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Usability of Booking a Flight Ticket Using Airline Applications on Smartphones

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ABSTRACT

In recent years, using online has emerged as the predominant method to book an airline ticket. Following the COVID-19 pandemic, there has been a surge in the popularity of small-group travel in Japan, leading to an increasing number of smartphone users booking tickets. Consequently, the user-friendliness of airline applications profoundly impacts users' willingness to make purchases. This study aimed to visualize challenges and areas for improvement in airline ticket reservations focused on Japan Airlines and Thai Airways. Therefore, experimental investigations were conducted using these smartphone applications of two airlines. The experiments involved five participants who were tasked with navigating through the entire reservation process using the applications of the respective airlines. Subsequently, we gathered participants' impressions regarding their experience of booking a flight ticket with the retrospective protocol analysis as a qualitative method. The flow of the reservation process was primarily categorized into the following five segments: location selection, date selection, flight selection, and personal information input. The results from the experiment underscore the essential attributes of a user-friendly application for booking a flight ticket. These attributes include optimizing the presentation of information, effectively categorizing data, strategically placing buttons to minimize errors, and ensuring a consistent navigational experience. This study's outcomes highlight that enhancing the usability of applications requires deliberate attention to these factors. In conclusion, this study addresses the pressing concern of designing intuitive and user-friendly airline applications for booking a flight ticket. This study also effectively categorizes the reservation process into key stages by focusing on the applications of Japan Airlines and Thai Airways. This comprehensive analysis accentuates the importance of design considerations in promoting user satisfaction, enabling airlines to cater to the growing trend of online reservations and offer users a seamless experience for booking a flight ticket.

Keywords: Airlines app, Flight ticket booking, Usability

INTRODUCTION

The COVID-19 pandemic has significantly altered travel patterns in Japan. There has been a decline in the demand for group tours, previously widespread, with a corresponding increase in the number of individuals opting for travel to minimize contact with large crowds (Sonoda and Aoyama, 2020). In addition, a 2021 survey on the use of airlines showed that about 50% of individual users who book air tickets responded

that they use the airline's official website. As a result, online booking is becoming the mainstream for purchasing air tickets (PR TIMES, 2022). When booking accommodation or air tickets online, the reservation system's usability significantly impacts purchase intent (Ani et al., 2019). Therefore, satisfaction with the air ticket reservation site affects the choice of the airline (Yazid and Jantan, 2017). Thus, reservation systems, including websites and applications, play a crucial role in air ticket booking. As a result, many airlines are making large-scale website improvements and introducing new mobile applications as a marketing strategy to make it easier for users to book and manage their air tickets. In previous research, related research on accessibility and usability evaluation of airline websites, an assessment of the websites of airlines based in India was conducted. As a result, none of the websites of Indian airlines met the standard accessibility guidelines, and there were challenges such as problems with text in different languages, broken links, and screen transitions that are difficult to understand for people with disabilities (Agrawal et al., 2019). Considering this context, the authors conducted a study using Google Lighthouse, a web accessibility assessment tool, to evaluate the websites of domestic airlines (Otsuka and Kang, 2022). As a result, all of the domestic airlines used in the experiment met the criteria set by Google Lighthouse in all items. Still, there were some challenges, such as insufficient color contrast and readability on the website and slow loading times, depending on the airline. Nevertheless, it was challenging to pinpoint precisely at which stage users experienced discomfort.

In addition, according to a study on the personal use of air ticket reservation apps, the demand for booking using air ticket apps is increasing yearly, so airlines need to provide users with more interactive and attractive features (Suki and Suki, 2017). Therefore, the authors developed prototypes of applications for three Japanese airlines and conducted an experiment involving air ticket bookings through these prototypes (Otsuka and Kang, 2023). The applications used were created in black and white to avoid the influence of the brand image, and information such as the brand logo was hidden. As a result, it was found that it is important to use the Gestalt laws, categorize information, and display the operations that users predict on the next screen to make applications that users feel more user-friendly. However, it's important to note that this experiment was conducted with Japanese participants who were regular air travelers. Therefore, it must provide insights into users booking flights for the first time.

Therefore, in this study, we experimented with the reservation system of Japanese and Thai airline apps as a subjective evaluation for people who have yet to experience flying or booking. This study aims to visualize the challenges and improvements in the design and usability of the reservation system based on the experimental results.

METHOD

Experiment Procedure

This experiment involved five university students in Thailand. Participants were instructed to utilize the Japan Airlines and Thai Airways applications to book round-trip flights from Bangkok to Tokyo between June 23 and July 3.

The experiment concluded once participants had successfully navigated the entire process, including selecting a destination, date, and flight, providing personal information, and choosing seats. In this experiment, since the participants had little prior experience in flying and making flight reservations, we decided to use existing applications, believing that this would minimize the influence of noise from brand image perceptions.

Analysis Method

This study employed Retrospective think-aloud analysis. This analysis examines thought processes by prompting participants to describe their thoughts and impressions while performing tasks, experiments, or surveys and recording the data. In this experiment, we utilized retrospective protocol analysis to encourage participants to reflect on their thoughts and reasons at specific moments while watching segmented 15-second portions of recorded experiment videos. This approach was employed not only to analyze the sequential flow leading to reservations but also to mitigate the potential distraction caused by participants using different languages.

RESULTS AND DISCUSSION

The results of the experiment conducted with airline applications revealed that the operational flow leading to completion can be primarily categorized into five phases: location selection, date selection, flight selection, inputting personal information, and seat selection. Table 1 represents a compilation of comments from Examinee A (Table 1). The findings and discussion are presented below.

Location Selection

The task of selecting departure and destination locations was completed by all participants within a 30-second time frame. However, the Retrospective think-aloud analysis revealed variations in participant responses concerning the differences between the two airlines' interfaces.

Thai Airways' approach involves displaying frequently used locations as favorites when users select a location based on the region where the application is being used. In contrast, Japan Airlines sets the location where the application is being used as the departure point, with destinations presented alphabetically (Figure 1). Participants preferred to display their favorite locations as candidates, similar to Thai Airways' approach. Additionally, participants suggested that Japan Airlines could optimize the process by pre-setting the departure point, thus reducing unnecessary user actions.

These findings suggest valuable insights for user interface design. Users can complete their tasks by modifying the interface to align with Japan Airlines' approach of pre-setting the departure location and adopting Thai Airways' method of displaying destination candidates in the order of user favorites. Such adjustments could reduce the time required for users to complete operations within the application.

Table 1. Retrospective think-aloud analysis for examinee A.

Examinee A (Thai Airways)		
TIME	TASK	COMMENT
0:15	Selection of departure and arrival locations	I always use a keyboard, and I'm used to it, so I used it.
0:30	Selection of arrival location	
0:45	Date selection	I initially had a different date set, but I quickly understood how to operate it. I usually scroll all the way down first to check how to operate.
1:00	Class selection for seats + Waiting time	I checked which seat class was the cheapest.
1:15	Display of prices for previous and following days	I think the screen showing the lowest prices for previous and following days is unnecessary. I wanted to select the flight time, so the extra screen confused me.
1:30	Display of prices for previous and following days	
1:45	Flight selection	I could select the flight time quickly, but I didn't understand the differences in options like Super Saver and Premium Economy Class.
2:00	Flight selection + Name input	I thought that things other than "Ms." and "Mr." before the name are not necessary, as I don't usually use them.
2:15	Name input	
2:30	Email address input	It was easy.
2:45	Confirmation of email address input and phone number input	It was easy. I had no problem entering the country code for the phone number.
3:00	Phone number input	
3:15	Emergency information input	It was easy.
3:30	Emergency information input + Waiting time	
3:45	Waiting time + Selection of carry-on baggage	I thought I had already selected the amount of baggage, but it was displayed here again.
4:00	Selection of carry-on baggage + Seat selection	
4:15	Seat selection	I thought it was a very crowded flight with all the front seats filled. If there are areas where you can't select a seat class, that should also be displayed.
4:30	Seat selection	

Examinee A (Japan Airlines)		
TIME	TASK	COMMENT
0:15	Selection of departure and arrival locations	The departure location was initially set to Bangkok. Narita was quickly selectable.
0:30	Date selection + Waiting time	It was not easy to make a mistake because the screen for selecting the departure date was there from the beginning.
0:45	Time selection	When I tapped the flight time, a different screen appeared. I had to press the small plus button at the bottom to proceed.
1:00	Name selection	It was easy.
1:15	Name selection + Setting date of birth	Entering the date of birth was easy for me since I'm used to it. I thought it might be difficult for someone not familiar with this calendar.
1:30	Setting date of birth + Selection of nationality	I thought the nationality was in alphabetical order, so I scrolled all the way down, but Japan was at the top because it was a Japanese airline.
1:45	Selection of nationality	
2:00	Setting phone number	I entered the country code for the phone number first, but then I noticed there was a separate blank to select the country code.
2:15	Reading instructions for email setup, and other confirmations	Right above the email address input, there was a checkbox for promotional information, so I thought only those who want emails should input.
2:30	Other confirmations + Error check	After pressing the confirmation button, an error occurred, so I had to go back to that point.
2:45	Error correction (Input of country code)	Even though it's by country, I had learned from a previous instance that Japan is displayed at the top.
3:00	Error correction (Input of email address)	
3:15	Error correction (Input of email address)	
3:30	Waiting time + Seat selection	
3:45	Seat selection	Some empty seats became available, but I want them to be displayed from the front because I want to see all the seats.
4:00	Seat selection	

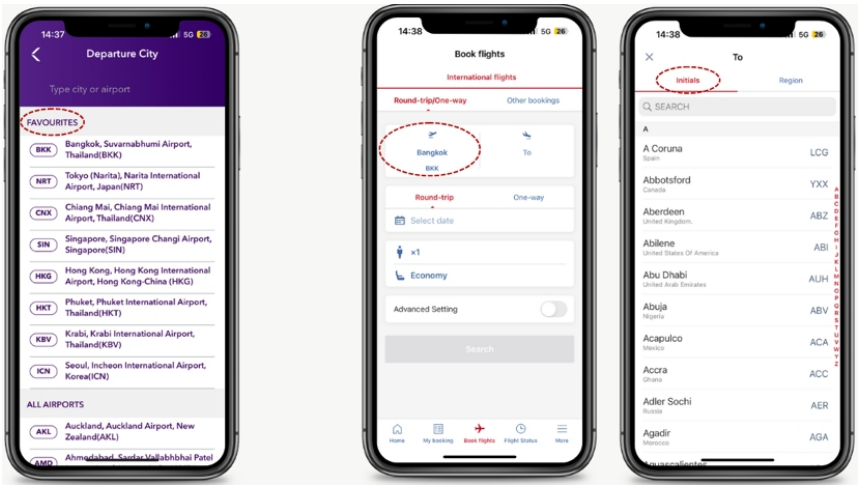

Figure 1: Location selection screens for Thai Airways and Japan Airlines.

Date Selection

In the context of date selection, it was observed that many participants took less time when using Japan Airlines' interface. The reason for this advantage became apparent: Thai Airways' date selection approach displayed the chosen date on top of the calendar upon tapping a date. Some participants who mistakenly perceived this as a button ended up wiping it multiple times (Figure 2).

This observation underscores the importance of minimizing user errors during date selection. To achieve this, the placement of potentially misleading buttons should be avoided, as seen in Thai Airways' interface. Instead, a more user-friendly approach, similar to Japan Airlines', where information or correction options are displayed near the selected date, can help alleviate user frustration. This design consideration can enhance the overall usability of the application and reduce user errors during date selection.

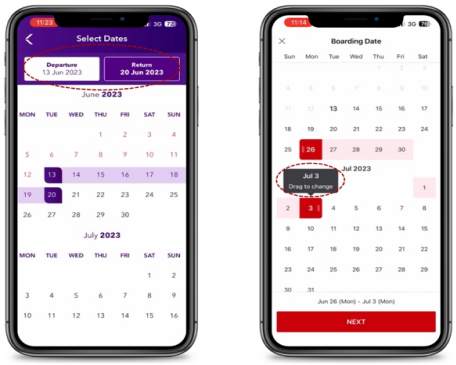

Figure 2: Date selection screens for Thai Airways and Japan Airlines.

Flight Selection

In the context of flight selection, several participants provided negative feedback. Thai Airways' approach initially displays the minimum fares for the preceding and following dates when selecting a flight before moving to the page for choosing the specific flight. Participants found this design problematic, especially when they had already decided on their travel date. Some inadvertently selected the wrong date due to the unclear distinction between flights at the border of their desired date. On the other hand, Japan Airlines allows passengers to choose their class of service after selecting their flight. Participants expressed dissatisfaction with the transition from vertical to horizontal scrolling when selecting this class (Figure 3).

These observations highlight the importance of information categorization and maintaining consistency in the user interface, particularly in sections where a significant amount of information, such as flight details and class selection, is presented simultaneously. To alleviate user burden and enhance usability, user interfaces should ensure a seamless transition between different sections and provide clear distinctions between relevant information categories.

Personal Information Input

The input of personal information emerged as the most time-consuming aspect of this experiment. However, given the frequent personal information input in daily life, only some participants expressed dissatisfaction with the time it took.

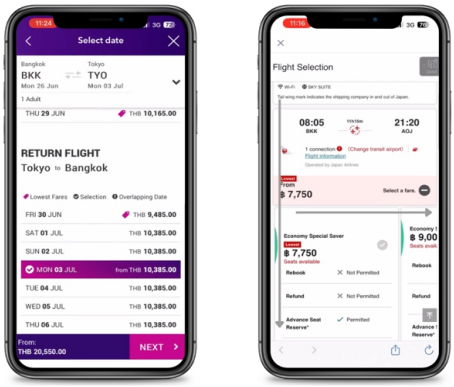

Figure 3: Flight selection screens for Thai Airways and Japan Airlines.

Nevertheless, notable observations arose. On Thai Airways' phone number input screen, some participants needed clarification due to the absence of instructions for entering the country code. Additionally, Japan Airlines, a Japanese airline, had a specification where passengers must input their family name first.

From these findings, it is evident that user assistance in scenarios with less common input requirements, such as the order of entering information like country codes or names during flight ticket reservations, is essential. Employing user-friendly options is crucial to ensure users can easily comprehend and navigate these less frequently encountered input situations.

Seat Selection

Thai Airways' seat selection screen allows passengers to view all seats from the front, while Japan Airlines only displays vacant seats. Participants expressed varying opinions on these approaches. When seat availability differs by class, some participants needed clarification when all seats were shown, as they mistakenly believed the front of the aircraft was fully occupied, as is the case with Thai Airways. Conversely, when only available seats were shown, as with Japan Airlines, participants found it challenging to assess the occupancy level and compare it with other flights (Figure 4).

These observations highlight the importance of designing seat selection interfaces that facilitate a clear understanding of seat availability, thereby reducing user stress. Color coding can enhance the user experience by differentiating available and occupied seats. By presenting seat availability as user-friendly, passengers can make more informed decisions when selecting their hearts and have a better overall experience during the booking process.

CONCLUSION

This study investigated the reservation systems of Japanese and Thai airline applications, targeting users with limited flight booking experience.

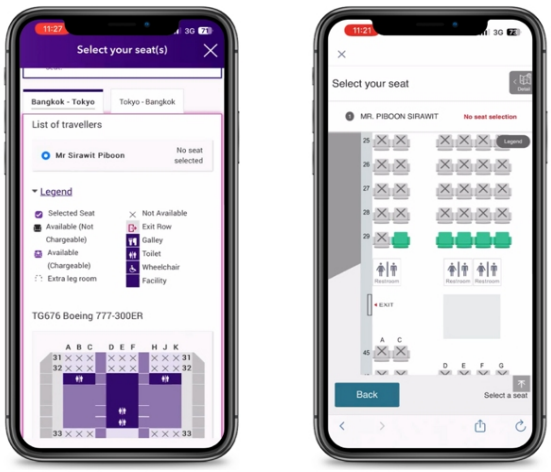

Figure 4: Seat selection screens for Thai Airways and Japan Airlines.

We aimed to identify design challenges and potential improvements based on empirical findings.

Key findings include:

- Location selection preferences favored displaying frequently used locations as favorites, similar to Thai Airways' approach.
- Date selection highlighted the need for clear instructions and user-friendly design to minimize errors.
- Flight selection indicated the importance of information categorization and interface consistency.
- Personal information input, though time-consuming, raised minimal dissatisfaction, but user assistance for less common input scenarios was recommended.
- Seat selection interfaces benefit from clear seat availability presentation, including features like color coding.

In conclusion, this study provides insights into improving airline reservation system design, particularly for novice users. User-friendly design and clear instructions can enhance the booking experience, benefiting a more comprehensive range of travelers.

REFERENCES

Emiri Otsuka and Namgyu Kang: Study on Measuring the Web Performance of Japanese Airlines Using Google Lighthouse, COWEKO2022 International Conference, pp. 111–116, 2022.

Emiri Otsuka, Namgyu Kang: Usability of Reservation Systems of Japanese Airlines, HCII2023.

Gaurav Agrawal, Devendra Kumar, Mayank Singh, Diksha Dani: Evaluating Accessibility and Usability of Airline Websites, Advances in Computing and Data Sciences, pp. 392–402, 2019.

Mariam Azwa Yazid, Azrul Hazri Jantan: User Experience Design (UXD) of Mobile Application - An Implementation of a Case Study -, Journal of Telecommunication, Electronic and Computer Engineering, pp. 197–200, 2017.
Norazah Mohd Suki, Norbayah Mohd Suki: Flight ticket booking app on mobile devices -Examining the determinants of individual intention to use-, Journal of Air Transport Management, 62, pp. 146–154, 2017.
Nur Ani, Handrie Noprisson, Nazlena Mohamad Ali: Measuring usability and purchase intention for online travel booking – A case study in -, International Review of Applied Sciences and Engineering, 10(2), pp. 165–171, 2019.
PR TIMES: We asked 1, 200 people! How do I purchase a ticket? https://prtimes.jp/main/html/rd/p/000000636.000044800.html (Viewed on 3 September 2022).
Sekiya Sonoda and Yumiko Aoyama: New life and society suggested by the Corona disaster, Keishin Journal of Life and Health, 4(2), pp. 1–13, 2020.