 BDT	590000 BDT	2280000 BDT

*Table 23: List of total earning***Total Revenue:**

SL No	Sectors	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1	Total Earning	5,00,000 BDT	3,20,000 BDT	4,70,000 BDT	5,20,000 BDT	5,90,000 BDT	2,280,000BDT
2	Total Equipment Cost	4,63,000 BDT	80,000 BDT	80,000 BDT	80,000 BDT	80000 BDT	7,83,0000 BDT
	Total Revenue	37,000 BDT	2,40,000 BDT	3,90,000 BDT	4,40,000 BDT	5,10,0000 BDT	1,797,0000 BDT

*Table 24: List of total revenue*

So, it is clear that, by promoting this system, SHAFIULLAH DYEING AND PRINTING or other companies will earn revenue per year, a big amount of taka with automation systems and saving time. The revenue will be increased per year. So, this project will be beneficial for the company and also staff, customer for suppliers.

### **6.3 Is DSDM Good or Bad for this Project**

This academic research must be done fast and include all essential features in order to be helpful for SHAFIULLAH PRINTING AND DYEING. Since the project may need to accept alterations while being produced, it should be developed iteratively. DSDM enables iterative development and sets strict guidelines and constraints. It ensures that the task will be finished accurately and on time. It also ensures user involvement for the duration of the project. It is clear that DSDM is the best strategy to adopt for a sophisticated ERP system.

## Chapter 7 – Foundation

### 7.1 The Assessment of the Area Of the study

The finest way to enhance the concept is to identify the issue. Because they will be using the system most frequently, the user may complete that component. As a result, several of the problems that the user reported seem to exist in the following ways. The integrated system has drawn criticism from SHAFIULLAH DYEING AND PRINTING, especially for the alterations made after the first rollout. The major causes of ERP system issues include a lack of corporate policies that safeguard the accuracy of data in the system and how it is utilized, as well as insufficient investment in IT employee training, including adopting and testing updates.

#### 7.1.1 Interview

This interview is the perfect choice if I want to acquire information, determine the true problem or comprehend the true goal. The genuine solution may be revealed by identifying the problem. Therefore, for the proposed system, the following user interview questions have been established:

##### 1. For Customers:

- When book order using proposal system what kind of problem faces
- Can I get the acceptance, delivery, sent, invoice, payment When the notice is made?
- Is the past transaction history significant!
- The developed applications are user friendly or not.
- Is the dashboard useful for saving time?

##### 2. For staffs:

- Customer proposal search and accepted what kind of problem faces
- Is accounting and report working properly or not
- Is Payment notification and payment history manageable
- Is inventory management and retainer managing properly

### 3. For admin:

- Faced any problem to create or manage staff, customer, and supplier
- Day, monthly or yearly report showing perfectly
- User access are manageable or not
- Is update order processing and monitoring

#### 7.1.2 Observations

Understanding individuals and their environment may be accomplished via observation. It's a tool that works best when we're looking at facts that are generally understood, rather than when we're unsure of what we're looking for. Rather than serving as a means of corroboration for presumptions, observation serves as a discovery tool. Observations will provide unexpected and surprising results. Without a doubt, observation serves a purpose. However, the objective could be rather general.

Observations are also extremely beneficial for detecting the real issue and compiling users' requirements. The workplace is frequently visited to better identify customer accommodations using observational methods. The following are the major findings:

- ❖ For Customer, check order booking system with proposal in the current structure
- ❖ Check the present system's notification mechanism for clients and suppliers.
- ❖ Understanding the true purpose of the past allows you to compute income and report it using the current system.
- ❖ For admin, checking order processing and history in the existing system.
- ❖ Payment history, inventory management, order tracking checking in the existing system
- ❖ For admin and staff, reviewing accounting and double entry eligibility report in the existing system.
- ❖ Creation of constant for Taxes, Payment Method, and other parameters checking in the existing system

### 7.1.3 Questionnaires

The most efficient method for gathering data and interviewing consumers and other stakeholders is through questionnaires. Short questions and MCQs are both options for some questions that the user can configure. The questions are therefore listed below:

Questions for Problem Identification			
Name		Age	
General User	Customers	Name	
Question-1	How often do booking orders include proposals?		
Answer:			
Question-2	How do you want to get notified of order status or tracking?		
Answer:			
Question-3	How do you want payment history?		
Answer:			
Question-4	Tell us about the Smart ERP system and which feather do you want?		
Answer:			

Questions for Problem Identification Questions for Problem Identification			
<b>Name</b>		Age	
<b>General User</b>	Staffs	Name	
<b>Question-1</b>	How do you manage customers and suppliers?		
<b>Answer:</b>			
<b>Question-2</b>	How do you manage a plan or goal?		
<b>Answer:</b>			
<b>Question-3</b>	How do you generate reports manually?		
<b>Answer:</b>			

Questions for Problem Identification			
<b>Name</b>		Age	
<b>General User</b>	Admin	Position	
<b>Question-1</b>	How do you want to access staff and customer?		
<b>Answer:</b>			
<b>Question-2</b>	Is it important retainer payment details adjust with order payment?		
<b>Answer:</b>			
<b>Question-3</b>	How to validate the customer or supplier payment method?		
<b>Answer:</b>			

## 7.2 Rich Picture

A rich image provides a top-down or bird's-eye view of how a system's users are interacting with it. Additionally, it illustrates corporate operations, communication, and opposing interests. The following is a rich illustration of the smart ERP system:

### Rich picture (Smart ERP system)

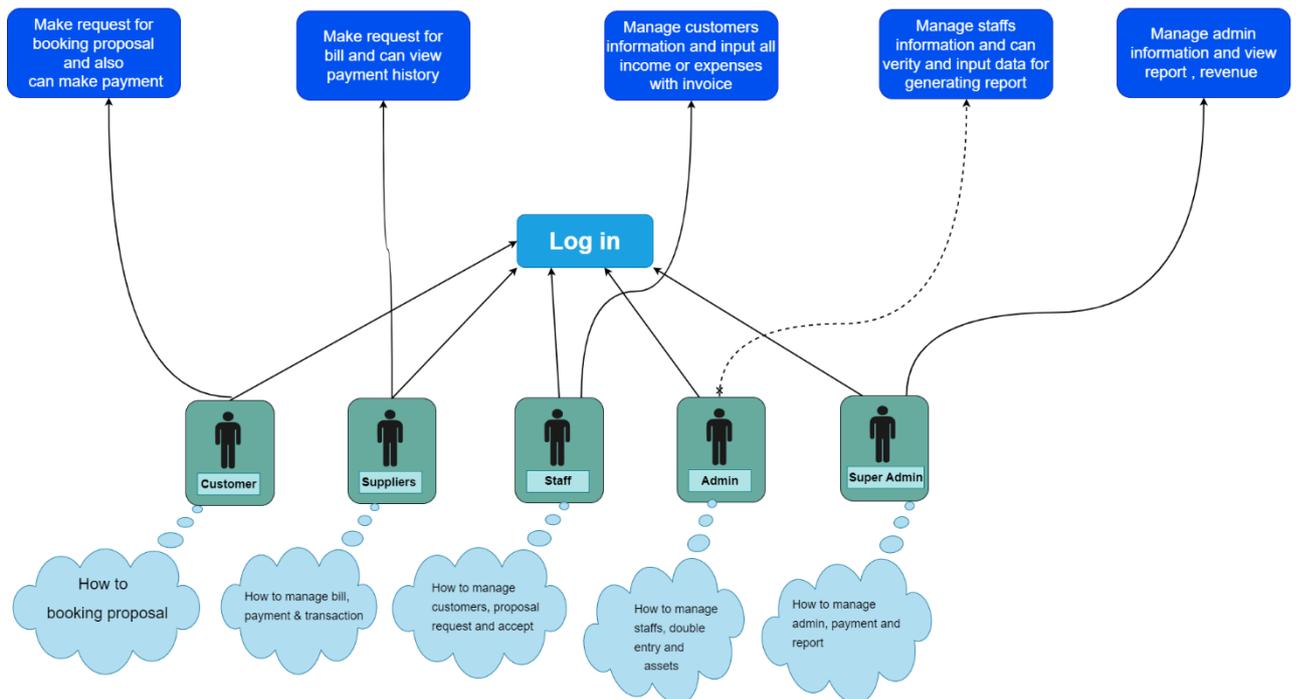
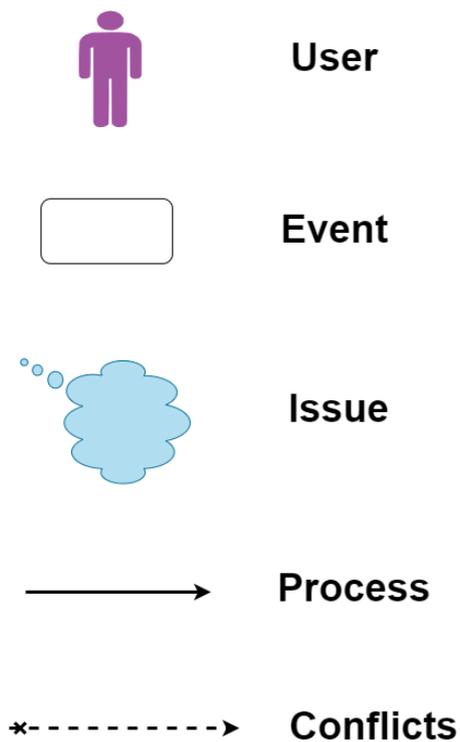


Figure 12: Rich picture of Smart ERP system

## The legends of rich picture



*Figure 13: Legends of rich picture*

## Key actors

There are five types of actors in the Smart ERP system:

- Super Admin
- Admin
- Staffs
- Customers
- Vendors

## Short description of rich picture:

The picture shows that the administrator may monitor and control all processes as well as resolve problems. It shows the conflict between consumers and employees, administrators and suppliers, and the super administrator. It also demonstrates that a variety of complications may develop.

### **7.3 Specific Problem Area Identification**

Various issues are discovered during the problem area identification step using information collecting techniques. A detailed visual from the Smart ERP system shows all system operations in their entirety. I was able to identify specific problems through analysis, including:

- There is no way to minimize an organization's expenditures while still delivering great work.
- Speedier data processing and a lack of real-time data for all units.
- Overcoming obstacles to the timely and successful execution of strategic planning.
- No web-based ERP system is designed to accommodate users from all over the world.
- No support for multilingual working platforms.
- Raw materials are not used properly, and the percentage of raw materials lost in the system has decreased.
- Inadequately produced goods.
- There is no product status tracking for the manufacturer or the consumer.
- Supply chain management is not performing well for both suppliers and customers.
- Customer service and financial management remain unimproved.
- There is no mail server for internal communication.
- Information accessibility for all organizational units' planning and management.
- Changes across systems must be synchronized across all management units.

### **7.4 Possible Solutions**

- Reducing all organization expenditures while maintaining high performance.
- Real-time data for faster data processing and improved services to all units.
- Making great strategic plans and putting them into action on schedule is simple.
- Globally consistent procedures and centralized management.
- It is simpler for users to access a web-based ERP system from anywhere in the globe.
- A functional platform with currency and multilingual capabilities.
- Proper raw material uses and a lower raw material loss rate in the system.
- ERP software ensures a high production.

- The ERP system automatically guarantees that production batch information, manufacture dates, and product expiration dates, among other things, are correct.
- The leveling mechanisms for the goods have been upgraded by the ERP system.
- It is simpler for both the producer and the client to track the goods.
- Direct sales orders might be placed using an online ERP platform.
- improved performance of the supply chain management for both customers and vendors.
- Customer service and financial management have both improved.
- Today, after-sale Additionally, services are linked to provide enhanced customer experience. and to be watched over for keeping customers.
- Through a mail server, an ERP system facilitates intra-organizational communication.

## **7.5 List of All Prerequisites**

The final overall requirement list is given below-

### **Functional Requirement**

- Customer and vendor login
- Multi Languages
- Invoice, Billing, and Transaction
- Multi users and permission
- Reports and charts
- User Friendly Invoice Theme
- Make own setting
- Double Entry Features
- Invoice module with QR code
- Budget plan and set goals.
- Accounting and billing system.
- Proposal system
- Email, SMS and notification sending facility

## Non-functional Requirements

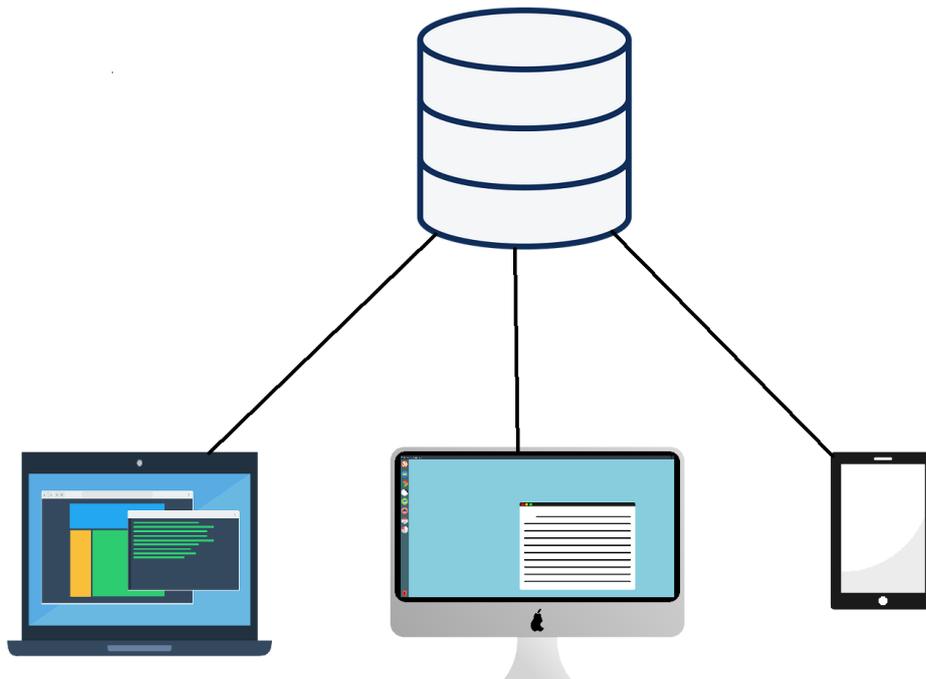
- attractive dashboard with sufficient data security and privacy.
- Preserve your data and resources with caution.
- design of an intuitive interface.
- To limit access, use authentication and permission.
- Implement the accessibility laws as written.
- Validation and confirmation

## 7.6 Technology to be implemented

Diverse technology options can be used to implement the proposed system. If you want to succeed, it's essential to choose the right technology. The alternatives are:

### Application Technology of Client-Server

This technique is windows - based, requiring the client to install the program on their device and save their data on a distant server. The remote server responded to the client application's request for the necessary data.



*Figure 14: Application technology of client-server*

**The client-server model application's features are listed below:**

- The server may more easily get new features without being interrupted.
- The decentralized server approach makes data recovery simple.
- The server requires less maintenance.
- Physical installation of the application is required.

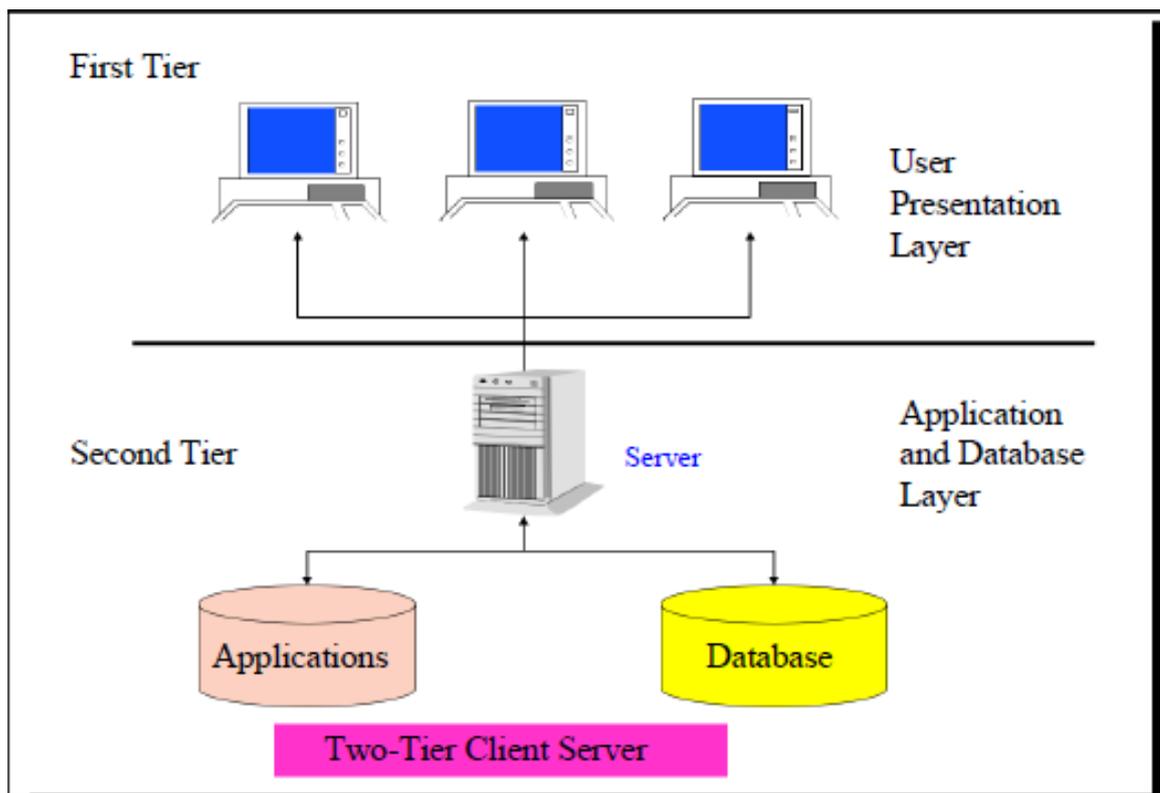
### **Architecture**

The most commonly employed architectures are

- Tier Two Architecture
- Tier Three Architecture

### **Configurations of ERP Systems: Client-Server Network Topology**

#### **Two tier architecture**



*Figure 15: Architecture of Two-Tier client server*

## Three-tier architecture

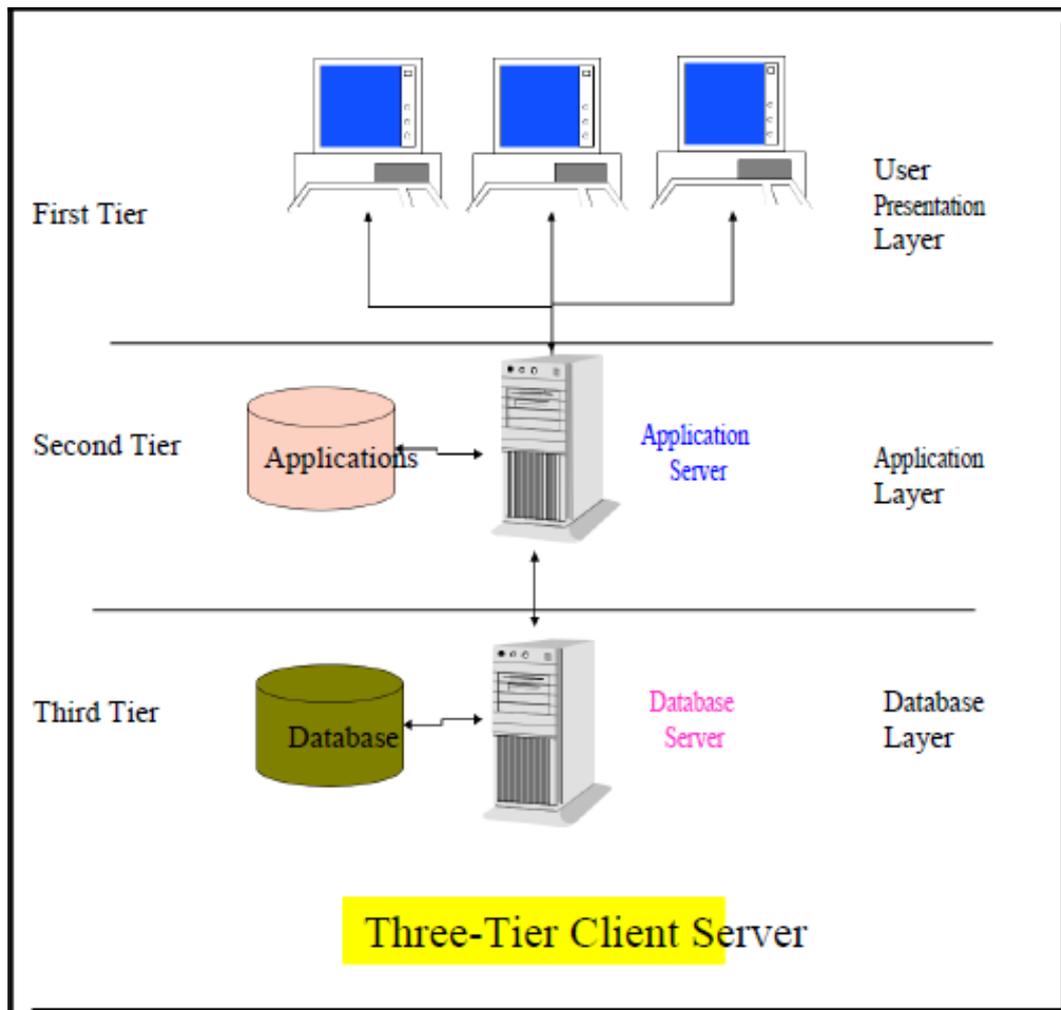


Figure 16: Architecture of Three-Tier client server

## Web application

Through the internet and a web browser, the program is accessible. This needed two different kind Web applications hosted on a virtual server, thus there is no need to install anything onto the client device.s of scripting. These are scripting on the client and server sides. The key benefits of a web-based application are as follows (Kohan, 2019):

- Accessed in the cloud via a web browser and the internet.
- Rather inexpensive.
- Accessible at any time and from any location.
- No installation is required.

## **7.7 Recommendation and Justification**

Everywhere in the globe must always be able to access the suggested Smart ERP System. The system needs to be accessible from any internet-enabled device, such as a tablet, laptop, desktop, and smartphone. Additionally, it must support several users concurrently. It makes the web application the suggested solution for the proposed system because client-server application technology cannot do this. ERP enables Production, sales, and distribution are only a few of the functional areas handled by an international group integrated information system. Other areas covered include finance, receivables and payables commodities, personnel management, and management of customer relationships (CRM). The majority of business operations are integrated, automated, and shared enterprise-wide in real-time via ERP, enhancing customer service and company image. ERP allows for full system integration.

## Chapter 8 – Exploration

### 8.1 Old System Use Case

Use Case diagrams show how a system's business functionalities flow. I'll use Infoblood.org as an example of an older system here:

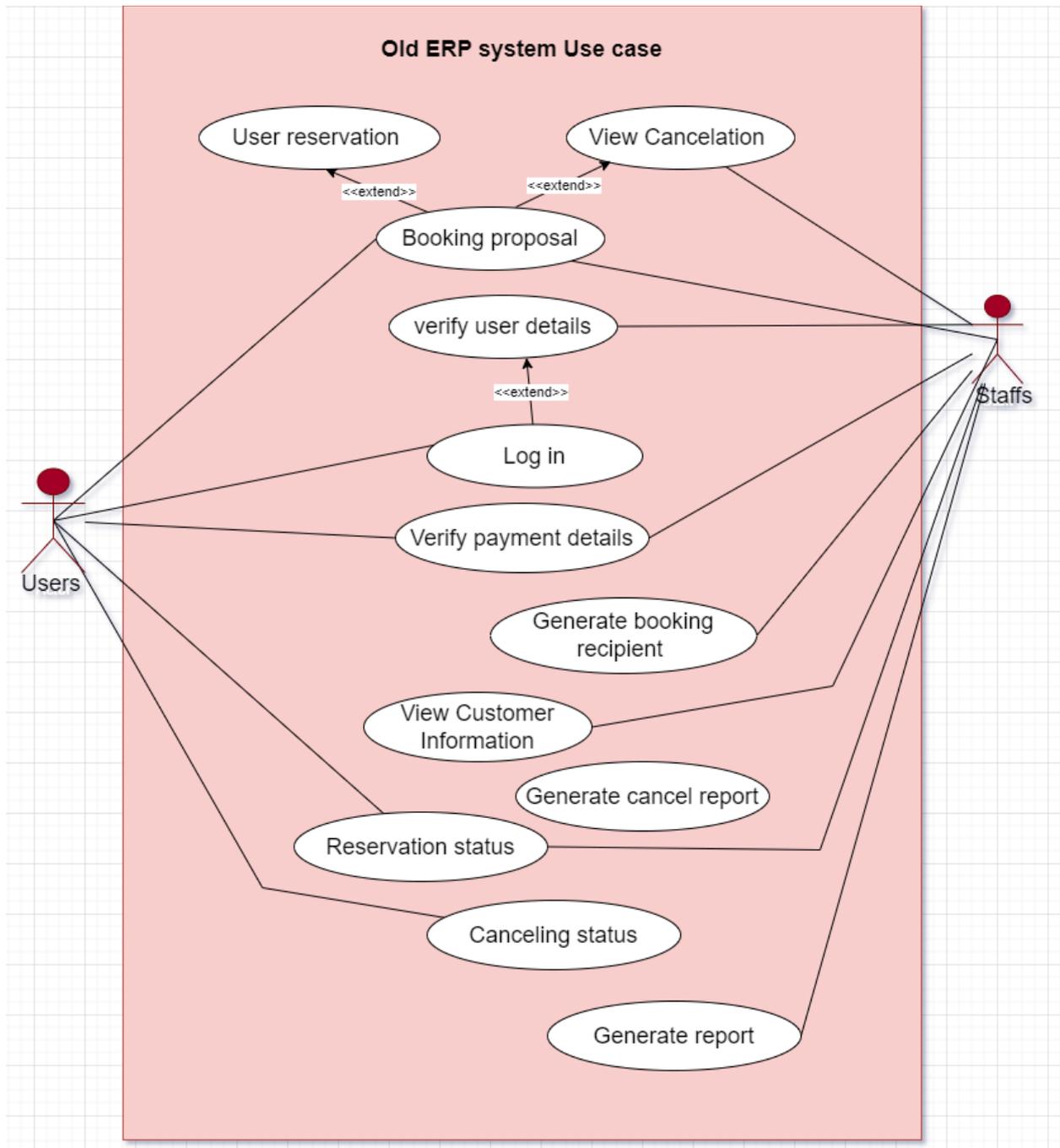


Figure 17: Use case of Old ERP system

## 8.2 Activity Diagram

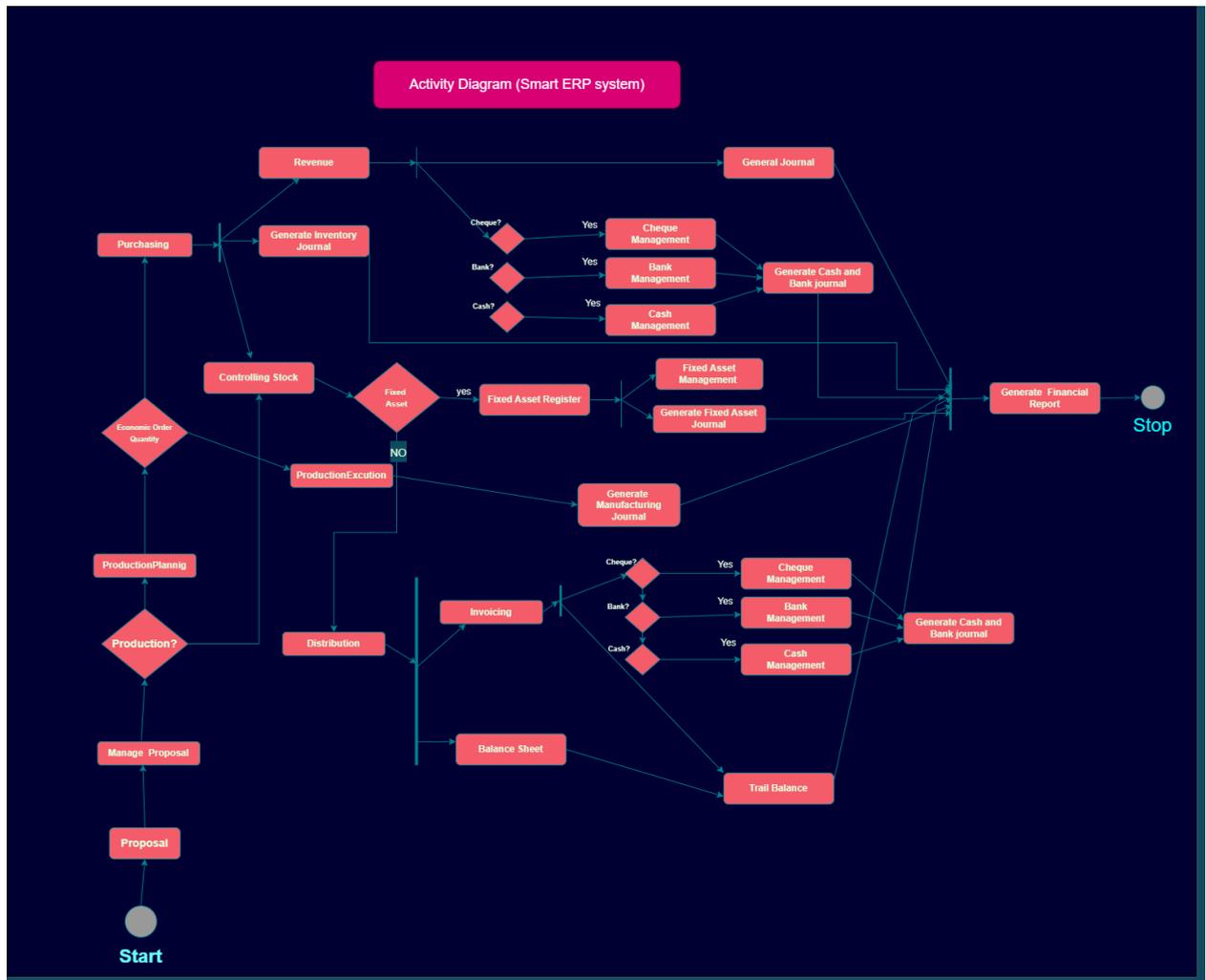


Figure 18: Activity diagram of Smart ERP system

### 8.3 Full system use case diagram

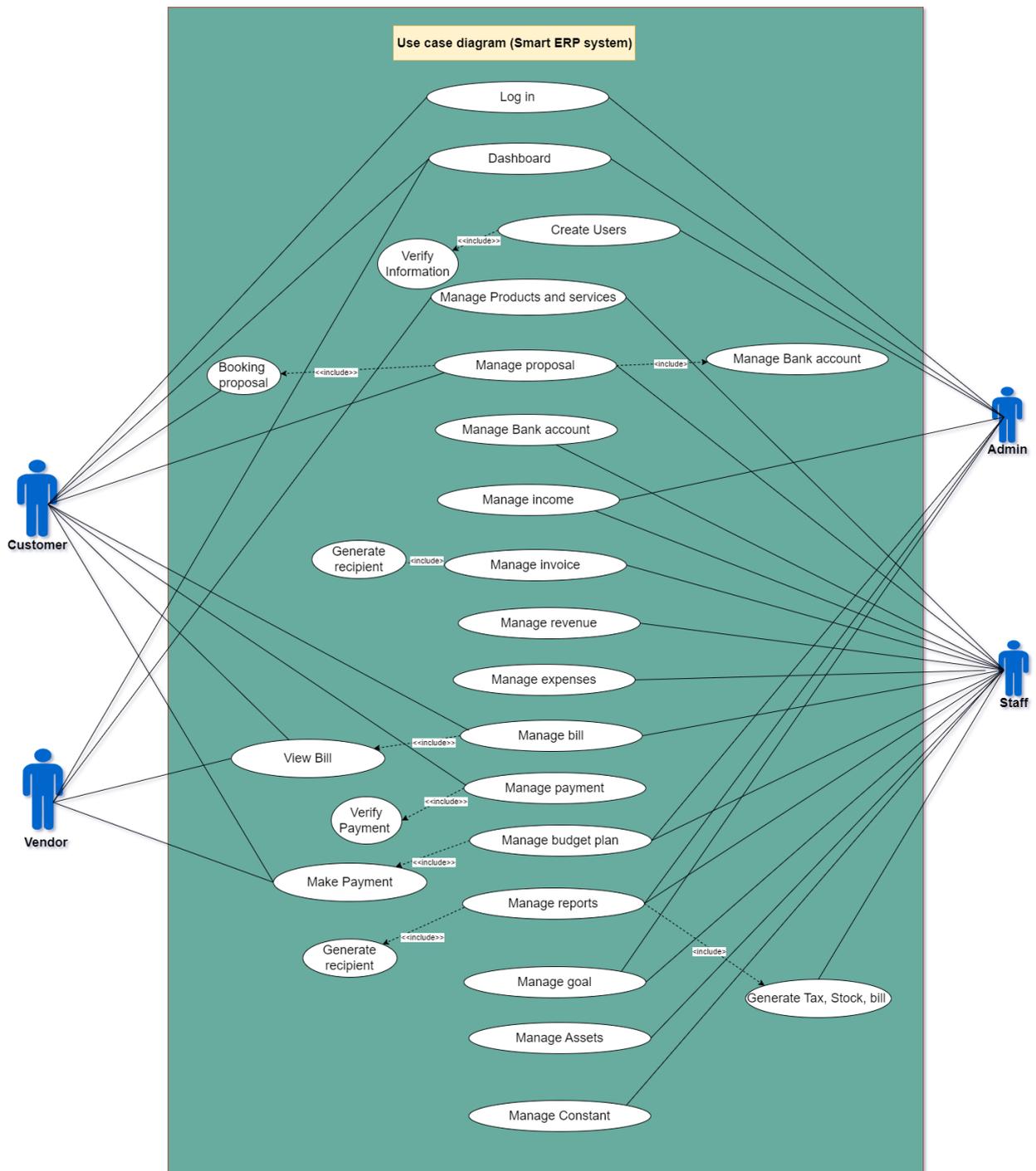


Figure 19: Use case diagram of Smart ERP system

## 8.4 Full System Activity Diagram

There are numerous user types and workflows in the suggested Smart ERP system. The activity diagrams for various work flows are shown below:

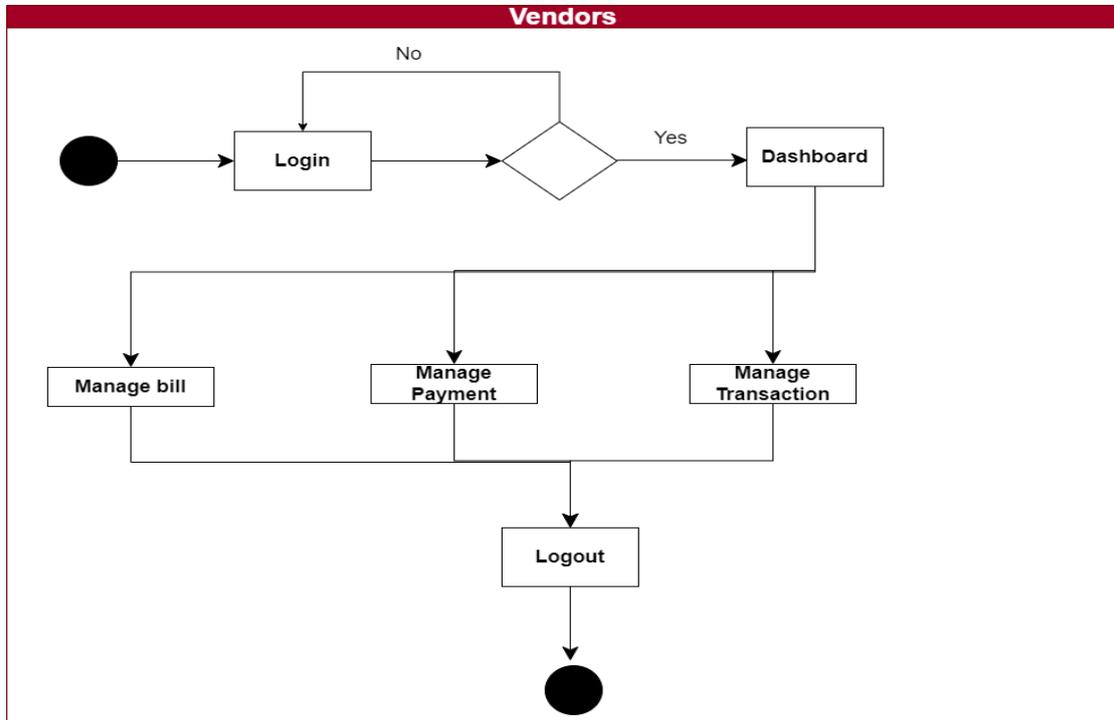


Figure 20: Activity diagram of Vendors

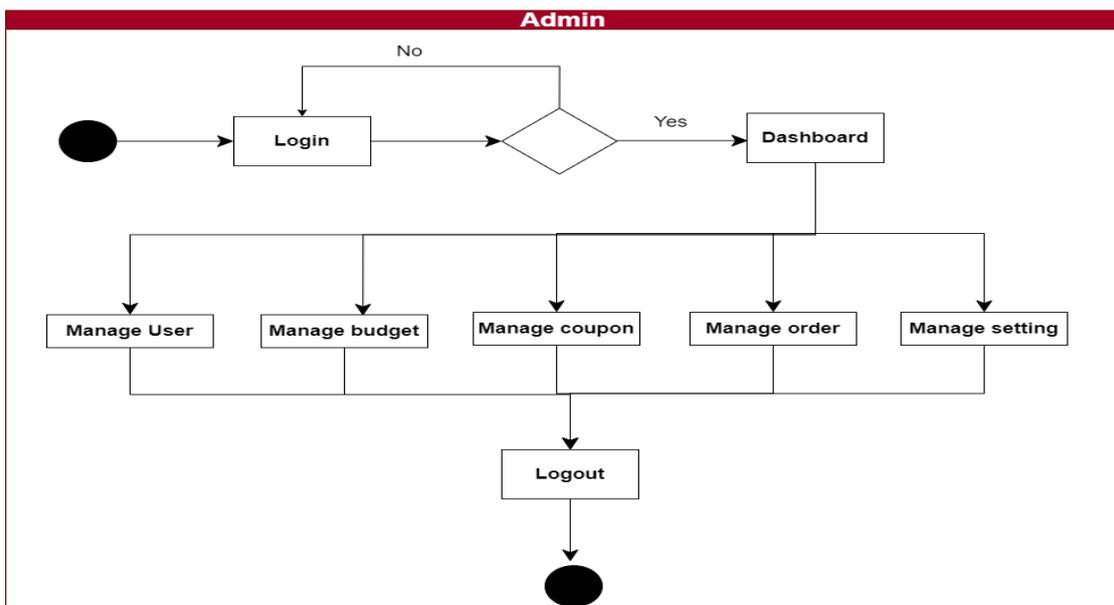


Figure 21: Activity diagram of Admin

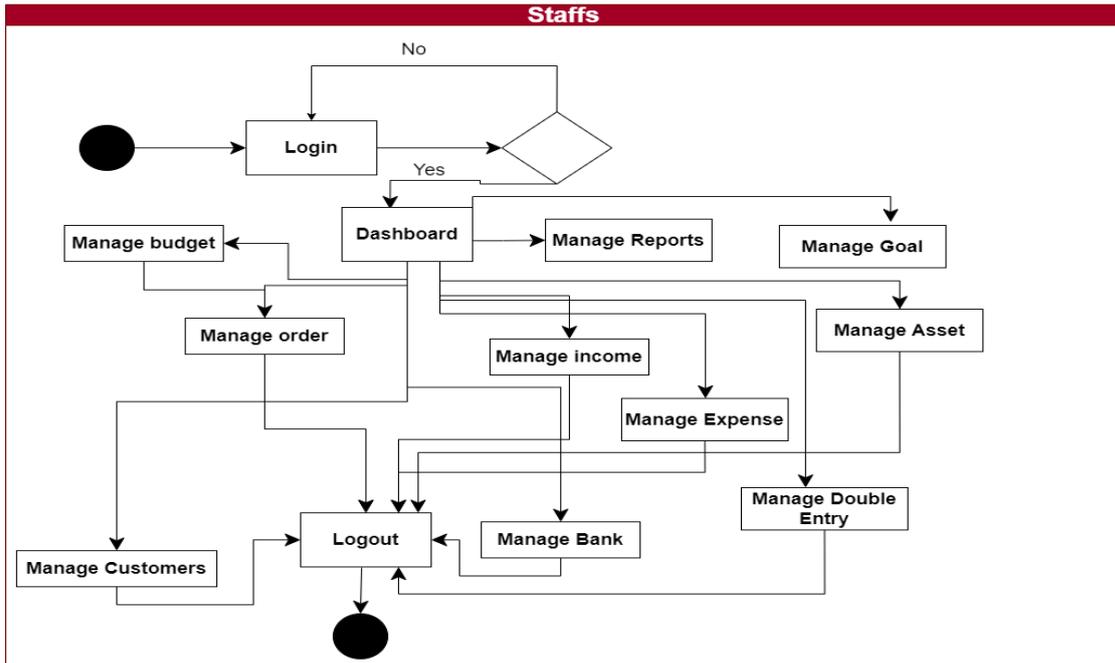


Figure 22: Activity diagram of Staffs

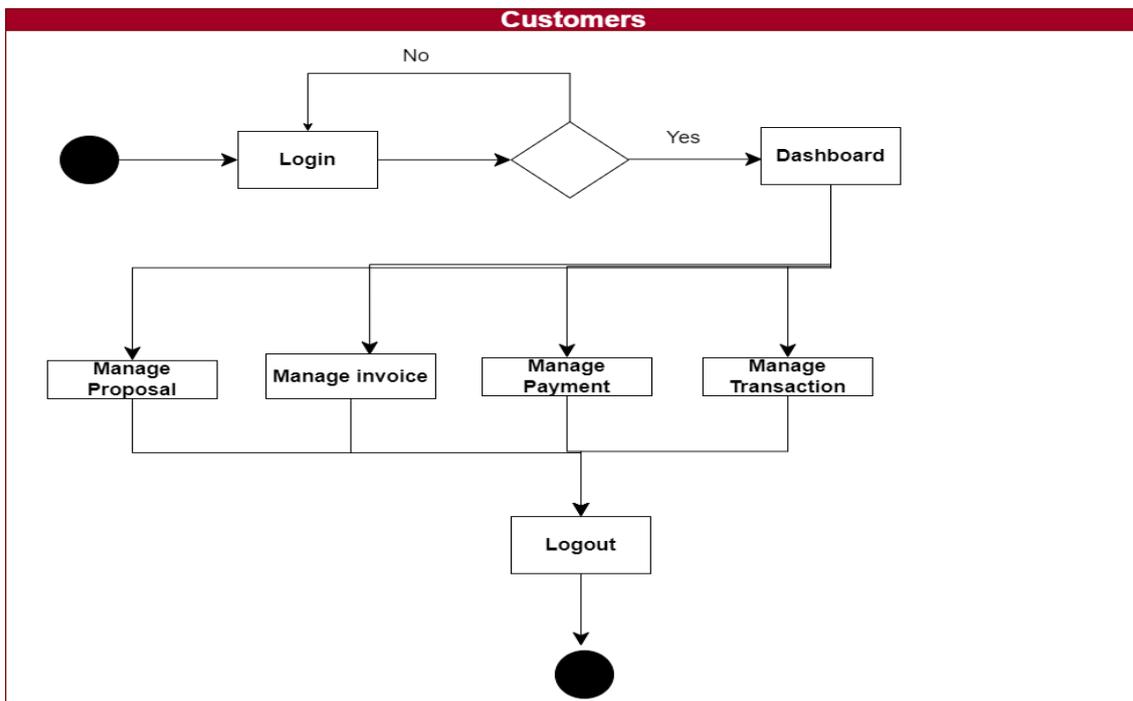


Figure 23: Activity diagram of Customers

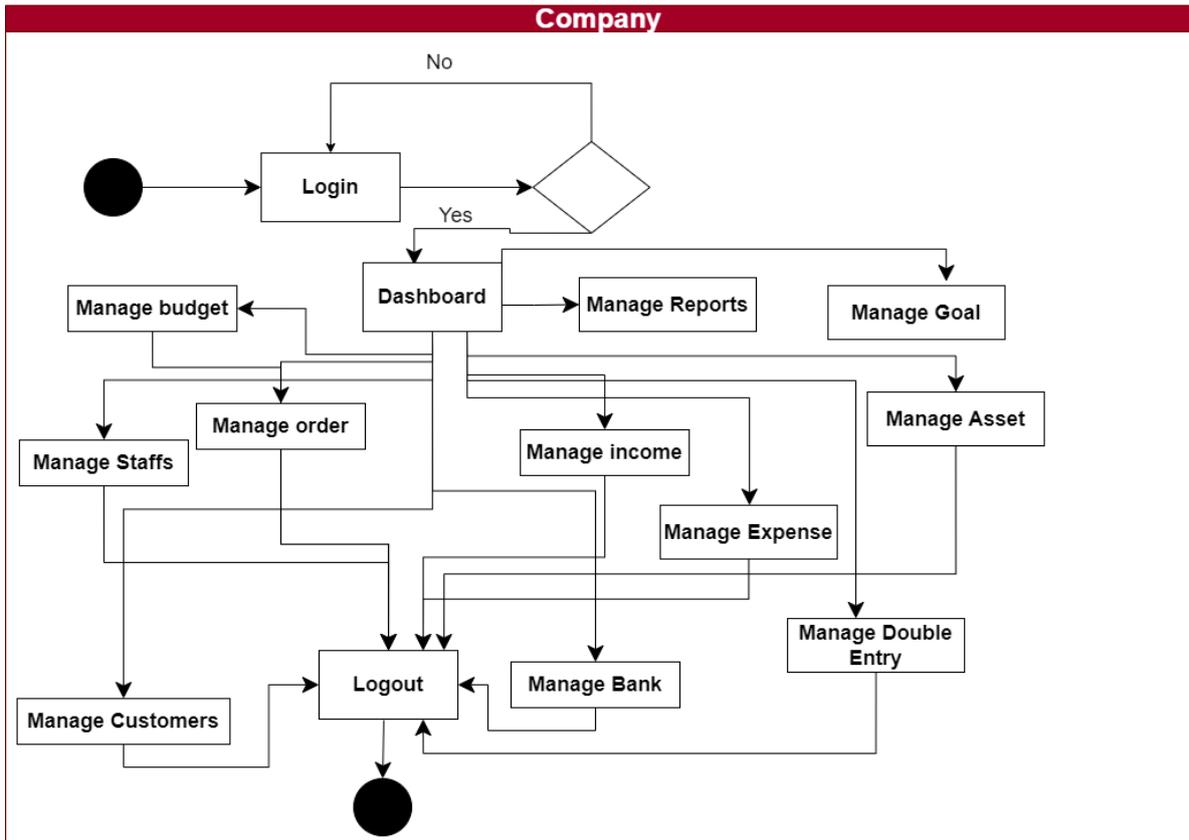


Figure 24: Activity diagram of Company

## 8.5 Requirements Catalog

A list of all the project's specific needs is called a requirement catalogue. Here, I'll add the identified needs in the appropriate format to the requirement catalog.

### User Authentication Requirement Catalog:

Source	Sign in	Priority	Requirements
Admin	All user	Must	M-01
<b>Functional Requirement</b>			
User System	Authentication	Admin will enroll all the user in the system & all user must have to use the given email address to sign in the system otherwise they will not able to access the system	

<b>Nonfunctional Requirements</b>			
<b>Description</b>	Target value	Acceptance value	comment
Login registration per day	20	15	

*Table 25: User authentication requirement*

### **Booking Proposal Requirement Catalog**

Source	Sign in	Priority	Requirements
Staff	All user	Must	M-02
<b>Functional Requirement</b>			
Proposal Booking	All the registered customer will be booking proposal and can view status of booking		
<b>Nonfunctional Requirements</b>			
<b>Description</b>	Target value	Acceptance value	comment
Proposal Booking status	20000	18500	

*Table 26: Proposal requirement catalog*

### Product stock and manage product

Source	Sign in	Priority	Requirements
Staffs	Staffs	Must	M-03
<b>Functional Requirement</b>			
<b>Product stock</b>	Staff can manage product stock and add proposal with stock report		
<b>Nonfunctional Requirements</b>			
<b>Description</b>	Target value	Acceptance value	comment
Stock per day or month	1000	650	/

*Table 27: Stock and managed products*

### Double entry system to manage accounting module:

Source	Sign in	Priority	Requirements
Staffs	Admin & Staffs	Must	M-04
<b>Functional Requirement</b>			
<b>Double entry</b>	Staff can manage journal, charts of accounts, balance sheet with report		
<b>Nonfunctional Requirements</b>			
<b>Description</b>	Target value	Acceptance value	comment
Export documents	500	350	

*Table 28: Double entry details*

**Eligibility transaction history and payment history management requirement catalog:**

Source	Sign in	Priority	Requirements
All users	All users	Must	M-05
<b>Functional Requirement</b>			
<b>History</b>	Staff and admin can manage transaction history and payment history customers can view those history.		
<b>Nonfunctional Requirements</b>			
Description	Target value	Acceptance value	Comment
payment notification	400	350	

*Table 29: Stock and managed products*

**Eligibility transaction history and payment history management requirement catalog:**

Source	Sign in	Priority	Requirements
All users	All users	Must	M-05
<b>Functional Requirement</b>			
<b>History</b>	Staff and admin can manage transaction history and payment history customers can view those history.		
<b>Nonfunctional Requirements</b>			
<b>Description</b>	Target value	Acceptance value	Comment
payment notification	400	350	

*Table 30: Eligibility transaction history*

**Budget plan management monthly, half yearly, yearly requirement catalog:**

Source	Sign in	Priority	Requirements
Admin	Admin and staff	Must	M-05
<b>Functional Requirement</b>			
<b>Budget plan</b>	Staff and admin can manage budget plans monthly, half yearly or yearly.		

Nonfunctional Requirements			
Description	Target value	Acceptance value	Comment
Budget plan panel dashboard	4000	3500	

*Table 31: Budget plan management*

### 8.6 Prioritized Requirements List (PRL)

I've created a priority list of the discovered needs using the MoSCoW prioritization approach. Below is the Smart ERP systems list of priorities for requirements.

**According to MoSCoW technique prioritized requirements are:**

**Must have**

SL	Requirement	Priority
01	Login for all users	Must
02	Manage Dashboard	Must
03	Create and manage Staffs, Customers, and Suppliers.	Must
04	Manage Products and services	Must
05	Manage proposal	Must
06	Manage income, invoice, revenue, expenses, bill, payment	Must
07	Manage reports	Must
08	Manage Assets	Must
09	Manage accounting system	Must

*Table 32: List of must have requirements*

**Should have:**

SL	Requirement	Priority
01	Manage Banking account and transactions	Should
02	Manage budget plan	Should
03	Manage goal	Should

*Table 33: List of should have requirements*

**Could have:**

SL	Requirement	Priority
01	Inventory management in invoice and bill	Could
02	Inventory management in invoice and bill	Could have
03	Manage Constant	Must

*Table 34: List of could have requirements*

### **8.7 Prototype of the new system**

Some Prototypes of the Smart ERP System are given here:

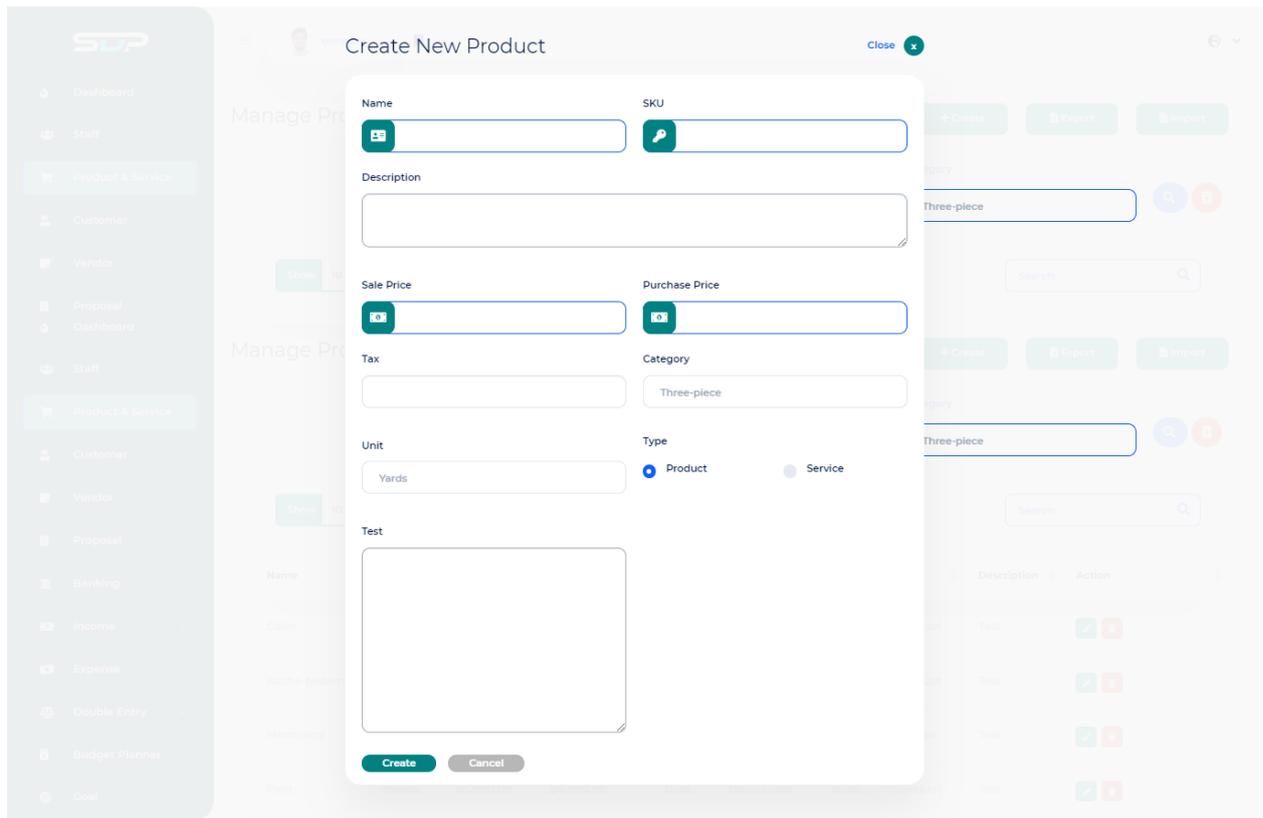


Figure 25: Prototype of create new product

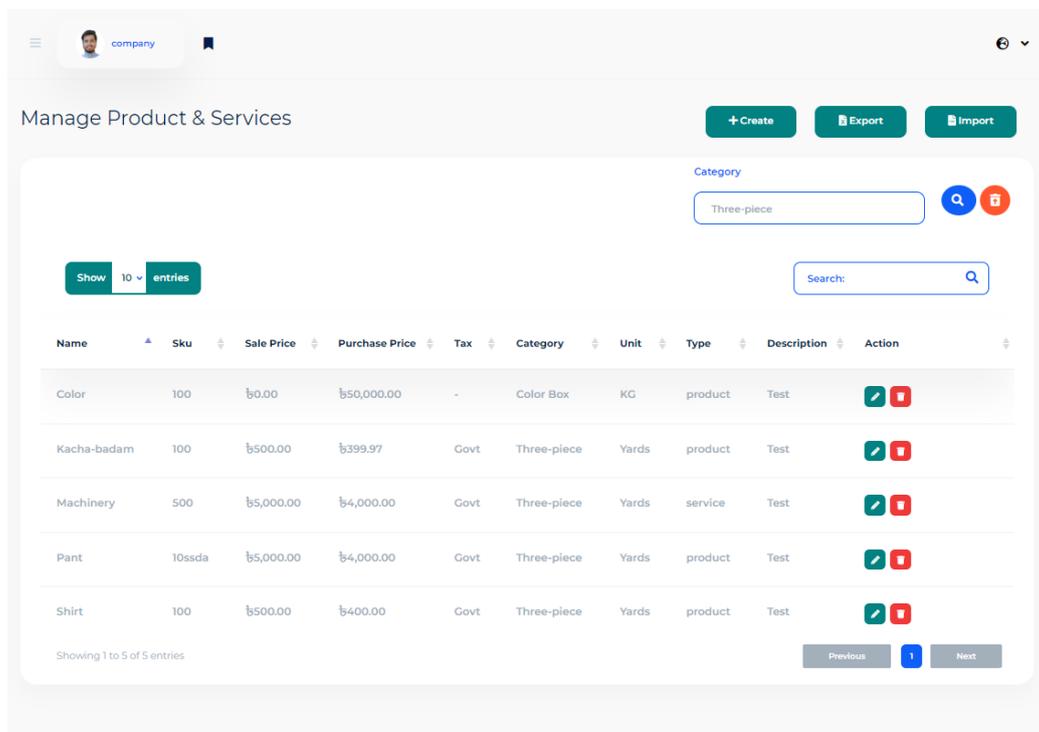


Figure 26: Prototype of manage products dashboard

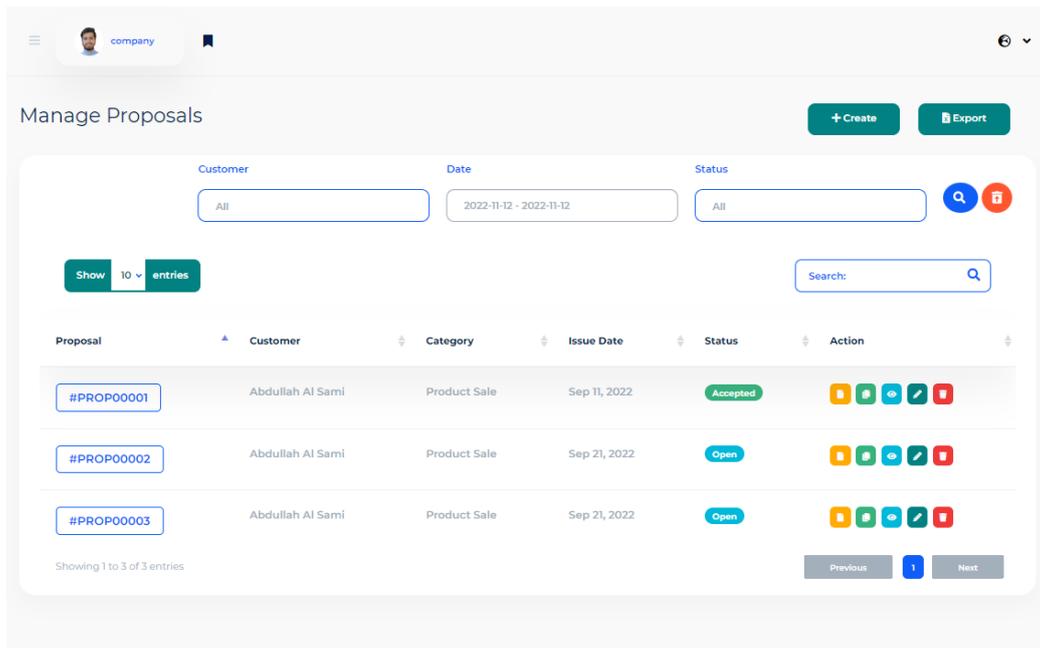


Figure 27: Prototype of manage proposal dashboard

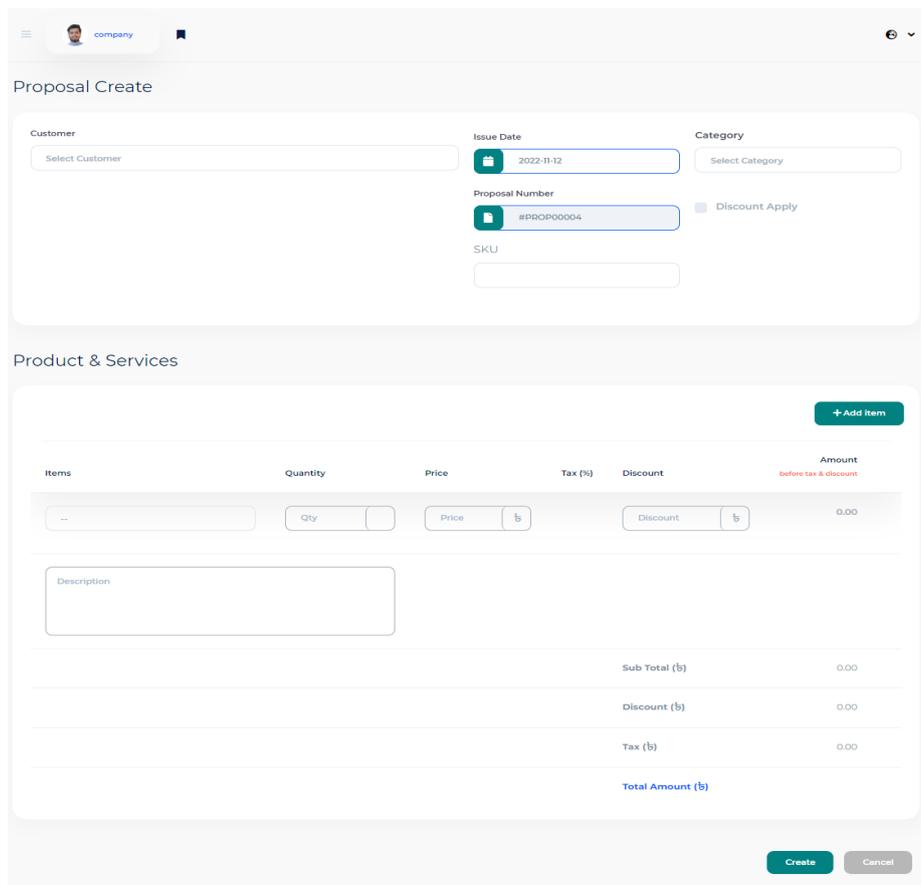


Figure 28: Prototype of product & services

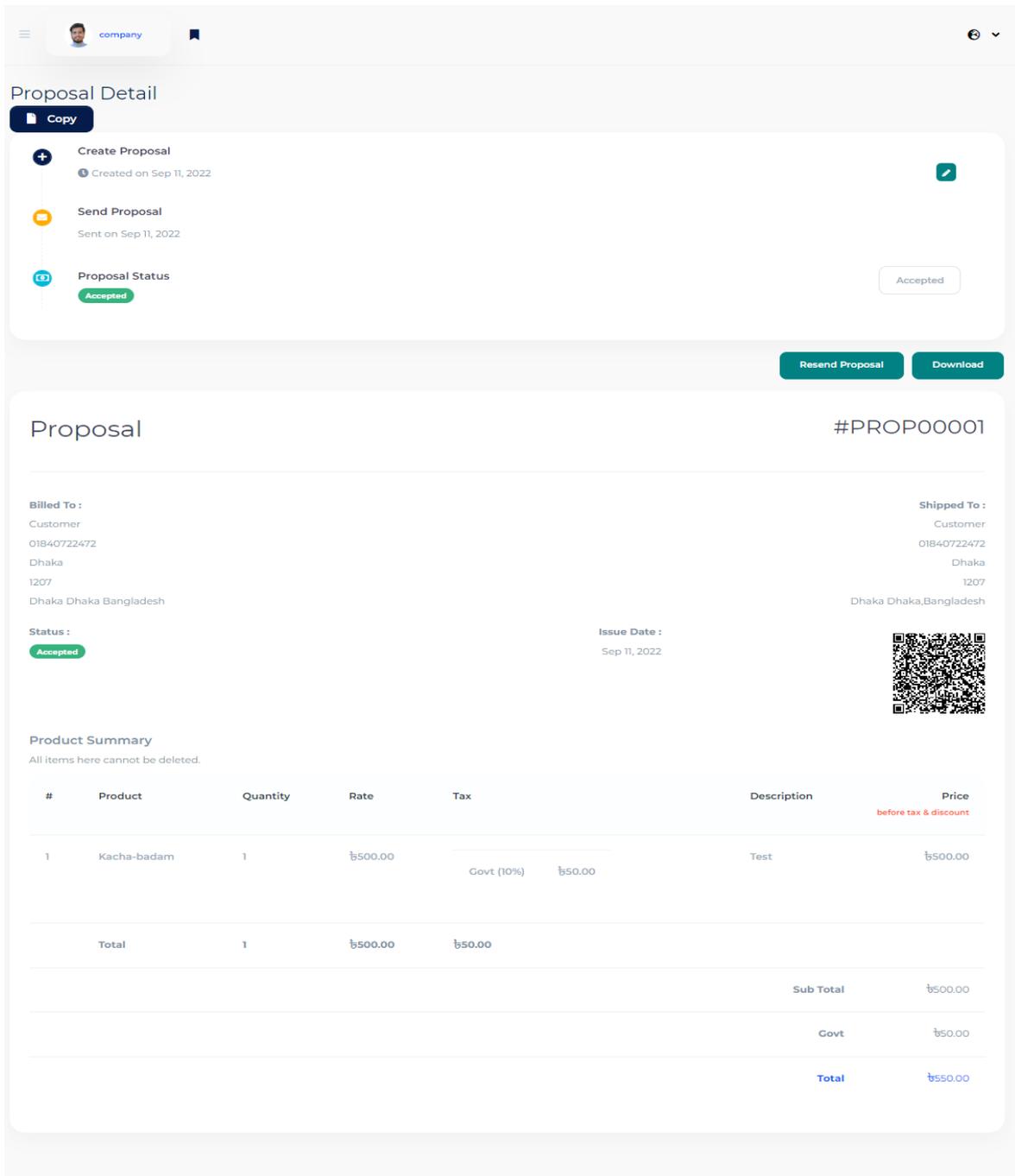


Figure 29: Prototype of proposal detail

Manage Chart of Accounts + Create

**Assets**

Code	Name	Type	Balance	Status	Action
120	Accounts Receivable	Current Asset	Dr. \$2,000.00	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
160	Computer Equipment	Fixed Asset	Cr. \$1,000.00	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
150	Office Equipment	Fixed Asset	Cr. \$1,000.00	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
140	Inventory	Inventory	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
887	Budget - Finance Staff	Bank & Cash	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
170	Accumulated Depreciation	Depreciation	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>

**Liabilities**

Code	Name	Type	Balance	Status	Action
200	Accounts Payable	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
205	Accruals	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
150	Office Equipment	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
855	Clearing Account	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
235	Employee Benefits Payable	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
236	Employee Deductions payable	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
255	Historical Adjustments	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
835	Revenue Received in Advance	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
260	Rounding	Current Liability	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>

**Expenses**

Code	Name	Type	Balance	Status	Action
800	Costs of Goods Sold	Direct Costs	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
600	Advertising	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
644	Automobile Expenses	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
684	Bad Debts	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
810	Bank Revaluations	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
605	Bank Service Charges	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
615	Consulting & Accounting	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
700	Depreciation	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
628	General Expenses	Expense	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>

**Income**

Code	Name	Type	Balance	Status	Action
460	Interest Income	Revenue	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
470	Other Revenue	Revenue	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
475	Purchase Discount	Revenue	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
400	Sales	Revenue	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>

**Equity**

Code	Name	Type	Balance	Status	Action
330	Common Stock	Equity	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
300	Owners Contribution	Equity	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
310	Owners Draw	Equity	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>
320	Retained Earnings	Equity	-	Enabled	<a href="#">-</a> <a href="#">+</a> <a href="#">x</a>

Figure 30: Prototype of manage chart of account

**Create Budget Planner**

Name:

Budget Period:

From:

To:

Category	January	February	March	April	May	June	July	August	September	October	November	December
<b>Income :</b>												
Maintenance Sales	<input type="text" value="0"/>											
Product Sale	<input type="text" value="0"/>											
<b>Total :</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Expense :</b>												
Rent Or Lease	<input type="text" value="0"/>											
Color box	<input type="text" value="0"/>											
<b>Total :</b>	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Figure 31: Prototype of budget planner

**Ledger Summary**

Start Date:

End Date:

Account:

Report: Ledger Summary

Duration: 2022-11-01 to 2022-11-30

Account Name: Accounts Receivable

Account Code: 120

Total Debit: ₺0.00

Total Credit: ₺0.00

Balance: Dr. ₺0.00

#	Transaction Date	Create At	Description	Debit	Credit	Balance
---	------------------	-----------	-------------	-------	--------	---------

Figure 32: Prototype of ledger summary

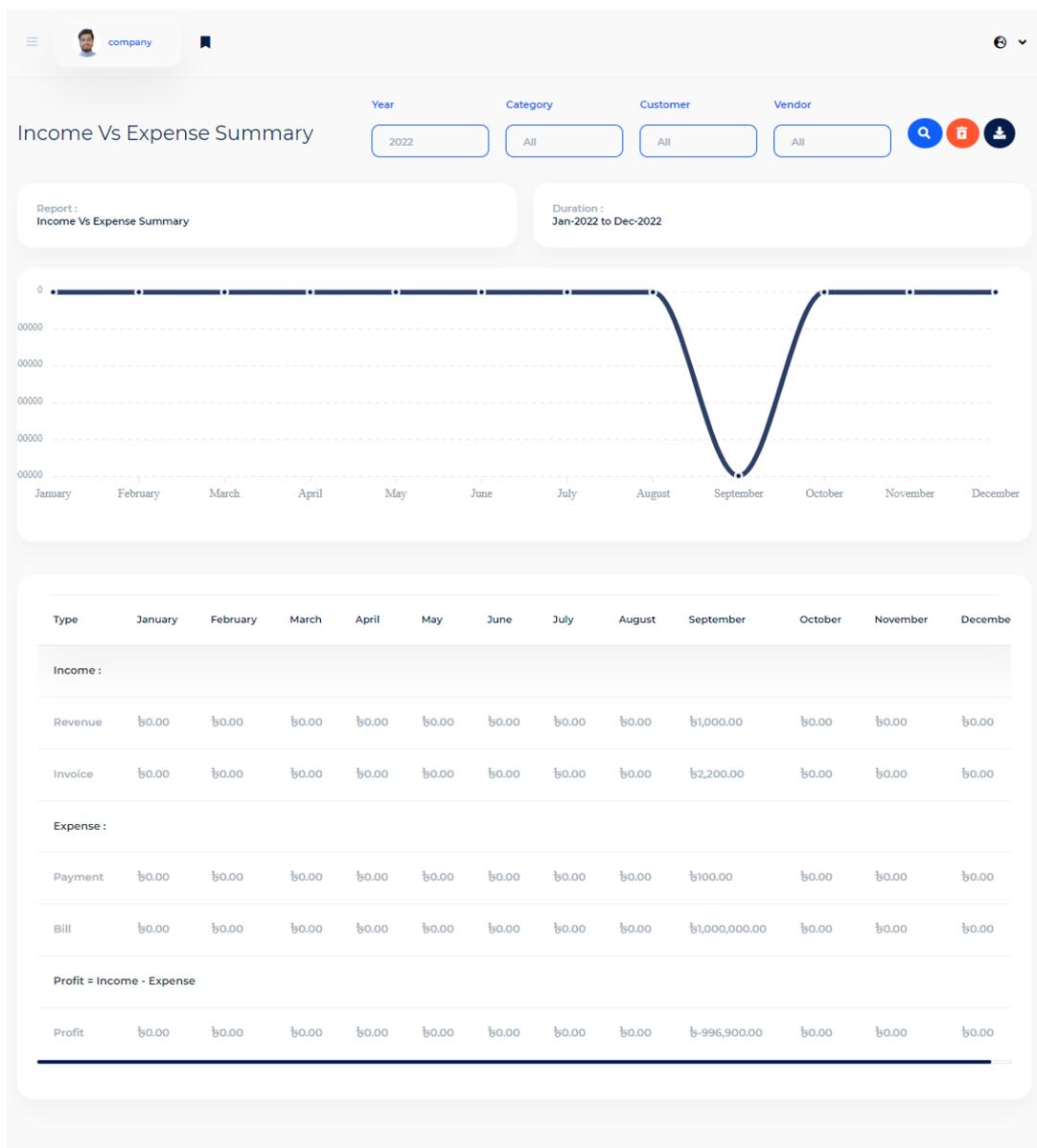


Figure 33: Prototype of income vs expense summary

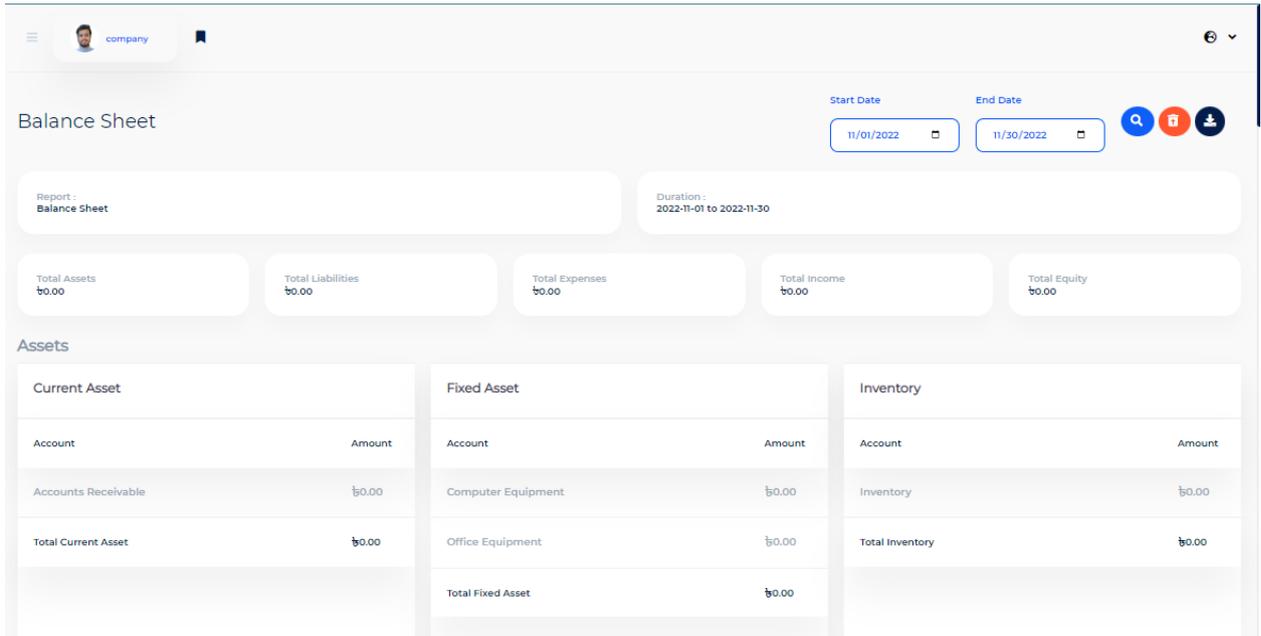


Figure 34: Prototype of balance sheet

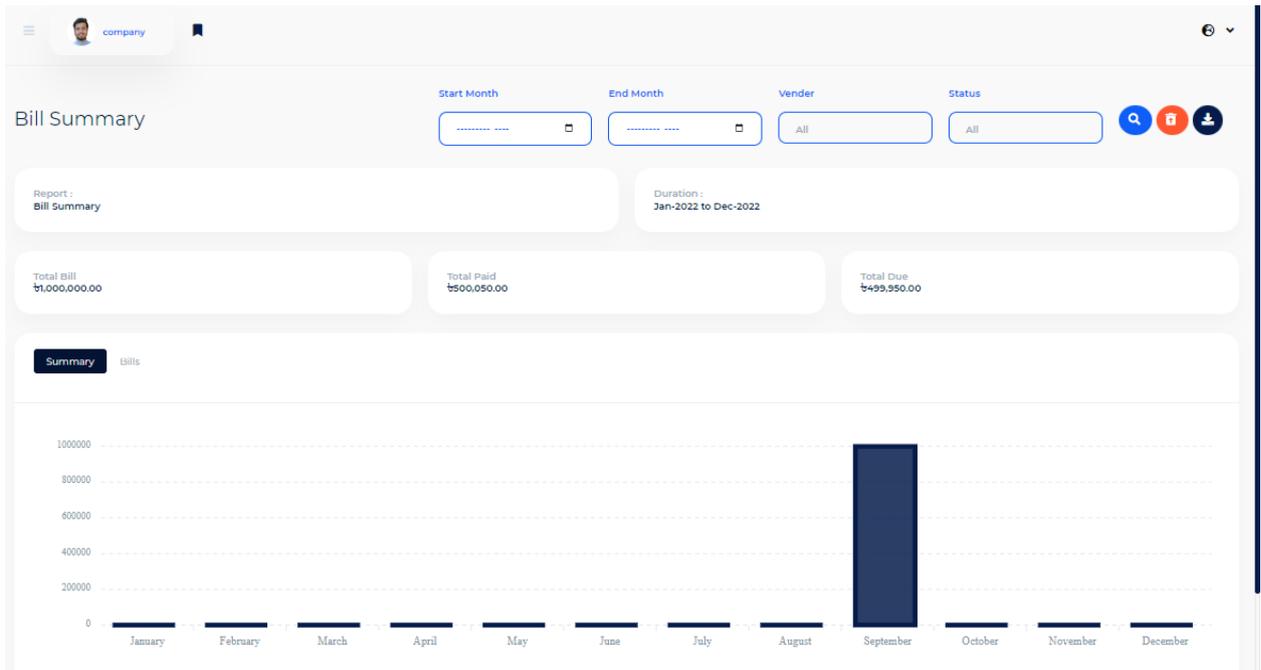
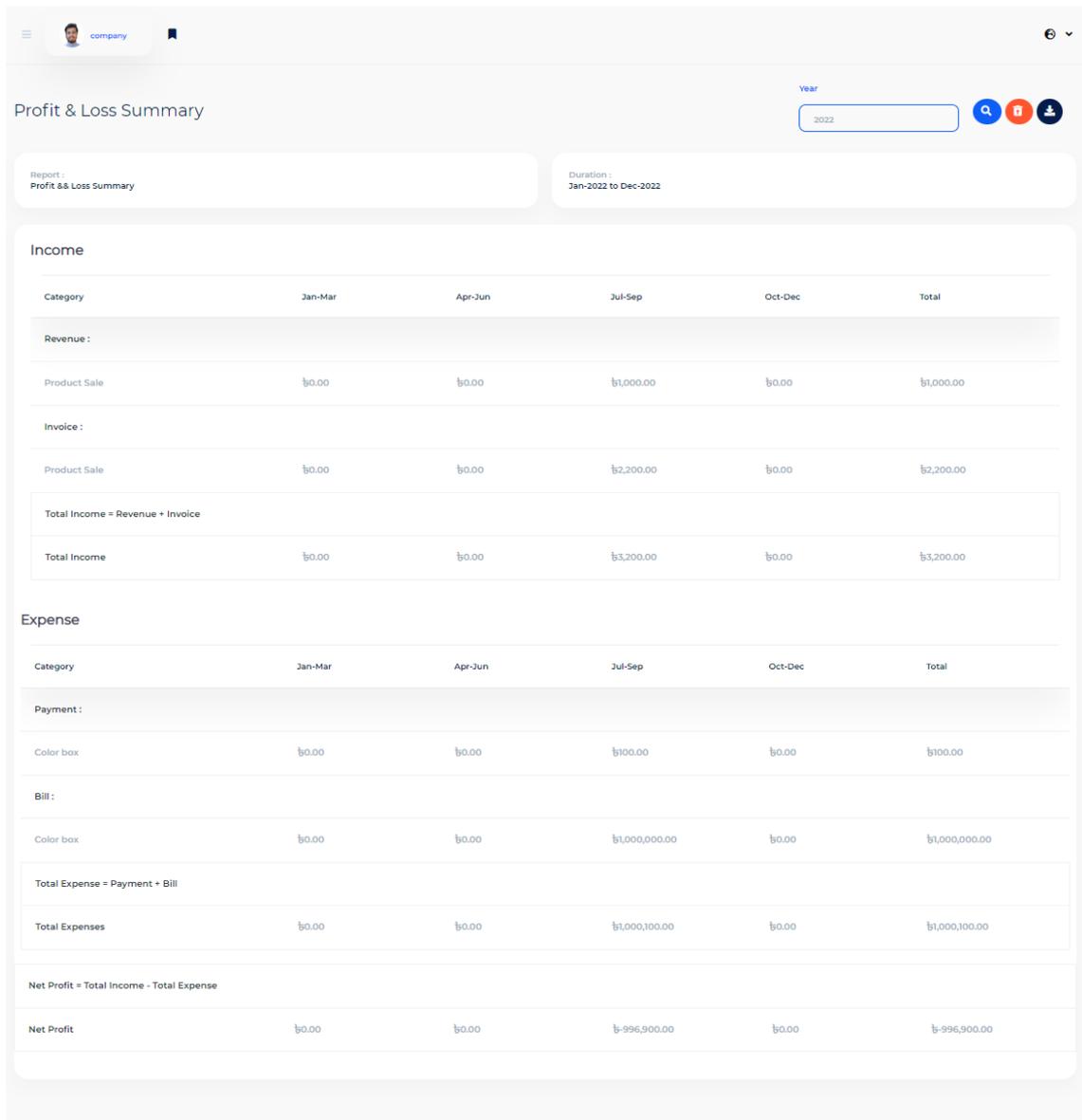


Figure 35: Prototype of bill summary



*Figure 36: Prototype of profit & loss summary*

## Chapter 9 – Engineering

### 9.1 New System Modules

The new Smart ERP system is constructed of many modules. Now I'll go through some of the system's important modules and how they function.

#### Login Module:

SL	User Action	SL	System action
1	User click on the Smart ERP system website link	1	The user will get a login form
2	User will have to provide a login credentials	2	The user validates with email & password
3	User will click on login button	3	If user authentication validates it will redirect to the home page. If any information is invalid it will show an error message.

*Table 35: List of login modules*

**Banking Module:**

SL	User Action	SL	System action
1	There are two modules Account and transfer users click on banking they can view amounts and can transfer.	1	The user will get a transfer form
2	Staff will have to provide a bank details	2	The user validates and provides details with a new bank account of the bank..
3	Staff can manage account with transaction history	3	Staff can manage the bank's history and generate print. Transfer amount one to another account.

*Table 36: List of banking modules*

**Booking proposal Module:**

SL	User Action	SL	System action
1	Staff or Customer click on proposal the Smart ERP system Navbar	1	The user will get a proposal form
2	Staff or Customer will have to provide a booking detail	2	The user validates and provides details with add new items.
3	Customer can view booking status	3	Staff can update status of booking details with sending, invoice, accepted, pending and customer can view status of booking details.

*Table 37: List of booking proposal modules*

**Budget plan Module:**

SL	User Action	SL	System action
1	Staff or admin click on budget plan the Smart ERP system Navbar	1	The user will get a budget plan form

2	Staff or admin will have to provide a budget plan details.	2	The user adds value and manages monthly , half yearly or yearly amounts .
3	Users can manage budget period	3	Staff can update the budget period and can manage plans.

Table 38: List of budget plan modules

**Double entry Module:**

SL	User Action	SL	System action
1	Staff click on Double entry of the Smart ERP system Navbar	1	The user will get various types of accounting modules.
2	Staff will have to provide a chart of account details.	2	Staff can manage the balance sheet. Journal, Trial Balance, Ledger summary.
3	Users can manage Ledger summary	3	Staff can manage summary with duration and balance.

Table 39: List of double entry modules

## 9.2 Use Case Diagram of the Smart ERP system

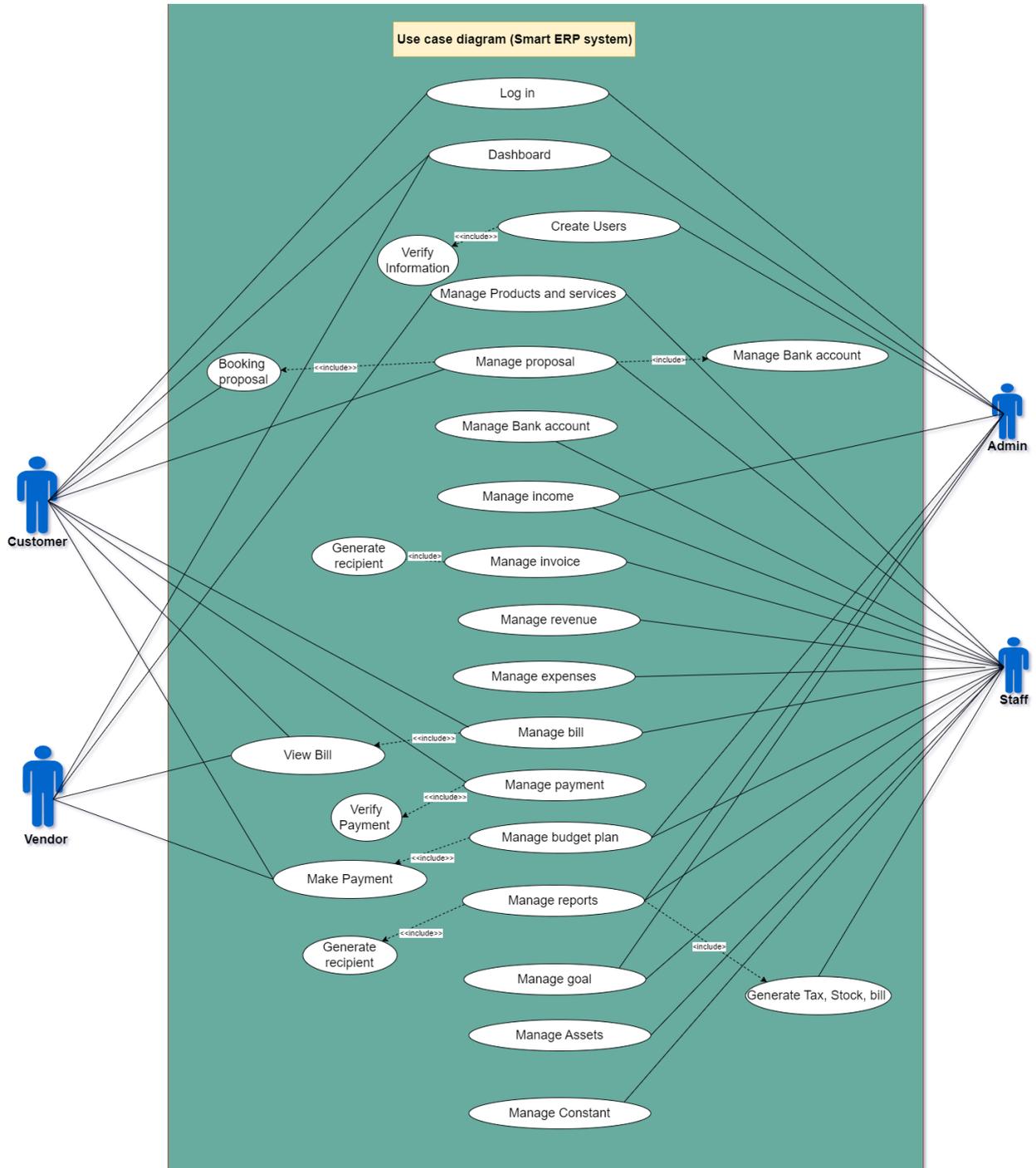


Figure 37: Use case diagram of Smart ERP system

### 9.3 Class Diagram of the BBSMS

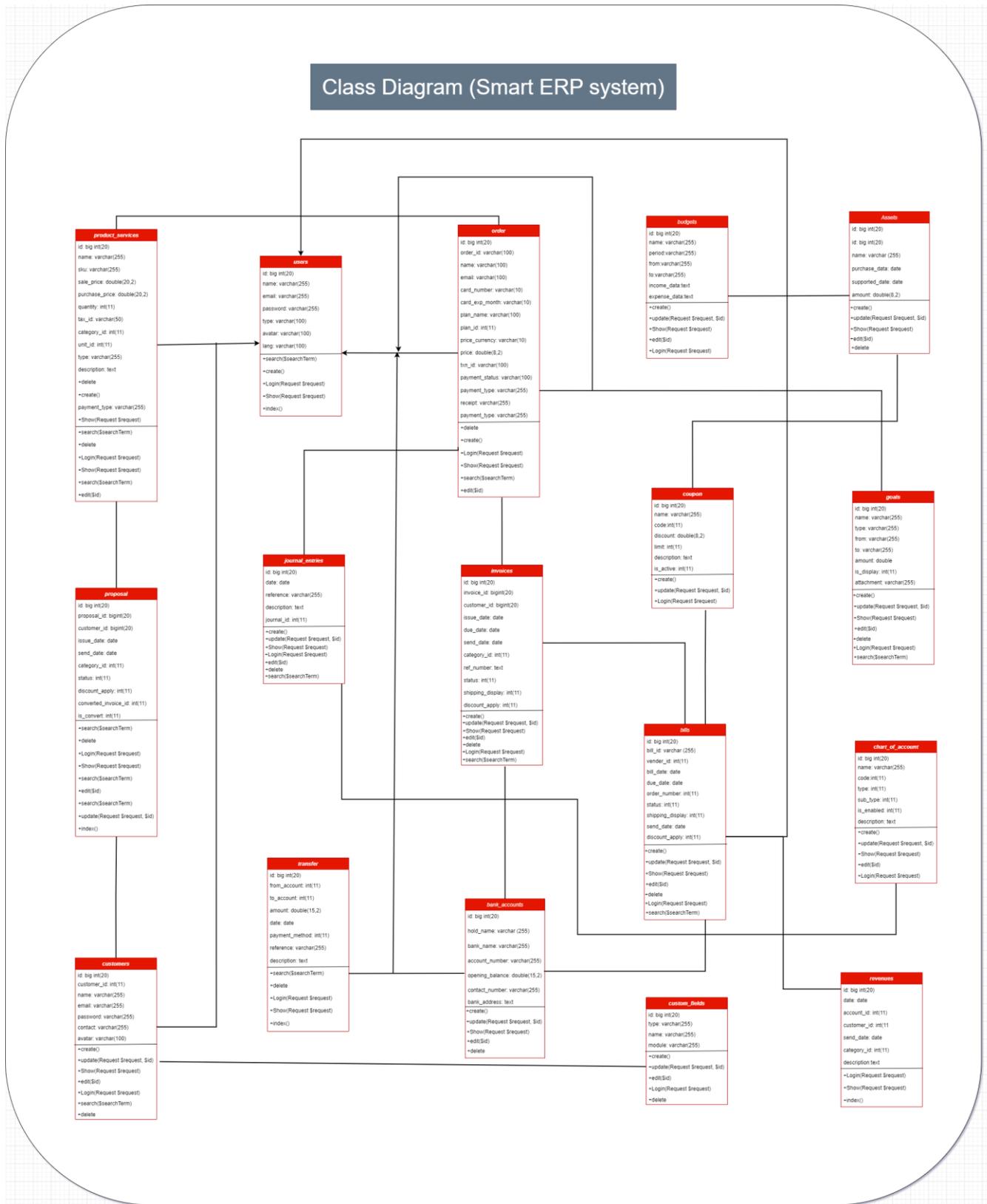


Figure 38: Class diagram of Smart ERP system



## 9.5 Sequence Diagram

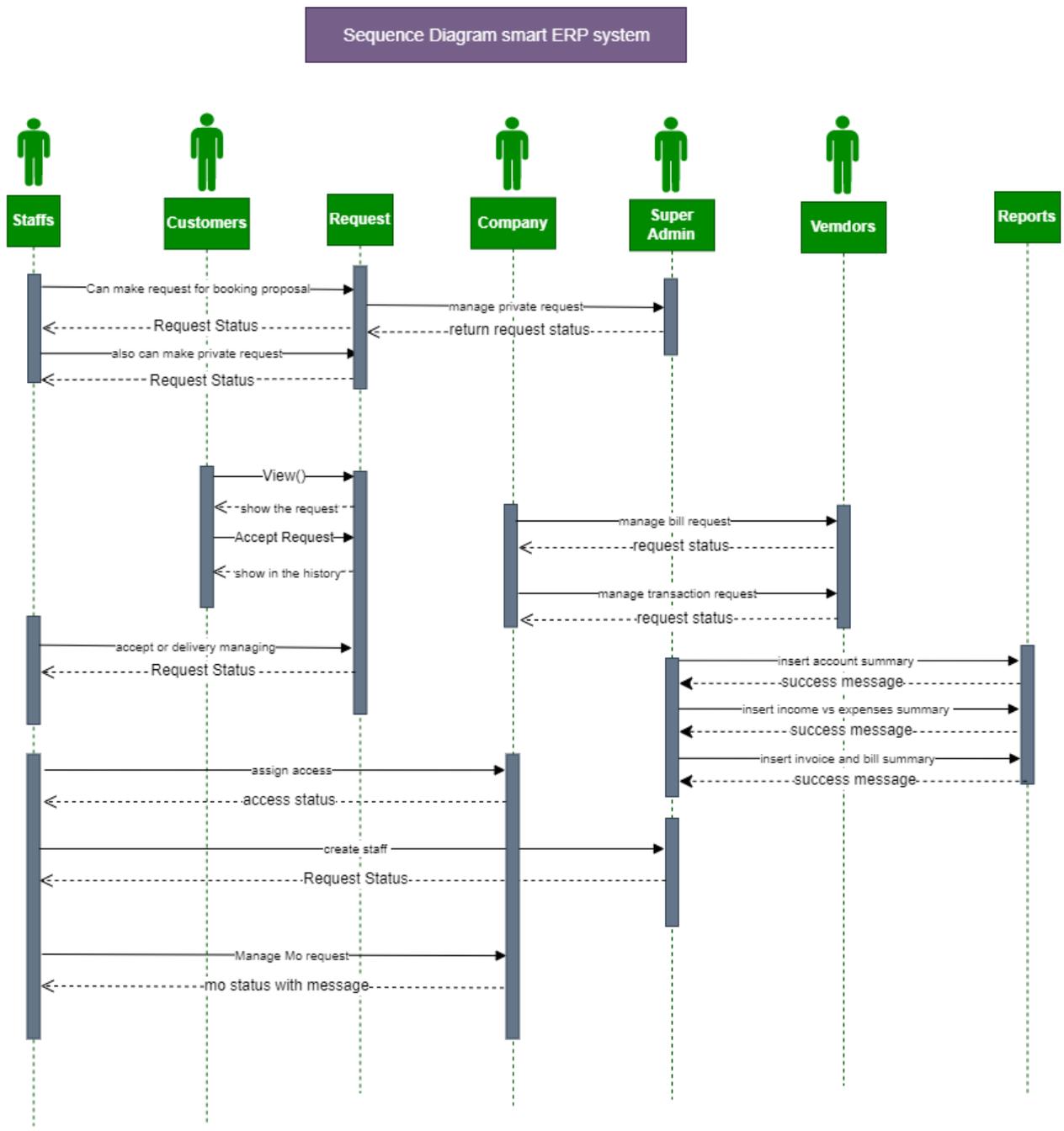


Figure 40: Sequence diagram of Smart ERP system

## 9.6 Component Diagram of the BBSMS

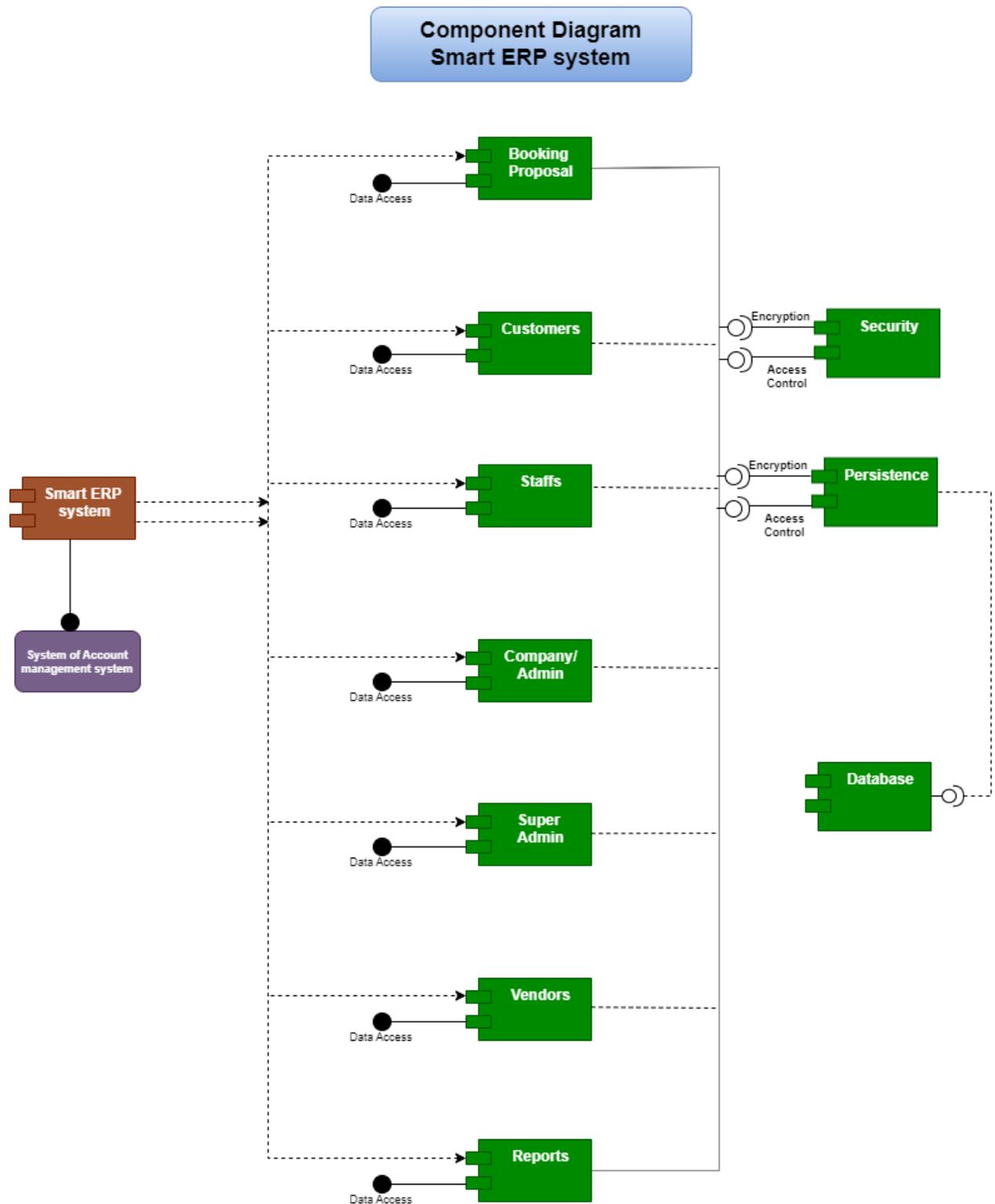


Figure 41: Component diagram of Smart ERP system

## 9.7 Deployment Diagram

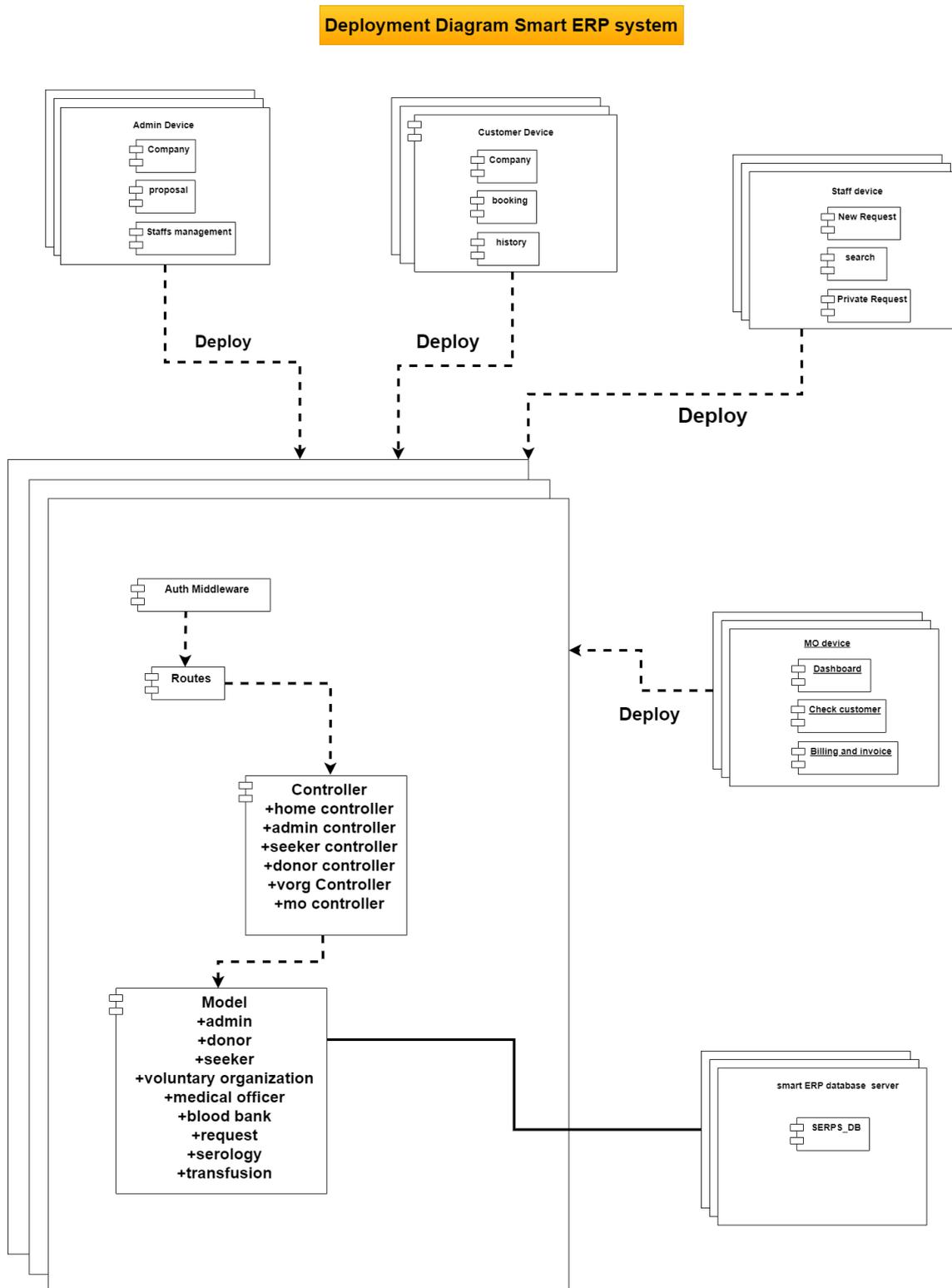


Figure 42: Deployment diagram of Smart ERP system

## 9.8 System Interface Design

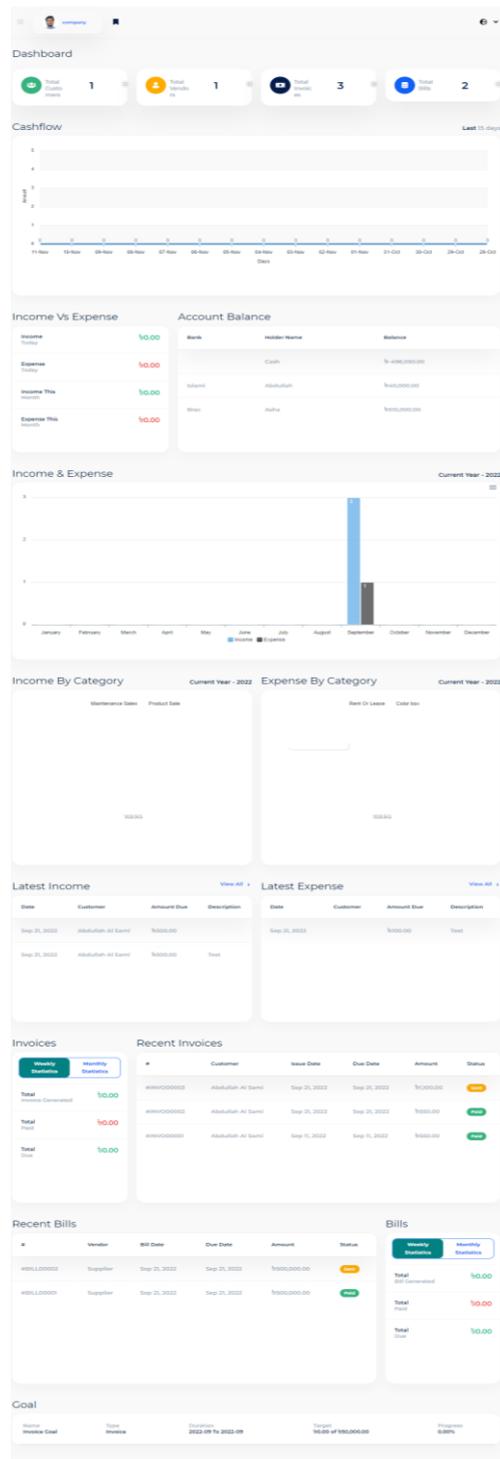


Figure 43: Dashboard of Smart ERP system

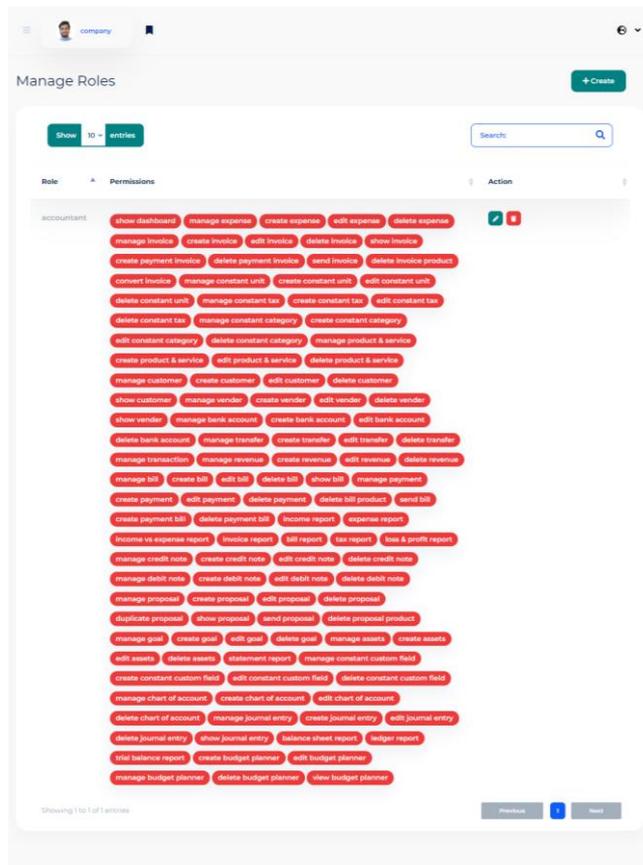


Figure 44: Manage roles of Smart ERP system

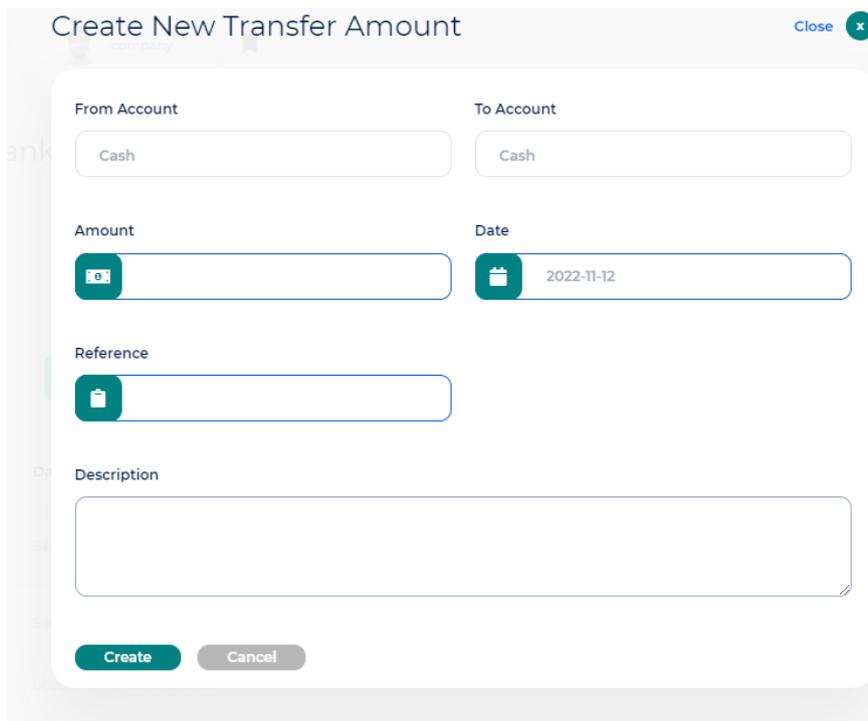


Figure 45: Prototype of new transfer amount

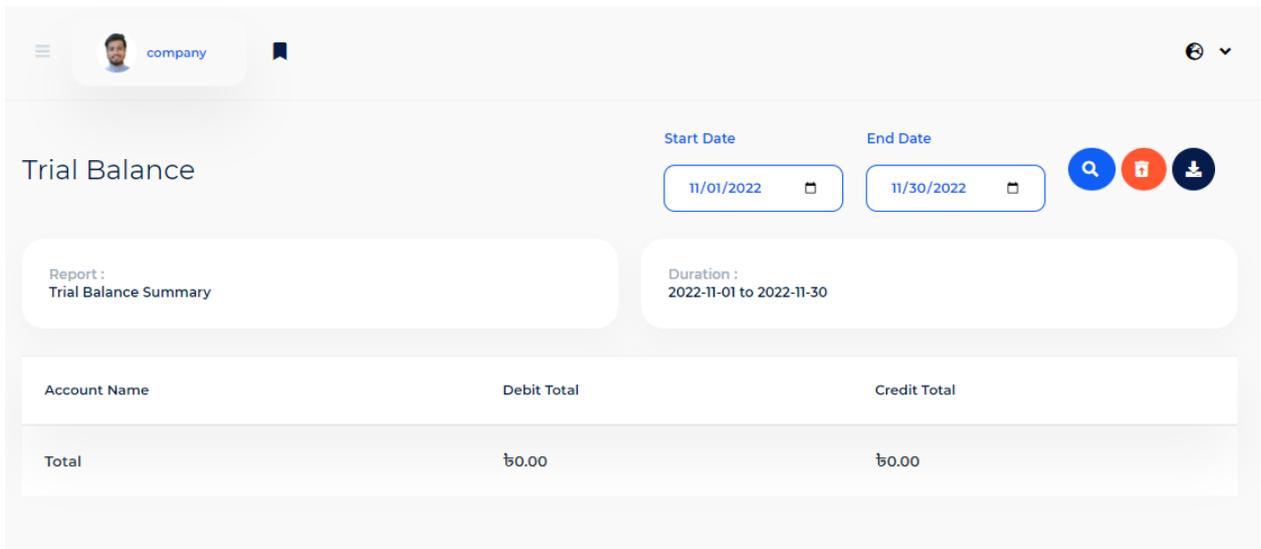


Figure 46: Prototype of trail balance

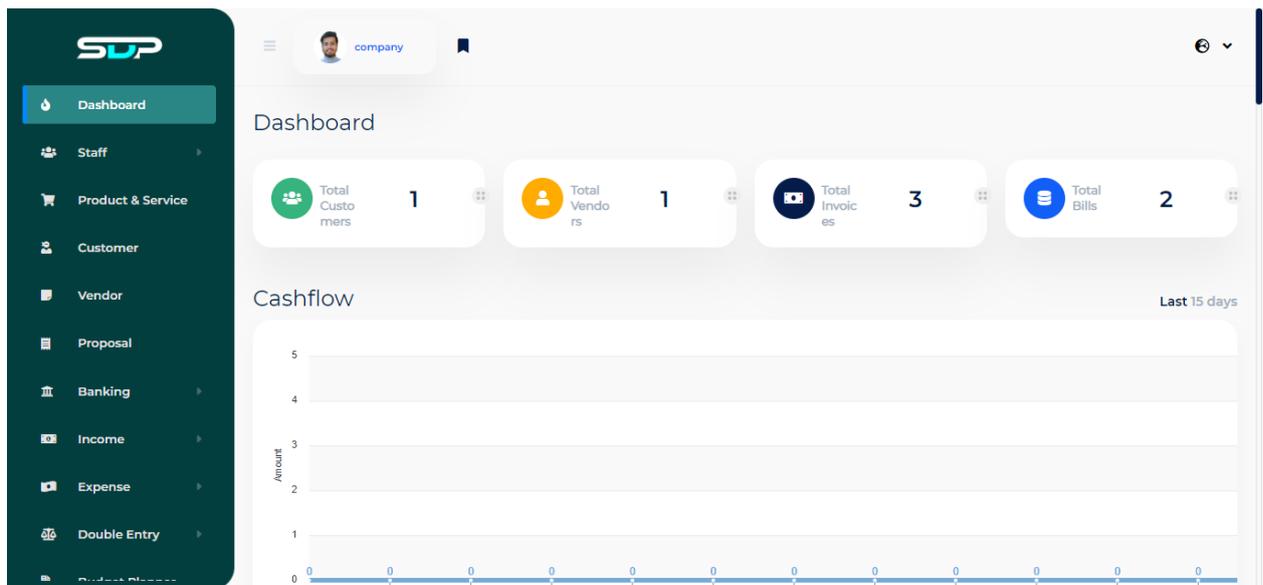


Figure 47: Prototype of admin dashboard

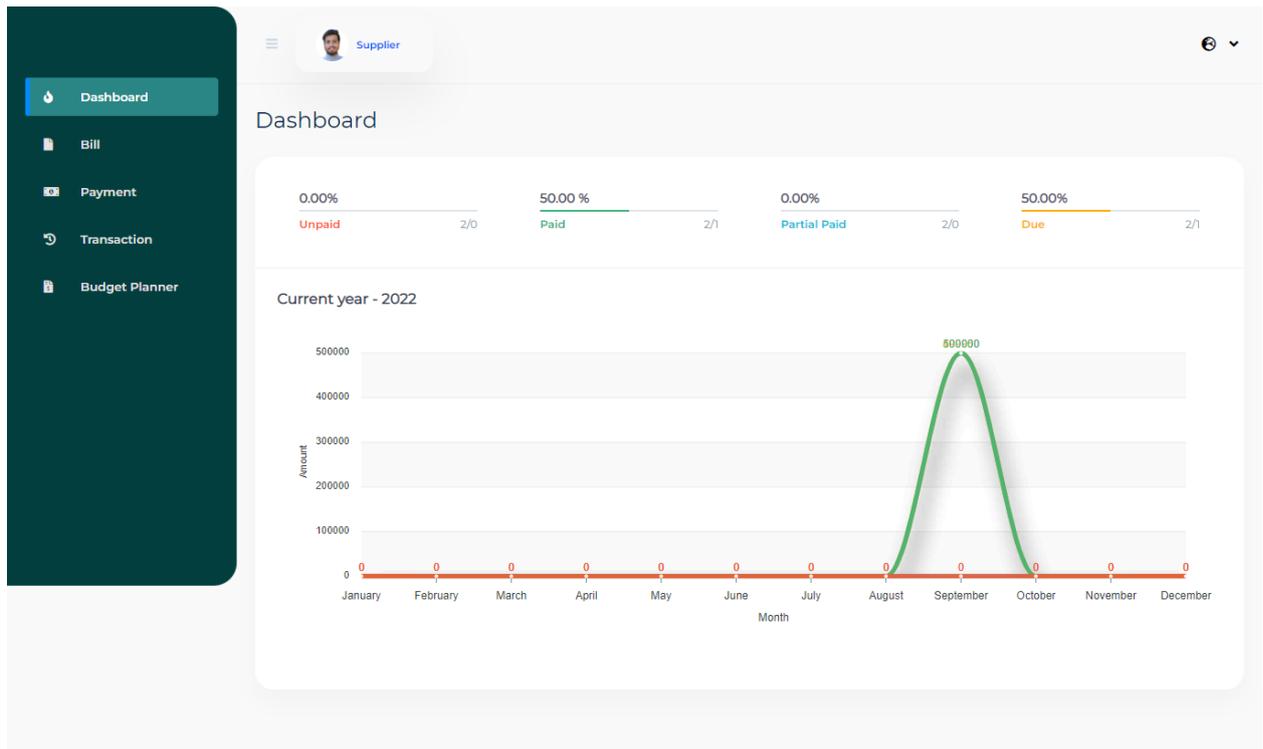


Figure 48: Prototype of profit by year

Transaction

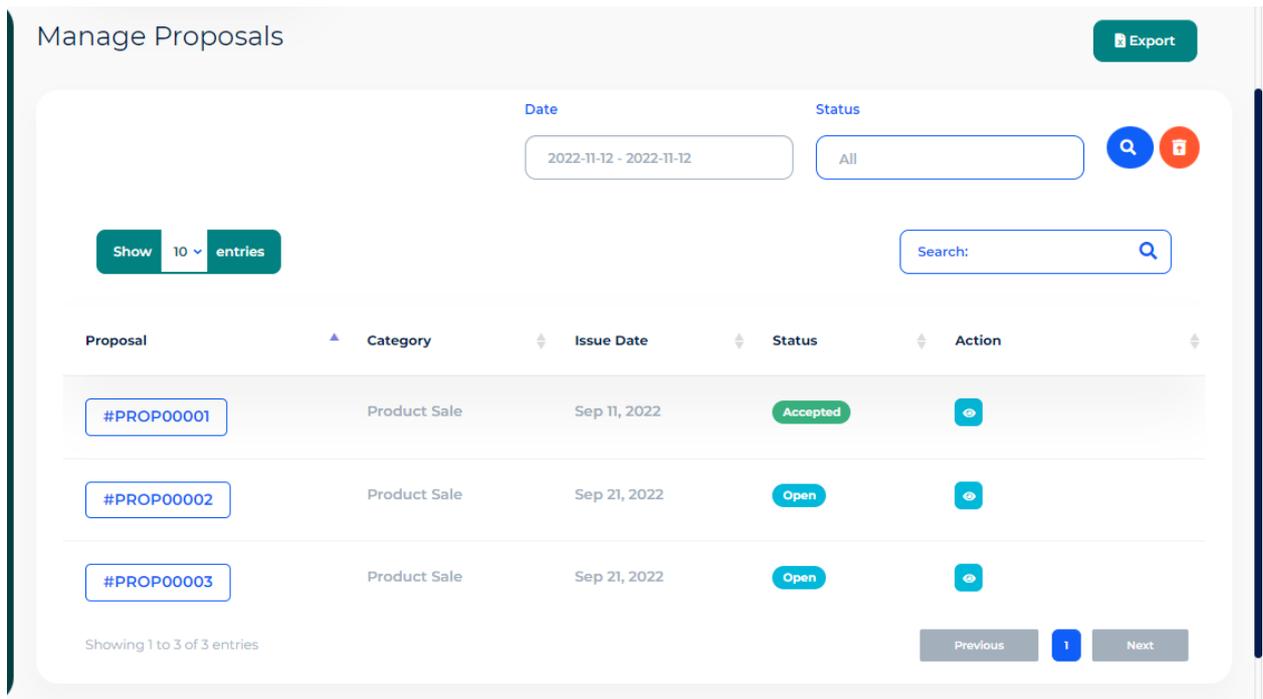
Date: 2022-11-12 - 2022-11-12 | Category: All

Show 10 entries | Search:

Date	Amount	Account	Type	Category	Description
Sep 21, 2022	₹500,000.00	Cash	Partial	Bill	Test
Sep 21, 2022	₹100.00	Cash	Payment	Color box	Test

Showing 1 to 2 of 2 entries | Previous 1 Next

Figure 49: Prototype of transaction



*Figure 50: Prototype of proposal requests*

## Chapter 10 – Deployment

### 10.1 Core Module Coding Sample

jQuery, JavaScript, CSS, HTML5, and Bootstrap were the skills I utilized to construct the Smart ERP system's front end. Additionally, PHP Laravel 8.54 was used to design the back end, with MySQL serving as the database management system. The most important coding examples are the ones listed below:

#### Login sample for the users:

```
@section('content')
<div class="login-contain">
  <div class="login-inner-contain">
    <a class="navbar-brand" href="#">
      
      
    </a>
    <div class="login-form">
      <ul class="login-menu">
        <li class="blue-login"><a href="{{ route('login') }}">{{ __('User Login') }}</a></li>
        <li class="gray-login"><a href="{{ route('customer.login') }}">{{ __('Customer Login') }}</a></li>
        <li class="gray-login"><a href="{{ route('vendor.login') }}">{{ __('Vendor Login') }}</a></li>
      </ul>
      <div class="page-title"><h5><span>{{ __('User') }}</span> {{ __('Login') }}</h5></div>
      {{ Form::open(array('route' => 'login', 'method' => 'post', 'id' => 'loginForm' )) }}
      @csrf
      <div class="form-group">
        <label for="email" class="form-control-label">{{ __('Email') }}</label>
        <input class="form-control @error('email') is-invalid @enderror" id="email" type="email" name="email" />
        @error('email')
        <div class="invalid-feedback" role="alert">{{ $message }}</div>
        @enderror
      </div>
    </div>
  </div>
</div>
```

Figure 51: Phpstorm project code of users

```

if($user->type == 'company')
{
    $free_plan = Plan::where('price', '=', '0.0')->first();
    if($user->plan != $free_plan->id)
    {
        if(date('format: 'Y-m-d') > $user->plan_expire_date)
        {
            $user->plan = $free_plan->id;
            $user->plan_expire_date = null;
            $user->save();

            $users = User::where('created_by', '=', \Auth::user()->creatorId()->get());
            $customers = Customer::where('created_by', '=', \Auth::user()->creatorId()->get());
            $vendors = Vender::where('created_by', '=', \Auth::user()->creatorId()->get());

            if($free_plan->max_users == -1)
            {
                foreach($users as $user)
                {
                    $user->is_active = 1;
                    $user->save();
                }
            }
            else
            {

```

Figure 52: Phpstorm project code of plans

**Proposal code:**

```

@extends('layouts.admin')
@section('page-title')
    {{__('Manage Proposals')}}
@endsection

@section('action-button')
    @can('create proposal')
        <div class="col-xl-2 col-lg-2 col-md-4 col-sm-6 col-12 pt-lg-3 pt-xl-2">
            <div class="all-button-box">
                <a href="{{ route('proposal.create',0) }}" class="btn btn-xs btn-white btn-icon-only width-auto">
                    <i class="fa fa-plus"></i> {{__('Create')}}
                </a>
            </div>
        </div>
    @endcan

    <div class="col-xl-2 col-lg-2 col-md-4 col-sm-6 col-12 pt-lg-3 pt-xl-2">
        <div class="all-button-box">
            <a href="{{ route('proposal.export') }}" class="btn btn-xs btn-white btn-icon-only width-auto">
                <i class="fa fa-file-excel"></i> {{__('Export')}}
            </a>
        </div>
    </div>
@endsection

@section('content')
    <div class="row">

```

Figure 53: Phpstorm project code of proposal

## Product and service code:

```
@extends('layouts.admin')
@section('page-title')
    {{ __('Manage Product & Services') }}
@endsection

@section('action-button')
    <div class="row d-flex justify-content-end">
        @can('create product & service')
            <div class="col-xl-2 col-lg-2 col-md-4 col-sm-6 col-6 pt-lg-3 pt-xl-2">
                <div class="all-button-box">
                    <a href="#" class="btn btn-xs btn-white btn-icon-only width-auto"
                        data-url="{{ route('productservice.create', 0) }}" data-ajax-popup="true"
                        data-title="{{ __('Create New Product') }}">
                        <i class="fa fa-plus"></i> {{ __('Create') }}
                    </a>
                </div>
            </div>
        @endcan
        <div class="col-xl-2 col-lg-2 col-md-4 col-sm-6 col-6 pt-lg-3 pt-xl-2">
            <div class="all-button-box">
                <a href="{{ route('productservice.export') }}" class="btn btn-xs btn-white btn-icon-only width-aut
                    <i class="fa fa-file-excel"></i> {{ __('Export') }}
                </a>
            </div>
        </div>
    </div>

```

Figure 54: Phpstorm project code of service

```
public function index(Request $request)
{
    if (\Auth::user()->can('manage proposal')) {
        $customer = Customer::where('created_by', '=', \Auth::user()->creatorId()->get()->pluck('name', 'id')
        $customer->prepend('ALL', '');
        $status = Proposal::$statuses;
        $query = Proposal::where('created_by', '=', \Auth::user()->creatorId());
        if (!empty($request->customer)) {
            $query->where('id', '=', $request->customer);
        }
        if (!empty($request->issue_date)) {
            $date_range = explode(' - ', $request->issue_date);
            $query->whereBetween('issue_date', $date_range);
        }
        if (!empty($request->status)) {
            $query->where('status', '=', $request->status);
        }
        $proposals = $query->get();
        return view('proposal.index', compact('proposals', 'customer', 'status'));
    }
}
```

Figure 55: Phpstorm project code of managing proposal

## Bank account code:

```
<thead>
<tr>
<th> {{__('Name')}}</th>
<th> {{__('Bank')}}</th>
<th> {{__('Account Number')}}</th>
<th> {{__('Current Balance')}}</th>
<th> {{__('Contact Number')}}</th>
<th> {{__('Bank Branch')}}</th>
@if(Gate::check('edit bank account') || Gate::check('delete bank account'))
<th> {{__('Action')}}</th>
@endif
</tr>
</thead>

<tbody>
@foreach ($accounts as $account)
<tr class="font-style">
<td>{{ $account->holder_name}}</td>
<td>{{ $account->bank_name}}</td>
<td>{{ $account->account_number}}</td>
<td>{{ \Auth::user()->priceFormat($account->opening_balance)}}</td>
<td>{{ $account->contact_number}}</td>
<td>{{ $account->bank_address}}</td>
@if(Gate::check('edit bank account') || Gate::check('delete bank account'))
<td class="Action">
```

Figure 56: Phpstorm project code of bank account

```
public function index()
{
    if(\Auth::user()->can(abilities: 'create bank account'))
    {
        $accounts = BankAccount::where('created_by', '=', \Auth::user()->creatorId()->get());

        return view('bankAccount.index', compact( var_name: 'accounts'));
    }
    else
    {
        return redirect()->back()->with('error', __( key: 'Permission denied.));
    }
}

public function create()
{
    if(\Auth::user()->can(abilities: 'create bank account'))
    {
        $customFields = CustomField::where('created_by', '=', \Auth::user()->creatorId()->where('module', '
        return view('bankAccount.create', compact( var_name: 'customFields'));
    }
    else
    {
        return response()->json(['error' => __( key: 'Permission denied.)], status: 401);
    }
}
```

Figure 57: Phpstorm project code of bank account

## Invoice code:

```
@extends('layouts.admin')
@section('page-title')
    {{ __('Manage Invoices') }}
@endsection

@section('action-button')
    <div class="row d-flex justify-content-end mb-2">
        @can('create invoice')

            <div class="col-xl-2 col-lg-2 col-md-3 col-sm-6 col-12">
                <div class="all-button-box">
                    <a href="{{ route('invoice.create', 0) }}" class="btn btn-xs btn-white btn-icon-only width-aut
                    <i class="fas fa-plus"></i> {{ __('Create') }}
                    </a>
                </div>
            </div>

            @endcan

            <div class="col-xl-2 col-lg-2 col-md-3 col-sm-6 col-12">
                <div class="all-button-box">
                    <a href="{{ route('invoice.export') }}" class="btn btn-xs btn-white btn-icon-only width-auto">
                    <i class="fa fa-file-excel"></i> {{ __('Export') }}
                    </a>
                </div>
            </div>
        </div>
    @endsection
```

Figure 58: Phpstorm project code of invoice

```
$customer = Customer::where('created_by', '=', \Auth::user()->creatorId()->get()->pluck('name', 'id'));
$customer->prepend('All', '');

$status = Invoice::$statuses;

$query = Invoice::where('created_by', '=', \Auth::user()->creatorId());

if(!empty($request->customer))
{
    $query->where('customer_id', '=', $request->customer);
}
if(!empty($request->issue_date))
{
    $date_range = explode(' - ', $request->issue_date);
    $query->whereBetween('issue_date', $date_range);
}

if(!empty($request->status))
{
    $query->where('status', '=', $request->status);
}
$invoices = $query->get();

return view('invoice.index', compact('invoices', 'customer', 'status'));
```

Figure 59: Phpstorm project code of invoice

## Expenses code:

```
{{ Form::open(array('url' => 'expenses', 'enctype' => "multipart/form-data")) }}
<div class="row">
  <div class="form-group col-md-6">
    {{ Form::label('category_id', __('Category')) }}
    {{ Form::select('category_id', $category, null, array('class' => 'form-control select2', 'required' => 'required')) }}
    @error('category_id')
    <span class="invalid-category_id" role="alert">
      <strong class="text-danger">{{ $message }}</strong>
    </span>
    @enderror
  </div>
  <div class="form-group col-md-6">
    {{ Form::label('amount', __('Amount')) }}
    {{ Form::number('amount', '', array('class' => 'form-control', 'required' => 'required')) }}
    @error('amount')
    <span class="invalid-amount" role="alert">
      <strong class="text-danger">{{ $message }}</strong>
    </span>
    @enderror
  </div>
  <div class="form-group col-md-6">
    {{ Form::label('date', __('Date')) }}
    {{ Form::text('date', '', array('class' => 'form-control datepicker', 'required' => 'required')) }}
    @error('date')
    <span class="invalid-date" role="alert">
      <strong class="text-danger">{{ $message }}</strong>
    </span>
  </div>
</div>
```

Figure 60: Phpstorm project code of expenses

```
use ...
class ExpenseController extends Controller
{
    public function index()
    {
        if(\Auth::user()->can('abilities: manage expense') || \Auth::user()->type == 'client')
        {
            if(\Auth::user()->type == 'client')
            {
                $expenses = Expense::select('expenses.*', 'projects.name')->join('projects', 'projects.id', '=', 'expenses.project_id');
            }
            else
            {
                $expenses = Expense::where('created_by', '=', \Auth::user()->creatorId()->get());
            }

            return view('expenses.index')->with('expenses', $expenses);
        }
        else
        {
            return redirect()->back()->with('error', __('key: Permission denied.));
        }
    }
}
```

Figure 61: Phpstorm project code of expenses

## Journal code:

```
@extends('layouts.admin')
@section('page-title')
    {{__('Journal Entry Create')}}
@endsection
@push('script-page')
<script src="{{asset('assets/js/jquery-ui.min.js')}}"></script>
<script src="{{asset('assets/js/jquery.repeater.min.js')}}"></script>
<script>
    var selector = "body";
    if ($(selector + " .repeater").length) {
        var $dragAndDrop = $("body .repeater tbody").sortable({
            handle: '.sort-handler'
        });
        var $repeater = $(selector + ' .repeater').repeater({
            initEmpty: false,
            defaultValues: {
                'status': 1
            },
            show: function () {
                $(this).slideDown();
                var file_uploads = $(this).find('input.multi');
                if (file_uploads.length) {
                    $(this).find('input.multi').MultiFile({
                        max: 3,
                        accept: 'png|jpg|jpeg',
                    });
                }
            }
        });
    }
</script>
```

Figure 62: Phpstorm project code of journal

```
public function store(Request $request)
{
    if(\Auth::user()->can(abilities: 'create invoice'))
    {
        $validator = \Validator::make(
            $request->all(), [
                'date' => 'required',
                'accounts' => 'required',
            ]
        );
        if($validator->fails())
        {
            $messages = $validator->getMessageBag();
            return redirect()->back()->with('error', $messages->first());
        }

        $accounts = $request->accounts;

        $totalDebit = 0;
        $totalCredit = 0;
        for($i = 0; $i < count($accounts); $i++)
        {
            $debit = isset($accounts[$i]['debit']) ? $accounts[$i]['debit'] : 0;
            $credit = isset($accounts[$i]['credit']) ? $accounts[$i]['credit'] : 0;
            $totalDebit += $debit;
            $totalCredit += $credit;
        }
    }
}
```

Figure 63: Phpstorm project code of journal

## **10.2 Possible Problem Breakdown**

**The entire project needs to be divided into manageable tasks in order to make it easier and increase the effectiveness of the system development. The planned project could be broken down in the ways listed below:**

- Analysis and database design
- Staffs panel management system
- Accounting management system
- Sales Management system
- Report Management system
- Admin panel management system
- Bank management system
- Asset management system
- Supplier management system.

### **Designing analyses and databases**

- The specifications specify and complete
- Gather information to define the needs, then normalize the data.
- Create an ERD and a data dictionary.
- The schema is created as a result of the data dictionary.

### **Admin panel development**

- The required pages design and identify
- Develop admin manipulation system
- Develop dashboard and report manipulation system
- Develop staffs and customers approval option

### **Accounting management system**

- Front-end design
- Journal manipulation system
- Account statement development
- Trail balance manipulation system
- Balance sheet manipulation system
- Ledger summary management

### **Sales Management system**

- Design required pages
- Proposal manipulation system
- Proposal track and control
- Request management

### **Report Management system**

- Front-end design
- The requirements identify and finalize
- The gathered information normalizes
- Income vs Expense management
- Transection and payment management

## **10.3 Prioritization while Developing the Solution**

**To determine the functionality of the system, we have already prioritized the list of criteria. It is now time to prioritize tasks for the development phase, which is essential because haphazard development could leave out some crucial features to develop. The following are the prioritized development tasks:**

- ❖ A visually appealing dashboard for comprehending company activity
- ❖ Restriction on employee permissions
- ❖ Curation of multiple roles for users through permission selection on various modules
- ❖ Because it is available in different languages, it is a tool that can be used on bangla platforms.

- ❖ Currency settings to add currencies as needed
- ❖ Double entries can be seen in a chart of accounts, a journal entry, a general ledger, a balance sheet, and a trial balance.
- ❖ Constants for taxes, payment methods, and other factors are created.
- ❖ Banking administration includes opening accounts, transferring funds, and managing transactions.
- ❖ Invoice and bill generation, as well as revenue and payment management
- ❖ Inventory Control in Invoice and Bill
- ❖ Report on Customer/Vendor Statements

## Chapter 11 – Testing

### 11.1 Test Plan Acceptance

An acceptance test plan has the same components as any other test plan, including scope, procedures, the test environment, resources, roles, acceptance test references, entrance criteria, exit criteria, tools, etc. Planning is the single aspect of acceptance testing that sets them apart. Business choices are driven by recurring test programs. An important document that offers instructions on how to carry out acceptance testing for a particular project is an acceptance test plan. Testing is a crucial step in creating effective software. A testing strategy ought to be created at the analytical stage. These proposals must be approved by both the user and the developer. The relevant testing requirements will be met thanks to the project's test plan. and the standards for user approval. There are two various test categories.

### Functional Testing

**Functional testing divided into three types these are:**

#### ❖ Unit Testing

- Form field validation for the input fields
- Booking proposal approval filtering
- Bank account filtering from the list
- Approved, pending and rejected booking proposal list filtering form the MO list.

#### ❖ Module Testing

- ❖ Submitting the registration and login forms without providing any data
- ❖ Registration with invalid data.
- ❖ Submitting a form with proper data.

#### ❖ Integration Testing

- ❖ Login system with the valid credentials
- ❖ Successful payment request
- ❖ Successful stock product and inventory.

## Nonfunctional Testing

I'm going to use four different kinds of non-functional testing in my project. As follows:

❖ **Acceptance Testing:**

→ Updating personal information from different user perspectives

❖ **Security Testing:**

→ Different page access for different user role

→ Login attempts with valid credential

❖ **Accessibility Testing**

→ User-friendly testing

→ Proper color contrast testing

❖ **Usability Testing**

→ Admin panel testing

→ Test the system with different user

### 11.2 Test case

Plans for test acceptance should be created for the exam once everything has been decided. These are test examples for the Smart ERP system:

Unit test –test case:

Test case name	Unit test		
Test class			
Test description			
Data source	Test steps	expected result	Actual result

--	--

**Module test –test case:**

<b>Test case name</b>	<b>Unit test</b>		
<b>Test class</b>			
<b>Test description</b>			
<b>Data source</b>	Test steps	expected result	Actual result

**Integration test –test case:**

<b>Test case name</b>	<b>Unit test</b>		
<b>Test class</b>			
<b>Test description</b>			
<b>Data source</b>	Test steps	expected result	Actual result

### 11.3 Unit testing

#### Unit test-1

##### Test case

Test case name	Unit test		
Test class	Add product and service		
Test description	Product name validation for booking proposal		
Data source	Test steps	expected result	Actual result
Staff	Submit the form	an error message	need validation

The screenshot shows a web form for creating a product or service. The form has the following fields and values:

- Name: Aklima Khatun
- SKU: 10
- Description: (empty)
- Sale Price: 10000
- Purchase Price: 11000
- Tax: (empty)
- Category: (empty, with a red error message: "Please select an item in the list.")
- Unit: (empty)
- Type: Product (selected), Service (unselected)

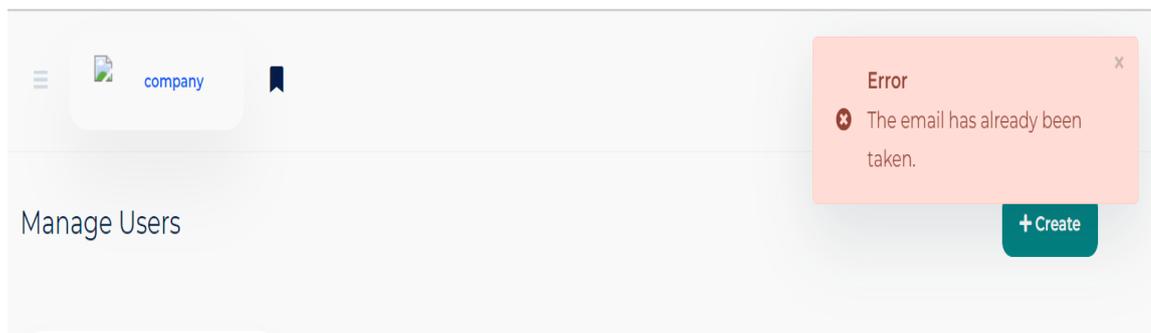
Buttons for "Create" and "Cancel" are visible at the bottom.

Figure 64: Unit testing of price

## Unit test-2

### Add user

Test case name	Unit test		
Test class	Adding users		
Test description	User Email and Username		
Data source	Test steps	expected result	Actual result
User entry	Input all data and submit the form	Got an error message	Need unique email address & username



*Figure 65: Unit testing of user email*

### Use case-3

#### Customer login

Test case name	Unit test		
Test class	User login		
Test description	Registered email and password		
Data source	Test steps	expected result	Actual result
Users	Input wrong registered data in the form	Invalid message	Need valid registered input

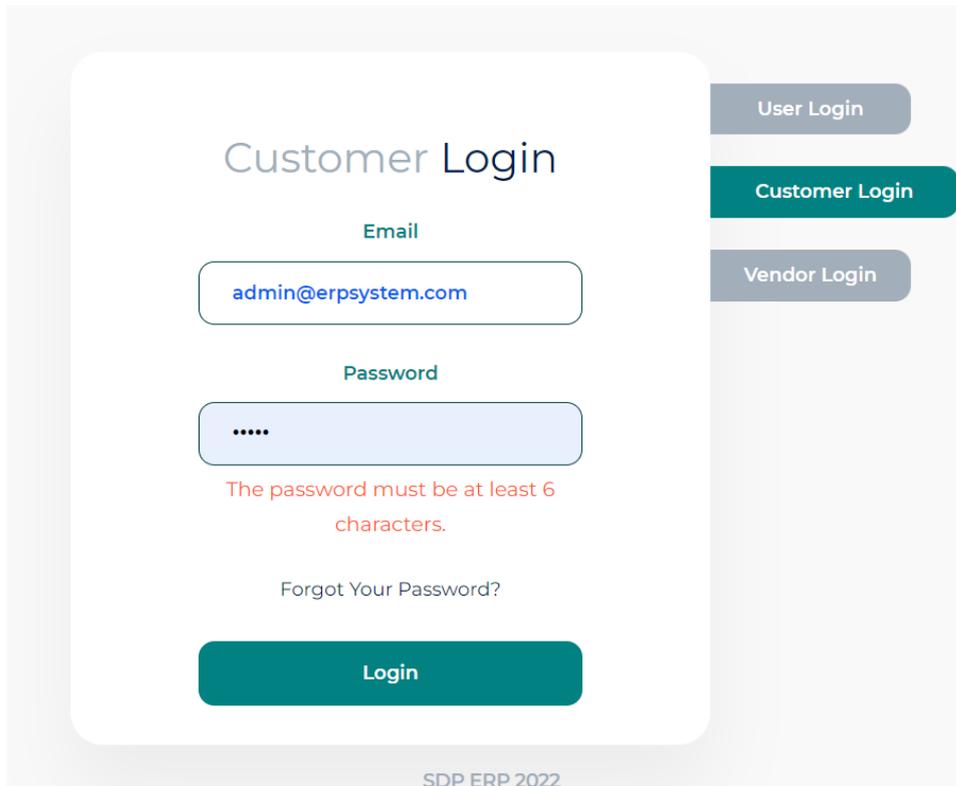


Figure 66: Unit testing of customer login

## 11.4 Module test

### Module test-1

Test case name	Module test		
Test class	Create customer		
Test description	Only user can create customer		
Data source	Test steps	Expected result	Actual result
User entry	Blank field is not acceptable	Got warning message	Need proper info

**Basic Info**

Name  Contact  Email

**Profile** ! Please fill out this field.

**Billing Address**

Name  Country  State

City  Phone  Zip Code

Address

Figure 67: Module testing of basic info

**Module test-2**

Test case name	Module test		
Test class	Create customer		
Test description	Only user can create customer		
Data source	Test steps	Expected result	Actual result
User entry	give an invalid email address	A message should display that the input field contains invalid data.	It shows that the email address is invalid.

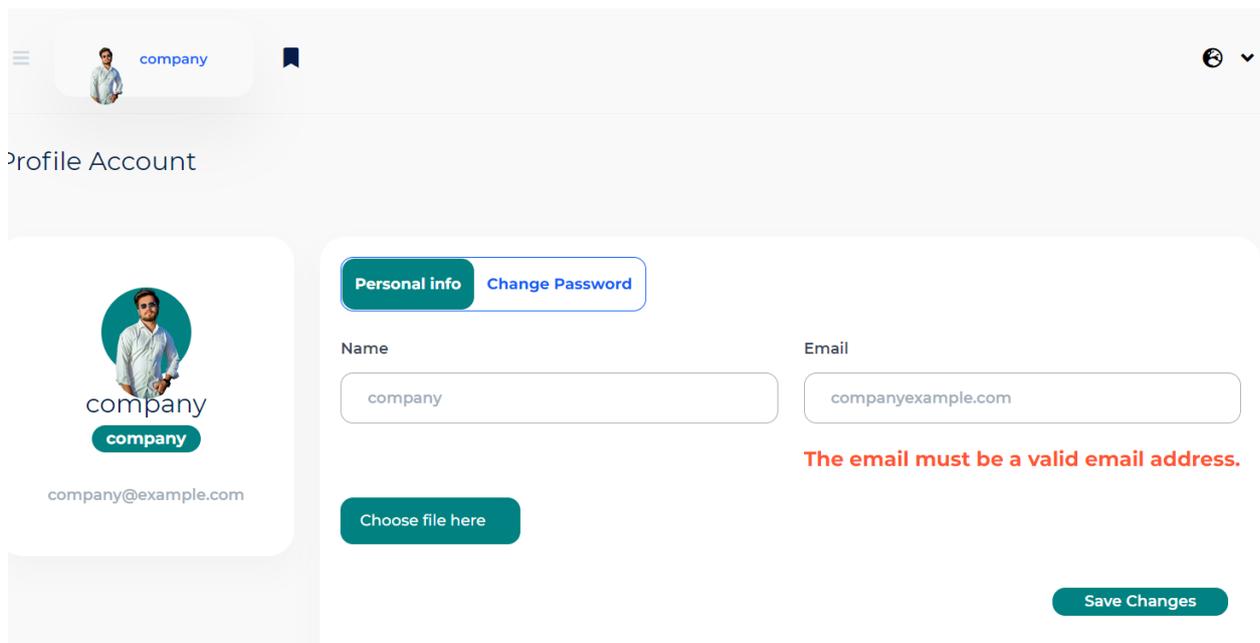


Figure 68: Module testing of company info

## 11.5 Integration Testing

### Integration Test 1

#### Test Case

Test case name	Integration test		
Test class	1.Auth\LoginController 2. Redirect If Authenticated Middleware		
Test description	Dashboard redirection and successful login attempt.		
Data source	Test steps	Expected result	Actual result
Staffs	1. login page 2. valid credentials 3. press on login	The customers should be authenticated and login should successful and redirected to the customer.	It shows that the email address is invalid.

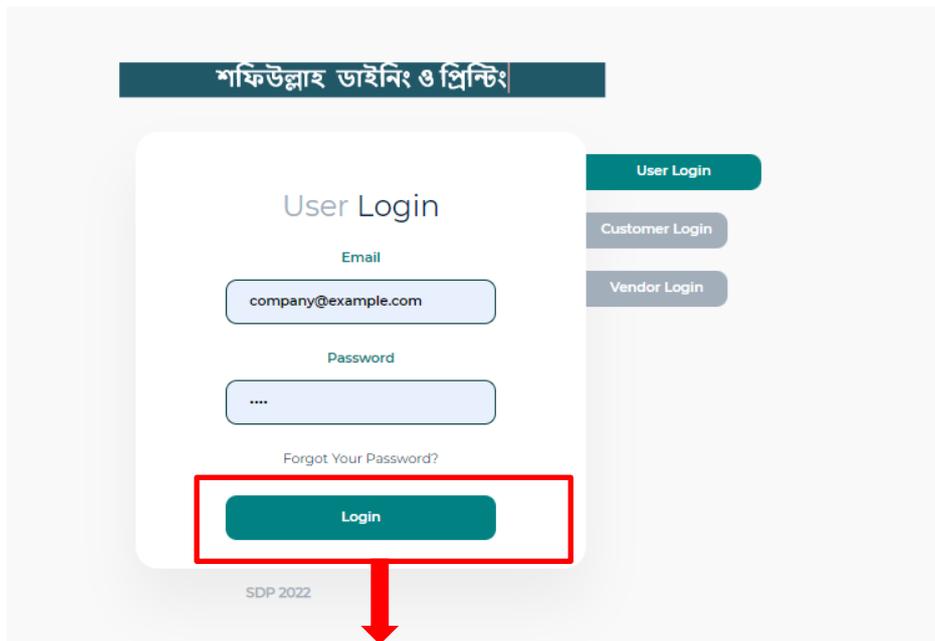


Figure 69: Integration testing of user login



Figure 70: Integration testing of dashboard

## Integration Test2

### Test Case

Test case name	Integration test		
Test class	Customers/vendors test controller		
Test description	Product and service added test		
Data source	Test steps	Expected result	Actual result
Company and admin	<ol style="list-style-type: none"> <li>1. login as staffs</li> <li>2. check customer eligibility</li> <li>3. Report generate</li> </ol>	Success message should show	System show booking proposal successfully added.

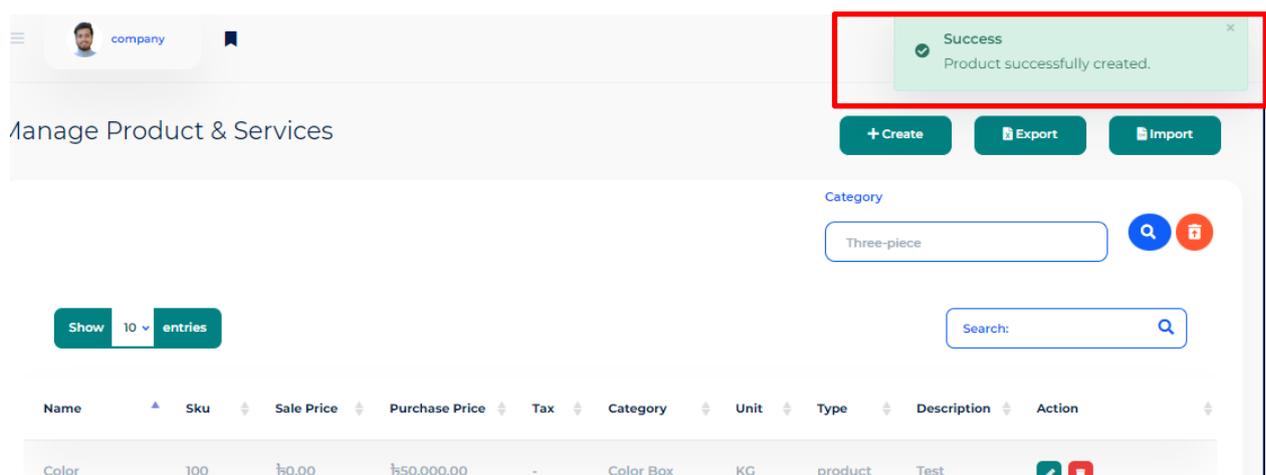


Figure 71: Integration testing of new product

## 11.6 Acceptance Testing

### Acceptance Test 1

#### Test Case

Test case name		Acceptance Test	
Test class	Customers/request controller		
Test description	Proposal test and integration test		
Data source	Test steps	Expected result	Actual result
Company and admin	1. login as staffs 2. accepts a request 3. check in customers profile	Request accept history should updated and show	The result is expected

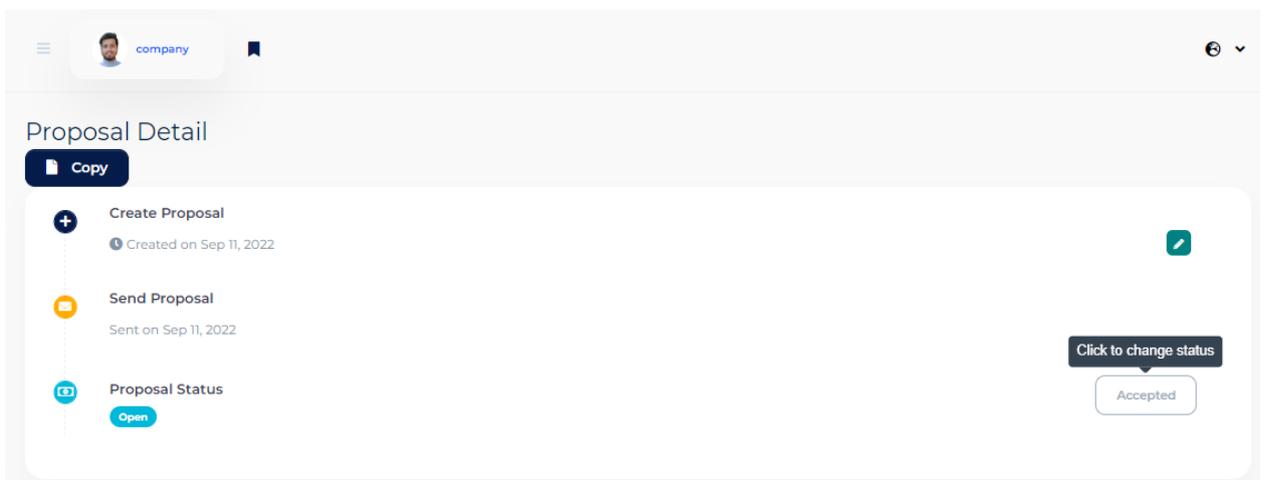


Figure 72: Acceptance testing of proposal detail

## 11.7 Security Testing

### Security Test 1

#### Test Case

Test case name      Security Test			
Test class	Auth/login controller		
Test description	Invalid login attempt security testing		
Data source	Test steps	Expected result	Actual result
All users	1. login page 2. wrong details and try to login	Showing error message and a message should show	The result is expected

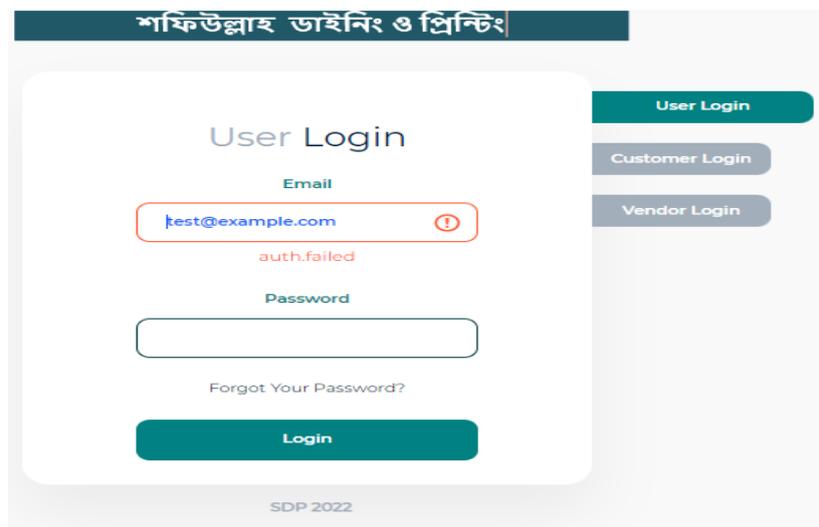


Figure 73: Security testing of proposal login

## 11.8 Accessibility Testing

### Accessibility Test 1

#### Test Case

Test case name	Accessibility Test		
Test class	Staffs controller		
Test description	Color & contrast test		
Data source	<b>Test steps</b>	<b>expected result</b>	<b>Actual result</b>
User entry	A color-blind customer used the system	No problem occurs during the use	The customers did no face any problem

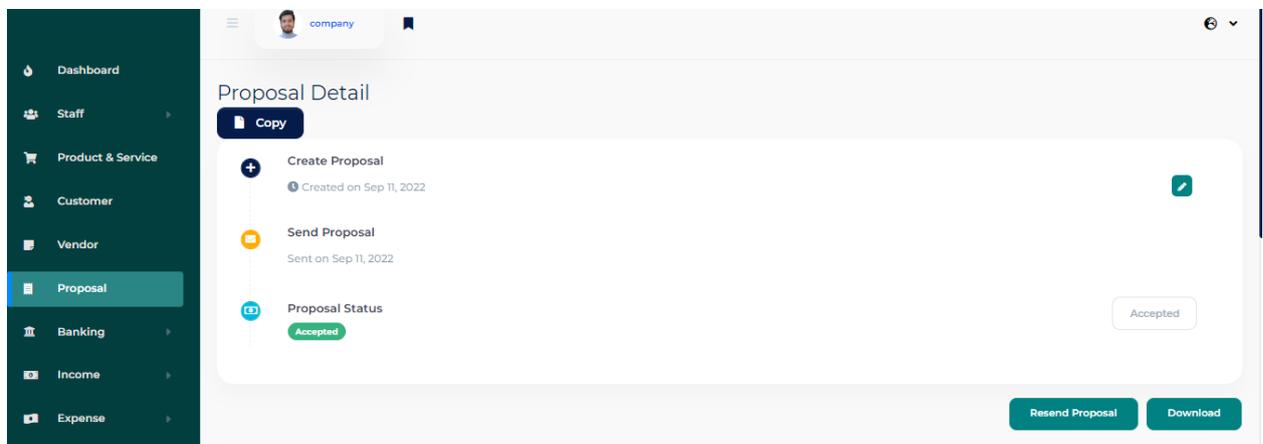


Figure 74: Accessibility testing of proposal detail

## Accessibility Test 2

### Test Case

Test case name	Accessibility Test		
Test class	Admin controller		
Test description	User friendliness testing		
Data source	<b>Test steps</b>	<b>expected result</b>	<b>Actual result</b>
User entry	Giving a admin to use the system	The system is user-friendly	The result is expected

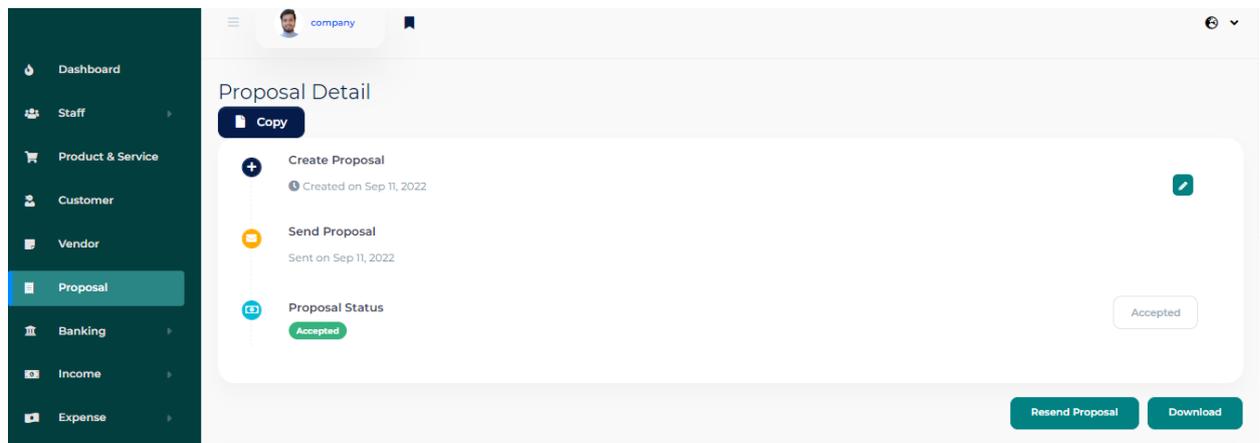


Figure 75: Accessibility testing of proposal detail

## Chapter 12 – Implementation

### 12.1 Training

Complex systems require users to undergo training before they can be used. For things to function properly, the team must ensure that there are sufficient users or operators. rely on system administration to work. Below is an example of the training methodology:

SL	User	Training Scope	Time Period	Comment
1	Users or Customer	Registering as a booking proposal, updating order history and payment history	2 hours	The methods are being understood by the users as intended.
2	Admin	Monitoring report and database and booking history ,payment history with dashboard and manage staffs with accessibility	1 hour	Admin can understand the operations easily
3	Staffs	Booking proposal and keep tracking status , income ,expenses with generating invoice	2 hour	Staffs can understand the operations easily
4	Vendors	Payment history review and assets information	1 hour	Vendors supply products monitoring stocks .

*Table 40: List of user training*

## **12.2 Implementation Scheme**

I have a lot of alternatives at every level of an Ir ERP deployment. The starting point is among the most crucial decisions. I need to choose if I want to utilize a phased approach or complete the procedure all at once before I start. The Big Bang realization is the latter. Although it could be effective for certain businesses, it is not always advised. The distinctions between this strategy and a phased ERP deployment will be discussed today, along with information that assisted me in determining which course was best for SHAFIULLAH DYEING.

### **Big Bang**

A "Big Bang ERP deployment" occurs when a company switches from an existing ERP system to a new one all at once. This indicates that all corporate offices and modules launch simultaneously. What situations would make this a good tactic? Big bang implementations work well for businesses when the new software will only be used in one or two functional areas. We constantly advise organizations to have backup procedures in place so they can recover data in the worst-case scenario because a crashed system may be disastrous even in these circumstances. When a firm transitions from an existing ERP system to a new solution in a single step, it is referred to as a "big bang ERP deployment." This indicates that all corporate offices and modules launch simultaneously. What situations would make this a good tactic? Big bang implementations work well for businesses when the new software will only be used in one or two functional areas. We constantly advise organizations to have backup procedures in place so they can recover data in the worst-case scenario because a crashed system may be disastrous even in these circumstances.

### **12.3 Scaling**

I have made this project for a company whose name is SHAFIULLAH DYEING AND PRINTING (SHAFIULLAH DYEING AND PRINTING) after that I will develop more modules so that every company can use it.

## **12.4 Load Balancing**

Optimizing the system for a specific number of users to allow for seamless access and use is known as load balancing. It is determined via load balancing how many people can utilize the system at once. The terms "load balance" and "load equalizer" refer to how much time and how long the system can endure. In order to make the system work more quickly, this technique divides the load among many servers. The recommended system will receive regular visits from four different user types, hence the best load balancing strategy must be devised to handle them.

## Chapter 13 – Critical Appraisal & evaluation

### 13.1 Objective Could be Met

The initially stated objectives are listed below:

- Login system for users, Customer, vendors
- Proposal and booking management
- Income and expenses with invoice generation
- Inventory Management in Invoice and Bill
- Budget planning
- Report generation management

#### Objective-1

##### Achievement rate and others

For all user types, the login mechanism has been successfully built. After completing the registration procedure, the customer, administrator, suppliers, and staff organizations can log in to the system. Following login, the user is taken to their intended dashboard where they may only view the sites they are authorized to see. For user authentication and system authorization, I made use of Laravel's standard authentication mechanism. There is a 100% success rate.

## **Objective-2**

### **Achievement rate and others**

Never before have mailing and creating proposals been so simple. By choosing consumers and including items and services in that list, create new propositions. Existing proposals can be modified by adding or deleting goods. These suggestions can be sent, and you can also see their current status. Make copies of these ideas, then, with just one click, turn them into invoices. Just consider how many hours of work you might save by doing this.

## **Objective-3**

### **Achievement rate and others**

Add additional items or goods to current invoices. With only one click, download, print, or resend invoices. In addition to Stripe and PayPal, customers may pay bills by QR scan. By bringing in fresh money, record their new earnings. Change their income source and include references. Furthermore, I have the option of filtering profits by account, client, category, and payment type. Add payments to current invoices to edit them. Bills may be downloaded, printed, or resent with only one click. Edit the payment summary and check the payment status. Create a new payment and include the newly produced cost in it. Add references and change the categories. Furthermore, I have the option of filtering profits by account, client, category, and payment type.

## **Objective-3**

### **Achievement rate and others**

Checking the stock status of every item I need for company operations would be simple, You may keep track of the inventory of each item registered to company at this location using the inventory management function. The amount will be immediately updated in Goods and Services for verification when an invoice or bill is created. In general, keeping track of product inventory levels is simple.

## **Objective-4**

### **Achievement rate and others**

A budget is a financial plan for a given time period designed to keep working capital under control. This characteristic aids in the flow of capital in this case. Budgets can be created monthly, quarterly, semi-annually, or annually based on your business objectives and needs. The major categories are "Income" and "Expenses," and subcategories can be edited/updated/delete.

## **Objective-5**

### **Achievement rate and others**

Get a transaction report with only a few clicks. Get the necessary account statement in PDF, CSV, or Excel format. Individual income, spending, taxes, invoices, and bill summaries are accurately created for you. Filter them by accounts, categories, and clients. A graphical representation of the Revenue VS Expense chart, together with a full profit and loss calculation, can also assist you in making educated judgments. Filter the tax summary and income vs expense graph by tax year.

## **13.2 Objective that totally don't meet of touched**

For the activities, practically the complete article corpus is contacted. However, just one target who is completely uncontactable used the mobile application to monitor their whereabouts.

### **The reasons why it could not be touch**

The communication gap with the goal is primarily due to the limited time available to complete the tasks. Due of the short turnaround time and the requirement for a continuously facilitating server, which is also quite challenging for the job, it would be very difficult. Due to the application's inability to function without a live server, development was suspended.

### **What could have been done**

The time box needs to be rescheduled, and extra time is required to finish the component in order to get to the highlights. Additionally, it must learn how to create hybrid apps.

## **Chapter 14 Lessons Learned**

### **14.1 Pre-Project-Review-closing**

A smart ERP system is enterprise resource planning software that makes revenue computation easier by keeping track of all firm accounting difficulties. Based on Laravel, this accounting software will make running a small or medium-sized business easier and more pleasant. Graphical presentations and tables of various components will assist them in making sound business judgments. I have to follow to predetermined guidelines, such as submitting project proposals, defending project titles, developing, and documenting projects. In order to efficiently manage the daily, monthly, or annual activities of SHAFIULLAH DYEING AND PRINTING (SHAFIULLAH DYEING AND PRINTING) and comparable companies, I concentrated on designing this ERP software. It can also generate reports.

### **14.2 What I have learnt**

I have changed several essential elements of building a structure. I learned how to manage structures in a variety of areas, including layout, structure, and extra database space. My skill set (units and reception, usability, and accessibility) also got better, which will help me in my future profession. Additionally, it helps me develop my programming skills by enabling me to build Application Programmable Interfaces (APIs) with sufficient authentication and security methods. Using the PHP Laravel framework, I investigated how to handle Ajax requests. I looked at approval, multi-level authentication, and the Haversian distance calculation method. As a result of my efforts, I was able to compile a wealth of foundational knowledge that will enable me to be highly effective in changing my life.

### **14.3 The problems I have faced**

I came across a number of challenges and roadblocks while working on the project. I frequently need to deal with and find solutions to problems because I employ an agile DSDM technique that necessitates iterative development. This implies that an issue develops in one time box and is fixed in a different time box and job. One of the most challenging tasks is locating geographic coordinates, and another is figuring out how far apart two coordinates are. Direct search that is performed without refreshing the page is another problem. Multi-level authentication and API development in Laravel are some problems I'm running against. "Many ERP initiatives fail because we are too focused on reaching the planned goals while refusing to change the way we do things," the most frustrating problem, according to the author, is keeping to the time frames. ERP implementation is a difficult task because it is a complex procedure that affects the entire company. This reflects a paradigm shift in the way labor is done by making room for automation rather than manual processes. This forces everyone to deal with problems with ERP installation and forces users and functional groups to come up with creative solutions. Companies need a dedicated project team to represent all ERP platform users because tackling such difficulties calls for the involvement of top management. As a result, it highlights the importance of business processes across all levels and divisions.

### **14.4 What Solution Occurred**

Whenever an issue arose, I attempted to solve it. To tackle the difficulty of extracting coordinates, I utilized the Google Geocode API to make and receive JSON queries. To compute the distance between two coordinates. I used a custom authentication system with a controller and middleware to build multi-authentication. I used API to provide access using the Laravel passport driver. I put a lot of effort into meeting the deadline and strictly followed the guidelines.

## **Chapter 15 – Conclusion**

### **15.1 Summary of the Project**

The Smart ERP system is an enterprise resource planning software that keeps track of all corporate accounting issues and makes it simple to compute revenue. This accounting software, which is based on Laravel, will streamline and facilitate SHAFIULLAH DYEING AND PRINTING'S commercial processes. Using a super administrator login, a graphical and tabular display of numerous components can assist them in making wise choices as then develop their organization. The company has committed a sizeable sum of money to the creation of an intelligent ERP system. A well-designed and integrated ERP system enables the sharing of the most recent information across all company divisions, leading to significant cost savings and increased productivity. When deciding which implementation strategies to use, management must take into account a number of crucial variables, including the degree of integration, the major business processes to be implemented, the e-commerce applications to be integrated, and whether functionality is required. By removing all barriers to communication, smart ERP solutions also simplify an organization. Therefore, the primary objective of ERP systems is to provide profitability and related data in order for managers and staff to better understand business performance and map out the future direction of the company. ERP systems also give businesses the ability to quickly correct problematic situations and reduce financial losses. Smart ERP systems help run the firm profitably and efficiently.

### **15.2 Goal of the project**

The Smart ERP system serves as a platform for organizations to plan and control the essential aspects of their business operations. Since they enable resource planning by integrating all operational processes into one system, many ERP software systems are crucial to enterprises. A planning, inventory-purchase, sales, marketing, finance, and human resources software system may also be linked.

- Improved management effectiveness
- Improved information availability and accuracy
- Enhanced reporting, precise planning, and improved synchronization

- Flexibility and scalability, as well as cost-efficiency
- Simplified access to management systems
- Improved client services, more competitiveness in the market
- Monitoring inventories, orders, supply chains, and services
- Automate business processes to boost productivity

### **15.3 Success of the Project**

Since the objectives are met, the project development's objective has been achieved. I got contact to develop this software six months ago. As we know ERP is big software which has many modules like HRM, CRM, Accounting, Point of Sale (POS) etc. It takes a good amount of time to make this software perfect and need a strong team but I am the only person who made this software for them in a very short time with documentation I think this is the big success for this project. With this software, they can save their time and money because by removing the current paper base work, they will manage their organization through full automation cloud-based software, thereby reducing the work of their staff and helping the admin to get report quickly.

### **15.4 What I have done in the documentation**

Since the beginning, I have finished all of the tasks necessary according to the paperwork. I completed various drawings, time boxing, analyses, and other tasks. The article also addresses various objectives and does so effectively. This report has all the data needed to complete the project.

### **15.5 Value of the Project**

Manual labor and manual procedures will always lose out to technology. The ERP Business Transformation Strategy's goal is to update and integrate business processes and technology. ERP or Enterprise Resource Planning is a software package that is often used to increase the operational efficiency of business resources. It is a collection of software modules that assist company owners in achieving their objectives more quickly. ERP deployment for a firm is done depending on the needs of the company. ERP is now a widely used software system across all industries, including small and medium-sized businesses. This project will have a different market value depending on how it is used. Having worked on this project for so long, I've accumulated expertise that will give me a competitive edge in professional positions.

### **15.6 My Experience**

I gained a lot of knowledge while working on this project. I dealt with a variety of situations that I had, which gave me a ton of experience. My ability to complete the project's requirements quickly and manage the entire project offered me a lot of experience. It was a highly rewarding experience for me to start a task from scratch and finish it entirely. Taking on new problems and overcoming them was a tremendous learning experience. I have gone through software's whole life cycle. I now understand how to initiate and complete projects. Another work experience I gained from this project was time management.

# Appendix A

## Unit Test

### Test case

Name of test			
Unit test			
Class	Add charts of account		
Description	Fill out the code feild		
Data source	Test steps	expected result	Actual result
User entry	Input all data and submit the form	Got an error message	Need unique code

### Add charts of account

The screenshot shows a 'Create New Account' form with the following fields and values:

- Name:** Abdullah Al Sami
- Code:** (Empty, with a validation error message: "Please fill out this field.")
- Account:** Liabilities
- Type:** Current Liability
- Is Enabled:** (Toggle switch is turned on)
- Description:** Test

Buttons at the bottom: Create, Cancel. A 'Close' button is in the top right corner.

### Unit testing on code text box

## Unit Test

### Test case

Name of test	Unit test		
Class	Adding journal		
Description	Must equal debit and credit		
Data source	Test steps	expected result	Actual result
User entry	Input all data and submit the form	Got an error message	Need equal debit and credit balance

### Adding journal

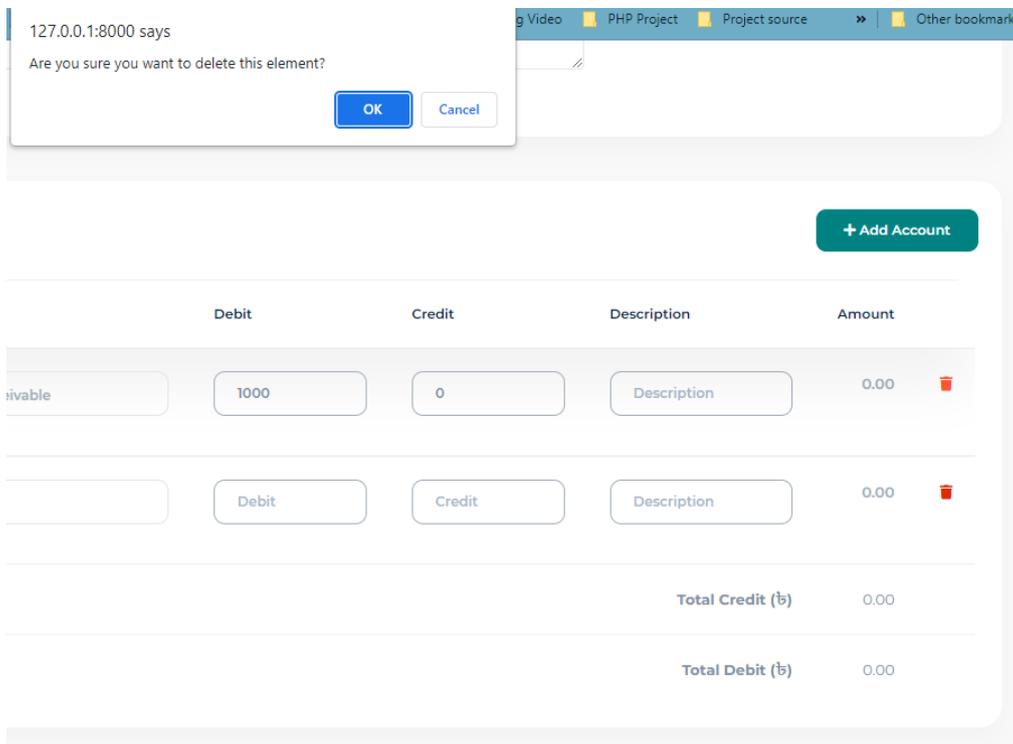
The screenshot shows a web application interface for creating a journal entry. At the top left, there is a user profile icon and the text 'company'. On the top right, an orange error message box displays: 'Error Debit and Credit must be Equal.' Below this, the page title is 'Journal Entry Create'. The form contains three input fields: 'Journal Number' with the value '#JUR00002', 'Transaction Date' with the value '2022-09-21', and 'Reference' which is empty. Below these fields is a large text area for 'Description'.

### Unit testing on debit credit field

**Test case**

<b>Name of test</b>	<b>Unit test</b>		
<b>Class</b>	Adding journal		
<b>Description</b>	Verify debit and credit		
<b>Data source</b>	Test steps	expected result	Actual result
<b>User entry</b>	Input all data and submit the form	Got an error message	Verify to delete any feild

**Adding journal**



**Unit testing on deleting element**

## Appendix B

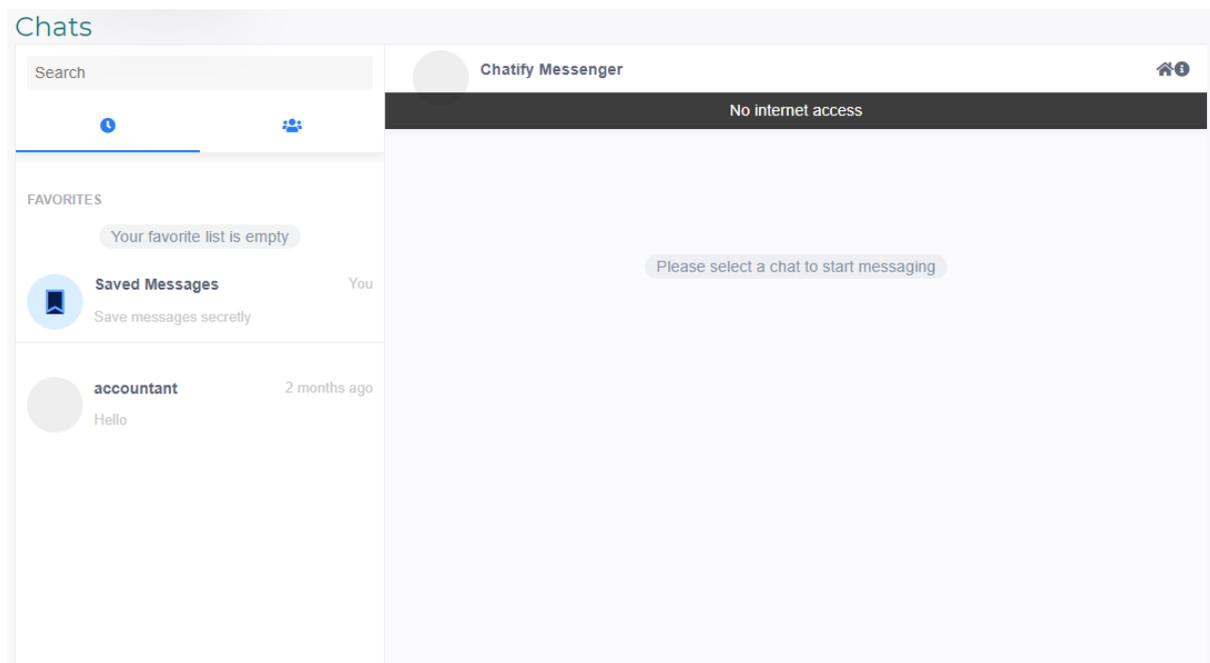
I have developed smart ERP system continues process and integrating new features or module which will be smarter and user friendly.

### Example:

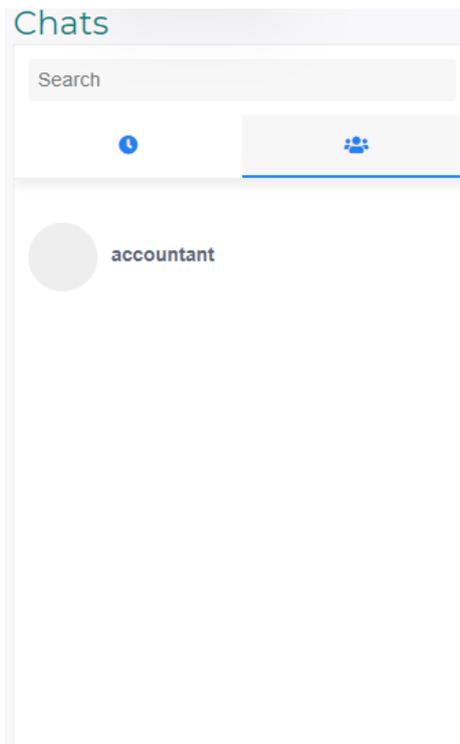
-  CRM
-  HRM
-  Messenger
-  Project system
-  Retainers

Now I have attached some screenshot this module:

### Messenger:



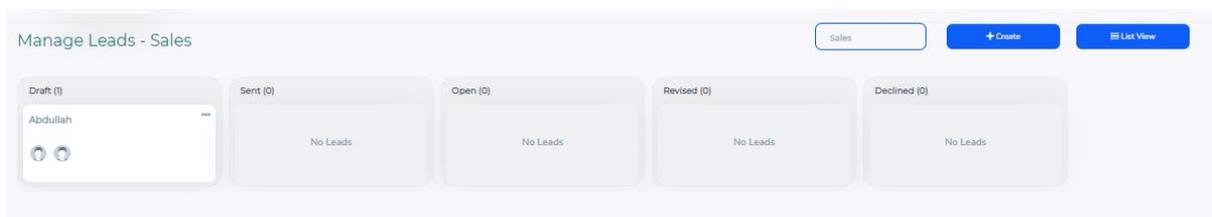
### Chatting facilities



**Chatting group**

**CRM:**

CRM managing leads-sales



**Dashboard of CRM**

## CRM management:

The screenshot displays a CRM management interface for a contact named Abdullah. At the top, there are buttons for 'Label', 'Edit', and 'Convert To Deal'. Below this is a navigation bar with tabs for 'General', 'Products', 'Sources', 'Files', 'Discussion', 'Notes', 'Calls', and 'Emails'. The 'General' tab is active, showing a pipeline of 'Sales' with a 'Draft' stage, created on 'Nov 18, 2022', and a progress indicator of '20%'. Below the pipeline are three summary cards: 'Product' with a count of 1, 'Source' with a count of 1, and 'Files' with a count of 0. The main content area is divided into three sections: 'Users' with a '+ Add' button and a list of 'company' and 'accountant'; 'Products' with a '+ Add' button and a list item 'Abdullah Al Sami (\$5,000.00)'; and 'Files' with a dashed box and the text 'Drop files here to upload'. At the bottom, there are two sections: 'Notes' with a rich text editor (Nunito) and 'Activity' with a list of recent actions: 'Update Sources company Update Sources' (5 days ago) and 'Add Product company Add new Products Abdullah Al Sami' (5 days ago).

### File attachment facilities

### HRM attendance list:

Manage Attendance List

Type:  Monthly  Daily

Month: November 2022

Branch: All

Department: All

Show 10 entries

Search:

Employee	Date	Status	Clock In	Clock Out	Late	Early Leaving	Overtime	Action
No data available in table								

Previous Next

### Attendance list of HRM

### HRM employee information list:

Employee [Edit](#)

**Personal Detail**

EmployeeId #EMP0000001	Name accountant
Email accountant@example.com	Date of Birth Jan 1, 1970
Phone	Address
Salary Type	Basic Salary

**Company Detail**

Branch	Department
Designation	Date Of Joining Jan 1, 1970

**Document Detail**

No Document Type Added!

**Bank Account Detail**

Account Holder Name	Account Number
Bank Name	Bank Identifier Code
Branch Location	Tax Payer Id

### Employee information

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## Abdullah 183-16-373

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