TITLE OF THE PROJECT

Restaurant Management System

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APPROVAL

This Project titled "Restaurant Management System", Submitted by Ismat Anamika, ID No: 181-16-249 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- 13-02-2022.

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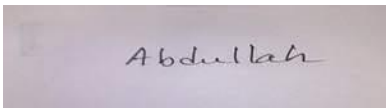

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Abstract

This restaurant management system is developed to manage a restaurant inventory system and payment-making system. this system will help the restaurant to manage their inventory with less time with security. and the payment-making system and report generation system will help them to monitor their services. so it is called this system will help the restaurant in their management.

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Chapter 1 - Introduction

1.1 Introduction

A restaurant business is now a day a most popular business in all over the world. This such kind of business that serves people with ready-made food. I developed this system to provide service facility to the restaurant. This system can be used by employees in the restaurant to handle the customers with their orders and can also help them easily find free tables.

This is services that mainly are provided is the food ordering and table management system and also create report by the cashier. And the category of food, menu and table management by admin or the owner. The restaurant menu is organized by some categories (Breakfast, Dinner, Lunch, Snacks, etc.) of menu items. The main objective builds the system this is to manage the food category and table reservation and the ordering and payment method system. Each menu item has a name, price, quantity, and description of that menu. With this developed system ordering and reservation of table management will become easier and systematic to replace traditional system where are still using paper. In this system there are two users. Admin or owner and the cashier. The owner can access all the system. He can add, menu, category and table. The cashier can reserve the table and menu for the customer, and after confirmation order the cashier can make the payment method and also can generate the report. And the owner or manager can view the report. This system is the system for managing the restaurant business. The main point of developing this system is to help restaurant administrator manage the restaurant business and help cashier for ordering and reserve tables.

1.2 Document Contents

In this document, the total following chapters will be documented as project work.

1.2.1 Chapter - 1: Introduction

This chapter will cover the Introductory description of the system.

1.2.2 Chapter - 2: Initial Phase

The initial study details are described in this chapter. The objectives and goal of the project. the problem, the solution for the problem all are included in this chapter.

1.2.3 Chapter - 3: Literature Review

The discussion about the problem domain solutions is included in this chapter.

1.2.4 Chapter - 4: Methodology

There are many types of methodology with its necessary and the best methodology for the system are discussed in this chapter.

1.2.5 Chapter - 5: Planning

There are many types of plans for the project are discussed in this chapter. for example, project plan, test plan, risk management plan all are included in this chapter.

1.2.6 Chapter - 6: Feasibility

The cost-benefit will be analyzed in this chapter. the feasibility study is also included in this chapter.

1.2.7 Chapter - 7: Foundation

The problem is identified by using identification technology in this chapter. The overall requirement list, and the best technology for the system are justified and recommended in this chapter.

1.2.8 Chapter - 8: Exploration

The use case diagram and UML diagram for a new system, the prototype for the system are contained in this exploration chapter.

1.2.9 Chapter - 9: Engineering

This chapter is contained the logical model and behavioral model for the restaurant management system.

1.2.10 Chapter - 10: Deployment

The coding sample for a specific topic, development problem breakdown with priority is included in this chapter.

1.2.11 Chapter - 11: Testing

This chapter will cover the test plans and testing results.

1.2.12 Chapter - 12: Implementation

The implementation of the project, the training model for the users is included in this chapter.

1.2.13 Chapter - 13: Critical Appraisal and Evaluation

This chapter will mainly cover what objectives were met successfully and what are not

1.2.14 Chapter - 14: Lessons Learned

The learning, the difficulties that I faced and what was the solution for this all are discussed in this chapter

1.2.15 Chapter - 15: Conclusion

The summary of the project, the success of the project, and the experience that I gathered all are included in this chapter.

Chapter 2 - Initial Study

2.1 Background of the project

There are thousands of restaurants all over the world. Some restaurants carry out their activities manually and some restaurants use a management system to carry out their work as it is the age of technology. A restaurant needs a variety of management systems such as an inventory management system, order management system, payment management system information system. The restaurants for which I have developed the management system have been using the manual system for a long time which has caused them some problems such as it is cost them more and taking more time and they would not be able to enter data or manage data accurately. They feel the need to use the technology best restaurant management system to get rid of such problems so I have created this restaurant management system so that they can alleviate their troubles and they can do their necessary work through this system.

2.2 Problem Areas

The company has been using manual systems for a long time and they have faced some problems like it takes a lot of time to use the system and it costs a lot of money then it takes up a lot of space for data storage as it is a paper-based system. On the other hand, their history can be lost or destroyed at any time by entering their management data. It also takes a lot of time for their employees to enter the data. It takes a lot of time to process the data. It also takes a lot of time to process an order and create a payment system. Generating daily reports through a manual system is a matter of time. So being a paper-based system the company usually faced this kind of problem. So, they feel the need to have a technology pest management system to manage their work properly and to reduce their hassle and reduce costs. That system will play a much more important role in managing their restaurants.

2.3 Problem Solution

The restaurant management system will help them a lot to get rid of the problems that the company faced as a result of using the management system. By using this system, they can easily manage their inventory system. It can be easily added, updated, and deleted from the menu, category, and table. They will be able to take orders and create them. They will also be able to perform daily activities through this system and will be able to store all the activities through a database. Since all the work can be done very easily and it takes less time and execution through this restaurant management system, they will get rid of the problems that the company was facing by developing and using the restaurant management system.

Chapter 3 - Literature Review

The survey of any specific topic to identify relevant theories is called a literature review. It mainly provides us with the current knowledge and gap in the existing research on that topic. sometimes the literature review is just the summary of the sources but generally, it has an organizational pattern with synthesis and summary.

3.1 Discussion on problem solutions based on published articles

The restaurant management system is basically implemented for a specific company to organize their management in a systematic digital way. in the overall world, there are many restaurants and most of the restaurants are using a technical management system. in my internship duration, I have developed a restaurant management system for a company that was used an analog paper-based system for their management system. but they had faced many problems during use that. so, they had decided to use a technical restaurant management system. The problem that they had faced during using the analog system are given below:

- This analog system was the reason for the restaurant's slow service provider.
- By using the manual system, they had faced much confusion and got errors.
- By using a manual system whole day was wasted aligning data.
- That manual system was lacking security.
- It causes insufficient storage space
- It was more difficult to modify data.
- And the manual system was increasing cost at every step.

3.2 Discussion on the Problem Solution

The restaurant was faced many problems for using the manual system so here is some possible problem solution those will in contained in this restaurant management software:

3.2.1 Enhance Security

As they were using the manual system so this technical system will give them more security. and there will be a backup of data so that there was no possibility of hacking data and no one can access it without permission.

3.2.2 Reduce Cost and Stay on Budget

The manual system was so costly but this system will reduce the cost.

3.2.3 Keep the Inventory System up to Date

The inventory system will be updated every time and the management will be within sort time and all inventory data will be updated whenever needed.

3.2.4 Reduce Time to Align Data and Information

By the paper-based system it was taken a huge time of aging data but in this new system data aligning will be in so short time that reduce their time and effort

3.2.5 Reduce Error and Easy to Modify Data

The error identification was so much tough in the paper-based system. but in this new system, error handling and resolving it is so much easy.

3.2.6 Generate Automatic Reports and Payment System

It can generate reports and payment systems that will be so time-consuming and perfectly.

3.3 Comparison of Three/Four Leading Solutions

This new system for restaurant management is developed according to the customer's needs. They gave requirements according to their need and the system was developed in such away. most of the restaurants are using management systems according to their need. this company was using the manual system and it was more difficult to manage the whole system so they are now thinking about such kind of system where the inventory managing, the report generation the payment system will be in an organized way within a short time and securely and perfectly. so according to their requirements, the system is developed and this will be the best solution for the company.

3.4 Recommended Approach

Considering the above discussion, the new restaurant management system will be developed in such a way that provides those.

- The outlook design is so attractive.
- This system will be user-friendly and cost-effective.
- Automated inventory control.
- Report generation system.
- Taking order and billing system.

Chapter 4 - Methodology

The success of the project mostly depends on the software development methodology that is chosen by the development team. By using the best methodology, the team can work efficiently for the best of the project. There are many methodologies for software development. Every methodology has its own advantages and disadvantages. The software team have to choose the best methodology for the development purpose.in this chapter, the selected methodology and the reason for selecting this methodology are elaborately discussed.

4.1 What to Use

In The develop process of any software, the software development methodology plays a vital role. There are many software development methodologies. For example, prototype model, waterfall model, agile development model, dynamic systems development model, rapid application development, joint application development, spiral model etc.

4.2 Choosing Methodology

For my restaurant management system, I have decided to use DSDM methodology I hope it will be the best and suitable option for my developed project.as this method always ensure the product quality with due time so I have chosen it. And by using this methodology the customer can change their requirements if they want for their project. So, by considering the time table and also the changing think of the customer I have chosen this DSDM methodology to use for developing my Restaurant management process.

4.2.1 Dynamic System Development Method (DSDM)

Dynamic Systems Development Method is an agile framework. DSDM addresses the entire project lifecycle and its impact on the business. This is an iterative approach to software development.

The DSDM methodology ensure that, any project must be tied to clearly defined strategic objectives. and also have to focus on early deliver of the project so that the customer gets the real benefits of the business. DSDM framework is built on four principles business study and feasibility, build iteration and design, functional model and prototype iteration and finally implementation (Lead., n.d.).

4.2.2 Advantages of DSDM

- Developers can easily access their users
- In this process It's easy to understand how the project is progressing
- The final system is more likely to meet the customer's real requirements
- Projects are delivered on time by using this methodology.
- Provides a technique independent process

4.2.3 Disadvantages of DSDM

- Sometimes it is costly
- It is not suitable for one-time projects.
- In this process the users and the developers are both need to be trained
- This methodology doesn't encourage developers' creativity.

4.3 Why to Use

When is developing a project it needs to follow a methodology to successfully meet the requirements given by the users within the fixed time and budget. every methodology has some pre-defined steps by following this it is possible to meet the main objectives of any project.

Although this is not easy to choose an appropriate methodology by considering the best output of the project, I have chosen this DSDM methodology and I hope it is very helpful to complete my project and will outcome the best output (Lead., n.d.).

4.4 Sections of Methodology

In this methodology there are some fixed sections. By following this the development team can develop the project easily. The fixed section is given below:

4.4.1 Pre-project Phase

The initial project idea, as well as the time frame, budget, and basic needs for the project, are generated in this section.

4.4.2 Feasibility Study Phase

In this section, the feasibility is measured. there are basically three kinds of feasibility operational, technical, and economic feasibility are defined in this section.

4.4.3 Requirement Gathering Phase

This is the requirements gathering phase and, in this phase, all requirements for the proposed system are gathered from the users. Both functional and non-functional requirements are gathered in this phase.

4.4.4 Requirement Analysis and Prioritization Phase

After gathering all the requirements, using a prioritizing approach such as MoSCoW, the gathered requirements are analyzed and prioritized in this section.

4.4.5 Exploration and Engineering Phase

It is the main iterative section of this methodology, here all the requirements are explored and the solution for these requirements is developed iteratively (Lead., n.d.).

4.4.6 Review Phase

The developer delivers the system in this phase and the users are tasting that, if there is any change to need, they send back the issue of the change to the developer's team.

4.5 Implementation Plans

This is the last phase of project work; in this phase the developed project is released for use. To make the new system available to use if there is any problem associated that have to be identified and resolved. In this section the release criteria the configuration is also identified. After all process when the new system is finally okay and completed then the system is launched.

Chapter 5 - Planning

5.1 Project Plan

This is the planning phase. in this phase, it shows the planning way how the project will be completed within a fixed time and budget. For the convenience of work to complete the implementation in time the project is divided into some parts and made a plan for all parts will be completed in a fixed period. all those timing and planning are divided and decided in this phase.

5.1.1 Management Plan / Work Breakdown Structure (WBS)

In this Work breakdown phase, all tasks are divided into some small parts. and then those small parts have to be completed with a fixed time period step by step. by completing those small parts

step by step all tasks will be done in a fixed period. this is an easier and efficient way to complete all tasks. The work breakdown structure gives an estimation of the time and task. if we don't use this WBS structure to complete the project then the project could be more difficult and complex to finish in the fixed time period. this structure gives us the category and sub-category of the task with time measurement (Resources., n.d.). this is given below in chat:

Serial	Task Name	Duration	Start date	Finnish date
1	Introduction	4 days	11/10/21	11/14/21
2	Initial Study	6 days	11/15/21	11/20/21
3	Literature Review	4days	11/21/21	11/24/21
4	Methodology	5 days	11/25/21	11/29/21
5	Planning	5 days	11/30/21	12/4/21
6	Feasibility Study	5 days	12/5/21	12/9/21
7	Foundation	4 days	12/10/21	12/13/21
8	Exploration	18 days	12/14/21	12/31/21
9	Deployment	14 days	1/1/22	1/14/22
10	Testing	4 days	1/15/22	1/18/22
11	Implementation	3 days	1/19/22	1/21/22
12	Critical Evolution	1 day	1/22/22	1/22/22
13	Lessons Learned	1 day	1/23/22	1/23/22
14	Conclusion	1 day	1/24/22	1/24/22
	Totals	75 days		

Table 1: Work Breakdown Structure of the Restaurant Management System

5.1.2 Resource Allocation (H/W, S/W. Models, Documentation)

Resources allocation for a project is one kind of process that manages all resources to meet the best project need within its duration. most often this refers to people but it can also refer to the specific tool, equipment, facilities, budget, or time. All those resources allocation in the right way ensure the best output of the project in an arranged way (Landau, n.d.). so, this is so significant

part of the project planning. The resources allocation for the restaurant management system are given below:

Serial	Task	Duration	Resource
1	Introduction	4 days	User, Analyst
2	Initial Study	6 days	Analyst
3	Literature Review	4 days	Analyst
4	Methodology	5 days	User, Analyst
5	Planning	5 days	Team leader, Analyst
6	Feasibility	5 days	User, Analyst
7	Foundation	4 days	Analyst, Designer, Developer
8	Exploration and engineering	18 days	Analyst, Designer, Developer
9	Deployment	14 days	Designer, Developer
10	Testing	4 days	Developer, Tester, User
11	Implementation	3 days	Analyst, Developer, User
12	Critical Evolution	1 days	Analyst
13	Lessons learned	1 days	Designer, analyst, Developer, Tester
14	Conclusion	1 days	Analyst

Table 2: Resource Allocation List

5.1.3 Time Duration / Time Boxing

As I used the DSDM methodology so it divides the tasks into some small parts with time boxes. In a DSDM project planning the deadline is more important to meet the goal of the project. This is the phase where all tasks are divided into some timeboxes with fixed time duration so that all tasks meet their goal. in the DSDM method, it is very important to complete tasks within time.

Time Box	Task	Resource
TB1	Introduction	User, Analyst

	Initial Study	Analyst
	Literature Review	Analyst
TB2	Methodology	User, Analyst
	Planning	Team leader, Analyst
	Feasibility	User, Analyst
	Foundation	Analyst, Designer, Developer
TB3	Exploration and engineering	Analyst, Designer, Developer
TB4	Deployment	Designer, Developer
	Testing	Developer, Tester, User
TB5	Implementation	Analyst, Developer, User
TB6	Critical Evolution	Analyst
	Lessons learned	Designer, analyst, Developer, Tester
	Conclusion	Analyst

Table 3: List of the Time Boxing

5.1.4 Gantt Chart

A Gantt chart is one kind of bar chart that provides a visual representation of project tasks scheduled overtime. this is basically used for project planning. This chart is used for seeing the start dates and end dates with the project goal to finish the full project.

Figure 1: Project Life Cycle Gantt Chart

5.2 Test Plan

This plan is important for finding any problem after input any data and show the actual result come or not.

5.2.1 Testing Against Time Boxes

The time box method is generally used to estimate the maximum unit of time for a certain segment.

Test Type	**Steps of test**	**Expected result**	**Actual Results**	**Comment**
Unit Testing				
Integration Testing				
Module Testing				
Acceptance Testing				
Security Testing				
Usability Testing				
Reliability Testing				

Table 4: Sample of Testing Against the Time Box

5.2.2 Required Tests

There are two types of testing system functional and no functional.

5.2.2.1 Functional Testing

5.2.2.2 Unit Testing

It is one kind of functional testing, in this testing The system developers mainly test all small sources are code together fit for use or not.

5.2.2.3 Integration Testing

In this testing method, the tester is mainly testing whether there gives any input the expected output comes or not. the white box testing and the black box testing are included (Aebersold, n.d.).

5.2.2.4 System Testing

This testing is performed with only black-box testing to test if there is an expected result come or not of internal work of code.

5.2.2.5 Nonfunctional Testing

5.2.2.6 Security Testing

Security testing is basically testing the security in the whole system. Whether any other user can access it or whether users can access it as per their instructions.

5.2.2.7 Usability Testing

Usability testing is a test of how user-friendly the system is or how easily a user can access the system or perform their tasks.

5.2.2.8 Acceptance testing

Basically, this testing is done to test whether any user has received their system according to their requirements or whether the system has been made according to their requirements, and how much they are accepting it (Aebersold, n.d.).

5.2.2.9 Reliable Testing

Reliable testing is used to test the reliability of a system, whether it can be moved to another page if accessed anywhere, or the ability to redirect from one page to another is tested in this testing (Aebersold, n.d.).

5.2.3 Test Case

The test case number. Test case type, test description and test steps all are included in this section.

A sample of a test case are given below:

Test Case Name		**Module Testing**	
Test Class			
Test Description			
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin			

Table 5: Sample of Test Case

5.2.4 User Acceptance Test Plan

This is the last and final step of testing. Here the testing performance is measured by the end-user of the project. They mainly check the overall performance of the project in this sector.

5.3 Risk Management

The methodology of identifying, analyzing, and reducing the risk which may be occurred during the project development life cycle is called risk management (Ray, n.d.). The risk management system helps to complete a project to meet its objective and expected goal.

The types of risk management are given below:

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

5.3.1 Risk Identification

Risk identification is most important to prevent the destruction of the project. In the risk management process, the first step is to identify the risk which may occur and can damage the project (Ray, n.d.).

The possible identification risks that can occur are given below:

Risks Type	Causes	Impact
Scheduling	Unexpected natural disaster	Late submission of project
Database Error	Sometimes data cannot be found due to lacking of system materials	The admin cannot fine the expected data
Unauthorized Access	An unknown person tries to access the system data may be changed or deleted	System may be hacked and data can be destroyed or illegal use
Technical Problem	Lacking of required performance	Late submission of project due to schedule failure
Project backup	Lacking of project backup	Effect on budget

Table 6: Table of Risk Identification

5.3.2 Risk assessment

The qualitative and quantitative value of risk including threats of a project is risk assessment.

Risks Type	Likelihood	impact	Restore Time
Scheduling	4	5	7
Database Error	5	5	6
Unauthorized Access	3	4	4
Technical Problem	2	3	3
Project backup	3	3	6

Table 7: Table of Risk Assessment

5.4 Change Management

5.4.1 Factors That Might Cause Change

During development there are many changes can be happened.

- Schedule categories may change
- Functional requirements may change
- User interface design may change
- Security and privacy sectors may change

5.4.2 Considering Business Value / Priority

To meet the goal of the project changes have been considered. as well as requirements we prioritize the changed functionality so that the user meets with their actual goal of the project.

Topic area	Level of priority
Scheduling segments	4
Requirements	6
User interface	3
Security and privacy	6

Table 8: Table of Priority

5.4.3 Changes That Are Allowed

According to the change's priority level, some changes are accepted. changes are accepted based on resources, schedule, cost, quality, and risk. During the development session, some changes are allowed according to priority.

5.4.4 Key Decision Takers of Change

If there is any change needed the decision taker can change it.

The decision taker who is included in the project are given below:

- Requirement Analyst
- Developers
- Testers

If there is any need to change any functional requirements the requirement analyst can change the requirements, and also the developer can change the code if needed. the tester can change the module if there occurs any error during testing.

5.5 Quality Management

The maintenance of the standard of the project that the user is agreed to accept during project initiation is called quality management (www.workfront.com., n.d.). This depends on several characteristics.

- The communication between the developers and the end-user.
- Constantly changes on requirements.

5.5.1 Rules Applied to Maintain Quality

To maintain the quality some rules and regulations have to follow. Quality control and quality assurance are included in this (www.workfront.com., n.d.).

5.5.1.1 Quality Control

By evaluating order, service quality control has been maintained. For example:

- By viewing the report of the everyday order process

5.5.1.2 Quality Assurance

By evaluating the right and wrong approach of the login system quality assurance has been maintained. For example:

- To ensure the cashier can log in and just access the cashier feature

5.5.2 DSDM Atern Standard Quality Measures

Solution quality: Based on the business need and requirements the solution quality has been ensured. for this there are two types of prioritizations was used there are:

- Time Boxing
- MoScoW

5.5.3 Quality Plan and Measuring Meter

In this step, some quality plans have been maintained. those are given below:

- ✓ The resources allocation and time schedules have been done successfully.
- ✓ After completing every module, the testing phase has been done properly
- ✓ After some changes occur the track and documentation have been changed properly for the next step done accurately.

Chapter 6 - Feasibility

6.1 All Possible Types of Feasibility

6.1.1 Operational Feasibility

The ability to utilize, perform and support the necessary tasks of a system is called operational feasibility. The creators of the project the operator or the users of the project are included in it. To be operationally feasible, the system must fulfil all the requirements given by the business and the usability have to be very user friendly. In this restaurant management system, I have completed all the requirements that are required by the business. The system is user friendly the admin and the cashier can easily access all the features and can complete their task easily. There is a very easy navigation bar that one can understand easily so the system is more operational feasible (GeeksforGeeks., n.d.).

6.1.2 Technical Feasibility

As the company was using manual process so this restaurant management system will be technical feasible as they can now easily manage their activities using this web bases system. This is developed and designed by using the latest technology so the system will run in any web browser with low-level internet connection. The system will be cost effective and all the resource those are need have to be affordable so this system will be technical feasible (GeeksforGeeks., n.d.).

6.1.2.1 Hardware

- Laptop
- Router

6.1.2.2 Software

- Xampp
- Microsoft office

6.1.2.3 Browser

- Windows 10(operating system)

6.1.2.4 Database

- MySQL

6.1.2.5 Server Side

- Html
- CSS
- Java Script
- Bootstrap
- JQuery

- Ajax
- PHP
- Laravel framework

6.1.3 Economic Feasibility

For this system the data are hosted into a remote server.

6.1.3.1 Desktop Application Cost

Equipment	**Cost Per Unit**	**Cost**
File server, well, email	7,000 taka per month	7,000
Desktop pc (core i9, 4.6 GHz processor, 32 GB RAM, 1 TB HDD)	120000 taka per month	12,0000
Total		127000

Table 9: Table of Desktop Application Cost

6.1.4 Market Research Analysis Based on the Feasibility Factors

At present mankind is moving towards automation everything so that they can increase the efficiency of their work. The restaurant management system is one kind of system that helps to keep all aspects of the dining establishment running smoothly. By using the system one restaurant can easily manage their work so fast and correctly. most of the restaurant are using the automation system rather than the manual system. So, it is very much important to develop and use an automated system. In this situation this company have decided to create a new system for their company, this system will be known as a restaurant management system. It will help the restaurant owner in many ways. He can manage inventory control, gather bills, manage bill manage menus and customer services by using this developed system. As nowadays most restaurants are using automated management systems rather than manual systems so this will be most effective for the company.

6.2 Cost Benefit Analysis

Cost-benefit analysis or CBA is a process that helps to support decision making in a project. It mainly helps to evaluate or measure the cost versus the benefit of the project to regulate the feasibility of the project. In this part, the benefit of the project is determined by comparing the expenditure and earn.

The cost-benefit analysis for this restaurant management project is given below:

6.2.1 Total cost

Serial Number	Equipment	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1	Desktop application Cost	127000	-	-	-	-	127000
2	Domain and hosting Cost	22000	22000	22000	22000	22000	110000
3	Employee Expenses	50000	50000	50000	50000	50000	250000
4	Other Cost	30000	30000	30000	30000	30000	150000
5	Total Cost	229000	102,000	102,000	102,000	102,000	637000

Table 10: Table of Total Cost

6.2.2 Total Earn

Serial Number	Sector	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1	Restaurant Business	200000	250000	300000	370000	450000	1570000

Table 11: Table of Total Earn

6.2.3 Total Revenue

Serial Number	Sector	First Year	Second Year	Third Year	Fourth Year	Fifth Year	Total
1	Total earning	200000	250000	300000	370000	450000	1570000
2	Total Cost	229000	102,000	102,000	102,000	102,000	637000

	Total Revenue	-29000	148000	198000	268000	348000	933000

Table 12: Table of Total Revenue

So by using this the company the company will earn revenue a big amount of taka rather than before. The revenue will be increased day by day.

So the management system will be beneficial for the company.

6.3 Is DSDM Good or Bad for this Project

Dynamic systems development method is an agile project delivery framework that is used for software as this is my internship project so I have to be complete it within a limited amount of time with all the requirements. As it is a management system for a restaurant so it may need to change some requirements during the development so it should be developed iteratively. The Dynamic system development method ensures the quality of work within the fixed time. And it also ensures the iterative development process with strict rules. As this method ensure delivery on time. And it is easy for understanding the processing of the project. So as by using this method the developments and progression occur quickly with proper budget and can deliver on time so the DSDM is the best method to use for the restaurant management system.

Chapter 7 - Foundation

7.1 The problem Area Identification

The problem area identification is most important for any project. The problem can be identified from the user of the project because they will use the system. So, some problem identified by the user are given below:

7.1.1 Interview

The interview is the best way to collect the actual problem or the Goal of the project. This this the process where the end user is asked some questionnaire about their problem and what they actually want from the new proposed system. So, for the restaurant management system, some questions are organized to ask the user of the system (Guide., n.d.).

7.1.1.1 Question for the owner/admin

- What kind of problem face during to use the manual system?
- What kind of system he actually needs to automated the system?

7.1.1.2 Question for the cashier

- What kind of problem they face during make an order system?
- Faced any problem of generate invoice manually
- By generating report manually what kind of problem they face

7.1.2 Observations

For knowing the actual problem and knowing the user's requirements observation is so much helpful processing. In this technique the development team have to go to the work place to see the actual scenario and have some points to collect requirements what they actual need to their new system (Guide., n.d.).

- Observe the process that they are using to get an order and make payment system in this manual process
- Point the management system of category menu table for the restaurant
- How they manage and save their menu item and selling report and what kind of problem they faced during that.

7.1.3 Questionnaires

Questionnaires are the best technique to collect requirements.in this technique some question n are pre generated to ask the users of the system (Guide., n.d.). It might be short questions, MCQ or survey. Some questions are given below:

Problem Identification Question			
Name:		**Gender:**	
User:	**Admin/manager**	**Age:**	
Question No-1	**How do you manage your inventory system?**		
Ans:			
Question No-2	**How do you want to see your report?**		
Ans:			

Question No-3	**Tell us your thought about the inventory management system.**
Ans:	

Table 13: Table of Manage Inventory System

Problem Identification Question			
Name:		**Gender:**	
User:	**Cashier**	**Age:**	
Question No-1	**How do u take order?**		
Ans:			
Question No-2	**how do u manage the payment and billing system?**		
Ans:			
Question No-3	**Tell us about your taking order and billing system**		
Ans:			

Table 14: Table of Take Order

7.2 Specific Problem Area Identification and Description

There are many problems has identified in the problem are identification by interview, observation, and questionaries.

analyzing those I have identified some specific problems. which are given below:

- There is no security of this manual system
- No modification process of data easily.
- No specific automated inventory management

- ❖ No consistency in data entry, error solution.
- ❖ No automated billing system and report generate system

7.3 Possible Solution

For this identified problem there are some possible solutions, those are given below:

- ❖ A centralized new digital management system should be developed
- ❖ The total automated inventory management system should be developed.
- ❖ Making billing system and automated report generating system can be developed.
- ❖ Overall privacy and security sector should be developed properly

7.4 Overall Requirement List

The final requirement list for the restaurant management system is given below:

7.4.1 Functional Requirement

- Category and menu management
- Table reservation management system.
- Taking order management
- Billing system
- Report generation system
- User management system

7.4.2 Non-functional Requirements

- Privacy and security policy
- Backup for data and resources
- User-friendly interface
- The authentication and authorization system for access restriction
- Verification & validation

7.5 What Technology to be implemented (Client/Web/Standalone)

There is much technology used for a new system. but the best technology chosen depends on what issue the system will be used and which users will it, so choosing the exact technology is important because the implementation of the system mostly depends on the best technology. some alternatives technologies are given below:

7.5.1 Client-Server Application Technology

In this technology, the application or the system needs to install the client's device. and the data are stored in any remote server.it is also called desktop-based technology. here the application requests a remote server for the stored data in the server (www.omnisci.com., n.d.).

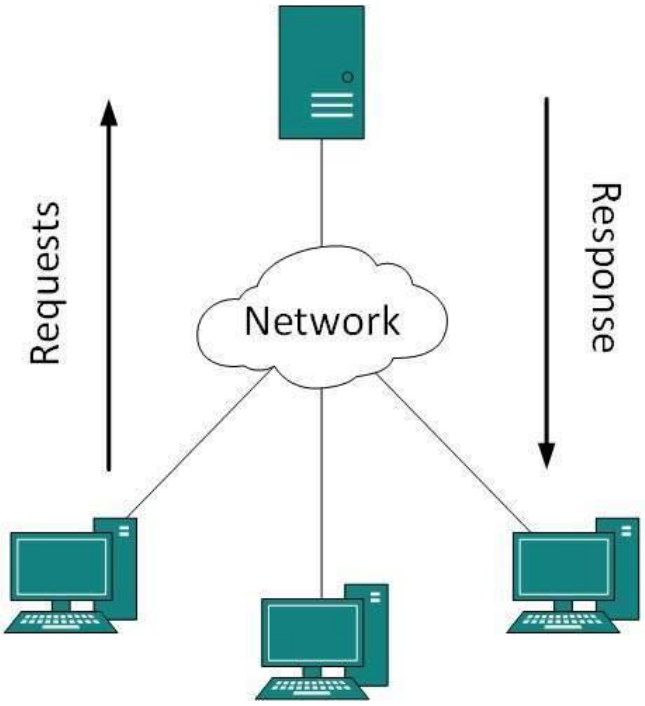

Figure 2: Figure of Client Server Application Technology

The features of the client-server application are given

- The system needs to be installed in the client device
- It is not portable easily
- It is costly because the client needs to purchase the application

7.5.2 Web Application

In this technology there is no need to install the system, the system is hosted on any remote server and this can be accessed from anywhere through the internet. the features of the web application are given below:

- There is no installation needed for the system in the client device
- Can be accessed via the internet from anywhere at any time
- There is a low cost in this technology rather than client-server application.

7.6 Recommendations and Justifications

The restaurant management system is for a specific company to manage their entire inventory and order-making system. and there are two users and it will be used in a restaurant only.so there is no need for a web application for this as there is no huge number of users, so the Web-Based application technology is recommended for the restaurant management system but our organization is developing the Desktop Based Application.

Chapter 8 - Exploration

8.1 Activity Diagram

8.1.1 Activity Diagram for Registration

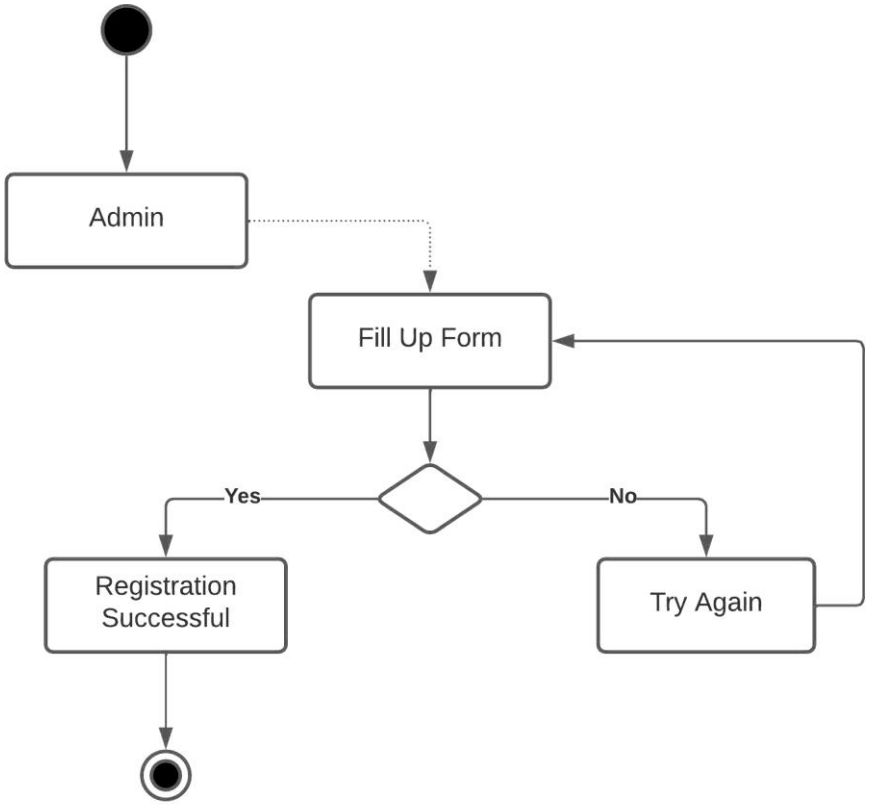

Figure 3: Activity Diagram for Registration

8.1.2 Activity Diagram for Admin

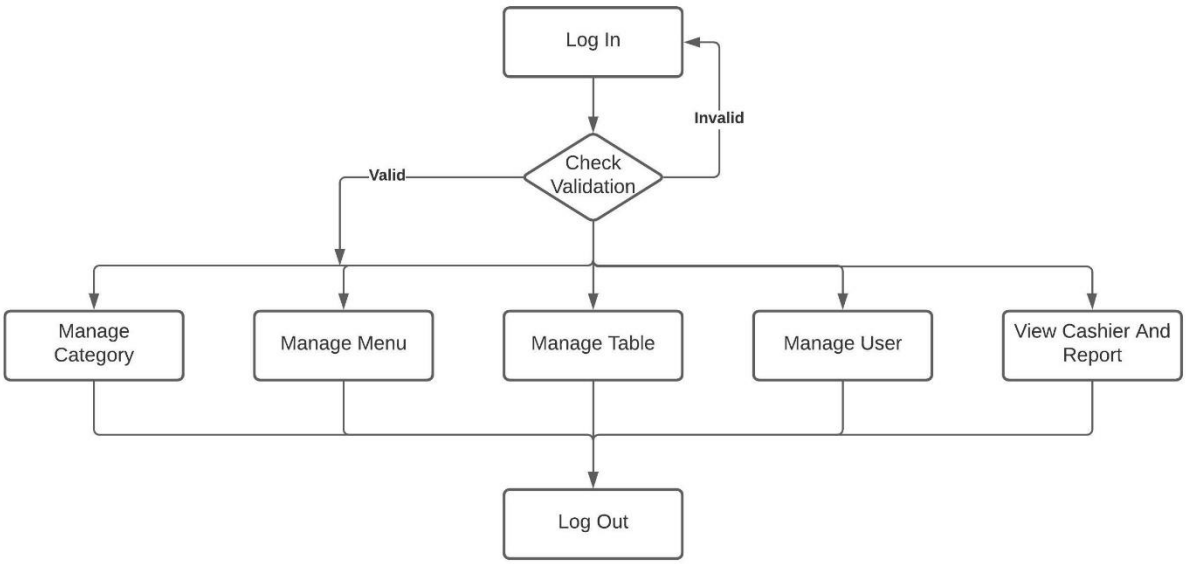

Figure 4: Activity Diagram for Admin

8.1.3 Activity Diagram for Cashier

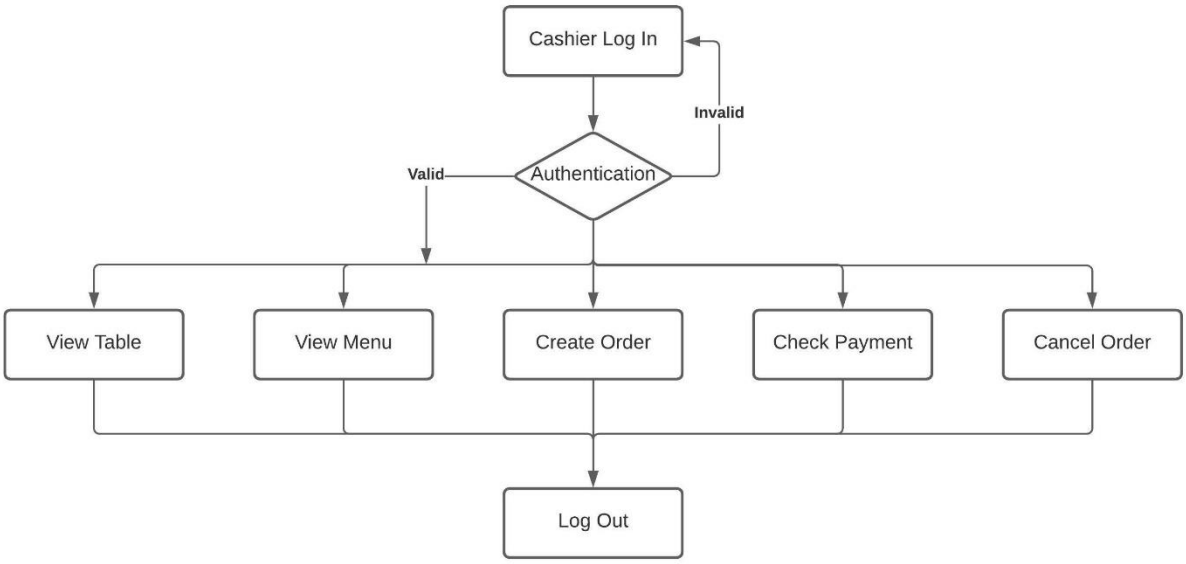

Figure 5: Activity Diagram for Cashier

8.2 Full System Use Case

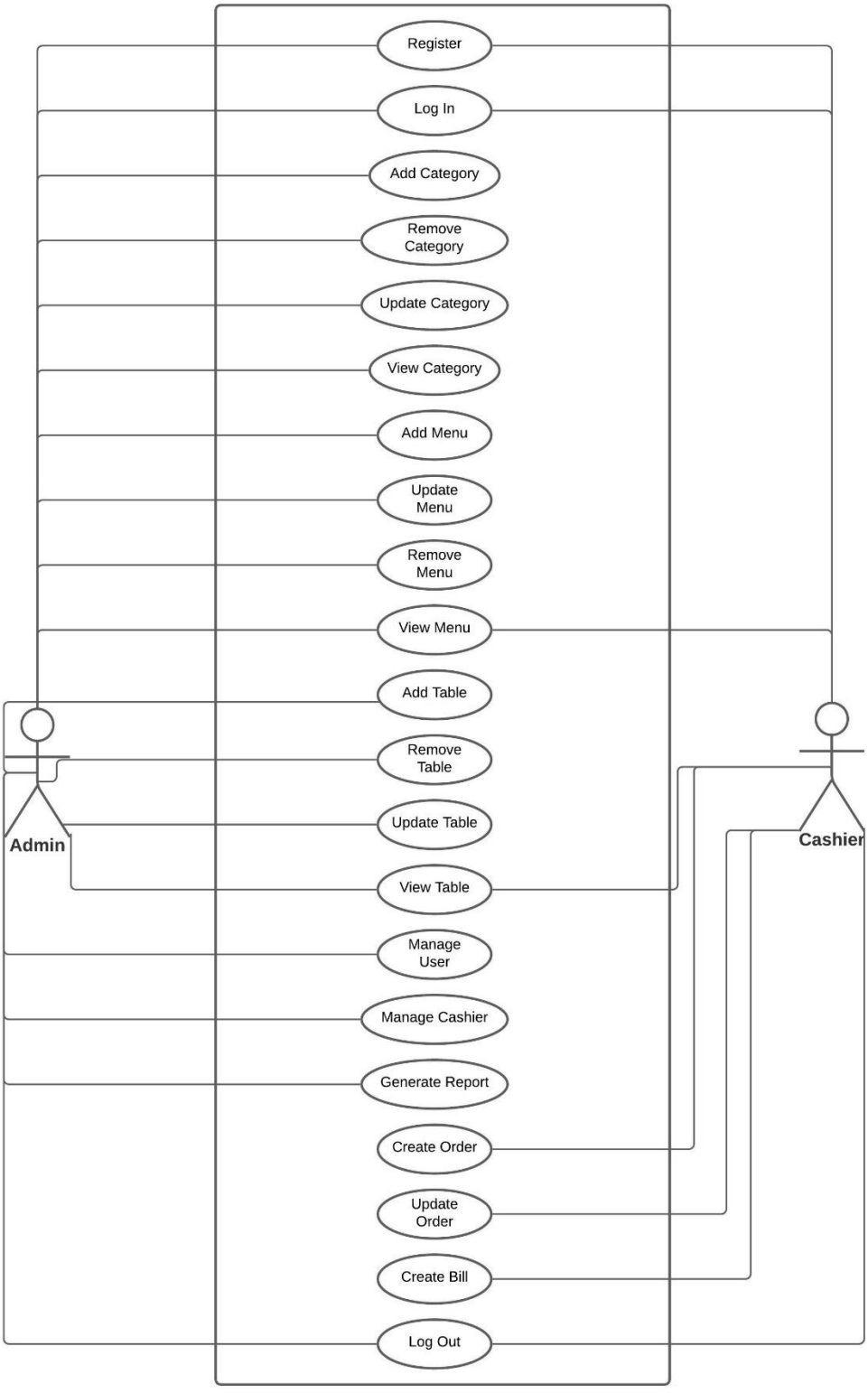

Figure 6: Full System Use Case Diagram

8.3 Requirements Catalog

All the identified requirements are listed in requirements catalog. Some requirements with requirements catalog are given below:

8.3.1 Registration and login requirement catalogue

Source	**Sing off:**	**Priority**	**Requirement ID:**
Admin	Admin	Must	M-001
Functional Requirement **Registration and Login for users** The admin and cashier need to registration and log in first. They cannot perform without authentication.			
Non-functional requirement			
Description	Target value	Acceptance Value	Comment
Login/registration	2	2	

Table 15: Table of Registration and login Requirement Catalogue

8.3.2 Manage Category Catalogue

Source	**Sing off:**	**Priority**	**Requirement ID:**
Admin	Admin	Must	M-002
Functional Requirement **Manage Category** The admin can view, update, delete category			

Non-functional requirement			
Description	Target value	Acceptance Value	Comment
Category management	50	20	

Table 16: Table of Manage Category Catalogue

8.3.3 Manage Menu Catalogue

Source	**Sing off:**	**Priority**	**Requirement ID:**
Admin	Admin	Must	M-003
Functional Requirement **Manage Menu** The admin can view, update, delete menu			
Non-functional requirement			
Description	Target value	Acceptance Value	Comment
Menu management	60	30	

Table 17: Table of Manage Menu Catalogue

8.3.4 Manage Table Catalogue

Source	**Sing off:**	**Priority**	**Requirement ID:**
Admin	Admin	Must	M-003
Functional Requirement **Manage Table**			

The admin can view, update, delete table			
Non-functional requirement			
Description	Target value	Acceptance Value	Comment
Table management	50	20	

Table 18: Table of Manage Table Catalogue

8.3.5 Take Order and Billing Catalogue

Source	**Sing off:**	**Priority**	**Requirement ID:**
Cashier	Cashier	Must	M-004
Functional Requirement **Manage Category** The cashier log in first and can take order and cancel order also and make bill			
Non-functional requirement			
Description	Target value	Acceptance Value	Comment
Order request	500	350	

Table 19: Table of Take Order and Billing Catalogue

8.4 Prioritized Requirements List (PRL)

Here I have MoScoW prioritization technique to make the priority list of the requirements.

For the restaurant the prioritized list of requirements is given below:

Serial	**Requirement**	**Priority**
1	Registration and log in for users	Must Have
2	Manage Category	Must Have

3	Manage menu	Must Have
4	Manage table	Must Have
5	Manage user	Must Have
6	Create order	Must Have
7	Create bill	Must Have
8	Generate report	Should have

Table 20: Table of Prioritize Requirement List

8.5 Prototype of new system

8.5.1 Dashboard

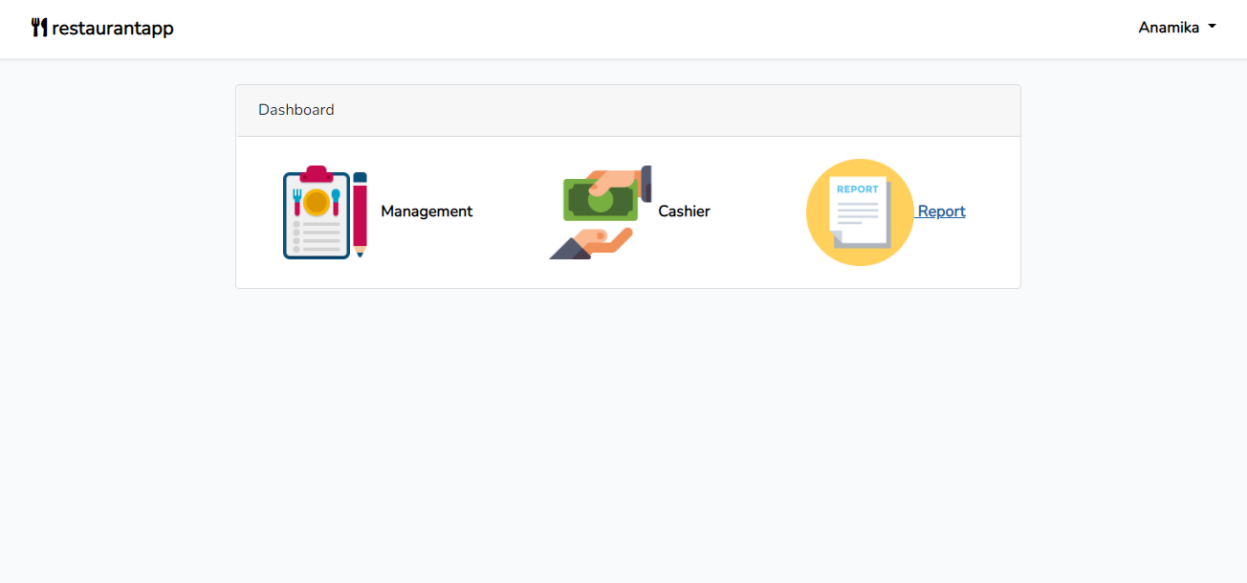

Figure 7: Prototype of admin Dashboard

8.5.2 Management

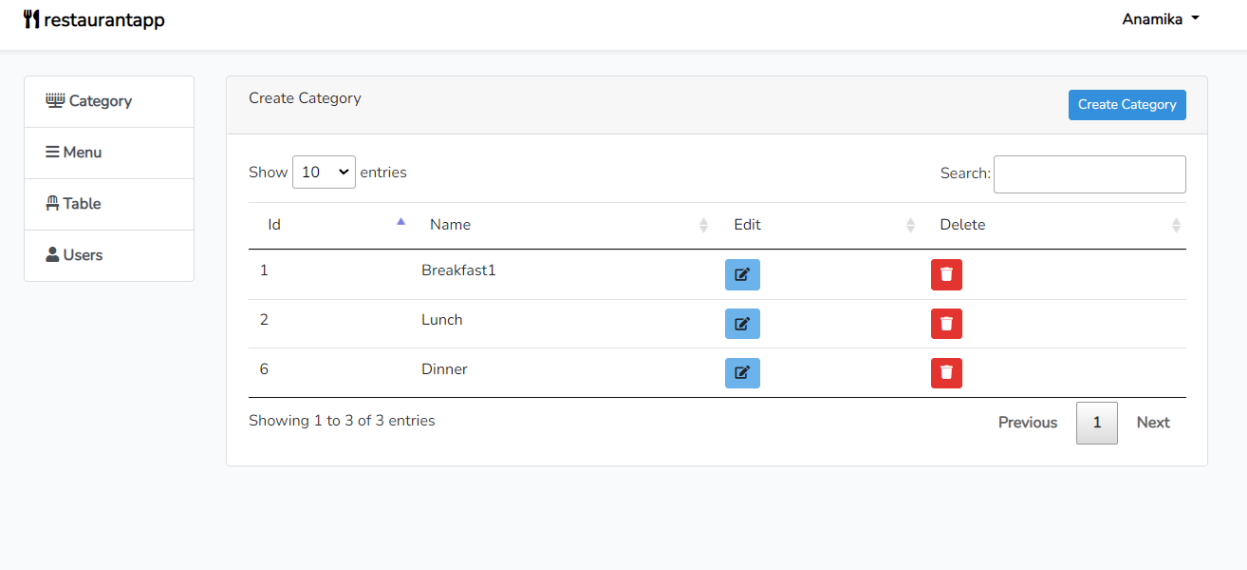

Figure 8: Prototype of Management

8.5.3 Order management

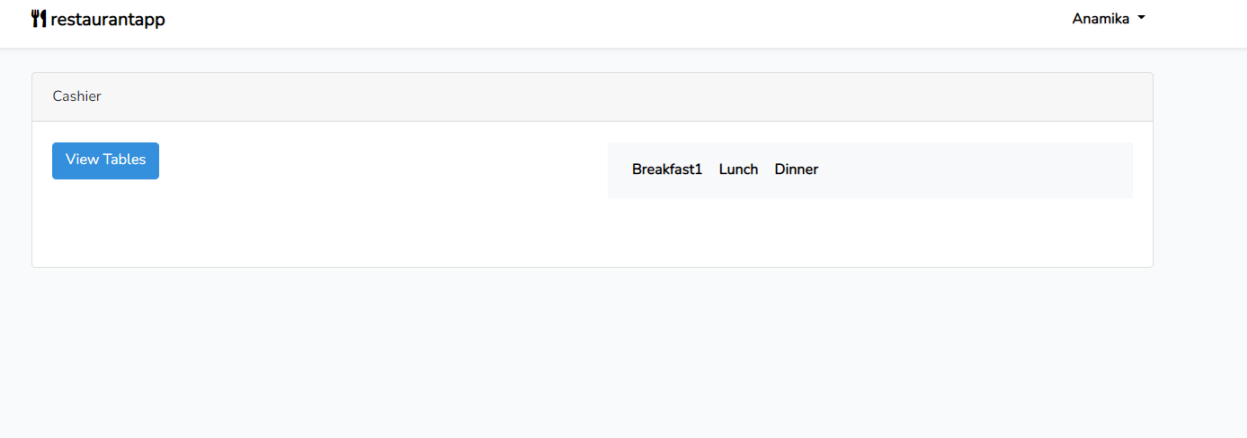

Figure 9: Prototype of order management

8.5.4 Report Generation

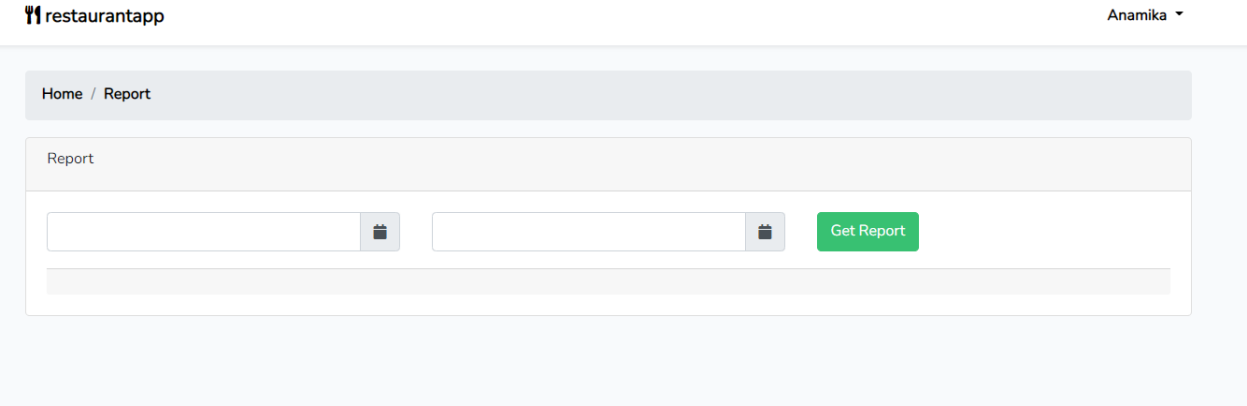

Figure 10:Prototype of Report Generation

Chapter 9 - Engineering

9.1 New System Modules

Some of the core modules of restaurant management system are given below:

9.1.1 Log in Module

Serial	User Action	Serial	System Action
1	Admin click on login	1	System will give user a log in form
2	Admin will provide all credentials	2	System will validate the given data
3	After fill the form admin will click on log in button	3	The System at first authenticate the admin if all given data is correct the admin will redirect to the admin dashboard otherwise it will show a error message.

Table 21: Table of Login System Module

9.1.2 Menu Create Module

Serial	User Action	Serial	System Action
1	Admin click on Create new menu	1	System will give user a menu create form
2	Admin will provide all credentials	2	System will validate the given data
3	After fill the form admin will click on Submit button	3	The System at first authenticate all given data. if all given data is correct then new menu will add to chart and system will show the menu page. If any given data is incorrect then the system will show an error message.

Table 22: Table of Menu Create Module

9.1.3 Create Order and Make Payment

Serial	User Action	Serial	System Action
1	Admin click on login	1	System will give user a log in form
2	Admin will provide all credentials	2	System will validate the given data
3	After fill the form admin will click on log in button	3	The System at first authenticate the admin if all given data is correct the admin will redirect to the admin dashboard otherwise it will show a error message.
4	After successfully log in the cashier request for view table	4	The system will provide all table info
5	The cashier selects a table	5	The system will show the selected table
	The cashier will click menu		The system will show all menu to the cashier

	The cashier will select the menu		The system will show the menu with quantity and price
	The cashier will click confirm order		The system will show payment button
	The cashier will click payment button		The system will show the payment form
	The cashier will click the save payment		The system will show invoice with two option go back and print option
	The cashier will click go back button or print button		If the cashier clicked on go back button, then the system will redirect the cashier in cashier dashboard. If the cashier will click the print button, then the system will show the print invoice

Table 23: Table of Create Order and Make Payment Module

9.2 Use Case Diagram for Restaurant management system

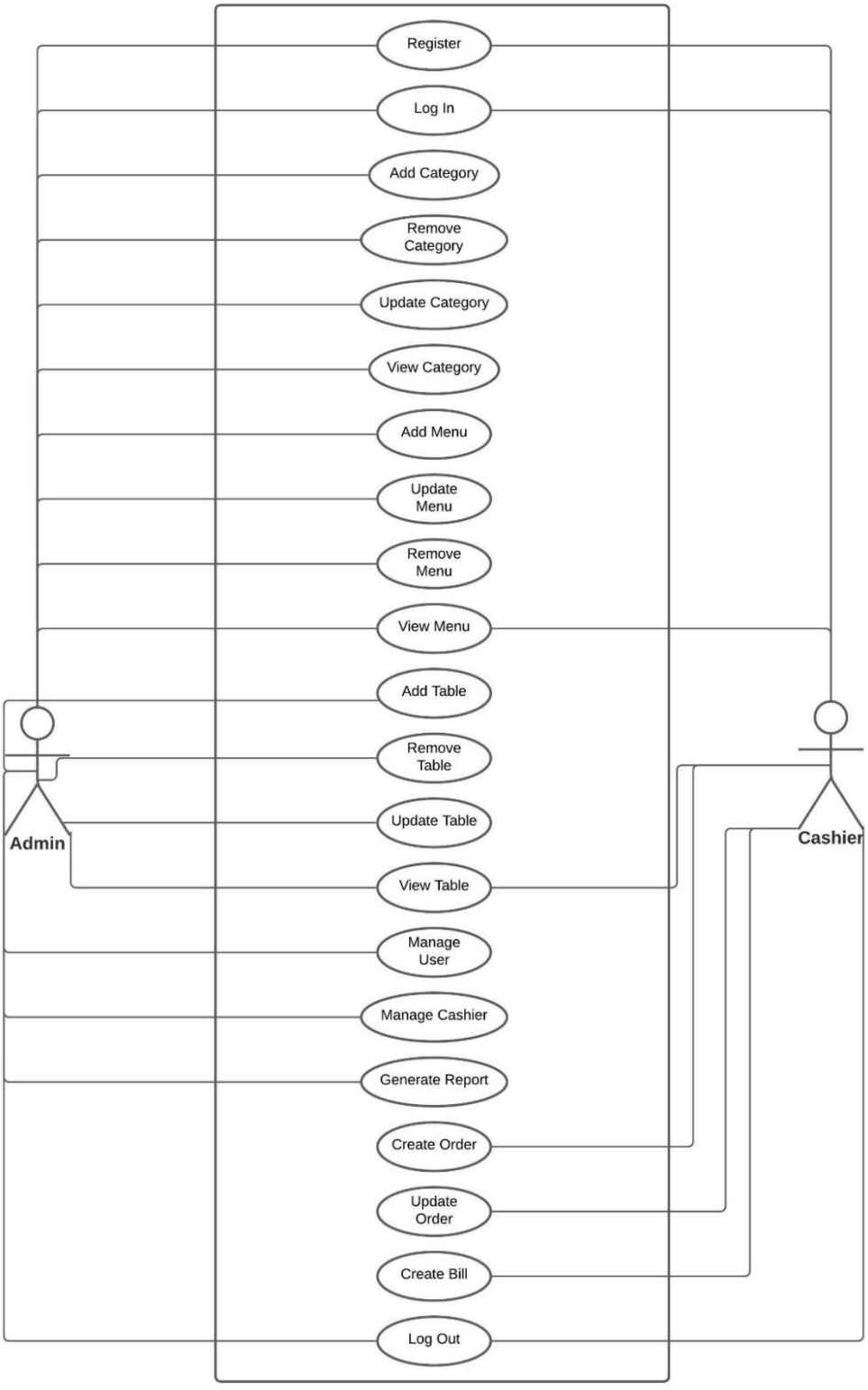

Figure 11: Use Case Diagram of Restaurant Management System

9.3 Class Diagram of the Restaurant Management System

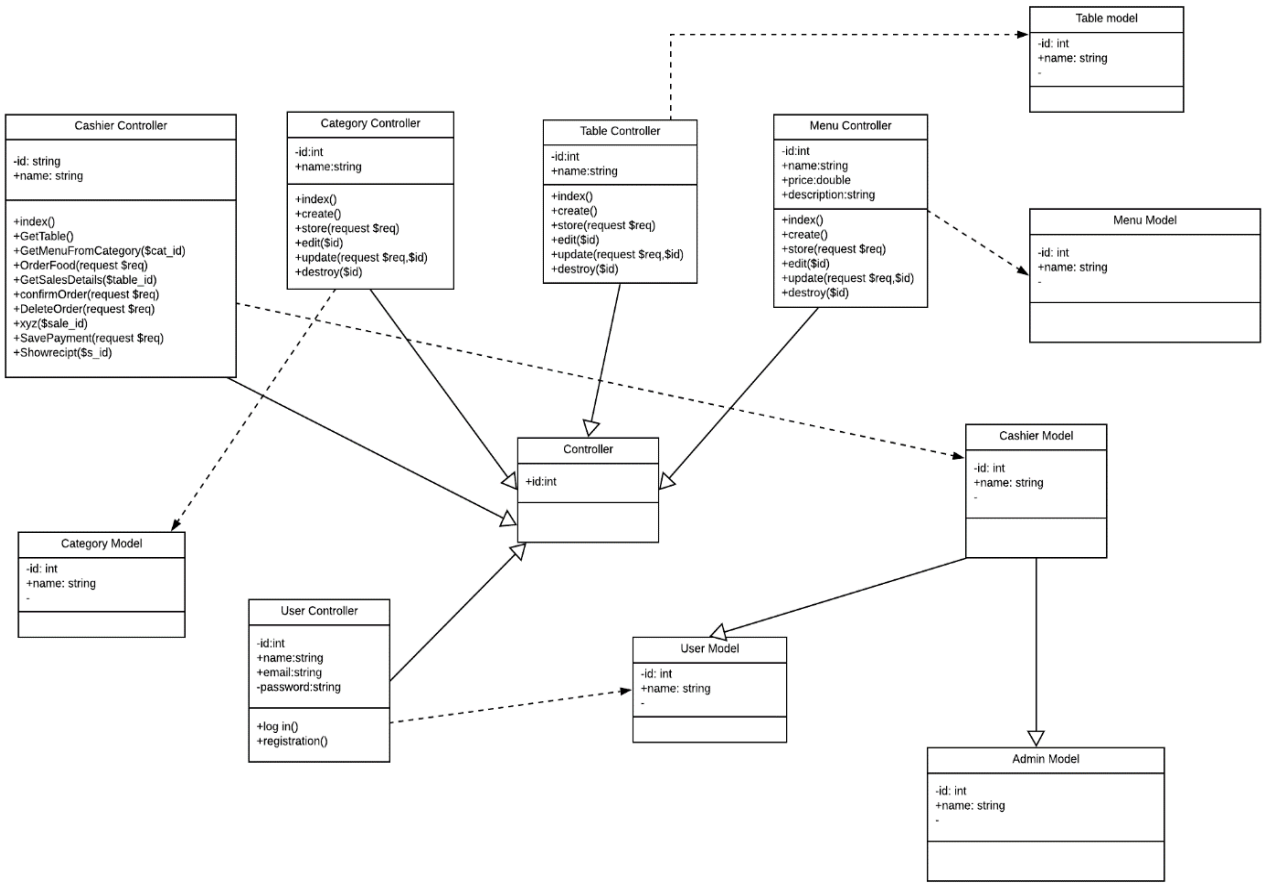

Figure 12: Class Diagram of Restaurant Management System

9.4 Peter Chen EERD Diagram

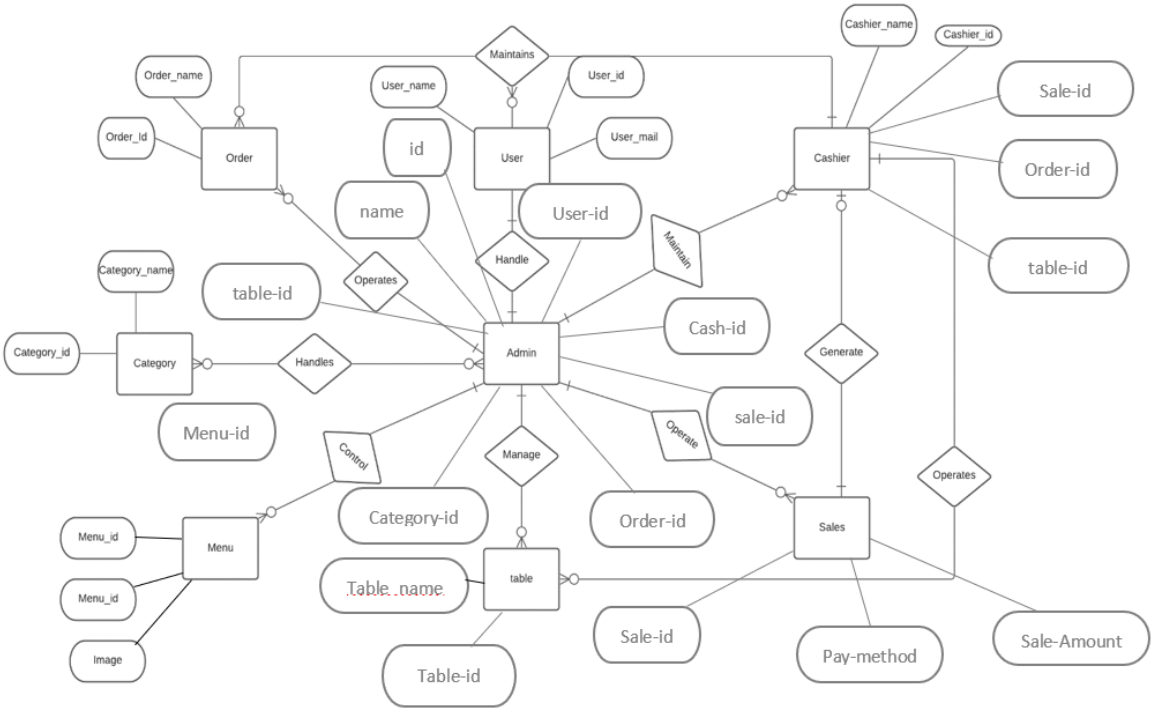

Figure 13: Figure of ER Diagram

9.5 System Interface Design

9.5.1 Dashboard

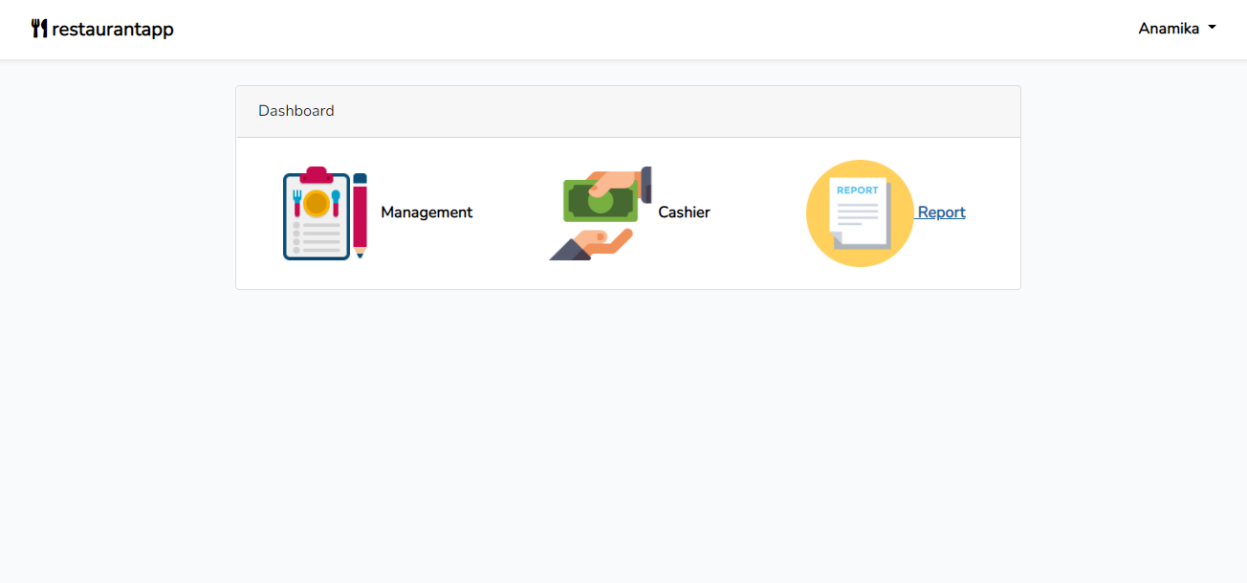

Figure 14: System Interface of Dashboard

9.5.2 Management

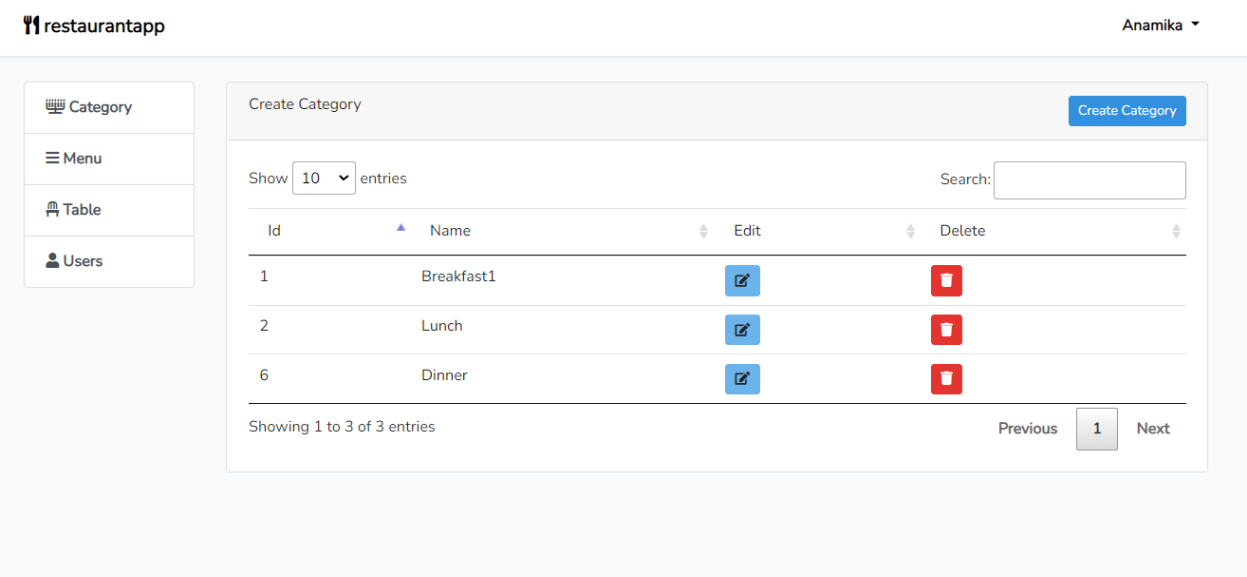

Figure 15: System Interface of Management

9.5.3 Cashier management

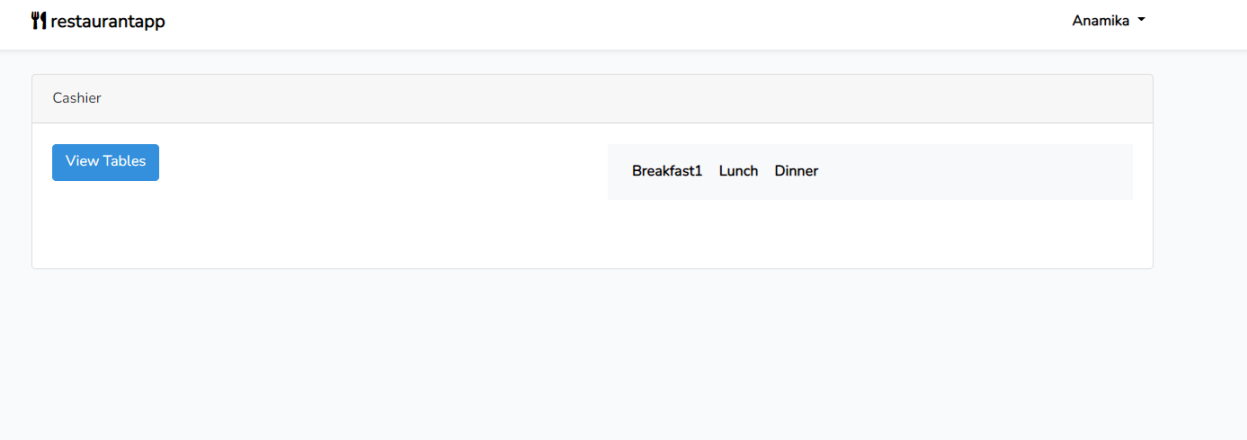

Figure 16: System Interface of Cashier Management

9.5.4 Report Management

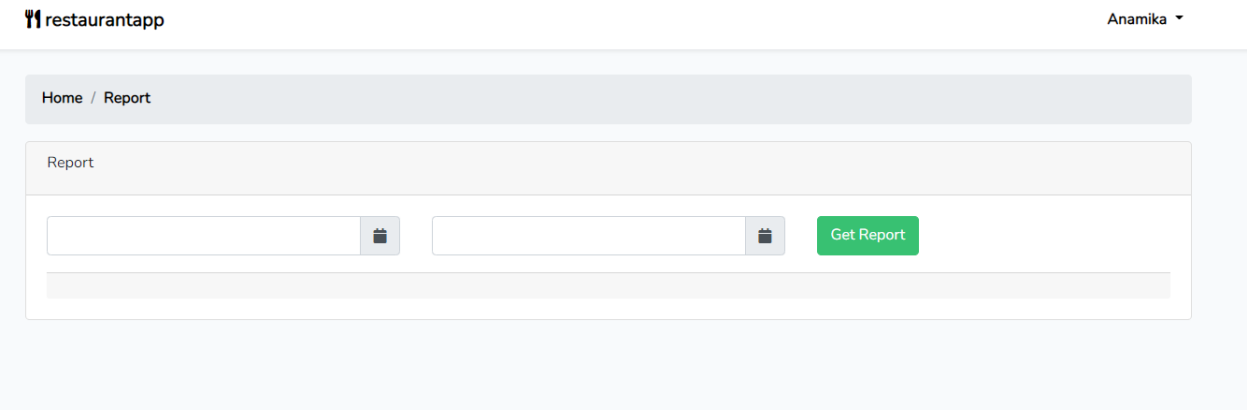

Figure 17: System Interface of Report Management

Chapter 10 - Deployment / Development

10.1 Core Module Coding Sample

For developing the Restaurant management system, I have used HTML, CSS, Bootstrap, JavaScript, and ajax for the front-end development. For the database, I have used MySQL. I have used the PHP laravel framework for the back-end development. The major part of my code is given below:

10.1.1 Manage Menu

```
public function index()
{
    $menus = menuModel::all();
    return view('management.menu')->with('menus',$menus);
}

/**
 * Show the form for creating a new resource.
 *
 * @return \Illuminate\Http\Response
 */
public function create()
{
    $categories = categoryModel::all();
    return view('management.CreateMenu')->with('categories',$categories);
}
```

```
    public function store(Request $request)
    {
        $request->validate([

            'name' => 'required',
            'price' => 'required',
            'description' => 'required',
            'cat_id' => 'required'
        ]);

        $imageName = 'noimgfound.jpg';

        if($request->image){
$request->validate([
    'image' => 'nullable|file|image|mimes:jpeg,png,jpg|max:5000'
 ]);


$imageName = date('mdYHis').uniqid().'.'.$request->image->extension();
$request->image->move(public_path('uploaded_img'),$imageName);
}


        $mod_menu  = new menuModel;
        $mod_menu->name = $request->name;
        $mod_menu->price = $request->price;
        $mod_menu->description = $request->description;
        $mod_menu->image = $imageName;
        $mod_menu->cat_id = $request->cat_id;
        $mod_menu->save();


        $request->session()->flash('status', $request->cat.' Menu Added!');


        return redirect('/management/menu');
    }
```

```
public function edit($id)
{
    $menus = menuModel::find($id);
    $categories = categoryModel::all();
    return view('management.editMenu')->with('categories',$categories)->with('menus',$menus);

}
```

```
public function update(Request $request, $id)
{




    $mod_menu  = menuModel::find($id);

    $request->validate([

        'name' => 'required',
        'price' => 'required',
        'description' => 'required',
        'cat_id' => 'required'
    ]);


    if($request->image){
        $request->validate([
            'image' => 'nullable|file|image|mimes:jpeg,png,jpg|max:5000'
         ]);

         if($mod_menu->image != 'noimgfound.jpg'){
            $imageName = $mod_menu->image;
            unlink(public_path('uploaded_img').'/'.$imageName);
         }



        $imageName = date('mdYHis').uniqid().'.'.$request->image->extension();
        $request->image->move(public_path('uploaded_img'),$imageName);

        }else{
            $imageName =   $mod_menu->image;
        }




    $mod_menu->name = $request->name;
    $mod_menu->price = $request->price;
    $mod_menu->description = $request->description;
    $mod_menu->image = $imageName;
    $mod_menu->cat_id = $request->cat_id;
    $mod_menu->save();


    $request->session()->flash('status', $request->name.' Menu Updated!');


    return redirect('/management/menu');

}
```

```php
public function destroy($id)
{
    $mod_menu  = menuModel::find($id);

    if($mod_menu->image != 'noimgfound.jpg'){
        $imageName = $mod_menu->image;
        unlink(public_path('uploaded_img').'/'.$imageName);
    }

    $mod_menu->delete();
    session()->flash('status', $mod_menu->name.' Celeted!');
    return redirect('/management/menu');
}
```

Figure 18: Core Code of Manage Menu

10.1.2 Order Food

```php
public function orderFood(Request $req){
    $menu_id =  $req->menu_id;
    $table_id  =  $req->table_id;
    $table_name  =  $req->table_name;
    $menu = menuModel::find($menu_id);

   $sale = sale::where('table_id',$table_id)->where('sale_status','unpaid')->first();
   if(!$sale){
       $user = Auth::user();
       $sale = new sale;
       $sale->table_id = $table_id;
       $sale->table_name = $table_name;
       $sale->user_id = $user->id;
       $sale->user_name = $user->name;
       $sale->save();
       $sale_id = $sale->id;

        $table = tableModel::find($table_id);
        $table->status = 'unavailable';
        $table->save();
       // $sale->xxxxxx = $req->xxxxx;
       //  $sale->xxxxxx = $req->xxxxx;
       //  $sale->xxxxxx = $req->xxxxx;
       //  $sale->xxxxxx = $req->xxxxx;
   }else{
       $sale_id =  $sale->id;
   }
    $saleDetail = new saleDetail;
    $saleDetail->sale_id =  $sale_id;
    $saleDetail->menu_id = $menu->id;
    $saleDetail->menu_name = $menu->name;
    $saleDetail->menu_price = $menu->price;
    $saleDetail->quantity = $req->quantity;
    $saleDetail->save();
    $sale->total_price = $sale->total_price + ($menu->price * $req->quantity);
    $sale->save();
    $html =  $this->xyz($sale_id);
   return $html;

}
```

Figure 19: Core Code of Order Food

10.1.3 Make Payment and Show Invoice

```php
public function savePayment(Request $req){
    $saleid = $req->saleid;
    $receivedAmt = $req->receivedAmt;
    $payment_type = $req->payment_type;
    $sale = sale::find($saleid);
    $sale->payment_type = $payment_type;
    $sale->sale_status = "paid";
    $sale->total_received = $receivedAmt;
    $sale->change = $sale->total_price - $receivedAmt;
    $sale->save();
     $tabs = tableModel::find($sale->table_id);
     $tabs->status = 'available';
     $tabs->save();
     return '/cashier/showReceipt/'.$saleid;
}



public function showReceipt($s_id){
    $sale = sale::find($s_id);
    $saleDetails =  saleDetail::where('sale_id',$s_id)->get();
    return view('cashier.showReceipt')->with('sale',$sale)->with('saleDetails',$saleDetails);

}
```

Figure 20: Core Code of Make Payment and Show Invoice

10.1.4 Show Report

```php
class reportController extends Controller
{
    public function index(){

        return view('report.index');
    }

    public function show(Request $req){

        $req->validate([
            'dateStart' => 'required',
            'dateEnd' => 'required'
        ]);

        $dateStart = date("Y-m-d H:i:s", strtotime($req->dateStart.' 00:00:00'));
        $dateEnd = date("Y-m-d H:i:s", strtotime($req->dateEnd.' 23:59:59'));


        $sales = sale::whereBetween('updated_at',[$dateStart, $dateEnd])->where('sale_status','paid');

        return view('report.showReport')->with('dateStart',date("m/d/y H:i:s", strtotime($req->dateStart.' 00:00:00')))->with('dat
    }


    public function export(){


    }


}
```

Figure 21: Core Code of Show Report

10.2 Possible Problem Breakdown

The total project needs to be broken into small parts so that the development is made easy. to make the development easy and to do well the full system has been broken down into some small tasks. The possible breakdown for the restaurant management system is given below:

- ✓ Analysis requirements
- ✓ Design the database
- ✓ Food management panel development
- ✓ Cashier panel Design and development
- ✓ Report generation panel Development

10.2.1 Analysis Requirements

- ❖ Gather all requirements
- ❖ Prioritize requirements
- ❖ Create ERD and data dictionary

10.2.2 Database Design

- ❖ Create all tables and
- ❖ Create all schema

10.2.3 Food Management Panel Development

- ❖ Design interface
- ❖ Design category, menu, table, user management.

10.2.4 Cashier Panel Design and Development

- ❖ Design cashier dashboard
- ❖ Make table and menu view system for cashier’
- ❖ Make taking order and billing system
- ❖ Make invoice making system and print the invoice.

10.2.5 Report Generation Panel Development

- ❖ Design page
- ❖ Make report generation system
- ❖ Design user roll system

10.3 Prioritization While Developing the Solution

As the random development may cause missing any core functionalities, we should prioritize the tasks during development.

The prioritized tasks list is given below:

- Analysis Requirements
- Design The database
- Database development
- Registration and login system implementation

Chapter 11 - Testing

11.1 Test Plan Acceptance

Testing plays an important role in delivering a successful project. This plan should be developed in the analysis phase. the user and the developer will accept the plan. There are two types of testing functional and non-functional (GeeksforGeeks., Acceptance Testing | Software Testing - GeeksforGeeks. , n.d.). All those test plans will ensure the requirements of the user of the project successfully.

11.1.1 Functional Testing

Some functional testing types are implemented below:

11.1.1.1 Unit Testing

- Form field validation.

11.1.1.2 Module Testing

- The Category and menu form submit without data
- Menu form fill with the invalid data.
- A form is submitted with actual data.

11.1.1.3 Integration Testing

- Login system with the valid qualification

11.1.2 Non-Functional Testing

Some non-functional testing types are implemented below:

11.1.2.1 Accessibility Testing

- Testing the user friendliness of the project.
- The design, color testing of the project user interface.

11.1.2.2 Security Testing

- The page and dashboard are accessible according to role.

11.1.2.3 Acceptance Testing

- Invoice show after confirm the payment
- Category, menu, table updating

11.1.2.4 Usability Testing

- Testing the admin panel
- Testing with users, the cashier.

11.2 Test Case

11.2.1 Unit Testing

Test Case Name		**Unit Testing**	
Test Class	Category controller		
Test Description	Category name validation for category		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	Fill all field except category name and submit.	An error message should be shown this field cannot be empty.	The cat fill is required

Table 24: Unit Testing Category Controller

11.2.1.1 Screenshot

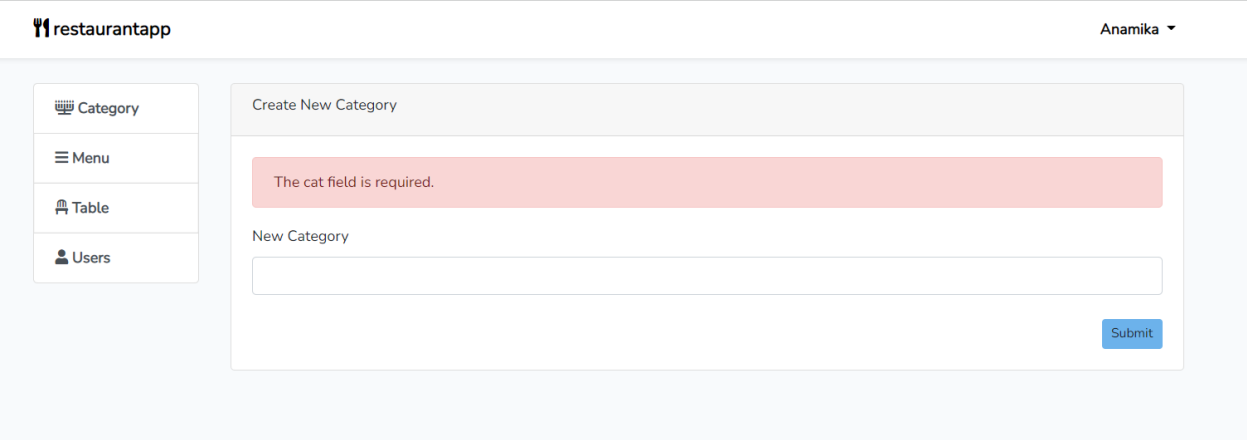

Figure 22: Figure of Category Controller

11.2.2 Module Testing-1

Test Case Name		**Module Testing**	
Test Class	Admin Controller		
Test Description	Menu form is submitting without input any data		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	Log in as admin then click on create new menu and click submit button without input any data	An error message should be shown for required all fields.	An error message is showing that those fields are required.

Table 25: Module Testing Admin Controller

11.2.2.1 Screen Shot

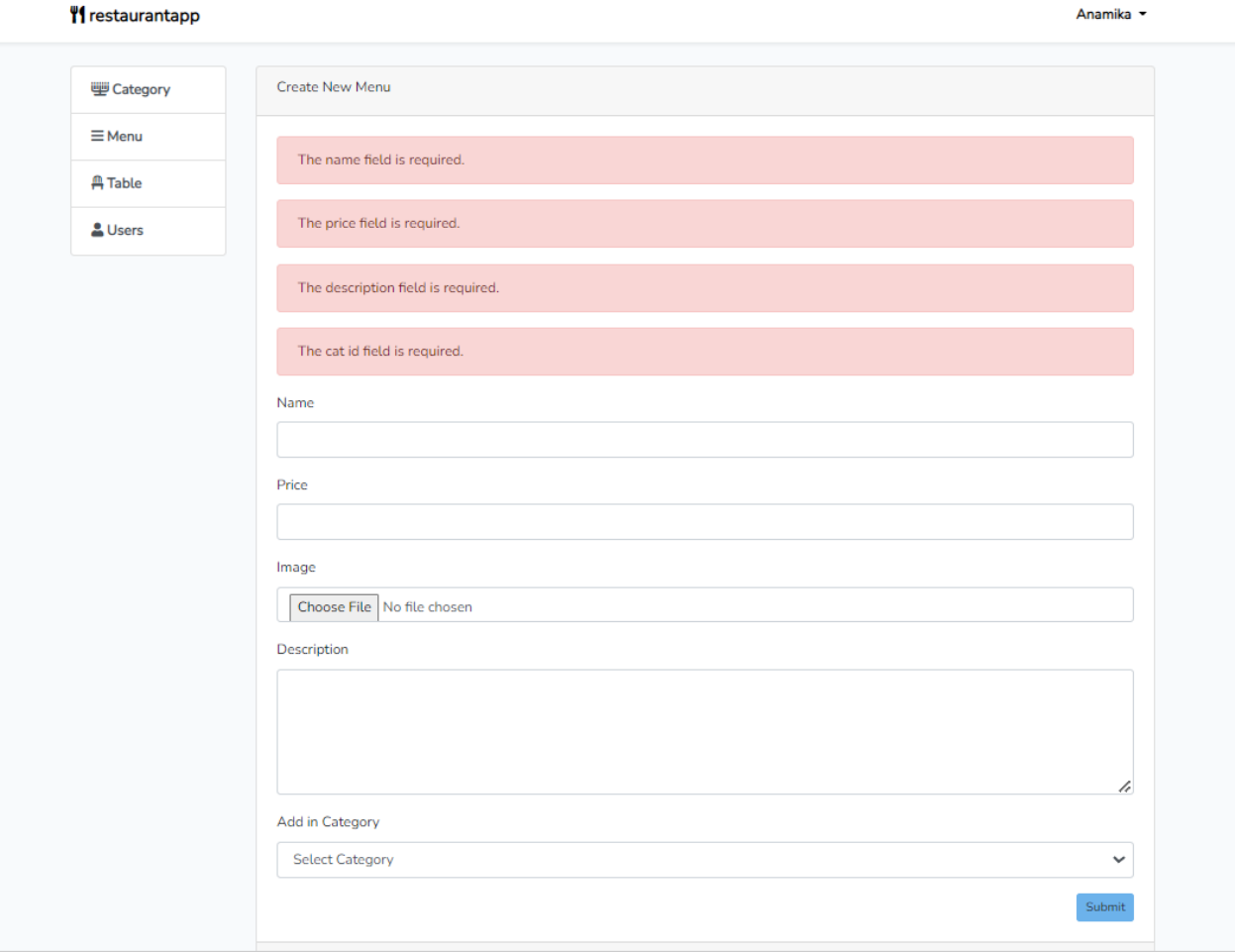

Figure 23: Figure of Create New Menu Admin Controller

11.2.3 Module Testing-2

Test Case Name		**Module Testing**	
Test Class	Admin/menu controller		
Test Description	Menu field fill with invalid data		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**

Admin	Fill any field in menu with invalid data	An error message should be shown this Input fields contains invalid data.	An error message is showing

Table 26: Module Testing Admin Menu Controller

11.2.3.1 Screen Shot

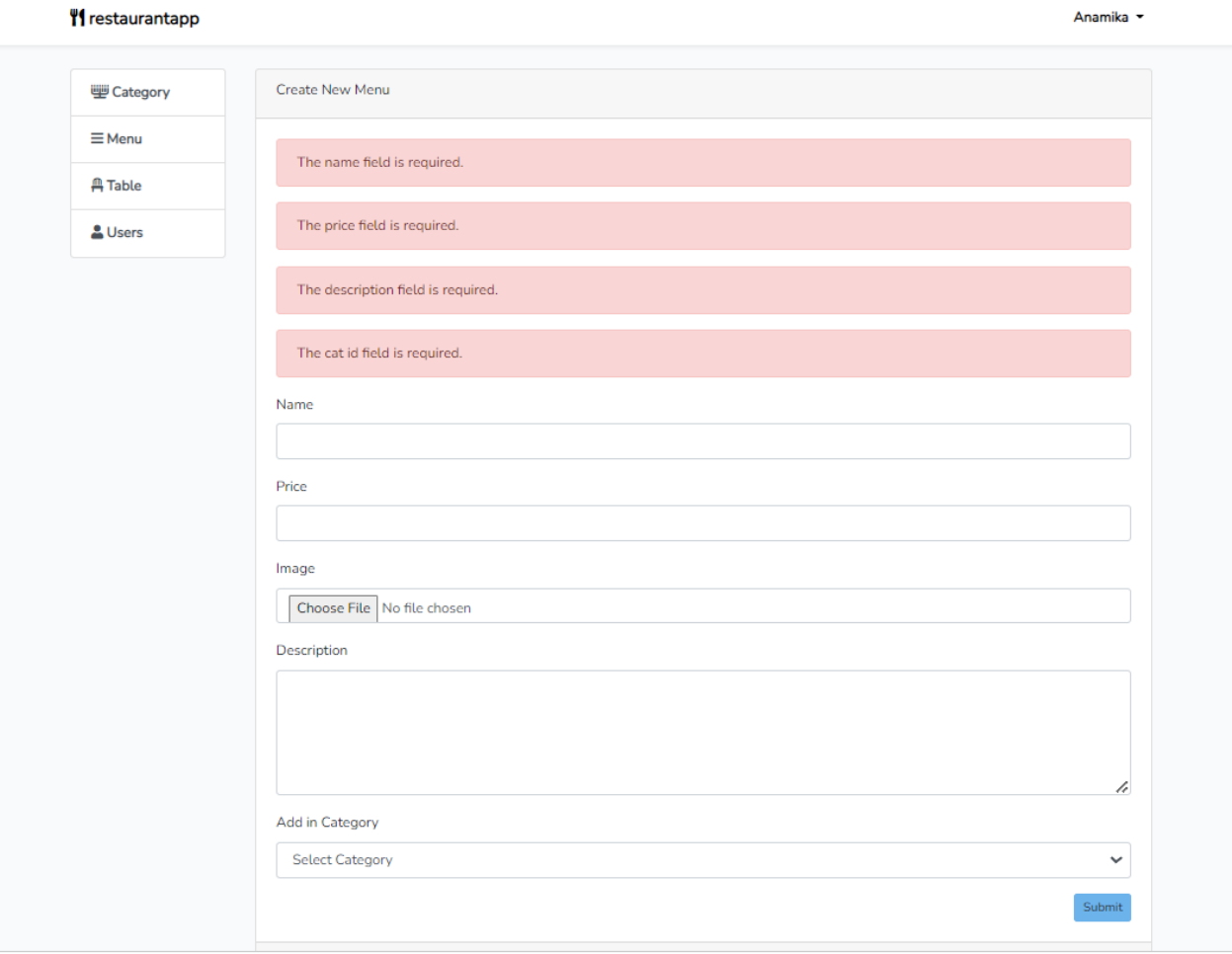

Figure 24: Figure of Menu with Invalid Data

11.3 Integration Testing

Test Case Name		**Integration Testing**	
Test Class	1.Log in controller 2.Redirect if authenticated middleware		
Test Description	Dashboard redirect after successfully log in		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	Go to login page and provide valid qualification and press log in	The cashier should be authenticated and log in will be success full and go to the cashier page.	The expected result has shown

Table 27: Integration Testing Login Controller

11.3.1 Screen Shot

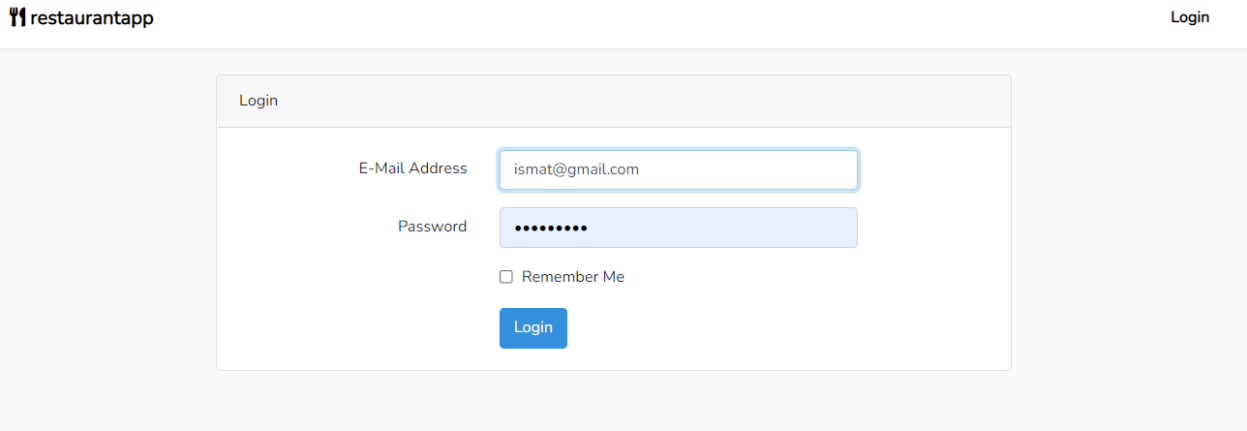

Figure 25: Figure of Login Controller

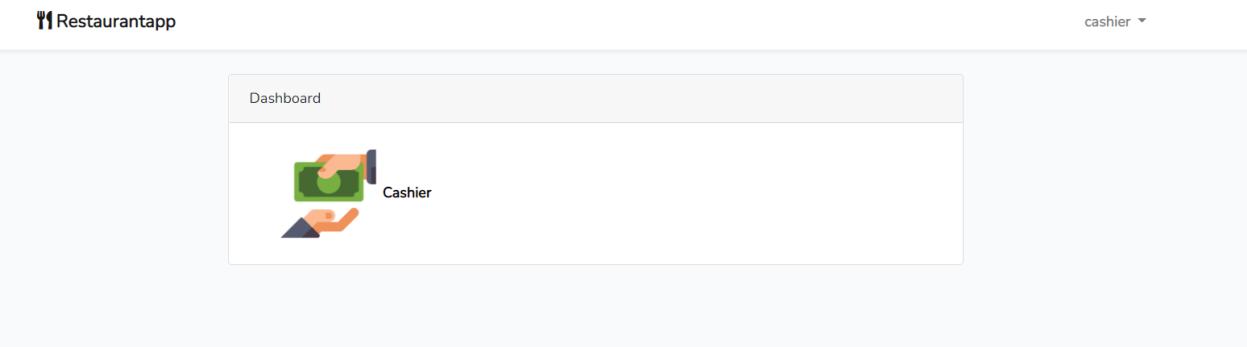

Figure 26: Figure of Cashier Dashboard

11.4 Accessibility Testing

Test Case Name		**Accessibility Testing**	
Test Class	Admin Controller		
Test Description	Testing the user friendliness of the project.		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	An admin is using the system.	The system is user friendly	Admin use the system easily without any difficulties.

Table 28: Table of Accessibility Testing

11.4.1 Screen Shot

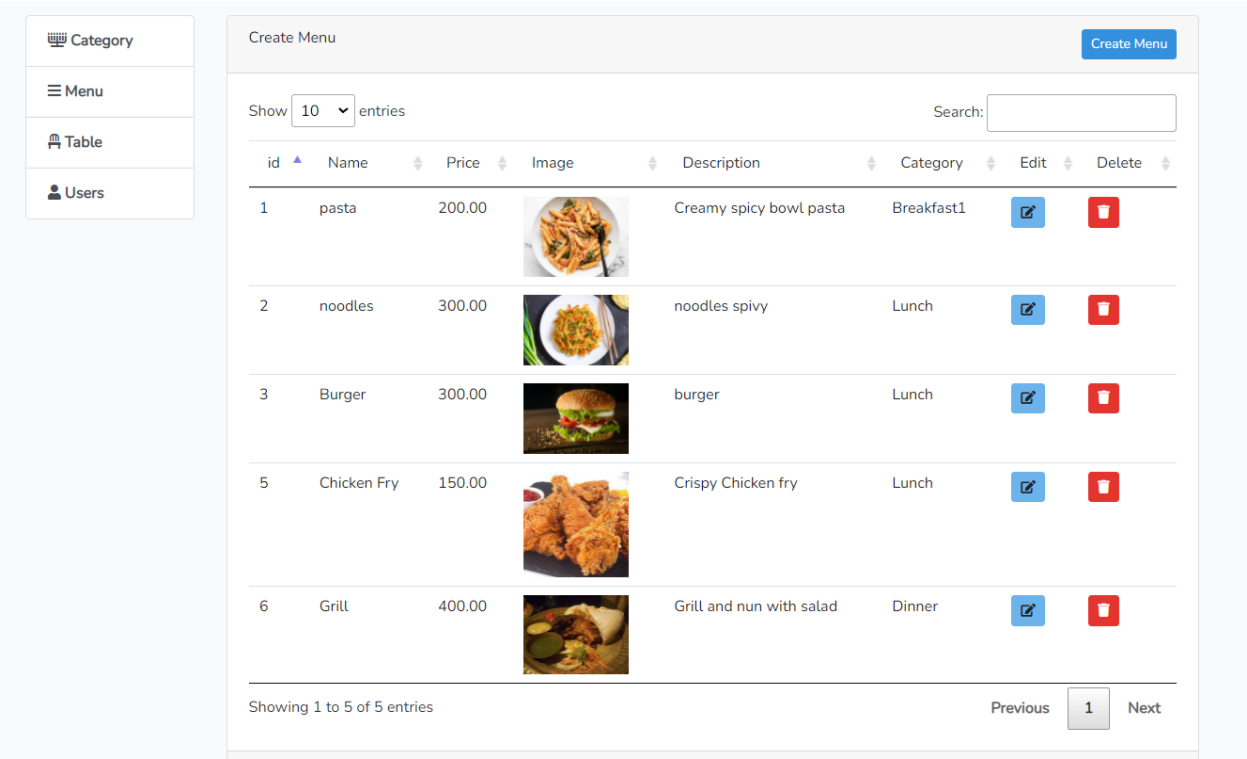

Figure 27: Figure of Acceptance Testing

11.5 Security Testing

Test Case Name		**Security Testing**	
Test Class	Log in Controller		
Test Description	Invalid log in attempt testing.		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	Input an invalid information and try to log in.	Not allowed for log in and show a message.	The credentials do not match our records.

Table 29: Table of Security Testing

11.5.1 Screen Shot

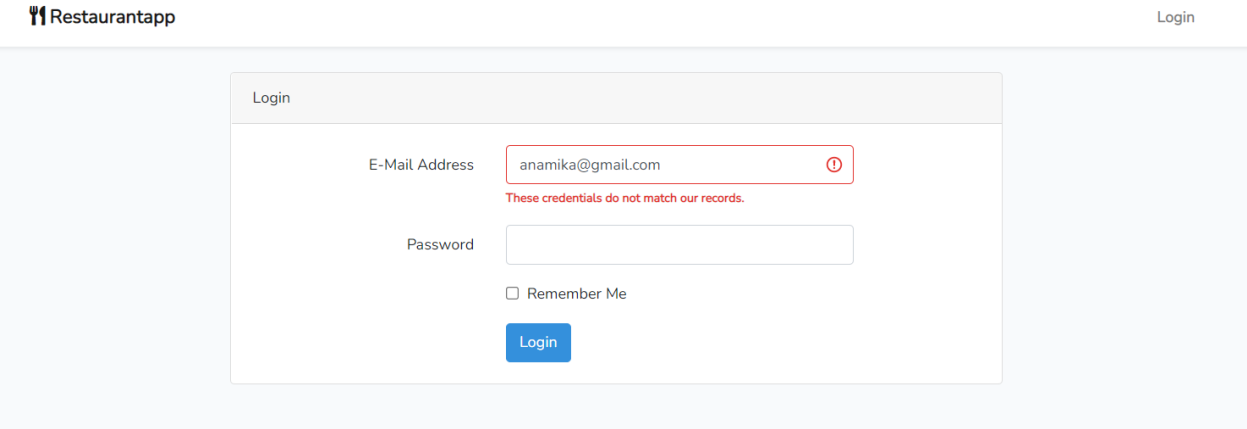

Figure 28: Figure of Security Test

11.6 Acceptance Testing

Test Case Name		**Acceptance Testing**	
Test Class	Cashier Controller		
Test Description	Expected result show after confirm an order		
Data Source	**Test Steps**	**Expected Result**	**Actual Result**
Admin	Take an order and confirm order after billing.	The invoice will be shown.	The expected result has happened.

Table 30: Table of Acceptance Test

11.6.1 Screen shot

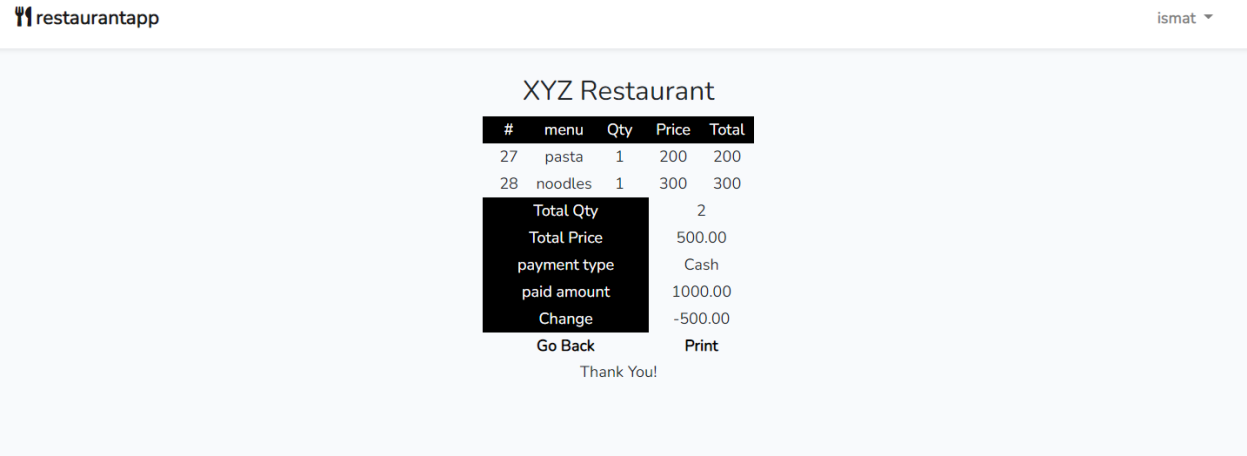

Figure 29: Figure of Acceptance Testing

Chapter 12 - Implementation

12.1 Training

As the users of the new system don't use this system before.so for understanding the uses of this new system training is most important. The users will be trained well to use the system by this training process. As the new system is fully functional so the management team must ensure the users are adequate to use or handle the new functional system.

The training procedures for the new users are given below:

Serial	User	Training Scope	Time Period	Comment
1	Admin	Add database for the category, menu, table and observe all process in the system	4 hours	Admin can access all and can easily understands all the operations
2	Cashier	Register as a cashier, make order with select menu and table make	3 hours	The cashier can accordingly

		payment system and report generate		understand the process.

Table 31: Table of Training

12.2 Big Bang (no pilot, parallel implementation scheme)

The switching between the old system and the new system happens within one day. Once everyone is starting to using the new system the old system is never be used. so, there are some problems that have to be faced with this big bang system those are, as by switching new system within one day may lost the old data. And if the environment changes certainly the employees may not adopt the new system easily but the advantages are in this process the new system does not need to be connected with any old system. A company think about to using new system, there are many ways to switching from old system to new system (Wikipedia., n.d.).

12.3 Load Balancing

The process of dividing the networking traffic among multiple servers is called load balancing. It mainly distributes application traffic across a number of servers to reduce downtime. It improves the overall flexibility, efficiency of an application. As the load balancing process divide the load with the different server so the system run fast. To avoid the downtime, the load balancing strategy should be developed (NGINX, n.d.).

Chapter 13 - Critical Appraisal and Evaluation

13.1 Objective Could be Met

The initially declared objectives are given below:

- Registration and log in system for the users
- Food items management system
- Table reservation and invoice system

13.1.1 Objective-1

13.1.1.1 Achievement rate and others

In my developed system, the registration and the log in system for the users are implemented successfully. The owner or admin and the cashier can register first and after successful registration, they can log in to the system. After login the users can access those pages only, where they are allowed to access. For implementing this system, I have used the larval authentication system for authenticating and authorizing the users. The success rate in this object is 100%.

13.1.2 Objective-2

13.1.2.1 Achievement rate and others

The category, menu for the food items and the table for reservation management system is fully implemented and successfully Working. The admin can add a new category or menu and also the table. And he also can update, delete, and view those. This is successfully working in this system.

13.1.3 Objective-3

13.1.3.1 Achievement rate and others

The table reservation and making payment are completely done. The cashier can reserve a table and select the item that the customer wants and according to these can make the bill and also can generate the invoice. This method is working successfully. The success rate is 100 percent.

Chapter 14 - Lessons Learned

14.1 Pre-Project-Review-Closing

As I did an internship project, here, to build up the Restaurant Management System at the starting time I followed a predefined Structure. Development with step by step and making the Documentation. The restaurant management system has mainly been developed to manage a restaurant successfully.

14.2 What I Have Learnt

During my internship session, I have learned many kinds of things.

In this session, I had to develop a restaurant management system, during this period I had to learn many new things for development. I have learned how a professional project has to develop and how to deal with the customer also. During this project I have to face many sector planning analysis designs etc., in every section, I have learned new topics. I have learned how to deal with a structure in various segments how to work with database sectors. in this period, I improved myself in the area of testing usability about a project that will help me in future have developed this management system with Laravel framework and during this development, my programming skill has improved. For example, I have learned how to make multiple authentication and security measures. To complete that task, I had to collect some basic information that will really help me in future.

14.3 The Problems I Have Faced

During my internship phase to develop a restaurant management system, I have faced many problems. I have followed the DSDM methodology and as it ensures iterative development so I had to face problems and I overcame this iteratively. Sometimes customers had added new requirements or change the requirements and I had to implement this. Another problem I have faced to creating the time box and working according to this time box. And the most difficult section for me is to create multi-level authentication in laravel.

14.4 What Solution Occurred

During the internship session whenever a problem has carried I had overcome that with my best effort. I have implemented the change requirements given by the customer with the use of the iterative methodology. I have used the custom authentication system to implement multiple authentications. I had created the best time box and to maintain that I have tried my best and had followed that time box exactly.

Chapter 15 - Conclusion

15.1 Summary of the Project

The restaurant management system is one kind of system that will be used in a restaurant to manage their activities like food item management and ordering and payment system.

The management team of the restaurant also the cashier will be users of its system the manager or the admin can manage the food item and the cashier can manage the order system and can make the billing method by using this system. Also they can see the report of selling. This restaurant management system is developed with PHP laravel framework and for front end development

HTML, CSS, and JavaScript are used. And all the diagrams and charts for this project development are attached with the documentation.

15.2 Goal of the Project

The main target of this project is to maintain a simple centralized system for secure and timely management of the activities of the restaurant. The main goals for this project s are given below:

- The overall system is monitored by central.
- It provides easy tracking of the inventory.
- Its help to monitor the accurate business report.
- To track sales down to the individual item.
- To create the financial statement in a timely and accurate manner.
- To save time and eliminate human error.

15.3 Success of the Project

The development of this project is successful because it meets all the requirements that the customers have given. In this project, the admin can control all the inventory systems and the cashier can make orders and billing systems. As this project has met all the requirements of the project so it is a successful project.

15.4 What I Have Done in the Documentation

I have described all my activities in the documentation paper. I included in this paper the introduction, purpose of the project. I have included all steps that I have done according to the methodology DSDM. Overall I included all activities, goals, results of the restaurant management system in this documentation.

15.5 Value of the Project

This restaurant management system will be a great platform for the restaurant. It will reduce their work of labor as well as time and cost. As this is the area of technology so this management system will keep them up to date with technology. And it will also help me because, during this implementation of this project I have learnt many this, I have gathered knowledge about teamwork, programming etc.

15.6 My Experience

In the total duration of the internship, my experience was excellent. I have learned a lot of things and I get a lot of experience. To develop this restaurant management system, I had to face some problems but every solution of problems gave me new experience and knowledge. So overall my experience was good and it will help me in my future professional life.

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