

## Article

# The Effects of the In-Flight Safety Information Characteristics on the Safety Behavioral Intention of Airline Passengers

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**Abstract:** This research aims to explore the effects that In-flight Safety Information Characteristics of airlines have on attitude, customer satisfaction, customer trust, and safety behavioral intentions. A total of 477 passengers with air travel experience were surveyed and responses were analyzed using a structural equation model. Among four in-flight safety information characteristics, reliability, informative, utility turned out to have positive effects on attitude, interactivity are not significant antecedents of attitude. In turn, Attitude had a positive effect on customer satisfaction, customer trust, and safety behavioral intentions. It is believed that this research can serve as a starting point for future studies on the diverse servicescapes of airport facilities. It is believed that this research can serve as an important basic data and strategy for securing passenger safety and efficient measures for airlines' in-flight safety information operation.

**Keywords:** in-flight safety information characteristics; attitude; customer satisfaction; customer trust; safety behavioral intention



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## 1. Introduction

In the aviation sector, safety is the first concern and is eventually related to profitability, and eventually, this is to accomplish their sustainability goals. Since the amount of damage caused by an aircraft disaster is typically substantial, safety is given first priority. For 61 years from 1959 to 2020, total 1666 cases of accidents occurred at passenger aircrafts in the whole world, and the number of deaths was total 30,132. Furthermore, from 2011 to 2020, there were casualties in 31 cases of 271 passenger aircraft accidents, and the number of deaths was total 1752, so average about 170 people are killed by aircraft accidents each year [1]. The International Civil Aviation Organization (ICAO) has prepared international safety standards and standards for navigation safety and accident prevention and recommends that 193 contracting countries follow them (ICAO, 2016) [2]. This provision reflects the implementation of the aviation safety management system (SMS) to improve overall safety management and aviation safety in airlines' management plans. It also includes safety risk management for the sustainability of the aviation industry.

All companies are undertaking diverse attempts to achieve sustainable development, and these efforts are being evaluated in various aspects. Special assessments may be added depending on the industry. According to Statista, a database company, the average number of fatalities from commercial air travel incidents is dropping. Manual handling (flight controls) and safety management account for 41% and 37% of the overall contributing factors to airplane accidents globally between 2016 and 2020, respectively. According to AirlineRatings, Qatar Airways, Air New Zealand, and Singapore Airlines are the top three safest airlines in the world for 2021.

According to ICAO, 'safety' is a state in which the level of risk that can cause personal injury or property loss is maintained below an acceptable level through risk management

(ICAO, 2013) [3]. Airline accidents not only directly cause financial loss to airlines and a decrease in productivity of workers, but also indirectly cause distrust and anxiety about safety in society as a whole [4]. This eventually damages the company's sustainable development. Bae and Park [5] also underline that airport safety is critical for the sustainability of the aviation industry, therefore risk tolerance that can cause accidents must be reduced to prevent accidents. Airline accidents have a significant impact on the level of safety awareness of airline users and change their preference for other modes of transportation [6].

An aircraft accident not only causes the anxiety and distrust of domestic/foreign passengers and the loss of airline's reputation and image, but also lowers the international safety grade evaluation of the relevant country. This brings down the value and competitiveness of the relevant airline in the long term, which is working as a factor threatening the sustainability of management.

The National Transportation Safety Board of the United States reported that 96% of passengers survived from freight aircraft accidents, and in 46% of severe accidents, the survival rate was 80% for last 20 years. It also stated that the survival rate could become much higher if the passengers are fully aware of flight safety equipment and rules [7]. Thus, for the survival from aircraft accidents, the importance of passengers' escape from aircraft in case of accident was rising up, and through the results of research on the in-flight safety for several years, people started perceiving the necessity of passengers' interest in the provision of in-flight safety information and communication of information. Especially, in the results of examining the factors affecting the survivability in survivable accidents, the improvement of passengers' perception of emergency escape method is a major factor [8].

To reduce the unnecessary violation of regulations and avoidable risks when traveling by plane, it is essential to acquire the in-flight safety information [9]. Especially, considering that the emergency coping method could be smoothly performed simply when the passengers pay more attention to the in-flight safety information and carefully read the safety briefing card, the importance of communication is more emphasized [10]. The safety information provided to aircraft passengers could be divided according to time, situation, and method of provision, and the contents are also different. The method of provision could be largely classified into in-flight safety information, in-flight safety announcement, and in-flight safety briefing card while the time could be divided into before departure, all times during flight, before landing, and after landing. In addition, this includes the emergency landing instructions for the survival in case of emergency.

As the prior in-flight safety information about safety functions of passenger aircraft, the in-flight safety briefing that comprehensively expresses all these types is provided in the form of live briefing performed by in-flight attendants, or in the form of images through the in-flight entertainment system [11]. Furthermore, this must be performed under the regulations related to before take-off, and the detailed items are composed and requested by the International Aviation Safety Standard [12,13] decided by the International Civil Aviation Organization (ICAO). Civil Aviation Authority (CAA) [14] explained when the passengers know what to do in emergency situation, the possibility to survive could be increasing, and the safety briefing and safety information card furnished nearby seats provide such important information about the location of exit and emergency equipment. The safety equipment generally includes life jacket, oxygen mask, seat belt/harness, and floor lamp.

However, many aircraft passengers do not pay attention to the briefing before departure, and more than 2/3 of them do not review the safety measures [15]. Especially, Fennell and Muir [16], Seneviratne and Molesworth [17] reported that the passengers who frequently use airplanes think the safety briefing before departure is repetitive, uninteresting, and boring. In addition, the modern society is producing various information [18], so it is an important task to attract the aircraft passengers' attention to safety information from environmental factors. Thus, the optimum measures should be researched by considering the aircraft passengers' possible repulsion and evasion of in-flight safety information provided when boarding a plane.

As the emphasis on the in-flight safety information was increasing, many research on its effects have been performed, and most of them focused on the effects on the cognition of in-flight safety information such as emotional responses to in-flight safety information image and perception of safety information education [14,19,20]. Similar to this, there have been researches on the effects of in-flight safety information contents on the behavioral intention, so the analysis on responses to the characteristics of in-flight safety information could attract more special attention.

The remainder of this paper is structured as follows. First, a conceptual background and literature review are presented, followed by a section outlining the methodology and design of the research. Subsequently, results are presented followed by a section discussing the findings as well as the conclusions.

## 2. Theoretical Background, Literature Review, and Hypothesis Development

### 2.1. In-Flight Safety Information Characteristics

This study perceived the safety information provided through in-flight safety information image as communication with the airline and flight attendants, and also classified its attributes (reliability, informativeness, utility, interactivity) based on the information delivered by the image media, and then applied them to this research. The traditional role of cabin crew to maintain cabin safety focuses on evacuation of aircraft in the event of an accident. In addition, flight attendants play an important proactive role in safety management that can contribute to accident prevention (ICAO, 2019) [21]. An airline operating an aircraft has an obligation to oversee all matters ranging from crew management, evaluation, training, and establishment of safety procedures and systems to maintain cabin safety [6]. In other words, it means that all passengers, including the airline operating the plane and the cabin crew on the plane, have an obligation to maintain safety. This set of roles has an ultimate impact on airline sustainability. The level of safety awareness among airline passengers is directly tied to the airline's sustainable growth [22].

Reliability means the degree of perceiving that the information provider has the knowledge, technique, and experience related to the topic of communication with the information receiver, and also provides unbiased opinions and objective information [23]. Furthermore, it was defined as positive energy or personal act towards the results of behavior, which would have important effects on the efficient group operation and organizational function [24]. Up to recently, there have been research aiming to manage the relationship with consumers as a fundamental element for successful business in the marketing area regarding this reliability factor [25]. Thus, the formation of reliability with customers is one of the most important elements for successful relationship marketing [26]. According to McKinney et al. [27], when the reliability of information is higher, it has positive effects on users' behavior and attitude, and it is the most representative characteristic of information source. DeLone and Mclean [28] said that the information of websites should be the newest information for obtaining the reliability, and when it was easier to understand, it had positive effects on users' attitude. Thus, the reliability of information is an important variable affecting the consumers' product purchasing behavior, and when the information receivers form high trust in the information provider, it is possible to see some changes in their attitude towards the direction intended by the information [29].

Informativeness or information offering was defined as the degree in which the information provider would provide meaningful information to customers [30,31]. This brings about mutually-positive benefits through the trade of information, and also has significant effects on the formation of reliability [32]. Especially, Wulf et al. [33] explained it as the degree in which the companies would provide meaningful information to customers, which would have positive effects on mutual benefits, and also show significant effects on the formation of reliability. Jung [34] said it would mean the contents and quality of information delivered to information users. The quality of information has effects on user satisfaction and use intention based on its own characteristics such as reliability, accuracy, and vividness while the high-quality information is working as a factor that

makes the users continuously use the system [35]. In addition, the judgment of service could be different depending on the quality and quantity of information obtained through accumulated consumption experience, which also has effects on the repurchasing behavior or recommendation to others [36,37].

Davis [38] presented the concept of perceived utility and perceived ease of use as the major factors affecting the acceptance and selection of a specific information technology such as computer technology, service, and software. The utility was defined as something meaning the benefit of collected information, and it could be reflected into decision-making in case when the value of collected information was highly judged [38,39]. In research on the characteristics of tourism information service through mobile devices, the perceived utility generally means the degree of thinking that using a specific product or service was helpful for the improvement of users' usability [38]. Examining the research on the utility based on online, the consumers were highly dependent on other users' reviews out of various product information. Thus, when the perceived utility through information was higher, the reliability of information was increased [40]. In addition, Heijden [41] explained that the perceived utility would have direct effects on the attitude toward information or use intention, and then emphasized it as an important element of positive behavior. According to the information acceptance model, the trust in the quality of information and information provider would increase the utility of information to people who would accept the information, which would have positive effects on the information acceptance [42].

In relation to interaction, its definition in diverse perspectives has been presented in academic areas such as marketing communication, advertising, and psychology [43,44]. The interactivity was conceptualized as a series of message exchange process of understanding the characteristics of an individual in the category of human communication, collecting/memorizing the individual's responses, and re-responding suitable for the individual's characteristics based on the data collected in the communication process afterwards [45]. Expanding it to a broader meaning, the interactivity was expressed as the characteristics of media providing the possibility of acts conducted with others in the environmental scope provided to individuals, or acts that were given and received between everything including human and object [46]. This interactive communication increases the user satisfaction, the closeness toward the counterpart of communication, and also immersion in the counterpart [47]. In online community, the interactivity is communication with the mediation of computer, plays important roles in sharing information, thinking, and experience between consumers, and also increases the closeness toward the counterpart or the favorable attitude toward the website [48]. Zhao and Lu [49] presented the results showing that the perceived interactivity of Social Network Service (hereafter, SNS) had important effects on the satisfaction, and especially, the interactivity according to the network effects of SNS had important effects on the formation of satisfaction.

Recently, there have been many research reflecting the characteristics of information quality provided through SNS and online, and this study verified the influence relation between in-flight safety information and attitude. Lien and Cao [50] studied the characteristics of WeChat social media service of China, and the motivation, trust, attitude, and positive Word of Mouth (hereafter, WOM) intention of service users. This study classified the characteristics of SNS contents information into playfulness, sociality, information offering, and reliability, and then verified the positive effects on the attitude of WeChat users. Im [51] understood the effects of health food-related SNS contents information characteristics on the brand attitude and purchasing intention of consumers. Its results verified that the information offering, interactivity, and information reliability had effects on the brand attitude, and the interactivity and information reliability had effects on the purchasing intention. The present study has drawn the following hypotheses based on the literature.

**Hypothesis 1 (H1).** *In-flight Safety Information Characteristics have a positively significant effect on Attitude.*

- 1-1 Reliability has a positively significant effect on Attitude.
- 1-2 Informative has a positively significant effect on Attitude.
- 1-3 Utility has a positively significant effect on Attitude.
- 1-4 Interactivity has a positively significant effect on Attitude.

## 2.2. Attitude, Customer Satisfaction, Customer Trust

Attitude means that a person who believes a specific behavior could bring about positive results forms a desirable attitude toward the behavior [52]. In addition, an individual's attitude toward the targeted behavior is a positive or negative anticipatory belief in the results of performing the behavior. The attitude toward a behavior includes the emotional elements of likes and dislikes such as feelings or emotional responses to an object of the behavior [53]. Tonglet, Phillips and Adam [54] explained the attitude which would be composed of favorable or unfavorable evaluation of performing a behavior. If some benefits are anticipated when performing a certain behavior, more favorable and positive attitude is formed. When no benefits are anticipated or unfavorable feelings are formed, such negative attitude and feelings are formed. Thus, an individual's attitude could be used for inferring a specific behavior that person would perform afterwards [55]. Therefore, to draw some behavioral changes, the attitude towards the behavior is important [56]. In this study, it means the individual aircraft passenger's attitude toward the in-flight safety information.

Customer satisfaction is a core element that is an important basis of corporate management [57]. In addition, on top of grabbing attention in the service industrial area, it is discussed by various researchers through research in the level of consumer behavior and marketing. Customer satisfaction means the psychological degree of overall satisfaction or pleasure felt by customers as a result of performing service to meet their expectation and needs [58,59]. Kotler [60] explains the concept of satisfaction as the actual performance responding to customers' expectation. In other words, the customer satisfaction similar to their expectation of products and services and performance they felt after actually using the products, could be decided by the expectation and perceived performance. Fornell and Westbrook [61] say that the success/failure evaluation standard of corporate activities should be based on customers, instead of company itself, so the customer advantage management strategies would be needed. This study argued that the customer satisfaction would be much influenced by the process of purchasing products and services, and the customer satisfaction would be individual's preference-based subjective evaluation of various outputs. Therefore, in this study, the customer satisfaction means the overall satisfaction with the information provider such as airline and safety including the in-flight safety information.

As a kind of expectation formed by an individual or group such as document, words, and promise, the customer trust was presented as a major behavioral factor deciding the long-term relationship between individuals or companies as confidence in a specific promise including the potential risk or trust in the counterpart [25]. Morgan and Hunt [26] explained that this trust could reduce the uncertainty when a consumer was feeling difficulties to make a decision, and divided the trust into trust targeting human and trust between organizations according to the object of interaction. As a similar concept, it could be also divided into cognitive trust formed based on others' ability and responsibility, and affective trust meaning the favorable communication by fully understanding the purpose and intention of the counterpart based on emotional ties [62]. Mostly in the marketing area, the trust means customers' belief in a service company, the employees' words, behaviors, and promises [63,64], and also means their belief in which the possibility of bad results when experiencing the service would be eliminated [32]. This customer trust is perceived as an important variable for the formation of relationships with customers, and it is an essential element deciding the quality of successful relationship [65]. Therefore, in this study, the customer trust means the customers' overall trust in the airline and safety formed through the in-flight safety information.

According to Ajzen and Fishbein [66], the customer attitude is an important variable that has significant effects on the customer satisfaction. Homer and Yoon [67] verified that the brand attitude based on consumers' emotion and tendency would have direct effects on the customer satisfaction. Ko and Chihwei [68] analyzed the relation between attitude and satisfaction with coffee-chain brands of university students, and reported that their brand attitude had effects on the revisit intention with the mediation of satisfaction. Keller [69] said that the consumers' strong association or favorable attitude toward the corporate social contribution activities would have positive effects on the trust.

Thus, based on the results of preceding research, this study set up the hypotheses as follows, in order to examine the influence relations of attitude, customer satisfaction, and customer trust.

**Hypothesis 2 (H2).** *Attitude has a positively significant effect on Customer Satisfaction.*

**Hypothesis 3 (H3).** *Attitude has a positively significant effect on Customer Trust.*

### 2.3. Safety Behavioral Intention

As a will to perform a specific behavior to achieve one's own thought, plan, and goal, the intention is a will to choose a proper means. In addition, as a future behavior that an individual expected and planned, the behavioral intention is the percentage showing the transference of attitude and belief into behavior, so the effects of intention on the behavior are relatively huge [70,71]. Goode and Harris [72] explained the intention as a conscious plan aiming to put efforts to perform a specific behavior with an intention formed from individual consumer's evaluation and normative structure. Similar to this, generally, the behavioral intention is defined as individual's subjective will and belief aiming to show a specific future behavior after forming the attitude toward a certain object, which could be variously defined depending on research subjects [73]. Fishbein and Ajzen [74] said when deciding the matter of performing a certain behavior, each individual would rationally think about the result to increase the predictability. Furthermore, when the result was regarded as positive, the probability to perform the same behavior would be increased.

According to much research, the customers who are concretely satisfied with the objects such as service and product, show such behavioral intentions such as repurchasing intention, purchasing intention, and recommendation intention, which would be led to positive corporate performance [75–78]. According to Oliver [79], when the state and experience of satisfaction with products or services are accumulated, the state of continuous preference is shown, which is called loyalty. Furthermore, a subfactor of loyalty could be revisit (repurchasing) intention. This could show the relation with behavioral intention shown as a following behavioral factor of satisfaction. Kozak [80] examined if the tourists who visited Majorca, Spain were satisfied with their tourism activities, the possibility of their revisit intention and positive WOM intention would be high. In addition, Ganesan [81] said that the trust would have effects on the purchasing intention in the future; the uncertainty of environment, characteristics of exchange, reputation, and consumer satisfaction would have effects on the trust; and the trust would have effects on the formation of long-term relationships such as repurchasing intention between customer and company. In addition, Sam and Tahir [82] explained that the trust would have direct effects on the purchasing intention, so when the trust was higher, the purchasing intention was increased, which was led to repurchase and recommendation while maintaining the continuous trade relation.

Thus, based on the results of preceding research, this study set up the hypotheses as follows, in order to examine the influence relations of customer satisfaction, customer trust, and safety behavioral intention.

**Hypothesis 4 (H4).** *Customer Satisfaction has a positively significant effect on Safety Behavioral Intention.*

**Hypothesis 5 (H5).** *Customer Trust has a positively significant effect on Safety Behavioral Intention.*

2.4. Research Model and Hypotheses

The research model was developed through a review of preceding studies on In-flight safety information characteristics, attitude, customer satisfaction, customer trust and behavioral intentions. The research model of the present research and related hypotheses are shown in Figure 1. Research hypotheses are represented by arrows, and all paths are set up as having positive effects.

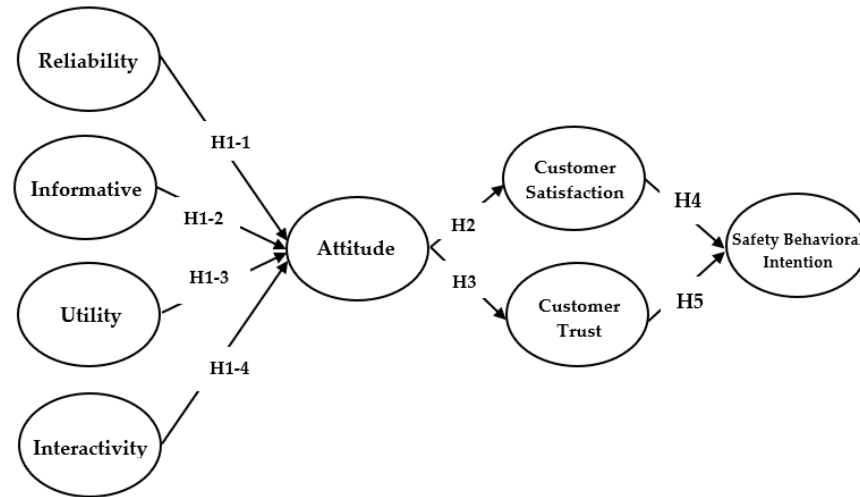


Figure 1. Hypothetical Model.

3. Research Design

The survey questionnaire was composed of 17 measurement items on four In-flight safety information characteristics [32,83–85], including four measurement items on attitude [53,86], four measurement items on customer satisfaction [59], three measurement items on customer trust [87] and four measurement items on behavioral intentions [20]. For each item, a 5-point Likert scale was used to mark an appropriate point, ranging between ‘Very much so’ (5) and ‘Not very much so’ (1). The measurement items for the questionnaire are shown in Table 1.

Table 1. Measurement items.

Construct	Item
Reliability	The in-flight safety information is reliable.
	The in-flight safety information is realistic.
	The in-flight safety information provides the specialized information.
	The in-flight safety information provides the information I desire.
Informativeness	The delivery method of in-flight safety information is stable.
	The in-flight safety information is the source of great information for safe air travel.
	The in-flight safety information provides the proper information characteristics.
	The in-flight safety information provides the information suitable for situations.
Utility	The in-flight safety information is convenient data that provides the safety information.
	The in-flight safety information is beneficial.
	The in-flight safety information helps decision-making related to safety.
	The in-flight safety information reduces time for me to understand the safety rules.
	The in-flight safety information is helpful for choosing my safety behavior.
	The in-flight safety information provides useful information.

Table 1. Cont.

Construct	Item
Interactivity	The in-flight safety information becomes a sufficient communication means for getting information.
	The in-flight safety information helps sharing the safety information between passengers.
	Regarding the in-flight safety information, it is always possible to have mutual dialogues with the information provider (airline, flight attendant).
Attitude	I think it is important to watch the in-flight safety information before flight.
	I think it is easy to understand the in-flight safety information.
	I think it is wise to watch the in-flight safety information before flight.
Customer Satisfaction	If I know the in-flight safety information, it would be helpful for emergency situations.
	I think the in-flight safety information is fully valuable.
	I feel friendly toward airlines because of the in-flight safety information.
Customer Trust	I think the in-flight safety information is useful.
	I positively think of the in-flight safety information.
	I overall tend to trust the provider (airline, flight attendant) of in-flight safety information.
Safety Behavioral Intention	I regard the provider (airline, flight attendant) of in-flight safety information is fully equipped with expertise.
	The provider (airline, flight attendant) of in-flight safety information has great effects on my decision-making related to safety behavior.
	I think every passenger should watch the in-flight safety information.
	I will obey the rules related to safety in the future.
	I will ask my company to perform the safety behavior.

The survey was conducted from 1 February to 3 March 2019, on Korean tourists who have experienced on-board safety communication video through air travel within the prior year. Of the 500 copies collected, 23 copies contained insincere or definitely insufficient entries. They were excluded from the analysis. In the final analysis, 477 copies were used and a model analysis for the structural equation was conducted to verify the hypotheses using AMOS 21.0. Full sample demographics are reported in Table 2.

Table 2. Sample characteristics (Total N = 477).

Characteristic	N (%)	Characteristic	N (%)
Gender		Purpose of Travel	
Male	251 (52.6)	Tourism	380 (79.7)
Female	226 (47.4)	Personal business	30 (6.3)
Age		Business Trip	45 (9.4)
Under 20	5 (1.0)	Study-abroad	1 (0.02)
20–29	137 (28.7)	Others	21 (4.4)
30–39	116 (24.3)	Travel Frequency(1 year)	
40–49	161 (33.8)	1–2	292 (61.2)
50–59	66 (11.5)	3–4	119 (24.9)
Over 60	3 (1.6)	5–6	27 (5.7)
Occupation		Over 7	39 (8.2)
Office Staff	181 (37.9)	Experience of sitting in the emergency exit row	
Businessman	23 (4.8)	Yes	229 (48.0)
Expert	53 (11.1)	No	248 (52.0)
Civil servant	16 (3.4)	Total	477 (100)
Soldier/Police/Fire fighter	51 (11.1)		
Student	80 (16.8)		
Others	73 (15.3)		

## 4. Results

### 4.1. Measurement Model Evaluation

Before verifying the study hypotheses, a confirmatory factor analysis was conducted to verify the validity and reliability of the measurement model. Being built on theory, this



study conducted a confirmatory factor analysis (CFA) without going through an exploratory factor analysis. Exploratory factor analysis (EFA) is mainly used when the relationship between variables and factors is not established theoretically or logically systematized [88]. Confirmatory factor analysis (CFA) utilizes specific measurement variables based on a strong theoretical background or prior research [89]. Therefore, in this study, confirmatory factor analysis was conducted, which is close to the theory verification process. Initial results of the CFA resulted in the low loading of some items. From factors such as utility of In-flight safety information characteristics, customer satisfaction and safety behavioral intention, one and two factor for each variable was removed because their squared multiple correlations (SMC) values appeared under 0.4, and their standardized regression coefficients were under 0.5. From the analysis, proper fit was calculated for reliability, Interactivity of In-flight safety information characteristics using two or more observed variables. However, only three observed variables were used for the factors of subjective norms and safety behavioral intention.

The results for the factor analysis on In-flight safety information characteristics were  $\chi^2/df = 3.040$ , GFI = 0.929, AGFI = 0.910, CFI = 0.973, NFI = 0.961, IFI = 0.973 and RMR = 0.032, revealing that the fit index was acceptable. For attitude, the results were  $\chi^2/df = 5.760$ , GFI = 0.987, AGFI = 0.937, CFI = 0.988, NFI = 0.986, IFI = 0.988 and RMR = 0.013. Customer satisfaction, customer trust, and safety behavior intention were measured together so that analysis of the model fit was possible due to the limitation of measurement variables, they were  $\chi^2/df = 1.681$ , GFI = 0.985, AGFI = 0.969, CFI = 0.996, NFI = 0.990, IFI = 0.996 and RMR = 0.010, indicating an acceptable fit index.

#### 4.2. Reliability, Convergent Validity and Discriminant Validity

The tests performed on the questionnaire concerning reliability and validity included internal consistency, convergent validity and discriminant validity tests. The reliability and convergent validity of the factors were estimated using Cronbach's  $\alpha$ , composite reliability and average variance extracted. Factor loadings of all items were significant at the  $p < 0.01$  level, and the Cronbach's  $\alpha$  of each construct ranged from 0.801 to 0.922. All of the latent constructs had a composite reliability of at least 0.70 and AVE of at least 0.50. Therefore, it was concluded that the measurement model had an adequate convergent validity level (see Table 3). To confirm discriminant validity among the eight constructs, following the criterion suggested by Fornell and Larcker [90], the discriminant validity was determined by comparing the square root of the AVE values with the correlations among the constructs. The results showed that the AVE value was somewhat lower than the square root of the correlation coefficient in the construct between all variables. Results of the correlation are displayed in detail in Table 4.

**Table 3.** Result of Measurement model analysis.

Constructs	Measurement Items	SMC <sup>a</sup>	Regression Weights (C.R.) <sup>b</sup>	Standardized Regression Weights	AVE <sup>c</sup>	C.R. <sup>d</sup>	$\alpha$ <sup>e</sup>
Reliability	R2	0.633	0.942 (20.673 *)	0.825	0.759	0.926	0.898
	R3	0.588	1.065 (21.035 *)	0.835			
	R4	0.694	1.093 (21.415 *)	0.846			
	R5	0.700	1.000 (Fix)	0.815			
Informative	I2	0.690	0.914 (24.154 *)	0.831	0.813	0.928	0.904
	I3	0.799	1.001 (27.628 *)	0.892			
	I4	0.788	1.000 (Fix)	0.889			
Utility	U2	0.658	1.113 (22.995 *)	0.810	0.811	0.945	0.922
	U3	0.762	1.057 (26.434 *)	0.872			
	U4	0.849	1.081 (29.609 *)	0.922			
	U5	0.762	1.000 (Fix)	0.873			

Table 3. Cont.

Constructs	Measurement Items	SMC <sup>a</sup>	Regression Weights (C.R.) <sup>b</sup>	Standardized Regression Weights	AVE <sup>c</sup>	C.R. <sup>d</sup>	$\alpha$ <sup>e</sup>
Interactivity	IT1	0.829	1.039 (17.522 *)	0.864	0.634	0.843	0.858
	IT2	0.670	1.143 (17.671 *)	0.875			
	IT3	0.428	1.000 (Fix)	0.718			
Attitude	A1	0.648	1.000 (Fix)	0.805	0.626	0.943	0.847
	A2	0.635	1.048 (18.199 *)	0.797			
	A3	0.645	0.981 (18.343 *)	0.803			
	A4	0.450	0.936 (14.884 *)	0.771			
Customer Satisfaction	CS1	0.663	1.000 (Fix)	0.793	0.849	0.914	0.801
	CS3	0.881	1.221 (23.985 *)	0.925			
	CS4	0.815	1.156 (23.654 *)	0.916			
Customer Trust	CT1	0.772	1.004 (22.042 *)	0.883	0.781	0.899	0.880
	CT2	0.755	1.069 (21.525 *)	0.867			
	CT3	0.620	1.000 (Fix)	0.791			
Safety Behavioral Intention	BI1	0.692	1.000 (Fix)	0.846	0.817	0.901	0.817
	BI2	0.704	1.136 (16.599 *)	0.826			

$\chi^2 = 717.543$ ,  $df = 271$ ,  $CMIN/DF = 2.648$ ,  $p = 0.000$   
 GFI <sup>f</sup> = 0.895, NFI <sup>g</sup> = 0.932, IFI <sup>h</sup> = 0.957, CFI <sup>i</sup> = 0.957, RMR <sup>j</sup> = 0.033, RMSEA <sup>k</sup> = 0.059

Note: \* Values in parentheses are critical ratios and all the values are significant ( $p < 0.01$ ). <sup>a</sup> Squared multiple correlations, <sup>b</sup> Critical ratio, <sup>c</sup> Average variance extracted, <sup>d</sup> Composite reliability, <sup>e</sup> Cronbach's  $\alpha$ , <sup>f</sup> Goodness of fit index, <sup>g</sup> Normed fit index, <sup>h</sup> Incremental fit index, <sup>i</sup> Comparative fit index, <sup>j</sup> Root mean residual, <sup>k</sup> Root mean square error approximation.

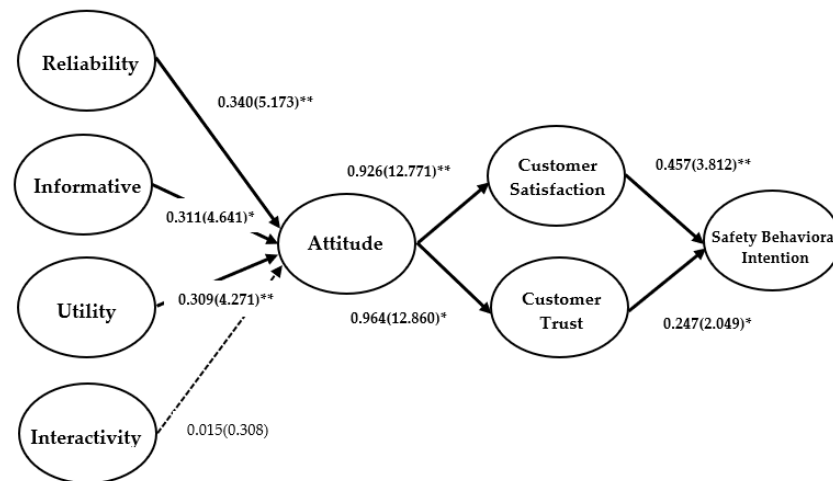
Table 4. Correlation matrix of variables.

Construct	1	2	3	4	5	6	7	8
Reliability	1							
Informative	0.782 **	1						
Utility	0.762 **	0.814 **	1					
Interactivity	0.602 **	0.595 **	0.744 **	1				
Attitude	0.632 **	0.585 **	0.565 **	0.354 **	1			
Customer Satisfaction	0.731 **	0.793 **	0.782 **	0.617 **	0.614 **	1		
Customer Trust	0.795 **	0.806 **	0.807 **	0.635 **	0.920 **	0.627 **	1	
Safety Behavioral Intention	0.552 **	0.635 **	0.643 **	0.477 **	0.676 **	0.629 **	0.551 **	1

Note: off-diagonal scores are the squared correlations between the constructs. The numbers in parentheses refer to standard error of the covariance. \*\* Significant at the 0.01 overall.

### 4.3. Hypotheses Test and Discussion

The results of the goodness of fit analysis of the research model showed that the goodness of fit index of the model was  $\chi^2/df = 3.281$ , GFI = 0.869, AGFI = 0.836, CFI = 0.938, NFI = 0.914, IFI = 0.938, RMSEA = 0.069 and RMR = 0.036. Most of the other indices were also within the goodness of fit range, but the values for GFI and AGFI did not adequately fall within this range. Still, because the values for most of the other indices were within the goodness of fit range, and because those that failed to reach the goodness of fit range did not deviate significantly in terms of difference, the measurement model of this research was judged to be appropriate [91–93]. The results of the hypotheses verification of the final research model are shown in Figure 2 and Table 5.



**Figure 2.** Result of the structural equation modeling (Total N = 477). Notes: The amount of variance explained. \*  $p < 0.05$ , \*\*  $p < 0.01$ .

**Table 5.** Results of research hypotheses testing (Total N = 477).

Hypothesis	Path	Standardized Estimate	C.R.	p-Value	Decision
H1-1	Reliability → Attitude	0.340	5.173	0.000 **	Supported
H1-2	Informative → Attitude	0.311	4.641	0.000 **	Supported
H1-3	Utility → Attitude	0.309	4.271	0.000 **	Supported
H1-4	Interactivity → Attitude	0.015	0.308	0.758	Not Supported
H2	Attitude → Customer Satisfaction	0.926	12.771	0.000 **	Supported
H3	Attitude → Customer Trust	0.964	12.860	0.000 **	Supported
H4	Customer Satisfaction → Safety Behavioral Intention	0.457	3.812	0.000 **	Supported
H5	Customer Trust → Safety Behavioral Intention	0.247	2.049	0.040 *	Supported

\*  $p < 0.05$ , \*\*  $p < 0.01$ .

The results of testing the antecedents affecting attitude showed that for reliability,  $\beta = 0.340$  and C.R. = 5.173 ( $p < 0.01$ ), for informative,  $\beta = 0.311$  and C.R. = 4.641 ( $p < 0.01$ ), and for utility,  $\beta = 0.309$  and C.R. = 4.271 ( $p < 0.01$ ), statistically significant except Interactivity.

This suggests that communication through safety information experienced in the airplane is recognized as a positive role of knowledge, skills, experience, mutual benefit, and efficient delivery of safety information related to the safety subject. The attitude to focus and acquire in-flight safety information can be improved. Especially, reliability was the most important factor. On the other hand, for interactivity, the results were not significant at  $\beta = 0.015$  and C.R. = 0.308. In contrast with the purpose of this study, in which cabin safety communication was defined as the concept of communication, the results of the study showed that the attributes of interaction were not influenced by the relationship with customers. Therefore, Hypothesis H1-4 was not supported.

Looking at the relationship between attitude and customer satisfaction, customer trust that customer satisfaction ( $\beta = 0.926$  and C.R. = 12.771) showed significance and customer trust ( $\beta = 0.964$  and C.R. = 12.860) showed significance at a significance level of 1%. This suggests that an increase in the attitude toward viewing in-flight safety information increases the satisfaction and value of the airline providing the information, and builds trust.

Lastly, the effect that customer satisfaction and customer trust had on safety behavioral intentions were  $\beta = 0.457$ , C.R. = 3.812 ( $p < 0.001$ ) and  $\beta = 0.247$ , C.R. = 2.049 ( $p < 0.05$ ), indicating it had statistically significant effects. This suggests that if the positive satisfaction and trust are formed through the factors of the safety information characteristic, the intention of the action to implement the safety information also increases.

## 5. Conclusions

Sustainability is a recurring issue that comes up year after year. Sustainability, as it has always been, will be a challenge for all businesses in 2022. The consequences of an aviation accident are enormous. Entrepreneurship that prioritizes safety is the key to ultimately enhancing profitability and building a sustainable company in the aviation sector.

This study endeavored to analyze the effects that the factors of the In-flight safety information characteristics (reliability, informativeness, utility, interactivity) had on the safety behavioral intentions of air travel's passengers. The results can be summarized as follows.

First, the findings suggested that the in-flight safety information characteristics such as reliability, informativeness, and utility had positive effects on the attitude. On the other hand, it was verified that Interactivity did not have significant effects. This presents several important considerations for forming the aircraft passengers' attitude according to the characteristics of in-flight safety information. Once the passengers perceive the trust in contents and source of in-flight safety information, they start forming positive attitude. In addition, the qualitative excellence of in-flight safety information brings about the favorable attitude aiming to accept the information. Furthermore, the customers' perception of value of in-flight safety information that would be helpful for safe trip shows positive effects. However, contrary to the purpose of this study specifying that the in-flight safety information would be the concept of bidirectional communication between airline and passenger, the interaction did not have effects on the relation with passengers. This result might be because the perception in which the flight attendants could provide a reply to information about image media has not been generalized.

Second, Attitude turned out to have statistically significant effects on the customer satisfaction. Passengers who understand the importance of communication and have positive anticipatory belief as a result of in-flight safety information have a satisfied anticipation of safe travel.

Third, Attitude turned out to have statistically significant effects on the customer trust. McKnight, Choudhury and Kacmar [94] said that it would be essential to have the trust between customer and brand, and the customers' favorable attitude would have important effects on the formation of trust. Thus, the passengers' positive attitude could increase the trust which is an important factor for the establishment of continuous relationships.

Forth, Customer satisfaction had positive effects on the safety behavioral intentions. This means once the passengers are overall satisfied by perceiving the anticipation and belief in the factors of in-flight safety information characteristics, they would perform better the rules and procedures of safety information. It is also possible to positively predict that the passengers would actively perform the safety behaviors in emergency situations. Similar to this, much research related to the attributes of service quality presented that the satisfaction would be generally an indirect path connecting to customers' behavioral intention [95,96].

Fifth, Customer trust had positive effects on the safety behavioral intentions. This means once the customers perceive the overall trust and confidence in the airline and safety, their safety behavioral will could be improved. The high trust in airlines includes the anticipation of reducing the risk factors in emergency situations.

In addition, based on the results of this research, the practical implications can be presented as follows. First, especially, the informativeness of in-flight safety information is the characteristic in which the information provided by the company is judged as excellent, so it is formed based on trust in the airline. Thus, the airlines should utilize the communication of in-flight safety information as a medium of reflecting the safety culture and consciousness of airline, rather than approaching it as mandatory regulations based on the Aviation Act. Second, the attitude by the perception of theme, relevant knowledge, technique, and experience of safety information forms the passengers' overall psychological satisfaction and trust in airline and safety, and also inspires the safety behavioral will. Thus, the airlines should carefully approach the contents of safety information by fully analyzing

the current status and foreign cases of safety information for the provision of in-flight safety information. They also need to deeply research the methods of communication. Third, contrary to the value-satisfaction-attitude model, this study verified the satisfaction through attitude. As the in-flight safety information has the aspect of mandatory acceptance of information for in-flight safety maintenance, it would be necessary to research the proper time and method of information exposure that could contribute to the formation of attitude. Thus, the results of this study could be used for establishing the efficient measures for the operation of in-flight safety information of airlines, and also used as basic data and strategies for the safety maintenance of passengers.

Despite the analytic results of the study above and the theoretical and practical implications, this study has limitations. This study researched the in-flight safety information provided through image before departure. The safety information provided to passengers could be divided depending on time, situation, and method of provision, and the contents could be also different. The method of provision could be largely classified into in-flight safety information image, in-flight safety announcement, and in-flight safety briefing card while the time could be divided into before departure, all times during flight, before landing, and after landing. The situation is divided into general flight situation and emergency situation. Thus, if further research verifies differences according to time or method of provision of in-flight safety information, it could draw more significant results based on the comprehensive analysis on the in-flight safety information. Second, this study conducted research on the in-flight safety information characteristics based on the samples of general airline passengers. Considering the theme of this study is related to safety, if the differences in the effects of perception of in-flight safety information on the safety behavioral intention are examined by dividing the subjects into the general occupational cluster and the safety-related occupational cluster such as firefighter, police officer, and security officer, it could be used as the definite basic standard for the roles of emergency evacuation assistants.

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