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Impact of Self Service Technology on Customer Behavioral Intention: Case of Intercity Railway Service in Sri Lanka

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Keywords: railway ticketing, smart self-service ticketing, process improvement, smart technologies, digital transformation.

I. Introduction

The British empire introduced railways to Sri Lanka in the year 1864 and, the purpose of it is to transport coffee from hill country plantations, which are situated in Kandy to the port city of Colombo. Since then, the whole railway services under Sri Lankan administration (context) can be identified as nothing up to the standards with efficient and effective measures to date. Still, most procedures are followed with the same old methodologies with a manual system of working.

Since 1864, the Sri Lanka railway has been following the same traditional way of issuing tickets. According to that process, passengers need to visit the counters in railway stations, pay the cash for their tickets and get the tickets. The tickets that are currently issued by the Sri Lanka Railways are valid only from the date of issue and to the given destination only. Also, the current ticket reservation process of Sri Lanka Railways can be identified as a primary level system. Because of this process, customers have to visit the railway station every time that they need to reserve a ticket. Passengers have to visit stations before 30 days of their trip to reserve the tickets. Also, limitations like five tickets per person decrease the value of the ticket reservation process. In this modern era, most countries have replaced their outdated and obsolete systems with innovative and outstanding systems using new technology. But still Sri Lanka Railways didn't consider this radical and dramatic change.

Current processes run with traditional methods contain a lot of non-value adding activities and waste tasks. Those old and obsolete processes consume more money, resources and especially valuable time of everyone. It causes to create employee dissatisfaction and also less customer engagement with the process. By using business process re-engineering methods and techniques, the Sri Lanka Railway can solve not just the issues mentioned above, but the whole current system can be made more productive and timely as well.

The train ride is popular among both local and foreign visitors. For some people, it gives a unique experience. Sri Lankan train ride is the most epic and scenic train ride in the world. Above statement is yes for some reasons, because the train ride is popular among both local and foreign visitors. The reason is it provides a unique travel experience. The picture-perfect eye-catching environment gives an incredible travel experience to those who travel by train. But because of some reasons, the standardization of Sri Lanka Railways goes down. When it comes to the seat reservation process, train schedules, ticket issuing, payment options and some other areas. Sri Lanka Railway has 396 trains, 340 railway stations and 16 intercity trains that covering the long-distance cities around the island, but only 6 railway stations have the facility to reserve tickets and poor payment options led fail the railway ticketing and reservation process by making it tired and dissatisfied service to everyone involved in the process.

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To travel long distance most people, prefer intercity trains because it reduces the travel time. When it comes to the profit earning, lack of customer engagement put Sri Lanka Railways under continuous losses. According to the current process, passengers have to visit the railway station before thirty days to their journey and contact the superintendent or station master to do the paperwork. Also, reservations can have done through telephone which again it should perform 30 days before the journey. This process is very unconvincing for both customers and staff who are involved in the process. Huge paperwork process, customers have to visit one of the six stations several times to do their reservations means time-consuming, people from rural area don't like to travel very long distance to reserve their tickets because additional costs are attached, due to the lack of space sometimes passengers have to cancel their reservations or change their schedules which make passengers and staff tired of the process. Seat reservation via telephone is not very popular and it's limited service. One person can reserve only five tickets and after the reservation through telephone customers have to visit one of the six stations to collect the tickets. Another problem is duplicate seat reservation and ticket issuing. Most of the developed countries previously suffered from this issue and they mitigate it by adopting technology for their process. They use ticket kiosk machines, online payment and reservations and mobile devices-based solutions as the methods and provide passengers with an effective, efficient and completely satisfied service to railway travelers. In Sri Lanka, most of the people who are living in rural areas have difficulties with technological affordability, most people don't have credit cards to make online payments. But with the disruptive technological changes change the world time to time, Sri Lanka railway is the only service provider that remain unchanged with the very old techniques and processers. What we think is, reducing non-value adding activities and reengineer the business process can provide a dramatic improvement to the ongoing system. And it will take Sri Lanka railway into a very attractive and efficient place. Also, BPR can provide equal quality service to people with different levels of income. Because the breadth of Sri Lankan railway system being too big and having a limited time frame to conduct whole research, this was narrowed down to one specific service. The target service is Intercity Railways, which is a large number of passengers travel and having several issues in the ticket reservation system and schedules and customer services. Therefore, this study is focused on the above-mentioned issues and try to provide solutions to overcome above-mentioned issues using modern technological features like self-ticketing kiosk and online payment options attached to the self-ticketing kiosk.

The main target of introducing Smart Self-Service Ticketing is to minimize the queues in the public areas, to provide better service experience and also provide quick service to the passengers as they wish. This solution mainly focusing on the intercity railway in Sri Lanka. Currently, the railway department has six railway stations from total to reserve tickets for intercity train route. But this current process requires passengers to visit one of the railway stations from above six railway stations from thirty days before their journey and contact superintendent or station master to do the paperwork (Sri Lanka Railways, 2019), alternatives ways are also available like reservation arrangements via telephone and again it also performed thirty days prior to travel.

Rail travel is service used through humans unfold the majority demographic and content groupings. per the analysis further than five hundreds of rail journeys were for business travel, a demand for distinctive point in time, a demand to journey as shortly as doable, etc. per an equivalent supply the opposite makes use of are like leisure travel, Special get entry to demand, a demand to travel as cheaply as viable etc.

II. Literature Review

According to the study "Modernization of Passenger Reservation System" conducted in the Republic of India, they are aware of the issues concerning the railway price tag reservation and to resolve that problem they conduct this analysis. They have targeted on 03 main objectives to conduct this analysis. Their main objective was providing service to the public. That objective is divided into 04 main areas to achieve: scale back time and price concerned in ticketing, give fast service to passengers and availability of knowledge and that they taking into account the availability of trains and accommodation. Their second objective was - "better operating atmosphere for staff". Through reducing time, price and redundant work it's straightforward to form higher operating atmosphere for workers as a result of it reduce employee isolation with their day-after-day tasks. Their third objective was "reduction in scope for unethical practices in reserving accommodation" to gather information on issues they used interviews, discussions, information printed by Ministry of Railways, Ministry of IT and Ministry of finance. (Shirish C Srivastava, 2007) Through that application, they supply the following facilities to customers:

- Quick reservation facilities from any station to station through IR.
- Reduce the length of queues as a result of the availability of PRS counters around the globe.
- Mistakes are reduced as a result of all the data embrace in price tag are often checked by the purchasers before printing it.

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- Information is offered everywhere in the globe through bit screens, web and phone.
- Unethical practices are mostly eliminated.

Similarly, "Automatic ticketing on London Underground" conducted in London researchers focused on issuing travel card (which permits travel on all the vehicle administrators with the one regular ticket) to be issued and checked consequently by any of the gatherings to their prerequisites. The London Underground coding field is refreshed at whatever point a ticket is handled at a door. Through that, reducing deceitful travel and expanding security in ticket workplaces. As for methodology, they use secondary data analysis. For that, they use an LUL customer database. (David Wanless, 1989).

Furthermore, according to the study "Itinerary choice and advance ticket booking for high-speed-railway network services" conducted in the United Kingdom, researchers mainly focused on analyzes the traveller stream task (agenda decision) issue in rapid railroad frameworks with different class clients and various class seats, given the train timetables and time-changing travel request. Researchers used a direct way to deal with model development booking cost with an unequivocal cost work, we consider booking cost endogenously, which is resolved as a piece of the traveller decision harmony. We demonstrate that this balance issue can be figured as a linear programming (LP) model dependent on a three measurement arrange portrayal of a time, space, and seat class. (Guangming Xua, 2018).

According to the study "Factors influencing online flight ticket purchasing." conducted in Korea researchers mainly focused to recognize the elements that affect the decision of buying aircraft tickets on the web. Furthermore, to distinguish if there is a connection among comfort and the eagerness to buy carrier tickets on the Internet, to investigate if there is a connection among trust and the ability to buy aircraft tickets on the Internet, and to analyze whether fulfilment with the previous buy of an aircraft ticket on the Internet is related with rehash buys. Non-probability sampling was utilized to target current Internet clients in Korea. The investigation utilized network locales, for example, the 'Daum Café' and 'MSN Community' to get to Internet clients. (TAE-HONG AHN, 2011).

Similarly, to the study "Smart Computing Applications in Railway Systems - A case study in Indian Railways Passenger Reservation System" conducted in India researchers focused to investigate various issues of executing keen processing in railroad frameworks relating to reservation models. As the researchers found out utilizing this UID-based innovation, it is conceivable to decentralize the errand of reservation from booking agents (in railroad reservation counters) to programmed ticket candy machines (ATVM) too. Since the open tickets are now issued through ATVMs, the booking highlight can likewise be executed in the ATVMs. This should effortlessly be possible by connecting the saved convenience of trains in the machines and by issuing biometrically confirmed/PIN secured Smart Travel Cards. On the other hand, the biometric data can be enrolled at Smart Card counters, while issuing the savvy cards. This can without much of a stretch expel some heap from the current PRS counters. (Parag Chatterjee, 2014).

Furthermore, according to the study "Towards the Internet of Smart Trains: A Review on Industrial IoT-Connected Railways" conducted in Spain authors tried to increase efficiency and aggressiveness: railroads face brutal challenges from different modes (for instance, the street area gives appealing, practical, solid, flexible, and helpful way to-entryway transport of cargo and travellers crosswise over outskirts). In Europe, the test is additionally expanded by a divided rail advertise, with various national frameworks for rail flagging and speed control. Subsequently, interoperability speaks to a key test for the free flow of rail traffic. Furthermore, to reduce rail commotion and vibration, especially in urban zones. Also to Reduce ozone-depleting substance emanations. (Paula Fraga-Lamas, 2017).

Moreover, according to the study "Integrated urban e-ticketing schemes – conflicting objectives of corresponding stakeholders" conducted in European Union researchers tried to survey the various interests and boundaries of private on-screen characters, governments and clients and features clashes of goals concerning e-ticketing plans. Methodologically, this paper tries to comprehend the above-shown focuses through an exhaustive writing audit of auxiliary sources, for example, logical reports and concentrates just as official statements, logical papers and introductions on coordinated ticketing when all is said and done and partner jobs specifically. The financial point of view on the e-ticketing condition demonstrates that e-ticketing is given by a system of heterogeneous on-screen characters and that solitary their collaboration and association lead to helpful outcomes. It is the heterogeneity of the on-screen characters' objectives inside various financial, social, political and land settings that shape the careful conditions and result of the plans. The paper demonstrates that every one of the depicted entertainers is required as a full accomplice, however, that they go into the association for different reasons: Public transport administrators are attempting to build their offer in modular part by giving superior support of their clients. Accordingly, settling convoluted duty structures is one significant objective, the travel industry division targets offering guests an incorporated bundle of vacation destinations to expand their vacation involvement; open vehicle frequently just assumes a minor job in their procedures, intermediaries, in

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particular, money related specialist co-ops and media transmission administrators are searching for territories to extend their portable instalment administrations. (Puhe, 2014).

According to the study "E-Ticketing as a New Way of Buying Tickets: Malaysian Perceptions" conducted in Malaysia authors focused to distinguish e-ticketing patterns among urban networks, especially in Kuala Lumpur, to researches the use patterns and examples of e-ticketing. Likewise, the investigation additionally centered around the clients' viewpoints towards e-ticketing as far as its helpfulness, dependability, security, accommodation and effectiveness. And furthermore to look at the effect of statistic factors on e-ticketing reception towards e-ticketing. They used questionnaires to gather information. Their discoveries on inspirations and boundaries of e-ticketing demonstrate that comfort and convenience fill in as solid factors that rouse buyers to buy tickets on the web. Security and protection concern was observed to be the greatest boundaries of e-ticketing. Finally, we found discoveries from this examination that age, level of instruction, and callings have a critical effect on the clients' discernments towards e-ticketing. (Ainin Sulaiman, 2008).

As identified through the study "Self-consciousness profiles in the acceptance of airline e-ticketing services" conducted in Spain authors focused to concentrated on extending the learning of hesitance in the zone of buyer conduct and especially in the field of relaxation travel web-based booking. Questionnaires were used to gather data. The consequences of the investigations performed must be considered with extraordinary alert. In these cases, the size and kind of the examples utilized may assume an applicable job in the develops operational capacity. (Jesús Manuel López-Bonilla, 2015).

According to the study "Consequences of Forcing shoppers to Use Technology-Based Self-Service" conducted in Netherland, they know the issues that arise once customers are forced to use technology primarily based self- services. The main purpose of their study is to fill the gap by investigation whether or not customers are forced to use of TBSS and attitudes, activity responses to the case. aside from that the second purpose of this study was associate degree whether or not providing interaction with a worker as a fallback possibility may facilitate to offset the negative consequences of forced use of TBSS and therefore the final purpose of their study was to extend the literature by exploring the role that consumers' previous expertise plays within the forced use of TBSS. They used questionnaires to assemble information and sample size was 4000 customers. That analysis shows solely promising results with relevancy the implications of forced use of TBSS. However, that result presents inceptive to research the case. conjointly this analysis enclosed differing kinds of TBSS choices and completely different service choices. This study targeted on conveyance service in one country. (Machiel J. Reinders, 2008).

As identified through the study "Development of a Mobile Airline Reservation System" conducted in Nigeria researchers meant to recognize developing mobile airline ticket reservation system for Nigerian airlines. The main objective of this paper is to develop a mobile airline seat reservation system that may assist the general public in gaining a better and quicker approach for the seat reservation and providing them with additional choices to book a price tag for travelling on real-time. (Oyelade 0. J., 2009).

According to the study "Improvement of urban passenger transport ticketing systems by deploying intelligent transport systems" conducted in Lithuania aims at encouraging consistent vehicle of individuals and merchandise. Furthermore, improving ticketing tasks require high speculations and exhaustive investigation. As a result, another period of present-day innovations calls notwithstanding for increasingly viable arrangements – in particular, virtual-ticketing frameworks that may be accomplished through the presentation of versatile advancements. (Jakubauskas, 2006).

According to the study "Flight ticket booking app on mobile devices: Examining the determinants of individual intention to use" conducted in Malaysia researchers are looking at individual aim to utilize flight ticket booking applications on cell phones. Authors used questionnaires to gather data. The strategy of the examination including estimation, information accumulation, and information investigative system. It is one of the items most often bought by customers in Spain. Students were a very applicable populace for this examination. (Norazah Mohd Suki, 2017).

According to the study "Exploring design principles for self-service technologies: The case of a ticket vendor machine" conducted in United States main goal was to research self-administration advances utilized in open spaces, and how they can be improved. Observations were used as data gathering methods. The main target was to investigate strategies for leading examination on self-administration innovation and to find structure rules that can improve the convenience of this kind of innovation. (Marius Semi, 2014).

According to the study "Challenges in Implementation of TVM (Ticket Vending Machine) in Developing Countries for Mass Transport System: A Study of Human Behavior while Interacting with Ticket Vending Machine-TVM" conducted in Pakistan authors focused the key test of this examination is to explore the reasons of low consideration in utilizing TVM as open office in correlation of customary strategy for obtaining tokens from ticket office by MBS voyagers. (Abbas, 2014). Furthermore, to research the contrasts among elderly and youthful age in connection to ease in utilizing

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present day advancements. As well as possibilities of upgrading the TVM for uneducated and untrained explorers. The two-fold strategy was received in the examination. The methodology of examining TVM utilization depends on on-field review; that holds primarily talking of MBS travellers, moreover, the perception was likewise assumed imperative job in get-together significant discoveries. In the perception part, genuine client experience has been recorded to distinguish the constant issues in TVM presently being utilized in Lahore MBS. Research has been practiced keeping in view the presence of common holes. As study checks mid-90s research that a significant pointer of shared holes exists fit as a fiddle of education societal position, ethnicity pay and sexual orientation. Meetings have been taken of 180 travellers including the two sexual orientations of people from 14-55 years of age. Perception of 60 travellers has likewise been recorded with a group of 12 Surveyors. Two individuals from each group went through around 4 hours autonomously on indicated areas. Following suppositions were contemplated in the segment of the survey to know the fundamental factor of TVM carelessness.

- Absence of suitable preparing among TVM clients.
- Dithering while at the same time utilizing TVM because of the absence of education.
- Threatening TVM interface and structure.
- The high dismissal cash proportion.
- Inadequate characterization for returning cash fit as a fiddle of coins.

Furthermore, clients are happy with the effectiveness of MBS yet requested increasingly token corners to keep away from time and vitality misfortune in getting tickets.

Moreover, according to the research "Automatic Vending Machine Prototype Model" conducted in India, the goal is to build up a candy machine model for distributing the things by credit or exchange. The accessibility of the things is likewise checked. It discovers its application by chiefly understudies and basic residents in open spots. Moreover, the point is to develop a programmed candy machine model, which can be introduced in schools, universities, medical clinics and other open spots. Past literature used as secondary data to gather information. The proposed framework is the structure of the model for a programmed candy machine. The model was intended for the usage of the mechanical structure of a candy machine which at long last outcomes in distributing a thing upon the inclusion of the coin. (M. Jasmin, 2016).

III. Objectives

Based on the above research questions the authors developed the following research objectives. Research objectives imply what is the end product of the research.

Main objective: The overall objective of this study is to prove that the current ticket reservation system should replace with the self-service ticketing technique.

Sub objectives:

- To explore the nature of the existing ticket reservation process.
- To explore the rail passenger issues related to the current process.

Through this research, authors try to justify the adoption of self-service ticketing approach to the Sri Lanka Railway Department by replacing existing inefficient proses. It will increase customer satisfaction, encourage usage of ticket machines and reduce the need for sales persons, customers can book their tickets at any time both up and down tickets, introduce self-serviced ticketing for public transport and eliminate the queue, save the time and money. Also reduce the cost of paper materials, empower and force customers with benefits of modern technology. Customers will be more secure with the verification of payment and booking via email and SMS confirmations. Also, Sri Lanka Railway has a similar goal as a plan to introduce electronic payment and seat reservation for special trains.

IV. Material and Methods

The research following both qualitative and quantitative methodologies and focus of the study is to gain an insight of Sri Lanka's existing railway ticket reservation system, identify its issues and to redesign the current process by minimizing current issues. An inductive approach is using in the study as it starts with observations and theories whereas the framework is proposing towards the end of the research process.

An exploratory design is following as there were no earlier studies done on the re-engineering of Sri Lanka's intercity railway reservation process. Besides, the main focus of the research is to familiarize and gain an insight into Sri Lanka's intercity ticket reservation process for later investigation and improvement.

Purposive sampling is following in selecting participants for the questionnaire and the passenger interviews to select the most productive sample to answer the research questions. For the questionnaire, 100 participants are deliberately choosing based on the fact that they are living within the boundaries of the Colombo district and are employed in Colombo and 100 participants select from railway department because they are daily engaged with the process.

From the interviews and observation, we conducted we've analyzed the most important content into a word cloud.

Also, authors focusing on different data gathering methods according to the objective:

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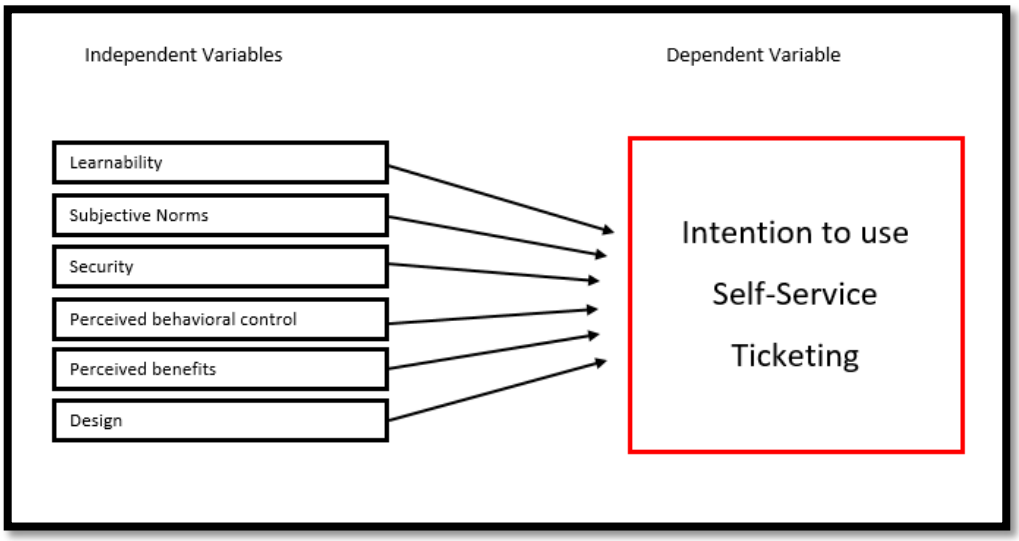
- To explore the nature of existing ticket reservation process – A face- to – face interviews conducted with Mr Champika S. Nanayakkara – Station Master Colombo Fort and Suburban and Mainline area and with Mr Asanka Samarasinghe – District Traffic Control. Also interviews through telephone calls conducted with Mr Bandara – Station Master Anuradhapura and with Mr Premarathne – Forman Demodara. Through observing and interviews authors find out following information about the current process:

- A briefing of the existing intercity railway reservation system.
- The main governing bodies and the services provided by them.
- Existing operational models.
- Current facilities, technologies used.
- Current and future trends of Sri Lanka's Railway Department.

- To explore the rail passenger issues related to the current process – For that online survey and questionnaire was used. Through the questionnaire, the most significant issues were identified and there purposive sampling was used. Interviews also conducted with people who are engaged with the current system. To analyze the findings which are collected through interviews, "WordItOut" online tool was used. we interviewed both employees and passengers who are engaged with the current ticketing process. Interviews were conducted in Sinhala which lasted for about 3- 5 minutes through that identified following factors:

- Current issues faced.
- Based on their thinking most significant issue.
- Corresponding expectations of customers.
- Limited payment options.
- Self-service channels that they most prefer.
- Their perception of using self-service channels to do their reservations.

V. Conceptual Framework



VI. Results and Discussion

- To explore the nature of existing ticket reservation process

Train transportation is one of the country's main public transportation network plays an increasingly important role in human navigation. Being the country's one of the main transport method, its policy formulation and implementation is entirely governed by parliamentary acts such as the National Transport Commission Act and Sri Lanka Transport Board Act etc.

The Ministry of Transport and Civil Aviation is considered to be the main regulatory institution governing railway department while several other institutions such as Road Passenger Transport Authority(RPTA), Sri Lanka Transport Board(SLTB) and Tourist Board are also involved in administration. The rains are governed by Sri Lanka Transport Board.

- Service classification and delivery

Sri Lanka's railway transport system can be classified as a state-owned service. The trains are operated and regulated by both the Ministry of Transport and Civil Aviation and Sri Lanka Railway Department. Sri Lanka Railway Department introduced a mechanism where the customers could reserve seats via Mobitel or Dialog's official websites. Also, citizens who are working in government institutions provide the facility to use season cards and passes. Season passes allow the user to pay train fare for the entire month at once. In the

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case of any inquiry or a complaint, passengers could directly dial Ministry of Transport and Civil Aviation's hotline number 0773087534 or passengers can inform it via an e-mail by sending mail to the maintransport@sltnet.lk email address. According to the recent statistics on Sri Lanka, the Railway Department indicates that there are 177 main railway stations and 162 sub railway stations (Anon., 2018). Table 4.1 depicts the basic information about the Railway Department while table 4.2 demonstrate statistics about operations of the Sri Lanka Railway Department.

Table 4.1: Statistics of Basic information about Sri Lanka Railway Department

Year	2018
Total Length of the trace (Km)	1465
No.of Main Railway Stations	177
No.of Sub Railway Stations	162
Train Halts	71

Source: Authors compilation based on data from the website of Ministry of Transport and Civil Aviation

Based on the statistics of table 4.1, among both main railway stations and sub railway stations, trains only stop in 71 stations. From that only six stations have ticket reservation facility. And around 20 stations have the reservation facility that provides by Mobitel and Dialog.

Table 4.2: Statistics of Operational Information about Sri Lanka Railway Department

Year	2018
Total trips operated (Both passenger and Goods trains)	117,189
Number of trains a day	375
Number of Passenger trains per day	352
Number of goods train per day	23
Number of passengers carried a day	367,000
Number of employees (permanent & casual)	16,433
Number of Goods carried a day MT	6,845

Source: Authors compilation based on data from the website of Ministry of Transport and Civil Aviation

Process Identification

To identify the current processes face-to-face interviews and observations were conducted by authors. Through that authors were identified there were 04 types of processors called counter reservation process, mobile reservation process, mainline process and normal ticketing process. Each process has different steps to follow. Above mentioned processors were designed as process notation diagrams by using "Draw.io" software.

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- Counter Reservation Process and Mobile Reservation Process

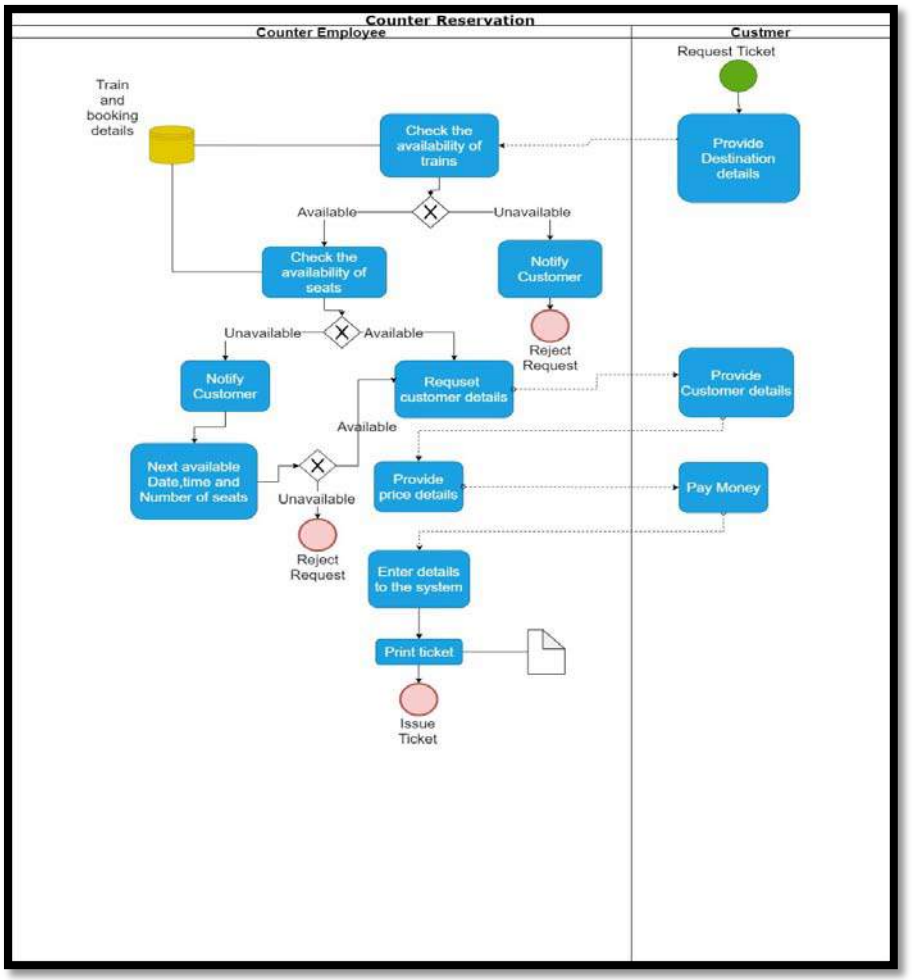


Figure 1: Counter reservation process

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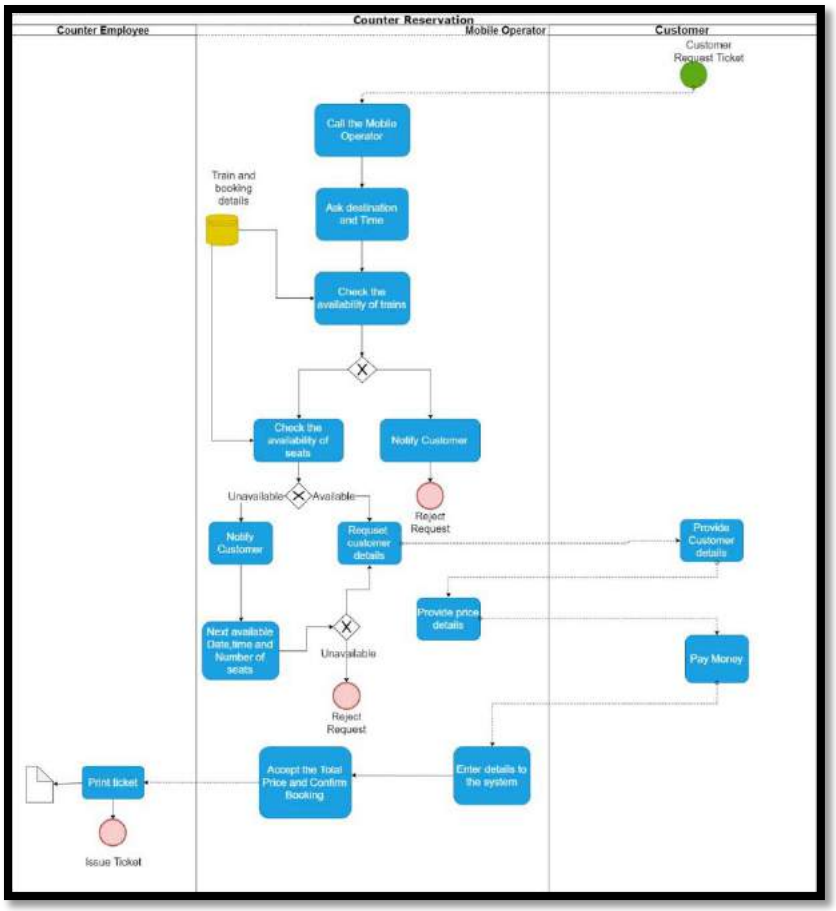


Figure 2: Mobile reservation process

Both counter reservation and mobile reservation processes are partially interconnected in such away. Mobile reservation process has an extra few steps when considering the existing process. Counter reservation process follows the following steps.

There are four train lines which have a seat reservation facility. Those are Badulla, Jaffna, Batticaloa and Beliatta. Badulla Intercity Train has 1st class AC (Ticket price Rs.1500), 2nd class (Rs.600), 3rd class seats, one train has a 1st observation room. Jaffna luxury train has more than 225 seats which passengers can reserve. This train has 1st class AC luxury (Rs.1700 per person ticket price), 1st class observation, 2nd and 3rd classes. Batticaloa, Trinco & Beliatta trains have sear reservation facility for 1st AC, 2nd and it has 3rd class which is without reservation.

Passengers have to do their all bookings 30 days in advance. Only accepted payment methods are by cash or government-provided Warrant. Tickets and reservation passes are issued only through counters at the railway station. Passengers can reserve their seats via phone calls from Dialog or Mobitel service providers, either way, they have to visit the station to collect the ticket. Dialogue or Mobitel does not provide the ticket. They only reserve the seat for a customer using customer details such as NIC, Name, and Mobile number. After the customer reserves their tickets via phone, the passenger will get a text message to his or her phone, then they have to visit the railway station counter to collect the ticket. Railway counter staff will check the identity number, collect the cash from the passenger and issue the ticket.

And those facilities are limited to selected stations. They are not providing reservation facilities to every station. Because of that person who is not having that facility in there nearby station have to visit a station in the distance area to make their reservation.

Or else Customer has to visit the railway station, waiting in the long queue, get the form and fill it or tell the required information to the staff member at the counter and reserve their ticket. Only accepted payment method at the counter is Sri Lankan Rupees. The customer has to pay the price to the counter and can collect the ticket.

One passenger can reserve 5 seats from his or her NIC, the same customer can repeat reserving a ticket for more than 5 seats waiting in the queue for several times. All five members NIC cards numbers are required but it's not compulsory in incidents such as children under 17 years of age. Railway counter staff member check the availability of the seats for the day that passenger requested, if seats are available, they

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confirm the booking and issue the tickets to the passenger. Seat availability is indicating on the screen of the system railway station has. It clearly shows the reserved and available seats.

Currently, the Railway department has installed their reservation system in main 54 railway stations. Arrival and Departure tickets can book on the same day at one time.

Customer can reserve any seat according to the availability. Duplicate reservations are restricted by the current system. When in a situation like, when two stations trying to book the same seat in the same train at the same time, the first person to book the seat will get the opportunity. No duplications for the same seat.

In night mail trains, reservation system more focuses on gender where, female passengers are allocated to the nearest female seat, male passengers are allocated to the nearest male passenger. It's a strict rule that railway department follows in night mail train that not to put female passengers and male passengers together, they have rooms called berth rooms, which is only for husband and wife or husband and wife with children. Berth rooms are with beds in night mail train.

There is mandatory information should be mentioned on the ticket such as gender, starting point, endpoint, date, time, ID number, ticket issuer name(staff). In Peek, hours and vacation seasons railway reservation system faces a huge slow due to high usage around the island wide stations. Customers have to come to the stations and spend hours in the queue to reserve a ticket, sometimes customers have to go back and come on the next day again to reserve a ticket. Customers experience a huge time-wasting and dissatisfaction.

Account balances are automatically calculated and staff members have to balance the money in their locker and the system generated calculation at the end of every shift. This is the only rail line which has an automated bookkeeping system.

If a customer loses a ticket they have to take full responsibility. Railway department is not responsible for ticket losses or else they don't issue a new ticket. The customer has to follow the steps to reserve the ticket again and pay the price again and get the ticket.

Cancellation or refund process has to be done within 24 hours unless the customer has no option to get a refund or cancellation process. In a special occasion, customer can reserve a whole part of a train, therefore they have to visit the Railway department and follow the process.

- Normal Ticketing Process

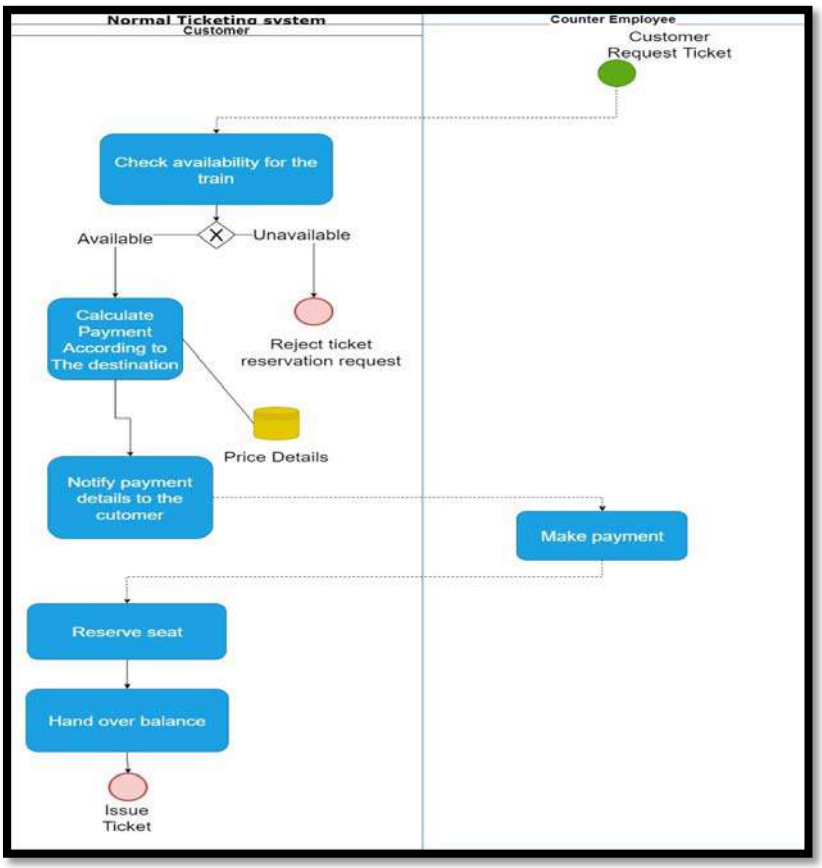


Figure 3: Normal ticketing process

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Normal Ticketing Process has separate four ticket counters assign to this process too. Here in Colombo railway station, these counters have tickets for short-run railway areas. For example, Colombo to Rambukkana, Colombo to Galle. Ticket prices here starting from Rs.10 to Rs.200. This is the busiest and most passengers preferred rail line, which is most passengers used to travel daily and it generates a massive amount of revenues daily.

Here they provide tickets only over the counter and every station has tickets for any station trains travelling this rail line. There are huge queues most of the time inside and outside of the station. Customers have to give money to the counter staff and tell them the departure venue they want to go and counter staff issue the ticket. Only accepted payment method is cash. It takes around one minute to issue a ticket, sometimes maybe more time required when the counter staff has to give the balance of the money. Since it has a huge demand by customers every day, they maintain a massive amount of printed tickets in every station in wooden cupboards. According to counter staff, they face lots of trouble maintaining that cupboard due to ants and other small animal attacks. According to railway staff superiors, they are dissatisfied about the money the put into print the tickets and the return they get.

Like all other rail lines, every counter staff member has to update and balance of their cashier locker money amount and price of the tickets they sell. It's a manual process and they are completely dissatisfied about the maintaining manual books. They said sometimes they made errors in calculations and even more, duplications can happen and sometimes data may be a loss if they lose their book and they have no recovery option.

- Main Line Ticketing Process

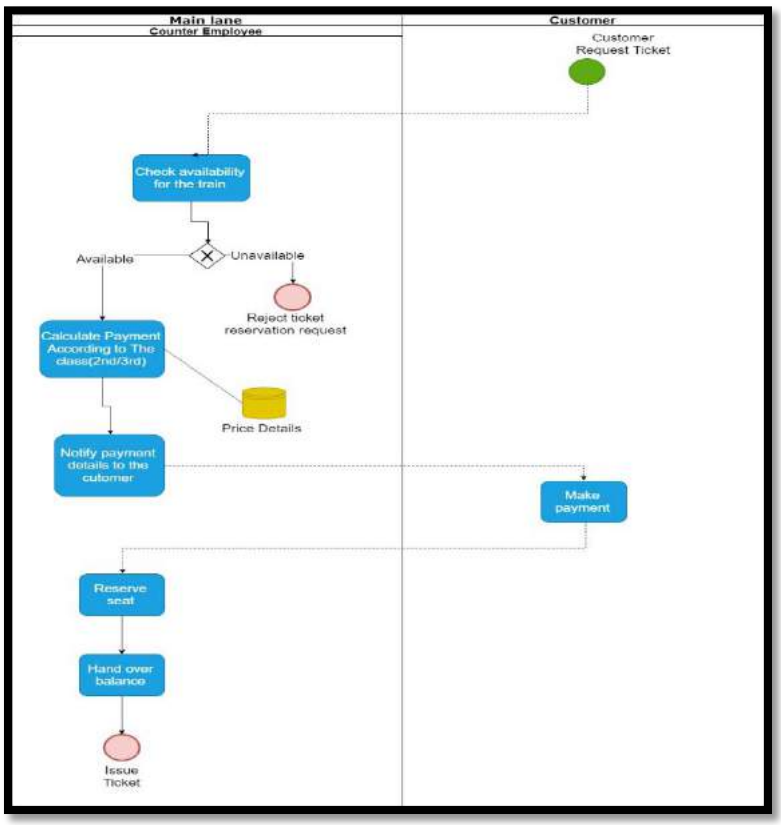


Figure 4: Main line process

Under this, they provide tickets for suburban areas and coastline (Colombo to Mathara and Beliaththa). Tickets they issue here are from staring from Rabmukkana, Awisswella line to Mathara line and Puththalama rather than that here they provide tickets for short-run train services.

They have four counters including two service counters: 1st line (Colombo fort- KKS(Kankasanthurai)-Thaleimannra), 2nd line (Colombo Fort to Badulla) from the other way Matale, 3rd line (Trincomalee- Battichlore) form that line they provide on reservation Intercity train ticket as well (Normal Intercity third class) tickets issue for number of sheets that they have. There are two intercity trains (Jaffna and Battichlore) and 4th line which issues 2nd class normal whole island but not reserve tickets. This mainline process used to issue second class tickets. They have another 8 and 9 Counters (Badulla cost line Kandy-Mathale which issues warrants)

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and under 9 counter they provide warrants to KKS & Thaleimannar (2nd class, 1st class). Also, they provide tickets for normal tickets as usual.

Other than that they follow the same process on night mail reservations. To record information related to the reservations of sleeping berth they use a ledger called "Sleeping Berth Ledger". There are ledgers same as this ledger for other reservations as well.

- To explore the rail passenger issues related to the current process

To look at the modern-day problems of ticket reservation from a passenger's perspective, statistics was once accumulated from the pattern of one hundred people via an online survey. These persons signify the team of workers of us of a who each day tour Colombo for employment. The resolution of contributors to the online survey has once completed the use of purposive sampling. In the survey, it was once located out that 57% of the people are used intercity trains to attain Colombo whilst 43% the use of sluggish trains to reach Colombo. And face-to-face interviews conducted with 10 people who are purposively selected.

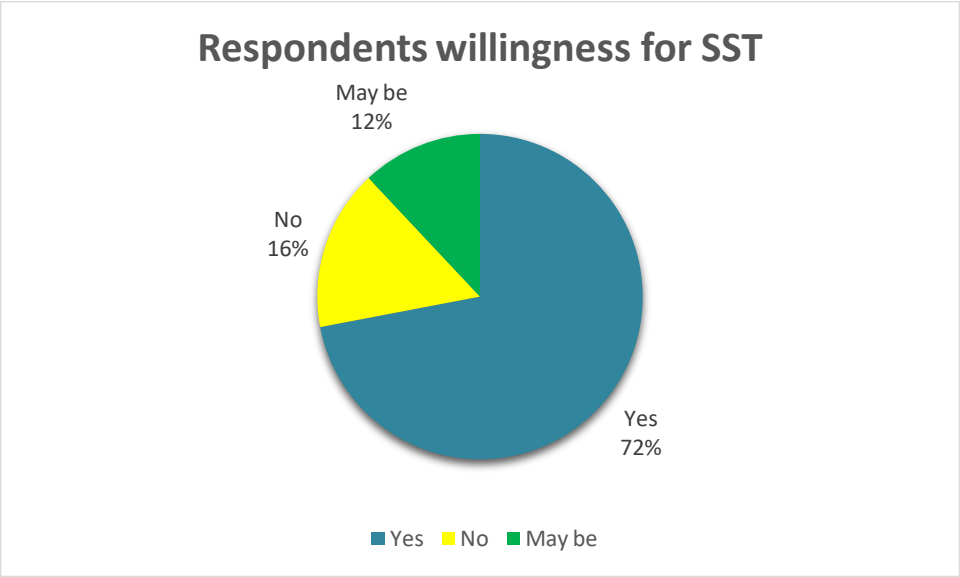


Figure 4.6: Respondents willingness for SST

According to figure 4.6, the willingness of the respondents for self-service ticketing was once illustrated. Most importantly, 72% of the respondents are agreed that they were inclined to use self-service ticketing even at a high cost. Hence, it is considered that if self-service ticketing is put into effect greater and extra passengers would use it alternatively that touring stations. It will enhance the effectivity and effectiveness of the manner as well.

Table 4.3 depicts the 09 issues recognized through lookup articles and present-day system observation. They are rated through respondents based on their order of importance. The Likert's scale with 3 tiers of significance was used for data collection with a score of 1 being much less important and a rating of three is exceptionally important. These facts were analyzed, and their cumulative frequencies were got through SPSS.

Table 4.3: Ticket reservation issues

Characteristics	Highly Important	Somewhat Important	Less Important
Customer waiting time	58%	38%	4%
Too complicated	37%	51%	12%
Limited number of stations to make reservations	28%	50%	18%
Require action on every request	38%	46%	16%
Poor refund policy	62%	26%	12%
Availability of seats	36%	49%	15%
No proof when loosing ticket	42%	51%	7%
Limited number of tickets per person	58%	35%	7%
Limited payment method	48%	46%	6%

Source: Authors compilation based on the gathered data from the survey conducted

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The findings indicate that the attributes most essential to the client were client bad refund policy, consumer waiting time, a limited number of tickets per character while the too complicated, no proof when losing the ticket, limited variety of station to make reservations and availability of seats have been regarded to particularly important. Figure 4.7 compares the degree of significance of identified issues.

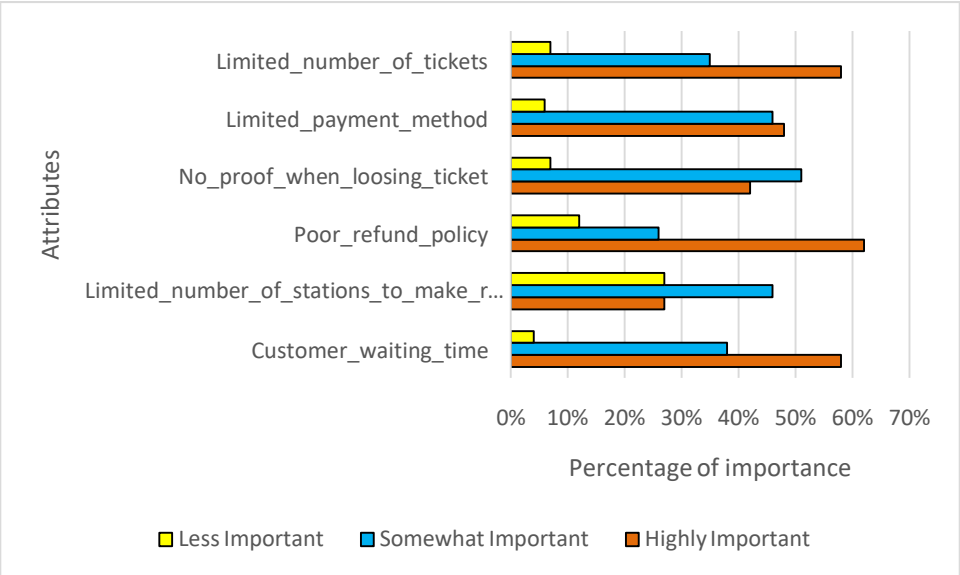


Figure 4.7: Identified issues Vs. percentage comparison

Meanwhile, the facts collected by the interviews with passengers indicated that the most frequent troubles they confronted when reserving ticket:

- The process is very slow
- Too customizable
- Create delays
- Ticket storing difficulties
- Manual accounts bookkeeping consume so much time
- Cause many errors and duplicates

The troubles had been also analyzed using a word cloud to identify the greatest issues. Thus, it used to be surely evident that the create delays used to be major trouble faced utilizing passenger whilst motive many errors and duplicates, too customizable and the system is very gradual were additionally significant.

VII. Conclusion

This research has targeted to explore the nature of the existing ticket reservation process and this study attempts to recognize the issues that customers face when using the current ticket reservation process. Finally, according to above-given results, we can justify that the Sri Lanka Railway Department need to adopt self-service ticketing facility to improve their efficiency in operations.

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Eventually, we would like to renown the support given by our families. Last but not least the employees in Sri Lanka Railway are an immensely thanked for all the grasp and help furnished to make the research success.

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Appendix A

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Customer_waiting_ti	100	1	3	2.54	.576	.332	-.806	.241	-.330	.478
Limited_number_of_stations_to_make_reservations	100	1	3	2.00	.739	.545	.000	.241	-1.145	.478
Poor_refund_policy	100	1	3	2.50	.704	.495	-1.066	.241	-.191	.478
No_proof_when_loosing_ticket	100	1	3	2.35	.609	.371	-.359	.241	-.639	.478
Limited_payment_method	100	1	3	2.42	.606	.367	-.520	.241	-.606	.478
Limited_number_of_tickets	100	1	3	2.51	.628	.394	-.914	.241	-.180	.478
Availability_of_seats	100	1	3	2.20	.696	.485	-.293	.241	-.902	.478
Too_complicated	100	1	3	2.25	.657	.432	-.313	.241	-.722	.478
Require_action_on_every_request	100	1	3	2.22	.705	.497	-.339	.241	-.933	.478
Valid N (listwise)	100									

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Customer_waiting_time

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	4	4.0	4.0	4.0
	2	38	38.0	38.0	42.0
	3	58	58.0	58.0	100.0
	Total	100	100.0	100.0	

Limited_number_of_stations_to_make_reservations

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	27	27.0	27.0	27.0
	2	46	46.0	46.0	73.0
	3	27	27.0	27.0	100.0
	Total	100	100.0	100.0	

Poor_refund_policy

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	12.0	12.0	12.0
	2	26	26.0	26.0	38.0
	3	62	62.0	62.0	100.0
	Total	100	100.0	100.0	

No_proof_when_loosing_ticket

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	7.0	7.0	7.0
	2	51	51.0	51.0	58.0
	3	42	42.0	42.0	100.0
	Total	100	100.0	100.0	

Limited_payment_method

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	6.0	6.0	6.0
	2	46	46.0	46.0	52.0
	3	48	48.0	48.0	100.0
	Total	100	100.0	100.0	

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Limited_number_of_tickets

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	7	7.0	7.0	7.0
	2	35	35.0	35.0	42.0
	3	58	58.0	58.0	100.0
	Total	100	100.0	100.0	

Availability_of_seats

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	16.0	16.0	16.0
	2	48	48.0	48.0	64.0
	3	36	36.0	36.0	100.0
	Total	100	100.0	100.0	

Too_complicated

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	12	12.0	12.0	12.0
	2	51	51.0	51.0	63.0
	3	37	37.0	37.0	100.0
	Total	100	100.0	100.0	

Require_action_on_every_request

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	16	16.0	16.0	16.0
	2	46	46.0	46.0	62.0
	3	38	38.0	38.0	100.0
	Total	100	100.0	100.0	

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