ADVANCING AIR TRAVEL: DESIGNING A DYNAMIC AIRLINE RESERVATION SYSTEM FOR DOMESTIC AIRLINES IN SRI LANKA

S.H.I.D.N. De Silva, M.T.A. Wickramasinghe, D. Gunasekara

Department of Information Technology, Faculty of Computing,
General Sir John Kotelawala Defence University, Sri Lanka
36-it-0010@kdu.ac.lk, thisaranianandi@gmail.com,
dgunasekara@kdu.ac.lk

ABSTRACT - The airline sector is rapidly expanding, with annual revenues in the millions of dollars. Because domestic airlines are the most convenient way to fly in Sri Lanka, local airline websites must be created. However, because there is severe competition in the sector, researchers recognized the need of establishing a web application. Authorizing an administrator to manage all passenger details and flight details, developing a more secure system, automating the e-ticket generating system, improving user satisfaction, lowering development and maintenance costs, and encouraging users with a low level of computer literacy to use the system are all features that will be supported to improve the efficiency of the domestic airline reservation system. As a result, the researchers' primary goal was to improve the program by expanding the aforementioned functionalities. To accomplish this, researchers chose features such as tokenization, bar code generators, report generators, and automatic ticket generators. Following the successful creation, researchers conducted a system test with participating domestic airline consumers. Based on the testing findings, all responders were pleased with the effective construction of the domestic airline reservation system.

Keywords: Reservation of domestic airlines; Flight booking; Web application

1. INTRODUCTION

Since flying is the quickest and most practical form of transportation in Sri Lanka, developers are building a domestic airline reservation system to make it possible for visitors to travel easily and quickly. The airline reservation system project aims to design and develop a domestic airline reservation system that can overcome the challenges of existing systems, such as dissatisfaction with user interfaces, computer literacy, un-secure flight bookings, and inability to generate an e-ticket. The main objectives are to understand the problems and implement a more efficient system, then test it and evaluate the test results. Researchers referred to research papers on Airline Reservation Systems to gain knowledge about existing systems and the technologies used. According to the research [3] conducted to compare the approaches of Natural Language Interfaces for Databases (NLIDB) and examine the advantages and disadvantages of NLIDB. NLIDBs convert natural language sentences into database queries, allowing users to interact with the databases directly. The Intermediate Query Approach makes it easy to map concepts to an intermediate representation. The study [4] found that hedonic value and subjective norms have a positive influence on continuance intentions towards using online reservation systems. Hedonic value has not shown a positive relationship with satisfaction, but satisfaction, usefulness, and subjective norms are important factors. A framework [6] was created to show how web services may be used with the finite automata computational model for online airline reservations. To assess the efficacy and efficiency of optimization, the JFLAP simulation program was used. The construction of a distributed airline reservation system for Nigerian airline firms was the main topic of [1] article. Travel agents and other distribution channels can make reservations for the majority of major airlines using this technology, which manages airline reservations and links with a global distribution system (GDS). The study [5] aims to create an online airline with a more flexible reservation process by examining the flexible traveler behavior. To do this, the study analyzes survey data using multiple regression and Pearson correlation coefficients. The findings from Pearson Correlation Coefficients for quality service are statistically significant, and Multiple Regression Analysis demonstrates the connection between airline service quality qualities, outside variables, and travelers' adaptable behavior. A study [2] titled "A Study of Airlines' Online

Reservation Services on the Internet" Investigated airline online reservation services and the advantages provided to online customers is the key objective. Many individuals use the Internet to research flights and make bookings. Finally, the goal of this study was to evaluate the key benefits and services that airline websites provide to their customers.

2. METHODOLOGY

The goal of this study is to create an airline reservation system by improving maintenance effectiveness, cutting costs, and raising user interactivity. To gather data, the researcher combined qualitative and quantitative approaches. A study was carried out among participants in flight-related WhatsApp and Facebook groups, and case studies centered on the history of airline reservations. With the assistance of the primary users, Passengers, Viewers, and Admin, data was collected through questionnaires and interviews. The examination of the surveys and interviews indicated the need for an online airline reservation system, the benefits and drawbacks of the available options, user difficulties, and considerations to boost system management support. The researchers came to the conclusion that a fresh approach to airline reservations was required.
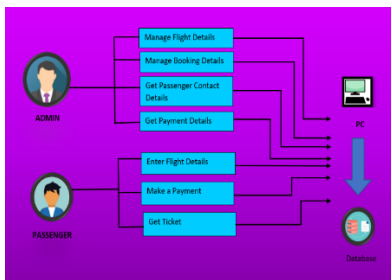
2.1. Proposed System

A single login is included in the system architecture for administrators, operators, and users. Administrators can handle inquiries, add promotions, add bookings, view passenger details, edit & delete details, view payment details, inform of flight cancellations, add/update gallery, and add/remove flight details. They can also add/remove flight details, update flight schedules, and add/remove reservations. Passengers get access to flight information, flight booking, the gallery, promotions, queries, payment options, and E-tickets.

Figure 1. Proposed System Architecture

2.2. Implementation

Main implementation modules were discussed here.

Figure 2, Figure 3. Flight details module is that the admin panel has CRUD operation functionality, allowing the administrator to handle both chartered and scheduled flights without hard coding the details.

Figure 4. Flight booking details module enables administrators to add, amend, remove, and download passenger records. The flight booking records Module increases the effectiveness of maintaining and distributing flight booking details.

Figure 5. Flight ticket module an electronic ticket receipt will be created promptly following a successful payment.
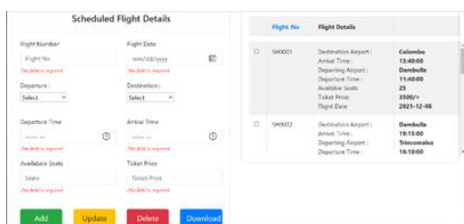

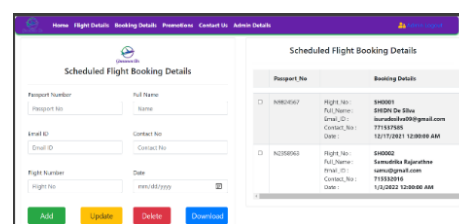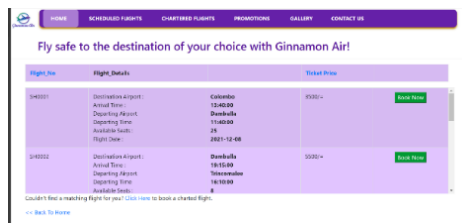**Figure 2.** Flight Details Module (1)

Figure 3. Flight Details Module (2)

Figure 4. Flight Booking Details Module

Figure 5. Flight Ticket Module

2.3. Technical Features Extraction

To get around the issues found, the system's creators combined a number of features. Data security, token APIs, report generators, Aspose document APIs, and the BarCode NuGet package library for C#.NET are some of these features. Report generators are employed to boost productivity, and the C#.NET BarCode NuGet package library offers better barcode generator functionality. Additionally, because all necessary capabilities are implemented into the system by the developers, there is no need to pay membership fees to other parties for their services, which lowers the overall cost of development.

3. RESULTS AND DISCUSSION

The researcher used acceptance testing (beta test) to evaluate the system. Two parties were airline administrators and flight seekers. The percentage of preferences for the system was high (72.7%), but some suggested some functionalities to be modified. The efficiency of the system was evaluated using 57 flight seekers. Most of the respondents (70.6%) agreed with the system, but some users found some problems and suggested areas to improve.

4. CONCLUSION

This automated domestic airline reservation system provides users and managers with a successful, effective, and efficient method. To solve the real problem encountered by the user with the existing system, the researcher used a web-based online flight reservation system. A consolidated database system minimizes numerous costs, time waste, paperwork, and makes record maintenance easier. The user can book a flight from anywhere in a short period of time, and it eliminates the need for a lot of paperwork such as ticket printing and document printing. The study advises adding the feature of accurate seat reservation, automatic flight cancellation process, agent communication process through chatbots, and process review system to improve the system's coherence.

REFERENCES

1. Ele, B. I., Agana, M. A., & Bukie, P. T. (2018). A distributed airline reservation system for Nigerian airline companies. Compusoft, 7(6), 2766–2772. https://doi.org/10.6084/ijact.v7i6.721
2. Law, R., & Leung, R. (2000). A study of airlines' online reservation services on the internet. Journal of Travel Research, 39(2), 202–211. https://doi.org/10.1177/004728750003900210
3. Mony, M., M. Rao, J., & M. Potey, M. (2014). An Overview of NLIDB Approaches and Implementation for Airline Reservation System. International Journal of Computer Applications, 107(5), 36–41. https://doi.org/10.5120/18750-0006
4. Mouakket, S. (2013). Investigating the factors influencing users' continuance intentions towards online reservation. 2013 International Conference on Computer, Information and Telecommunication Systems, CITS 2013. https://doi.org/10.1109/CITS.2013.6705709
5. Mushtaq, A., Sulaiman, S., & Loviscach, J. (2010). Flexibility issues: A reason for not using online reservation systems? Proceedings 2010 International Symposium on Information Technology – System Development and Application and Knowledge Society, ITSim'10, 3(July), 1076–1081. https://doi.org/10.1109/ITSIM.2010.5561615