Factors Influencing Airport Technology Development: Customer Convenience, Aviation Security, and Environmental Issues

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Abstract— Technology development had introduced automation techniques in the airport operation and service system. Passengers also feel more comfortable choosing an airport which has equipped with technology. Therefore, many airports are becoming more enthusiastic about implementing new technologies because they can increase efficiency, reliability, and sustainability within their operations. This article then tried to explain several factors which are significantly influencing airport technology development. The method used by the authors was a qualitative method focusing on the literature review. The research result showed that there are three prominent factors influencing airport technology development. First, the customer convenience factor encourages airports to apply self-service technologies that are more flexible and efficient. Second, the aviation security factor creates body scanner technology to automatically scan the passengers and the liquid explosives detection system. Third, environmental issues can be looked at from the airport’s efforts to implement various energy-saving behaviors and utilize renewable energy sources. Moreover, there are also other factors influencing the airport technology development, namely price, rapidness, customer experience, customer value, risk minimization, and communication enhance.

Keywords— airport technology, customer convenience, aviation security, environmental issues

I. INTRODUCTION

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<td>Chen et al.</td>
<td>2001</td>
<td>Customer comfort, increased communication and customer value have a positive and significant influence on the development of airport technology</td>
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<td>Drennen</td>
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<td>Gocmen</td>
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### III. METHODOLOGY

The method used in compiling this article is a qualitative method with a literature review design. Therefore, instead of focusing on primary data, this paper focuses more on secondary data, which includes journal articles and organizational research. However, the data is credible and relevant to the topic discussed. This is because the author uses trusted sources obtained from various international journal sites, such as JSTOR, Taylor & Francis, and Sage Publication.

### IV. RESULT AND DISCUSSION

#### A. The Influence of Customer Convenience on Airport Technology Development

The development of airport technology is influenced by customer comfort factors. This factor is closely related to confidence benefits which can form feelings of comfort, security and certainty of expectations regarding the airport services provided [3]. Airports usually choose self-service technology so that customers can have more control over their wishes. In addition, self-service technology can also save time and costs; reducing waiting times; more efficient, flexible, and comfortable to use; and make it easier for consumers to design what they want. This technology has been applied to check-in kiosks which are an integral part of airport facilities and the development of e-tickets also allows the use of the internet for check-in [11].

By considering customer comfort factors, airports can implement common-use self-service (CUSS) technology which provides services to customers in purchasing tickets,
progressing seating order, printing boarding passes, baggage tags, and viewing various other types of information [8]. The airport will also consider the use of technology that allows customers to change flight schedules, change personal information, check flight status, and other services that can increase their convenience. Apart from that, CUSS technology can also increase effectiveness during the boarding process. In the development of airport technology, there are at least three main factors to pay attention to, namely the ability of technology to reduce space, increase effectiveness in the check-in process, and reduce transaction time [12].

The argument that customer comfort influences the development of airport technology is in accordance with the arguments of Drennen [8], Abdelaziz et al. [11], Gualandi et al. [12], Ku & Chen [13], Chen et al. [6], and Bogicevic et al. [3].

B. The Influence of Aviation Security on the Development of Airport Technology

Airlines usually also consider security aspects in choosing the technology used at airports. This is because this technology will become a vital component in the airport security system which is used to prevent threats from terrorists or other irresponsible parties [9]. Therefore, several airports have begun to develop the latest technologies, which include body scanners to carry out automatic checks on passengers and liquid explosive detection systems (LEDS). Body scanners have been used by a number of airports around the world to check whether passengers are carrying prohibited non-metallic items on their bodies. Meanwhile, the distribution of LEDs still tends to be lower compared to body scanners. [14].

In order to fulfill security aspects, the airport is also working to implement new technology into existing operational arrangements; interactions between human operators, technology, and infrastructure; regulatory framework; and organizational culture. In the 2010s, there were at least two types of body scanners available on the market, namely terahertz and millimeter wave nonionizing technology and backscatter x-ray ionizing technology [14]. Aviation security then received increasing attention after the events of September 11, 2001, or 9/11 in the United States. Security restructuring is starting to be carried out in Western countries, such as centralizing security in the aviation system and tightening the passenger screening process at airports. In fact, the United States Transportation Security Administration uses more sophisticated and expensive technology that can detect criminal records of passengers at airports [15].

The statement that aviation security influences the development of airport technology is in accordance with the results of research conducted by Feng [9], Leo & Lawler [15], and Hofer & Wetter [14].

C. The Influence of Environmental Issues on Airport Technology Development

The airport industry is facing increasing environmental pressures. There is great concern about the impact that airports have on the environment, so airports are starting to make efforts to become more responsive to existing environmental issues. One of the energy-saving measures implemented by the airport is the installation of solar photovoltaic panels on the roof of the airport building. Other energy-saving measures include building insulation and lighting renovations using light emitting diodes or LEDs [16].

The use of robots or artificial intelligence technology is then designed to react to sudden changes in the environment. Mobile boarding passes have also been widely implemented to reduce paper use, thereby avoiding deforestation [5]. Apart from that, several airports are also starting to use renewable energy sources because of the many benefits they offer, such as (1) having a lighter impact on the environment; (2) providing alternative energy sources to operate the airport; (3) produces very little waste; and (4) reducing ground emissions [16]. Thus, the development of airport technology is influenced by the challenge of reducing negative impacts on the environment.

The argument that environmental issues have an influence on the development of airport technology is in accordance with the results of research carried out by Baxter et al. [16], Gocmen [10], [5], and Miskolczi et al. [1].

D. Conceptual Framework

Based on the background of the problem, literature review, and discussion above, the author succeeded in obtaining the following conceptual framework.

From this conceptual framework, it can be seen that customer comfort, aviation security, and environmental issues have a significant influence on the development of airport technology. However, apart from these three factors, there are also other factors that have a similar influence, namely:

1. Price: Drennen [8], Feng [9], De Neufville [7], Bogicevic et al. [3], and Lee-Anant & Monpanthong [5];
2. Speed: Drennen [8], Bogicevic et al. [3], and Lee-Anant & Monpanthong [5];
3. Customer experience: Lu et al. [17], Ku & Chen [13], Bogicevic et al. [3], and Gocmen [10];
4. Customer value: Ku & Chen [13], Chen et al. [6], and Pell & Blondel [18];
5. Risk minimization: Feng [9], De Neufville [7], and Hofer & Wetter [14];
6. Improved communication: Chen et al. [6] and Miskolczi [1].

V. CONCLUSION

Based on the results of the literature review, discussion, and conceptual framework, it can be concluded that there are three hypotheses that can be used for further research related to the development of airport technology. The three hypotheses in question are as follows:

1. Customer comfort has a significant influence on the development of airport technology;
2. Aviation security has a significant influence on the development of airport technology;
3. Environmental issues have a significant influence on the development of airport technology.

REFERENCES


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