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TITLE OF THE PROJECT

Travel agency ERP system

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APPROVAL

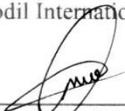
This Project titled “Travel agency ERP system”, Submitted by Abir Halder, ID No: 182-16-319 to the Department of Computing & Information Systems, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in Computing & Information Systems and approved as to its style and contents. The presentation has been held on- 23-08-2022.

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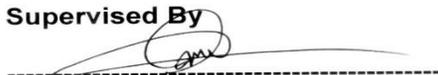
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Declaration

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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It is said that the teacher is the second parent because it is the teacher who helps a student to move forward by giving the right advice. During my internship program, I got two teachers who always helped me to make the right decision and gave me ideas on how I can easily complete a difficult task. They never left me alone in any hard work all the time calming me down by inspiring mental strength. One of them is Md. Abusaid Sk Babu, who is my intern trainer, and another one is Abdullah Bin Kasem Bhuiyan, who is my academic supervisor.

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Abstract

Travel agency ERP management system is a web-based application which will be used to maintain a connection between the customers and the organization. This Travel ERP, means Enterprise Resource Planning Software that automates all operations related to travel business including itinerary generation, inventory management, lead generation, customer relationship management and to manage travel business efficiently with latest and demandable technology. Along with it will help to create, maintaining and above all making the whole Travel agency ERP management system automated.

The Travel agency ERP system will assist a business to improve its relationship with current customers along with attracting new customers and also reclaiming the old ones. This technology is linked to a software platform that makes it easier to collect, organize, and manage consumer data. It would be helpful to travel companies and agencies to automate all processes of travel business with advanced features to improve their business efficiency and increase their online bookings. It will be difficult to expand the business or organization without keeping adequate track of the client relationship above all recording and controlling all data. This method will help businesses in learning more about their customers as well as their service taking habits, such as who they are and why they are interested in you, how many customers you have, which service they are taking, how the organization is dealing with users and finally all financial related data with proper tracking with lower error rate. If the system is applied properly, this method has the possibility to provide a competitive advantage that would be helpful for all.

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Chapter 1 – Introduction

1.1 Introduction

To track a company's connection, maintain the interaction with their customer, making all the activity of a service agency easier and automated and finding the upcoming customers will be easier by Travel agency ERP. The concept is straight which will assist to establish a business relationship in case of developing an organization.

Travel agency ERP solution enables organizations to stay in touch with customers, streamline processes, and boost earnings. Although people start talking of Travel agency ERP, people usually mean a Travel agency ERP system, which is a tool that helps with agent productivity, product management, messaging systems, and many other tasks.

Travel agency ERP will be helpful to solve several problems and also handle customer relationships across the entire organization or customer journey, which is related with marketing, customer service, sales, and marketing interactions, among other activities. The Travel agency ERP software allows you to focus on your company's interactions with a variety of people, including colleagues, all types of dealing and communication with vendors, users who receive services, or consumers by gaining their business, providing support throughout the course of your relationship with them, and including finding new customers and additional services throughout the lifecycle of the relationship. [1]

Travel agency ERP system will assist a company in improving the connection between old and new or current vendors, consumers, better understanding about customers preference and regaining lost clients also. Here the customers will be able to buy any type of air tickets and take the hotel booking through some easy steps, even the clients can control over his /her tickets such as canceling or adding the new one. This ERP system is connected with a software system that has made it easier to gather, organize, and manage information about the whole system. Some specific steps will be followed in every movement. This Travel agency ERP system may be advantageous to both small and large enterprises, by proper implementation. This ERP data will ensure customers advantages with some special facilities. It is feasible to filter the data so that promotions

do not target previous buyers. Businesses may also utilize the data to develop consumer loyalty programs.

1.2 Document Contents

The following chapters will be covered in this document to describe the activities in this project.

Chapter 1: Introduction

The following chapters is a preliminary summary of the Travel agency ERP system and project.

Chapter 2: Initial Study

In the initial study, the background of a Travel agency ERP system, a new system needs to developed due to which problem and what is the solution of this specific problem, I will explain.

Chapter 3: Literature Review

In the literature review chapter, I will explain details about the problem domain that is occurred and the solution for this specific problem. I will also make a comparison between the leading solution that exists for the same problem. I will recommend some approaches for the specific Travel agency ERP system.

Chapter 4: Methodology

In this section, I will discuss some methodologies that can be used for Travel agency ERP system. Then I will recommend a methodology that suits Travel agency ERP system and explain how will I apply it in this project.

Chapter 5: Planning

In the planning section, I will explain the project plan including work breakdown structure, allocation of the resources, create a Gantt chart for this project and create a time boxing.

Chapter 6: Feasibility

The detailed feasibility study of the Travel agency ERP project and create a cost-benefit analysis for this project will be done in this section.

Chapter 7: Foundation

The problem area identification through some data collecting techniques, requirements, and selection of the technology and implementation will be covered in this section.

Chapter 8: Exploration

This section will contain the use case and activity diagram of the project and the requirement catalog and also the new system prototype.

Chapter 9: Engineering

In the engineering chapter, the recommended diagram will be included, and the new systems interface design will be added.

Chapter 10: Deployment

Core module development coding sample, the problem breakdown of Travel agency ERP, and the creation of a priority list for this project development will be added in this section.

Chapter 11: Testing

Travel agency ERP system testing including unit testing, integration testing, and module testing will be done in this section.

Chapter 12: Implementation

All kinds of implementation techniques will be covered in this chapter and the training session will be covered also.

Chapter 13: Critical Appraisal and Evaluation

All appraisal and critical evaluation will be covered in this section.

Chapter 14: Lessons Learned

Which problems I have faced and what I have learned during the project development will be covered.

Chapter 15: Conclusion

In this section, the project summary will be added and the experience will be explained.

Chapter 2 – Initial Study

2.1 Background of the project

Travel agency ERP is sometimes misunderstood as a relatively new concept. While the phrase is new, the practice dates back to the dawn of commerce and money. Travel agency ERP has evolved into one of those wonderful ideas that ruled the corporate world in the 1990s, promising to forever change the way businesses of all sizes interact with their vendors and customers. It was a lengthy process that was better in theory than in practice for a variety of reasons. First and foremost, there was the difficulty and expense of correctly tracking and updating the large number of required documents. Newer software systems and enhanced tracking tools have greatly expanded ERP capabilities, allowing ERP's true promise to be realized. As newer, more customized Internet options enter the market, pricing has come down, allowing even small businesses to profit from certain ERP packages. [2] Consider what it takes to be a great trader and start a business today, and you'll see that nothing has changed.

Three things to know about the client are:

- ❖ Admin and clients are in the requirement includes chain.
- ❖ What they intended to booking or re-issue?
- ❖ Finally, what is the location of admin and clients?

For thousands of years, accounting has been used to keep track of who owned what and who owed what to whom. Accounting records, the earliest form of a customer database, naturally included names and addresses. Initially, segmentation would have been based on personal wealth and financial capacity. ERP is a concept that has been around for a long time. [3]

A travel agency ERP system will assist a company in strengthening its relationships with current vendors and customers, attracting new vendors and consumers, and regaining lost clients. This system is linked to a software system that makes it easier to gather, organize, and manage information about the consumer because it will be difficult to expand the business or company without proper tracking of the customer relationship.

2.2 Problem Area

Because I participated in the internship program, I was exposed to a variety of business problems and was able to solve them at the time. One day, a client mentioned that he was having some issues with his business. He has not been able to properly store his customer information such as air ticket details, hotel booking records, financial records, which has made him unable to distinguish between old and new customers. As a result, he has lost his customers. Also, he was not able to do all the work of his business in an organized way. As well as he is facing problems communicating with vendors and no proper way if consumers reissue tickets or apply for refund. As a result, he is not getting the expected profit of his business. After hearing these problems of our client, we define those problems as:

- Lack of learning about the client demand.
- Unable to organize and automate the business efficiently.
- Poor data visibility.
- Lack of optimization of the customer interaction.
- Lack of proper communication with vendors and consumers by the agency.
- Some advanced and critical real-life issues need to be solved.
- Lack of policy enforcement.

Lack of learning about the client demand: Learning about your customers, such as who they are and why they want your service or products, as well as purchasing or booking patterns, is a basic requirement for running a business. As a result, businesses are better able to anticipate and meet their customers' needs. However, failing to learn about the customer may result in the business becoming unprofitable.

Unable to organize and automate the business efficiently: It is critical to properly organize and maintain certain aspects of a business in order to run it successfully. It is also critical to automate business aspects in order to increase efficiency. A wide range of data, ranging from the sales process to marketing campaigns and business analytics, can benefit any company. It is difficult to move the business forward without proper organization, maintenance, and automation.

Poor data visibility: Managing financial issues is impossible when a company does not know how its money is spent by field employees. Because of this lack of visibility, finance teams miss errors, duplicate reports, missed receipts, and even potential fraud.

Lack of optimization of the customer interaction: Customer satisfaction is the primary goal of any business. If the owner is unable to satisfy the customer, the business is jeopardized. The simplest way to satisfy a customer is to optimize that customer's interaction. It is difficult to run a business without a proper process of customer interaction through simplification and streamlining.

Lack of policy enforcement: One of the best ways to manage expenses is to develop a policy that everyone in the organization must follow. Based on current IRS regulations governing reimbursements, as well as your company's culture and budget reality, that policy should outline exactly what is and is not an allowable expense.

2.3 Possible Solution

We decided to create a Travel agency ERP system after defining the problem. We advise the client to incorporate Travel agency ERP into their strategy before the number of customers requires the use of an ERP platform. Small businesses and even freelancers may benefit from travel agency ERP solutions.

This Travel agency ERP solution will help businesses learn more about their customers, such as who the customer is and why the customer is buying your products, as well as purchasing patterns. It will also assist in booking any airline ticket or hotel through an automated system. It will also be easier for admin to keep all financial documents with employee details above all agency activity. Travel agency ERP has the potential to provide a competitive advantage if implemented successfully. Properly classified customer data enables businesses to identify the most appropriate recipients for promotions and new goods. Travel agency ERP enables the organization and automation of various aspects of a company's operations.

Travel agency ERP automates and manages a wide range of business processes, including sales, marketing strategies, and marketing statistics, as well as client and financial data management. As a result, businesses can structure their operations into data that is simpler and easier to interpret.

Travel agency ERP software enables businesses to improve the efficiency of their client relationships. By automating and modernizing one of the most difficult customer engagement activities, travel agency ERP improves. This can lead to an increase in client and vendor satisfaction.

Accessible Your websites should provide service information, use instructions, and technical support 24 hours a day, seven days a week. Create a service plan for each client based on their specific requirements and expectations, and then figure out how to meet those requirements and expectations. Conduct follow-up sales calls to assess cognitional variance following the purchase, as well as the likelihood of repurchases, repurchase timeframes, and buyback frequencies. [4]

Chapter 3 – Literature Review

A literature review includes research papers, books, and other materials related to a specific topic or field of study. It serves as a summary and critical assessment of the sources that have been examined. When writing a literature review, it is critical to show the readers how a research project fits into the larger context of the subject matter about which the researcher is writing. It's a good way to see how various pieces of work fit into the larger picture of the research question at hand. It's a term used to describe how one piece of art compares to the others under consideration. Essentially, it seeks out new perspectives on previous work. [5] A literature review provides a broad overview of a specific subject for the purposes of system development. A project's literature review aids in the identification of problems and potential solutions. This section allows researchers to discuss their findings and draw comparisons in the same field, which is critical for a successful system.

3.1 Discussion on problem domain

When it comes to running a successful business, it's critical to understand as much as you can about your customers, including their demographics and why they buy your package, and the most important part is that as a travel agency administrator, how easily and automatically you are dealing with. As a result, businesses are better able to anticipate and meet their customers' needs. Inadequate customer knowledge, on the other hand, may result in revenue loss. Some components must be properly organized and maintained in order to effectively manage a firm. Furthermore, automating corporate processes is critical to increasing productivity. Every business can benefit from a wide range of data, from sales to marketing to business analytics. It is difficult to proceed with a company that lacks adequate organization, maintenance, and automation.

Every company's primary goal is to keep its clients happy. Clients who are dissatisfied with their service pose a risk to the company. Optimizing client contact is the most efficient and effective way to ensure client satisfaction. It is difficult to manage a firm if the client engagement process is not refined and simplified. To determine whether key client information is missing from a data file when an owner opens it. The data is incomplete. His clients cannot be reached because he lacks

an authentic email address or phone number through which to contact them. When he sends a corporate newsletter to the email addresses, you get a lot of hard bounces (bad email addresses). Old data from many years ago appears in your system, indicating the existence of businesses that have since closed or changed names. Your company's database is being clogged by stale data. Revenues at your company have remained flat because you are targeting the same group of customers. There aren't enough new leads coming in for the company. [6]

- Keeping customers satisfied is the number one priority of any business. Customers who are unhappy with their service pose a risk to the company. Optimizing customer interaction is the most efficient and successful technique for ensuring customer happiness. It is difficult to maintain control of a company while improving and streamlining the client interaction process. Client service expectations are quite high. Unfortunately, it is all too common for a small business to overlook the importance of providing excellent customer service to both new and existing customers. It is not enough to provide multiple ways to contact a company; a successful company treats each customer and client with respect and individuality, while also responding promptly and courteously.
- A general strategy will fail miserably, but if you do not have immediate access to prior contacts with consumers, you risk alienating them. If a customer calls or emails about a previously stated problem only to discover that there is no record of this, employees in the sales department may stumble and customer service representatives may appear dumb. If your follow-up message and marketing materials are not tailored to their specific needs or interests, your clients will believe they are being treated as an afterthought.
- Messy, poorly managed data can be a major issue for businesses. When you need to find critical sales data but have to search through hundreds of different papers, charts, and spreadsheets, this can be a major issue. You should be able to call, text, or email all of your clients, leads, and potential customers from a single location. Customers' purchase histories can be used to answer any questions or issues they may have, and logs of previous contacts with that contact can be easily accessed. Based on your sales and marketing data, you should be able to create bespoke reports with graphs, visual aids, and other charts in real-time. [7]

SL. No	Name of the project	Features	Limitation
[s1]	Travel Agency Management System DBMS-Mini-Project	Employ details, Vehicle details, Booking dashboard	No user-friendly interface, lower function.
[s2]	Travel Agency ERP system Automation	Traveler details, Booking package	High loading workspace time, Scribble user interface.
[s3]	TravCount Travel Agency	User travel history, Important notification, Payment with invoice.	Fewer function, user data monitoring limitation, Ticket booking unavailability.

Table 1: Literature analyst

3.2 Discussion on problem solutions

Travel agency ERP is the best solution for resolving the aforementioned issues. Travel agency ERP solutions make it possible to standardize the processes of various jobs and assignments. When everyone in the company knows how to do specific tasks and enter specific data into the system, there is less room for error and more room for productivity. Work will go more smoothly if employees understand how to relate to one another and to the ERP.

- You'll be able to access all of your data in one place and find it when you need it with the Travel agency ERP system. It may be difficult to provide excellent customer service without client-focused tools and features. As a result, travel agency ERP systems will offer a diverse set of service options. Because they are designed for specific industries or purposes, it is simple to find Travel agency ERP with a strong emphasis on customer service. One of the most important business solutions for Travel agency ERP is the consolidation of customer data from various sources and the use of that data to forecast future sales.

- Travel company ERP can help your company plan for the future by analyzing historical sales patterns and habits and forecasting sales income. This is an essential feature for any enterprise-level company.
- Social media presence and awareness are critical for a company. Look no further if you're looking for the right tools to keep track of the social media landscape. Travel agency ERP systems will provide a variety of options for social media administration and marketing. You can schedule posts, track competitors, and much more. Depending on your specific needs, you may be able to find a solution that emphasizes social skills over sales or customer service.
- Travel agency ERP is an excellent tool for staying in touch with current and prospective clients and prospects. You can contact all of your contacts via phone, text message, or email from a single location. Any previous correspondence with that contact or a customer's previous purchases can be quickly accessed to answer any questions or concerns they may have. Many travel agency ERP systems include the ability to respond via social media message platforms. [8]
- Customers are better understood when a Travel agency ERP system is used, which allows businesses to learn more about their customers, such as who they are and why they buy your products, as well as patterns in their purchasing histories. If implemented properly, travel agency ERP has the potential to provide a competitive advantage. Properly classified customer data enables businesses to identify the most appropriate recipients for promotional offers and new product introductions.
- Travel agency ERP software allows a company to organize and automate certain aspects of its operations. Travel agency ERP streamlines and automates a wide range of corporate activities, from sales procedures to marketing campaigns and business analytics, as well as customer information management. ERP is becoming increasingly popular among businesses of all sizes. Because of these advancements, businesses can organize their operations into data that is easier to understand and interpret.
- Businesses can improve the effectiveness of their client relationships by using travel agency ERP software. Travel agency ERP assists businesses in increasing customer

satisfaction by streamlining and simplifying many of the more complex customer engagement activities. Your websites should be accessible seven days a week and twenty-four hours a day, seven days a week. Product information, usage instructions, and technical support information should all be available on your websites.

- Determine how to meet those requirements and expectations by identifying and developing a service plan for each client that is tailored to their specific needs and expectations. Make follow-up sales calls after the sale to assess cognitional variance, repurchase likelihood, repurchase timeline, and frequency with which customers buy back their products. [9]

3.3 Comparison among the leading solutions

Comparing two or more services entails identifying the important, comparable features of each and then determining which characteristics of one are similar to the other, which are different, and to what extent they differ. By examining the differences in attributes between them, it is possible to determine which services are better suited for a given function. [10]

Comparison is required to develop a software solution suitable for a problem because comparing a software solution that is already prepared for that specific problem is effective or not or needs to consider its pros and cons so that a solution can be created with the previous pros and can reduce the cons.

Note: Since I did the internship program under **VMSL** (Virtual Market Solution Limited-) our tech leader do this comparison, and he didn't tell me anything about this comparison.

3.4 Recommended Approach

In reality, nothing is perfect, and some flaws may remain. Neither I nor my system are exceptional. So, here are some suggestions for making the system more user friendly and reliable:

- Improve the lead management so that it can determine the high-quality leads.
- Make the dashboard's data chart and graph process more user-friendly.
- It is made easier by the report generation process.
- booking forecasting should be more dynamic.
- The ability to sync and share files should be added.

- More security was added to role-based views.
- Integration of call services elevates the system to a higher level
- More customization options should be included.

Chapter 4 – Methodology

The phrase "software development methodology" refers to the systematic methods that should be used when working on a software development project. Since the invention of computers, designers have been able to combine design theory with practical realities. The development of software should be approached methodically. IT organizations are increasingly accepting of the use of a software development process. Structure, standards, and goals are all important considerations when it comes to getting the most out of a team. Different software development approaches may be used for various tasks. I cannot emphasize how important it is to choose and stick to a software development process. When you take the software improvement process for granted, you expose yourself to a number of dangers. Engineers without clear direction may be frustrated by the client's ever-changing demands, which may be exacerbated by omissions or misunderstandings. As a result, the software is subjected to repeated revisions with little regard for the project's long-term implications. [11]

4.1 What to use:

It is critical to take note that software improvement approaches play a significant role in the software development process. Each software developer is familiar with the following software development methodologies: joint application development model (JAD), agile software development model, prototype model, dynamic systems development model (DSDM), waterfall model, rapid application development model (RAD), and so on. Now is the time to learn about the benefits and drawbacks of the models mentioned above, and I will go over three of them.

Waterfall Model

The waterfall model is one of the software development strategies that follows a sequential or linear process. The highest-level grouping of jobs that comprise the task's breakdown is called a stage. A waterfall model must be completed sequentially and with clear exit conditions, such as the agreement of all project participants, for it to work. The waterfall model includes a list of activities, associated documents, and exit criteria for each stage. When working on large-scale IT projects, larger organizations frequently require the use of SDLC methodology products. As a result, Software Information Companies use a similar strategy when developing IT applications for their clients, because the project's resources, scope, budget, and results must all be carefully managed. [12]

The several phases of the Waterfall Model are shown in the following diagram:



Figure 1: Waterfall Model

Advantages of Waterfall Model

- The team must first complete all of the project's requirements in order to properly describe the overall scope of the project, create a comprehensive timetable, and design the overall application.
- It optimizes resource use because activities can be divided into many groups to be worked on concurrently or grouped together to maximize resource utilization.
- A thorough understanding of all requirements and objectives leads to a more effective and powerful application plan.

- Having a detailed timetable and resource allocation makes evaluating the current state of a project easier. [13]

Disadvantages of Waterfall Model

- It is generally difficult, especially in Business Implementation, because comprehensive business requirements must be gathered early in a project, because organization owners have not thoroughly considered what they expect, and business requirements may change throughout the owner's project.
- A detailed explanation of the duties and deliverables of the business integration application is required, which may be beyond the project team's capacity or skill at the start.
- Waterfall projects are sometimes spread across many months or quarters as a result of the "big bang" methodology, even though this isn't a fundamental need associated with waterfall projects. As the timeline for an IT project lengthens, project delays, overspending, and failure to meet goals become more likely. [14]

Dynamic System Development Method (DSDM)

The Dynamic Systems Development Methodology (DSDM) is a paradigm for iterative Agile software development. All tasks are assessed based on how well they align with the company's strategic goals and how quickly they can provide value to its members and other partners. It is an iterative, evolving process influenced heavily by the Rapid Application Development (RAD) paradigm. [15]

The several phases of the DSDM methodology are shown in the following diagram:

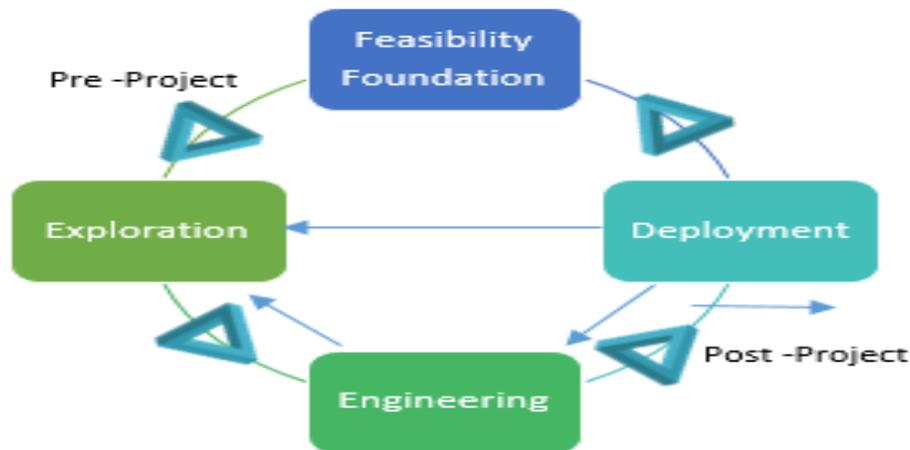


Figure 2: DSDM Methodology

Advantages of DSDM Methodology

- With a flexible process, you can fulfill project time constraints while as yet keeping up with quality.
- Everybody in the organization might see where the project is at any given time.
- Prioritizing on business cases in the DSDM model guarantees that any initiatives conveyed by DSDM are vital to the organization.
- You can give appropriate product functionality rapidly.
- Access to end-users is a breeze for designers.
- Costs are all the more effortlessly controlled, permitting the project to go quickly and effectively. [16]

Disadvantages of DSDM Methodology

- Management expenses may be rather high at times.
- Small businesses may not be bearing the cost of the establishment costs.
- DSDM discourages engineers from expressing their own innovation.
- Even if more advanced alternatives are accessible, projects adhere to a set standard. [17]

Rapid Application Development Methodology

In terms of a precise arrangement, rapid application development is far superior due to its emphasis technique on the current solution and client input. This methodology is primarily a strategy for agile software advancement. As a result, this methodology prioritizes rapid prototyping over time-consuming planning. Many people believe that it is a personal technique, but it is not. Rapid application development is the concept gained by treating software projects more like clay than steel, which is how traditional advancement methodologies now manage them. [18]

The several phases of the RAD methodology are shown in the following diagram:

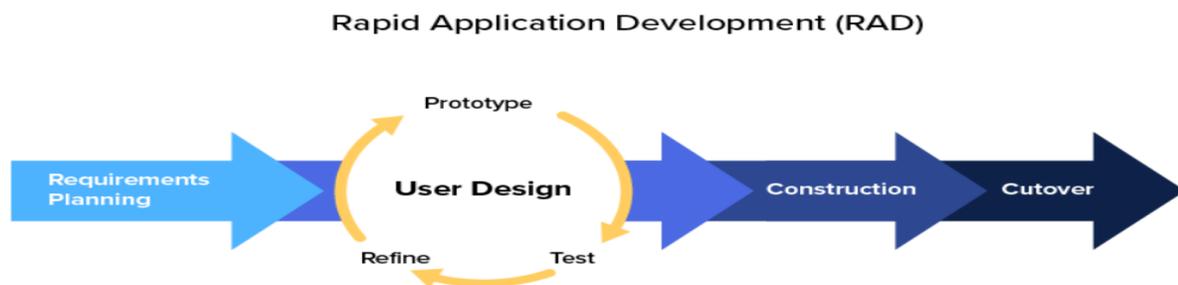


Figure 3: RAD Methodology

Advantages of RAD Methodology

- Requirements are always subject to change for developments.
- The organization esteems and encourages clients to give remarks.
- Reaction times for surveys are lightning-quick.
- The time it takes to make another feature is decreased considerably.
- More result with a smaller workforce. [19]

Disadvantages of RAD Methodology

- Requires incredible teamwork.

- Unfit to work in enormous groups.
- Requires a group of highly qualified developers.
- Throughout the product's lifespan, it is necessary to consider the needs of its user.
- It's just proper for short-term tasks. [20]

Choosing Methodology

I have selected to use the DSDM approach for the Travel agency ERP project because of the aforementioned considerations. For the Travel agency ERP project, DSDM will be the awesome and most appropriate alternative since The DSDM technique constantly delivers best-quality products and delivers those products on time. The DSDM strategy is incredibly adaptable for use in any company or business organization. During the improvement of a project, the client or customer might adjust their requirements if they believe they are essential.

4.2 Why to use

If the system is going to achieve the deadline and budget, it should adhere to a bunch of methods. By following a, set of tried-and-true methods, a system supports the achievement of a project's essential goals. Despite the fact that choosing the ideal methodology for an academic project of this kind is quite difficult, it will essentially aid in the completion of the project and the conveyance of its outcomes.

4.3 Sections of Methodology

Because of DSDM's iterative structure, business delegates can see the arrangement as it advances, offer feedback, then ask for modifications during the solution's development. One of the DSDM lifecycle ideas is "Focus on the Business Requirement," which starts in the pre-project stage and guarantees that tasks are related with organizational objectives. DSDM stages are described below, along how they relate with each other. The three stages of the DSDM approach are as per the following:

Pre-Project Phase: Several projects are considered during the Pre-Project Phase, and one is ultimately chosen. At this stage, an estimate of the project's funding requirements is also produced, and whether or not the project will be implemented is determined.

Project lifecycle Phase: The management of the project outlined in the Pre-Project phase is the goal of this phase. The sub-phases have been broken down from this phase:

- ❖ **Feasibility study:** The goal of these sessions is to generate ideas for project management concepts rather than actual projects. The answers to these questions will be used to guide the project's development, evaluate its expenses, and adapt it to the DSDM model in order to produce a feasibility report.
- ❖ **Study of the business:** The business analysis is divided into two parts: The first document examines the business's flexibility, which can only be achieved if the project is designed using DSDM. In this section, we will attempt to identify the project's characteristics as well as user expectations. A list of criteria will be compiled at the end of the research, and these requirements will be ranked in order of importance for the creation of the others.
- ❖ **Iteration of the functional model:** Throughout this iteration of the functional model, requirements defined in previous rounds are gathered and translated into Functional Models. Functional prototypes of the requirements are built so that the user can see how an application will work. This satisfies the first principle. Different groups of end-users evaluate and validate the effectiveness of functional prototypes.
- ❖ **Iteration of design and development (Design & Build Iteration):** The goal of the Design & Build Iteration phase is to turn the functional models created in the previous phase into fully functional, user-satisfying products. To accomplish this, we will create design prototypes and test them with users, as we did in the previous step.
- ❖ **Implementation:** Finally, in the implementation phase, after the prototypes have been tested by the intended users, the implementation and training of future users takes place.
- ❖ **Post-Project Phase:** In the post-project phase, it's checked to see sure everything functions as it should. During this time, maintenance and software upgrades are necessary. This stage usually takes place six months after the project has been delivered to the customer. [21]

4.4 Implementation Plans

The final stage of the project, in which the completed application is made available to the public. Once a problem with the new system has been identified and resolved, it should be made available

for use. The release criteria, configurations, and strategies are decided in this section. If everything goes well, the new system is installed and tested.

Chapter 5 – Planning

5.1 Project Plan

The execution and control stages of a project are defined by a set of formal documents known as a project plan. The strategy includes risk management, resource management, and communication, as well as the project's overall scope, cost, and timeline. To ensure that your project runs smoothly and that risks and difficulties are minimized, it is critical to go through the project planning process before beginning work on the actual project implementation. These project management papers cover every aspect of your project in great detail. [22] Project planning will benefit everyone involved in the project, including the project manager and his team. Setting goals, reducing risks, meeting deadlines, and delivering the accepted product, technical support, or solution, among other things, will all be accomplished through planning. This section will cover project plans in general, including work breakdown structure, time boxing, and a Gantt chart. Some examples are as follows:

5.1.1 Management Plan / Work Breakdown Structure (WBS)

A project's activities are organized in a hierarchical structure is known as WBS (Work Breakdown Structure). The WBS "breaks down" a venture's structure into smaller, more sensible components. If the project requires it, tasks may be split down further into subtasks for every conveyance. A component of project lifecycle the executives that divides huge, complex tasks into little pieces, very sensible parts that might be outsourced to specific persons or teams is known as work breakdown structure (WBS). [23] As a result, the Travel agency ERP system has been divided into categories and subcategories in the work breakdown structure (WBS) as shown in the chart below:

	Task Name	Duration	Start	End
1	Introduction	7 days	07 -Jan-2022	14-Jan-2022
2	Initial Study	4 days	15-Jan-2022	19-Jan-2022
3	Literature Review	6 days	20-Jan-2022	26-Jan-2022
4	Methodology	7 days	27-Jan-2022	03-Feb-2022
5	Planning	7 days	04-Feb-2022	11-Feb-2022
6	Feasibility	9 days	12-Feb-2022	21-Feb-2022
7	Foundation	4 days	22-Feb-2022	26-Feb-2022
8	Exploration	16 days	27-Feb-2022	15-Mar-2022
9	Engineering	40 days	16-Mar-2022	25-Apr-2022
10	Deployment	25 days	26-Apr-2022	20-May-2022
11	Testing	7 days	21-May-2022	28-May-2022
12	Implementation	4 days	29-May-2022	02-Jun-2022
13	Critical Appraisal and Evaluation	5 days	03-Jun-2022	08-Jun-2022
14	Lessons Learned	4 days	09-Jun-2022	13-Jun-2022
15	Conclusion	1 days	14-Jun-2022	15-Jun-2022
	Total			

Table 2: Work Breakdown Structure of Travel agency ERP

5.1.2 Resource Allocation

When a process of allocating the best available resources to projects and tasks is called as resource allocation. In order to prevent under or abuse, it monitors workloads. Individuals are then reallocated, if essential, as per the current accessibility of assets and the timescales of the task.

Resources in the organization will be assisted with taking advantage of their potential via this initiative. That's because when done correctly, it may increase both consumer and staff happiness.

[24]The travel agency ERP project's resource allocation is as follows in order to satisfy the pre-scheduled project delivery schedule:

	Task Name	Duration	Recourse
1	Introduction	7 days	Analyst User
2	Initial Study	4 days	Analyst
3	Literature Review	6 days	Analyst, Team Leader
4	Methodology	7days	Analyst, Developer
5	Planning	7days	Analyst Developer, Team Leader, Designer
6	Feasibility	9 days	Analyst, Team Leader
7	Foundation	4 days	Analyst, Designer, Developer
8	Exploration	16 days	Analyst, Designer, Developer
9	Engineering	40 days	Designer, Developer
10	Deployment	25 days	Analyst, Developer
11	Testing	7 days	Designer, Developer, User, Tester
12	Implementation	4 days	Developer, Analyst User
13	Critical Appraisal and Evaluation	5 days	Analyst Developer, Testing
14	Lessons Learned	4 days	User, Analyst
15	Conclusion	1 days	Analyst

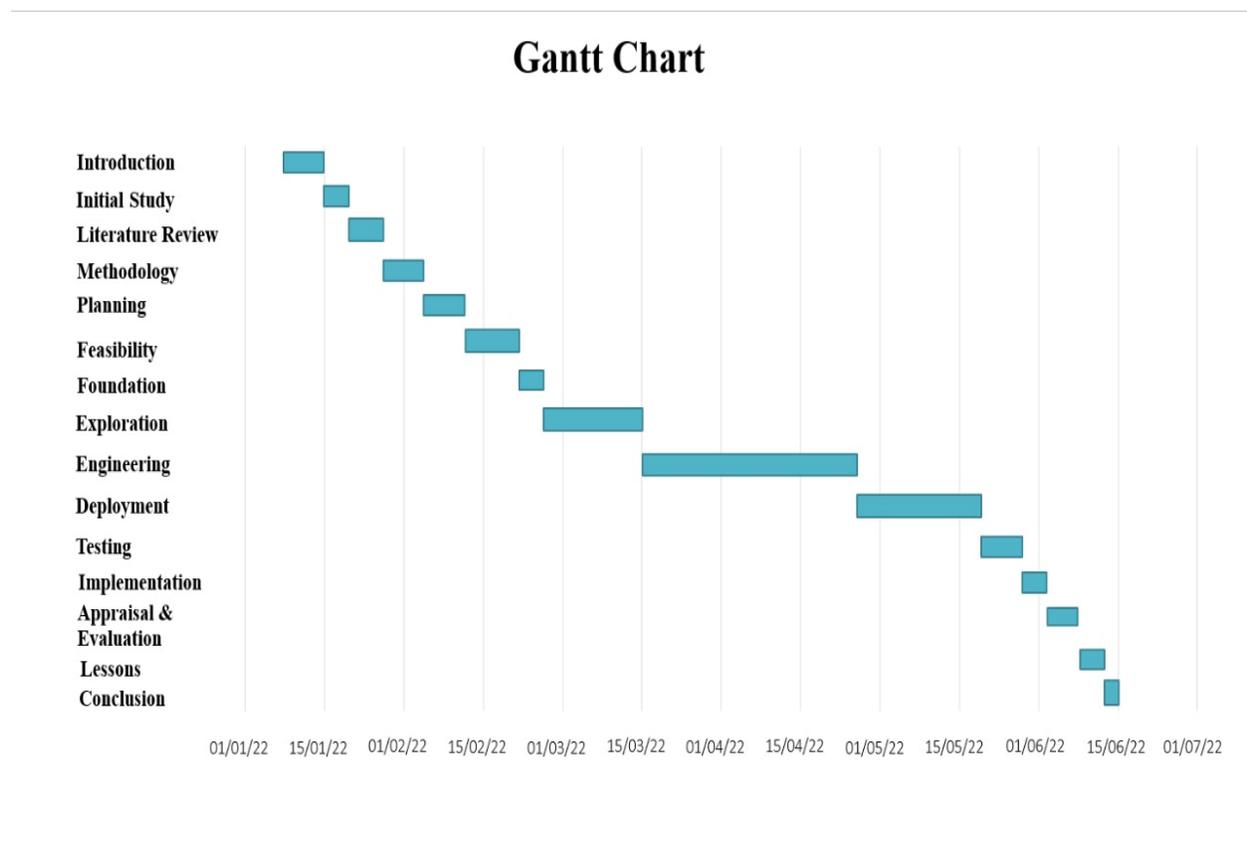
Table 3: Resource Allocation List**5.1.3 Time Boxing**

The term "timebox" is used when a well-defined deliverable must be delivered within the allocated time and resources. Deliverables have a time limit and cannot be extended. When a timebox is used, one of the factors in project management that differs from traditional advancement control is the size of the deliverable. Quality, on the other hand, is consistently reliable. It is critical that the project manager constantly evaluates the trade-offs between the scope and quality of expectations and the deadline for task completion. If the timebox is not met, the scope and/or quality of the deliverable cannot be reduced further.

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

Table 4: List of the Time Boxes**5.1.4 Gantt Chart**

In project management, if the project is complicated, the Gantt chart will benefit the project's completion. With the Gantt chart, all projects of varying sizes can be completed easily and effectively because it aids in scheduling and planning. All types of scheduling and dependencies, as well as deadlines for each step of the system and the beginning and end dates of each task, indicate that how much work will be completed at each stage will be shown by a horizontal bar. At the time of scope changes of a task will be tracked by the Gantt chart, when it's time to work with different partners or a big team. The Gantt Chart for his Travel agency ERP is given below:

**Figure 4: Gantt Chart**

Chapter 6 – Feasibility

Every one of the relevant aspects of a project including technical, scheduling issues, legal, and financial are taken into consideration for the completion of the project successfully and the feasibility study measures the possibility of this successful finishing. One of the numerous criteria, such as return on investment (ROI) and cost, determines the viability of a project, which measures whether the project earned sufficient income from clients or failed to sell the product to customers. Project financial benefits and motivations to quantify are not just concerns for a feasibility study. To put it another way, the definition of "feasible" varies by industry and project goal. [25]

6.1 All Possible Types of Feasibility

6.1.1 Operational Feasibility

The operational or functional feasibility of a proposed system determines how successfully it handles issues, fits the requirements identified during the systems project scope statement, and exploits opportunities. The organization's willingness to implement the suggested framework is evaluated. This is possibly the most difficult and difficult to evaluate. Management must commit to the project in order to assess its viability. It is likely to be approved and used if management requested it. However, it is critical that the employee base accepts the change. [26] Because operational feasibility is always concerned with the Travel agency ERP required functionalities, proper verification and validation of Travel agency ERP user inputs, along with navigation system need to make them easy and smooth, request option should be easier and increase the usability Travel agency ERP and location-based searching for the proposed system will make the Travel agency ERP system effortless and easier to use.

6.1.2 Technical Feasibility

A large part of identifying resources is determining technical feasibility. It computes the proposed project's technological requirements. The technical capabilities of the organization are then compared to the technical requirements. If the existing technological competence is sufficient to meet the task requirements, the systems project is considered technically feasible. The analyst

should assume that current technology resources can be updated or enhanced to meet the needs of the application under consideration. This is where system analysts' expertise and supplier relationships come in handy, as they can respond to the technical feasibility question based on previous experiences and contacts with sellers. Technical feasibility testing shows that users of Travel agency ERP can manage their activities more readily than they could with the old manual procedure. The system is built and created utilizing cutting-edge web technologies, ensuring that it is compatible with any web browser that supports a connection to the internet at a low level. The system employs a strong authentication architecture to ensure that application data is accessible safely. The web-based application is an acceptable and cost-effective software platform and resources, ensuring that it is technically acceptable and, more importantly, that it is platform-independent. Therefore, in the context of this Travel agency ERP project, the technological aspects are as follows:

1. Hardware:

-  Wi-fi Router
-  DELL laptop

2. Software:

-  Xampp
-  MS Word
-  Google Sheets
-  Google Chrome Browser
-  Mozilla Firefox
-  Windows 11 OS
-  PHP Strom

3. Database:

-  MySQL

4. Technology:

4.1 Admin Slide:

- ✚ HTML
- ✚ CSS
- ✚ Bootstrap
- ✚ JavaScript
- ✚ Ajax
- ✚ jQuery

4.2 Server Side:

- ✚ PHP

6.1.3 Economic Feasibility

The economic feasibility of a project is determined by conducting a cost-benefit analysis of the proposed plan. This term refers to a systematic and unbiased evaluation of a project's SWOT (Strength, weakness, opportunity, and threat) analysis, which includes the resources needed to complete the task and a forecast of the project's success. This process includes both technical and strategic analysis. [27]

Cost of a Web-based Application

It is possible to get to a web-based application through an HTTP network connection rather than directly from the device's memory. A web browser is widely used to execute web-based software. In a web-based application, also identified as a client-based application, a small amount of the program is loaded to a user's PC and performed on an external server.

Equipment	Cost Per Unit	Cost
Internet	2,500(Per month)	2,500
Desktop/ Laptop (core i7,	1,50,000	1,50,000

1.60 GHz up to 3.40 GHz, 16GB DDR4 RAM, HDD, SSD) 1,57,000		
Domain, Hosting and email service	14,500(Per month)	14,500
Total	1,67,000	1,67,000

Table 5: Cost of a Web-based Application

Cost of a Desktop Application

A desktop application is a piece of software that an individual may use to do certain activities on their own personal PC. A word processor and a music player are examples of multi-purpose desktop programs, whereas gaming applications exist just to provide entertainment.

Equipment	Cost Per Unit	Cost
Desktop/ Laptop (core i7, 1.60 GHz up to 3.40 GHz, 16GB DDR4 RAM, HDD, SSD)	1,60,000	1,60,000
File, Web and Email servers	14,500(Per month)	14,500
Total	1,74,500	1,74,500

Table 6: Cost of a Desktop Application

Cost of a Mobile Application

A mobile application is a computer or laptop program that runs on a mobile device like a smartwatch, tablet, or phone is called a mobile application. Numerous applications need the Internet. Digital distribution systems permit users to download apps from app stores.

Equipment	Cost Per Unit	Cost
Mobile (6 GB RAM, 64 GB	32,000	32,000

ROM)		
File, Web and Email servers	14,500(Per month)	14,500
Total	46,500	46,500

Table 7: Cost of a Mobile Application

6.2 Cost-Benefit Analysis

Cost-benefit analysis is a strategy or functionality that allows organizations to decide which actions to take and which to avoid. The cost-benefit analyst adds up all of the potential benefits of a condition and then subtracts all of the costs of acting on that condition. Consultants and analysts use these models to put a monetary value on things that cannot be seen, such as the costs and benefits of living in a specific city or town. [28] The following are the projected income and costs for the next five years:

Cost in total

Serial No.	Equipment Cost	1st Year	2nd Year	3rd Year	4th Year	5th Year	Cost in total
1	Web-based Application	₹1,18,000					₹1,18,000
2	Email, Domain & Hosting	₹14,000	₹14,000	₹14,000	₹14,000	₹14,000	₹70,000
3	Mobile-based Application	₹1,10,000					₹1,10,000
4	Desktop-based Application	₹1,30,000					₹1,30,000
5	Maintenance	₹50,000	₹50,000	₹50,000	₹50,000	₹50,000	₹1,50,000

6	Staff Expenses	₹32,000	₹32,000	₹32,000	₹32,000	₹32,000	₹1,60,000
Total		454000	96000	96000	96000	96000	738000

Table 8: Total Cost Estimation for the project

Earnings in total

Serial No.	Sector of earning	1st Year	2nd Year	3rd Year	4th Year	5th Year	Earning in total
1	Ticket & visa	₹2,21,000	₹2,22,000	₹2,26,000	₹2,30,000	₹2,20,000	₹11,19,000
Total		₹2,21,000	₹2,22,000	₹2,26,000	₹2,30,000	₹2,20,000	₹11,19,000

Table 9: Earning estimation for the project

Revenue in total

Serial No.	Revenue sector	1st Year	2nd Year	3rd Year	4th Year	5th Year	Revenue in total
1	Earning	₹2,21,000	₹2,22,000	₹2,26,000	₹2,30,000	₹2,20,000	₹11,19,000
2	Cost	₹ 454000	₹ 96000	₹ 96000	₹ 96000	₹ 96000	₹ 738000
Total Revenue		₹ -233000	₹ 126000	₹ 130000	₹ 134000	₹ 124000	₹ 361000

Table 10: Estimated Revenue on a Five-year scale

As a result, it is apparent that by promoting this technique, the organization would be able to collect a large number of takas in income every year. Every year, the revenue will be raised. As a result, this initiative makes beneficial the organization.

Market Research Based on ERP Software

This market research is incorporated into the ERP system and is based on client data. All of this information is available to the entire organization, regardless of department. Validation ensures that no one with access privileges outside of the department can view the secret data. Clients' late payment notices, for example, should be available only to the finance department and not to customer service. The ERP system has all of the data, but it's connected and customized in a manner that's both efficient and effective. Customer Relationship Management in the United States At the end of 2020, the market was esteemed at USD 8,871.71 million, and by 2027, it is predicted to have developed to USD 10,066.57 million, with a CAGR of 10.39 percent. The research includes market size and forecasts for USD, EUR, GBP, JPY, and AUD in five main currencies. When money exchange data is easily accessible or available, business executives may make better decisions. The years 2018 and 2019 are utilized as baselines, 2020 is used as an estimated year, and the forecast period spans the years 2022 through 2027. [29]

6.3 Is DSDM Good or Bad for this Project

The travel agency ERP is a client-oriented solution as well as an academic endeavor that should be completed in a short period of time with all basic functions. Because this is such a large project, the requirements may change from time to time. As a result, any methodology used must be adaptable to changing circumstances. As a result, it should be refined over several iterations. DSDM employs a set of strict rules and guidelines to keep the improvement process iterative. DSDM will help the organization meet corporate targets and goals while also providing tangible benefits. The characteristics and quality of the project are generally fixed in the conventional project management methodology. It will thus resolve the deadlines, quality criteria, and expenses while emphasizing the product's features. Because this is a large project, DSDM must be able to work effectively with a wide range of problem-solving activities. DSDM provides developers with

end-user access. As a result, it is clear that the DSDM strategy is the best approach for the Travel agency ERP system.

Chapter 7 – Foundation

7.1 The Problem Area Identification

The majority of software is created in response to a problem. To create usable software, it is necessary to first identify the actual problem. It is impossible to provide an accurate solution without first understanding the problem. That is why identifying problem areas is critical when developing a system. Users assist the software company in this area by providing data. Because the user will be utilizing a solution and is aware of the issue for which this specific solution is required, his information will be more appropriate for building the solution. There are numerous ways to identify the issue. Two of them are provided and are used to create this solution:

7.1.1 Interview

The interview is a process in which two or more people talk face to face about a specific problem or solution. It is one of the most effective problem-solving techniques.

7.1.2 Questionnaires

The questionnaire is another data-gathering strategy. It's a kind of interview called a written interview. In this process, interviewers have a set of questions to get the information from the user.

Note: This problem area identification portion has been completed by the analyst of navigator and the user. Since I did the internship program under Virtual Market Solution Limited-VMSL, I am informed just about the used method.

7.2 Overall Requirement List

The requirement's list is mainly divided into two parts:

- ❖ Functional Requirements
- ❖ Non-Functional Requirements

7.2.1 Functional Requirements

The Functional Requirement (FR) defines the service that software must provide. This is how a software framework or a component of one is described. A function is nothing more than the behavior and outputs of a software system. In other words, it makes no difference what kind of function a system performs as long as it can compute, process data, or communicate with people. Another type of functional requirement in software engineering is the functional specification. [30]

- Admin can add the customer.
- Admin must have the ability to log in and log out. Also, the admin can change his password.
- Admin information and customer information can be seen and changed anytime.
- Contact management should be added
- Lead management must-have in the system.
- Admin can add Ticket issue
- Admin can add re-issue.
- Admin can add refund apply
- Admin can download CSV sales reports
- Booking performance management must be added.
- Admin can be added the task
- Admin can manage the ticket issue
- Admin will be able to work with email management
- Create report and analytics automatically
- Integrate advanced communication system
- Customers can be called through phone calls from the system
- Customer service and support tools should be integrated
- Customer regression analysis function should be added
- Admin can manage service level agreement.
- Ticket status should be customizable

7.2.2 Non-Functional Requirements

The Non-Functional Requirement characterizes the quality specification of a software system (NFR). These non-functional criteria are critical to the software system's success and are evaluated based on responsiveness, usability, security, and portability. How fast does the page load? is an illustration of a nonfunctional demand. Systems that do not meet non-functional criteria may fall short of meeting the needs of their users. [31]

- General Data Protection Regulation (GDPR) function will take the system to another level.
- Integrate the API to synchronize the system data and use them with multiple devices.
- The system should be available 99.9% uptime.
- The system should be scalable to many customers and also huge records list
- The system should have a backup option so that the admin can download all information daily.
- All data and information must be secured.
- The system should be hosted with private hosting so that the data can't be lost.
- Restrict the access through authentication and authorization
- Maintainability should be easier.
- The user interface should be designed easy to understand.
- System validation and verification.
- Authentication should be maintained strictly

7.3 Technology to Be Implemented

The Travel agency ERP system can be implemented utilizing different of technological alternatives. To achieve success, it is critical to select the appropriate technology. The technology that will be used is web technology or web application technology, which is a server-based system that will be available to anyone with internet access. Web technology or innovation is extremely beneficial today because it can be accessed from anywhere on the planet without the need to download or install any additional programming or software. One component of the online system is dedicated to the administrator, while the other is dedicated to the user. In both cases, the information is adequate, and the interface design is proper.

The Web-based Application

According to computer science, computer software that utilizes web browsers and the internet to perform specific tasks is called a web-based application. Server-side language (PHP and ASP) and client-side languages (JavaScript and HTML) are utilized to store and retrieve data, respectively, in web applications. In this way, clients may communicate with the business by filling out forms online, managing content, making purchases, etc. As an additional benefit, the software enables workers to produce, share, and collaborate on documents from a various of locations and devices. [32]

Benefits of the Web application:

- As long as the browser is suitable, web applications may be utilized on different of devices and operating systems.
- There are no incompatibilities since everybody has access to the same version.
- They don't occupy up space on the hard disk, consequently there are no limitations.
- There is a reduction in the utilization of pilfered software in subscription-based online apps because of their implementation.
- Both the organization and the end-user save money since there is less support and maintenance needed by the business and lesser requirements for the end user's PC. [33]



Figure 5: Web Application

Chapter 8 – Exploration

8.1 Full System Use Case for Travel agency ERP system

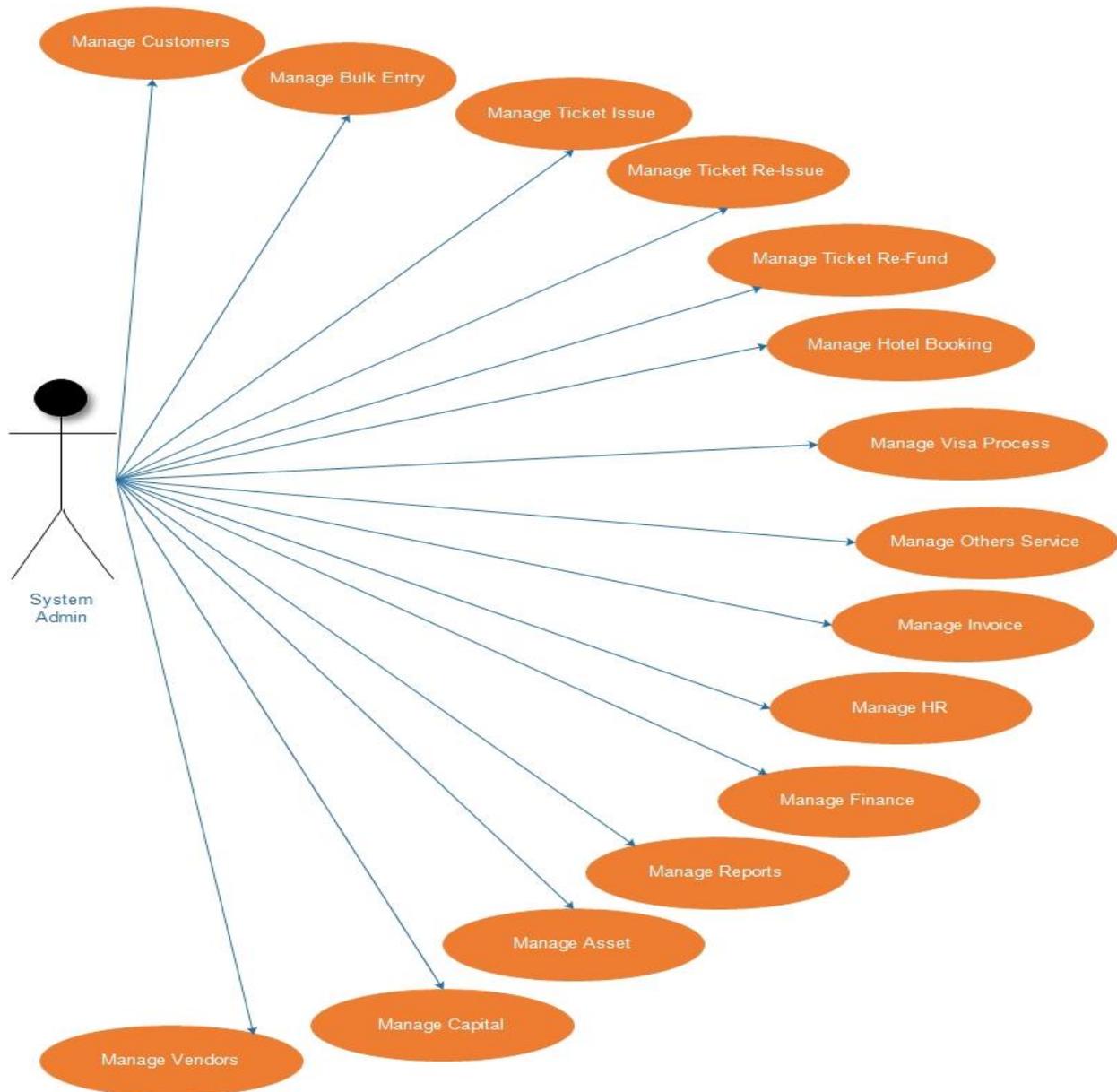


Figure 6: Full System Use Case

8.2 Breakdown of Use Case diagram according to the functions of Travel agency ERP

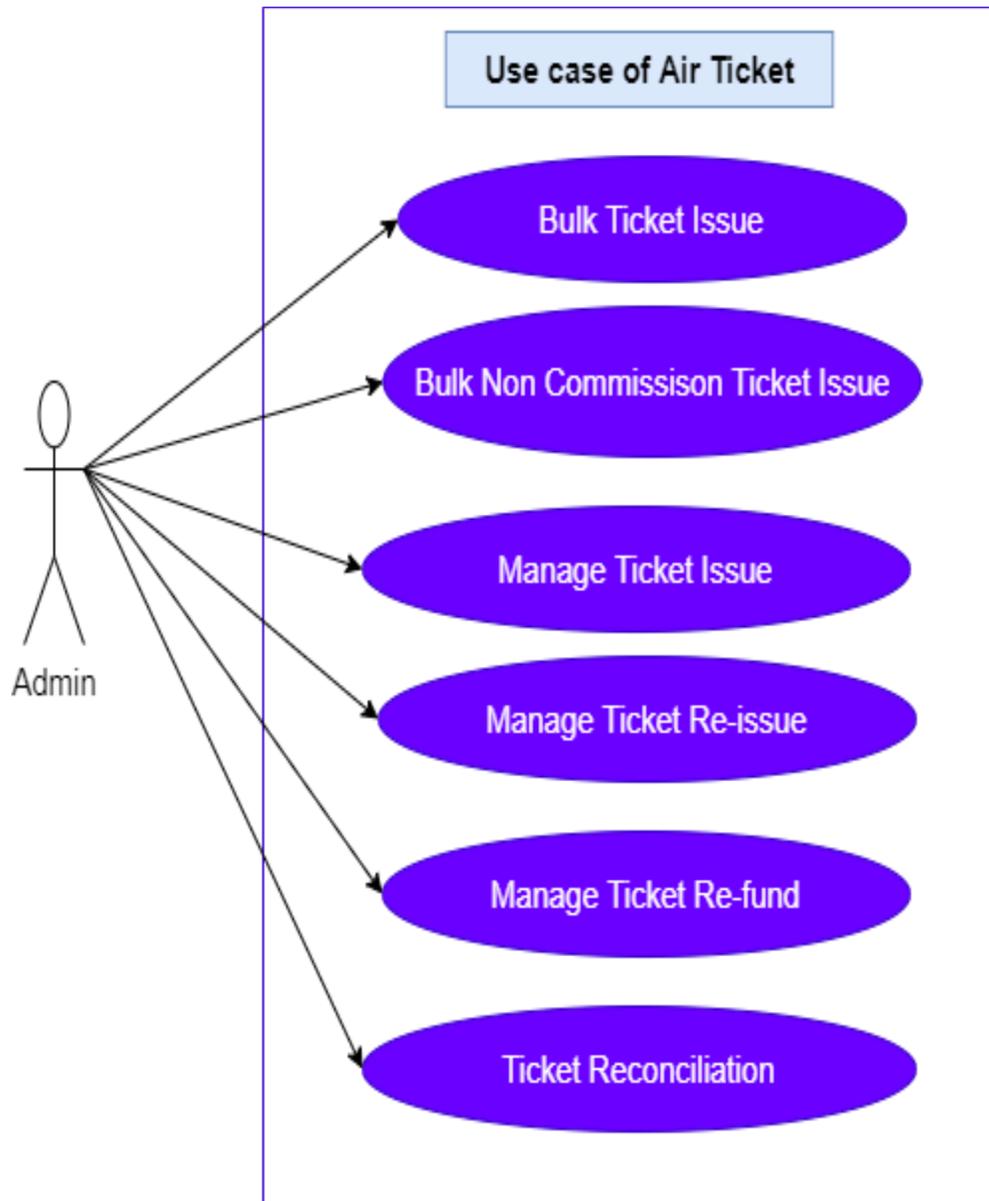


Figure 7: Use Case for Air Ticket

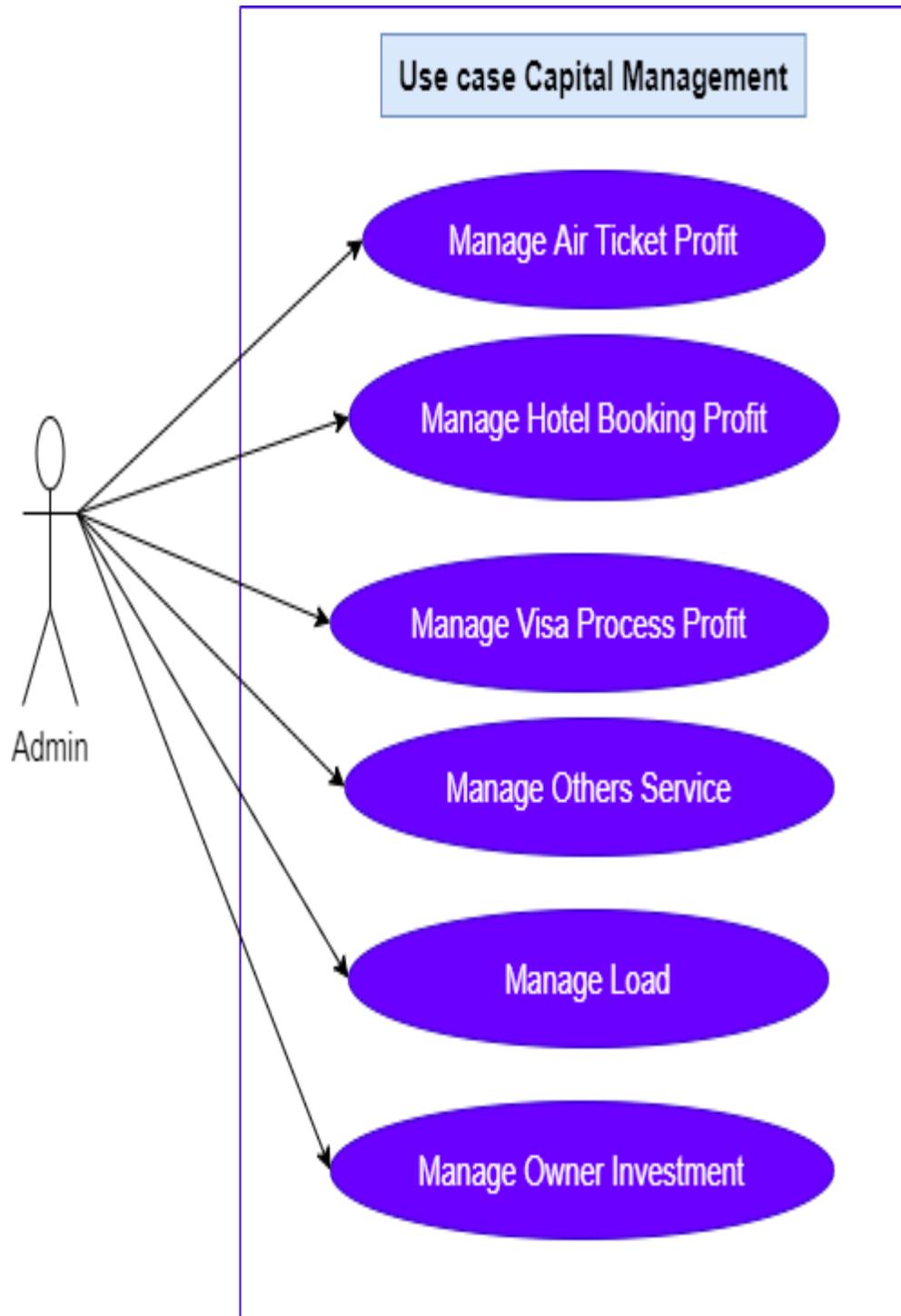


Figure 8: Use Case for Capital Management

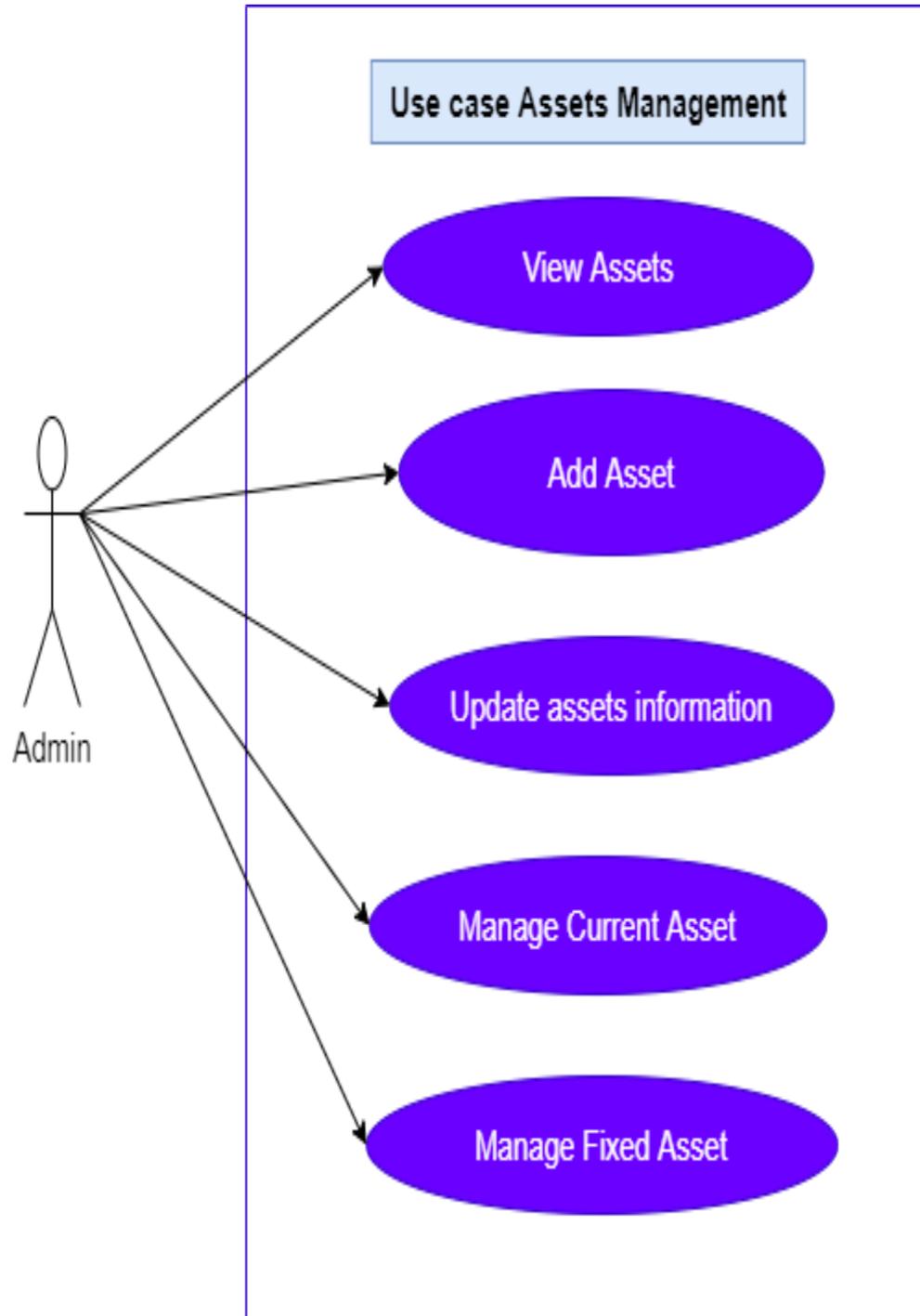


Figure 9: Use Case for Assets Management

8.3 Requirements Catalogue

For doing a task it is necessary to identify the requirement. Those necessities should be stored in a list called requirement catalog. According to the standard format of the requirement catalog, all identified requirements will be added to the list:

Requirement catalog for the login system

Requirement Type		Functional Requirement	
Requirement Name		Login system for the admin	
Requirement Description		The admin of this system should be logged in during the software installation. When the admin logs in, no one else will be able to access the system except the administrator with appropriate authentication.	
Requirement ID	Date Source	Priority	Sign off
M-01	Admin	Must	Admin
Requirement Type		Non-Functional Requirement	
Requirement Name		The attempt of login per day	
Description	Target Value	Acceptance Value	Comment
	1400	900	Only the admin can log in.

Table 11: Requirement catalog for the login system**Requirement catalog for creating contacts**

Requirement Type		Functional Requirement	
Requirement Name		Admin will create contacts information.	
Requirement Description		Leads, accounts, partners, vendors, competition, and contacts are all functionalities of contacts. Admin must have the ability to create them.	
Requirement ID	Date Source	Priority	Sign off
M-02	Admin	Must	Admin
Requirement Type		Non-Functional Requirement	
Requirement Name		Contacts added per day	
Description	Target Value	Acceptance Value	Comment
	800	700	Admin can add them

Table 12: Requirement catalog for creating contacts

Requirement catalog for creating Ticket issue

Requirement Type		Functional Requirement	
Requirement Name		Admin will create Ticket issue instruction.	
Requirement Description		Ticket issue options contain some functionalities including re-issue, sales, and refunds. Admin must have the opportunities to create them.	
Requirement ID	Date Source	Priority	Sign off
M-03	Admin	Must	Admin
Requirement Type		Non-Functional Requirement	
Requirement Name		Ticket issue functions added per day	
Description	Target Value	Acceptance Value	Comment
	1000	900	Admin can add them

Table 13: Requirement catalog for creating Ticket issue

Requirement catalog for creating re-issue

Requirement Type	Functional Requirement
Requirement Name	Admin will create re-issue info.

Requirement Description		Re-issue options contain lots of functionalities. Admin must have the opportunities to create them	
Requirement ID	Date Source	Priority	Sign off
M-04	Admin	Must	Admin
Requirement Type		Non-Functional Requirement	
Requirement Name		Re-issue added per day	
Description	Target Value	Acceptance Value	Comment
	9000	800	Admin can add them

Table 14: Requirement catalog for creating re-issue

8.4 Prioritized Requirement List (PRL)

The MoSCow priority technique is the most effective way to create a project priority list. As a result, I intend to use this method to create a priority list of all identified requirements for the Travel agency ERP system. The following is a list:

Priority Type	Must-Have
Serial No.	Requirement Name
1.	Admin login option at the time of installation to the system.
2.	The admin has added all contact functions such as leads, accounting, partners, and so on.

3.	Campaigns, booking inquiries, and occurrences are all required in the system, and the admin will be able to manage them.
4.	Most manageable ticket function

Table 15: Must-have requirement list

Priority Type	Should Have
Serial No.	Requirement Name
1.	Manageable strategic functionalities
2.	Project management functionalities should be simpler.
3.	The General Data Protection Regulation (GDPR) function should add the project.

Table 16: Should-have requirement list

Priority Type	Could Have
Serial No.	Requirement Name
1.	Organization details and all functionalities about the organization could be added to the system.
2.	Travel agency ERP could be added to the system to maintain the organization's services easily.

Table 17: Could-have requirement list

8.5 Prototype of the new system

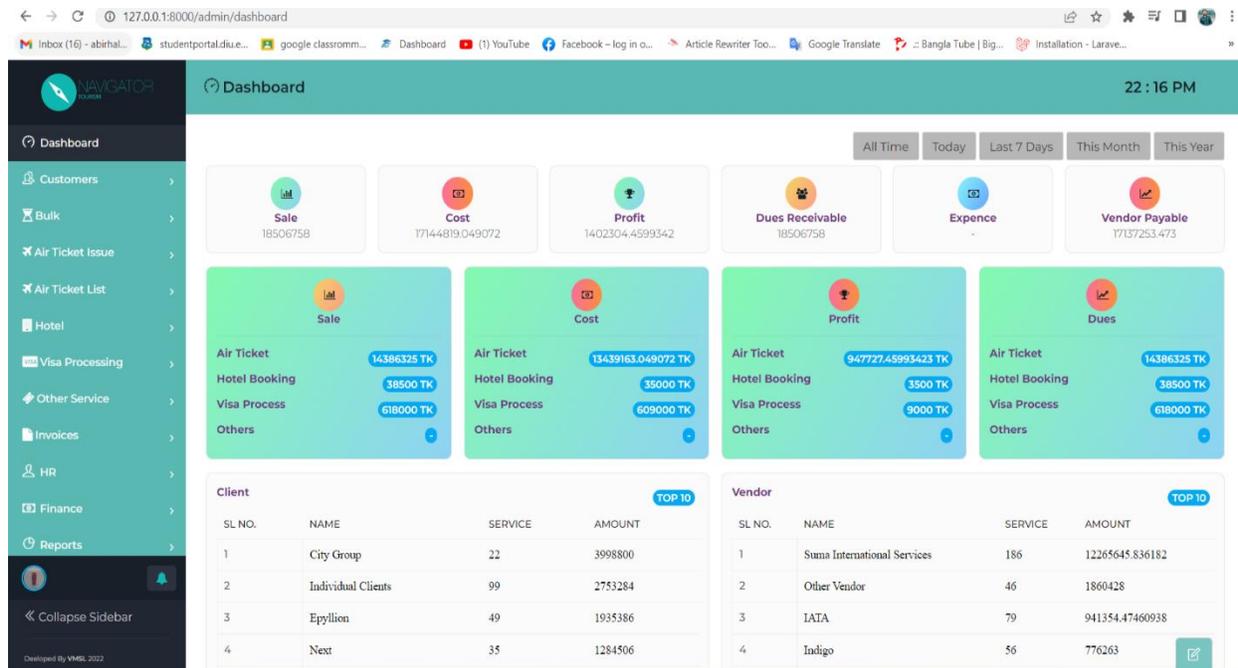


Figure 10: Dashboard prototype

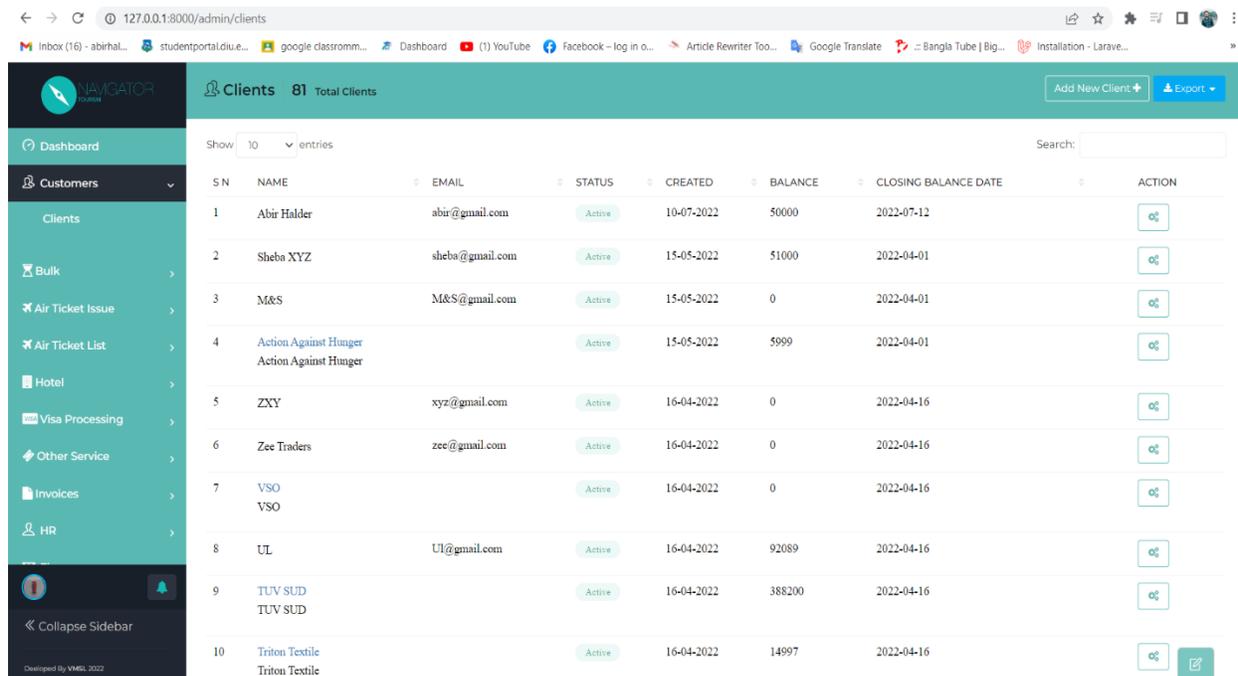


Figure 11: Client's prototype

The screenshot shows a web application interface for 'Air Ticket Booking'. The top navigation bar is teal with the 'NAVIGATOR' logo and the text 'Air Ticket Booking'. Below this, the page title is 'ISSUE TICKET'. The main content area contains several interactive elements:

- A 'Download Sample CSV' button.
- A file upload field with a 'Choose file' button and the text 'No file chosen'.
- An 'Upload CSV' button.
- A 'Generate Data' button.
- A 'Date' input field with a red asterisk, containing the value '2022-07-18'.
- 'Save' and 'Reset' buttons below the date field.

The left sidebar is dark teal and contains a navigation menu with items like 'Dashboard', 'Customers', 'Bulk', 'Ticket Issue', 'Non Commission Ticket', 'Air Ticket Issue', 'Air Ticket List', 'Hotel', 'Visa Processing', 'Other Service', and 'Invoices'. At the bottom of the sidebar, it says 'Developed By WMSL 2022'.

Figure 12: Bulk prototype

The screenshot shows the 'Bulk' form in the 'Air Ticket Booking' system. The page title is 'ISSUE TICKET'. The form includes:

- 'Select Client' dropdown menu with a 'Manage Client' link and a red asterisk.
- 'Date' input field with the value '2022-07-18'.
- 'No. of Ticket' input field with a red asterisk.
- 'Confirm' and 'Reset' buttons.
- 'Ticket & Billing Info' section with two tables:

SL NO.	PAX NAME	TICKET NO.	PNR NO.	GROSS FARE	BASE FARE	VENDOR	EXTRA COM.	VENDOR SC.	CLIENT DISC
SL NO.	REFERENCE NO	ISSUE DATE	TRAVEL DATE	ARRIVAL DATE	TAX	COMMISSION	AIT (0.3%)	NET COMMISSION	CLIENT SALE
- 'Passport & Visa Info' section with a 'Note' input field.
- Summary section on the right with input fields for:
 - Total Client Pay
 - Total Vendor Pay
 - Total Profit
 - Previous Due (highlighted in red)

The left sidebar is identical to Figure 11, with 'Bulk' selected in the menu. It also says 'Developed By WMSL 2022' at the bottom.

Figure 13: Air Ticket Issue prototype

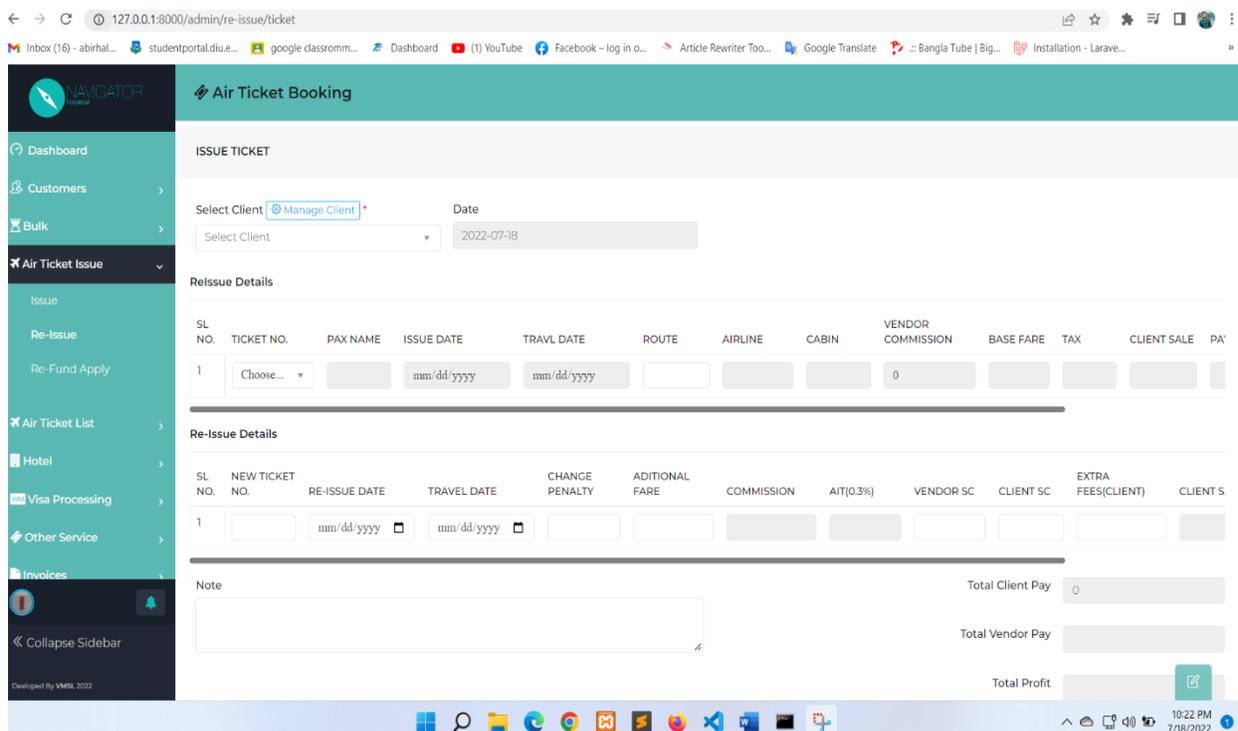


Figure 14: Air Ticket Re-issue prototype

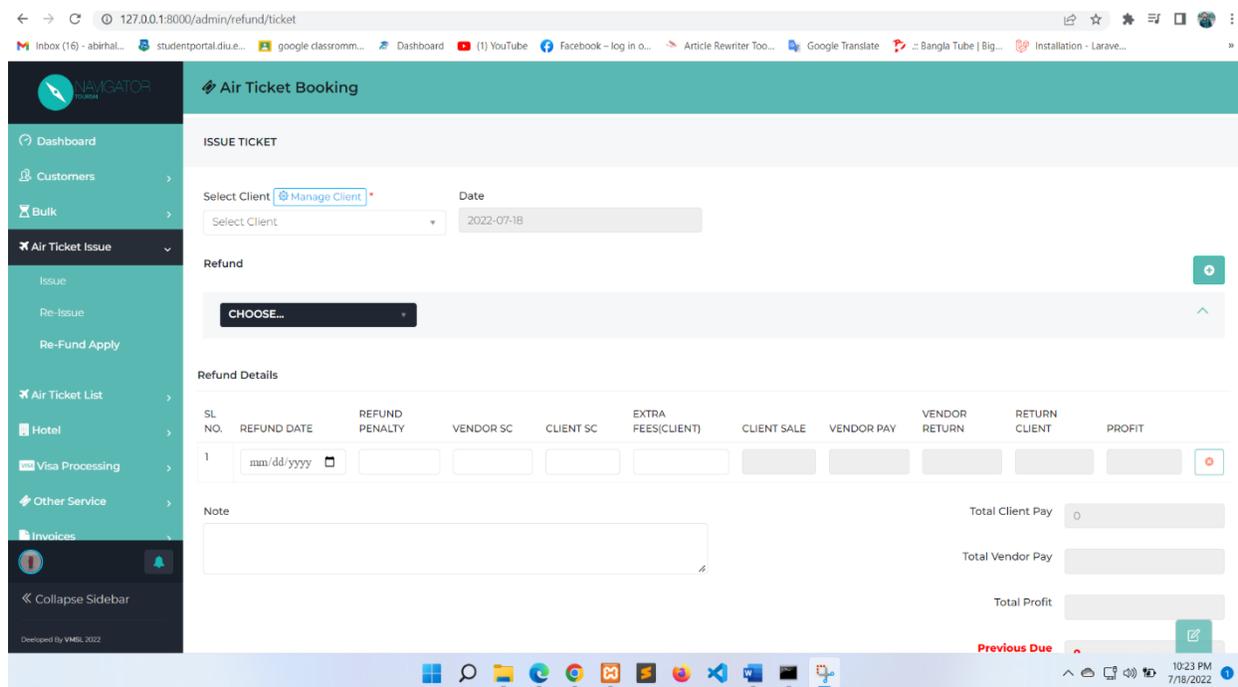


Figure 15: Air Ticket Re-fund prototype

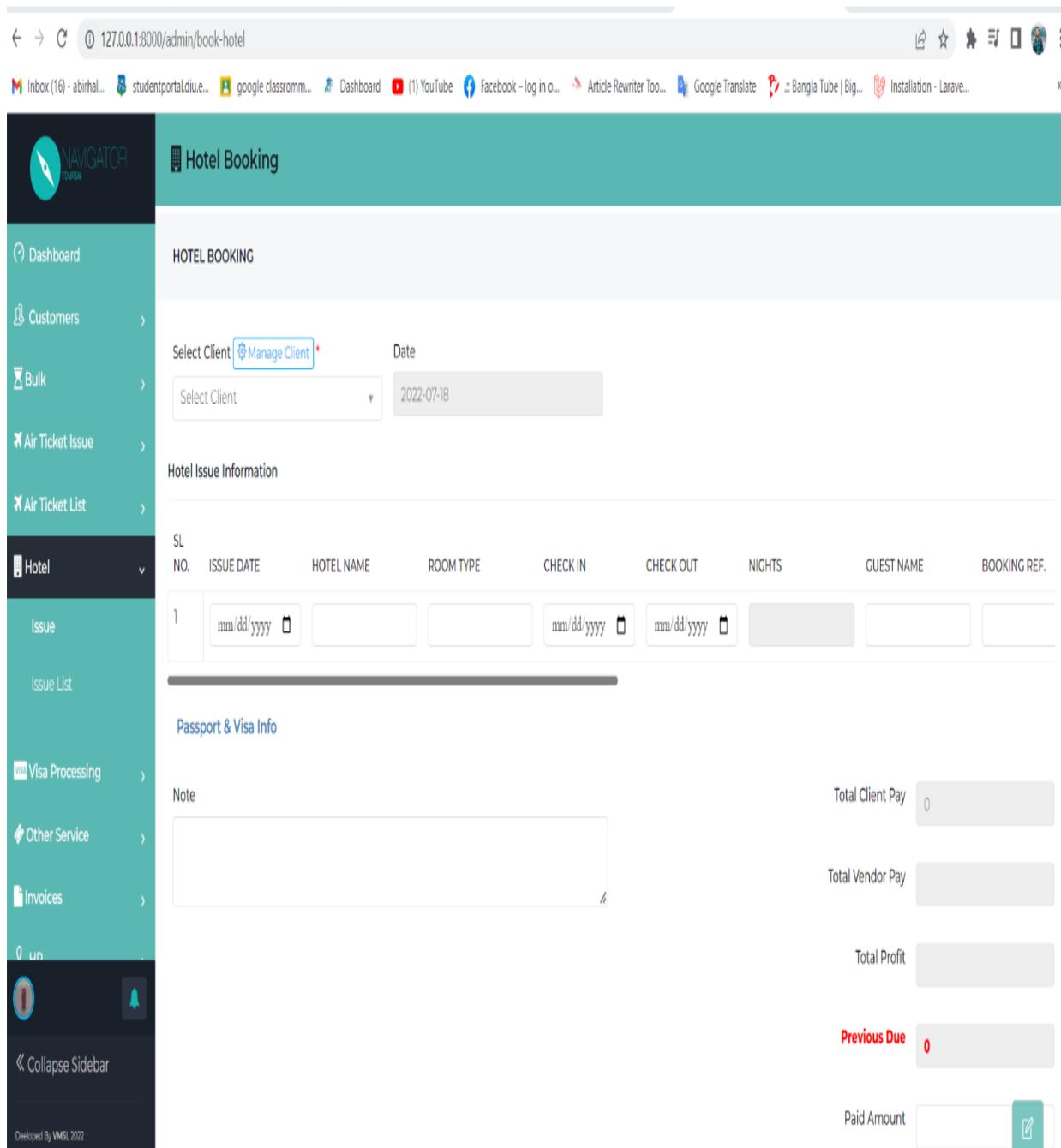


Figure 16: Hotel Booking prototype

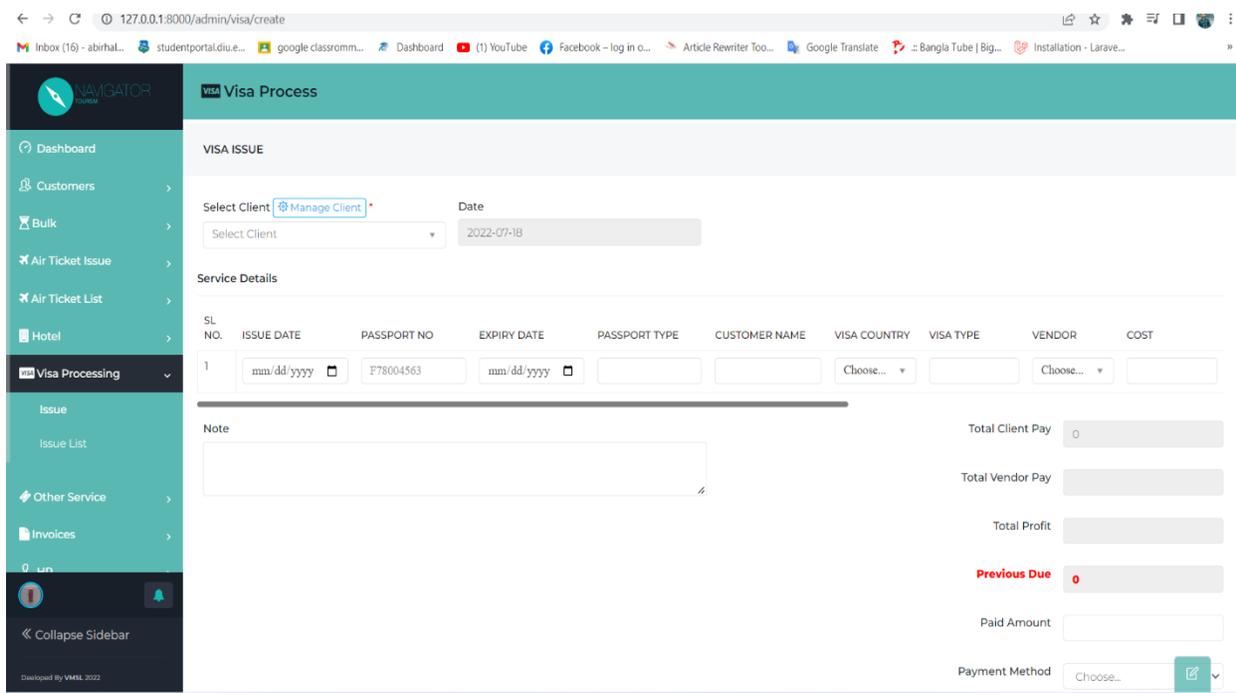


Figure 17: Visa Process prototype

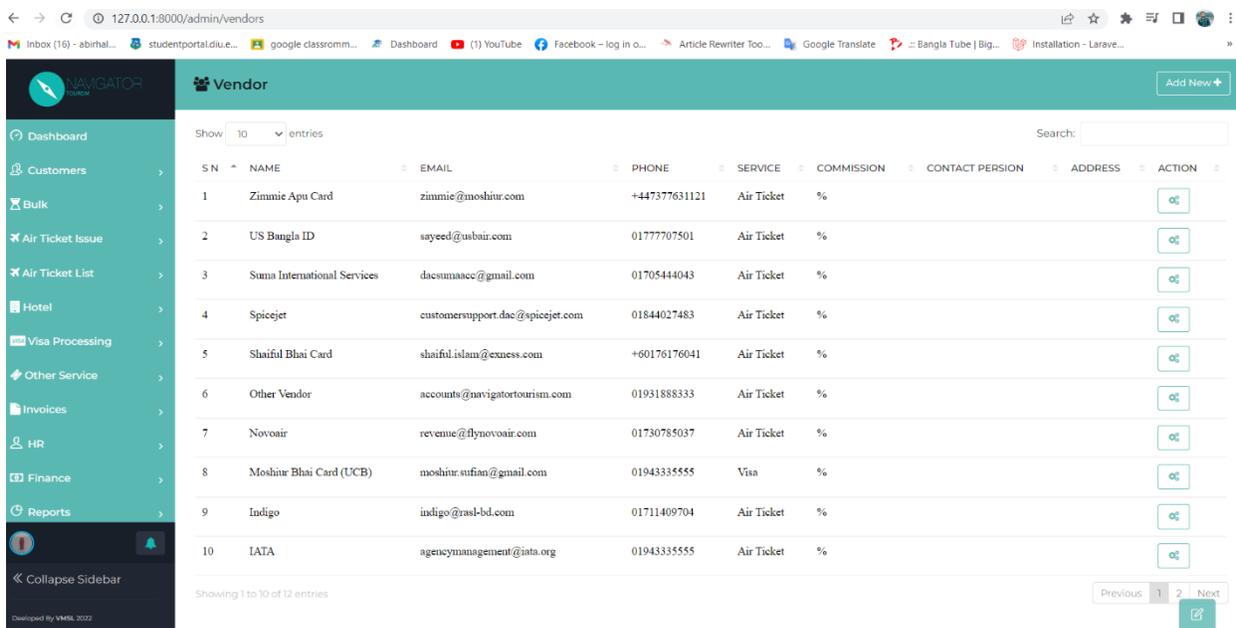


Figure 18: Vendor List prototype

Chapter 9 – Engineering

9.1 Modules of the new system

The Travel agency ERP system is full of new modules since it is a complete system of customer relationship management and navigator tourism management. As a result, there will be numerous modules to explain. I'll show and explain some of the core modules here:

Note: Here I will show if a user takes an action, then how the system interacts with the system.

Module for the login system

Serial of Action	The action of User	The interaction of System
1.	After completion of registration, the admin will navigate the URL.	The system will take the admin to the login page and display a login form if the admin has not already logged in, or it will take the admin to the dashboard.
2.	After being visible the login form, the admin will provide the necessary credential.	After receiving the admin's credentials, the system will determine whether or not the user provided valid format data.
3.	Now, it's time to log in. The admin will press the sign-in or login button.	The system will compare the credentials obtained from the admin to the data in the database. If the credentials are correct, the admin will be directed to the dashboard,

		otherwise an error message will be displayed.
--	--	---

Table 18: Module for the login system

Module for Contacts

Serial of Action	The action of User	The interaction of System
1.	The admin will click the contacts option from the sidebar navigation bar.	The system will open the contacts option and will show its included function to the clients and employees.
2.	The admin will click the function according to his needs.	The system will direct the admin to a specific page based on the request.
3.	The admin will request to add, edit or delete the information according to his needs.	The system will obey the user's instructions and respond to the admin's request.

Table 19: Module for Contacts

Module for Ticket Booking

Serial of Action	The action of User	The interaction of System
1.	The admin will click the Ticket issue option from the sidebar navigation bar.	The system will open the ticket issue option and will show its included function to the admin.
2.	The admin will click the function according to his requirements.	The system will direct the administrator to a specific page based on the request.

3.	The admin will request to add, edit or delete the information according to his needs.	The system will obey the user's instructions and respond to the admin's request.
----	---	--

Table 20: Module for Ticket Booking

9.2 Use Case for Travel agency ERP

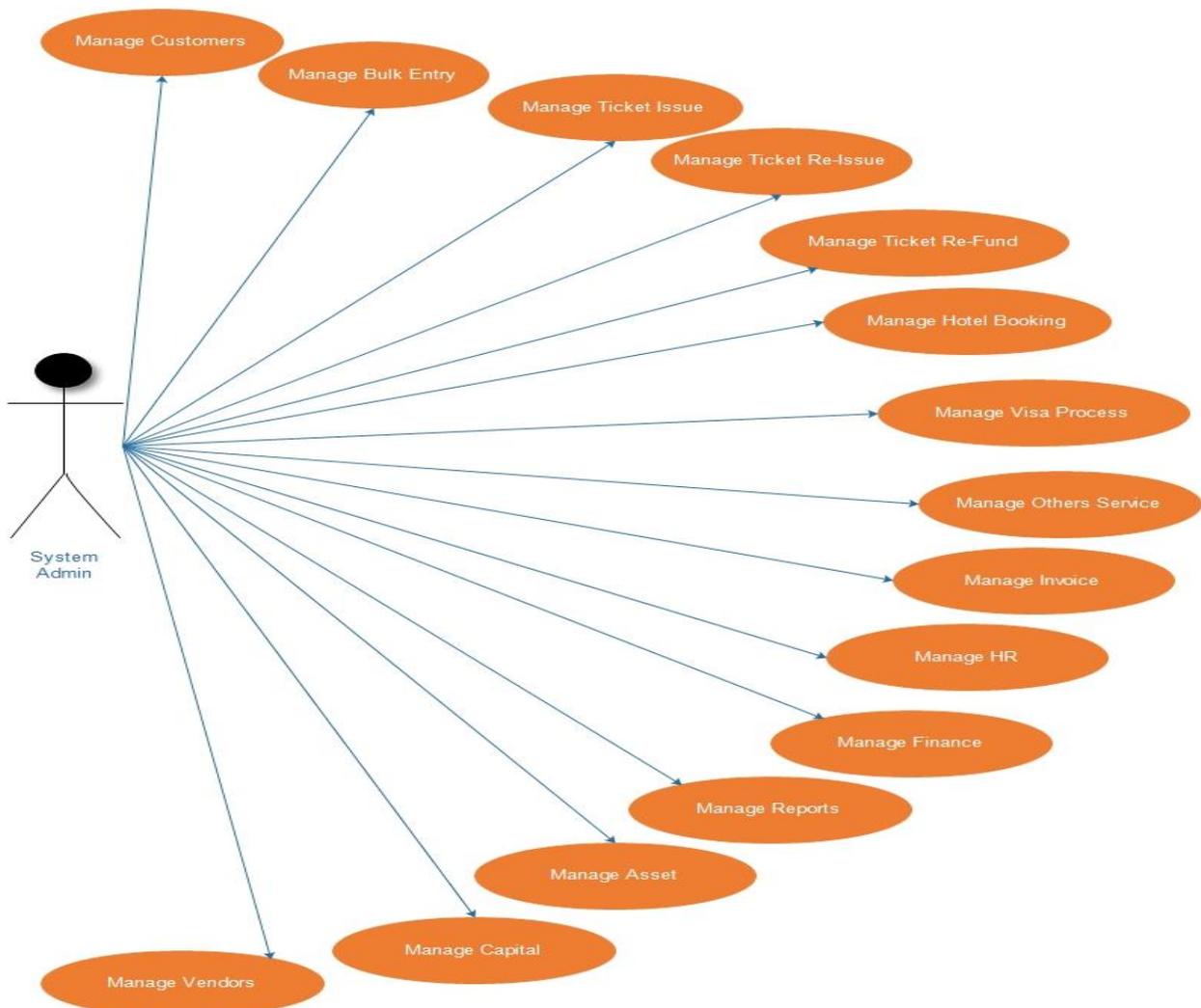


Figure 19: Use Case for Travel agency ERP

9.3 Class diagram for Travel agency ERP

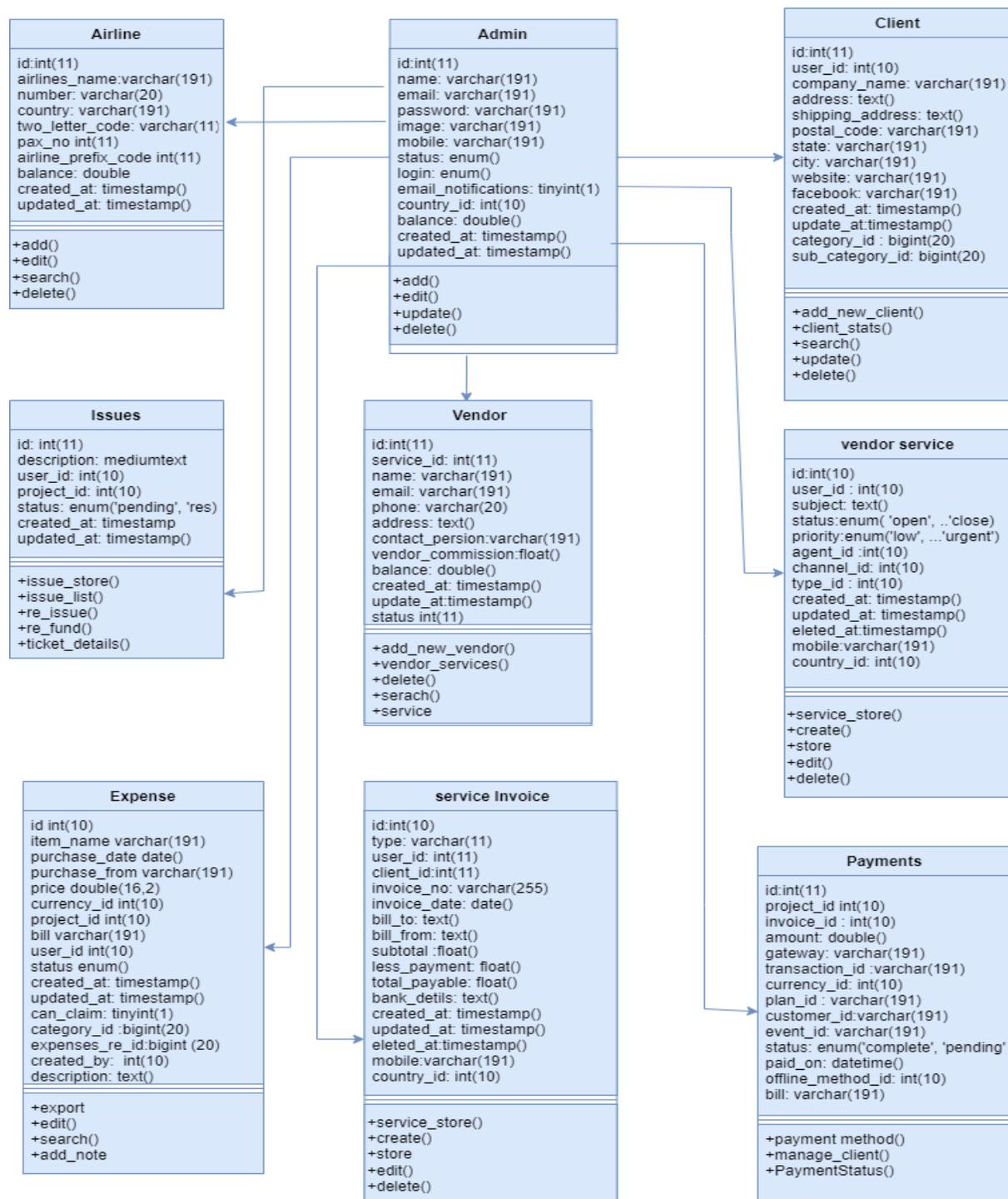


Figure 20: Class diagram for Travel agency ER

9.4 ERD for Travel agency ERP

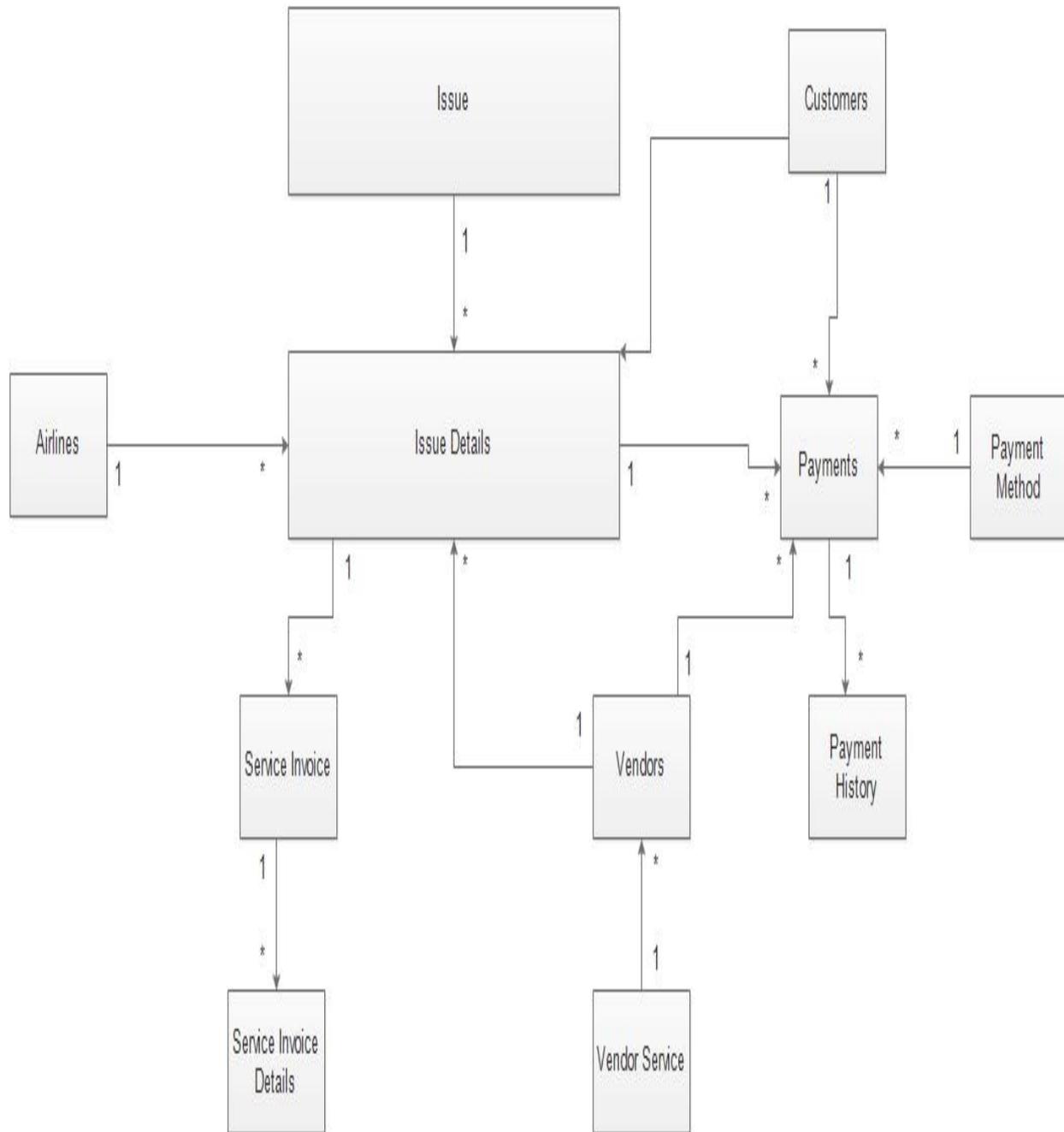


Figure 21: ERD for Travel agency ERP

9.5 Sequence diagram for Travel agency ERP

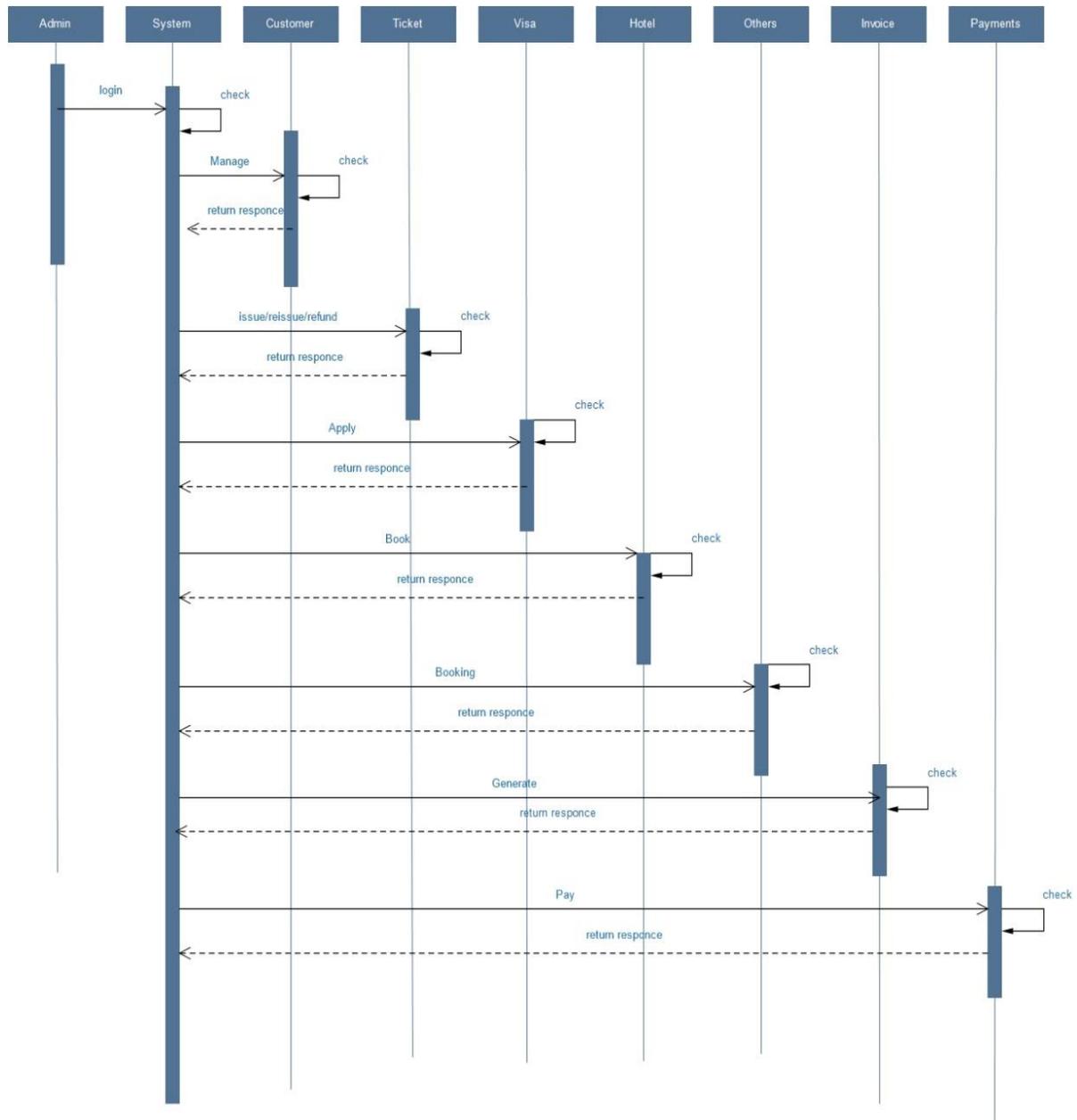


Figure 22: Sequence diagram for Travel agency ERP

9.6 Component diagram for Travel agency ERP

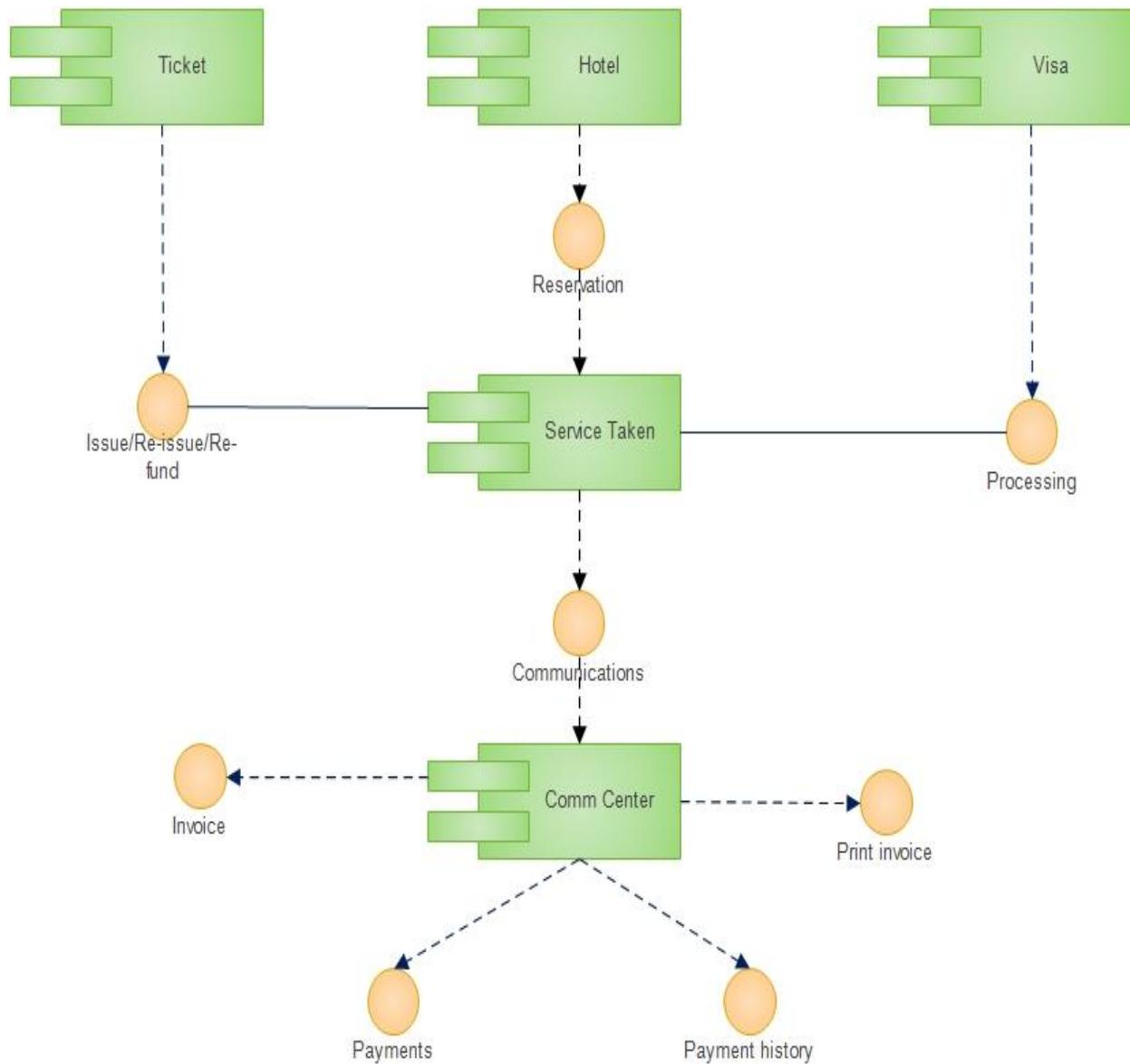


Figure 23: Component diagram for Travel agency ERP

9.7 Deployment diagram for Travel agency ERP

Deployment Diagram

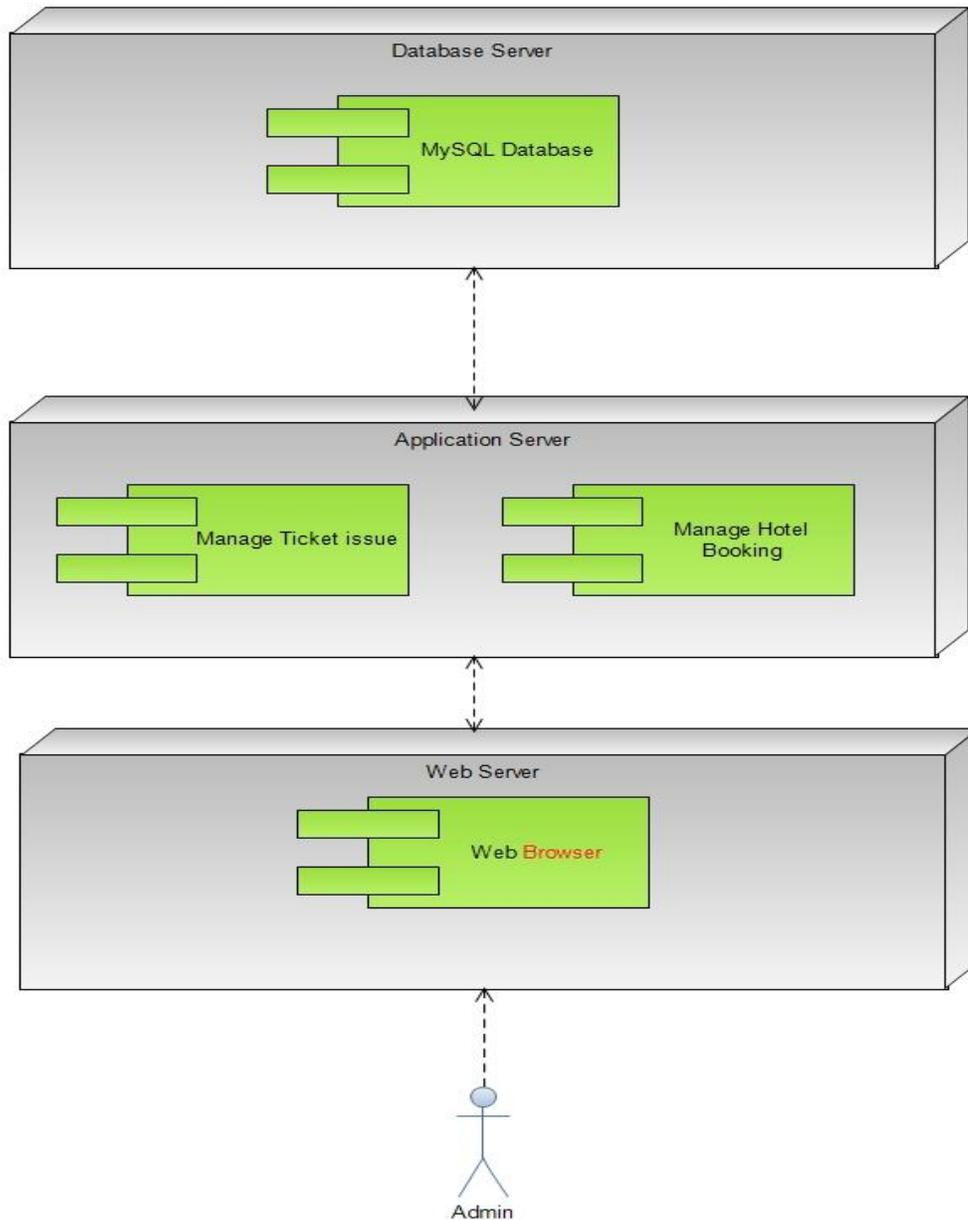


Figure 24: Deployment diagram for Travel agency ERP

9.7 System Interface Design / Prototype

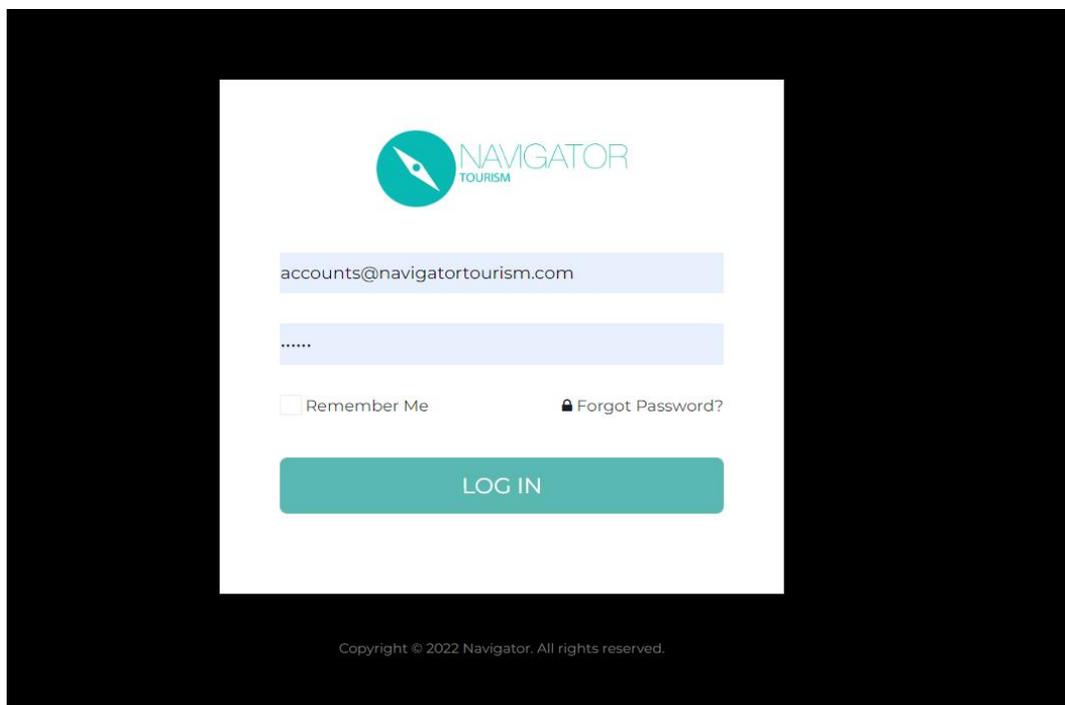


Figure 25: Login Design Travel agency ERP

S.N	NAME	EMAIL	STATUS	CREATED	BALANCE	CLOSING BALANCE DATE	ACTION
1	Abir Halder	abir@gmail.com	Active	10-07-2022	50000	2022-07-12	OC
2	Sheba XYZ	sheba@gmail.com	Active	15-05-2022	51000	2022-04-01	OC
3	M&S	M&S@gmail.com	Active	15-05-2022	0	2022-04-01	OC
4	Action Against Hunger Action Against Hunger		Active	15-05-2022	5999	2022-04-01	OC
5	ZXY	xyz@gmail.com	Active	16-04-2022	0	2022-04-16	OC
6	Zee Traders	zee@gmail.com	Active	16-04-2022	0	2022-04-16	OC
7	VSO VSO		Active	16-04-2022	0	2022-04-16	OC
8	UL	Ul@gmail.com	Active	16-04-2022	92089	2022-04-16	OC
9	TUV SUD TUV SUD		Active	16-04-2022	388200	2022-04-16	OC

Figure 26: Clients list Design Travel agency ERP

NAVIGATOR

Clients Edit

Abir Halder
Last login at: --

0 Total Service
0 Paid Amount

0 Total Payable
0 Pending Amount

Profile | Contacts | Services | Invoices | Payments | Statement

Full Name | **Email** | **Mobile**

abir@gmail.com | +880-01952504156

Company Name
Abir Halder

Address
Dhaka

Developed By WMS, 2022

Figure 27: Clients details Design Travel agency ERP

NAVIGATOR

Employees

ADD EMPLOYEE INFO

Employee ID * Employee Name * Employee Email * Password *

The employee id field is required. The name field is required. The email field is required. Generate Random Password
The password must be at least 6 characters.

Designation Department

Booking Manager | Booking

Slack Username Joining Date * Exit Date Gender

Address
Dhaka

Skills
Cook x Skills

Mobile Salary (BDT) Log In

Developed By WMS, 2022

Figure 28: Employees details Design Travel agency ERP

127.0.0.1:8000/admin/book-hotel

Hotel Booking

HOTEL BOOKING

Select Client Manage Client Date 2022-07-18

Hotel Issue Information

SL NO.	ISSUE DATE	HOTEL NAME	ROOM TYPE	CHECK IN	CHECK OUT	NIGHTS	GUEST NAME	BOOKING REF.
1	mm/dd/yyyy			mm/dd/yyyy	mm/dd/yyyy			

Passport & Visa Info

Note

Total Client Pay 0

Total Vendor Pay

Total Profit

Previous Due 0

Paid Amount

Figure 29: Hotel booking design Travel agency ERP

127.0.0.1:8000/admin/invoice/create

Invoice

ISSUE INVOICE

Select Client Manage Client

Invoice Number: NTM-22-25 Invoice Date: mm/dd/yyyy

Bill To:
 Navigator Tourism
 Address: 1/3 Eskaton Garden, Ramna
 Dhaka - 1000, Bangladesh
 E-TIN: 650817290922
 VAT Registration No. (BIN): 001928005-0208

Bill From:

Service Details

SL NO.	ISSUE DATE	SERVICE	PAX NAME	ROUT	VENDOR	COST	SALE	PAID AMOUNT	NO.
--------	------------	---------	----------	------	--------	------	------	-------------	-----

Figure 30: Invoice design Travel agency ERP

Invoice Issue List

Show 10 entries

Search:

S N	ISSUE DATE	INVOICE NO	COMPANY	AMOUNT	DUE	PAID	ACTION
23	2022-04-24	NTM-22-22	Aristropharma	869000	869000	0	<input type="button" value="🗑️"/>
22	2022-04-24	NTM-22-2	Aristropharma	79000	79000	0	<input type="button" value="🗑️"/>

Showing 1 to 2 of 2 entries

Previous 1 Next

Developed By VMSL 2022

Figure 31: Invoice list design Travel agency ERP

Service Payment

MAKE PAYMENT

Select Client Paid Amount Payment Date Payment Method

Select Client

Service Details

SL NO.	ISSUE DATE	SERVICE	PAX NAME	ROUT	VENDOR	COST	SALE	PAID AMOUNT	NOTE
<input type="button" value="Save"/>	<input type="button" value="Reset"/>								

Developed By VMSL 2022

Figure 32: Service payment design Travel agency ERP

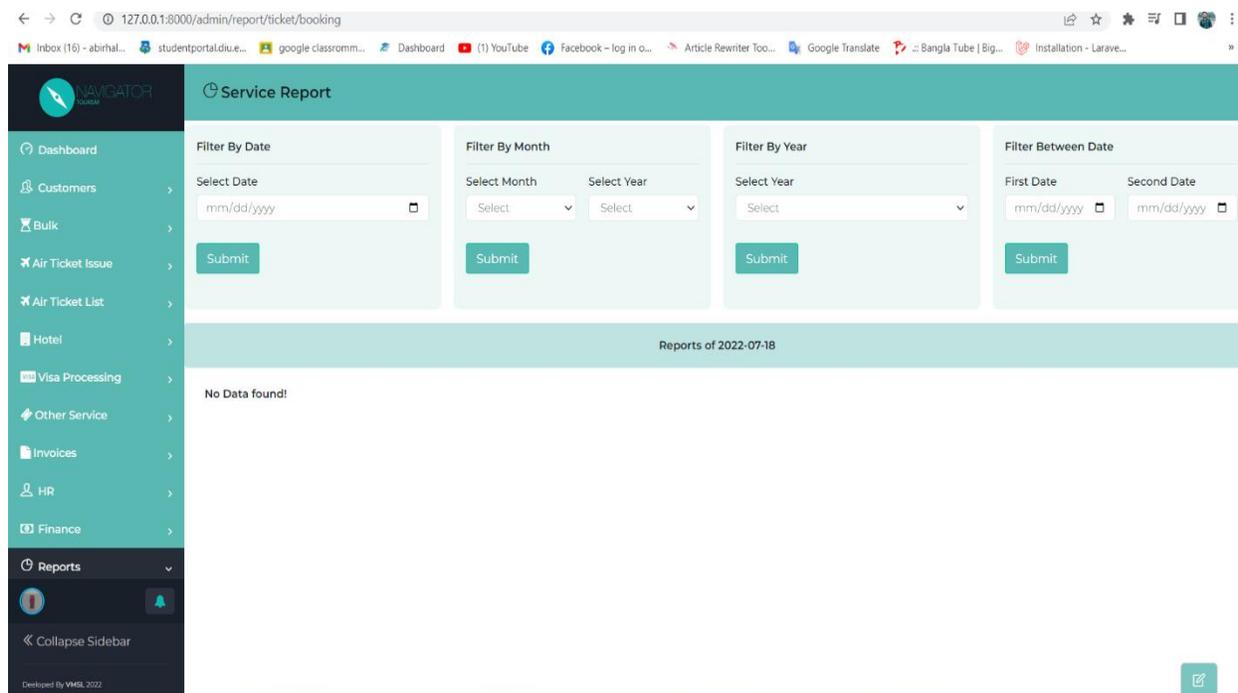


Figure 33: Service Report design Travel agency ERP

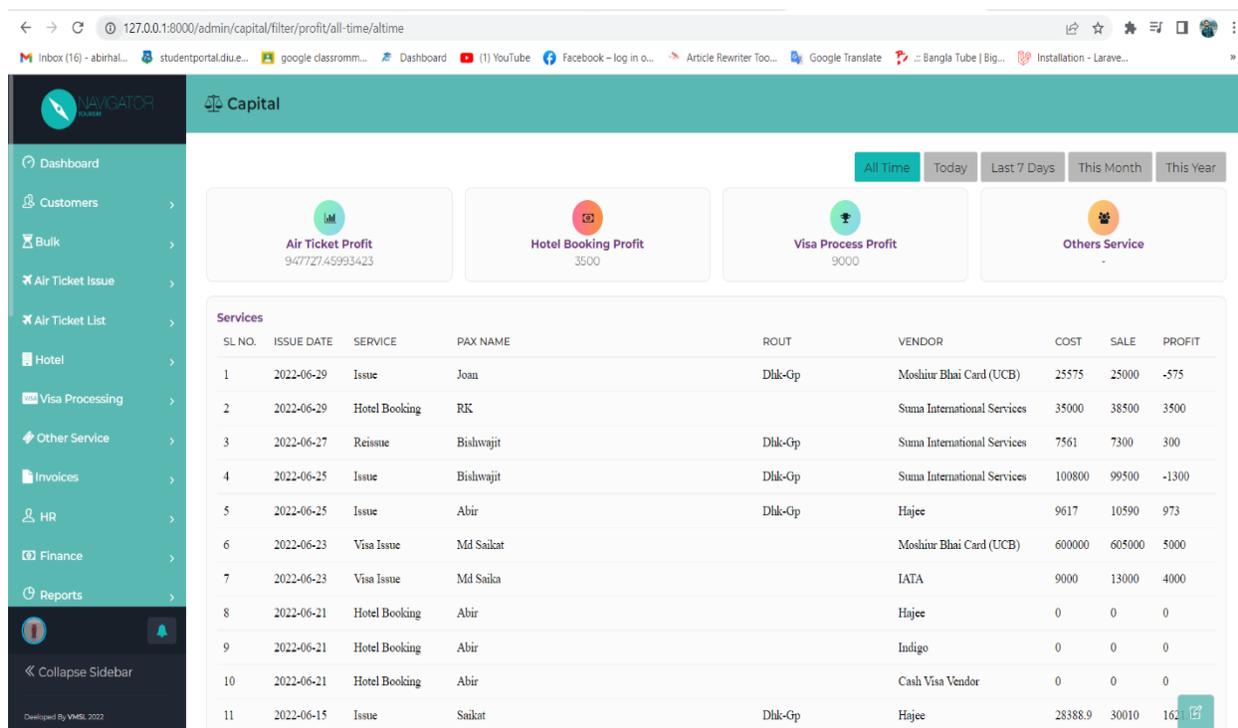


Figure 34: Service Report design Travel agency ERP

Chapter 10 – Deployment/Development

10.1 Core Module Coding Sample

```

TicketBookingController.php
use Vajra\DataTables\Facades\DataTables;

class TicketBookingController extends AdminBaseController
{
    use CurrencyExchange, AppBoot;

    public function __construct() {
        parent::__construct();
        $this->pageTitle = 'Air Ticket Booking';
        $this->pageIcon = 'fa fa-ticket';
    }

    public function issue(){
        $last_invoice = '';
        $last_invoice .= '180050';

        $id = DB::table('ticket_bookings')->orderByDesc('id')->first();
        $lastId = $id->id ?? 1;
        $lastId++;
        $last_invoice .= $lastId;

        $this->clients = User::allClients();
        $payment_method = DB::table('current_asset')->orderBy('name', 'ASC')->get();
        $vendors = DB::table('vendors')->orderBy('name', 'ASC')->get();
        $countries = DB::table('countries')->orderBy('name', 'ASC')->get();
        $airlines = DB::table('airlines')->orderBy('airlines_name', 'ASC')->get();

        return view('admin.air-ticket.issue-ticket', $this->data, compact('last_invoice','vendors','countries','airlines','payment_method'));
    }

    public function issueStore(Request $request){
        $uniqid = uniqid();
        $issue=array();
        $issue['unique_id'] = $uniqid;
        $issue['client_id'] = $request->client_id;
        $issue['user_id'] = $this->user->id;
        $issue['date'] = $request->sale_due_date;
        $issue['no_of_ticket'] = $request->no_of_ticket;
        $issue['total_client_payable'] = $request->total_client_payable;
        $issue['total_vendor_payable'] = $request->total_vendor_payable;
        $issue['total_profit'] = $request->total_profit;
        $issue['previous_due'] = $request->previous_due;
        $issue['present_due'] = $request->present_due;
        $issue['paid_amount'] = $request->paid_amount;
        $issue['payment_method'] = $request->payment_method;
        if ($request->present_due == 0) {
            $issue['payment_status'] = 'pending';
        }else{
            $issue['payment_status'] = 'Paid';
        }
        $issue['notes'] = $request->note;
    }
}

```

Figure 35: Ticket booking controller sample code

```

<div class="panel panel-inverse">
    <div class="panel-heading">@lang('Issue Ticket')</div>
    <div class="panel-wrapper collapse in" aria-expanded="true">
        <div class="panel-body">
            {!! Form::open(['id'=>'createTicketBooking', 'class'=>'ajax-form', 'method'=>'POST']) !!}
            <div class="form-body">
                <div class="row">
                    <div class="col-md-12 row">
                        <div class="col-md-3">
                            <div class="form-group">
                                <label class="control-label required">@lang('Select Client')
                                    <a href="{{ url('admin/clients/create') }}" class="btn btn-xs btn-outline btn-info"><i class="ti-settings"></i> @lang('Manage Client')</a>
                                </label>
                                <select class="select2 form-control" data-placeholder="@lang('Select Client')" id="client_id" name="client_id" required="">
                                    <option value="0">@lang('Select Client')</option>
                                    @foreach($clients as $client)
                                        <option value="{{ $client->id }}">{{ ucwords($client->name) }}</option>
                                    @empty
                                        <option value="">@lang('No client added')</option>
                                    @endforeach
                                </select>
                            </div>
                        </div>
                        <div class="col-md-3">
                            <div class="form-group">
                                <label class="control-label">@lang('Date')</label>
                                <input type="text" id="sale_due_date" name="sale_due_date" value="{{ date('Y-m-d') }}" class="form-control" readonly="" >
                            </div>
                        </div>
                    </div>
                    <div class="row text-center">
                        <div class="col-md-2"></div>
                        <div class="col-md-2 text-right">
                            <div class="form-group">
                                <label class="control-label required">@lang('No. of Ticket')</label>
                            </div>
                            <div class="col-md-2">
                                <div class="form-group">
                                    <input type="number" id="no_of_ticket" name="no_of_ticket" min="1" class="form-control" required="" >
                                </div>
                            </div>
                            <div class="col-md-2 text-left">
                                <button type="button" id="add" class="btn btn-success"> <i class="fa fa-plus"></i> @lang('Confirm')</button>
                                <button type="reset" id="removeBtn" class="btn btn-default">@lang('app.reset')</button>
                            </div>
                        </div>
                    </div>
                </div>
            </div>
        </div>
    </div>

```

Figure 36: Issue Ticket sample Code

```

create.blade.php × BulkTicketController.php ×
}
$this->pageIcon = 'fa fa-ticket';
}
// bulk non commission issue
public function bulkNonCommission(){
    $last_invoice = '';
    $last_invoice -- '180050';

    $id = DB::table('ticket_bookings')->orderByDesc('id')->first();
    $lastId = $id->id ?? 1;
    $lastId++;
    $last_invoice -- $lastId;

    $this->clients = User::allClients();

    $vendors = DB::table('vendors')->orderBy('name', 'ASC')->get();
    $countries = DB::table('countries')->orderBy('name', 'ASC')->get();
    $airlines = DB::table('airlines')->orderBy('airlines_name', 'ASC')->get();
    $payment_method = DB::table('current_asset')->orderBy('name', 'ASC')->get();

    $path = public_path('csvgenerate/Non Commission Sample.csv');

    $file = false;
    $file_name = '';
    if(file_exists($path)){
        $file = true;
        $file_name = 'Non Commission Sample.csv';
    }

    return view('admin.air-ticket.bulk-non-sommission-issue', $this->data, compact('last_invoice', 'vendors', 'countries', 'airlines', 'payment_method',
        'file', 'file_name'));
}

public function DownloadNonCommissionCsv(){

    $filePath = public_path("Non Commission Sample.csv");
    $headers = ['Content-Type: application/csv'];
    $fileName = 'Non Commission Sample.csv';

    return response()->download($filePath, $fileName, $headers);
}

public function StoreNonCommissionCsv(Request $request){

    if ($request->hasFile('csvfile')) {
        $file = $request->file('csvfile');
        // Files::deleteFile();
        $destinationPath = 'csvgenerate';
        $path = public_path('csvgenerate/Non Commission Sample.csv');

        if(file_exists($path)){
            unlink($path);
        } else {

```

Figure 37: Bulk Ticket controller sample Code

```

CapitalManagementController.php ×
{
    parent::__construct();
    $this->pageTitle = 'Capital';
    $this->pageIcon = 'fa fa-balance-scale';
}

/**
 * Show the application dashboard.
 * @return \Illuminate\Http\Response
 */

// current asset
public function profit()
{
    $today = date("m");
    $this->ticketProfit = DB::table('ticket_issue_details')->whereMonth('issue_date', $today)->where('issue_reissue_refund_status', 'Issue')->orWhere('
    issue_reissue_refund_status', 'Reissue')->orWhere('issue_reissue_refund_status', 'Refund')->sum('profit');
    $this->hotelProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Hotel Booking')->whereMonth('issue_date', $today)
    ->sum('profit');
    $this->visaProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Visa Issue')->whereMonth('issue_date', $today)->
    sum('profit');
    $this->othersProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Other')->whereMonth('issue_date', $today)->sum('
    profit');

    $this->services = DB::TABLE('ticket_issue_details')
    ->join('ticket_issue', 'ticket_issue.unique_id', 'ticket_issue_details.unique_id')
    ->join('vendors', 'vendors.id', 'ticket_issue_details.vendor_id')
    ->select('ticket_issue_details.*', 'ticket_issue.unique_id', 'ticket_issue.client_id', 'vendors.name')
    ->whereMonth('ticket_issue_details.issue_date', $today)
    ->orderBy('issue_date', 'DESC')
    ->get();

    return view('admin.capital.profit', $this->data);
}

public function profitFilter($option, $value){

    if ($option == 'today') {
        $today = $value;

        $this->ticketProfit = DB::table('ticket_issue_details')->whereDate('issue_date', $today)->where('issue_reissue_refund_status', 'Issue')->
        orWhere('issue_reissue_refund_status', 'Reissue')->orWhere('issue_reissue_refund_status', 'Refund')->sum('profit');
        $this->hotelProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Hotel Booking')->whereDate('issue_date', $
        today)->sum('profit');
        $this->visaProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Visa Issue')->whereDate('issue_date', $today)
        ->sum('profit');
        $this->othersProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Other')->whereDate('issue_date', $today)->
        sum('profit');

        $this->services = DB::TABLE('ticket_issue_details')
        ->join('ticket_issue', 'ticket_issue.unique_id', 'ticket_issue_details.unique_id')
        ->join('vendors', 'vendors.id', 'ticket_issue_details.vendor_id')
        ->select('ticket_issue_details.*', 'ticket_issue.unique_id', 'ticket_issue.client_id', 'vendors.name')

```

Figure 38: Client management controller sample Code

```

VendorManagementController.php
/**
 * Create a new controller instance.
 *
 * @return void
 */
public function __construct()
{
    parent::__construct();
    $this->pageTitle = 'Vendor';
    $this->pageIcon = 'fa fa-users';
}

/**
 * Show the application dashboard.
 *
 * @return \Illuminate\Http\Response
 */

// current asset
public function index()
{
    $vendors = DB::table('vendors')
        ->join('vendor_services', 'vendors.service_id', 'vendor_services.id')
        ->select('vendors.*', 'vendor_services.service_name')
        ->orderByDesc('id')
        ->get();
    return view('admin.vendors.index', $this->data, compact('vendors'));
}

public function create()
{
    $services = DB::table('vendor_services')->get();
    return view('admin.vendors.create', $this->data, compact('services'));
}

public function store(Request $request){
    if (DB::table('vendors')->where('name', $request->name)->exists()) {
        return Reply::redirect(route('admin.vendor.create'), __('Already Exist.'));
    }else{
        $user = DB::table('vendors')->insert(
            [
                'name' => $request->name,
                'phone' => $request->phone,
                'email' => $request->email,
                'address' => $request->address,
                'service_id' => $request->service_id,
                'contact_persion' => $request->contact_persion,
                'vendor_commission' => $request->commission,
            ]
        );
        return Reply::redirect(route('admin.vendor.create'), __('Vendor Added'));
    }
}

```

Figure 39: Vendor management controller sample Code

```

VisaProcessController.php
use DateTime;
use Illuminate\Support\Facades\DB;
use Yajra\DataTables\Facades\DataTables;

class VisaProcessController extends AdminBaseController
{
    use CurrencyExchange, AppBoot;
    /**
     * Create a new controller instance.
     *
     * @return void
     */
    public function __construct()
    {
        parent::__construct();
        $this->pageTitle = 'Visa Process';
        $this->pageIcon = 'fa fa-cc-visa';
    }

    /**
     * Show the application dashboard.
     *
     * @return \Illuminate\Http\Response
     */

    public function index(){
    }

    public function create(){
        $last_invoice = '';
        $last_invoice .= '180050';

        $id = DB::table('ticket_bookings')->orderByDesc('id')->first();
        $lastId = $id->id ?? 1;
        $lastId++;
        $last_invoice .= $lastId;

        $this->clients = User::allClients();
        $service_type = DB::table('other_service_type')->get();
        $vendors = DB::table('vendors')->orderBy('name', 'ASC')->get();
        $countries = DB::table('countries')->orderBy('name', 'ASC')->get();
        $payment_method = DB::table('current_asset')->orderBy('name', 'ASC')->get();
        return view('admin.visa-process.create', $this->data, compact('last_invoice', 'service_type', 'vendors', 'countries', 'payment_method'));
    }

    public function store(Request $request)
    {
        $uniqid = uniqid();
        $issue=array();
        $issue['unique_id']=$uniqid;
        $issue['client_id']=$request->client_id;
    }
}

```

Figure 40: Visa Process controller sample Code

```

CapitalManagementController.php
* @return \Illuminate\Http\Response
*/
// current asset
public function profit()
{
    $today = date("m");
    $this->ticketProfit = DB::table('ticket_issue_details')->whereMonth('issue_date', $today)->where('issue_reissue_refund_status', 'Issue')->orWhere('
    issue_reissue_refund_status', 'Reissue')->orWhere('issue_reissue_refund_status', 'Refund')->sum('profit');
    $this->hotelProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Hotel Booking')->whereMonth('issue_date', $today)
    ->sum('profit');
    $this->visaProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Visa Issue')->whereMonth('issue_date', $today)->
    sum('profit');
    $this->othersProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Other')->whereMonth('issue_date', $today)->sum('
    profit');

    $this->services = DB::TABLE('ticket_issue_details')
    ->join('ticket_issue', 'ticket_issue.unique_id', 'ticket_issue_details.unique_id')
    ->join('vendors', 'vendors.id', 'ticket_issue_details.vendor_id')
    ->select('ticket_issue_details.*', 'ticket_issue.unique_id', 'ticket_issue.client_id', 'vendors.name')
    ->whereMonth('ticket_issue_details.issue_date', $today)
    ->orderBy('issue_date', 'DESC')
    ->get();
    return view('admin.capital.profit', $this->data);
}

public function profitFilter($option, $value){
    if ($option == 'today') {
        $today = $value;

        $this->ticketProfit = DB::table('ticket_issue_details')->whereDate('issue_date', $today)->where('issue_reissue_refund_status', 'Issue')->
        orWhere('issue_reissue_refund_status', 'Reissue')->orWhere('issue_reissue_refund_status', 'Refund')->sum('profit');
        $this->hotelProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Hotel Booking')->whereDate('issue_date', $
        today)->sum('profit');
        $this->visaProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Visa Issue')->whereDate('issue_date', $today)
        ->sum('profit');
        $this->othersProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Other')->whereDate('issue_date', $today)->
        sum('profit');

        $this->services = DB::TABLE('ticket_issue_details')
        ->join('ticket_issue', 'ticket_issue.unique_id', 'ticket_issue_details.unique_id')
        ->join('vendors', 'vendors.id', 'ticket_issue_details.vendor_id')
        ->select('ticket_issue_details.*', 'ticket_issue.unique_id', 'ticket_issue.client_id', 'vendors.name')
        ->whereDate('ticket_issue_details.issue_date', $today)
        ->orderBy('issue_date', 'DESC')
        ->get();
    } else if ($option == 'last-7-days'){
        $today = Carbon::today()->subDays(7);
        $this->ticketProfit = DB::table('ticket_issue_details')->where('issue_date', '>=', $today)->where('issue_reissue_refund_status', 'Issue')->
        orWhere('issue_reissue_refund_status', 'Reissue')->orWhere('issue_reissue_refund_status', 'Refund')->sum('profit');
        $this->hotelProfit = DB::table('ticket_issue_details')->where('issue_reissue_refund_status', 'Hotel Booking')->where('issue_date', '>=', $today)
        ->sum('profit');
    }
}

```

Figure 41: Capital management controller sample Code

```

InvoiceController.php
public function index(){
    $this->clients = User::allClients();
    $this->employees = User::allEmployees();
    $invoice = DB::TABLE('service_invoices')->orderBy('id', 'DESC')->first();
    $this->last invoice = $invoice->id ?? 1 + 1;
    return view('admin.invoices.invoice-create', $this->data);
}

public function indexSingle(){
    $this->clients = User::allClients();
    $this->employees = User::allEmployees();
    $invoice = DB::TABLE('service_invoices')->orderBy('id', 'DESC')->first();
    $this->last invoice = $invoice->id ?? 1 + 1;
    return view('admin.invoices.invoice-create-single', $this->data);
}

public function getAllServices($id){
    $result = DB::TABLE('ticket_issue_details')
    ->join('ticket_issue', 'ticket_issue.unique_id', 'ticket_issue_details.unique_id')
    ->join('vendors', 'vendors.id', 'ticket_issue_details.vendor_id')
    ->select('ticket_issue_details.*', 'ticket_issue.unique_id', 'ticket_issue.client_id', 'vendors.name')
    ->where('ticket_issue_details.client_id', $id)
    ->get();

    $datas = array();
    $data = '';
    $total = 0;
    foreach ($result as $row) {
        $total = $total + $row->client_sale;
        if ($row->issue_reissue_refund_status == 'Issue' || $row->issue_reissue_refund_status == 'Reissue' || $row->issue_reissue_refund_status == '
        Refund'){
            $paid_amount = DB::table('payment_details')->where('ticket_no', $row->ticket_no)->sum('client_amount');
        } else{
            $paid_amount = DB::table('payment_details')->where('ticket_no', $row->id)->sum('client_amount');
        }
    }
}

```

Figure 42: Invoice controller sample Code

10.2 Possible problem breakdown

It is quite tough to appropriately big work at a time and complete the work properly. It will also take enough time. However, if the work is divided into small steps, it will be easier to complete and will take less time than the previous time. The work will be done correctly and efficiently. As a result, the following is a possible problem breakdown for Travel agency ERP:

- ❖ Database analysis and design
- ❖ Dashboard design and development
- ❖ Contacts design and development
- ❖ Ticketing booking design and development
- ❖ Hotel booking design and development
- ❖ Visa processing design and development
- ❖ Sales design and development
- ❖ Capital management design and development
- ❖ Asset management design and development
- ❖ Invoices management design and development
- ❖ Vendor management design and development
- ❖ HR management design and development
- ❖ Reports management design and development

Database analysis and design:

- ❖ Identify the system requirements and confirm them
- ❖ Gather all the expected information
- ❖ All gathered information should be normalized
- ❖ Make ERD and data dictionary according to the information
- ❖ Make the database schema according to the data dictionary

Dashboard design and development:

- ❖ Design the dashboard.
- ❖ Design for all charts and graphs section.

- ❖ Develop the dashboard.
- ❖ Make a function for retrieving data for charts and graphs.

Contacts design and development

- ❖ Identify all functionalities that should be in this section.
- ❖ Design the particular section one by one.
- ❖ Develop all the sections according to the necessities.

Ticketing booking design and development

- ❖ Identify ticket section's functionalities.
- ❖ Front-end design for all functionalities.
- ❖ Make a function to develop the functionalities one by one.
- ❖

10.3 Prioritization while developing

Prioritizing requirements during system improvement is essential. I've already prioritized the list of requirements based on the MoSCoW standard. Now I'll show you a list of the prioritized requirements that I'll follow while developing Travel Agency ERP.

Priority Serial	Requirement
1	Admin registration at the time of installation and login to the system.
2	All functions of contacts including leads, accounting, partners, etc. added by the admin.
3	Ticket issue functions like campaigns, sales inquiries, and occurrences must-have in the system, and the admin will be able to manage them.
4	Most manageable ticket Booking functions.
5	Manageable logistic functionalities
6	Project management functionalities should be easier.

7	The system should include the General Data Protection Regulation (GDPR) function.
8	Travel agency information and all company functions could be added to the system.
9	Organization could be added to the system to maintain the company's services easily.

Table 21: Priority list while developing

Chapter 11 – Testing

11.1 Test Plan Acceptance

A Test Plan includes documentation of the test strategy, objectives, timetable, evaluations, and deadlines, as well as the resources required to complete the project. You'll understand what we're talking about if you think of it as a testing template. They assist those who are not part of the QA department (such as business managers, engineers, and client-facing teams) by thoroughly explaining the testing system. They act as a road map for quality assurance engineers as they conduct testing. They go into great detail about things like exam scope, test estimate, and general methodology. We've compiled everything into one document to make it easier for management to evaluate and reuse this information. [34] There are two kinds of testing.

➤ **Functional Testing:**

Functional testing is a technique used by quality assurance professionals to determine whether a piece of software meets its specified requirements. Because the tester is completely unfamiliar with the system's underlying logic, black-box testing methodologies are used for functional testing. Functional testing is only concerned with determining whether or not a system function properly. [35] The following are three types of functional testing:

❖ **Unit Testing:**

- Input fields validation or approval.
- Chosen types filtering.
- For processing, pending, in acknowledgment, future contact, incorrect, unobtained, and conversion filtering in the list.

❖ **Module Testing:**

- Submit login form without login accreditations.
- Registration data or log-in credential is invalid.
- Submit a form with genuine or legitimate data.

❖ **Integration Testing:**

- Login with a legitimate login credential.
- Personal information was added and updated or refreshed successfully.

➤ **Non-Functional Testing:**

Non-functional testing examines the functionality and execution of software. Functional testing, on the other hand, seeks to confirm the overall functionality of a piece of programming. Functional and non-functional testing are both necessary for software development. Both contribute to the proper operation of your product. Non-functional testing refers to testing that is not part of the functional process. [36]There are numerous types of non-functional testing.:

- ❖ Security Testing
- ❖ Usability Testing
- ❖ Acceptance Testing
- ❖ Accessibility Testing

11.2 Test Case

A system test, as used in software engineering, is a single test that is run to fulfill a specific software testing objective, such as testing a specific program route or ensuring that a certain requirement is met. A test case is made up of input parameters, projects, and procedures, as well as a technique to test and expected results. Test cases, rather than random testing, are the foundation of deliberate testing. It is feasible to make a collection of test cases that will give the appropriate coverage of

the program under test. Utilizing test cases that have been formally described, it is possible to run the same tests again against consecutive versions of the program, allowing for more sequential and effective regression testing. The test cases that I have utilized for testing this system is given below:

Unit test – test case:

Test Case Name	Unit Test		
Test Class			
Test Description			
Source of Data	Test steps	Expected Result	Actual Result

Table 22: Unit test -test case

Module test -test case:

Test Case Name	Unit Test		
Test Class			
Test Description			
Source of Data	Test steps	Expected Result	Actual Result

Table 23: Module test -test case

Integration test -test case:

Test Case Name	Unit Test		
Test Class			
Test Description			
Source of Data	Test steps	Expected Result	Actual Result

Table 24: Integration test -test case

11.3 Unit Testing

Unit Test -Test Cas

Test Case Name	Unit Test		
Test Class	Employees create controller		
Test Description	Validation of an employee's id, email, name while creating a contact		
Source of Data	Test steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> 1. Complete all fields on the form except the required employees id, name, email, password. 2. Fill out the form and submit it. 	This field is required error message will appear while trying to create an employee.	A message appears that the field is required for creating the employees.

Table 25: Unit test - 1 - test case

The screenshot shows a web browser window with the URL `127.0.0.1:8000/admin/employees/employees/create`. The page title is "Employees" and the main heading is "ADD EMPLOYEE INFO". The form contains the following fields and their states:

- Employee ID**: Required field, currently empty. Error: "The employee id field is required."
- Employee Name**: Required field, currently empty. Error: "The name field is required."
- Employee Email**: Required field, currently empty. Error: "The email field is required."
- Password**: Required field, currently empty. Error: "The password must be at least 6 characters." There is a checkbox for "Generate Random Password".
- Designation**: Dropdown menu with "Booking Manager" selected.
- Department**: Dropdown menu with "Booking" selected.
- Slack Username**: Text input with "Abir".
- Joining Date**: Text input with "12-07-2022".
- Exit Date**: Text input with "13-07-2022".
- Gender**: Dropdown menu with "male" selected.
- Address**: Text area with "Dhaka".
- Skills**: Text input with "Good".
- Mobile**: Text input with "+93 (AF) 01952504156".
- Salary (BDT)**: Text input with "40000".
- Log In**: Dropdown menu with "Enable" selected.

Unit Test - 2 - Test Case:

Test Case Name	Unit Test		
Test Class	The controller of employee's creation		
Test Description	Employee add and check.		
Source of Data	Test steps	Expected Result	Actual Result
Admin	1. Filled the form with all information. 2. Submit the form.	After entering all data and saving the information, you will be taken to this specific employee's details page.	After entering all data and saving the information, you will be taken to this specific employee's details page.

Table 26: Unit test - 2 - test case

The screenshot shows a web browser window with the URL 127.0.0.1:8000/admin/employees/employees/create. The page title is 'Employees' and the section is 'ADD EMPLOYEE INFO'. The form contains the following fields and values:

- Employee ID: 2
- Employee Name: MD Joan
- Employee Email: joan@gmail.com
- Password: [Redacted]
- Designation: test
- Department: test
- Slack Username: @joan
- Joining Date: 12-07-2022
- Exit Date: 21-07-2022
- Gender: male
- Address: Dhaka
- Skills: Good
- Mobile: +880 (BD) 1952504196
- Salary (BDT): 20000
- Log In: Enable

Unit Test - 3 - Test Case:

Test Case Name	Unit Test		
Test Class	employee		
Test Description	Validation of contacts lists		
Source of Data	Test steps	Expected Result	Actual Result

Admin	<ol style="list-style-type: none"> Log in to the admin panel. Click the employee's page. After go to the employee page and check the all-employee list. 	Employees that made should to be displayed on the employees list on the employee page.	Employees that are made should be displayed on the employees list on the employee page.
-------	---	--	---

Table 27: Unit test - 3 - test case

The screenshot shows the 'Employees' page in the Navigator Tourism Admin Panel. The page features a sidebar on the left with navigation options: Dashboard, Customers, Bulk, Air Ticket Issue, Air Ticket List, Hotel, Visa Processing, and Other Service. The main content area displays a table of employees. The table has columns for SN, NAME, EMAIL, USER ROLE, STATUS, and ACTION. There is one entry with SN 1, NAME Shihan Manager, EMAIL accounts@navigator tourism.com, USER ROLE Role of this user cannot be changed, and STATUS Active. The page also includes a search bar, a 'Show 10 entries' dropdown, and a 'Total Employees' indicator showing 1. The bottom of the table shows 'Showing 1 to 1 of 1 entries' and navigation buttons for 'Previous', '1', and 'Next'.

11.4 Module Testing

Module Test - 1 - Test Case:

Test Case Name	Module Test
Test Class	The controller of employee's creation
Test Description	Make an employee attempt without entering any information

Source of Data	Test steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> 1. Log in to the system 2. Go to the employee page and click add record. 3. Click the save button without giving any data. 	This field is required message will appear for the required field.	This field is required message will appear for the required field.

Table 28: Module test - 1 - test case

Module Test - 2 - Test Case:

Test Case Name	Module Test		
Test Class	The controller of employee creation.		
Test Description	Make an employee attempt using a data format that isn't valid.		
Source of Data	Test steps	Expected Result	Actual Result

Admin	<ol style="list-style-type: none"> 1. Log in to the system 2. Go to the employee page and click add record. 3. Click the save button with giving invalid information format. 	Please enter an id, valid email, password, address message that will be appeared for the invalid data.	Please enter id, valid email address password message that will be appeared for the invalid data.
-------	---	--	---

Table 29: Module test - 2 - test case

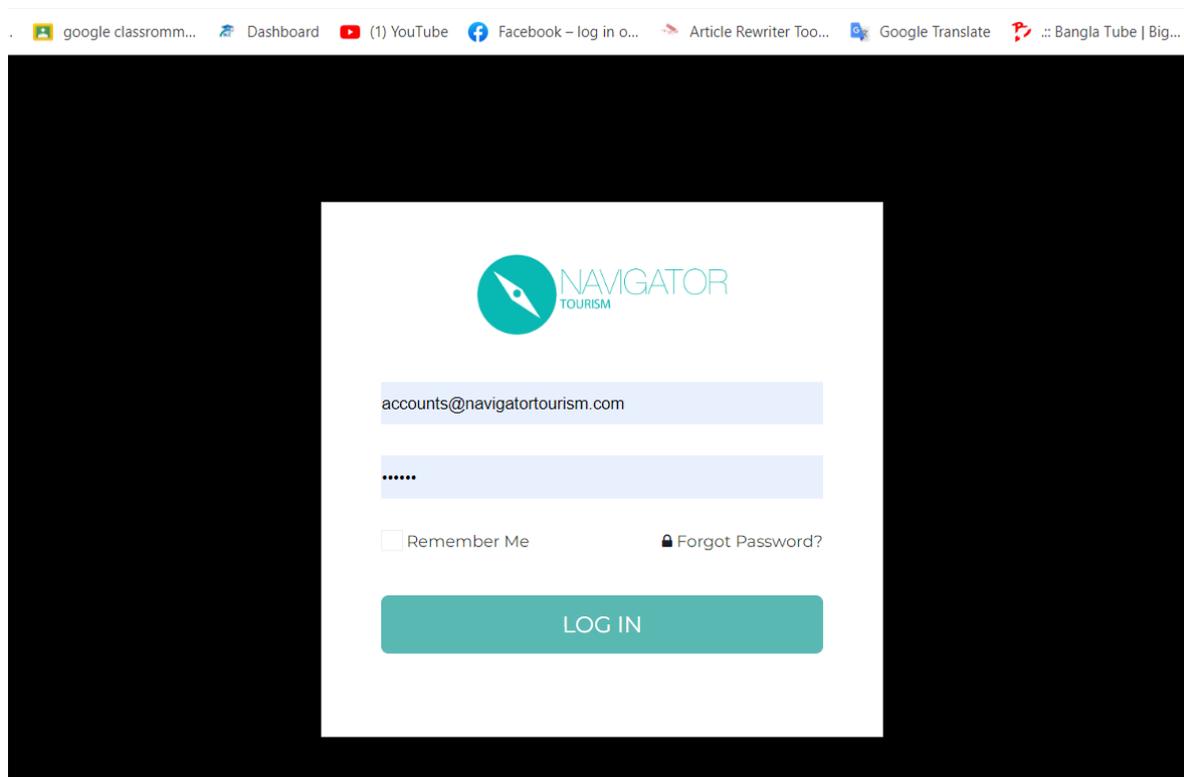
11.5 Integration Testing

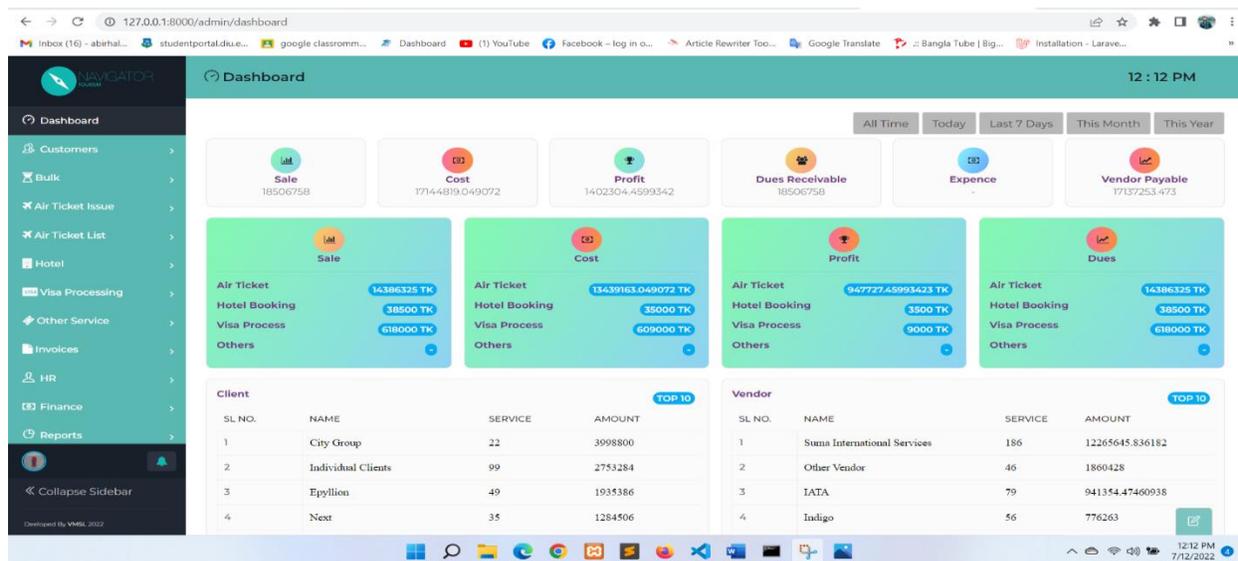
Integration Test - 1 - Test Case:

Test Case Name	Integration Test
Test Class	The controller of Authentication.

Test Description	Login with valid credentials and redirect to dashboard.		
Source of Data	Test steps	Expected Result	Actual Result
Admin	<ol style="list-style-type: none"> 1. First go to the URL 2. Enter all of your correct email address and password. 3. Click on the login button. 	If the credentials are correct, the page will redirect to the dashboard.	If the credentials are correct, the page will redirect to the dashboard.

Table 30: Integration test - 1 - test case





Integration Test - 2 - Test Case:

Test Case Name	Integration Test		
Test Class	Personal info controller		
Test Description	Personal information adds and edits the information.		
Source of Data	Test steps	Expected Result	Actual Result
Admin	1. Navigation bar to the page called My Preferences. 2. Click on the edit option. 3. Change the necessary data.	All data was successfully updated.	All data was successfully updated.

Table 31: Integration test - 2 - test case

The screenshot shows a web browser window with the URL `127.0.0.1:8000/admin/clients/130/edit`. The page title is "Clients" and the main heading is "UPDATE CLIENT INFO". The form is titled "COMPANY DETAILS" and contains the following fields:

- Client Name: Abir Halder
- Closing Balance: 50000
- Closing Balance Date: 07/12/2022
- Address: Dhaka
- Mobile: +880 (BD) 01952504156
- Office Phone Number: 01952504156
- City: Dhaka
- State: Dhaka
- Client Email: abir@gmail.com (Note: Client will login using this email.)
- Postal code: 1000

At the bottom of the form, there are two buttons: "Update" (with a checkmark icon) and "Back".

Chapter 12 – Implementation

12.1 Training

Training is especially important when software is introduced because users must be trained on how to use the program. Training is required following software deployment to ensure optimal productivity, lower partner turnover, and spirit from the very beginning. There are various strategies for sending training modules to the client of the PC system, as well as other methods for maintaining the program once it has been installed. When developing a strategy for effective implementation, the essential elements of the organization must be examined. Keeping managed services lines clear from same issue calls can help keep support representatives accessible for severe situations. After the program is built training and help are required since framework may not be sufficiently able to help specific programming settings like port allotments and print capacities. A table that describes the training procedures of Travel agency EPR is given below:

SN.	User	Training Scope	Time Period	Comment
1	Admin	Successfully create leads, accounts, vendors, air-ticket issue, re-issue, re-fund application, hotel booking, Visa process application, customers, sales inquiries, and occurrences. And how to create a database to store that information. How can the administrator properly modify the above information? The data that Admin added will be editable. Admin will be trained on the required function field, which is required for creating the aforementioned function.	3 hours	Admin can easily understand all functions and operators.

Table 32: Admin training

12.2 Big Bang

The significant methodologies of implementing a new system in an organization can be separated into three pieces: the first one is big bang adoption, the second one is gradual adoption and the last one is linear adoption. All old and new system work in lined up in direct reception, empowering all clients to become viable with the most recent framework while continually chipping away at the past system. The term "phased adoption" refers to how the arrangement will be carried out in stages, with each stage carrying the system nearer to full reception. The exchange from utilizing the past system to using the new framework, known as huge explosion reception, happens on a legitimate date, the purported "moment system changeover". The new system will be executed on that day for everybody, and the old system will simply be staged away after that. A big bang acceptance will be used to explain this preparation in the systematic approach. Big bang acts by

rapidly switching off the past system and enacting the ongoing one. This strategy is much speedier than the others since it utilizes the new situation right as the test is done.

The recommended software need not to be consistent with or a connected to any current systems is the main benefit of big bang acceptance. This impressively improves on the general design of the proposed system, particularly in an organization with a few contradictory systems. Compared among the acquisition types, the big bang is more costly, despite the fact that it has fewer learning chances built into it, requiring more arranging. This preparation will be explained using the efficient methodology of such big bang acceptance. Big bang works by rapidly turning off the previous system and activating the current one. This strategy is much faster than the others because it takes advantage of the new situation as soon as the test is completed. The information transfer from the previous system may cause damage, instability, and insecurity because information may be obliterated and the proposed program may crash. It is implemented on a single site with a single HR department.

12.3 Scaling

The scaling of this project has been finished by the group of Travel agency ERP. As an intern trainee, I did not get any info about this scaling acknowledgment.

12.4 Load balancing

Load balancing refers to the enhancement of a framework in response to the impact of its clients. The number of clients struck indicates the number of people who have used the system at the same time and how long it has been operational. The terms load balancing and load equalization are used to describe this. It appropriates the interest of more than a few servers, allowing the system to run smoothly. There is only one client who is an administrator, but the number of hits per day is enormous because it is a large system that stores a large number of clients' data; thus, an ideal load balancing strategy should emerge.

Chapter 13 – Critical Appraisal and Evaluation

13.1 Objective Could be Met

The following is a list of the goals that were initially announced:

- ❖ login system for admin
- ❖ Ticket booking and booking record management.

Objective/goals – 1

Achievement rate and others:

Only the admin has access to the system's login function. Admin information, as well as login credentials, must be provided during program installation. Once the system has been installed on the local computer, the administrator can log in using the credentials he provided when installing the software. If the credentials are accurate, then the admin will redirect to the dashboard. It will require a few seconds to ready the system and after that admin needs to give the visiting purpose so that he can remember why he logged in to the system. Then the admin will redirect to the dashboard and he will get permission to access the whole system. Thus, the accomplishment rate for these goals is 100 percent.

Objective/goals – 2

Achievement rate and others:

Ticket booking and booking record management include, booking inquiries, occurrences, opportunities, booking requirements, and vendor inquiries. Admin can create the info for the above function. He is also able to update them according to the need and can see the list of this info of special functions. Booking options are sometimes used in ERP but we include them in the Travel agency ERP system because the functionality that is contained by the marketing booking option is necessary for the Travel agency ERP system. The booking and booking record option contain the major functionality of Travel agency ERP and those functions work perfectly. So, the accomplishment rate for these goals is 100 percent.

13.2 How much better could have been done

This Travel agency ERP is a comprehensive management system for a company. In any case, nothing can be completely precise; it can only get better and better. This travel agency ERP system may also be superior to the current system. This current system meets all of the requirements of an ERP system, but it has not been fully enhanced. It takes far too long to load. When an administrator logs into the system, they are directed to the dashboard. But it requires enough time to load the dashboard, so it can be improved so that the system can load in a brief time. Without loading issue, this has no major issue that can be better than other in this system.

Chapter 14 – Lesson Learned

14.1 Pre Project – Review – Closing

Travel agency ERP is mainly a web-based management system. To develop up this system for navigator tourism company has followed a predefined structure like collecting the necessary from the client, making a plan to build the system, choosing an architecture for this system, and choosing a name for this system. Then I have developed this system with PHP and composed documentation as per the project. This Travel agency ERP system is concerned about client following, maintaining the relationship with clients, etc.

14.2 What I have learned

Travel agency ERP is a web-based application for Navigator Tourism Company. I have worked as a designer and developer for this project since I am an intern trainee of Virtual Market Solution Limited (VMSL). I learned a lot of things that can really be beneficial for me in the future while working on this project. Above all else, I have learned how to work with others' made software design. While I had begun the plan, I have learned some unique new design techniques that were unfamiliar to me. For designing this project, I have learned them and implemented them into the project. For example, making a design by templating and how to make the design easier to understand.

I anticipated the system's advancement after completing the design. It is critical to create a database before developing any system. A system cannot be completed unless a legitimate database is planned. I previously worked for a small database that was required for the small venture. In any case, in this system, I learned how to work with a massive database and more information tables. Following the database plan, comes the coding for developing the system. It was extremely difficult for me to create such a large project. Because I needed to write clean, comprehensible, and simple code so that future improvements would be easier for the developer. In any case, I needed to keep all functionalities and necessities with simpler logic. After finishing the task, I was assigned to communicate the system on the live server. It was my first-time installing software on a shared server. Thus, I can say it was an extraordinary journey because I have learned too many things during this project and internship.

14.3 The Problems I Have Faced

I was working as a designer and developer both in this Travel agency ERP system. Several difficulties and issues have arisen during the system's lifetime. The most difficult aspect for me was working with the project architecture created by the group leader. Because it is difficult to work with other people's designs. It takes enough time to comprehend the design. Because I used the Agile DSDM process, which requires iterative development, I must face and resolve challenges iteratively. This implies that issues that come in one timebox are solved in this other timebox and task. While I have begun the plan for the project, I was instructed to do the design by templating. But I did not know how to do the templating for the design that is the reason it required some time to complete the design. Likewise, I needed to learn user-friendly design in a new way. At the point When I began working on the project's database, I realized I'd have to develop a big database with a enough of data tables. However, I had never worked with such a large database before. Making connections between the data tables was difficult for me. The biggest challenge for me in developing such a large system was that it was my first time working on a large project. It was not easy for me to write two thousand lines of code the first time. In that are numerous new things I needed to learn for developing the project properly that require some time than normal creating time. Since the Travel agency ERP system is a completely web-based application, I had to deploy

the project on a shared server. In any case, I had no experience dealing on a live server that's it gave me some pain to deploy on a live server.

14.4 What Solution Occurred

Every problem has a solution. I have created an answer for each of the problems mentioned above and completed the system. Most importantly, I devised a method for working with software engineering established by others. While working on the plan, I discovered a few new design approaches that surprised me. While developing this project, I learned them and incorporated them into the system. For example, how to create a design with templating and how to make the design more understandable. Following the completion of the design, I have planned for the system's advancement. A database must be designed before any framework can be built. A system cannot be completed until a suitable database is designed. I recently worked with a few minor databases that were expected for the small venture. Notwithstanding, with this system, I found an answer on the best way to work with a large database and a few data tables. Following database plan, coding for system advancement follows. Making such a huge task was difficult for me. Because I needed to create clear, understandable code that would make future advancement easier for the creator. However, I needed to balance all capabilities and requirements with simpler logic. After finishing the project, I was tasked with transferring the system to the live server. It was my first time installing software on a shared server, and I discovered the simplest method for deploying the system.

Chapter 15 – Conclusion

15.1 Summary of the project

Travel agency ERP is a web-based application that will assist the navigator tourism company in maintaining client and vendor relationships. This system is used to create and maintain records for ticket booking, re-issuance fund application, visa process and contacts, and a variety of other special automatic activities. Within the ticket booking and contacts function, the organization can keep track of a client's leads, accounts, partners, vendors, competition details, and contacts. When the navigator tourism company implements the ticket booking function, it will be able to create and record ticket booking details. Sales inquiries are important in a company, so that company will be able to inquire about sales through this ticket booking function and keep track of occurrences. This Travel agency ERP system can help you solve sales-related issues. It is a complete navigator tourism organization management system that covers all features of an ERP system. This system is designed with HTML, CSS, Bootstrap4, JavaScript. PHP programming language has been utilized to develop this Travel agency ERP system. All kinds of charts, tables, diagrams and figures have been provided with the documents.

15.2 Goal of the project

Since I did an internship program in Virtual Market Solution Limited-VMSL, this project goal has been set by navigator tourism company. In the software industry, a system's goal or objective is set according to the client's requirement. This Travel agency ERP system's goal has been also set according to the navigator tourism company requirement. The goal of the Travel agency ERP:

- ❖ Have to make the opportunity to learn more about the client through a system.
- ❖ Have to make a system that will assist the navigator tourism organization to organize the business more efficiently.
- ❖ To automate the business requirements a proficient software system.
- ❖ Make a usable method for following client collaboration without any problem

15.3 Success of the project

At the point When a thing meets its objectives, at that point, we can say the thing is fruitful because it has fulfilled the targets. Travel agency ERP system has met its all objectives according to the navigator tourism company requirements.

- ❖ This Travel agency ERP system has the ability to assist the navigator tourism organization learn more deeply about their client.
- ❖ A system has been made that will assist the navigator tourism organization to organize its business more efficiently.
- ❖ Travel agency ERP is a perfect software to automate any business.
- ❖ Travel agency ERP has all functionalities to follow client interaction.

Therefore, it is clear that the Travel agency ERP system has been completed successfully.

15.4 What I have done in the documentation

Because this is academic documentation, I needed to first follow the academic documentation structure when creating this documentation. I've made sense of everything I've done during the project in this documentation. Above all, I wrote an introduction to the system in the documentation before beginning the initial study for this project and completing all required steps for this framework step by step. All tables in this documentation were created using MS Word, and all diagrams and figures were created using a third-party application.

15.5 Value of the project

It is more challenging to do any work totally manually. If everything that work can be done automatically then time and inconvenience can be saved. Technology makes it conceivable to do the same amount of work effectively with less time and less effort. It is very challenging and time-consuming to manually keep all the client details of an organization. However, it is critical for an organization to retain all of its retail clients. If this task can be completed in less time and with less effort, it will be a good choice. Travel agency ERP automates this process by requiring less effort and time to store various business details. As a result, the value of travel agency ERP is much

higher in this technological age. Since the Travel agency ERP will assist an organization with all kinds of client details in addition to their contacts as well as booking Increase, Opportunities, Campaign, etc.

15.6 My Experience

Because I was unfamiliar with all of the technologies required for this project, I learned a lot while working on it. I had to relearn these things and figure out how to implement and complete the project successfully. I've also learned how to collaborate with software engineering created by others. While I had begun the design, I have also learned some new better design strategies that were new to me. For designing this project, I have learned them and implemented them into the system. For example, creating a design by templating and how to make the design easier to use. I have planned the system's development after completing the design. A database must be designed before any system can be developed. A system cannot be completed unless a proper database is designed. I had previously worked with some small databases that were required for the small project. However, in this system, I learned how to work with a large database and multiple data tables. Following database design, comes system development coding. Creating such a large project was a significant challenge for me. Because I needed to write clean, readable code that would make future development easier for the developer. So that was a fantastic journey for me because it taught me a lot of things that will be useful to me in the future.

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