

# The Effect of Digital Applications on Customer Satisfaction in Malaysian Passenger Airline Industry: Post- Pandemic Era

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## Abstract

In recent times, digitalisation has become increasingly utilised by companies globally to shape their businesses and to effectively increase sustainable customer loyalty, create distinctiveness, as well as provide competitive advantage. The airline sector is actively involved in sustainable digital innovation due largely to its cost structure, competition intensity and desire to improve customers experience and organisational performance. This paper therefore seeks to investigate the impact of digital marketing applications and strategies adopted by both local and international airline operators in Malaysia. The study specifically focused on determining the relationship between the independent variables of digitalization strategies construct (pre-arrival digital tools usage, boarding digital tools usage and arrival digital usage ) and the dependent variable ( customer satisfaction).As result, the study adopt quantitative methodology whereby primary data will be collected through an online questionnaire survey to be administered to conveniently selected sample respondents in Klang Valley area, Malaysia. The survey data will seek to analyse sustainable digital application best practices in the industry in Malaysia in the context of the effect of digital marketing on customers relation management post -COVID 19. By using SPSS Version 23 data analysis tool, descriptive and correlation analysis were performed to determine the degree of association among the tested variables. The findings of the study will have implications on customers expectations and demand from airline companies as well as assist airline sector practitioners improve on effective adoption and utilization of digital technology to drive change and improve performance in the turbulent aviation business environment.

**Keywords:** Digital Application, Customer Satisfaction, Airway Sector, Mobile Application.

## Introduction

The rapid information, communication and technology advancement has overtime revolutionised all facets of life. According to Fachrurazi et al.(2022) global firms will continue

to develop and use digital technology as a medium for marketing activities. Apparently, digitalisation provides numerous benefits to industries that acknowledge its scope including the airline industry. Digitalisation is defined as a cultural evolution or a social phenomenon structured to create a new business model for companies (Hossain et al., 2023). Over the years, the airline industry has made tremendous investment in terms of money and time acquiring new digital technologies including self-service equipment, websites mobile communications, complex software packages and many other elements (Phillip and George 2003; Milkau and Bott, 2015). These technologies fundamentally help in promoting organisational performance (Hossain et al., 2022). In essence digital technologies assists airlines provide optimal services that create value and guarantee customer satisfaction (Bashir et al., 2020). Heiets et al (2022) stated that low - profit margins has become a major constraint for adoption of advanced digital technologies by airline operators hence their inability to replace conventional technologies in the sector. Thus, there is a need for the aviation industry to ascertain where the challenges are in order to make improvements.

It is also important to highlight that with the rapid expansion of social media networks and mobile applications in this era, the digital-verse provides a broader opportunistic space for the airline industry to promote new innovative business ideas. Shrivastava (2023) has stressed that multiple social media and various digital platforms can be leveraged by organisations for target marketing and customer analysis post pandemic era. Consequently, the analysis and examination of digitalisation impact on the airline industry may assist the companies in the industry adjust or generate new strategies to attract more passengers and obtain corresponding benefits. For instance, Karaagaoglu and Çiçek (2019) posit that the ultimate goal of improving digital processes in the airline sector is improved performance and profitability. The position reinforced by Lampathaki et al (2019) that airlines can improve operational efficiency and reduce costs through digital transformation.

It is obvious that with fierce competition among companies in post pandemic era in the airline industry new innovative technologies designed to improve consumption activities of the target audience, facilitate globalisation and access to internet, expand electronic commerce activities and competitive advantage have become the dominant logic of majority of the airline companies operating in the global environment (Babenko et al., 2019; Dragomir & Dumitru, 2022). Another valid example is provided by Sioshansi et al (2022) who emphasised that British Airways harnesses the simplification and automation of the operation process through digital technology and assigns resources to different links to ensure costs reduction and maximization of profits. A previous study by Yoon and Yang (2006) had found many airline companies expanding their flight tickets sales abilities through various platforms. Using these platforms has helped in reducing the distribution channels and commissions paid to travel agents which invariably result in operating costs reduction and increased revenue (Yoon and Yang, 2006).

This paper therefore focuses on analysing digital marketing applications in Malaysian airline industry in post COVID 19 era as it investigates specific digital infrastructures, the rationale for airline's digitalisation and the impact of ICT applications in improved performance of the airline industry. In addition, the paper has as its secondary aim the analysis of digital impact from the perspective of the passengers who are influenced in the whole flight process and how airlines are motivated to position their marketing strategies. In this regard some specific indicators like average waiting period and loss rate are taken into consideration to estimate the functions of digital infrastructure, optimize operational efficiency and improve customer experience. As one of the most valued topics at present, to what extent digitalization can

impact the airline industry is worth analyzing. In addition, as one of the most important elements of the airline industry, passenger preference has a huge impact on airline performance. Thus, researching the development and impact of digitalization on the airline industry will be significant for industry development and can contribute to the existing body of literature.

## **Literature Review**

### ***Concept of Digitalisation***

Noroozi et al (2010) defined digitalisation as the adoption and application of digital technologies by an organisation. In other words digitalisation involves usage of digital technology and data to facilitate organisational revenue generation transform business models and create a digital information-centric environment for a business to thrive (Moghrabi et al., 2023; Alkaabi et al., 2019). This has positioned digitalisation at the centre of societal and economic transformation (Alkaabi et al., 2020). Schallmo and Williams (2018) argued that firms across industries are motivated to embrace digital transformation to improve their businesses despite some shortcomings like privacy and security issues. Most of scholarly discourse on digitalisation focused on factors affecting adoption of specific digital technology such as broadband internet (Colombo et al., 2013), digital marketing (Taiminen and Karjaluoto, 2015) social media Brink (2017); Khaled et al (2019), Internet of things Quigley and Burke (2013), e-commerce Gregory et al (2007); Arntz et al (2019), Internet banking Zarafat et al (2013) etc. Most of these studies were done pre-pandemic era which has leaves a knowledge gap that this paper intends to fill especially on the impact of digital technology adoption and utilisation in the airline industry of an emerging economy. Pardo et al (2022) had categorised the impact of digitalisation into three main components. Firstly, it can optimise the already existing business activities, which is referred to as “activity-links-centred digitalisation.” Digitalisation can also help facilitate new business activities inputs know as “resource-ties-centred digitalisation”. Finally, digitalisation can help create and maintain networking between various business partners which is referred to as “actorbonds-centred digitalisation”. Among available choices of digital technologies therefore, airline companies should understand that they have the opportunity of leveraging these technologies to gain competitive advantage in the industry (Pagani and Pardo, 2017).

### **Digitalisation in the Airline Industry**

Evidences abound in literature on the impact of airline industrial deregulation in the 1990s and the major organisational shift in industry (Gillen et al., 1990; Heiets et al., 2022). In terms of digital transformation of conventional businesses, airline companies have overtime been pushed to modify marketing strategies in order to increase their efficiency, performance and competitive advantage in the fast growing low-cost airline market (Cento, 2008).

Lampathaki et al (2019) study on digital transformation in aviation data and intelligence marketplace found that digitalisation is a thriving trend in the aviation sector with about 58% of airlines forming digital strategies. The study therefore concludes that technology innovation through data platforms has the potential of accelerating digital transformation in the airline industry thus allowing companies to leverage on its benefits. So, unlike other firms in various industries selling tangible products to customers, airline firms provide intangible service for passengers while adjusting such services to meet customers’ expectations. Hence, the need for these companies to constantly provide interactive platforms for customers, suppliers and partners through the application of digital methods and competencies (Stone,

and Woodcock, 2014). Furthermore, Andal-Ancion et al (2003) suggested the adoption of digitalisation strategies in the airline industry to facilitate standardisation processes for increased efficiency in the competitive environment. This suggestion is made based on the airline companies responsibility of providing customers with a real-time interface; access to flight information on a regular round the clock basis and price list at real time across companies (Andal-Ancion et al. 2003). It is therefore managerial responsibility and decision makers obligation of airline companies to improve their company's internalisation plan in conformity to their expected competitive strategies in order to attract and retain customers (Lee and Falahat, 2019).

Jarach (2002) affirmed that digitalisation process in airline industry creates a link between customers and airline companies to enhance one-to-one relationship especially for target customers and suppliers. Through this arrangement digital products and services are offered to customers that are driven by the desire to provide customer with satisfactory services. Some of these personalised services include check –in and bag dropping. Sinha et al (2018) study found that digitalisation processes contributed significantly in reduction of passengers waiting time and long check in processes at airports.

In Malaysia, digitalisation activities of airlines and other organisations suggest that diverse forms of such activities are being strongly pursued. Lee et al (2022) identified the influencing factors that are peculiar to these Malaysian firms as dependence on formal and informal networking connections. Grimpe et al (2023); Yu, et al (2022) equally admit in their respective studies that businesses including Airlines operating in multiple countries face enormous challenges during digital transformation. This is due largely to the fact that the need to find solutions to the differences between existing international knowledge and newly created digital knowledge including information overload. Furthermore, they also need to ensure a well-co-ordinated transformation in different business units across various national environments that tend to increase the complexity of the process. According to George and Schillebeeckx (2022) the more diversified an organisation is geographically, the greater it is exposed to the aforementioned challenges.

The need for a study that will define the mechanisms of digitalisation in the airline sector post pandemic is therefore strengthened by the above summations. Hence this study intends to explore the digital marketing applications as a tool of rapid enhanced profitability of Airlines in Malaysia. Although there have been many studies on digitalisation and digital technology trends, but the link between the concept and development of post pandemic digital marketing applications in the airline sector has not been adequately illuminated in previous literature. Thus, to fill this literature gap, this paper identifies how digitalisation and digital technologies affect the Malaysian airline industry.

### **Digital Marketing Applications**

Altindal (2013) has demonstrated in his study how usage of mobile applications, web and other new media platforms promote brands and their commercial activities. While Varnali (2010) provided an alternative terms for digital marketing such as interactive marketing, online marketing and web marketing. It is however argued in literature that the transformation of customer experience is the cornerstone of digital transformation (Sabri et al., 2023). Evidently, digital technologies facilitates the preparation of diverse direct, online and experiential campaigns that brings advertisement of products and services closer to the customer. These campaigns include niche database advertising and award-winning card layouts, digital tape ads, pay as you go online, rich text ads, branded web sites, viral ads,

branded social networks, in-game ads (advergaming), interactive virals and entertainment ads, SMS texts, online blogs, text, e-mail and mass media. Öztürk (2013) described four stages of initiatives designed to draw a customer closer to a brand. The first stage focuses on consumer engagement, the second phase is to create dialogue, thirdly is to participate in these dialogues and finally make the customer have a dual role as a consumer and ambassador of the brand. It is also necessary to draw attention to the fact that digital platform, which has unlimited customer freedom in relation to digital marketing that allows brands to interact with customers without space limits, cannot be controlled by the brands and that utmost care should be taken in respect of the risks arising from this situation (Öztürk, 2013; Polas et al., 2020; Polas et al., 2019).

Westerman et al (2014) further stressed that digital marketing has remained an important tool in the airline sector ensuring the meeting of customer needs and strengthening of interactions between airlines and their customers. The process of digital marketing begins when a passenger or customer make bookings with either mobile phone or a computer through the boarding process using smart device enabled airline company application, to flight process, luggage identification and delivery, hotel services and car rentals services etc. Furthermore, digital technology equally facilitates storage of customers' preferences, payment history, departure and arrival dates, sales, travel habits, behaviours, flight mileage and other relevant data in score collection cards or systems. Such data contributes in enhancement of customer relationship management as well as offering customised promotions to airline services customers.

In addition to making provisions for customised products, it is also known that digital technologies have a positive effect on improving marketing studies. It is through this process that customers preferences for travel can be analysed and if the search is made for a country, promotional or affordable flights to that country can be provided to the customer in various ways; E-mail marketing, Social media Marketing, Web page marketing, search engine Ads and mobile applications. For instance e-mail marketing is the most often used for customer relationship management by airline companies to segment target audience and provide highly targeted promotions and campaigns to customers that are willing to respond. In fact there are many parameters in e-mail marketing in airline industry. Obviously, it is one of the effective ways of attracting new customers, increasing the loyalty of existing customers, enhance brand awareness, communication campaigns, obtaining details about the customer through forms completed by the customer. E-mail marketing has become effective again when communication and advertisements became available from mobile devices. Sending e-newsletters e-mail, campaigns and e-mail promotions to customers increases the number of clicks on the website of the company. Thus, the right message is provided to the target audience at low cost and the feedback can be measured easily as customer information is recorded (Rialti et al., 2022). On the aspect of social media marketing, social networks, online communities, blogs, wikis or similar collaborative media platforms for marketing, sales and customer service purpose (Öztürk, 2013). In this regard airline companies would have to embrace social media platforms like facebook, instagram, youtube, Twitter, LinkedIn, TIKTOK and Flickr to provide adequate interaction with their customers. These social media platforms will enable airline operators learn on real time customers perception of their brands as well as help them promote their products and services to a wider range of prospective customers. Nonetheless there are also risks associated with a customer's ability to freely share ideas and experiences on social media marketing platforms, These platforms in this period need more attention in terms of control and management than other traditional

marketing channels. It is therefore very important companies manage them professionally with regards to follow-up, content, services and feedback. Social media avails customers with opportunities and freedom to engage with airlines of choice as often as possible to know whose products and services appeals most to them.

The website has also become an active marketing tool available to companies to effectively and efficiently operate their businesses uninterruptedly 24/7. As a marketing tool it enables companies to advertise their products and services easily with a broader reach. For airline companies, having an easy-to-use website, understandable menus, effective design, regularly updated and satisfactory content, easy to download sites and aesthetic web page are vital in attracting customers attention (Bhattacharjee et al., 2019). The quality of the products and services provided on the website and the convergence with the target audience are also important points for easy communication and interactive web site marketing (Rialti et al.2022; Polas et al., 2020).

Another important marketing instrument relevant for business promotion in the airline sector is web marketing. Web marketing that is user friendly needed in this sector because of the competitive nature of the airline industry. Under this platform, the search engines such as Google Adwords, Yahoo Overture, and Microsoft adCenter reveals ad slots on the right hand corner. It is however important that airline companies rank well in search engines like skyscanner and Kayak. For mobile advertising, this has to do with marketing activities aimed at delivering and promoting brand products via mobile networks ( mobile phones and other digital devices ) using a none fixed network. Mobile applications are mainly used to facilitate direct contact between customers and marketing managers (Öztürk, 2013).

Another means through which airline companies and customers interact is through online booking and ticket purchase. This process, in addition to improving customer experience provides the company with a large database for future marketing promotions and campaigns. As a matter of fact customer through ticket searching, booking and online check-in leave digital footprints behind that can be harvested by the airline companies. In this regard information such as passengers allergies, nationality, vaccination status etc may be easily stored for future retrieval for improved customer experience and services.

To suggest that digital strategies have an effect on product pricing strategies would not be inaccurate. Due to the numerous difficult routes, customer payment habits, the time of year, and other numerous factors affecting ticket costs, it is only logical that the airlines that employ digital marketing efficiently are one step ahead of the competition.

### **Methodology**

This study is cross-sectional and is based on airline customers perspective. It adopted quantitative research methods which have philosophical roots in positivism (Saunders et al., 2007). The online survey questionnaire instrument was utilised to collect primary data from passengers of different ages and travel purposes. Nardo (2003) states that surveys focusing on customers is efficient in measuring passengers attitudes towards the airline industry's digital transformation. Study participants comprised of 190 respondents randomly selected from among student groups and their parents who have had different experiences about airline industry's digital infrastructures. This study employed descriptive statistics and Pearson's Product Moment Correlation Coefficient (PMCC) to estimate the coefficients of the explanatory variables. According to Saunders et al (2007) when investigated variables contain numerical data PMCC should be used to examine the relationship. According to Wang et al.

(2013) this model ignores the individual and time effect, and minimizes the error between estimated and actual observed points on the line.

*Survey Analysis*

This particular segment of the study provides detailed explanation on the result of descriptive statistical analysis performed. The tables below present the findings on descriptive statistics of the dependent and independent variables. It actually presents summary statistics of the mean, standard deviation, frequency and percentage level of variables. The descriptive table reveals the totality of number of observations for the sample.

Table 1

*Socio -Demographic Descriptive Statistics Analysis By Gender*

Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	136	71.6	71.6	71.6
Female	54	28.4	28.4	100.0
Total	190	100.0	100.0	

The above table and chart show the distribution of respondents by gender. There were 136 male constituting 71.6 percent of the total respondents with 54 females or 28.4 percent of the total respondents in the distribution. This is indicative of the fact that more males could easily be accessed which can be understood from both cultural and religious point of view.

**Age Category**

Table 2

*Socio -Demographic Descriptive Statistics Analysis By Age*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid 18-25	3	1.6	1.6	1.6
26-34	25	13.2	13.2	14.7
35-43	68	35.8	35.8	50.5
44-and above	94	49.5	49.5	100.0
Total	190	100.0	100.0	

The descriptive statistics table and pie chart of the respondents reveals that majority of retail traders in the market were within the age bracket of 44-55 years representing 49.5 percent of the total distribution, it is closely followed by 68 subjects or 35.6 percent of the respondents whose ages ranges from 35-43 years while the least at 1.6 percent were those between 18-25 years may be because in Nigeria people of that age group are presumably still depending on their parents.

**level of Education**

Table 3

*Socio -Demographic Descriptive Statistics Analysis by Educational Level*

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Primary level only	21	11.1	11.1	11.1
secondary level	43	22.6	22.6	33.7
below degree	49	25.8	25.8	59.5
degree	52	27.4	27.4	86.8
post graduate	25	13.2	13.2	100.0
Total	190	100.0	100.0	

Table 3 is an outcome of descriptive statistics analysis of responses based on educational qualification of the sampled population. It clearly shows that most of the traders are educated with 52 or 27.4 percent of them having university degree, 25.8 percent below degree but above secondary school certificate while only 11.1 percent have only primary school certificate. This is the reason there is a preponderance adoption of digitalization in the industry.

Table 4

*Descriptive Statistics of Respondents Digital Adoption***What is your level of digitalization adoption**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid low	3	1.6	1.6	1.6
moderate	25	13.2	13.2	14.7
high	68	35.8	35.8	50.5
very high	94	49.5	49.5	100.0
Total	190	100.0	100.0	

The table four above provide information on the distribution of respondent's level of digitalization adoption in the study area. Whereas there were at least 94 or 49.5 percent of the respondents who are very high adopters of digital technology among the study group, 35.8 percent were high adopters as only 1.6 percent were found to be low adopters perhaps as a result of low awareness or low income.

Table 5

*Descriptive Statistics Of Respondents Digital Utilisation***To what extent do you utilize digital technology in your business**

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid low	2	1.1	1.1	1.1
moderate	51	26.8	26.8	27.9
high	57	30.0	30.0	57.9
very high	80	42.1	42.1	100.0
Total	190	100.0	100.0	

The degree of digital tools utilization among the respondents is demonstrated in the table above. Very high utilizers were 80 in number about 42.1 percent, closely followed by high utilizers who were 57 in number or 30 percent of the respondents, moderate utilizers were 51 or 26.8 percent as low utilizers were only 2 or 1.1 percent of the total samples.

Table 6

Descriptive Statistics of Respondents Digital Platform Of Choice what digital platforms do you often use to carry out your business

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Facebook	2	1.1	1.1	1.1
Instagram	12	6.3	6.3	7.4
twitter	73	38.4	38.4	45.8
online market application	103	54.2	54.2	100.0
Total	190	100.0	100.0	

Table 6 above presents the various digital sales platforms of choice used by the respondents in carrying out their airline transactions. Online market application was the most preferred platform of choice as about 103 or 54.2 percent of the respondents utilize it consistently, followed by twitter at 38.4 percent and Instagram at 6.3 percent.

Table 7

*Presents the Pearson Product Moment Correlation Analysis correlation analysis*

			Pre-arrival Digital tools usage	Boarding Digital tools usage	Arrival Digital tools usage	Satisfaction
Pre-arrival tools usage	Digital	Pearson Correlation	1	.584**	.002	.433**
		Sig. (2-tailed)		.000	.981	.000
		N	190	190	190	190
Boarding tools usage	Digital	Pearson Correlation	.584**	1	.135	.451**
		Sig. (2-tailed)	.000		.062	.000
		N	190	190	190	190
Arrival usage	Digital tools	Pearson Correlation	.002	.135	1	.041
		Sig. (2-tailed)	.981	.062		.575
		N	190	190	190	190
Satisfaction		Pearson Correlation	.433**	.451**	.041	1
		Sig. (2-tailed)	.000	.000	.575	
		N	190	190	190	190

\*\* . Correlation is significant at the 0.01 level (2-tailed).

result between the independent and dependent variables. The dependent and independent variables were correlated to ascertain the degree of association between them. Consequently, the overall data from 190 respondents in the study sample were employed in the correlation analysis. All the proxies of the independent variable (Digitalisation) positively correlated with dependent variable (satisfaction). They were also found to be statistically significant for the study. The dependent variable satisfaction has a moderately strong significant relationship with Pre-arrival Digital tools usage at a coefficient value of 0.451 and significant p value of 0.000. Furthermore, the dependent variable has a fairly strong significant relationship with Boarding Digital tools usage variable at a coefficient value of 0.433 and significant p value of 0.000. The dependent variable has a poor association with Arrival Digital tools usage variable at a coefficient value of 0.041 and significant p value of 0.575

### Discussion and Conclusion

Digital marketing applications in Malaysian airline industry in relation to customers satisfaction were examined in this study. The findings from the questionnaire data indicated that pre-arrival digital tools usage, boarding digital tools usage and arrival digital tools usage have positive association with airline customers' satisfaction in Malaysia. There are several activities at the pre-arrival stage where attention is paid to passengers to purchase air tickets online as well as make comments about airline services on different social media platforms. It is also found that online ticket sales through different mobile applications and tools have gradually replaced the traditional ticket purchase system. Some of these transactions are done either through airline websites (direct distribution) or on internet driven platforms of

travel agencies. Consistent with the findings Duziak (2023) stressed that the audience for ticket purchase on the main website of airlines have been a preference of many airline companies customers post COVID 19 as they take into consideration the regularity and safety of such websites. There is an empirical support for the study findings as Yu (2008) states that online ticket purchase popularity provides opportunities for airline companies to target customers directly.

This study also found that boarding digital tools usage equally helps effectively during check-in procedures, passengers need to conduct security check on their belongings and luggage before boarding. Five typical digital infrastructures used in airport security check have been selected, namely X-ray baggage screening, Body screening, Face recognition system, Fingerprint recognition system, and Red infrared detector, to count the frequency of security problems. Passengers' views about facial recognition system, which is one of the most widely used machines mentioned before, have also been collected and classified based on their annual flight times. On the aspect of digital application usage at the time of arrival, the study found that different airlines have distinctive methods of facilitating passengers luggage retrieval and exit through custom check points for international arrivals. In this stage, it focuses on passengers' ways to get luggage information based on different age groups and how they go through customs according to their flight times .

### **Suggestions**

The study therefore suggests that airline operators in Malaysia such as AirAsia, Batik Air Malaysia, Malaysia Airlines, MASkargo etc need to further improve their digital tools usage efficiency in the area of facial recognition systems and x-ray baggage inspection systems. Since these digital security facilities are controlled by computers, they will certainly have fewer problems unlike when done manually, Besides, in order to improve the efficiency and service quality of the airport, the airport needs to introduce advanced technology to transform and upgrade these safety-related facilities. There is no doubt that the digital development of the airline industry has continuously upgraded and improved the facilities of the airport, which has accelerated the passenger process (You, 2018), However, future studies can use other approaches such as qualitative research method to access the role of digital technology adoption and utilisation in the airline industry.

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