A Study on Importance and Satisfaction of Airport Selection Attributes: Focus on Gimpo International Airport and Incheon International Airport

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Abstract

This study is aimed at identifying the importance and satisfaction of airport selection attributes by targeting Incheon International Airport and Gimpo International Airport in the metropolitan area of Korea. For this research, Korean aviation experts were surveyed and the differences between importance and satisfaction of airport selection attributes were analyzed by utilizing gap analysis and importance-performance analysis. As for Gimpo International Airport, the satisfaction was higher than the importance in terms of accessibility and facilities. In addition, as for Incheon International Airport, the satisfaction was higher than the importance in terms of operation, facilities, services and spatiality. Based on the findings, the relative strengths, weaknesses, and strategic alternatives of each airport were introduced.

Keywords: airport selection attributes; airport competitiveness; gap analysis; importance-performance analysis

1. Introduction

The airports in Korea are competing fiercely with foreign airports in Northeast Asia including China, Japan, Hong Kong, and Taiwan. It has led to their facility expansion and more investment in airport services to attract more customers. Also, low-cost airlines are growing rapidly, leading to the rapid increase in air travel demand. Thus, the competition among airports is expected to increase significantly. Under the circumstances, Korea's two gateway airports, Incheon International Airport (IIA) and Gimpo International Airport (GIA), are striving to attract more customers. Specifically, they are trying to maximize customer satisfaction and values by grasping their needs and exceeding their expectations. Through the paradigm shift, they are striving to attract more customers and increase their revenues.

To maximize profits and actively respond to the rapidly changing airline industry, airports should identify the airport selection attributes and set strategies accordingly. Therefore, this study is intended to identify the airport selection attributes perceived as important by airport users and the satisfaction in each attribute to offer strategic implications that should be pursued by airports to boost their competitiveness and attract more customers. In particular, this study seeks to analyze the differences between the importance and satisfaction in airport selection attributes perceived by the users of Korea's two gateway airports, IIA and GIA.

2. Airport Selection Attributes

Selection attributes refer to the physical, observable characteristics of a product and has a relatively specific meaning. The attributes have a significant impact on product selection and thus affect the decision-making of consumers. Selection attributes have differential features compared to importance. Consumer choice behaviors are the result of intrinsic decision-making process of humans. It involves the following. First, customer evaluation on their decision-making alternatives consists of factors that include the environment and space that limit the evaluation.

Second, the attributes of alternatives are integrated towards the perceived destination. Third, the evaluated attributes are linked to spatial behaviors through the decision-making principles of individuals. When travelers select an airport, they are affected by such selection attributes. There are lots of studies on airport selection and the selection attributes. There are various factors that affect the airport selection, which are as follows.

Bradley (1998) found that airfare, number of flights, time to access the airport, transportation for airport access affect the airport selection. Among them, he found that airfare and time to access the airport are the most significant attributes. In addition, he found that travel time and number of flights are highly significant among the business travelers. Adler et al. (2005) and Hess et al. (2007) stated the following as the airport selection attributes: airlines; time to access the airport; flight time; connectivity; airfare; flight delay; aircraft model, punctuality; frequent flyer program. Loo (2008) chose the following as significant attributes for airport selection: time to access the airport; access method; access cost; number of airlines; number of flights; airfare; shopping and check-in delay. Among them, airfare, time to access the airport, number of flights, and number of airlines are statistically very significant. In particular, airfare, time to access the airport, and number of flights are significant among all airport customers using multiple flights. Naohara et al. (1993) and Furuichi (1994) conducted a study on airport selection among airport users travelling abroad from Japan. They found that accessibility, time to access the airport, and number of flights are highly significant factors. According to Windle & Dresner (1995), the important factors for airport selection in Washington DC and Baltimore are time to access the airport and number of flights. They were established as the most basic and significant factors. Also, greater competition makes the time-related access factor less important, according to them. Among the airport selection attributes, Marco (2008) established the following as the variables related to airlines and flights: availability of flights to particular destinations; availability of preferred airlines; frequent flyer program; number of flights; airfare; in-flight services; punctuality. In particular, he stated that the number of flights is a significant factor in airport selection, because more flights increase the choices of departure and arrival time. Marcucci and Gatta (2011) introduced five variables that affect airport selection; they include the following: type of airlines; flight connectivity; waiting time; parking space; number of flights.

3. Methodology

This study has established the airport selection attributes and items based on the previous studies and in-depth interview with aviation experts in Korea. The final survey contains 15 questions on the following five factors: accessibility; operation; facilities; services; spatiality. Those factors are regarded as important selection attributes in Korean airports. The factors were used to analyze the differences between the importance and satisfaction in GIA and IIA selection attributes. The importance of the attributes was evaluated through Likert 7-point scale. The importance was measured as follows: 1= Not very important; 7=Very important. The satisfaction in airport selection attributes was measured as follows: 1=Very dissatisfied; 7=Very satisfied. The measured variables and items are indicated in Table 1.

Table 1: Airport Selection Attributes

Factor	Item
Accessibility	Time to access airport
	Transportation to airport
	Transportation cost
Operation	Flight frequency
	Flight schedule
	Routes
Facilities	Resting facilities
	Parking facilities
	Information facilities
	Commercial facilities
Services	Customs, immigration and quarantine (CIQ) service quality
	Luggage handling
	Employee service quality
Spatiality	Airport image
	Airport cleanliness

This study has surveyed Korean aviation experts as to the importance and satisfaction of airport selection attributes in GIA and IIA. The aviation experts were those working for a government agency, educational institution, research institute, airline, or an aviation related company. The survey was done for a month from July to August in 2014. A total of 150 copies of the questionnaire were distributed and 93 of them were used for empirical analysis. Those with insincere or unreliable responses were excluded. The demographic characteristics of the sample are indicated in Table 2.

Table 2: Demographic Features

Item		Number	Percentage (%)
Gender	Male	56	60.2
	Female	36	38.7
Age	20s	5	5.4
	30s	34	36.6
	40s	39	41.9
	50s	14	15.1
Work Experience	Less than 5 years	20	21.5
	5-10 years	19	20.4
	11-15 years	20	21.5
	15 years	33	35.5
Career Field	Government agency	29	31.2
	Educational institution, research institute	19	20.4
	Airline, company related to air travel	44	47.3
Main Airport Used	Gimpo International Airport	26	28.0
	Incheon International Airport	65	69.9
	Others	2	2.2
Main Route Used	China	6	6.5
	Japan	6	6.5
	Southeast Asia	37	39.8
	Others	43	46.2
Travel Companions	Alone	17	18.3
	2-3	55	59.1
	4-5	17	18.3
	6 or more	3	4.3
Purpose of Travel	Sightseeing	65	69.9
	Visiting relatives/ friends	5	5.4
	Work	20	21.5
	Others	3	3.2
Transportation	Car	22	23.7
	Bus	38	40.9
	Subway	32	34.4
	Taxi	1	1.1
	Missing value	1	1.1
	Total	93	100

4. Empirical Results

4.1 Gap Analysis

T-test was conducted to verify the differences between the importance and satisfaction in airport selection attributes. The results of gap analysis for each factor and item are shown in Table 3 and Table 4. Significant differences were found between GIA and IIA in each factor.

Table 3: Result of Gap Analysis for Each Factor

Factor	GIA			IIA		
	Importance	Satisfaction	p-value	Importance	Satisfaction	p-value
Accessibility	5.63	6.20	.000***	5.63	4.49	.000***
Operation	5.85	4.98	.000***	5.85	5.92	.495
Facilities	4.52	4.62	.497	4.52	5.67	.000***
Services	5.34	5.32	.883	5.34	5.94	.000***
Spatiality	5.42	5.34	.621	5.42	6.32	.000***

*** $p < 0.001$

Table 4: Result of Gap Analysis for Each Item

Factor	Attribute	GIA			IIA		
		Importance	Satisfaction	p-value	Importance	Satisfaction	p-value
Accessibility	Time to access airport	5.66	6.20	.000***	5.66	4.49	.000***
	Transportation to airport	5.88	6.25	.001*	5.88	5.17	.000***
	Transportation cost	5.35	6.14	.000***	5.35	3.81	.000***
Operation	Flight frequency	5.72	5.21	.001***	5.72	5.80	.566
	Flight schedule	5.83	5.08	.000***	5.83	5.88	.669
	Flight routes	6.01	4.66	.000***	6.01	6.10	.453
Facilities	Resting facilities	4.64	4.41	.191	4.64	5.90	.000***
	Parking facilities	4.31	4.53	.272	4.31	5.19	.000***
	Information facilities	4.49	4.79	.134	4.49	5.68	.000***
	Commercial facilities	4.63	4.74	.533	4.63	5.92	.000***
Services	CIQ service quality	5.20	5.20	.978	5.20	5.98	.000***
	Luggage handling	5.43	5.39	.785	5.43	5.97	.000***
	Employee service quality	5.38	5.37	.928	5.38	5.86	.001*
Spatiality	Airport image	5.24	5.29	.754	5.24	6.29	.000***
	Airport cleanliness	5.59	5.39	.220	5.59	6.35	.000***

* $P < 0.05$, *** $P < 0.001$

As for GIA, the satisfaction was higher than the importance in terms of accessibility and facilities. As for IIA, the satisfaction was higher than the importance among all attributes, except for accessibility. In particular, there were significant differences in the following factors at both airports: time to get to the airport; transportation time; traffic charge. Those are sub-factors of accessibility.

GIA is located in Seoul, the capital and biggest city of Korea. Thus, the accessibility of GIA is much higher than the IIA. Accordingly, the accessibility satisfaction in GIA was very high. It is the second largest airport in Korea with the highest accessibility as it is located in Seoul. However, the accessibility satisfaction in IIA was lower than expected. Although transportation facilities were built to improve the accessibility, the satisfaction was lower than expected. Even though there are diverse transportation means such as airport railroad and airport shuttle, it is inconvenient for users, due to lower accessibility than GIA.

The operation factor of the two airports is as follows. While the GIA users considered flight factor as important, their satisfaction was low. Thus, the airport needs to increase their satisfaction by increasing the routes and number of flights. As for IIA, there were no significant differences in flight factor. Although it was opened only 13 years ago, the number of airlines and routes has increased 60%, with 88 airlines flying to 183 cities around the world (as of January 2013). With so many airlines, the airport has heavily invested in facilities to preoccupy the air travel demand and gain a competitive edge in Northeast Asia's air travel market. It is planning to expand the aircraft mooring points and transportation facilities by 2017. It led to the customer satisfaction as to its flight factor as expected.

As for GIA, there were no significant differences in the facilities, services, and spatiality. However, there were significant differences in those areas at IIA. In fact, GIA is more than 30 years old. Thus, its facilities are mostly worn out. Above all, it needs to expand the waiting area for group travelers and replace old facilities. Also, various measures and strategies are needed for passenger safety and to create a pleasant waiting area. In particular, the following are recommended: boarding bridge and moving walk expansion; increasing the number of security checkpoints; reducing the luggage handling time by reorganizing the check-in counters and luggage management system. In other words, the airport needs to be transformed into a customer-friendly, convenient airport by boosting its functionality and convenience.

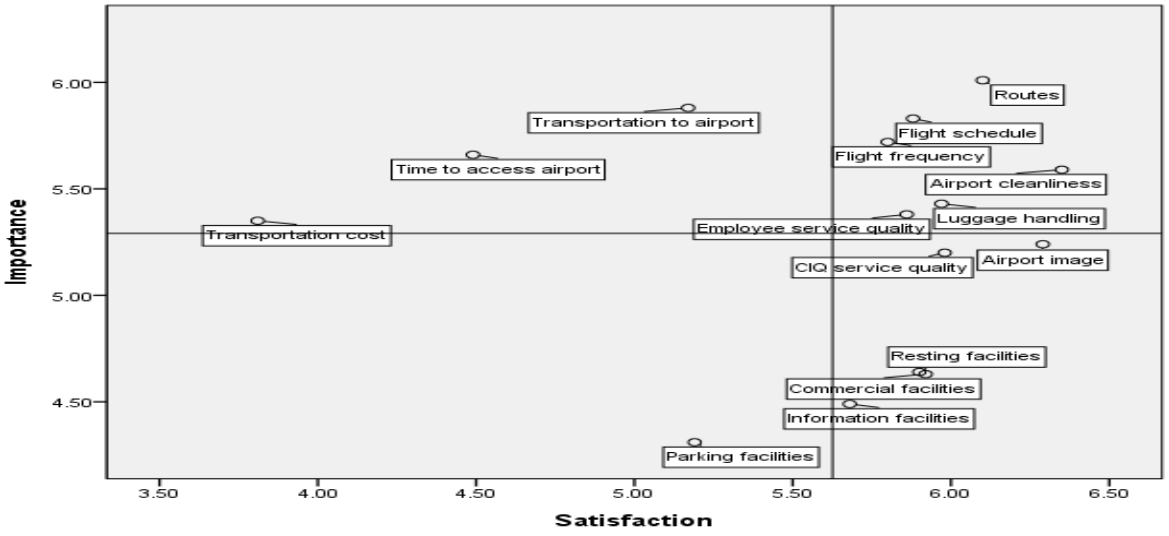
In terms of spatiality, the importance score was 5.42 and satisfaction score was 5.34 for GIA. It means that the satisfaction in GIA is lower than the expectations, given its image and cleanliness. However, the differences were not statistically significant. On the other hand, the satisfaction in the IIA's spatiality was very high. It is because the airport won the World's Best Airport Award and attracted lots of officials, boosting its brand value.

4.2 IPA Results

According to Martilla & James (1977), it is more effective to use a median value than the mean value when the data is concentrated on particular values. For relative evaluation of data, however, it is more effective to use the mean value. Therefore, IPA was conducted by applying the mean value. The mean value of importance stood at 5.29. In terms of mean value of satisfaction, GIA scored 5.24, while IIA scored 5.63. The results on the items of "Keep up the good work", "Concentrate here", "Low priority" and "Possible overkill" in accordance with IPA matrix as to importance and satisfaction of the airport selection attributes are as shown in Figure 1 and 2.

Figure 1: IPA Result for GIA

Figure 2: IPA Result for IIA



The IPA analysis by airport showed that some items belong to the same quadrant, while there are differences in others. Among the accessibility-related items for "Keep up the good work," there is 'transportation.' It is because both GIA and IIA focus on their airport transportation. They should maintain their performance in transportation. As for GIA, its transportation to airport, transportation cost and access time belong to the "Keep up the good work" quadrant. As for IIA, they belong to the "Concentrate here" quadrant. It reflects the tollgate fees and more time to get to IIA.

The items in the "Concentrate here" quadrant are the ones with low satisfaction, although they are perceived to be important by the customers. Thus, the items should receive the most investment to boost the satisfaction. Those are the area that can bring the maximum effect with minimum investment. The reason operation related items belong to "Concentrate here" at GIA is because it is not able to meet the customer demand, despite the increased number of international flights. Therefore, it needs to improve the flight routes, frequency, and schedule as the first priority.

As for IIA, transportation to airport, access time and transportation cost, the accessibility items, belong to this quadrant. Thus, the airport needs to create measures to reduce the access time and transportation cost to boost the customer satisfaction.

The items in the "Low priority" quadrant are ignored by the customers and don't need to be improved on. They exist mainly at GIA. However, it is not necessary to invest in the items, unless they are not actively used, and heavy investment is not necessary. Since remodeling is planned for GIA with completion by 2017, the items are likely to be improved naturally. Thus, the items don't need to be worked on for the time being.

The items in the "Possible overkill" quadrant are not so important, but the satisfaction is high. If the attributes in the quadrant are applied to other areas, it can bring better results. The "Possible overkill" items are the ones with excessive investment, although the attributes are not so important. It is 'airport image' at GIA and 'facilities' at IIA. It shows that the airport focuses on its facilities with excessive investment. Thus, IIA should focus on reducing the transportation cost, rather than facility investment.

5. Conclusion and Implication

This study has identified the importance and satisfaction of airport selection attributes by targeting Korea's two gateway airports. As a result of gap analysis, there were significant differences between the importance and satisfaction in the airport selection attributes. At GIA, the differences were found in the following factors: access time; transportation; transportation cost; flight frequency; flight schedule; flight routes. At IIA, the differences were found in the following factors: access time; transportation; transportation cost; resting facilities; parking facilities; information facilities; commercial facilities; CIQ service quality; luggage handling; employee service quality; airport image; airport cleanliness.

According to IPA analysis, routes, frequency and schedule of flights need to be improved for GIA. As for IIA, the accessibility needs to be improved urgently. It needs to maintain the customer satisfaction by providing convenient transportation and reducing the cost. At both airports, luggage handling, employee service quality, airport cleanliness were perceived to be very important by the customers. In terms of operation, GIA is not able to meet the customer demand, although it has increased the number of international flights. Thus, it needs to improve the routes, frequency, and schedule of its flights. In terms of facilities, IIA showed high satisfaction in most areas, while it was low at GIA. Thus, it needs to replace its old facilities with heavy investment. As for IIA, it has invested too much on its facilities so it needs to focus more on reducing the transportation cost.

The purpose of this study is to offer strategic suggestions on GIA and IIA by identifying the importance and satisfaction of airport selection attributes. That's what makes this study unique and significant. However, this study has the following limitations. First, the importance and satisfaction were identified only about the overall airport selection attributes. If more items are examined as an airport city, including culture, arts, and technology, it will bring more meaningful results. Second, this study examined only two airports in the metropolitan area, although there are 15 airports in Korea. Thus, the importance at each airport was not fully reflected. Third, the sample size was not big enough. In this study, 150 aviation experts were surveyed and 93 copies were used for empirical analysis. A bigger sample size is necessary to gain more reliable results. Importance and satisfaction in airports can change, depending on the demand, oil price, and airline supply. Therefore, it will be meaningful to examine the changes in importance and satisfaction in airports over several years, rather than a particular time.

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References

Adler, T., Falzarano, C.S., &Spitz, G. (2005). Modeling service trade-offs in air itinerary choices. Transportation Research Record: Journal of the Transportation Research Board, 1915, 20-26.

Bradley, M. (1998). Behavioral models of airport choice and air route choice. In J. D. Ortuzar, D. Hensher, & S. Jara-Diaz (Eds.), Travel Behaviour Research: Updating the State of Play (pp. 141–145). Amsterdam: Elsevier.

Furuichi, M., & Koppelman, F. S. (1994). An analysis of air travelers' departure airport and destination choice behavior. Transportation Research Part A, 28(3), 187-195.

Hess, S., Adler, T., & Polak, J.W. (2007). Modelling airport and airline choice behavior with the use of stated preference survey data. Transportation Research Part E, 43(3), 221-233.

Loo, B. (2008). Passengers' airport choice within multi-airport region (MARs): some insights from a stated preference survey at Hong Kong International Airport. Journal of Transport Geography, 16(2), 117-125.

Naohara, S., Uai, T., Hyodo, T., & Morichi, S. (1993) Analysis of international passengers from non-major airports. Proceedings of Annual Conference of JSCE, 4(43), 492-493.

Marco, K., (2008). The Role of Accessibility in Passengers' Choice of Airports, International Transport Forum, Discussion Paper No. 2008-14

Marcucci, E., & Gatta, V. (2011). Regional airport choice: Consumer behaviour and policy implications. Journal of Transport Geography, 19(1), 70-84.

Martilla, J.A, & James, J.C. (1977). Importance-performance analysis. Journal of Marketing, 41(1), 77-79.

Windle, R., & Dresner, M. (1995). Airport choice in multiple-airport regions. Journal of Transport Engineering, 121(4), 332-337.