Airline Booking System

Mumtaj Shaikh [1*], Rahul Borate [2]

[1] Department of Cloud Technology, School of Engineering, Ajeenkya DY Patil University, Pune, Maharashtra, India
[2] Professor, School of Engineering, Ajeenkya DY Patil University, Pune, Maharashtra, India
*Corresponding Author Email: mumtajnoor1604@gmail.com

Abstract

A reservation system that is computerized has been used for retrieving and storing useful information that is related to travel. These reservation systems have been classified as the PSS or Passenger Service Systems for the purpose of handling critical functions in an airline. This helps in providing the latest art technology into a robust platform, that is flexible in the styling of an airline. Stable and secure systems in the airline industry depend on several architectures that primarily require usage of systems simultaneously. Airline ticket booking systems are conducted through websites and applications in recent times as the tide of technological advancement has impacted e-tourism. Companies design their websites to host a large number of users/customers while aiming to introduce advanced and engaging features. The paper aims at designing a website, based on HTML, CSS and PHP for an effective, quick and seamless airline ticket booking. Using a secondary methodological approach, the paper reveals that using HTML and CSS for website design can help in making the website more attractive and engaging, while PHP is utilised for the back-end designs. PHP is beneficial for such website design projects as it can give dynamic results. In conclusion, the designing of the website for airline ticket booking can simultaneously provide multiple operable features to the users. This study in the development of an airline reservation system has primarily used the concepts of Machine Learning and Artificial Intelligence. Artificial Intelligence and the technologies that are cognitive helps to ensure the data sense in automating the analytics, and the maintenance of machinery and other internal processes. These AI technologies have been proven useful in the different aspects for the management of airline operations.

Keywords

Airline website, CSS, HTML, online ticket booking, PHP, ticket booking website,

INTRODUCTION

Online airline booking systems are operated by automated systems to ensure accurate account creation, booking and cancellation of tickets, ticket viewing, and various types of administrative operations. All these operations are to be conducted simultaneously across multiple numbers of users. As stated by [1], technological development has led to the use of Big Data, Machine Learning and other AI technologies to be incorporated into the airline systems design for accurate predictions of arrival and departure timing and delays. The customers, as the priority users of such systems, must be provided with proper information regarding their flight status, ticket booking status, query status and so on. The paper aims at designing a website, based on HTML, CSS and PHP for an effective, quick and seamless airline ticket booking. HTML and CSS are implemented to design the front end while PHP is used to design the back end, creating the project using MySQL.

The airline ticket booking website consists of various types of features and options to aid the customers. Such websites are designed by airline companies to fit the preferences of the customers. As mentioned by [2], website designers' worldwide use JavaScript for website designing as it provides them with flexibility and personalisation features. The rise in popularity of e-tourism has increased the demand for designing company-specific websites for ticket booking, ticket cancellations, payments, delay notifications and so on. [3] articulated that CRS-Web-Front ends and online bookings are designed to support independent customer operations. In essence, these websites can be navigated easily by the customers with minimal help, enhancing the capacity of the airlines to host a larger customer base.

Using HTML and CSS tags for these website designing processes helps to make the navigation design easy for users. HTML is used especially by designers to make the entire website framework more attractive and engaging for users, leading to customer acquisition. The design process using HTML/CSS is also compatible with JAvaScript and PHP, which are utilised for the study. Therefore, the paper, stimulating a Design for airline ticket booking website demonstrates the most engaging and effective designing process that can be used by airline companies.

PROBLEM STATEMENT

The main aim of this study is to design an airline booking system using the frontend technologies such as HTML, CSS, and JavaScript. Online Airline Ticket Booking systems help to ensure that customers get adequate information before booking an online ticket for their reservation. Apart from that, this will also help them to compare the prices from different websites thereby ensuring they are getting the best possible price during their flight booking.

LITERATURE REVIEW

Online Airline Reservation Systems History

In the era of global competition, there are several organizations all around the world that are getting advanced in their features of technology. Most common and important innovations are communications and technology of information. There are several industries that have been using

software advancements for maintaining transactions of a business. American Airlines are the first that have established automation of booking systems in the year 1946. Using the system for the tracking of information improves the efficiency of drawing attention to the other airlines. United Airlines have developed the systems of Apollo Reservation, that allows the access of travel agents. The development and research in the reservation systems of airlines have become an aspect of the industry of air carrier companies [4]. There are other commercial airlines available worldwide that have established their systems of online reservations. There are travel agents that have started to push a system that can automate different Airline Systems for their reservations. The deregulation of Airlines that have happened in the year 1978, enhances the importance of airline computation for their reservation system and accessibility. Passengers are capable of gaining adequate knowledge in the markets for their entry into the industry. There is information on individual airlines that have became accessible and thereby enhances the systems of airline reservation. The systems of airline reservation have been developed into the systems of reservation that have been used by these airlines. Systems of airline reservations are one of the changes in the early stages of improving airline efficiency. The systems of airline reservations have evolved eventually into the systems of reservations of a computer. Systems of Airline Reservations is a system that is computerized and helps in retrieving information thereby conducting transactions connected to the travel of air. These systems have been designed originally by the airlines and have been extended at a later stage for travel agencies' usage [5]. Major systems of Airline reservations sell and book tickets for different airlines company. These airlines have divested holdings that are direct for making the systems accessible to the consumers with the help of Internet Gateways.

Figure 1. Airline Reservation System
(Source: [5])

Systems related to the Reservation Information

The process of GDS or Global Distribution Systems has been computerized worldwide for the development of reservation networks as a single access points. They help the airline websites in reserving hotel rooms, car rentals, and other items that are related to travel. The primary system of distribution is the World span and Amadeus by the huge systems of airlines. The software that are used for the design and development of an airline booking system addresses the general purpose of writing a specific task using a programming language such as PHP in designing the database systems. GDS or Global Distribution Systems is a system of reservation that has been used in the reservation of airline seats, rental cars, and other items that are related to travel such as sites of online reservation, and large corporations. There are several subsystems in Information Technology that make information on reservation systems operational. They are nature friendly and often affect the operations of others present in the system. This consists of computer resources, procedures, and people that are involved in the enterprise of modern businesses. In an airline booking system, hardware is considered the physical device that has been used for the processing of different information. This includes different machines such as computers, and tangible objects such as paper sheets on magnetic disks. There are several software that includes different information sets for the processing of information [6]. It also comprises different program types that can enable for the carrying out of different tasks. This type of software can be further classified into two different systems such as application and system software. System software can be concerned with the help of computer systems connected to the software of applications for performing a specific task. This can be written with the help of using a programming language or software in the database. There are raw and unprocessed data that can be specified and cleaning the system of the database in the absence of proper data. Basic and simple factors that depend on the processing and information of an organization are needed to be founded. Elements of data and their relationships should be defined precisely and recorded accurately in the dictionary of data. These data are required for the operating of systems of information that includes users at the end side and specialists of information systems. These end users are a different set of people that can use their system of information for the reservation purpose. These often include system analysts, operators of computers, programmers, and others. There are several other components that have influenced information failure in their systems.
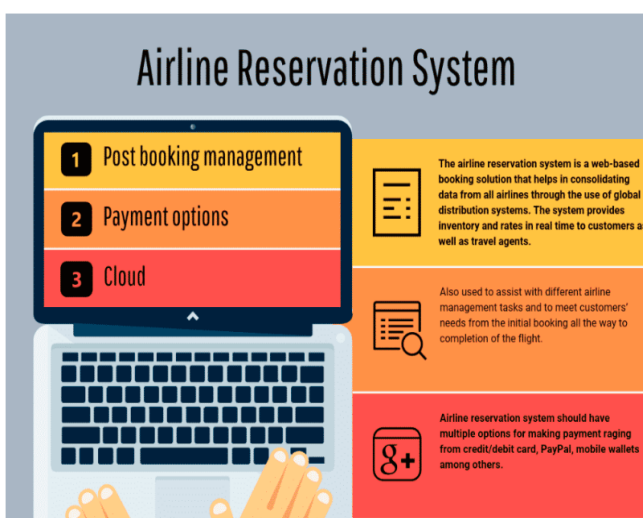
Figure 2. Source code used for designing the online reservation system
(Source: [6])

Different Types of Reservation in the Reservation Systems

A database has been collected in the form of API for the collection of non-redundant datasets. Database can be considered as the collection of data that could be included as the datasets during developing a website. The invention of computers helps in sorting the datasets and their structure undergoing a significant change. There are different types of reservation systems that have been included in the website that has been designed. Guaranteed Reservation system helps to ensure the companies in following a specific schedule of the customers. This guarantees the customers in opting several methods such as advance deposit, guaranteed Reservation of the travel agents, and guaranteed credit card payment. In the TPS or Transaction Processing Systems, transactions on a daily routine have been conducted for the purpose of business. These are the information systems that process datasets in the business transactions such as payroll system, and instructions of production. There are other systems included in the development of an airline website such as Management Information System, Decision Support System, and Executive Support System.
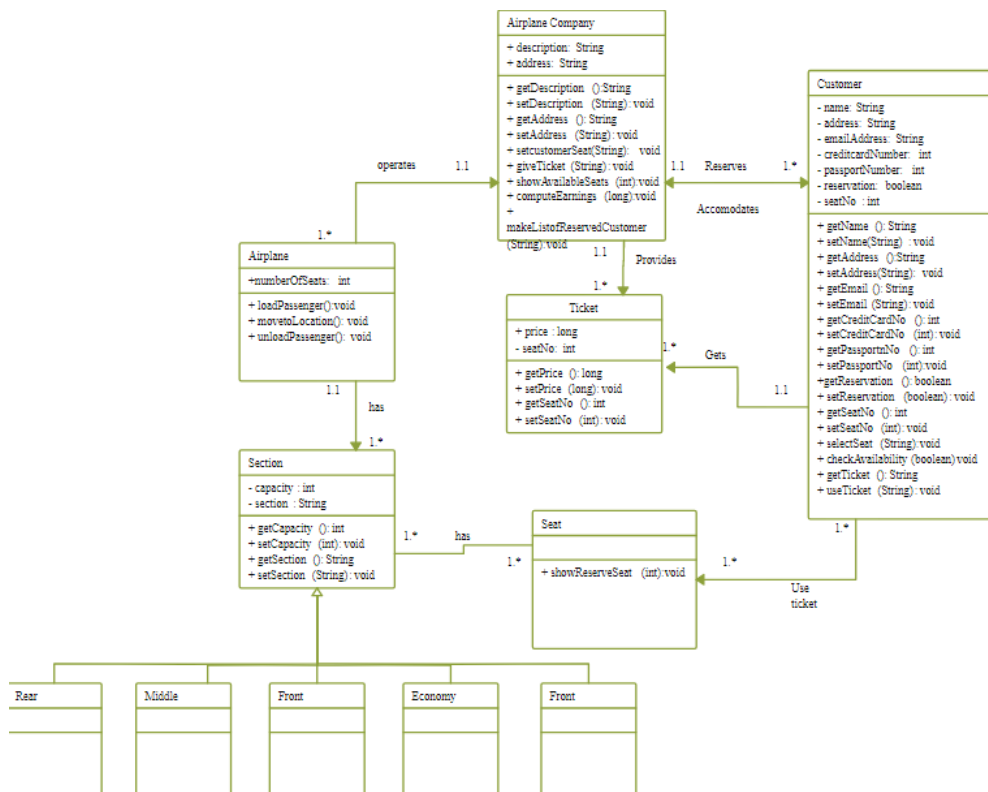

Figure 3. Structure of an Airline Reservation System
(Source: [7])

There are different types of reservations in the online reservation systems that can conveniently help in the reservation process. Guaranteed Reservation Systems ensures that companies hold items for the customers for a specific time period depending on the customers' schedule. Customers should guarantee that their reservation for that specific item is done properly. For guaranteeing the process of reservation, there are customers that should opt for different methods. These methods include guaranteed

payment in the credit card reservation, partial payment or advance deposits, and guaranteed reservations for the travel agents. Non-guaranteed reservation ensures the company is holding their items for the customers for their reservation purposes [7]. Reservation agents ensure that for encouraging their customers in guaranteeing reservations, especially in seasons that are high. The system of information is the combination of software, people, and hardware that processes the data resources for their specific purposes.
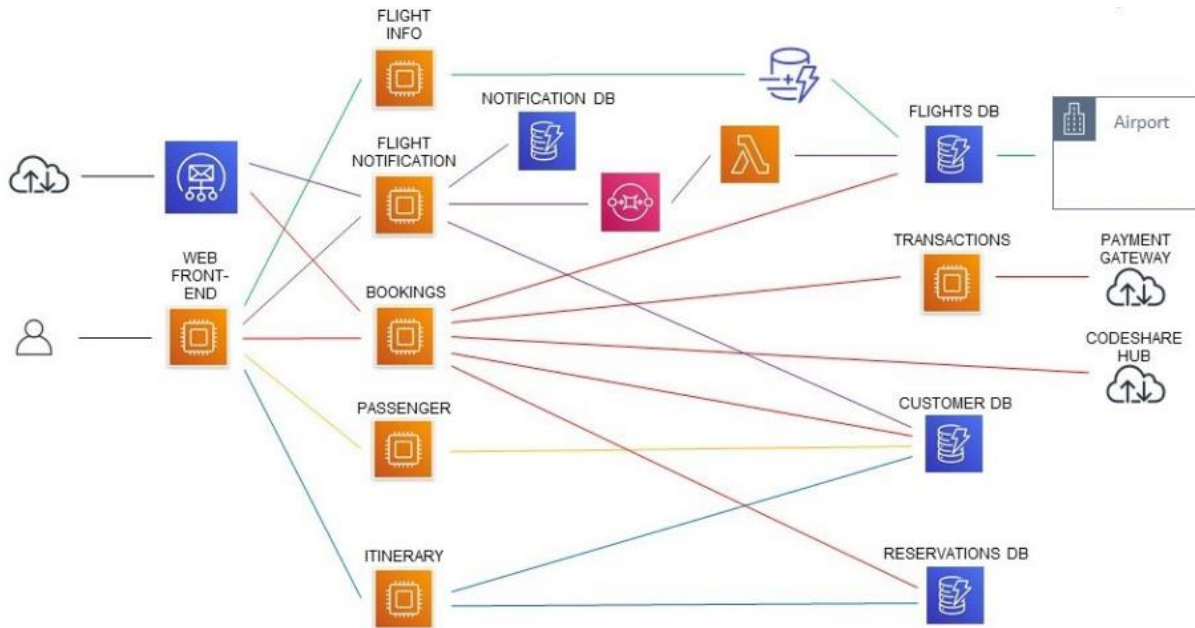

Figure 4. Architecture of an Airline Reservation System
(Source: [7])

There are several online airline reservation systems that have over 28 % of the tourism and travel revenue. For the purpose of several businesses there are several meeting and networking clients that are operating from across the world. There are big and small organizations that ensure corporate travel efficiently. During the time of business, the management and booking could be done back and forth in the software of airline reservation systems. Comparison of different websites helps in travel booking and managing the schedules of flight simple and easier. It further becomes quicker in managing the needs of a business and saving resources and time. The reservation systems of airlines are always available thereby giving unlimited access in the experience of users. The ease of booking the flights has become important and it requires users to stay connected in the reservation systems. The website that has been created compares the inventory of different airlines and provides large travel inventory, integrated payment gateways and several other options. These types are systems of transaction processing that is a computerized systems for performing transactions on a daily basis. TPSs are systems of information that process the data which results in the transactions of a business. These include a system of payroll and instructions for productions. MIS has been performed primarily to the information sources that usually consist of data from systems

of transaction processing. MIS consists of data in the form of summaries for the report management of series [8]. It helps in providing several information for the management of an organization. Information from the MIS helps the managers in directing and monitoring the organizations effectively. Decision System Support has been designed specifically for helping the management to make certain decisions about a possible outcome. The DSS comprises of different techniques and tools that can be used for collecting information thereby analyzing alternatives. These DSS often involve the usage of spreadsheets and different databases for developing "what-if" models.
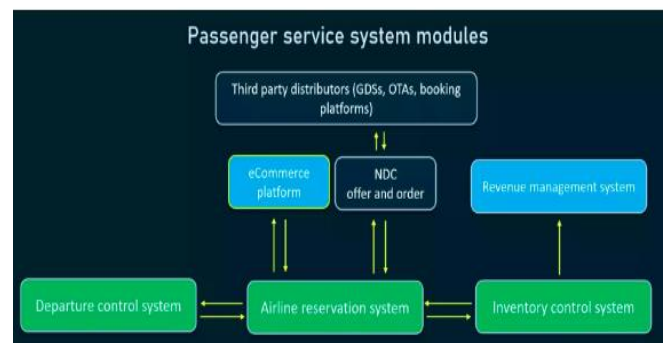

Figure 5. Passenger Service System Module
(Source: [8])

Research gap

This research has focused on the development of a website using frontend technologies such as HTML, CSS, and JavaScript, and also backend technologies such as PHP. There are several research gaps that have been involved in this study. First, a proper and stable internet connection will be required for checking the reservations and performing the online bookings. Apart from that, the transition to online tools is considered to be a good idea for investment in the possible internet services in a particular region [9]. There are several people that have been performing their business in online mode, and thereby web-based bookings often become a significant method for attracting new customers. Online websites can often crash, and produce incorrect results that can decrease the user experience and also create problems for the users. Apart from that, there are several people that do not have access to adequate knowledge of using an online platform for ticket booking. For them, online booking is a hassle job since they prefer to use offline systems of booking.

METHODOLOGY

This study has been carried out from different perspectives that can be used in describing the research for revealing differences and similarities in the airline offers. The data have been collected from the experience of firsthand and their observations, thereby presenting the collected data in developing and converting into different graphs. They have been correlated with the help of an analysis process that includes instrumentation, identification of the sample, and period of data collection.

Software used in developing the website

In this project, the programming languages that have been used for the development of the system are HTML, CSS, Bootstrap, JavaScript, and Python. HTML is the Hypertext Markup Language that could be linked to different websites for building purposes. This allows structuring and creation of paragraphs, sections, and different links for the purpose of using HTML as attributes and tags. CSS or the Cascading Style Sheets have been used primarily for the XML or HTML documents in a stylesheet language of the stylesheet [10]. The main purpose of CSS is to specify different items that could be displayed in the media papers such as screens, paper, and other media platforms. JavaScript is known as the building block of the web that includes CSS and HTML for making interactive and dynamic browsers and applications. Python is considered as an open-source programming language that has several applications such as data research, web development, and AI. The framework that is based on Python can be used for different features such as Rapid Development that have been encouraged by Django.

Tools for Development

The tools that have been used for the development purpose include Visual Studio for coding, PyCharm, Google Chrome, and Windows Powershell. Visual Studio Code has been developed by Microsoft and is commonly known as VS Code. This helps in debugging the support, highlighting the syntax, and also enhances the completion of the Code. On the other hand, PyCharm is a Development Environment that offers several important tools for different programmers. They further provide an effective environment for the development of Python, WebWeb, and Data Science.

Conceptual design

This study has focused on the development of a system that can be used for developing an online airline booking website. For the purpose of development, different technologies have been used such as HTML, CSS, and JavaScript for the Frontend part and Python for the Backend or server-side part. These technologies are interconnected and have been developed throughout the course of this research [11]. First, HTML has been used to design the structure of the website followed by CSS for styling purposes, and finally JavaScript for the logic building and creativity of a website. After that, Python has been used as a backend server language for making the website live and operable.

RESULTS AND DISCUSSION

This study has focused on the design and development of an Airline Booking system that can be used to book Airline tickets of different carriers from multiple cities and also International Destinations. There are several features that have been added to this website in order to make this website more accessible to the users so that everything could be found in one place. The below chart describes the different functionalities that this website has:

Table 1: Features of an Airline Booking System

SALIENT FEATURES OF THE AIRLINE BOOKING SYSTEM	
Online Ticket Booking:	The website that has been developed helps in booking online air tickets across several cities and international destinations.
Solving Customer Query:	This website also helps in solving the queries and concerns of a customer that helps the customers into a hassle free experience.
Raising Grievance:	This website also helps to raise grievance against an airline company in case any customer faces any problematic situations.
Securing Payment Gateways:	Secure payment gateways are provided in this website that helps customers in securely paying for the tickets and other services.

Different types of interactive and graphical systems could be achieved by the systems of ARS. The system of ARS provides easy to use Graphical User Interface as a part of the working desktop in the working of an administrator. It also helps in providing an interactive interface for the graphical user on the WWW for the normal customers. Customers are recommended to register themselves for proceeding in the service of ticket booking. Customers need to input the details that are particular during the process of registration, and also they will be required to register officially with the help of using their password and username. Table 1 depicts the different features that an airline booking system has and the different features that the customers can use during visiting the website such as online ticket booking, online payment, raising complaints, and many more. The requirements of implementation depend entirely on the specifications of the systems and are responsible for the software and hardware requirements of the systems [12]. Client computers need to have a stable connectivity for accessing the web servers with the help of using TCP/IP. It will be installed on the servers of different computers that run either Windows or Linux. There are servers that needed to consist of at least 10GB RAM and 1 TB Storage. In the user environment part, it has appeared that the URL of Airlines Rwenzori has been typed into those browsers. While staying on this page, customers can choose between the registration and booking of tickets and different flights for their journey details and accessing the contact page. This type of registration has been done by the customers in order to book a ticket or flight before their departure. For this, users should register first and access the clicks of the customers on the home page.
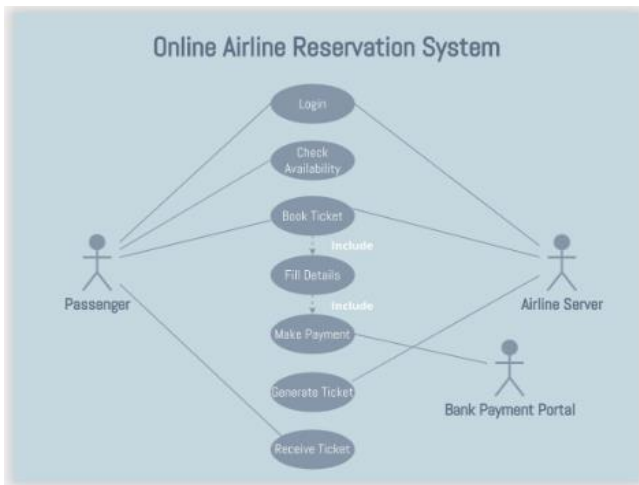

Figure 6. Online Airline Reservation System
(Source: [12])

The passwords of the customers and their IDs have been considered mandatory which signifies that customers should fill their details before their record. The interface have been accessed by clicking on the link that is present on the home page. Customers are required to enter their password and ID for developing their records, thereby providing a piece of information that is detailed during the process of registration,

thereby also providing flight and booking information. This type of interface is a result of the search that is successful for the record of a customer, which contains the information that has been used for the purpose of registration. This interface has been accessed by the use of proper information and customer ID, a password that can be used for finding the final records. The journey interface is accessible with the help of non-registered and registered users for viewing details of the journey.

Table 2. Comparing the website developed with other websites

COMPARING THE WEBSITE WITH OTHER WEBSITES	
There are several other online ticket booking websites such as Vistara, American Airlines, Air France, Emirates that have their own website and provides online ticket booking from one place to another. These websites often lacks the features of raising a complain against their organizations.	The website that has been developed in this study focuses on the complaints of a customer and in case of any complain the customer has the right to raise a complaint against that specific airlines in order to solve their queries.

The page that has been used for the purpose of registration helps in viewing details of the journey to the users. This interface further shows that the Rwenzori Airlines are responsible for taking this to the specific date and time. Table 2 compares the website that has similar functionalities such as online ticket booking and online payment systems. This helps in understanding the different features that other websites lacks and the features that the website that is being developed consists. The form of flight and ticket have been accessed by linking the flights to the top menu system. It can be accessed by different users that want to book their tickets and have already booked their flight tickets [13]. The purpose of booking users should be registered to the journey ID for scheduling the overall booking. Forms that are used in the flight booking could be accessed for the reservations of flights on the interfaces or flight pages. There are several fields that are mandatory in the booking of airline tickets online. A form of ticket booking can be accessed by the reservation links that are available on the page of the flight. There are several fields on the form that are mandatory and users are therefore expected to fill in all those details before making a booking. The interface of the ticket details appears after a successful booking process of the ticket in which users are required to remember the ticket ID that can be used for the booking of a flight. Finally, the ticket cancellation forms could be accessed by clicking on the reservation button on the page of the flight. This will ensure the users to receive a refund in case of flight cancellations.

CONCLUSION

The primary aim of this study is to design an Airline Booking System for the online reservation of tickets across different cities. Online reservation system will help the users to book their ticket from the comfort of their home thereby comparing their prices to different websites for ensuring the best possible price could be available. The website that has been designed will also help the users to raise their request to the concern support teams in case of any problems that the customers have to face. Apart from that, it will also help to know the flight running status and the arrival and departure time.

In today's time, the world has moved to the advanced way of internet technology, even tasks of mundane such as paying the bills, booking vacations, and shopping have become an online business. The industry of airline has taken advantage of the rise of the Internet for developing the reservation systems of the airlines. This study has been performed by using the technologies of Frontend Development such as HTML, CSS, and JavaScript. These technologies have been used for developing an Airline Booking website that has several functions such as online ticket booking from one city to another, solving the queries of any customer, solving complaints, and other problems related to Airlines. Passenger service modules are also being developed in these systems that focus on the different procedures that could be implemented during serving a passenger. These modules are used during the flight operation that tells the crew members the necessary steps that needed to be followed during the flight operation. Apart from that, the payment options have also been looked into this website so that customers can pay online during their flight booking without any hassle and securely.

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