



Thai Passengers' Satisfaction on Self-Service Technology Adoption at the Suvarnabhumi Airport, Thailand

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Abstract

Suvarnabhumi Airport is considered being the gateway of Thailand. The capability of the airport is the key factor to be capable of handling the growing number of passenger either Thai or Foreigner. Undoubtedly, the installation of the self-service technology is becoming a strategy and facilitating the airport passengers. The research purposed to study and compare Thai passengers' satisfaction levels toward the adoption of the self-service technology at Suvarnabhumi Airport. The 400 questionnaires were executed to collect data from Thai passengers who traveled through Suvarnabhumi Airport using simple random sampling method. The study revealed that most Thai passengers have an overall satisfaction of check-in Kiosk service ($\bar{X} = 3.693$) regarding its convenient which have the most opinion ($\bar{X} = 3.762$) due to the convenient access of Kiosk counters. In terms of the satisfaction of an automated passport control gate, most respondents have an overall opinion ($\bar{X} = 3.680$) as it enables passengers to reduce processes and time to enter the country's immigration control. Furthermore, Thai passengers have an overall view about the flight information display ($\bar{X} = 3.946$) which allows passengers to retrieve their flight status. The finding of comparison between respondents' satisfaction perspectives towards the self-service technology application at Suvarnabhumi Airport suggests that the kiosk check-in counter, the automated passport control gate, and the flight information display monitor show the perspectives differently with statistical significance.

Keywords: Passenger Satisfactions, Self-service Technology, Suvarnabhumi Airport

1. Introduction

The International Air Transport Association (IATA) speculated that passenger's global air transportation would be double to 8.2 billion by 2037. Especially, The Asia-Pacific segment will play a major role in growth with greater than an equal part of the total amounts of perspective passengers over the next 20 years coming from its markets. IATA also revealed that this market is being streamlined by integration of a continuous forceful economic growth, a rise in household incomes, and improvements of a satisfactory population and demographic profiles. (International Air Transport Association, 2018). Furthermore, all told, the world's airports facilitated 8,277,676,508 passengers, 118,612,750 metric tons of cargo, and 95,772,011 aircraft movements. (Airport Council International, 2018). Air transports are also equally important in connecting people and linking economies to further develop the global economy. (Green, 2014). The development of airports is a necessary part of the nation's air transport system. They provide all the basic physical, organizational structures and facilities required to enable passengers and cargo to transfer from ground to air and allow airlines for taking off and landing. (Wells and Young, 2004; Graham, 2014). According to the forecasting of The International Civil Aviation Organization or ICAO, it has taken into account many divergent and opposing perspectives, while they also endorse the current optimism of airlines and aircraft manufacturers. It further contains various market trends and analyses concerning economic growth and technological change. (The International Civil Aviation Organization, 2017). Airport providers are likewise shifting to adopt technological innovations to play a key role in its industry towards a more frictionless, "traveller-centric" approach to the end-to-end travel journey. (CTM, 2018).

The rapid expansion of Thailand's aviation growth is the centre of gravity for global aviation shifts to the Asia-Pacific region. This is reflected through the constantly increasing in the total air traffic across the country in recent years. (Thailand Board of Investment, 2016). The six major airports in Thailand consists of Suvarnabhumi Airport, Don Mueang International Airport, Chiang Mai International Airport,



Hat Yai International Airport, Phuket International Airport and Mae Fah Luang – Chiang Rai International Airport. These mentioned airports are operating by Airports of Thailand Public Company Limited or AOT. According to the AOT's 2018 annual report, Suvarnabhumi Airport and Don Mueang International Airport are the main airports that accommodated a total of 878,999 flights and 139,518,488 persons of AOT's aircraft movement and passenger number, both domestic and international. (Airports of Thailand Public Company Limited, 2018). The Suvarnabhumi airport has been adopting a campaign for air passengers to use its automatic check-in kiosks to reduce the congestion during departure time. (Thai PBS, 2015). Two automated passport control gates, getting through airport customs and immigration process, are typically take around 30-45 minutes to proceed. But with the latest self-service machines, passengers will take less than 20 seconds. The automated passport control gate uses the biometric identification to verify passport holders, including facial recognition and fingerprints. (ctn news, 2018). Furthermore, the adoption of the flight information display monitor is able to lead airport passengers to their gates on time. (Siemens, 2010). The installation of the self-service technologies, in regard to the machine's product, service and convenience, at Suvarnabhumi airport will enable its passengers to experience a seamless traveling through the airport and promote its organization as the air transport gateway of the ASEAN region.

2. Objectives

1. To study Thai passenger's satisfaction levels on the application of the self-service technology at Suvarnabhumi Airport
2. To compare the adoption of the self-service technology at Suvarnabhumi Airport on Thai passenger's satisfaction

3. Materials and Methods

Quantitative Research was utilized in this study which cohered to the objectives of the study. Data collections were separated into 2 types:

3.1 Primary Data

400 Questionnaires were distributed to collect data from Thai people who had used the self-service technologies, for instance, the kiosk check-in counter, the automated passport control gate control, and the flight display information at Suvarnabhumi Airport using simple random sampling method. Descriptive Statistics were used to describe the frequency distribution data. Percentage, mean score, and standard deviation were used to analyze the statistical data. Also, the data from the rating scale and One - way ANOVA f-Test were analyzed in terms of the adoption of the self-service technologies at Suvarnabhumi Airport on Thai passenger's satisfaction.

3.2 Secondary Data

As to gather information correlating to the study, the researchers have studied concepts, theories, and relevant research from various sources with regard to the adoption of the self-service technology, such as the kiosk check-in counter, the automated passport control gate control, and the flight display information and the satisfaction of airport passengers with regard to its product, service, and the convenience of the self-service technologies.

4. Results and Discussion

4.1 Results

In the study of Thai Passengers Satisfaction as it relates to the self-service technology adoption at Suvarnabhumi Airport, Thailand, the researchers have gathered information from primary data and secondary data. The results of the quantitative data were retrieved as questionnaires from Thai passengers who traveled through Suvarnabhumi Airport, and consisted of the following:



4.1.1 Respondents Demographic Data

It is clearly seen that most of the respondents were females with 51 percent and males with 49 percent. The greater number of domestic passengers had a range of age 20 – 40 years old (70.30 percent), age 41-60 years old (23.80) and age lower than 20 years old (6 percent). The major of marital status was married with a percentage at 53.50 and unmarried at 46.50 percent. For the part of education, great quantities of respondents graduated with a bachelor's degree, followed by a master's degree 13.30 percent, vocational level 9 percent, high school level 5 percent and doctorate only 1 percent. A large number of occupations of the passengers were company employee 45.30 percent, business owner 22 percent, state enterprise staff 14 percent, student 11 percent, government officer 4.80 percent and other careers 3 percent. Most of Thai passengers had earned monthly incomes 15,000 - 25,000 Baht (32.30 percent), 25,001 -35,000 Baht (30 percent), 35,001 - 45,000 Baht (19.30), 45,000 Baht (9.50 percent) and rest of respondents who had had lower income than 15,000 Baht (9 percent) respectively.

4.1.2 Respondents satisfactions toward application of the self-service technologies at Suvarnabhumi Airport.

According to Thais' respondent satisfaction in perspectives of the self-service technology's convenience, service and product. The data were analyzed into those aspects from the most to the least scale found that:

4.1.2.1 The kiosk check-in counter had an overall point of views from Thais at the average ($\bar{x} = 3.693$), 1) the convenience of kiosk at the average rating ($\bar{x} = 3.762$), in terms of the accessibility of the kiosks which have less complexity of using ($\bar{x} = 3.860$), the convenience of serving passengers ($\bar{x} = 3.742$), and clear manual for checking in ($\bar{x} = 3.685$). 2) the service of the kiosks at the average rating ($\bar{x} = 3.720$), with regard to the displays of foreign languages ($\bar{x} = 3.807$), the in-time responding for check in ($\bar{x} = 3.757$), the global quality of machines in system designation ($\bar{x} = 3.742$), and the understandable manual and directory ($\bar{x} = 3.575$), and 3) the kiosk product at the average rating ($\bar{x} = 3.596$), regarding the favorable color of the kiosk check-in counters which are sorted by the airline colors ($\bar{x} = 3.380$), the modern design of the kiosk counters ($\bar{x} = 3.795$), the suitable size that had been placed in a passengers check-in areas ($\bar{x} = 3.640$), and a large number of kiosk counters that located in the departure hall of Suvarnabhumi Airport($\bar{x} = 3.570$).

Table 1 Respondents satisfactions perspectives toward application of kiosk check-in counter at Suvarnabhumi Airport

Satisfactory Perspectives	\bar{x}	S.D.	Satisfactions Rating Scale	Ranking
Convenience	3.762	0.438	Satisfied	1
Service	3.720	0.515	Satisfied	2
Product	3.596	0.422	Satisfied	3

4.1.2.2 The automated passport control gate had a total aspect of the passengers at the average ($\bar{x} = 3.680$), 1) the convenience of the auto gate at the average rating ($\bar{x} = 3.741$) regarding the machine's clear guidance for using ($\bar{x} = 3.855$), a decrease in the passengers' time spending on passport control procedures ($\bar{x} = 3.687$), and passengers' needs satisfaction to get through those passport control area ($\bar{x} = 3.682$). 2) the service of the auto gate at the average rating ($\bar{x} = 3.670$) in terms of the machines' intelligible using procedures ($\bar{x} = 3.830$), a precise data detection from passengers passport information ($\bar{x} = 3.687$), passengers' time saving in the arrival area ($\bar{x} = 3.495$). 3) The automated passport control gate's product with the average rating ($\bar{x} = 3.629$) regards to the auto gate's functional design ($\bar{x} = 3.690$), the auto gate's capability of a large number of Thai passengers ($\bar{x} = 3.667$), the auto gates' worldwide standard design ($\bar{x} = 3.625$), and the auto gates' outstanding characteristics ($\bar{x} = 3.535$).



Table 2 Respondents satisfactions perspectives toward application of automated passport control gate at Suvarnabhumi Airport

Satisfactory Perspectives	\bar{x}	S.D.	Satisfactions Rating Scale	Ranking
Convenience	3.741	0.498	Satisfied	1
Service	3.670	0.465	Satisfied	2
Product	3.741	0.498	Satisfied	3

4.1.2.3 The flight information display monitor had an overall perspective of respondents with the average rating ($\bar{x} = 3.964$), 1) the product of the flight information display monitor with the average rating ($\bar{x} = 3.899$), regards to the size of its screen edge which has a proper dimension ($\bar{x} = 4.112$), a greater number of installed monitors that suitable for the large amount of Thai passengers ($\bar{x} = 3.905$), and the area, either arrival or departure hall, that appropriately placed the flight information display monitors ($\bar{x} = 3.677$). 2) the convenience of the flight information display monitor at the average rating ($\bar{x} = 4.083$), a responding from the flight information display service at the airport that was well received by Thais ($\bar{x} = 4.1175$), the installation of the flight information display monitors in the passenger terminal, both arrival and departure hall, has an eye-catching or is easy to spot ($\bar{x} = 4.075$), and the more convenience for looking into airlines' flight timetable ($\bar{x} = 4.057$), and 3) the service of the flight information display monitor at the average rating ($\bar{x} = 3.858$), regards to the locations of the flight information monitor inside Suvarnabhumi Airport that are able to display the useful information for the passengers to readily check their flight status ($\bar{x} = 4.032$), the capability of the monitors also displayed suitable data which related to passengers' needs ($\bar{x} = 3.862$), and the font size of the monitors that were also legible ($\bar{x} = 3.680$).

Table 3 Respondents satisfactions perspectives toward application of flight information display monitor at Suvarnabhumi Airport

Satisfactory Perspectives	\bar{x}	S.D.	Satisfactions Rating Scale	Ranking
Convenience	4.083	0.438	Satisfied	1
Service	3.858	0.515	Satisfied	3
Product	3.898	0.422	Satisfied	2

4.1.3 Analyzed Hypotheses Testing

Mentioning the self-service technology regarding the kiosk check-in counter, the automated passport control gate, and the flight information display monitor, of which Thai passengers had a point of views about its service, It seemed that the difference of those self-service technologies that is related to Thai passengers' satisfaction was statically significant. Thus, it is hypothesized that:

H0: There is no difference in the satisfaction level of Thai passengers in regard to the self-service technologies.

H1: The difference of Suvarnabhumi Airport's self-service technology relate to Thai passengers' satisfaction.

**Table 4** Comparison between Suvarnabhumi Airport's kiosk check-in counter relate to Thai passengers' satisfaction

Kiosk Check-In Counter (Independent Variance)								
Dependent Variances	Analysis of Variance	SS	DF	MS	F	Sig.	\bar{x}	S.D.
Product	Between Subjects Variance	35.747	8	4.468	104.791	0.000*	-	-
	Within Subjects Variance	16.673	391	0.043	-	-	-	-
	Total Variance	52.420	399	-	-	-	3.596	0.422
Service	Between Subjects Variance	39.481	10	3.948	118.702	0.000*	-	-
	Within Subjects Variance	12.939	389	0.033	-	-	-	-
	Total Variance	52.420	399	-	-	-	3.720	0.515
Convenience	Between Subjects Variance	30.556	5	6.111	110.127	0.000*	-	-
	Within Subjects Variance	21.864	5	6.111	-	-	-	-
	Total Variance	52.420	399	-	-	-	3.762	0.438

Note: Significance at $p < 0.05$

Table 4 shows that Thai passengers' satisfaction differs significantly related to the kiosk check-in counter, concerning its product, service and convenience. In all three cases, the state of a null hypothesis is that there is no difference in the (product/service/convenience) satisfaction level of Thai passengers in regard to the kiosk check-in counter.

**Table 5** Comparison between Suvarnabhumi Airport's automated passport control gate relate to Thai passengers' satisfaction

Dependent Variances	Analysis of Variance	Automated passport Control Gate (Independent Variance)						
		SS	DF	MS	F	Sig.	\bar{X}	S.D.
Product	Between Subjects Variance	51.497	9	5.722	165.185	0.000*	-	-
	Within Subjects Variance	13.509	390	0.035	-	-	-	-
	Total Variance	65.006	399	-	-	-	3.629	0.428
Service	Between Subjects Variance	53.951	8	6.744	6.744	6.744	-	-
	Within Subjects Variance	11.055	391	0.028	-	-	-	-
	Total Variance	65.006	399	-	-	-	3.670	0.465
Convenience	Between Subjects Variance	54.067	7	7.724	276.773	0.000*	-	-
	Within Subjects Variance	10.939	392	0.028	-	-	-	-
	Total Variance	65.006	399	-	-	-	3.741	0.498

Note: Significance at $p < 0.05$

According to the result, Table 5 reveals that Thai passengers' satisfaction differs significantly related to the automated passport control gate, concerning its product, service and convenience. In all three cases, the state of a null hypothesis is that there is no difference in the (product/service/convenience) satisfaction level of Thai passengers in regard to the automated passport control gate.

**Table 6** Comparison between Suvarnabhumi Airport's flight information display monitor relate to Thai passengers' satisfaction

Dependent Variances	Analysis of Variance	Flight Information Display Monitor (Independent Variance)						
		SS	DF	MS	F	Sig.	\bar{x}	S.D.
Product	Between Subjects Variance	47.334	6	7.889	143.195	0.000*	-	-
	Within Subjects Variance	21.651	393	0.055	-	-	-	-
	Total Variance	68.986	399	-	-	-	3.898	0.509
Service	Between Subjects Variance	51.648	7	7.378	166.823	0.000*	-	-
	Within Subjects Variance	17.338	392	0.044	-	-	-	-
	Total Variance	68.986	399	-	-	-	3.858	0.523
Convenience	Between Subjects Variance	45.838	6	7.640	129.703	0.000*	-	-
	Within Subjects Variance	23.148	393	0.059	-	-	-	-
	Total Variance	68.986	399	-	-	-	4.083	0.498

Note: Significance at $p < 0.05$

Table 6 reveals that Thai passengers' satisfaction differs significantly related to the flight information display monitor, concerning its product, service and convenience. In all three cases, the state of a null hypothesis is that there is no difference in the (product/service/convenience) satisfaction level of Thai passengers in regard to the flight information display monitor.

4.2 Discussions

According to the study of Satisfactory levels of Thai passengers on self-service technology adoption at Suvarnabhumi Airport, Thailand can be discussed as follows:

4.2.1 This report studies the respondents' satisfaction perspectives towards the application of the self-service technologies (i.e. kiosk check-in counter, automated passport control gate, and flight information display monitor) at Suvarnabhumi Airport. The passengers satisfied the convenience of the kiosk because the accessibility of kiosks have less complexity of using, the kiosks provide more convenience for serving passenger, and the kiosks have a clear manual for checking in. The service of the kiosks with regard to its displays in foreign languages, an in time responding for check-in, global quality machines in designing system, and understandable manual or instruction. For the Kiosk's product, the passengers were satisfied due to the favorable color of the kiosk check-in counter that sorted by its own airline color, the kiosk counters' modern design, the kiosk's suitable size that placed in a passengers check-in areas, and a large number of kiosk counters that located in its departure hall. From the study of fitting facilities to self-service technology usage, evidence from kiosks in Taiwan Airport is congruent with the recent study. In its second result, it revealed that the application of the check-in kiosks could allow



passengers to complete boarding process more easily and enable the passengers to proceed to boarding more speedily. (Ku and Chen, 2013). They are pleased about the application on the automated passport control gate, regards to the convenience of the machine that has clear guidance for using, a decrease in passengers' time spending on passport control procedures, and passengers' rapidity to get through those passport control area. While, the service of the auto gate has intelligible using procedures, precise data detection from passenger passport information, and passengers' time saving in the arrival area. Regarding to the automated passport control gate's product, it has a functional and worldwide standard design, a capability to handle a large number of Thai passengers, and the outstanding characteristic of the machines' exterior. Thai passengers are also complacent with the airport's flight information display monitor. Consistent with recent research (Rio et al., 2016) about the automated border control e-gates and facial recognition systems, results shown that when the e-gates is being proceeded, the passengers exactly notice what to do. Therefore, if the system is fast, e-gate will allow passenger to get through in merely 15-20 seconds. It is a notable finding that those passengers are satisfied with the product of the flight information display monitor, regards to the size of its monitor edge that has a proper dimension, the capability to handle large amounts of Thai passengers, and the appropriate locations of the monitors in either arrival or departure. Mentioning the convenience of the flight information display monitor, Thais are able to receive a responding from the flight information display service at the airport due to the installation of the monitors that can get an eye-catching or be easy to spot. It also increases the convenience for passengers to look into airlines' flight timetable. For the service of the flight information display monitors, it is able to display the useful information for those passengers to readily check their flight status and suitable data which relates to passengers' needs. Also, the font size of the monitors is legible. According to the previous studies about the airport management, the value of the customer display systems is coherent with the finding such that the installation of the information display inside the airport is a key factor in the annual rankings of the quality of product, services, comfort, and convenience provided by the airports. It plays a major role in customer's experience in which the monitor could provide a guidance or facilitation data for airport passengers. (Marks et al., 2015).

4.2.2 The comparison of the relationship between differences of the airport's self-service technology adoption (i.e. kiosk check-in counter, automated passport control gate, and flight information display monitor) relate to Thai passenger's satisfaction (i.e. its product, service, and convenience). There is no difference in the (product/service/convenience) satisfaction level of Thai passengers in regard to the check-in kiosks, the automated passport control gate, and the flight information display. Furthermore, Thai passengers satisfied the adoption of the kiosk check-in counter and the automated passport control gate in terms of convenience, service and product of the machines. The highlight of the flight information display monitor has satisfied passengers in regard to its convenience, product, and after service. Our finding is agreeable with the recent study on the impact of traveler-focused airport technology on traveler satisfaction. Airports that purpose to be perceived as satisfying service should equip distinctive supporting technologies for facilitating their own clients who travel through the airport. (Bogicevic et al., 2017).

5. Conclusion

The installation of the kiosk check-in counter, the automated passport control gate, and the flight information display monitor at Suvarnabhumi Airport enables Thai passengers to experience the airport's facilities' development, which is the adoption of the self-service technologies. From the perspective of the passengers' satisfaction on technologies, the finding shows that the kiosk check-in counter allows passengers to proceed their check-in process more quickly and smoothly. Furthermore, the kiosk counters have specifically various colors for catching passenger intention and they are installed with multi-international languages for foreign users as well. The installation of the automated passport control gate makes domestic passengers to accomplish their time of arrival immigration process accurately and conveniently. In addition, the auto gate readily presents the instruction of using in-country language and also decreases the amounts of Thai passengers queuing in the immigration line, as well as international



passengers. Thai passengers have given the point of view about the flight information display monitor at Suvarnabhumi Airport that it is able to display an up-to-date of the airlines' both arrival and departure time and information. Moreover, the size of the monitors satisfied Thai passengers that it has a suitable screen edge and dimension.

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