Impact of Implementing Online Bus Seat Reservation on Provincial Bus Trips in the Philippines

Patricia Nicole Ramos
School of Industrial Engineering & Engineering Management, Mapua University, Philippines

Joshua Ocampo
School of Industrial Engineering and Engineering Management, Mapua University, Philippines

Phil Matthew T. Fornal
School of Industrial Engineering and Engineering Management, Mapua University, Philippines

Michael N. Young
School of Industrial Engineering and Engineering Management, Mapua University, Philippines
mnyoung@mapua.edu.ph

ABSTRACT

Online Bus Seat Reservation is a system where bus users can reserve their seats using a web-based application. It is made for the ease of access for both the bus trip administrators and the bus users. It maintains all customer details, their bus information which includes their bus route, bus seat, bus trip arrival time, bus trip destination time, and bus fare. To gather data, the researchers use Google Forms since it is not possible for the researchers to gather data physically since there is a pandemic which hinders the researchers from going outside. The application achieved is capable of checking the reservations made by a certain person which includes their personal information and bus seat reservation information. Despite the existence of the application, there is still a need for usage of Email for sending the confirmation email and also for the ticket which can be presented to the person-in-charge of the bus trip on the day of the trip. This study is conducted to see if there is an impact on the bus users if instead of going to the bus companies themselves to reserve a bus seat, they can reserve the bus seats online and also to determine what options do passengers need when it comes to an improved bus reservation system.

CCS CONCEPTS

• **Information systems** → Data management systems; Database management system engines; Database query processing; Query optimization.

KEYWORDS

Online Bus Seat Reservation, Google Forms

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1 INTRODUCTION

Public transport plays an important factor if it comes to the daily lives of many people. The precious advances in technology and services could be bound to the growth of the efficiency and effectiveness of a system. The prevalent growth of transportation software around the globe is evident when it comes to the evolution of information gathering and processing applications used in the transportation industry. More and more people are preferring to book their tickets online in the comfort of their home since it is more time and energy-efficient that way. Electronic tickets serve as evidence that the ticket holders are verified and permitted to board the said transportation mode. The design of the software will be beneficial especially to the administration side because they can consolidate the volume of information that they are handling. The software can be used by a third-party company where users can choose from a variety of bus companies which includes also the variety of bus routes, times, and fares which will be efficient for users looking for their desired transportation mode.

Mezhani in one of his studies suggested that that the integration of pricing construction should be implemented and that the mode of payment should be fully dependent on fully automatic fare payment. [1]

2 LITERATURE REVIEW

2.1 Bus Seat Reservation System on Provincial Bus Trips

The usual views at bus terminals in the Philippines' capital Manila; long lines at ticket stands, big luggage and containers, people waiting for their rides, and unfulfilled "chance passengers' on standby. The current bus seat reservation on provincial buses is mostly done on-site which means more hassle for the customers' part.

2.2 Online Transport Booking System

An online transport booking system is essentially a database information system that is used in a multi-user setting over the client or server networks.[2] The main objective of this structure is for tidying up which has system management. From another perspective, he explained out that the methodology and technology being applied in a new transportation system can be applied to other areas

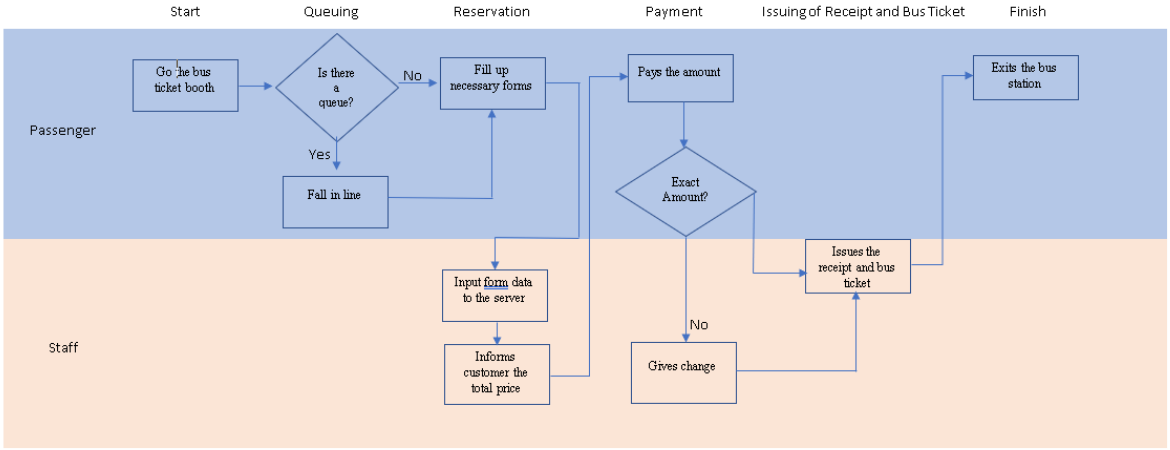

Figure 1: Current Bus Seat Reservation Process

of movements. The online ticket booking system is one significant factor of Chinese government ICT application to improve people's well-being by giving convenient access to a ticket which is usually the concern when there is a holiday in China. [3]

2.3 Impact of Efficient Transportation Booking System on the economy

Fresh technologies play a progressively significant role concerning to travel buying. The increase of Information and Communication (ICT) involves drastic variations in multiple areas of the market, including the expansion of tourism [4]The huge use of the Internet creates a unique opportunity for the evolution of the tourism segment, transforming the industry, and moving customer behavior in many parts [5]

3 METHODS

3.1 Data Collection

Since there is a pandemic, the researchers heavily relied on online sites and applications for the data gathering. For the study, the researchers surveyed a survey on the question "What is the impact of implementing online bus seat reservation on a provincial bus trip in the Philippines?" The population of the study is comprised of 100 respondents who use the bus as their mode of transportation. This population is chosen because they are the ones exposed to the disadvantages and advantages of the current bus reservation system. The questionnaire will be given to the respondents where the data retrieved will be used for data analysis. The researchers asked the following questions:

1. How often do you ride a provincial bus?

A. Agreement Measurement

In this section, the process wastes in the current system of bus seat reservation will be identified through measuring the agreements with the following statements.

1-Strongly Disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly Agree.

1. I walk more distances and travel back and forth to the concerned ticket booths to reserve a bus seat.

2. Filling up the same physical form multiple times takes a lot of time.

3. The concerned ticket booths use too much paper for the documents such as seat reservation forms.

4. There are occasions where the personnel doesn't know the bus trip details.

5. The current system of reserving bus seats are prone to identity theft and documentation error.

6. Having an e-ticket is convenient to avoid losing your bus ticket.

B. Frequency Measurement

1. How often do you go to the bus ticket booth to reserve a bus seat?

2. How often do you experience difficulty concerning the bus seat reservation system?

3. How long does it take to reserve a bus seat (including the queuing time)?

C. Application Features

In this section, the features that the passengers need and want can be identified and will be used for future improvements on the online bus seat reservation system applications.

1. A Calendar feature where you can see the days where particular bus trips are scheduled.

2. Can be used on different devices (e.g. mobile devices, laptops, etc.)

3. Get real-time updates whenever a bus trip's capacity is fulfilled.

4. Search engine where you can see the different bus companies and their bus trip routes and fares.

5. Can make a reservation off-site.

6. Has an option to cancel a bus trip given it has an understandable reason.

7. Generates an e-ticket where passengers can present it to the concerned personnel for boarding.

Table 1: Provincial Bus Users

	Respondents		
	Frequency		
	1-2 times per month	3-4 times per month	More than 5 times per month
How often do you ride a provincial bus?	54	21	25

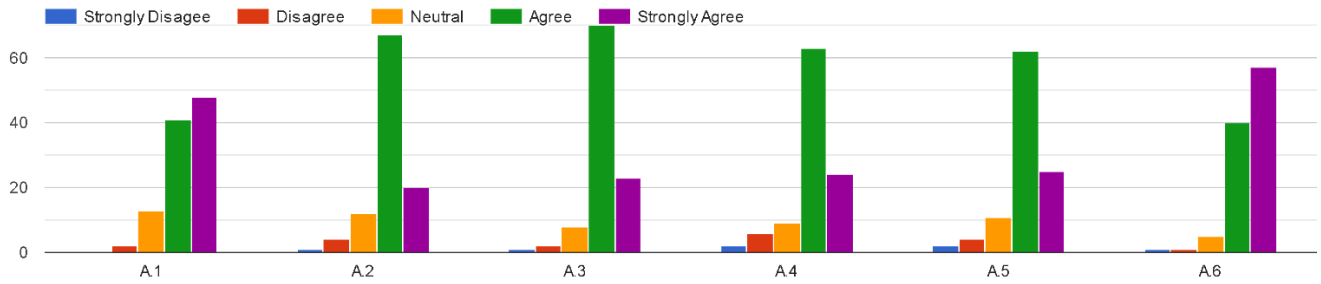

Figure 2: Agreement Measurement

3.2 Data Analysis

The questionnaire will be measured on a five-point Likert scale of Strongly Agree- 5, Agree- 4, Neutral- 3, Disagree-2, and Strongly Disagree-1. Data will be analyzed using the IBM SPSS Program. IBM SPSS is a program that is used by researchers to analyze data using statistical analysis. The program also offers a vast library of machine learning algorithms, text analysis, and open-source extensibility.

3.3 Data Interpretation

All of the mean responses below 3 will be regarded as not acceptable while all of the mean responses of 3 and beyond will be accepted as there is enough data to prove that implementing an online bus seat reservation on provincial buses in the Philippines will have an impact to the bus passengers.

3.4 Software

A prototype program was made using Microsoft Access. Given its accessibility, we used this program to make various queries, forms, and tables on which we can input our sample data which are retrieved online. Sample pictures are provided and can be viewed in the appendix section.

3.5 Current Bus Seat Reservation System

The current bus seat reservation system requires improvement for it has problems when it comes to its efficiency. 1 shows the customers' experience map.

4 RESULTS

In 1, the researchers will show the results of the data gathering based on the online questionnaires and the discussion about the data which have been analyzed, evaluated, and interpreted to satisfy the objectives of this study. The presentation of results includes t the frequency and percentage of the respondents' answers to each question.

2 shows the process wastes in the current system of bus seat reservation where the researchers have identified through measuring the agreements with the following statements: 1- Strongly Disagree, 2- Disagree, 3- Neutral, 4- Agree, and 5- Strongly Agree.

In 2, the researchers identified how often respondents experience bus seat reservation incidents on the frequency Measurement.

3 shows the features that the passengers need and want can be identified and will be used for future improvements on the application. Answers will be measured with the following statements: 1-Not Important, 2-Slightly Important, 3-Moderately Important, 4-Important, and 5-Very Important.

3 shows the respondents' experience on how long does it take to reserve a bus seat (including the queuing time).

4.1 Proposed Bus Seat Reservation System

The proposed bus seat reservation system is shown in Figure 4, wherein the prototype MS Access program will be improved and will take consideration of the survey results:

Table 2: Frequency Measurement

	Respondents					
	Frequency			Percentage		
B. Frequency Measurement	**1-2 times per month**	**3-4 times per month**	**More than 5 times per month**	**1-2 times per month**	**3-4 times per month**	**More than 5 times per month**
Question B.1	31	47	22	31%	47%	22%
Question B.2	57	23	20	57%	23%	20%
Question B.3	58	22.1	19.2	58%	22.1%	19.2%

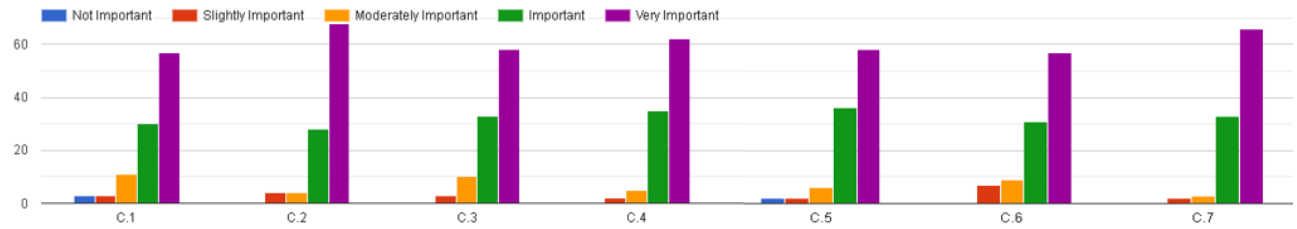

Figure 3: Application Features

Table 3: Time Measurement

	Respondents			
	Frequency			
	Less than 5 mins per month	**5-10 mins per month**	**10-30 mins per month**	**More than 30 mins per month**
How long does it take to reserve a bus seat (including the queuing time)?	10	17	22	51

1. Passenger Form – This form will ask the passenger's name, address, gender, email address, phone number, current station, destination station, schedule, and seat number.
2. Calendar Feature – This will show the dates of booked trips.
3. Search Engine – This will let the passengers search for their desired bus route.

5 DISCUSSION

Using the descriptive analysis feature in the SPSS program, we have analyzed that when it comes to do the respondents ride a provincial bus how often, there is a mean of 1.71 and a standard deviation of 0.844. The results for the Agreement Measurement section, 48% said that they strongly agree on walking more distances and traveling back and forth to the concerned ticket booths to reserve a bus seat, 20% said that they strongly agree on filling up the same physical form multiple times takes a lot of time, 23% said that they strongly agree that the concerned ticket booths use too much paper for the documents such as seat reservation forms, 24% said that they strongly agree that there are occasions where the personnel doesn't know the bus trip details, 26% said that they strongly agree that the current system of reserving bus seats are prone to identity theft and documentation error and lastly, 56% said that they strongly agree that having an e-ticket is convenient to avoid losing one's bus ticket.

6 CONCLUSION

Having an efficient and effective reservation system is crucial especially when it comes to the transportation system. By having an online reservation system, passengers can reserve their seats in the comfort of their homes. During these times when there is a pandemic, having an online reservation system will lessen the contact of people with each other and will help lessen the confirmed COVID-19 cases. By having an online reservation system that consists of features that will be extremely helpful to the passengers, many passengers will opt to use the online system. Based on our analyses above, supported by data which is provided by our respondents, there is an impact if ever there will be an online bus reservation system on provincial buses in the Philippines.

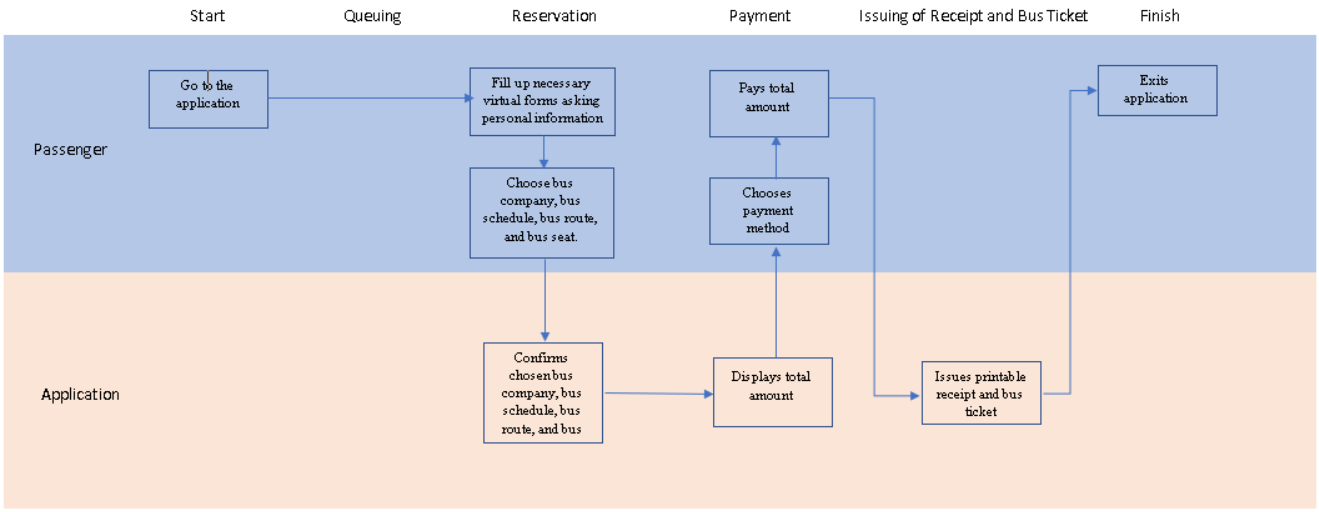

Figure 4: Proposed Bus Seat Reservation System

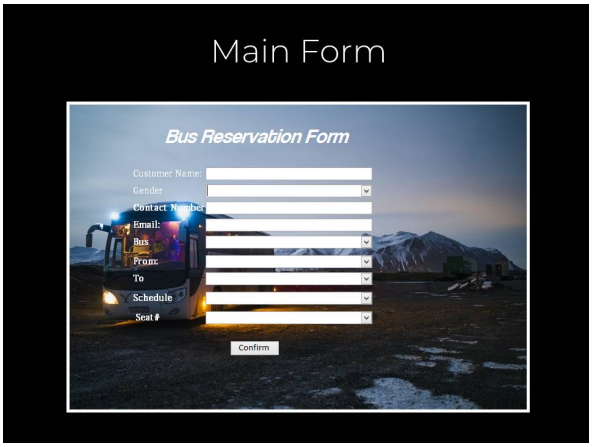

Figure 5: Bus Reservation Form

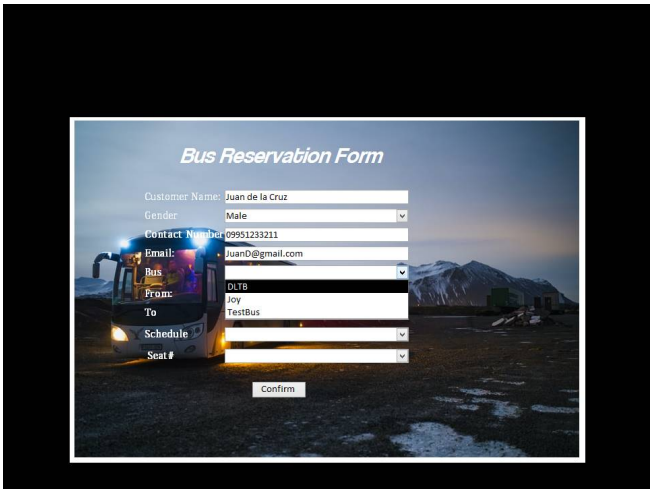

Figure 6: Bus Company Options

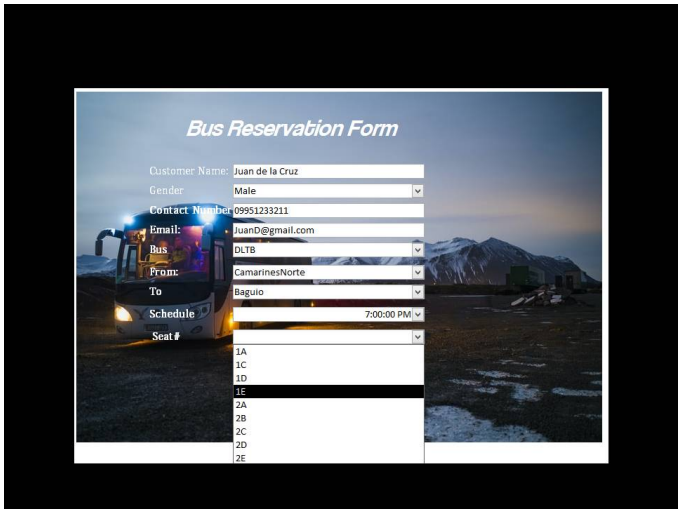

Figure 7: Bus Seat Options

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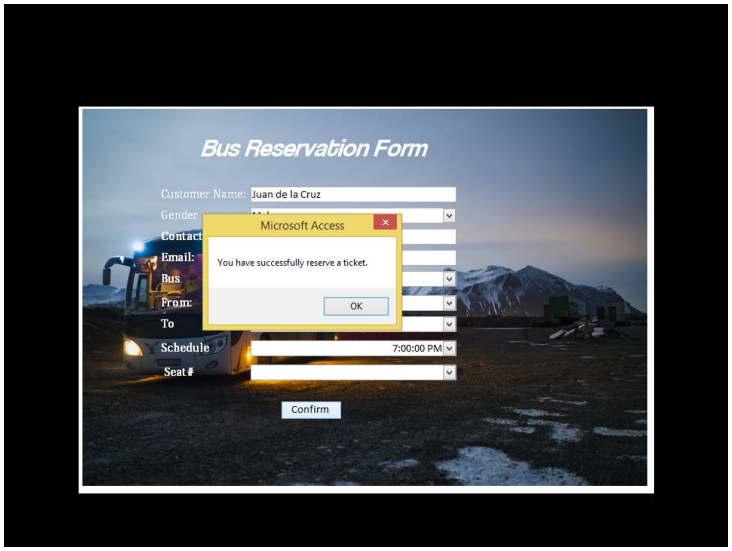

Figure 8: Proof of Successful Transaction

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APPENDIX

In Figure 5, This form will ask for personal information about the passenger.

In 6, passengers can choose from different bus companies.

In 7. passengers can choose their desired bus seats. Note that once the seat is taken, the same seat will not be included on the list of seats available for the next transaction.

In Figure 8, After the passenger has completed the transaction, MS Access will display a prompt saying that you have successfully reserved a ticket. The e-ticket will be sent through email to the passengers.