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Technology Acceptance Model in use of Technologies for Contactless Process during the Covid-19 Pandemic

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Abstract

During this pandemic, airports have an important role in rebuilding trust on aviation by means of safe travel and not posing a health risk to airport officials and prospective passengers who will fly. To gain trust and become the 5-Star Covid19 airport, airport management in Indonesia. The purpose of this study was to measure passenger acceptance of Technologies for Contactless Process (TFCP) provided by the airport to prevent the spread of Covid-19 by adopting the Technology Acceptance Model (TAM). The quantitative approach is deemed suitable for the method of collecting data from researchers conducting analysis based on actual respondents. The study collected 220 questionnaires from passengers using TFCP at several big airports in Indonesia and the data was analysed using Likert scale techniques by measuring Perceived ease of use and perceived usefulness. The results of the study significantly that passengers are willing to adapt using TFCP. Perceived Ease of Use is very positive and strong pre-indicator as the formation of TFCP acceptance by passenger intentions at the airport. Behavioral intention on use of TFCP is dominated by passengers' own desire and influenced by feeling more comfortable when using TFCP during pandemic period at the airport. This attitude of intention to use TFCP is because after using and understanding the function of TFCP will give a positive impact on the health and safety of themselves and others.. This research contributes as the basis of a better strategy by airport managers managing TFCP by understanding the passenger experience. This study also did not combine all external indicators in this TAM model, but only used to the intentions and behaviour of using TFCP by passengers during the flight process at the pandemic situation.

Keywords: TAM; TFCP; Perceived Usefulness and Ease of Use.

INTRODUCTION

The movement of tourists towards a tourist destination is called tourism process, but it cannot be denied that tourism activities can be influenced by various factors that can support or holp up the tourism itself. Currently the world is facing the Coronavirus Disease pandemic or better known as Covid-19 which is an infectious disease caused by a new virus, namely Coronavirus (WHO, 2020). The movement of tourists mostly depend on air transportation where the air transportation is an important element, almost 52% of the movement inbound and outbound travellers in the world (UNWTO, 2013).

During this pandemic, airports have an important role in rebuilding trust on aviation by means of safe travel and not posing a health risk to airport officials and prospective passengers who will fly. To gain trust and become the 5-Star Covid19 airport, airport management in Indonesia, especially PT. Angkasa Pura must have:

- Very high standard of airport cleanness & maintenance procedure
- The consistency of cleanness & hygiene monitoring

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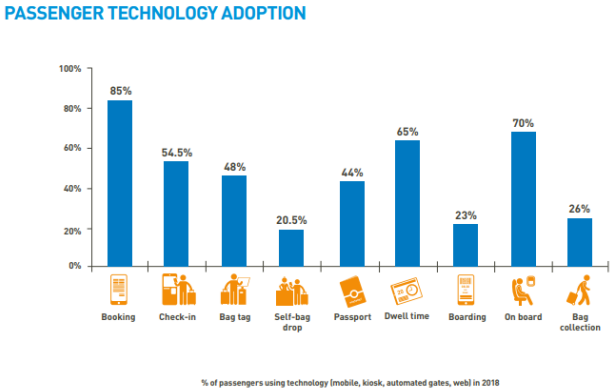
The key achievement for trust of passengers during the pandemic by Indonesian Airport management:

1. Technology for Contactless Process (TFCP)
2. Physical Distancing
3. Standard of Staff Personal Protective Equipment
4. Cleanliness and Maintenance Procedures
5. Security Screening
6. Hand Hygiene Facilities (Availability, Visibility and Quality)

TFCP as one of the point on key achievements is complemented by technology, there are:

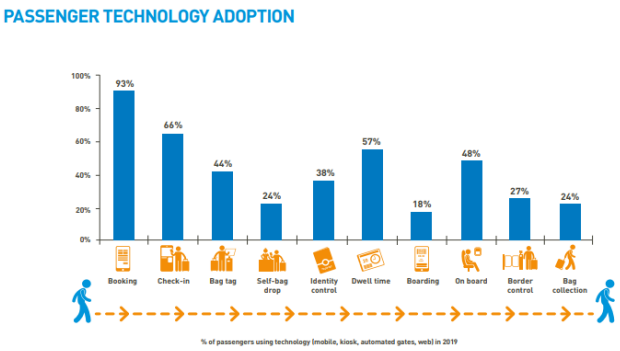
a) E-Gates, boarding pass scanners :
   Contactless access to security, lounges, etc. and Contactless boarding
b) Automated border control, Automated bagdrop, check-in kiosks
c) Biometrics, single token is Automation of the passenger journey without the need to present travel documents at check-in, access to security, border control and boarding

TFCP is the air travel protocol technology procedure that used during check-in, security/immigration, and boarding procedures at departure airports, which are expected to help minimize the transmission of the Covid-19 virus due to reduced direct interaction with airport officials.



Nevertheless the TFCP is still relatively new at Indonesian airports so not all passengers are familiar with the use of this technology. The research objective was to see how much the Passenger's Technology Acceptance Model in use of TFCP during their departure and arrival at the airport.

Figures 1 Passenger Technology Adoption



Source: SITA Passenger IT Insight 2019 & 2020

Based on Figure 1, we can see that the need for Passenger Technology Adoption at airports in the world increases every year, especially during the pandemic from 2019 to 2020, the increase of technology needs is increasing and almost a necessity for all aspects of service for passengers during the departure process and their arrival at the airport. This reflected as a self-service action that passengers can take in preventing Covid 19 through air travel.

The previous author's research in 2018 showed that TAM passenger at the Soekarno-Hatta airport was more dominated by Self check-in kiosks, which amounted to 76.79%. Research gap between previous research are the technology as the main focus of the research, in the first research in 2018 the author only talk about the self service machine and also the different situation. During this pandemic, PT. Angkasa Pura as the management of major airports in Indonesia provided more technology Self Service Tools (SST) equipment for passengers. Therefore, at this time the authors will conduct research on TAM passengers in the use of TFCP during a pandemic at Indonesian airports

B. RESEARCH METHOD

The purpose of this study was to find out how perceived ease of (PEOU), perceived usefulness (PU), behavior intention and use behavior in using TFCP. The quantitative approach is

$$\alpha = \left(\frac{k}{k-1}\right)\left(1 + \frac{1\sum Si^2}{S_\chi{}^2}\right)^n = e$$

deemed suitable for the method of collecting data from researchers conducting analysis based on actual respondents. This study looks at passenger perceptions about the acceptance of using TFCP independently at several airports in Indonesia which are the main airports, namely Soekarno Hatta Airport, Kualanamo, Ngurah Rai, Juanda, Sultan Syarif Kasim, El Tari, Sepinggan. The population for this study were air passengers who made domestic flights.

The sampling technique used in this study was purposive sampling. Thus, only passengers who use TFCP during the boarding and arrival processes at the airport with *infinite population technique* (Suprapto, 2004) there are 220 respondents with formulas:

$$n = 5 \times k$$

Note: n = Sample

k = Total of indicators

With a total of 15 questionnaire questions compiled for TAM with PEOU and PU for TFCP at airports which are divided into 2 parts of questions, there's one part PEOU and part PU by asking about attitudes and behavior using TFCP. This study uses a Likert scale with 5 points for the survey instrument, 1 for strongly disagree, 2 for disagree, 3 for neutral, 4 for agree, 5 for strongly agree. In addition, demographics were also measured using nominal and ordinal scales. All questions in this study were tested for validity first before being distributed to passengers using the validity test.

The validity test was carried out on 30 samples, then the researcher looked back at t table 0.05 (5%) for dk = 28 then it had t table = 0.374 so that the data would be said to be valid if t count was equal

to or greater than t table. The test of reliability in this study used the Alpha Cronbach Yanki formula technique with the formula:

Variable	Coefficient Variable	Cronbach Alpha if item deleted	Result
Technology Acceptance Model	0,909	0.700	Reliable

C. RESULTS AND ANALYSIS

Table 1

Passenger Demographic Profile

Demographic Characteristic	Variable	Percentage
Gender	Male	44,6%
	Female	55,4%
Age	17-23 years old	15,8%
	24-30 years old	30,7%
	32-37 years old	8,9%
	38-44 years old	14,9%
	45-50 years old	12,5%
Education	Senior High School	18%
	Diploma	16%
	Bachelor	42%
	Post Graduate	20%
	Doctoral	2%
Occupation	Student	16,8%
	Staff	58,4%
	Private Sector	13,9%
Technology for Contactless Process	E-gate, Boarding & Pass Scanner	63%
	Automated Border	26%
	Automated Bag Drop	24,8%
	Self Check in Kiosk	71%

Based on table 1, we can see that TFCP users are dominated by women which are 55.4% with an average age 24-30 years old for 30.7%. In addition their occupation are employees and 42% bachelor degree. The most frequently used of TFCP equipment are E-gate, boarding & Pass Scanner about 63% and also Self Check in Kiosk 71% for their departure and arrival process at the airport. The users of TFCP for air travelling mostly are millennials but we need to look how TAM passengers in the use of TFCP with research indicators using the TAM concept. What we need is how the acceptance for TAM passengers with the research indicators from TAM's variable.

Table 2

Perceived Useful of Technology of Contactless Process

According to TAM theory, passengers will accept a computerized technology if they have confidence to the technology itself. It is believed as a strong indicator on the Perceived Useful of TFCP. PU is defined as a passenger's perception of the performance of technology at the airport. The previous author's research about TFCP Perceived Usefulness at the airport, especially on self check in kiosk at the Soekarno Hatta airport found 76.79%. In this study Perceived Usefulness of passengers were increased becomes 86.90%. PU gives strong influenced by the pandemic situation. Passengers consider that TFCP have been designed as good as passengers need and it can provide the efficiency of departure & arrival process. Passengers also have an image that they have contribution to prevent the spread of covid-19 by using TFCP and believe that this is the one of way to prevent the spread of the covid-19 virus. According to Davis (1989), Perceived usefulness (PU) is shown as the main determinant and perceived ease of use (PEOU) as a secondary determinant of intention to use certain technologies.

According to the findings in Wixom and Todd (2005), perceived usefulness (PU) is influenced by perceived ease of Use (PEOU). Passenger experience in using TFCP is considered quite efficient. The system that has been designed is considered good by passengers at 86.90%. It will be very effective for TFCP acceptance at the airport and be an assessment of airport performance in efforts to prevent covid-19 in passenger air travel. Although PU is not fully effectively 100% because there are still 14.62% of the sample on this study who still do not accept the perceive useful from TFPC caused by certain indicators.

Table 3

Perceived Ease to Use of Technology of Contactless Process

Perceived Usefulness	Percentage	Symbols
- Pandemic situation changed me to use TFCP	86,72%	PU1
- Using TFCP makes me feel a good example for others in effort to prevent the Covid-19 pandemic	80,09%	PU2
- Using TFCP makes the departure & arrival process efficiently during pandemic	88,36%	PU3
- TFCP has been designed with good quality for ease useful for passenger in pandemic period	90%	PU4
- Using TFCP contactless can reduce the spread of covid-19 virus	81,72%	PU 5
Perceived Usefulness	85,37%	PU

Perceived Ease of Use	Percentage	Symbols
- I am confident to use TFCP during pandemic	89%	PEOU1
- I believe airport maintain TFCP system for passenger easier use	85%	PEOU2
- There is clear signage how to use TFCP	77%	PEOU3
- I accustomed to using TFCP equipment at the airport	89,72%	PEOU4
- Airport sterilized TFCP equipment periodically	83,18%	PEOU5
- Using TFCP is one effort to reduce the numbers of spread of covid 19 at the airport	90,45%	PEOU6
Perceived Ease of Use	85,72%	PEOU

Perceived Ease of Use also has a significant value with percentage almost same as Perceived Useful that is 85.72%. If referring to the concept of TAM where Perceived Useful (PU) is influenced by Perceived Ease of use (PEOU), PEOU is the determinant of attitude towards use in TAM. Passengers will know the benefits of TFCP only if they will find it easy to use the technology (Warkentin et al. 2002). Ease and trust in the use of this technology will give a positive attitude to the system. The author also gets an answer from passengers that in this time passengers feel more confident and begin to feel accustomed to using TFCP at the airport during the pandemic period. It is a very positive and strong pre-indicator as the formation of TFCP acceptance by passenger intentions at the airport. This PEOU will have a significant positive effect on TFCP's (PU) usability

Table 4

Indicators of behavior intention of Technology for Contactless Process

Behavioral Intention	Percentage
- Using TFCP is my Self Desire	51%
- I feel more comfortable to use TFCP	49%

Behavioral intention on use of TFCP, the author's previous research (Syifa, 2018) proved a significant effect that perceived Ease of Use (PEOU) and perceived usefulness (PU) on behavioral intention (BI) on using of Self Check in Kiosk as one of TFCP gives a direct effect on the intention of behavior to use TFCP at Soekarno Hatta airport. In this study, also can be seen at TFCP behavior intention is dominated by passengers' own desire by 51% and also influenced by feeling more comfortable when using TFCP during pandemic period at the airport. This is very related to the consistency of the experience of Perceived useful (PU) in technology which is a strong indicator in the formation of passenger behavior intention.

Table 5

Indicators of Use behavior of Technology of Contactless Process

Use behavior	Percentage
- I used TFCP for CHSE Protocols	64%
- I used TFCP because Airport and Airline Regulation	36%

Use behaviour is a long process that is consistently formed from PU and PEOU to set up behaviour intent continuously by passengers. Use behaviour is formed through attitudes towards objects and attitudes towards behaviour (Fishbein and Ajzen, 1975). Davis (1989); Taylor and Todd (1995), the results showed that perceived usefulness has a direct influence on BI or through attitudes. There is a difference between the previous research on the findings (research gaps) became the focus of this study while incorporating construction attitudes in TAM. Referring to this concept, PU and PEOU were formed a positive attitude of intention to use the technology at the airport. It is a very good thing that TAM was effectively accepted by passengers during the pandemic. This attitude of intention to use TFCP is because after using and understanding the function of TFCP will give a positive impact on the health and safety of themselves and others.

From table 5 shows that passengers behaviour to use because they feel this is a Health protocol (CHSE) for their air travel. Health protocol awareness behaviour is seen by 64%, in addition to this attitude and behaviour applied by passengers because it becomes a regulation that has been applied by the airport and airlines. Awareness on the independence of the use of technology provided by airports and airlines as a Common Use Self Service Kiosk (CUSS) is a very positive TAM acceptance. TAM acceptance must continue to be monitored by airport control, information technology and information service in improving the development and effectiveness of TFCP in Indonesian airports.

D. SIMPULAN/CONCLUSION

1. Conclusion and implication

Empirically, this research proved that the intention to use TFCP was influenced by Perceive usefulness and Perceive ease of use of passengers. Behaviour intention is a major contribution to establish the use behaviour.

The conclusion is Technology Acceptance Model for TFCP can be accepted by passengers as an effort to prevent the transmission of covid-19 concluded quite successfully done by PT. Angkasa Pura as the airport management. The implementation of using the TFCP has an important role to ensure safety and healthy airport operational by providing technology less contact and self service and or automatically can reduce the transmission of covid-19 and will not spread to the public.

2. Limitation

This study has a limitation which is the survey could not represent to all the airports in Indonesia, but only conducted at several major airports which are managed by the PT. Angkasa Pura.

So this research can not represent for all airports in Indonesia because not all airports in Indonesia have been applied Technology for Contactless Process. This study also did not combine all external indicators in this TAM model, but only used to the intentions and behaviour of using TFCP by passengers during the flight process at the pandemic situation.

3. Recommendation

In this study the authors provide several recommendations for airport management, such as:

a) Addition of TFCP facilities and supporting infrastructure thereby there are not queues in the departure and arrival process
b) It is need to socialize periodically about the using of TFCP as well as for standard procedures that must be carried out by passengers
c) Need to maintain the TFCP services for passengers so it will increase the acceptance TAM by passengers
d) TFCP needs to be designed specifically for disabilities passengers
e) Improved the facilities and convenience of using TFCP more effectively by connected to passengers' device while at the airport
f) Sterilizing all the TFCP facilities regularly so it will not become a spreading source to the covid-19 virus

4. Future Research

The authors suggest in future need to do further research for passengers who may not have used TFCP either during the pandemic or at the end of the pandemic period. Hopefully, the next study can reveal how TAM can be accepted by passengers who have not used TFCP. This future research can be become a comparison to the this research.

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