A Survey on Arrival Passenger Satisfaction Factors of Bandaranaike International Airport Services

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Abstract— **Airport industry has been a vast area which has been growing each second to cater to the demand of the passengers who have been arriving and departing through worldwide distributed airports for various types of purposes. This research had carried out to find out the Arrival Passenger Satisfaction of Bandaranaike International Airport Services. The passenger has been the king in the airport industry who can make a business success or a failure. To provide quality services as required by the passengers, airports should be following up on the modified strategies and amended policies. Because of an airport has been the entrance to the country which has been needed to be attracting new investments towards the country to build up the economy. BIA has been like our heart and it needs to perform well to keep the body alive**

A questionnaire had designed with 41 variables and a questionnaire survey had conducted. The target sample has been Bandaranaike International Airport users, although the sample size had 300, there had only 263 valid responses. Simple random sampling had used in this study and SPSS had used to analyze the data.

The factors will be covered up as the independent variables and the dependent variable has been the passenger preference on BIA. Frequencies test will be run to all variables and for the demographic factors. A factor analysis had carried out to reduce the number of variables and grouping factors which have the same characteristics. Once this had completed the 41 variables had reduced to 9 variables. A hypothesis testing will determine the independent and dependents variables for the passenger satisfaction as well as a factor analysis model will be illustrated to identify the relationships between variables and demographic factors, correlations and reliability of the factors. Finally, the research findings had discussed, and recommendations had made. The basis of recommendations had to focus on customer service and comfortability to have an efficient and effective BIA service system.

Keywords —**BIA terminal, Passenger satisfaction, Airport**.

I. INTRODUCTION

The main international airport serving as the gateway to Sri Lanka has been Bandaranaike International Airport famous as Katunayake International Airport. BIA assists as the heart for airline services such as Sri Lankan Airlines, Sri Lankan cargo, Millennium Airlines and Cinnamon Air. BIA has been the first international airport in Sri Lanka and has been controlled by Airport and Aviation Services Limited (AASL). Foundation begins in 1964 and had finished in 1967. BIA had the main point for the UK's Royal Air Force within World War II and had delivered to the Royal Ceylon Air Force in 1957. After it renamed as Katunayake International Airport. There have been 30 airlines serve the airport's more than 9 million passengers per year.

Bandaranaike international airport vision has been "To be the most efficient and friendliest premier aviation hub in the Asian region" and mission has been "We will strive to give competitive aviation facilities and services with best practices while ensuring stakeholder satisfaction" stated in Bandaranaike international airport annual report, 2015. In 2017 BIA recorded 9,805,045 passenger movements, 58,460 aircraft movement and 265,786 (MT) air freight movements. The Bandaranaike international airport has only one runway (04/22) runway length 3441m (11,290ft). The government has planned to invest on a second runway at BIA, can land A380 to the airport.
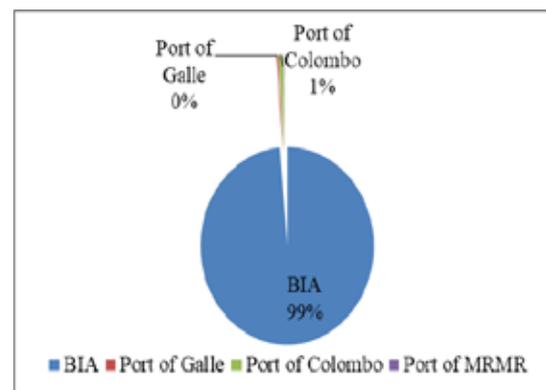

FIG. 1 TOURIST ARRIVALS BY TYPE OF GATEWAY

A. The Significance of the Study

Passenger satisfaction has become a significant factor in air travel which may affect the reputation and long-term profits of airports. BIA needs to respond quickly to the changes that take place in the air travel industry to meet their demands. This research will help Bandaranaike International Airport to identify the areas where their services have been good at and areas where they must improve.

B. The Objectives of the Research

The research has focused on understanding the customer satisfaction factors of Bandaranaike International Airport services to generate new business by meeting the requirements of potential customers. The following objectives have been contrasted through this research.

- Find out the factors that has an impact on customer satisfaction in BIA Service
- Categorize the factors that have the highest impact on Customer Satisfaction

C. Research Questions

Focused question has been what have been passenger satisfaction factors of BIA? According to the research question, responses will be gathered, and factors will be collected to find the answer to the research question.

II. REVIEW OF LITERATURE

According to [1] passenger satisfaction has been depending on the service and facilities that have been located at the BIA when they have been travelling at a time as arriving or departing. BIA Passengers have been showing least satisfaction level with the services and facilities which have been being offered by the immigration department. It defines a passenger as "a person who's travelling on a train, bus, airline, taxi, ferry, automobile, or other carriers" [2]. According to [1] travellers desire on-air terminal staff has been identified with the capacity to give solid and precise administrations and the readiness to help clients and give benefits fast reactions. Confirmation shows that staff with the expert learning of administrations and carries on kindly and benignant has been probably going to win the clients' trust and certainty. The study done by [5], declared that the services include the complete targeting factor has been readily manageable by the service provider that expedites customer behaviour during the service meet and improve their whole service quality perception. According to [4] baggage delivery has 3 types of problems. Facility and equipment related problem, Passenger related problems and Staff related problems. Facility and equipment related problems can also extend baggage access time. The high efficient equipment that has been used in baggage unloading and loading has been carousels, vehicles and trolleys, band conveyor, portable conveyor. The insufficient number of this machine can cause delays. According to [3] the significance of assurance wellbeing and security in an aeroplane terminal can't be over-underlined mainly in furnishing travellers with a protected and consistent experience. According to [1] prove there has been no any affect from the demographic factors to the satisfaction of the passengers. There has been no value concerning treating especially for any age group, gender biases, special attention for the travelling purpose, number of times travelled and time of using BIA.

III. METHODOLOGY

A. The Definition of the Research and the Design

The Methodology of this research had done to collect required data, to analyse that data and to understand the specific factors that affect to the customer satisfaction of Bandaranaike international airport services. A methodology has defined as "is a systematic way to solve a problem. It has been a science of studying how research has been to be carried out" [6].

The design concept for this research has been a conclusive Design. Using conclusive design, the relationship between the satisfaction factors and passenger can be easily assessed. By using the conclusive design, a convivial model could be designed to fulfil the ultimate objective of this research. Another reason conclusive design has been best suited for

this research has been that of the large sample rate (300) and the fact that the primary data has been quantitative

B. Population and Sample

Research Sampling has been an act, a method of determining criteria or properties of the whole population. [7] Basic Tools of Research (Chapter 9) describes "A population distribution has been a statement of the regularity with which the units of analysis or cases that, together make up a population which have been observed or have been expected to be observed in the various classes or categories that make up a variable"

As per the [8], There have been 98.7% passengers arrives through Katunayake (BIA) to Sri Lanka. The target population of the research has been the passenger's departure from the BIA during the month of July to August. The annual statistical report 2016 of Tourism Research and Statistics indicates, 209,351 and 186,288 of passenger-arrivals during July and August of 2016. The random sampling method has been used in sample selection for departure passengers from BIA during the month of July and August.

C. The Questionnaire Design

The questionnaire used for this research has been designed on printed Forms; this had the main form of primary data used in this research. The questionnaire has been based on Multiple Choice methods where respondents would choose the most suitable answer. It had distributed among Bandaranaike international airport users using printed format to an identified sample size of 300. The questionnaire consisted of 2 parts which have been further discussed.

- Demographic
- Variables

D. Data Collection Method

Data originating from the researcher for the objective of addressing the research issue. It has been what the researcher originally collects from the target sample or population. In this specific study, primary data has been that collected from the sample/respondents through the deployment of questionnaires. The Secondary data has been the data that has been gathered and saved in databases, books or any other mode for some determination. In this study, secondary data has been collected from the registers of the companies used for the study and online articles and journals specifically relevant to the field of study, which has been customer satisfaction.

E. Data Analysis Tools and Methods

The process of analysing the collected data id adequately described beneath this division. The results of demographic data will be shown through multiple representation methods such as tables, bar charts and pie charts.

As the questionnaire has outlined on the printed form and Google forms This has included qualitative section, using a Liker weighting system. This qualitative data will be converted to quantitative data using a coding for a more accurate evaluation. Once the quantitative data has been

gathered, software i.e. Statistical Package for Social Science (SPSS) will be used to analyse the numerical data. The answers obtained from SPSS will ascertain the main variable and eliminate any highly correlated variable hence giving a more reliable picture of the collected data and rejecting any sort of reflection of data, which would a result in an inaccurate analysis. In data analysing by using statistical methods and the SPSS firstly Preparing data for entering to SPSS (Data coding), Defining the variables, Entering the collected data, Testing reliability using Cronbach alpha, Checking Bartlett's statistic and Kaiser-Meyer-Olkin, Data reduction using Factor analysis and Finally relationship with computed factors and demographic factors has been checked.

IV. ANALYSIS

A. Descriptive Analysis

According to the analysis the most number of Bandaranaike International Airport users have been Males which amount to 68.1% of the total usage. Females only count for 39.9% of the total users. From the study, the dominant usage has been of males whom satisfaction needs have been addressed by the study. According to the analysis the most number of Bandaranaike International Airport users have been Asian 78.3%. And European 9.1%, Oceania 8.7% and Others 3.8%. From the study, the main usage has been of Asian whom satisfaction needs have been addressed by the study

Due to the descriptive analysis of the research most of the Bandaranaike International Airport users have been young generation (around 16-25 yrs.). The age group of 25-40 stands next in usage. From the descriptive analysis, the most users have been annually users representing 42.6%, monthly users consist of 7.6% and other users on 49.8%. According to nominal data many of the Bandaranaike International Airport users have been largest amount has been 31.9% which have been between $300-$1000 incomes earners. Next largest amount has been 24.7% which have been between $75-$300 incomes earners. The data analysis indicates that the degree holders reside the highest in the sample analysis. Both A/L and Postgraduate share a similar proportion (14.4%) and others have been 17.5. Students (O/L's) indicate a lower representation of usage in Bandaranaike International Airport. The study could address the airport user needs by reaching out to the larger proportion users

Due to the sample data, private sector employees (11.8%) mostly use Bandaranaike International Airport services than public sector employees (55.5%).The sample data indicate that most of the Bandaranaike International Airport users have been people who travel for Pilgrimage (10%), Leisure (47%), Business (14%), Studies (14%) and other purposes (15%) whose requirements successfully addressed by the study users who travel for personal reasons also represent a large proportion in the selected population

By the sample data it has been evident that the Sri Lankan Airline (31%) has been the most used Airline service and Another Airline has been Second place (29%). both Singapore and Emirates have been got similar number of percentage (13%). Qatar and Malaysia Airlines have been low users in Bandaranaike international airport (8% and 6%).

B. Factor analysis

1) *Reliability Test:* *The reliability of the data set has tested, and the Cronbach alpha valve has occurred as .942, which has stated in the methodology as "Excellent". Therefore, the reliability of the data set has proved.*

2) *KMO Test and The Bartlett's test of Sphericity: "The Kaiser-Meyer-Olkin" value of the data has appeared as .905. This value lay KMO ≥ 0.9 and has termed as "Marvellous". This proved that the data set could use for the factor analysis. Bartlett's test of Sphericity has given the significance level as .000 (<.05). This has indicated that the variables used in the study have been unrelated. This provides that the variables of the study have been unsuitable for structure detection. The data set has accomplished the requirement of validation for conducting a factor analysis hence; the analysis has pursued the process of factor analysis*

3) *The Scree Plot: This scree plot analysis has plotted all the principal components. The components on the steep slope in the plot have been the best represents of the components. They describe the fundamental relationship among the variables of customer satisfaction identification process. This study has 9 first-rated principal components. The study has 41 components on the shallow slope, which has described as slight contribution towards selection process.*
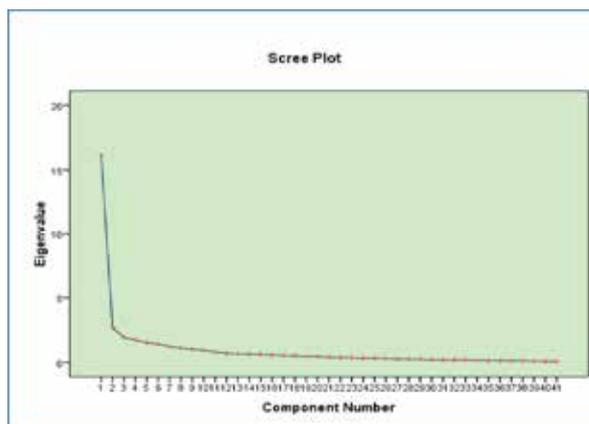

Fig.2 Scree Plot, Principal Component Analysis

4) *Principal Components Extracted from Factor Analysis: The analysis shows that the study has 9 principal components. The Cumulative percentage column has given that the percentage of variance has accounted 70.824 for the first 9 components of the study. The rotated component matrix helps in identifying which component belongs to which factor. It can be observed that although there are 41 factors, these factors can be grouped into 9 larger factors. The table below represent the categorized factors according to SPSS.*

TABLE 1
VARIABLES OF FACTORS IDENTIFIED

Factor 1: **Baggage Handling and Staff Professionalism**	User Friendly Environment Security Officer Behavior Standardized Baggage Handling Speed of Baggage Delivery Handling Baggage Misplacements Safety of Baggage Security Level of Baggage Staff Professionalism.
Factor 2: **Utility Related factors**	Parking Ticket Price Cleanliness at BIA Communication Hotel Booking Taxi Booking Comfortable Restroom Washroom Conditions Refund and Reverse Vending
Factor 3: **Display of information and Retailing**	Ease of Finding Way Displaying of Signage Flight Information Retailer.
Factor 4: **Safety and staff behaviour**	Safety of Passengers Passengers Security Level Waiting Area Condition Staff Behaviour
Factor 5: **Waiting area Facility**	Baggage Carts Condition Waiting Area Seat Capacity Boarding Area Seat Capacity Comfortable Seating.
Factor 6: **Personal Care Factors**	Medical and Healthcare firefighting Action Bank Service Transit Handling
Factor 7: **Queuing and Time related factors**	Counter Processing Time Queue Area Condition Wi-Fi Emergency Handling
Factor 8: **Parking Related Factors**	Comfortable Entrance Parking Area Condition Adequate Parking Areas
Factor 9: **Recreational Factors**	Restaurant Lounge Service Quality

Source: Researcher Output

C. Hypothesis test

TABLE 2

PEARSON CHI-SQUARE TEST OF BAGGAGE HANDLING AND STAFF PROFESSIONALISM

	Asymp. Sig. (2-sided) Nationality	Asymp. Sig. (2-sided) Travel Frequency	Asymp. Sig. (2-sided) Income	Asymp. Sig. (2-sided) Education	Asymp. Sig. (2-sided) Employment
Pearson Chi-square	**.001**	**.038**	**.024**	**.025**	**.139**
Likelihood Ratio	.003	.012	.006	.012	.055
Linear-by-Linear Association	.046	.240	.058	.211	.083
N of Valid Cases					

H_0: Baggage Handling and Staff Professionalism is independent from descriptive variables.

H_A: Baggage Handling and Staff Professionalism is dependent from descriptive variables.

- Baggage handling and staff professionalism has been significant with demographic variables such as nationality, travel frequency, income and education.
- Pearson chi-square test of a utility-related factor has indicated that it's highly significant with all the demographic variables.
- Pearson chi-square test of Display of information and retailing nationality has proved that income and education variables have been significant.
- Pearson chi-square test of safety and staff behaviour has explained that nationality and income variables have been significant.
- Chi-square test of waiting area facility gives that nationality, income, education and employment variables have a higher level of significance over it.
- Chi-square test of personal care factors has been significant with nationality, income and employment variables.
- Chi-square test of queuing and time-related factor has been insignificant with all the demographic variables.
- Chi-square test of parking-related factors has been vital with nationality and education variables.
- Chi-square test of recreational factors has been insignificant with all the demographic variables of the study.

V. CONCLUSION

A. Conclusion from the Analysis of the Study

The Descriptive analysis of the study has shown that most numbers of BIA users have been Asian male. The logical reason for this result has been that the researcher has used only the arrival terminal Bandaranaike international airport and most of Asians tend to come to the country through BIA. In the age, category 16-25 age group has been got the highest percentage of using BIA. Most of the respondents represent the average income level between $300-$1000 and indicated that they use to arrival terminal annually. For travel purposes, most of the respondents of the research have been Leisure travellers, because Sri Lanka has been a more attractive country in the tourism industry. The other respondents have shown a similar percentage in travel purpose i.e. business and study category. Majority of the BIA respondents of the survey have been degree holders and working in the privet sector. Sri Lankan airline has been the most used airline in Bandaranaike international airport as its national airline in Sri Lanka.

In the reliability test of the study, Cronbach alpha got 0.942 value and KMO value of the data has appeared as 0.905 proving that the dataset has acceptable to proceed in factor analysis. It has been the successful step to the research. A factor analysis had carried out to reduce the number of variables of the study. The analysis has generated nine factors out of the forty-one factors. The computer-generated factors have been baggage handling and staff professionalism, utility-related factors, display of

information and retailing, safety and staff behaviour, waiting area facility, personal care facility, queuing and time-related factors, parking-related factors, recreational factors. The principal component analysis extraction sums of squared loading of the analysis have explained that the first 9 components of the study have represented 70.824%. An equation has been formulated to express the relationship between observed variables and the generated component. The formulate equation has been the component score coefficient matrix of the variable multiple by affiliate variable of the component and get the summation.

Cross-tabulation analysis of the demographic variables and computed factors has been conveyed to examine the significance of each variable to the generated factors. Pearson chi-square test has revealed that baggage handling and staff professionalism has been significant with demographic variables such as nationality, travel frequency, income and education. Pearson chi-square test of a utility-related factor has indicated that it's highly significant with all the demographic variables. Pearson chi-square test of Display of information and retailing nationality has proved that income and education variables have been significant. Pearson chi-square test of safety and staff behaviour has explained that nationality and income variables have been significant. Chi-square test of waiting area facility gives that nationality, income, education and employment variables have a higher level of significance over it. Chi-square test of personal care factors has been significant with nationality, income and employment variables. Chi-square test of queuing and time-related factor has been insignificant with all the demographic variables. Chi-square test of parking-related factors has been vital with nationality and education variables. Chi-square test of recreational factors has been insignificant with all the demographic variables of the study.

B. Recommendation

The research has suggested that developing the parking facilities and improves the customer handling services by expanding the parking facilities for the BIA users by preparing the proper plan for the parking might enhance the satisfaction of the customer. Research has proposed that upgrades in communication, information technology and Wi-Fi facilities, and a vast range of retailer will heighten the attraction. Establishment of free Wi-Fi service has been required by most of the respondents.

BIA should introduce the modern facilities like other airports in the world to attract the foreign investments to develop Sri Lankan economy by giving better services to the passengers and need more caring about the passengers. BIA must facilitate with the separate immigration counters for the foreigners and local passengers. Otherwise, all the passengers have been standing on a queue until the right turn and the checking counter staff services must be improved by allocating more staff for the different requirements of the passengers.

C. Limitations of the Study

The scope of the study has limited to Bandaranaike International Airport services in Sri Lanka, but Sri Lanka has another airport to handle passengers. Factors that affect customer satisfaction in another Airport service could be different from the findings of this survey. In future studying

& surveying on all the Airport services in Sri Lanka will help to overcome this limitation.

In future studies surveys done with other terminal and another airport, related respondents may give a solid result.

Affecting of more demographic factors will be enhancing the opportunity to measure the satisfaction of the passengers by doing future research on it. Developing of the research can be carried out by adding more variables other than mentioned in this research and according to that analysis the passenger preference on the BIA.

VI. Acknowledgment

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