## Efficient Airline Reservation System



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Technology

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## **DEDICATION**

I would like to dedicate this thesis to my Parents, my respected teacher Sir Munawwar Iqbal and my Friends due to their backing and courage; I'm able to complete this perplexing task.

**ACKNOWLEDGEMENT** 

All praise to Almighty Allah for giving me the courage to complete this project within the

specified time. I express my gratitude to my kind supervisor Sir Munawwar Iqbalwho kept

my morale high by her appreciation and motivation and guided and taught me different

techniques. He was always available whenever I consult him. His valuable suggestion

significantly improved this work and without his precious guidance I would never be able to

complete such a project. I am extremely fortunate to have him as supervisor.

I would like to acknowledge the support of my family member, I owe all my achievements to my

truly, sincere and most loving parents, Brother, and Sister. They mean a lot to me.

I am also thankful to all the worthy teachers and staff members of Institute of information

technology, Quaid-i-Azam University Islamabad. At the end I would like to extend thanks

to all my friends, class fellows who have helped me in this project.

Thank You So much!

Maria Bibi

#### **ABSTRACT**

Internet becomes tremendously popular in 2 decades. Nowadays internet becomes a major source for people searching for online reservations without the issue of meeting travel agents. my project plan to obey these purposes. We developed a web-based application Airline Reservation System where a traveler can reserve a flight ticket from home through the internet, the system provides flight details, cost, date and time, etc. Whenever a passenger booking a ticket, it will pay online and get the ticket online then he can print it. He can retrieve his ticket record till the date of flight, it will save the time of travelers and get a quick response, it also helps the traveling office teams to maintain the record easily.

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Project in brief

Project Title: Efficient Airline Reservation System

System Used: Intel(R) Core(TM) i5-2370M

Operating System: Microsoft windows 10

Development Tool: Visual Studio 2019

Language: .Net, HTML, CSS, JavaScript

Start Date: 20th September 2019

End Date: 24th April 2021

## Chapter # 1 Introduction

#### 1.1Introduction

The World Wide Web has been popular for the past two decades, and most airlines have set up online reservations. Nowadays internet becomes a major source for people searching for online reservations without the issue of meeting travel agents. There are different ways for traveling so one way to travel is to travel by air. Customers who want to travel by air nowadays have a variety of airlines and different times to choose from. These days the competition between the airlines is so fierce that customers are getting a lot of discounts and luxuries that will give this particular airline an important edge. We developed a web-based application Efficient Airline Reservation System where a traveler can reserve a flight ticket from home through the internet. the system provides flight details, cost, date and time, etc.

Whenever a passenger booking a ticket, it will pay online and get the ticket online then he can print it. He can retrieve his ticket record till the date of flight [1].

## 1.2Statement of the problem

Because of this manual procedure involved in airline management, clients have no choice but to follow these erroneous procedures. The way information is stored is poor. This limits the number of government documents accessible to users because the system is not capable of managing antiquities that could come in handy at any time. There are few security control systems where consumer goods, documents and confidential information can be protected from unauthorized access by global airlines to increase user-friendly direct systems, productivity and efficiency.

## 1.3Purpose of the study

The project aims to highlight the relevance and importance of airline booking system (ARS). This is offered to enhance the relationship between customers and airline agencies using ARS, which facilitates the process of flight ticketing and sales and all air travel processes.

## 1.4Aims and Objectives

The project aims to design and implement software that helps airline system employees issue reservation tickets for different air flights and maintain records of different passengers and provide instant services to passengers.

## 1.4.1The objectives include

- 1. Maintain consistency at the information desk and in different physical locations, different ways of access, such as by phone, via web.
- 2. Minimize repetitive work by system administrator and reservation clerk.
- 3. To maintain customer information in case of emergency.
- 4. To raise awareness among many travelers about various special offers and discounts
- 5. To minimize the number of empty seats on a flight and make maximum use of the flight capacity.
- 6. To maintain the ability to adopt flexible pricing policy.

#### 1.5Significance of study

The importance of the airline reservation system is the computerization of the organization's activities. This helps to make the day-to-day work of the organization easier. The

computerization of their operations has had a positive effect on the organization's economy. The results of this research will also help management to increase revenue and run day-to-day activities more easily. This presentation will be useful for all those who use Airline Flight Information System (ARS), Flight Operators, Air Travel Operators, Travel Agents and Airline Agencies.

## 1.6Methodology:

- A general review of the existing system to spot the bottle neck, correct them and the procedure in a new solution.
- A system design which cut across designing software and a new system operation. i.e.,
   Operation manual.

## 1.7Scope of study

This study is limited to the complete tasks of airline booking in relation to the online airline ticket portal for service providers.

## Chapter # 2 Requirements

#### 2.1Requirements

A requirement is a specification or want that must be met or satisfied within a certain timeframe.

System requirements are a description of the services that the system should provide.

Requirements reflect the needs of customers for a system that serves a certain purpose.

Requirements are dividing into different categories.

## 2.1.1Requirements Elicitation

Before requirements can be analyzed, modelled, or specified they must be gathered through an elicitation process. Requirement's elicitation is the practice of researching and discovering the requirements of a system from users, customers, and other stakeholders. The practice is also, sometimes referred to as "requirement gathering". Requirement's elicitation involves meeting.

If the Stockholders of Different Candies, then Discover Information About were the proposed system [2].

## 2.1.2 Requirements Analysis

Requirements analysis we determine the needs or conditions to meet the new or altered product or project. The requirements should be documented, actionable, measurable, testable, related to identified needs or opportunities.

## 2.1.3Requirements Specifications

Requirement Specification is the process of writing user and system requirements in a requirement document. User and system requirements should be clear, vague, easy to understand, complete and consistent. User requirements for a system should define active and passive requirements so that they can be understood by system users who do not have technical knowledge.

## 2.1.4Requirements Validations

Requirement's validation is the process of checking that requirements define the system that the customer really wants. It overlaps with elicitation and analysis, as it is concerned with finding problems with the requirements. During the requirements validation process, different types of checks should be carried out on the requirements in the requirements document. These checks include.

Validity checks
Consistency checks
Completeness checks
Realism check
Verifiability

## 2.2Functional Requirements

Functional requirements are features or functions that developer must implement to enable the users to accomplish their tasks. Functional requirements describe what a system should do.

## 2.2.1Registration

Only registered user can view or book flights.

#### 2.2.2Add

Admin can add Flight.

#### 2.2.3Delete

Admin can delete Flight data.

## 2.2.4Update

Admin can update or change Flight' information.

## 2.2.5Login

By entering valid information user can login to system.

## 2.2.6Logout

After completing his/her task he/she will be log out from the system.

## 2.3Non-Functional Requirements:

Non-functional requirements elaborate performance characteristics of a system. They are also known as quality attributes.

## 2.3.1Reliability

The system should provide storage of all databases with automatic switchover. All information should be reach to admin without an error.

## 2.3.2Implementation

Implementation of the system using different languages like HTML, CSS and ASP.Net is used for database connectivity. Database is a part of MySQL.

## 2.3.3Availability

The system will be available according to proposed schedule so the user can access it easily.

## 2.3.4Portability

The end user is fully portable. The user can use this system on any OS using any web browser.

The system will be able to run on any device.

## 2.3.5Usability

The website is designed for user friendly environment and ease of use.

## 2.3.6Security

The system's confidential information is accessed and managed only by authenticated administrators on server side.

## 2.4Interface Requirements

It defines the hardware, software, or database elements with which a system or component should interface.

2.4.1Graphical User Interface	2.4	.10	Grai	phica	1 U	Jser	Inter	face
-------------------------------	-----	-----	------	-------	-----	------	-------	------

☐ Login page
□ Sign up
☐ Add flight
☐ Upcoming flights
$\square$ Book flights
☐ Payment
☐ Tickets

#### 2.4.2Hardware Interface

All hardware's that are required for system to connect internet will be hardware interface like MODEM, WAN and LAN.

□ 2.20GHz Processor □ 8GB RAM□ 64-bit Operating System

#### 2.4.3Software Interface

Any browser like Chrome, Firefox etc.

Microsoft Visual Studio 2010(ASP.net using C#, HTML) and MYSQL is used to store all information in database.

Quires are used to retrieve data from database.

# CHAPTER # 3 System Analysis and Design

## 3.1Introduction

System development is systematic process deal with understanding and specifying in detail What system should do and now the components of the system works together. It includes planning, analysis, design, deployment, and maintenance. Here, I will primarily focus on.

Analysis

#### Design

## 3.1.1Analysis

We want better understanding of project we can analysis is it means we break the project into smaller part and then analysis it or understand the smaller parts of that projects and from the analysis of project we decide that what the system should do. It is conducted to study a system or its parts in order to identify its objectives. It is a problem solving technique which is used to improve the system and ensures that all the components of the system work efficiently to accomplish their purpose.

## 3.1.2Design

The process of design is plan/specification for the construction of system in form of prototype. It is used to create a new business system or replacing an existing system by defining its components or modules to satisfy the specific requirements.

#### 3.2Component Overview

It is an online site for user where they can easily encrypt and decrypt their text message by using different algorithms. The main functionality of the system is described in following UML diagrams.

## 3.3UML Diagram

A UML diagram is a diagram based on the UML (Unified Modelling Language) with the purpose of visually representing a system along with its main actors, roles, actions, artefacts. We write document for maintain information about system [3]. There are different type diagrams of UML.

- One Diagram of Behavioral Diagrams
- Second Diagram of Structural Diagrams
- Use Case

#### 3.3.1Behavioral Diagrams

It shows how the system behaves and interacts with itself and other entities (users, other systems). They show how data moves through the system and how objects communicate with each other.

## 3.3.2 Use Case Diagram

The diagram of use case is a set of functions, services, and actions use case A "system" is something being developed or operated, and "actors" are people or entities diagram using actor for the functionality of system [3].

## System

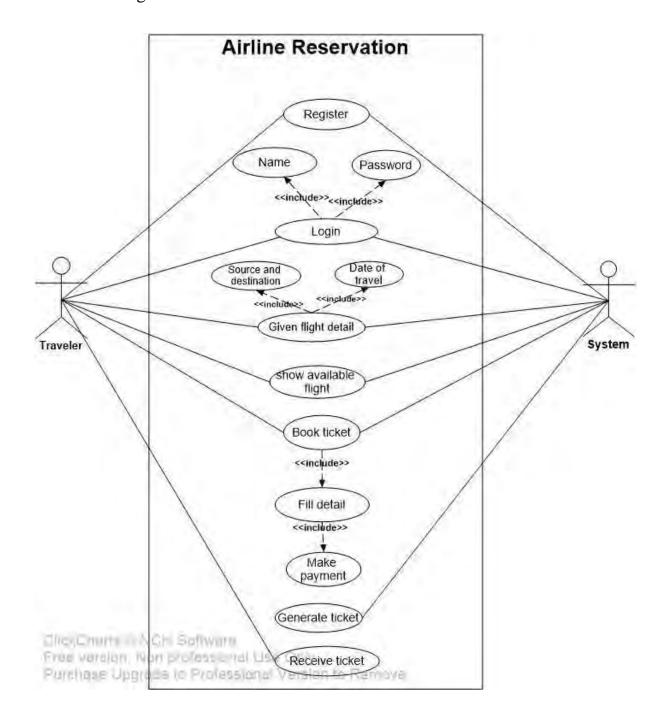
It is a rectangular shape system boundary contains use cases in it and actors are place outside the system [3]. Use Case

It is an oval shape which represents the functions of the system [3].

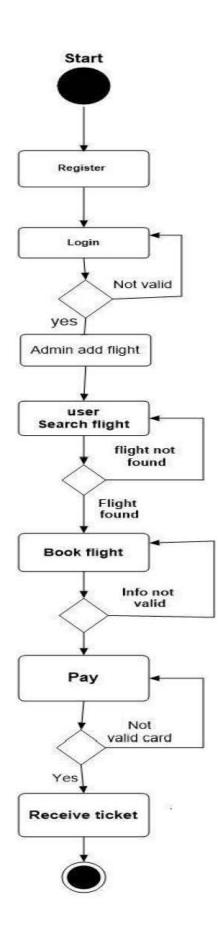
#### Actor

Actors are the users of a system. They are represented with the actor stereotype [3].

## 3.3.3Use Case Diagram:



## 3.4Activity Diagram



## 3.5Class Diagram

Class diagrams are a type of structure diagrams that describe the structure of a system by showing the system's cases, their attributes, operations or method, and the relationships among objects [3].

Class Diagram Notation:

A class notation consists of three parts:

• Class Name

Class name in the first partition.

Class Attributes

Attributes are shown in the second partition.

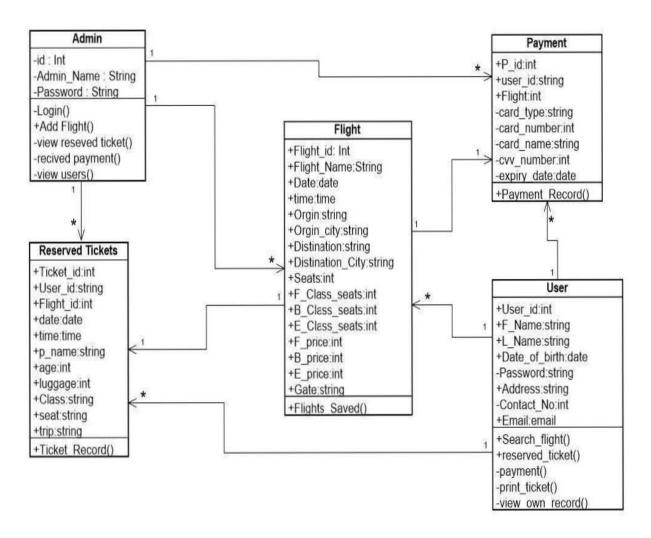
• Class Operations (Methods)

Operations are shown in the third partition. They are servicing the class provides.

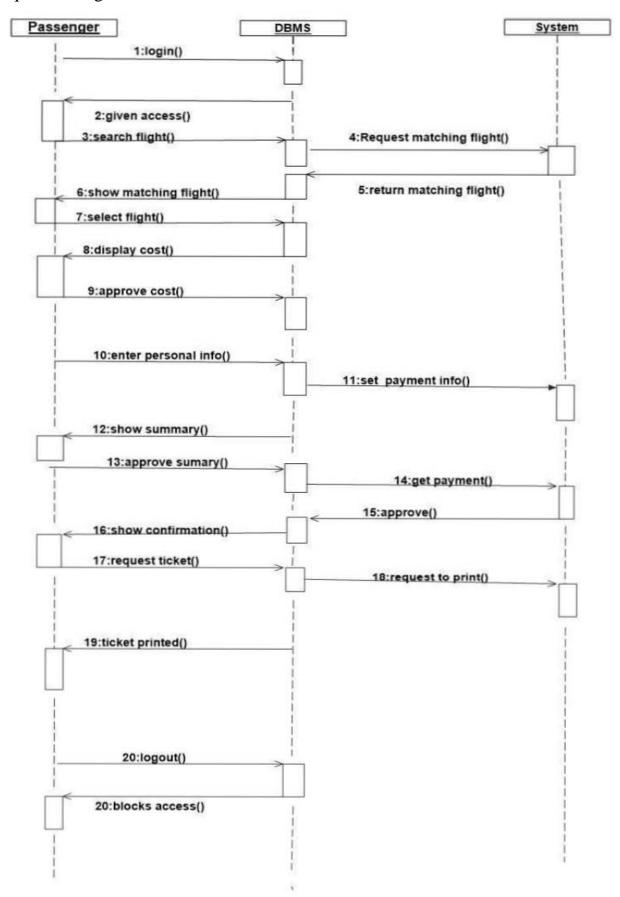
## 3.5.1Class Relationships

- Inheritance or Generalization
- Aggregation
- Simple Association
- Composition
- Dependency

## 3.5.2Class Diagrm



## 3.6Sequence Diagram



## 3.7Conclusion of Chapter

In this chapter I discuss all the Analysis and Design of the Project. Defining the Architecture, Component, modules, interface and data for a proposed system to satisfy the specified requirements.

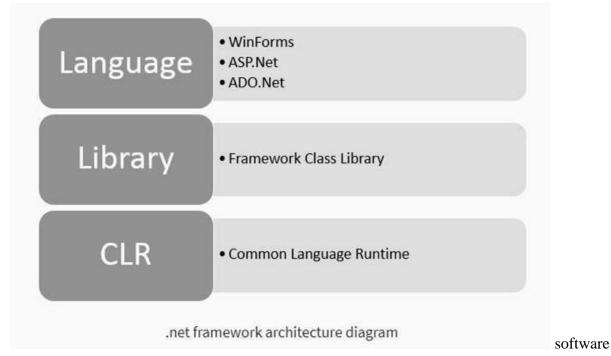
# Chapter # 4 Software Description And Implementation

#### 4.1Introduction to Microsoft .Net

.Net Framework is a software development platform developed by Microsoft. The purpose of this framework was to create applications that run on the Windows platform. The first version of the .NET Framework was released in 2002. The .NET Framework can be used to build both form-based and web-based applications. Web services can also be developed using the .NET Framework [4].

#### 4.2Net Framework Architecture

It includes a large class library named as Framework Class Library (FCL) and provides language interoperability (each language can use code written in other languages) across several programming languages. Programs written for .NET Framework executes in a software environment (in contrast to a hardware environment) named the Common Language Runtime (CLR). The CLR is an application virtual machine that provides services such as security, memory management, and exception handling. As such, computer code written using .NET Framework is called "managed code". FCL and CLR together constitute the .NET Framework. FCL provides the user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. Programmers produce software by combining their source code with .NET Framework and other libraries. The framework is intended to be used by most new applications created for the Windows platform. Microsoft also produces an integrated development environment largely for .NET



called Visual Studio [2].

## 4.3 NET Components:

## 4.3.1 Common Language Runtime

Common Language Runtime (CLR), the virtual machine component of Microsoft's network framework, manages the implementation of .NET programs. Just temporarily, the compiler converts the managed code into machine instructions, which are then executed on the computer's CPU. All programs written for the .NET Framework, regardless of programming language, are executed by CLR. All versions of the .NET Framework include CLRs. The

CLR team was launched on June 13, 1998. CLR provides additional services including memory management, type safety, discount handling, garbage collection, security and thread management [2].

## 4.3.2Class Library

The .NET Framework includes a collection of standard class libraries. A class library is a collection of methods and functions that can be used for a primary purpose. For example, there is a class library with ways to handle all tasks at the file level. So there is a method that can be used to read text from a file. Similarly, there is a way to write text in a file. With Microsoft's move to .NET Core, the CLI foundational class libraries implementation is known as CoreFX instead of FCL [2].

## 4.3.3Languages

The types that can be built into the .NET Framework are broadly classified into the following categories

[2].

- Winform: This is used to develop form-based applications, which run on the end user machine. Notepad is an example of a client-based application [2].
- ASP.NET: It is used to develop web-based applications, which are designed to run on any Internet browser such as Chrome or Firefox application [2].
- ☐ The web application will be processed on the server, in which internet information services will be installed [2].
- ☐ Information is a component of Internet Information Services or IIS Microsoft used to run the Asp.Net application [2].
- ☐ The execution result is then sent to the client machines, and the output is displayed in the browser.

Microsoft always makes sure that the .NET Framework is compatible with all supported Windows operating systems [2].

## 4.4.Net Framework Design Principle

There were following design principles. The .Net framework is very relevant to the design. Netbased applications [2].

## 4.4.1Interoperability

The .Net framework provides very backward support. Suppose you have an application on an older version of the .Net framework, say 2.0. And if you have tried to run the same application on a machine.If there is a higher version of the .Net framework, say 3.5. The application will still work. This is because with each release, Microsoft make sure that older versions of the framework get better with the latest version [2].

## 4.4.2Portability

Applications built on the .Net framework can be built to work on any Windows platform. And now in recent times, Microsoft has envisioned Microsoft products to work on other platforms, such as iOS and Linux [2].

## 4.4.3Security

The .NET Framework is a good security tool. These built-in security mechanisms help both verify and verify applications. Each application can clearly define its own security procedures.

Each security method is used to give the user access to the code or program they are running [2].

## 4.4.4Memory Management

The common language manages all of the runtime work or memory. The .NET Framework has the potential to view resources that are not used by the running program. He will then release these resources accordingly. This is done through a program called "Garbage Collector". Runs as part of the Net Framework. Garbage pickers run at regular intervals and check which system resources are not being used, and release them accordingly [2].

### 4.5Simplified Deployment

The .NET Framework also includes tools that can be used to package applications built on the .NET Framework. These packages can then be distributed to client machines. Packages will then automatically install the application.

## 4.6 Web Based Implementation:

A website is a program that accesses a network connection using HTTP instead of having a device's memory. Websites often run on web browsers.

#### 4.7Database Tool Selection

A database is a separate application that collects a large amount of data. Each database has one or more separate APIs for creating, accessing, managing, searching, and copying the data you already have. We use the Relative Database Management System (RDBMS) to store and manage heavy data. All data is stored in various tables and relationships are established using the primary keys and other keys known as foreign keys.

## 4.7.1MYSQL Server

The database system selected for this project is MySQL Server. It is the most popular cross-platform open source database system. It is a well-organized language database system that is used on the web and runs on servers. It supports standard MySQL and configures on multiple platforms. MYSQL is increasingly reliable and easy to use. RDBMS is being used for both small and large applications. It is used to access databases on the Internet due to its connectivity, speed and security.

## 4.8Operating System:

- 64 bit operating System.
- Windows 10

## 4.9Development Tools:

- Microsoft Visual studio 10
- SQL Server 2012

#### 4.10Microsoft Word 2019:

The Microsoft word 2013 is used in my project for documentation of the whole project.

#### 4.11Microsoft Visio:

The Microsoft Visio is used in my project for drawing diagram of the project.

## Chapter # 5 User Guide

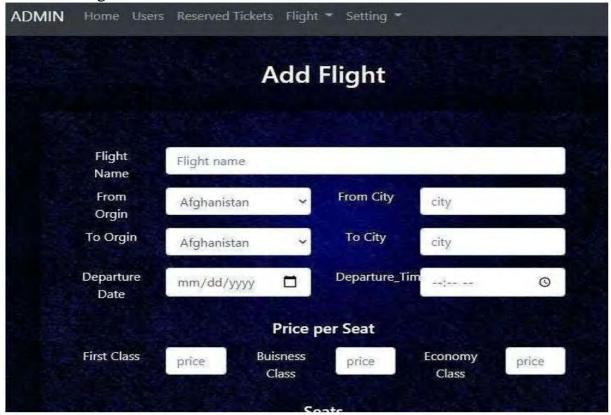
## 5.1 Home page

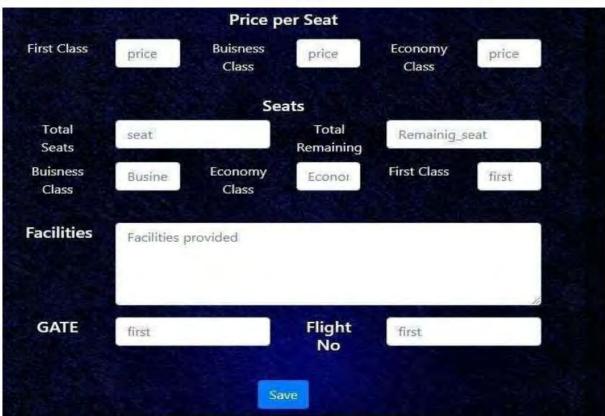


5.2Admin Login



## 5.3 Add Flight





## 5.4 Sign up



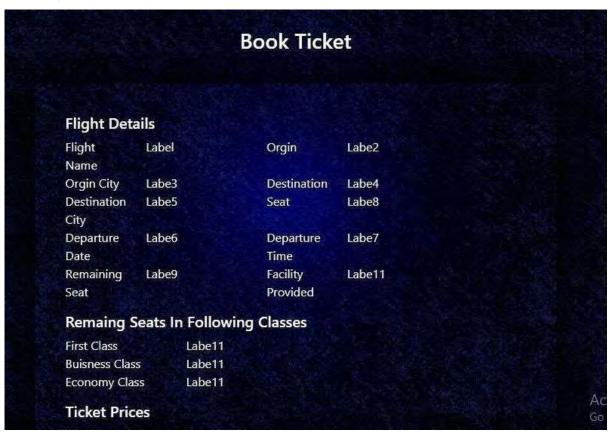
## 5.5User Login



## 5.6 Upcoming Flight

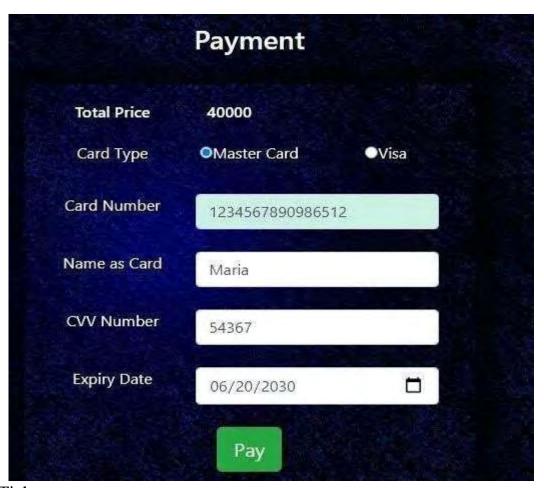


## 5.7Book Flight

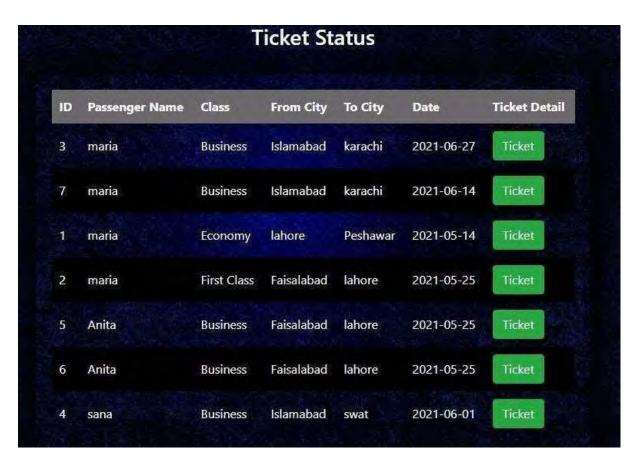




## 5.8 Payment



5.9 Ticket status



## 5.10icket



# Chapter # 6 Testing and Evaluation

## 6.1Introduction

This section describes the testing and evaluation of the developed website. Section 6.2 examines three levels of testing. Software testing means testing the developed course software. It looks at questions such as: Are web pages properly designed, whether all links work,

whether all audio files are present. Section 6.3 covers the diagnostic phase of the system. Reports its implementation and whether it works properly. The system is then reviewed from a software standpoint.

## 6.2Testing

This section includes template testing. It's all about concept testing, software testing, and of course software testing. Conceptual testing raises the question of whether a developed website works properly [4].

## 6.2.1Software testing

Software testing is an important element of software quality assurance and represents the final reuse of details. Software testing involves both authentication and validation. Verification includes checking that the program is up to date, while verifying that the application meets the user's expectations. Static checking techniques include program inspections and analyzes. Involves using dynamic technique (test) system. Accordingly, the verification stages use the same things in technical language as the white box testing technique, while the verification stage uses the black box testing technique. The testing process usually has five steps. First, individual units are tested in unit testing. Module Testing Test module (usually a combination of dependent units). Subsystem testing tests the collection of modules and often does not match the subsystem interface. The system is tested as a whole and finally, the (user) acceptance is tested [4].

## 6.2.2Module testing

Module testing is defined as a software testing type, which examines individual sub-programs, subroutines, classes, or procedures in a program. Instead of testing the entire software program at once, the module recommends testing the small building blocks of the testing program. Module testing is largely based on a white box [4].

Module testing is recommended because:

The program is more likely to identify errors or bugs in smaller parts of the program [4].
Multiple modules can be tested simultaneously and therefore support parallel testing [4].
Testing can be easily arranged [4].

## 6.2.3Unit Testing

Unit testing is a level of software testing where individual units / components of software are tested. The goal is for each unit of software to perform according to design. The smallest testable part of any software in a unit. It usually has one or more inputs and usually the same output [4].

## 6.2.4Subsystem testing

System authentication is tested as a test of system testing. This is done using system hardware and software installed in the operational environment [5].

Subsystem level testing should be:

- When individual developers, sellers or contractors stand alone are responsible for providing the subsystem [5].
- When the full functionality of a subsystem could not be tested at the grassroots level because it was not fully integrated with the necessary communication infrastructure [5].
- When it was previously impossible to contact field devices for the testing phase [5].

## 6.2.5System testing

System testing is a level of testing that validates a complete and fully integrated software product. The purpose of the system test is to evaluate the features of the last-to-last system. In general, software is just one element of a large computer-based system. Finally, the software is interface with other software / hardware systems. System testing is actually a series of different tests aimed solely at a complete computer-based system [5].

#### 6.2.6Acceptance Testing

Acceptance testing is a level of software testing where the system is tested for acceptability. The purpose of this test is to evaluate the system's compliance with business requirements and to assess whether it is acceptable for delivery [4].

#### 6.3Evaluation

Assessment is a systematic commitment to the competence, value and importance of an article, using the standard of governance under a set of criteria. It can help an organization, program, design, project or any other intervention or initiative to consider a goal, a reality concept / suggestion, or an alternative to help make a decision. Or to determine the degree of success or value in relation to the aims and objectives and results of such an action. Evaluation is the

process of making meaningful suggestions and giving meaningful meaning to predictions or predictions of results or actual effects. It looks at the real objectives, and what has been predicted or accomplished and how it has been accomplished [6].

## 6.3.1Purposes

Objectives can be assessed for decision making, decisions, conclusions, outcomes, new knowledge, organizational development and capacity building objectives which improve in response to the needs of the identified stakeholders, decisions about future programming, And / or accountability is ultimately socially aware. Action to reduce social problems and contribute to organizational or social value.

## Chapter # 7 Conclusion and Feature Enhancement

#### 7.1 conclusion

The purpose of this project is to design a website for travelers where users can search their required flights. From the project plan, to learn how to plan the project, to include the professional English writing, time table design. For design process, to learn how to design a web product, to include the UML images graphic, functions analysis. Because I needed to learn some scripting languages and server side languages which was an awesome experience.

For the final product, the functions of login and download. It has been tested on Windows PC which works finely. That means that the final product's cross platform design is successful. Although without the testing in real mobile devices, but if it could work on simulator, it will work fine on real devices too.

I will pay more attention on the beginning website analyzing and coding skill. Because analysis is the most important part in product development. And some problems come from the coding skill; my supervisor gave me a lot of. That is the second point which I will work hard on.

## 7.2Future Enhancements:

In future, I have planned to include more facilities. I shall try to make this website more visible by changing some things and more interestingly by adding some more things.

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