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The Digital Transformation of Egypt Air Flights and the Passenger Experience

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Abstract

Nowadays, the aviation industry is witnessing a rapid and disruptive era that could be described as the "era of hyper-competition," in which fierce competition for resources has been raised among industry stakeholders, as well as the erasure of traditional competitive barriers to become the dominant force. In this regard, this research seek to investigate the fundamental relationship between Egypt Air passengers' attitudes toward flight digital transformation practices, pre-flight, in-flight, and post-flight stages, and their experience value. For that sake, the research employed a descriptive analytical methodology by using a questionnaire as a quantitative method. The survey sample covered a random sample of Egypt Air passengers, with a total number of 724 questionnaires distributed online over the sample. Egypt Air was chosen for the study because it is the country's flag carrier that has been seeking for digital transformation coping with Egypt vision 2030 for inclusive sustainable development. The results were analyzed using descriptive statistics, reliability analysis, coefficient analysis, Pearson correlation analysis, and regression analysis with the support of SPSS v.25. The research reached several results, the most important of which is that there is a significant but weak positive correlation between passenger attitudes toward flight-related digital practices and the digital flight experience value. The research thus recommended that Egypt Air should intensify its awareness of passenger flight digital practices in terms of their values and how to use them for better seamless flight; it should also condense self-service techniques and promote them online through its website, mobile application, and social media platforms.

1. Introduction

Recently, the world had witnessed the fourth industrial revolution, that era of digital workforces and constant connectivity (artificial intelligence, machine learning, analytic block chain, etc.). Consequently, artificial intelligence is going to be a dominant global force,

allowing humanity to benefit from more accurate and efficient outcomes and enabling businesses to get closer to customers by understanding what they value and how to serve them well (**Amadeus, 2017**). New technologies have opened up new markets, which have in turn led to the emergence of new customers and competitors who, accordingly, are driving new expectations (**KPMG International, 2017).**

In this context, the whole aviation, travel, and tourism sectors have outpaced other sectors in exploring new and emerging technologies with the potential to enhance customer experiences and boost operational efficiency, thereby achieving competitive advantages **(Zhang & Wen, 2017).** The use of technologies in process automation and passenger engagement, such as mobile customer relationship management (CRM), cloud computing, block chain technologies, big data, the Internet of Things (IOT), and robotics, is central to digital transformation. Another critical aspect is flow monitoring, which uses predictive and preventive solutions such as airport indoor geo-location, identity management, flow management, or radio frequency identification (RFID) **(Zaharia & Pietreanu, 2018).** In this concern, the importance of the current study is divided into two parts which are; "the Theoretical Importance" which is to enrich the field studies and researches related to the digital transformation in aviation industry as one of the vital issues for which Egypt vision 2030 seek, and "the Practical Importance" which is concerned about reaching a set of results and recommendations that can help superior management of Egypt Air to be transformed digitally improving its services and operations offering passengers better seamless experience achieving their satisfaction and loyalty.

Research Problem

Nowadays, aviation industry is pressed by a hyper fierce competition driving the industry stakeholders to struggle for getting distinct competitive advantages providing passengers with better, fast and seamless travel experience and attaining their satisfaction and loyalty. In this context, the main issue of this research is the relation between Egypt Air's digital transformation (DT) and its passenger experience value. For that sake, the current research highlights the DT techniques offered by Egypt Air for its passengers and the DT of operations and processes' contribution to passenger experience value, in addition to the obstacles passengers may face within the DT journey.

Research Aim

The current research aims mainly to explore the core relation between Egypt Air passenger attitudes for flight DT practices and their experience value. In order to achieve the research's main aim, some objectives were targeted as follows:

1. Measuring the extent to which Egypt Air passengers are satisfied with and benefit from Egypt Air's digital services.
2. Exploring if Egypt Air passengers prefer the flight related pre, in and post digital practices rather than the conventional ways to precede flight processes.
3. Identifying the obstacles that may face passengers with in Egypt Air airlines flights digital transformation journey.

2. Literature Review

2.1. Digital Transformation and Passenger Experience Value

While passenger numbers are expected to quadruple over the next 20 years **(IATA, 2020, P.54).** However, infrastructure is not keeping up, and a crisis is emerging. In order to meet the growing demand for air freight and passenger travel as well as to continue bringing up

positive social and economic effects, airlines should have access to adequate, high-quality infrastructure with affordable costs **(IATA, 2018b, p.36)**. Leading businesses therefore concentrate on two complementary processes to succeed in digital transformation: redesigning consumer value propositions and altering their operations with digital technologies for increased customer connection and collaboration **(Berman, 2012).** In this concern, digitalization practices, apart from creating closer connections to customers, it is considered as the base for interoperable data-sharing mechanisms that can connect stakeholders more efficiently within ecosystems of whole the aviation, travel and tourism value chain this what the **Figure (1)** illustrates for how organizations in the ecosystem relate to customers into an end-to-end customer service and each other is evolving.

Through the traveler journey steps (**Pre-In-Post flight**), companies work together serving customers directly and indirectly. Therefore, both the industry and customers can capture the opportunities and values that digital transformation presents.

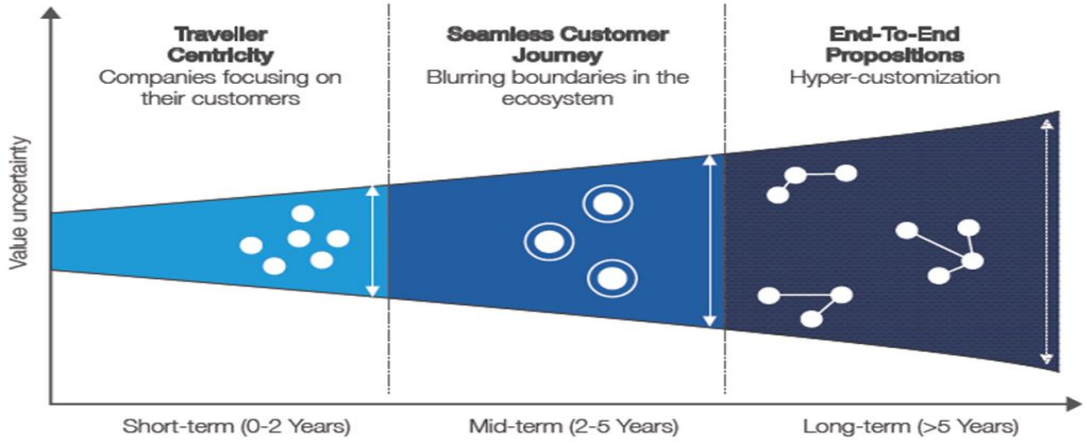

Fig. 1. Evolution of Living Travel Experience
Source: World Economic Forum, 2017, p.12

Furthermore, the **world economic forum WEF (2017)** adaptation of the aviation, travel, and tourism ecosystem model contributed to shaping consumer expectations for convenient, on-demand services by fostering business model innovation within sector boundaries. Promisingly, the majority of airlines' digital transformation strategies focus on streamlining procedures linked to passenger flights, introducing new technology, and launching innovation initiatives in order to engage with customers more and give them a seamless and flawless travel experience. However, there are still additional areas that are acknowledged as having an impact on passengers' views toward satisfaction and loyalty, such as increasing operational efficiencies, reducing costs and delays, boosting sales, and enabling continuous profitability **(Forbes Online Magazine, 2019).** Customers nowadays are accustomed to receiving high levels of service in other industries, which has an impact on their expectations in the aviation, travel, and tourist sectors, where fragmentation makes it challenging to maximize service levels. Therefore, the essential facilitator to overcome such fragmentation is industries' digitization **(World Economic Forum, 2017).**

According to **Kane et al., (2015)** digital transformation is an organizational transformation in which business models and procedures are changed by digital technology. To fully take advantage of the changes and possibilities provided by digital technology, such transformation of business activities, processes, models, competences, operational

procedures, and organizational capacities are profound and fundamental **(Li et al., 2018).** In this concern, in order to provide highly customized, end-to-end travel experiences, it is crucial to put consumers at the center of travel services and integrate physical and digital assets to enable seamless customer journeys **(World Economic Forum, 2017).**

Therefore, according to researchers view point related to customer-based approach for more frictionless and enhanced customer experience, the digital transformation has been come to play a crucial role in this context serving passenger flight (pre-in-post) and e-customer relationship management E-CRM with its consequences in service businesses in general and in aviation industry particularly. According to the figure no.2, the customer is considered as a major corner of the digital transformation multifaceted journey. The customer aspect is indeed attached to other axes that are necessary for the effective and successful strategy of "value proposition for customers," mainly oriented to customize flight operations and improve customer service in a more personalized, valued, and seamless way.

Based on the illustrated figure below, the researchers concluded that involving all structure levels is an essential issue for achieving targeted goals such as better customer experience, seamless service, and competitive advantages. To get these goals big amount of data is required to be digitized and the services in addition to processes or operations digitalization along with the organizational culture changes and business model modifications and developments or totally replacement with modern one. Furthermore, all of these depend on suitable set technologies and efficient, talented staff members and management leadership who embrace the organization's vision and mission, which together seek goal achievement with convenient and spiritual statements, pushing the whole firm towards DT to get better service and process efficiency. For that sake, steps within a digital transformation strategy (DTS) should take into consideration market research and customer demands in order to provide or deliver the best customer experience to meet needs and expectations. Getting the suitable digital transformation techniques (DTT); internet of things (IOT), Cyber security, mobile automotive devices, artificial intelligence (AI), machine learning (ML), Sensor technologies…and so on; for DTS successful application as a core part of whole digital transformation business (DTB), plans and tactics implementation for delivering better experience and achieving customer satisfaction and loyalty".

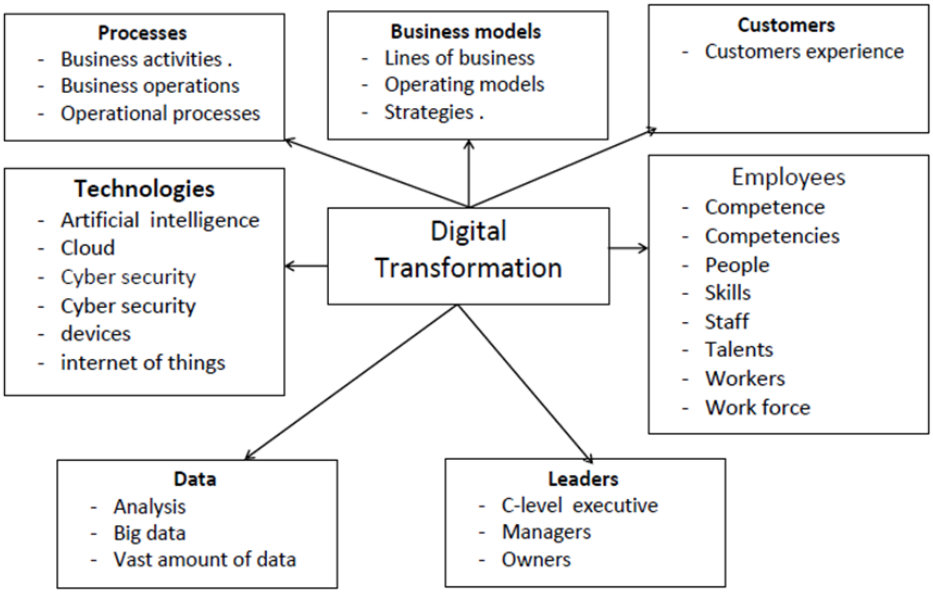

Fig. 2. Digital Transformation Aspects
Source: Verina& Titko, 2019.

Customer experience and cost control may be key value-creation and proposition drivers in this situation. Moreover, customers will save money and time, while businesses will have free cash flow and operating margins that will benefit the whole sector **(World Economic Forum, 2017, p.11).** Moreover, when consumers are satisfied, this is predicted to lead to increased customer loyalty **(Brodie et al., 2013).** On the other hand, consumer satisfaction can be felt in a number of contexts, along with purchasing patterns and behaviors. The customer's experience of interaction and communication with the company (the "moment of truth," as it is known) and their expectations have a significant impact on their level of satisfaction **(Khalid et al., 2018)**. Airlines provide customers with a wide range of digital services, and it is clear that customer satisfaction is directly influenced by these offerings. From this viewpoint, airlines can better understand their customers' needs and offer personalized, high-quality services **(Heiets et al., 2022).** IATA has been collaborating with the industry to create and implement creative solutions in this area to address passenger demands and keep up with rising demand **(IATA, 2018a).** Moreover, the aviation sector is a customer-focused industry that focuses on the "customer first" approach. Additionally, passengers expect their journeys to be fast, convenient, smooth, and personalized—from booking and checking in through security to picking up their bags at the airport of their destination **(IATA, 2020).**

2.2. Flight Digital Transformation Practices

Due to the new embedded use of digital technology, airlines and airports can succeed in terms of resource utilization optimization, cost reduction, higher staff productivity and job efficiency, streamlined supply chains, and greater customer satisfaction and loyalty **(Rachinger et al., 2018)**. In this regard, technologies based on passenger processing have a significant influence on a passenger's experience. Passengers have to go through a rigorous planning and scheduling process, check-in procedures, luggage management, control boards, and security clearance, which frequently has an effect on how satisfied they are with their whole air travel experience. Modern air travel nowadays heavily relies on modern technology

including self-service kiosk check-ins, airport smartphone applications and websites, home self-bag tagging, self-boarding gates, and baggage tracking **(Patel, 2018)**.

Technology is always changing and getting smarter every day that nowadays, passengers could design their trips on their own without physically presence or interactions at airlines or travel agencies and board the plane with only a few clicks. Recently, airports and airlines have started to provide passengers with contact-free options for checking in and obtaining flight information, bolstering free touch services for airline passengers **(Pageloot, 2021).** According to worldwide top airports, the internet of things IOT, big data & analytics, and cloud computing have constantly been recognized as the key prominent digital technologies on which airports have placed the most attention in recent years **(Arthur D.Little, 2018).** As addressed by **Amadeus Global Report (2017)**, clouding systems, digital identification and biometrics, internet of things, and self-service technologies (e.g., kiosks, QR codes, self-bag tags, self-boarding pass, and so on) are considered trendy technologies recently.

2.3. Egypt Air

Egypt Air is almost ready to move forward with its digital transformation in order to support Egypt Vision 2030, which aims to set priorities and achieve goals in light of recent global economic, social, and political changes while adhering to state public policy and achieving specific economic, social, and environmental goals in specific sectors within the overall state plan. The civil aviation axis aids in both direct and indirect ways in reaching the sustainable development objective, **as the Egyptian Ministry of Planning, Monitoring, and Administrative Reform (2018)** noted in its "Sustainable Development Strategy: Egypt's Vision 2030." The strategy and plan of the Ministry of Civil Aviation were developed in a manner that was harmonious and compatible with these goals in light of these environmental and sociological changes, which directly affected how the civil aviation axis was prioritized. In this regard, Egypt Air Information Technology Sector, is seeking to increase business agility and benefit from advancing technologies to bring legacy applications forward to the web, improving the overall usability of all applications to serve better, by supplying innovative ideas, serving customers based on utilization of the availability of strong infrastructure, information systems management skills, in addition to covering operation & maintenance, network infrastructure, system engineering, IT security and IT technical support **(Egypt Air Annual Report, 2019).**

3. Research Methodology

To fulfill research aim the current paper set some hypotheses to reach main results and propose recommendations for Egypt Air to boost the effect of passenger use for DT techniques carrying out pre, in and post-flight procedures on his or her experience value. Research hypotheses are concluded as follow:

H1:.EgyptAir passengers' attitudes toward using digital techniques before, during, and after flights are significantly related to their experience value.

H2: Egypt Air’s digital flight practices have a significant impact on the digital transformation experiences of its passengers.

H3: There is a significant correlation between Egypt Air passengers' experiences of digital transformation obstacles and their use of flight-related digital technologies.

The current research adapted the descriptive analytic approach where the quantitative method was used, which is the questionnaire as a quantitative research method that was designed and distributed online over a random sample of EgyptAir airline passengers. Then the statistical analysis of the questionnaire data was carried out via SPSS V.25 for getting descriptive statistics, correlations, and regressions among study variables.

3.1. Data Collection

This research was based on primary data sources from the online questionnaire which has been distributed over 724 passengers of different ages, educational levels and job positions. The questionnaire was prepared in an approach is relevant to the situation and study problem to decrease invalid responses with mandatory/ compulsory questions for form fulfillment. The questionnaire forms were distributed in a period of January till July 2022.

3.2. Measures

Fulfilling research aim the research employed a method of descriptive analytical methodology by using a questionnaire tool. The questionnaire was designed addressing the passenger flight practices within passenger experience digital transformation in whole process beginning with booking to deplaning. The questionnaire consisted of two sections with four dimensions to collect research-related data as follows:

Section 1: Demographic Data, which encompasses general information and personal data about the passengers, such as gender, age categories, education levels, and job positions.

Section 2: Study Related Data is the second part of the questionnaire and consists of questions related to the digital technologies and practices in Egypt Air and passenger service operations related to the flight's three stages: pre, in, and post flight, and accordingly in the three operational areas: airports, airlines, and onboard.

In this context, the questionnaire highlighted the way in which the passengers carry out their flight procedures: in a conventional way or digitally. That’s why, the questionnaire has been developed based on digital technologies and Egypt Air passenger flight digital practices (pre-in-post flight) which are; Egypt Air official website, Egypt Air mobile application, biometrics& the one ID, clouding &IOT, QR codes and automated kiosks. Consequently, the questionnaire has focused on passenger experiences of digital transformation-based value and digital transformation obstacles. In this context, it's worthy to mention that according to the lack of field studies that addressed the digital transformation in terms of research purpose, the questionnaire was mainly based on literature reviews related to the research topic, therefore it has been divided into four dimensions as follows:

1. "Passenger Flight Practices," which is related to exploring the EAAs' passenger attitude toward flight procedures.
2. "End-to-end Digital Techniques," which is concerned with demonstrating the passenger digital experience, end-to-end digital technologies, and fast self-service through the Egypt Air mobile application and the official website.
3. "Passenger Experience: Digital Transformation Value for Passengers" by measuring to what extent digital self-service is valuable based on the passenger perspective.
4. "Passenger Experience Digital Transformation Obstacles" focusing on obstacles that may embed passengers against using the digital techniques pre, in, and post flights.

3.3. Data Reliability and Validity

3.3.1. Data Validity

To validate the data collection instrument utilized in this study in terms of its readability, format, and ability to measure the study's constructs, the researchers distributed the questionnaire instrument to a number of passengers on EgyptAir. The questionnaire instrument was then updated and refined to reflect the comments and suggestions received by the domain experts. Moreover, the experts showed interest and interacted with the researchers concerning the questionnaire instrument, which adds to its validity.

3.3.2. Data Reliability

Before proceeding with data analysis, to ensure consistent measurement across various items in the questionnaire, the measures' reliability was tested. Indeed, the reliability of a measure indicates the stability and consistency of the instrument. In this concern, Cronbach's alpha coefficient measures this issue and ranges from 0 (no internal consistency) to 1 (maximum internal consistency)**.**

Table 1

Digital Transformation Overall Cronbach's Alpha

Variable	No of Items	Cronbach's Alpha	Coefficients
Biometrics	4	.931	.965
Clouding	4	.790	.889
Automated Kiosks	3	.932	.965
QR Codes	7	.952	.976
Passenger Experience Digital Transformation Values	17	.971	.985
Passenger Experience Digital Transformation Obstacles	5	.908	.953
Total	40	.970	.985

As shown in the table no.1, Cronbach's Alpha estimated .970 indicating that the items of scales are highly correlated to each other and that the re-conducting the study on the same sample with the same characteristics after a period of time is likely to be given the same results by 97% which in turn does mean the possibility of relying on this form and proves the validity of the study methodology results.

3.4. Data Analysis

To achieve the objective of this study, the researchers used the descriptive analytic approach. The researchers depend on using the Statistical Package for Social Sciences (SPSS) to process data statistically. The treatment included many statistical methods, such as frequencies, percentages, means, and standard deviation (SD), to describe the characteristics of the study population of the functional variables and to determine the responses of its members towards the study axes. Moreover, the research used Cronbach's alpha test to

calculate the stability coefficients of the questionnaire and the coefficient of stability for each axis of the research. Pearson correlation analysis and Regression analysis were consequently employed for proving research hypotheses.

3.5. Results and Discussion

The following part explains the results concerning the four dimensions representing the passenger experience's digital transformation.

3.5.1. Descriptive Analysis of Research Variables

Section One: Demographic Characteristics of Respondents

The discussion of the research findings begins with a brief demographic profile of the respondents in terms of gender, age, education level, and job positions.

Table 2

Demographic profile of sample elements

Variable	Frequency	Percentage
Gender		
Male	428	59.1%
Female	296	40.9%
Age Categories		
20-29	76	10.5%
30-39	188	26%
40-49	180	24.9%
50-59	188	26%
60 and More	92	12.7%
Educational Levels		
Diploma	12	1.7%
Bachelor's	428	59.1%
Post Graduate	284	39.2%
Job Positions		
Public Sector Employee	400	55.2%
Free Business	136	18.8%
Managerial Employee	88	12.2%
Unemployed	68	9.4%
Other…	92	12.7%

Table No. 2 explained that the majority of the respondents were females (59.1%), rather than males (40.9%). Of this sample, the age categories of 30-39 years and 50-59 years had the greatest number of respondents with equal percentages in total (52%), followed by the age group of 40-49 years (24.9%), while the 20-29 age group had the lowest percentage. The subject in turn indicates that the majority of respondents were among youth and older passengers. Moreover, the educational levels of respondents revealed that 59.1% of them are highly educated, while 39.2% of them are postgraduates. The job positions of respondents reveal that 55.2% of respondents are public sector employees, while only 18.8% of them are

free-standing business individuals. Nonetheless, the lowest percentage was for those who are not employed, with 9.4% of the total percentage, while the others varied among doctors and professors.

Table 3

Descriptive profile of Egypt Air passenger data

Item		Frequency	Percentage
How many flights you had on Egypt Air Airlines?	Just one flight	72	9.9%
	2-3	216	29.8%
	4-5	140	19.3%
	6 Flights and more	296	40.9%
Are you a member of Egypt Air Frequent Flyer Program FFB?	Yes	228	31.5%
	No	496	68.5%
Which class you prefer to fly on Egypt Air?	Economy Class	484	66.9%
	Business Class	240	33.1%

As explained in Table 3, 40.9% of respondents had six flights or more, while 29.8% had 2 to 3 flights, and 19.3% had 4 to 5 flights. Whereas, the table results indicated that only 9.9% of respondents had just one flight with Egypt Air airlines. Moreover, the table shows that the majority of respondents do not have membership in Egypt Air Plus, with a high percentage of 68.5%. Moreover, 66.9% of respondents prefer flying in economy class rather than business class.

Section 2: Study Related Data

1) Descriptive Analysis of Flight Digital Practices

Table 4

Flight Digital Practices

Variable	Website	App	Not use
Flight Digital practices			
I often search for my flight availability	%54.7	%24.9	%20.4
I usually book my flight	%48.1	%21.5	%30.4
Check-in and scan my documents	%33.7	%13.8	%52.2
Getting my bag-tag	%17	%12.8	%70.2
Extract boarding pass	%26	%17.1	%56.9
Select my seat position, meal and other flights			%47
Track my baggage onboard	%15.5	%5.5	%79
Trust e-payment	%48.6	%19.3	%32

As illustrated in Table No. 4, the majority of respondents often search for flight availability through websites, while only 24.9% search via application and 20.4% don't search online. Moreover, 48.1% of respondents used to book flights through the website, and 30.4% of them don't make bookings either through the website or the mobile app. The majority of respondents (52.2%) have not checked in flight documents through websites or the application, followed by 33.7% who do so through the website. Related to bag tagging, around 70% of respondents don't self-tag their luggage inline, neither through the website nor via the app. whereas, around 57% of respondents don't use the website or the application for self-boarding, and 26% do so through the website. 15.5% of respondents track their bags onboard, whereas only 5.5% do via the application. Nonetheless, 48.6% of respondents trust e-payment more through the website, while only 19.3% of them trust the application's e-payment policy. It could be explained that passengers prefer electronic practices in some travel procedures with different proportions and the technique used, whether it is the official website or the mobile application.

However, most passengers with more than 50% percentages do not prefer self-service techniques; through website or the mobile application. These results highlighted the essential need for more supporting SST applications and raising passenger use value awareness specially that according to **Airline IT Survey (2017),** most of the passengers around the world (around 87%) use SST for booking and over half (54%) of them prefer SST for check-in services**.** Furthermore, passengers who use a mobile phone or self-service kiosk to handle travel tasks across the journey can expedite their experience, compared to those who choose face-to-face interactions **(Alcatel Lucent Enterprise ALE, 2018)**.These results highlighted the crucial role that self-service technologies have been playing recently and are therefore supported by what **IATA (2016)** has addressed: that in today's digital world, passengers want to be in control of their journey and avoid long queues. They want such control not only for checking-in but also at other airport processing points. As a result, airports are facing increased pressure from both airlines and passengers to provide a seamless journey through their facilities. Nonetheless, the mobile technology revolution has made self-service options increasingly possible at every step of a passenger's journey; from booking to boarding **(SITA, 2020).**

2) Descriptive Analysis of Flight Digital Techniques

Table 5

Descriptive Statistics of flight Biometrics Practices

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
Biometrics							
Checking Travel Documents before the Trip	63%	19.9%	17.1%	1.54	.769	1	Disagree
Self-issuing Boarding Pass	69.6%	14.4%	16%	1.46	.755	2	Disagree
Activation of One-ID	73.5%	13.3%	13.3	1.40	.711	3	Disagree
Baggage Self-checking	77.3%	9.9%	12.7%	1.35	.695	4	Disagree
Total Mean=1.44							Disagree

As the table no.5 show, the attitudes means and std. deviation related to passenger use of flight experience digital techniques are summarized. The values explained that the total mean (1.44) indicated general negative attitudes for passenger flight experience digital techniques. When the total mean value for passenger knowledge and use of biometrics practice was 1.45 pointing out almost negative attitude, the general neutral standard deviation with value around 0.5 indicated moderate deviation among answers. In this context, while the highest passenger use of biometrics within flight experience mean was for checking travel documents before the trip with value 1.54 and standard deviation value around 0,8 which indicates a high deviation among passengers attitudes over this practice. Whereas, the lowest mean value was for baggage biometrics self-check practice with low mean value 1.35 and standard deviation around 0.7 which is considered high deviation value pointing out that passenger attitudes for this practice have been diverged highly between 63% of passengers don't use and 12.7% do use this practice. These results could be more supported by what **SITA (2020)** had reported that, making the check-in process completely touch-less is the main priority for airports. Airports want passengers to be able to check-in (89%), print bag tags from their mobile devices (79%), and drop bags (67%) without touching a screen. Biometric technology is the focus for airport investment to enable a faster automated passenger process.

Table 6

Descriptive Statistics of flight Clouding Technology

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
Clouding Systems							
At airport lounges	50.3	21.5	28.2%	1.78	.858	1	Neutral
On aboard of the plane	62.4%	17.1%	20.4%	1.58	.808	2	Disagree
tracking baggage through mobile devices on board	84.5%	5.0	10.5%	1.26	.635	4	Disagree
Positioning systems (GPS) on board and at airports	71.3%	12.7%	16.0%	1.45	.754	3	Disagree
Total Mean=1.52							Disagree

Related to the clouding techniques table no.6 summarized the attitudes means and std. deviation related to passengers use attitudes for clouding techniques. The total mean value (1.46) indicated almost negative attitudes in addition to deviation moderate value around 0.5 which in turn refers to neutral deviation attitudes among passengers' answers about knowledge and use of clouding techniques within flight journey stages. Furthermore, the highest passenger use of clouding techniques within flight experience mean was for clouding techniques at airport lounges with value 1.78 and standard deviation value around 0,9 which indicated a high deviation among passengers attitudes over this practice with using attitudes with 28.2% and 50.3% don't use. Whereas, the lowest mean value was for tracking baggage through mobile devices on board with low mean value 1.26 and standard deviation 0.635 which is considered moderate deviation value pointing out that passenger attitudes for this practice had been neutrally diverged between 84.5% of passengers don't use and 10.5% do use this practice. These percentages agrees with **SITA (2020)** estimation that looking at the next three years, top IT investment priorities for airport CIOs remain cyber security (94%), cloud services (90%), and business intelligence (87%).

Table 7

Descriptive Statistics of Automated Kiosks Flight Practices

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
Automated Kiosks							
Travel documents self-baggage tagging at airports	69.1%	10.5%	20.4%	1.51	.812	2	Disagree
Self-baggage tagging at airports	72.4%	11.0%	16.6%	1.44	.761	3	Disagree
Getting boarding passes	61.3%	16.0%	22.7%	1.61	.831	1	Disagree
Total Mean= 1.52							Disagree

The mean and std. deviation related to passengers use attitudes for the automated kiosks within journey as summarized above in the table no.7, the total mean value (1.52) indicated negative attitudes in addition to deviation moderate value around 0.5 which in turn estimated neutral deviation attitudes among passengers' answers about knowledge and use of automated kiosks at the Egyptian airports. Furthermore, the highest passenger use of kiosks within flight experience mean was for Getting boarding passes with value 1.61 and standard deviation value 0,831 which indicated a high deviation among passengers attitudes over this technology with using attitudes with 22.7% and 61.3% don't use. Whereas, the lowest mean value was for baggage self-tagging at airports with low mean value 1.44 and standard deviation 0.761 which is considered high deviation value pointing out that passenger attitudes for this practice had been highly diverged between 72.4% of passengers don't use and 16.6% do use this practice.

Table 8

Descriptive Statistics of Flight QR Code Technique

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
QR Codes							
Check-in e-ticketed flight documents	67.4%	11.0%	21.5%	1.54	.825	3	Disagree
Boarding pass identification	64.1%	9.9%	26%	1.62	.870	2	Neutral
Baggage self-check	73.5%	9.9%	16.6%	1.43	760	5	Disagree
Activating internet operators at airports	71.3%	12.7%	16.0%	1.45	754	7	Disagree
Egypt Air Duty-Free online shopping	78.5%	5.5%	16.0%	1.38	.745	6	Disagree
Corona virus detection measures at airports	64.1%	8.3%	27.6%	1.64	.886	1	Neutral
Passing through the airport gates	69.6%	9.9%	20.4%	1.51	.812	4	Disagree
Total Mean= 1.51							Disagree

According to table no.8 the total mean value of QR Codes passenger use attitudes was 1.27 indicating negative attitudes in addition to the weak deviation with low value 0.442 which in turn referred to almost agreement deviation attitudes among passengers' answers about knowledge and use of QR codes with in passenger flight experience. Furthermore, the highest mean of passenger use of QR codes practices was for Corona virus detection measures at airports value 1.64 and standard deviation value 0,886 which indicates a high deviation among passengers' attitudes over this technology that around 64% don't detect corona virus through QR while around 28% do. Then the use of QR for electronic ticket flight documents checking with high deviation value 0.825 and using QR codes for Passing through the airport gates with high deviation value 0.812 which pointing out a high deviation among passenger use attitudes for this practice. Whereas, the lowest mean value was for EgyptAir Duty-Free Shopping through QR technology with low mean value 1.38 and standard deviation 0.745 which is considered high deviation value pointing out that passenger attitudes for this practice have been highly diverged between 78.5% of passengers don't use and 16 % do use QR codes for online Egypt Air shopping.

3) Descriptive analysis of Passenger Experience Digital Transformation Value

Table 9

Descriptive Statistics of Passenger Experience Digital Transformation Value

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
Passenger Experience Digital Transformation value							
The electronic services provided by the company are effective	12.7%	40.9%	46.4%	2.34	.692	6	Agree
The Egypt Air website is easy to navigate	14.9%	37.0%	48.1%	2.33	.722	7	Neutral
The Egypt Air application on mobile devices is easy to navigate	15.5%	42.5%	42.0%	2.27	.711	8	Neutral
Effective online customer service	22.1%	43.1%	34.8%	2.13	.744	12	Neutral
The company's electronic content on the Internet is sufficiently presented	20.4%	45.3%	34.3%	2.14	.727	11	Neutral
Follow the company on social media pages on the Internet	24.3%	32.6%	43.1%	2.19	.800	9	Neutral
The electronic offers provided by the company are sufficiently presented	27.1%	44.8%	28.2%	2.01	.744	14	Neutral
Trust in Egypt Air's online privacy policy	13.3%	35.9%	50.8%	2.38	.707	4	Agree

Variable	Don't use	Neutral	Use	Mean	SD	Rank	Attitude
I trust the electronic payment policy of Egypt Air	12.7%	32.0%	55.2%	2.43	.707	1	Agree
The actual quality of Egypt Air digital services always met my expectations	18.8%	50.3%	30.9%	2.12	.695	10	Neutral
The technological infrastructure of Egyptian airports is sufficient and effective to confront the Corona epidemic crisis	22.1%	44.2%	33.7%	2.12	.738	10	Neutral
Digital services on board are very satisfactory	23.2%	46.4%	30.4%	2.07	.729	13	Neutral
Effective electronic customer relationship management in Egypt Air	22.1%	49.2%	28.7%	2.07	.710	13	Neutral
It is better to travel with Egypt Air than to travel with other airlines	12.7%	42%	45.3%	2.33	.689	5	Neutral
I consider my travel experience with Egypt Air excellent	9.9%	47%	43.1%	2.33	.649	5	Neutral
I would like to repeat the experience of traveling with Egypt Air	8.8%	40.9%	50.3%	2.41	.648	2	Agree
I recommend my friends and relatives to travel with Egypt Air	8.8%	42%	49.2%	2.40	.647	3	Agree
Total Mean= 2.24							Neutral

Table no.9 presented the means and standard deviations of "**Passenger Experience Digital Transformation value**", where the means ranged between (2.43- 2.01) compared with the total instrument mean for the field (2.24). The item "**I trust the electronic payment policy of Egypt Air**" ranked first with a mean and standard deviation (mean=2.43, standard deviation = 0.707) compared with the total instrument mean and the standard deviation. The item "**The electronic offers provided by the company are sufficient**" ranked last reached a mean (2.01) and the standard deviation was (0.744) compared with the mean and standard deviation of the total instrument. Shown results in the previous table reveal that passengers are neutrally satisfied with digital transformation of travel experience values with Egypt Air airlines with total mean 2.24. The highest satisfaction attitudes were for passenger trust in the e-payment policy of the airline with mean value 2.43 and preference to repeat the travel

experience with Egypt Air airlines with high mean value 2.41 in addition to recommending Egypt Air for relatives and friends with strong attitude mean value 2.40.

Moreover, passenger e-satisfaction attitudes shown above revealed that the e-services of Egypt Air are almost effective and Egypt Air website and application are moderately easy to navigate with neutral mean values. Nonetheless, the lowest passenger digital experience values were for the actual quality of Egypt Air digital services which based on passenger perspective neutrally meet their expectations and the technological infrastructure of Egyptian airports is considered neutrally sufficient and effective to confront the Corona epidemic crisis. Furthermore, the passenger responses indicated neutral satisfaction attitudes towards the onboard digital services and e-customer relationship management in Egypt Air with same mean value (2.07). Whereas, the responses revealed that passenger almost valued or benefited with Egypt Air airlines privacy policy. Furthermore, the online customer services, electronic content and the online offers sufficiency on website and mobile application have passenger moderate satisfaction attitudes with mean values among 2.01: 2.13 which indicate neutral attitudes.

These results agreed with **Alcatel Lucent Enterprise ALE (2018)** stating that self-service applications such as booking, check-in, baggage-tagging, baggage-drop-off, boarding and baggage-tracking provide autonomy, reduce wait times at all stages of the journey; from check in through to the baggage claim after arriving at the destination; and improve the passenger experience. Moreover, making the check-in process completely touches-less is now the main priority for airports to help protect passengers and staff, improve passenger experience, and drive efficiency **(SITA, 2020)**.

4) Descriptive analysis of Passenger Experience Digital Transformation Obstacles

Table 10

Descriptive Statistics of Passenger Experience Digital Transformation Obstacles

Variable	Disagree	Neutral	Agree	Mean	SD	Rank	Attitude
Passenger Experience Digital Transformation Obstacles							
Easily book and buy tickets through the website	17.1%	40.3%	42.5%	2.25	.730	1	Neutral
I can easily book tickets through the unified number of Egypt Air	34.8%	35.4%	29.8%	1.95	.803	3	Neutral
Easily check out my flight through the official website or mobile app	30.9%	27.1%	42.0%	2.11	.847	2	Neutral
Self-made kiosks in Egyptian airports are easy to use	48.1%	32.0%	19.9%	1.72	.775	5	Neutral
Easily extract the boarding pass through the mobile application or the official website	42.0%	31.5%	26.5%	1.85	.814	4	Neutral
Total Mean= 1.98							Neutral

Table No.10 explained that, the means and standard deviations of "**Passenger Experience Digital Transformation Obstacles**", where the means ranged between (1.72- 2.25) compared with the total instrument mean for the field (1.98) the item "**Easily book and buy tickets through the website**" ranked first with a mean and standard deviation (mean=2.25, standard deviation = 0.730) compared with the total instrument mean and the standard deviation. The item "**Self-made kiosks in Egyptian airports are easy to use**" ranked last reached a mean (1.72) and the standard deviation was (0.775) compared with the mean and standard deviation of the total instrument. Results shown in table reveal that passengers are neutrally able to deal with digital transformation techniques with Egypt Air airlines with total mean 1.98 The automated kiosks are the most technique which the passenger find difficulty to deal with, followed by self-boarding online. Then booking flights through the unified number and checking the flight through website or mobile app. Whereas the technique with which the passengers have less difficulties is booking flights online (mean= 2.25, SD=.730) **.**

3.5.2. Pearson Correlation analyses

- **Correlations between the Flight Digital Practices and Passenger Experience Digital Transformation Value**

Table 11

The Flight Digital Practices Correlation with Passenger Experience Digital Transformation Value

		Biometrics	**Clouding Systems**	**Automated Kiosks**	**QR Codes**
Passenger Experience Digital Transformation Value	Pearson correlation Coefficient	.394**	.403**	.397**	.395**
	Sig.	.000	.000	.000	.000
****. Correlation is significant at the 0.01 level (2-tailed)**					

The table No.11 revealed a significant weak positive correlation between passenger attitudes toward biometrics flight-related practices and his or her digital flight experience value with (.394) which means that the less the passengers do use biometrics the less value they get. This shown result may had been because of many reasons such the almost lack of awareness toward the biometrics techniques and its contribution for more seamless journey in addition to the desire of some passengers to finish flight procedures in a conventional way much more than the modern techniques with its obstacles. Moreover, the results point out a significant moderate correlation between clouding active practices and passenger digital benefits for seamless journey with (.403) the result in turn stated that respondents with 54.1% have the enough knowledge for the clouding technologies. The total mean of passenger use is (1.52) showing the weak attitudes in general for using internet of things and clouding systems technique for flight procedures at airports lounges or on board. This value explains the passenger use of the clouding techniques pre, in and post flight and the internet of things on board and airports relation with his or her benefits gotten from this use getting journey void of hardships especially with the modern life style attached to mobile devices. Nonetheless, the table above stated a significant weak correlation either between passenger attitudes toward kiosks technique and his or her digital experience value (.397) and the same weak

correlation is between passenger attitudes toward QR flight practices and his or her flight digital benefits with (.395).

These results boost the study results concluding the generality of responses with mean 1.54 for not having enough knowledge and use of kiosks techniques for flight procedures. Moreover, the results in turn explained that though the most of respondents with around 73% have the enough knowledge for the QR Codes, the total mean (1.51) explicated negative attitudes for using QR technique for flight procedures with not agree attitudes for using the QR technologies whether within document check, boarding pass ID, duty free products online shopping, corona virus detection measures at airports or passing airports gates. Hence, for passengers to get more value they need to more use quick response codes within flight procedures. These results could be boost by what **Barich et al., (2015)** had considered that, within the many steps of passenger journey the airline, airport operator, ground handler, regulatory agency, and others have an ever-growing list of devices, technologies, and applications through which they could choose to provide self-service opportunities could deliver passengers most seamless travel experience. Consequently, the research **H1** was proved that the passengers' use attitudes toward DT technologies; before, during and after trip; is significantly related to their experience value.

- **Correlations between the Flight Digital Practices and Passenger Experience Digital Transformation Obstacles**

Table 12

The Flight Digital Practices Correlation with Passenger Experience Digital Transformation Obstacles

		Biometrics	Clouding Systems	Automated Kiosks	QR Codes
Passenger Experience digital transformation obstacles	Pearson correlation Coefficient	.463**	.411**	.539**	.570**
	Sig.	.000	.000	.000	.000
**. Correlation is significant at the 0.01 level (2-tailed)					

The table No.12 revealed a significant moderate correlation between passenger attitudes toward biometrics flight-related practices and the passenger experience digital transformation obstacles with coefficient value (.463). Moreover, there was a significant moderate correlation between passenger attitudes toward clouding flight-related practices and application obstacles based on passenger perspective with .411 which means that the passenger moderately is faced with difficulties against using clouding systems at the airports and on board that is might because moderate awareness answers for clouding systems with around 54% of respondents are aware. The results consequently indicated a significant moderate correlation between passenger attitudes toward automated kiosks flight-related practices and application obstacles based on passenger perspective with (.539). Nonetheless, there was a significant moderate correlation between passenger attitudes toward QR flight-related applications and application obstacles based on passenger perspective with (.570). Results moreover concluded neutral and moderate correlations between digital transformation techniques and passenger use obstacles which in turn drive passengers more to prefer the pre, in and post flight procedures in traditional ways.

Here the correlation results proved the research **H3** indicating significant correlation between Egypt Air passengers' experiences of digital transformation obstacles and their use of flight-related digital technologies. The results furthermore assured that the significant need to more raise passenger awareness of how to use digital techniques for getting its illimitable values for better experience. Hence, the shown correlations results in turn addressed the difficulties that passenger may have within travel experience and flight operations digital transformation. Moreover, the study findings highlighted the intensive issue of passenger awareness absence with the multifaceted values of digital transformation to have better, personalized, more seamless and frictionless journeys.

3.5.3. Regression analysis

- **Regressions analysis of flight digital practices effect on The Passenger Experience Digital transformation Value**

Table 13

Simple Linear Regression Analysis

Regressions	R Square	F	Beta	Sig
Biometrics	.155	132.371	.394	.000
Clouding Systems	.162	139.642	.403	.000
Automated Kiosks	.158	135.035	.397	.000
QR Codes	.156	133.422	.395	.000

According to the show results in table no.13, passenger experience value influenced by passenger use of flight biometrics related practices by 39.4%. Moreover, the results of Simple linear regression analysis shows that clouding systems use affects passenger experience value with 40.3%, then automated kiosks affects passenger experience value with 39.7%, and finally the use of QR codes affects passengers experience value with 39.5% with high F values and significant positive beta values. Therefore, the regressions results revealed general positive contributions and high effects the digital transformation practices have on passenger experience value within flight processes and operations digital transformation journey. These results agreed with **Drennen (2011)** related to SSTs that set customers in the driver's seat allowing them the complete control over the travel experience. Customers are now able to perform the tasks that ticket agents were usually asked to do. Currently customers are given the choice between the service employee interface and the use of SST, however with the increased use and demand for SST these choices can be eliminated substantially as time passes.

- **Regressions analysis of flight digital practices effect on The Passenger Experience Digital transformation Obstacles**

Table 14

Simple Linear Regression Analysis

Regressions	R Square	F	Beta	Sig
Biometrics	.214	197.077	.463	.000
Clouding Systems	.162	139.642	.403	.000
Automated Kiosks	.290	295.020	.539	.000
QR Codes	.325	347.600	.570	.000

Regression results shown at the table no.14 explained that experience digital transformation obstacles are influenced by the use of QR codes by 57%. Moreover, the results of Simple linear regression analysis show that automated kiosks affects passenger experience value with 53.9%, then biometrics practices affect passenger experience obstacles with 46.3%, and finally the use of clouding techniques affects obstacles that face passengers within experience digital transformation with 40.3% with positive beta and a significant high F values. These regressions boosted correlations results assuring the difficulties passenger have within travel experience and flight operations digital transformation. Nonetheless, these findings highlighted the intensive issue of passenger awareness absence with the multifaceted values of digital transformation to have better, personalized, more seamless and frictionless journeys. In this context, the regressions analysis of flight digital practices effect on the passenger experience digital transformation value and obstacles proved research **H2** that Egypt Air's digital flight practices have a significant impact on the digital transformation experiences of its passengers.

Conclusion and Recommendations

This research aims mainly to explore the core relation between Egypt Air passenger attitudes for flight DT practices and their experience value. In order to achieve the research's main aim, the research has employed the descriptive analytical method, through which the questionnaire tool has been adapted to prove research hypotheses. In this regard, different tests were applied, including the reliability test, the correlation test, and the regression test. Hence, the research got the following results: passengers prefer electronic practices in some travel procedures with different proportions and the technique used, whether it is the official website or the mobile application. However, the lowest percentages of digital use were for the application compared to the website, while most passengers do not prefer self-service techniques, whether through the website, the mobile application, biometrics, kiosks, QR codes, or clouding techniques in completing pre-, in-, or post-flight procedures. The passengers are neutrally satisfied with the digital and self-service options provided by Egypt Air airlines. However, the passengers neutrally have obstacles within experience digital transformation.

Furthermore, Pearson correlation analysis revealed a significant weak positive relation between passenger attitudes toward biometrics flight-related practices and the digital flight experience value. Moreover, the results point out a significant moderate correlation between clouding active practice and passenger digital benefits for seamless journey. There are significant weak correlations either between passenger attitudes toward kiosk technique and his or her digital benefits and satisfaction or between passenger attitudes toward QR flight practices and his or her flight digital benefits. There are significant moderate correlations between passenger attitudes toward flight-related practices and their experience digital transformation obstacles. Whereas, the results of regression analysis show that passenger digital experience value is influenced by passenger use of flight related digital practices with high and positive beta values. The passenger's attitudes toward the flight's digital practices affect his or her experience with digital transformation obstacles with high and positive beta values.

Research Recommendations

1. Egypt Air should intensify the awareness of passenger flight digital practices in terms of its values and how to use for better seamless flight.

2. Egypt Air should condense self-service techniques and promote them online through a website, a mobile application, and social media platforms.
3. Egypt Air should develop a website and mobile application with several features that boost the ease of digital use and attract passengers to use them**.**
4. Egypt Air should dedicate digital units at airline offices and the hub airport to help passengers use the digital self-service techniques easily.
5. Egypt Air should support digital infrastructure at airports and on board.

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التحول الرقمي لرحلات مصر للطيران وتجربة المسافر

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معلومات المقالة

الكلمات المفتاحية

مصر للطيران؛ التحول الرقمي؛ قيمة تجربة المسافر ؛ تجربة السفر الرقمية الشاملة.

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الملخص

تشهد صناعة الطيران هذه الآونة حقبة متسارعة تتسم بمنافسة شديدة بين شركات الطيران المختلفة حول العالم بعد أن أصبحت القدرات التنافسية القوة الرئيسية الداعمة التي تميز كل شركة عن غيرها من الشركات. وفي هذا الإطار تسعي الشركة القابضة لمصر للطيران لتفعيل التقنيات الرقمية وتكنولوجيا التحول الرقمي في ادارة الأعمال وخدمات المسافرين رقميا التي من شأنها أن توفر التسهيلات المختلفة للمسافرين من بداية الرحلة وحتي نهايتها والتي تشتمل علي ستة محاور لإجراءات السفر مرورا بمراحل الرحلة الثلاث (قبل، أثناء وبعد) وذلك تماشيا مع رؤية مصر ٢٠٣٠ للتحول الرقمي ضمن استراتيجيات التنمية المستدامة. ومن ثم يهدف البحث الراهن إلي الكشف عن العلاقة الارتباطية بين اتجاهات مسافري مصر للطيران نحو ممارسات التحول الرقمي، وقيمة تجربة السفر المقدمة لهم. ولتحقيق هذا الغرض تبني البحث الراهن المنهج التحليلي الوصفي باستخدام الاستقصاء. وقد اشتملت عينة البحث علي عدد ٧٢٤ مفردة من ركاب شركة مصر للطيران للخطوط الجوية وقد تم توزيع استمارات الاستقصاء علي عينة البحث الكترونيا. وتم تحليل نتائج البحث باستخدام التحليل الوصفي الإحصائي ومقاييس الدلالة الإحصائية ومقاييس الإرتباط والانحدار من خلال البرنامج الإحصائي SPSS v.25 . وقد توصل البحث إلي مجموعة من النتائج أهمها، وجود علاقة إيجابية ضعيفة بين اتجاهات المسافرين علي شركة مصر للطيران نحو الممارسات الرقمية وقيمة السفر المقدمة لهم. وخلص البحث إلي عدة توصيات موجهة لشركة مصر للطيران أهمها ضرورة رفع الوعي لدي المسافرين بكيفية استخدام التقنيات الرقمية وأهميتها في تسهيل إجراءات الرحلة بمراحلها الثلاث (قبل وأثناء وبعد الرحلة) إلي جانب ضرورة تعزيز الجهود الترويجية الإلكترونية عبر الموقع الرسمي للشركة وتطبيقات الهاتف وصفحات التواصل الإجتماعى.