

CUSTOMERS' PERCEPTION OF BIOMETRIC SECURITY AND TIME EFFICIENCY IN ONE ID IMPLEMENTATION IN THE AVIATION WORLD

Fidya A Noor^{1*}, M Muflih Hamadi², Aswanti Setyawati³, Nashrullah⁴

^{1,2,3,4} Institute of Transportation and Logistic Trisakti, Jakarta, Indonesia

*Corresponding author: fidyaadawiya@gmail.com

Abstract. Today's public air transportation includes a number of segments of passengers who inherently pose extraordinary stages of security risk. The ICAO on the 40th meeting encouraged the IATA's One ID project to highlight the advantages of biometric recognition to impenetrable and facilitate the passenger clearance procedure. Biometric systems can enhance travel security without compromising customers' value, satisfaction, and privateness. Passengers who are mostly to fly are additionally extra willing to share their biometric identifiers to speed up airport processes (i.e enhance staff productiveness with the aid of decreasing time spent on manual identity checks). It moreover gives real-time visibility of where passengers are in the airport process, permitting much less queuing. This all will assist to optimize airport time and area effectivity. Biometric structures current challenges, relate to customers' perceptions of system utility, privacy, credence, and anxiety, which should be examined in the context of consumer adoption. This research aims to know customers' perception of One ID implementation in the future aviation world in terms of biometrics security and time efficiency. The data is collected through a random sampling of 100 respondents and this research was analyzed by a quantitative approach.

Keywords: biometrics security, time efficiency, customers' perception, technology, One ID

Introduction

The terrorist acts that began on September 11, 2001, in New York, then London bombings in 2005 and also bombings on Christmas day in 2009, have made many countrywide and global security authorities concerned to strengthen protection. Specifically, all authorities wanted to have better control of people who travel, mainly by air and throughout borders (Morosan & Morosan, 2013). The United States implemented one of all the primary complete identification systems from the Department of Homeland Security's US Visitor and Immigrant Status Indicator Technology program which used biometrics. The system is accurately controlled and tracked the visitors from in- and out the country (Morosan & Morosan, 2013). Other comprehensive systems supported biometrics are also applied in different countries, including Japan and several countries in Europe.

Current technological advances are accompanied by digitization, including at the airport, where all information and passenger processes can be accessed by electronic devices that are connected with a security system. The International Air Transport Association (IATA) has designed a security system that uses passenger biometrics who will travel so that the documents that relate to personal data, travel info, and passenger flow at the airport are recorded on a digital platform called One ID. The application of a biometric system presents a green and seamless airport view, which applied paperless design (Berti, 2020) and additionally shortens passengers' processing time at both origin and destination with no need for manual checking by the officers. According to The International Air Transport Association, One ID will be implemented in 2037 at the airport around the world. The application of this biometric system also provides challenges, related to consumers' perceptions about the biometric function itself, biometric security of passenger personal data, time efficiency, and others that must be examined further. The goal is to obtain a connection between the development of travel security technology with stakeholders, both companies and customers.

Biometrics security

In general, there are three types authentication, they are: (1) Something you own (ownership): key or identity card; (2) Something you remember (knowledge): keyword or number you decided to remind; (3) something in you: the biometric (Liu & Silverman, 2001). Biometric technology is the most accurate authentication due to the superiority of biometric among other authentication models. These advantages are: (1) It is difficult to be manipulated because it makes use the concept of something about someone identity; (2) It approves an audit trail to every incident: who has been accessed (who), the place (where) and when (when) the person does; (3) Prevents individuals who do not have the authorization to access (Tarigan, 2004). Biometrics is a system that reads parts of the human body to collect authentication, which uses unique and permanent parts of individuals such as retina, fingerprints, voice, and face or body characteristics (Liu & Silverman, 2001). Biometric security is a structure of information technology that supports the system (Tarigan, 2004). The mechanism is to match between data that received through the biometric reader with data in a biometric database or in other words, is comparing the predefined data with the presented data (Tarigan, 2004).

Time Efficiency

Time efficiency is the level of time savings during implementation until the process is completed (Muchdoro, 1997). Developed automation in airport control procedures will ultimately - and with quick steps - lead to an increase in personnel productiveness with the aid of lowering time spent on manual checks. Thus, encouraging "improving security" will be a "security change", therefore automation will bring more reliable methods and provide time efficiency when carrying passengers, i.e with systems that support biometrics. When passengers use a biometric system, they will be recognized at every touchpoint at the airport. The passengers' identity, travel info, and all related to airport process can be accessed through device and biometric recognition. So, there is no process repeatedly, no need queuing and the passengers will enjoy their new experience with a seamless journey. ("www.iata.org/one-id," 2020).

Customers' perception

Customers attempt recent technologies to use and give an impression of the services without has a direct relationship with firm agents (Hsieh & Lin, 2006). Customers' perception is the process of how stimuli are chosen, organized, and interpreted. The significant relationship of the service provider with customer refers to their perceptions of functionality value towards company product (Authors, 2016). For biometric new system technology, the functionality can be objectively evaluated after using it so that it is hard to check further on how this technology can perform the intended task (function) in a right and easy way for users. In other cases, without the purpose of evaluative actions, most users will depend on substitute evaluative actions (Xu, Goedegebuure, & Der, 2015), such as their beliefs about technological functionality (e.g usability, security, system design, and quality).

The following figure describes about the hypotheses of the study

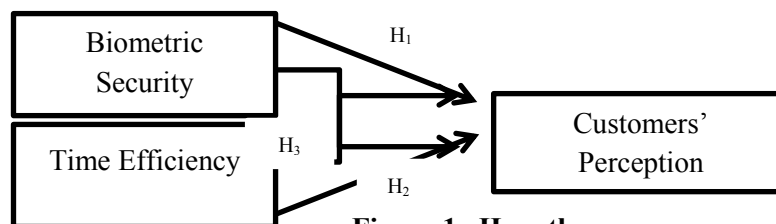


Figure 1. Hypotheses

- H₁. Biometrics security significantly effects customers' perception
H₂. Time efficiency significantly effects customers' perception
H₃. Biometrics security and time efficiency simultaneously have significant effect on customers' perception

Method

The methodology in this research used descriptive verification with a quantitative approach, which aims to find out the relationship between variables. The result is to clarify the research object by seeing generated significant value (Sugiyono, 2010). The quantitative approach means the research use objectively view with the data obtained by the measurements in previous scientific information, or by factual information through questionnaires and polls. The data may in the shape of mathematics or numerical, the goal is to ensure a determined hypothesis ("Chapter III Research Method," 2004). The population is a place that has objects/subjects characteristics and attributes dictated by researchers to be examined and got the result while the sample is a person that has characteristics and attributes dictated by researchers in the population (Sugiyono, 2010). The population in the study was unknown, so the sample was taken randomly for 100 respondents who had been traveled by using air transportation. The object of this research is One ID. In this case, the independent variables are biometrics security (X_1) and time efficiency (X_2), and the dependent variable is customers' perception (Y). The data was obtained by distributing questionnaires. All the question items in the questionnaire are adopted and modified from each variable with a total of 14 questions. To measure each variable, this research used Likert Scale with a score range (1=strongly disagree: 5=strongly agree).

Discussion and Result

This research aims to find out customers' perception of One ID implementation in the future aviation world in terms of biometrics security and time efficiency. There are 100 random respondents who had been traveled by using air transportation collected by distributing survey questionnaires. The characteristics of the respondents are displayed in the following figures:

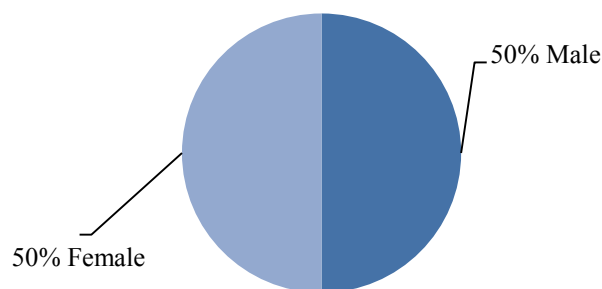


Figure 2. Characteristics of the Respondents by Gender

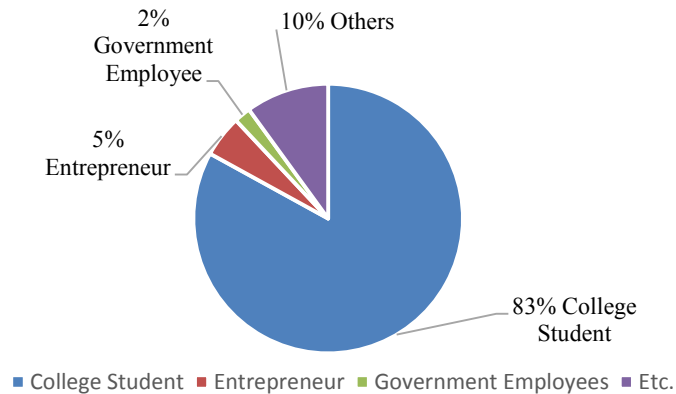


Figure 3. Characteristics of the Respondents by Occupation

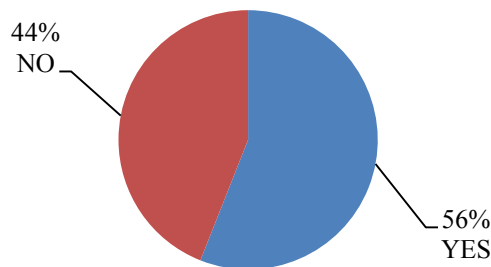


Figure 4. Characteristics of the Respondents by Experience Used Biometrics at the Airport

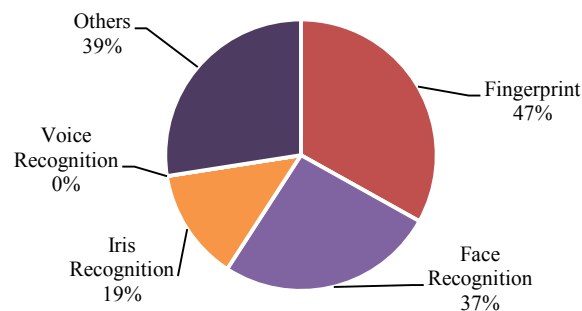


Figure 5. Characteristics of the Respondents by Types of Biometrics used at the airports

The figure 2 describes the gender of the respondents that the amount of the female and male is as same as 50%. Then, the figure 3 is about the occupation of the respondents. It shows that 83% of the respondents are college students, while the 2% of the respondents are government employee, 5% of the respondents are entrepreneur and the rest of 10% are other occupations. Figure 4 is the result of the respondents whether they have experienced on using biometrics at the airport. There are 56% of the respondents have used biometrics at the airport and 44% of them have not experienced on it at all.

The last figure, figure 5 is about the usage of biometric types. There are types of biometric that used at the airport; 47% the most used is fingerprint, 37% used face recognition, 19% used iris recognition, 0% used voice recognition and 39% choose other types.

Based on the result of the research, the validity of each item can be seen below :

Table 1. Validity Test Biometrics Security

Items	R Count	R Table 5% (100)	Validity
1	0,928	0.195	VALID
2	0,940	0.195	VALID
3	0,946	0.195	VALID

Table 2. Validity Test Time Efficiency

Items	R Count	R Table 5% (100)	Validity
1	0,771	0.195	VALID
2	0,852	0.195	VALID
3	0,854	0.195	VALID

Table 3. Validity Test Customers' Perception

Items	R Count	R Table 5% (100)	Validity
1	0,822	0.195	VALID
2	0,806	0.195	VALID
3	0,834	0.195	VALID
4	0,820	0.195	VALID
5	0,823	0.195	VALID
6	0,782	0.195	VALID
7	0,825	0.195	VALID
8	0,781	0.195	VALID

Based on those three tables, the result of validity items from all variables are valid because R count is higher than R table ($R \text{ count} > R \text{ table}$) so, it can be used for this research.

Table 4. Reliability Test

Cronbach's Alpha	N of Items
0,705	14

Based on table 4, it can be stated that the research in the form of a questionnaire is reliable because the value of Alpha Cronbach's is $> 0,6$. It means that the measuring instrument used in this research is reliable, then the data can be analyzed further.

Table 5. Substructure 1 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	8.230	1.936		4.251	.000
Biometrics Security	.673	.153	.318	4.411	.000

Time Efficiency	1.410	.173	.586	8.136	.000
-----------------	-------	------	------	-------	------

a. Dependent Variable: Customers' Perception

Based on table 5, biometrics security significantly effects Customers' Perception by generating a value that is 0,318. Then time efficiency significantly effects customers' perception by generating a value that is 0,586.

Table 6. Substructure 2

ANOVA ^a					
Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	1739.417	2	869.708	90.442	.000 ^b
Residual	932.773	97	9.616		
Total	2672.190	99			

a. Dependent Variable: Customers' Perception

b. Predictors: (Constant), Time Efficiency, Biometrics Security

Based on table 6, it is showed that biometrics security and time efficiency simultaneously have a significant impact on customer's perception, because the F count 90,4242 > F table 3,09.

From the calculation of substructure 1 and substructure 2, it can be summarized as follows :

Items	Direct Effect	Remarks
Biometrics Security → Customers' Perception	0,318	Significant
Time Efficiency → Customers' Perception	0,586	Significant

Based on the table above, it shows that the direct effect of biometrics security on customers' perception is 0,318, and time efficiency on customers' perception is 0,586. The calculation presents that there are significant effects from each independent variable and simultaneously to the dependent variable.

Conclusion

Based on the result and data analysis, biometrics security has a significant relationship with customers' perception. It means biometric security can be trusted and relied on considering biometrics in each person has its own uniqueness so that it can't be lost and is difficult to manipulate. In line with the previous research on biometric systems, the customers have perception that One ID will be able to secure a passenger's data through encryption (Kim & Bernhard, 2014).

Afterward, time efficiency also has a significant relationship with customers' perception, because the customers emphasize how effectively working hours were actually used during the authentication process. In previous research, authentication proved time efficiency that implemented in Global Mobility Networks (Yu, Lee, Park, Park, & Lee, 2020). While the authentication in One ID will make the customers recognized in every touchpoint at the airport. This will cut the redundant procedure, and no more time is wasted due to the process of losing travel documents. At last, this will permit travelers to come to the airports that are prepared to fly in pretty much every movement situation.

The research also proves that biometrics security and time efficiency simultaneously have a significant effect on customers' perception with the value direct effect of time efficiency is higher than biometrics security. It means time efficiency influences on customers perception. Customers who likely to fly are also more willing to share their biometric identifiers to speed up

airport processes. Biometrics security that is unique and reliable provides time efficiency in the process of its use and it forms a positive perception of customers. Thus, in accordance with the purpose of implementing One ID, it is to achieve a connection between the development of travel security technology with stakeholders, both companies and customers.

References

- Authors, F. (2016). Article information : Teleological Sales and Purchase Approaches in Complex Business Relationships – Customers' Expectations before and Perceptions after Purchase.
- Berti, A. (2020). One ID: inside IATA's plan to end paper travel documents, (January 16, 2020). Retrieved from <https://www.airport-technology.com/features/iata-one-id/>
- Chapter III Research Method. (2004), 1–22.
- Hsieh, J. C. L. P., & Lin, J. C. (2006). The role of technology readiness in customers' perception and adoption of self-service technologies. <https://doi.org/10.1108/09564230610689795>
- Kim, J., & Bernhard, B. (2014). Factors influencing hotel customers' intention to use a fingerprint system.
- Liu, S., & Silverman, M. (2001). A Practical Guide to Biometric Security Technology.
- Morosan, C., & Morosan, C. (2013). Biometric solutions for today's travel security problems. <https://doi.org/10.1108/17579881211264477>
- Sugiyono, P. D. (2010). Metode penelitian pendidikan. Pendekatan Kuantitatif.
- Tarigan, J. (2004). BIOMETRIC SECURITY : ALTERNATIF PENGENDALIAN DALAM SISTEM, 90–105.
- www.iata.org/one-id. (2020). Retrieved from <https://www.iata.org/en/programs/passenger/one-id/>
- Xu, Y., Goedegebuure, R., & Der, B. Van. (2015). Customer Perception, Customer Satisfaction, and Customer Loyalty Within Chinese Securities Business Customer Perception, Customer Satisfaction, and Customer Loyalty Within Chinese Securities Business : Towards a Mediation Model for Predicting Customer, (January 2015), 37–41. <https://doi.org/10.1300/J366v05n04>
- Yu, S., Lee, J., Park, Y., Park, Y., & Lee, S. (2020). applied sciences A Secure and Efficient Three-Factor Authentication Protocol in Global Mobility Networks. <https://doi.org/10.3390/app10103565>