

SMART AIRLINE SOLUTIONS ARE THE NEXT GAME CHANGER FOR AIRLINE INDUSTRY

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Abstract

This paper analyses the impact of smart automation tools like information technology (IT), Artificial Intelligence (AI), Robotics, etc. applications in the airline industry. To address this purpose, a review of IT innovation in the airline industry, on service patterns and service quality is done. The paper explores the next big wave in automation and travel technology overall and will focus on “the process” as well as “the people”. This paper attempts how information technology, AI and Robotics can enhance and improve the travel experience from booking to destination. Technology will deliver airline customers an engaging, more “humanized” interaction. This could mean personalized travel itineraries pushed to your cell phone or digital “identities” to speed security clearance or personal GPS to ease the navigation of airports and destinations. Ironically, technologies will ultimately induce a more “human” experience in travel even for making smooth payment. The paper attempts on airline focusing more on technology as an important component and investment in their future (best illustrations are SABRE-Semi Automated Business Research Environment, CUTE-Common User Terminal Equipment, ILS). Inefficiencies in outdated technology have hindered airlines from quickly and easily making business changes. The ATC continues to rely on RADAR and analog radio in a satellite and digital world unless improvements are made on these strained systems, continued growth in air travel-both commercial and private-will result in increased delay, loss of revenues, and overall hampering the growth in the air travel. New generation technology

systems are being put in place today. One of the recent developments is for “Using an emerging global network, ATN (Aeronautical Telecommunication Network)”. Information Technology will demonstrate innovations in more In-flight services and entertainment including access to the internet and phone.

Keywords: *IT, Airline, SABRE, Travel, RADAR, ILS*

Introduction

Information Technology, AI, Robotics, etc have been revolutionized the entire business world. Airlines were early adaptors of IT and have a long history of technological innovation in comparison to many other travel and tourism businesses. As per eMarketer, an Internet research firm, together with all sectors that are online have generated less revenue than online travel (Goldsborough, 2001) which indicates IT impact.

The airline industry in particular had fostered a dependency on technology for their operational and strategic management which further leveraged to customer experience. Before the 1950s in the absence of IT, the general process for Booking/Ticketing was relatively the same by a local travel agency or national travel agency. Firstly travel agencies had to check availability with the airline operator on the phone. Then they used to issue the manual ticket to the customer. If a hard copy of the ticket is lost then the customer could not travel. Thereafter customers had to go for manual check-in and boarding, as far as baggage services were concerned. If there is no direct flight from origin to destination (e.g. Jaipur to London) then they had to take their check-in baggage from every VIA destination and check-in again for the next destination. This was very hectic and time-consuming. Air Traffic Control (ATC) was using old and traditional methods for navigation of airplanes which did not fuel-efficient and safer. IT productivity in the US from 1995 to 2002 was 2/3 (Jorgenson, Ho & Stiroh, 2005).

Airlines have been investing heavily in IT since the 1950s. They have pioneered the introduction of IT as they realized the need for efficient, quick, inexpensive, and accurate handling of their inventory to communicate with travel agencies and other distributors. In 1962, American Airlines introduced its SABRE¹ computer reservation system (CRS) and by the mid 1970s SABRE was much more used for Booking/Ticketing, Check-in, Inventory control,

¹ SABRE—Semi-Automated Business Research Environment

etc. IT provided the base for generating flight plans for the aircraft, tracking aircraft, and developing a range of decision support systems. Therefore airlines had developed, purchased, or leased a similar system to satisfy similar needs. In the 1970s, an enormous growth of air traffic as well as a greater demand for information had increased the demand for efficient and effective internal and external communication with all airline stakeholders stimulating the development of CRS. The major CRS installed terminals in travel agencies assist remote printing of travel documents such as ticket itineraries, boarding pass, and empowered FFP (frequent flyer programs). In the 1980s, travel agencies and airline operators were demanding access to several carriers from a single terminal. Therefore, CRSs were developed to offer a wide range of tourism products². CRS system, such as SABRE, developed their database to include itineraries and inventory from other airlines. Two groups of scheduled airlines emerged in Europe to develop the new Global Distribution Systems (GDS), namely Galileo and Amadeus. GDSs still provide the backbone for communication among airline and travel agencies. Since the 1990s, GDSs had made miracles in the airline industry. GDSs enabled airlines as well as travel agencies to access all essential information on their screens and to develop comprehensive travel itineraries from the interconnected system. CRSs have given birth to four major GDSs namely SABRE, Worldspan, Amadeus, and Galileo. IT has enabled selling tickets on online websites therefore tickets will be issued which eliminates the need for advertising (Croft, 2001).

Many of the airlines are taking away commissions on booking of an airline ticket due to the wide availability of IT tools to travelers therefore travel agents, brokers have to introduce some additional services if they charge any fee on tickets (Maselli, 2002).

Irrespective of the company has loyalty, reputation, size, etc but if they are not online they are not getting the sale (Mullaney, 2002, p. 64). It is hard to know but they have to adapt IT technology in their processes. The majority of customers are not using a single source to travel (Mullaney, 2002).

Since the beginning, when air traffic operation started, they had been using traditional techniques such as RADAR and analog radio in the satellite. In the early 1980s, the international civil aviation community started to express concern about the limitations of existing facilities and procedures and their inability to cope with increasing air traffic in future years.

² Tourism Product—Airline Reservation, Hotel Reservation, Car Rental, etc.

Consequently, the ICAO (International Civil Aviation Organization) Council in 1983 identified and assessed new concepts and technology in the field of air navigation, including satellite technology. It made recommendations thereon for the development of air navigation for international civil aviation over twenty-five years.

In February 1993, the Air Navigation Commission (ANC) established the Aeronautical Telecommunication Network Panel (ATNP) to develop Standards and Recommended Practices (SARPs), guidance material, and other relevant documents for the ATN. The first set of ATN SARPs was finalized in November 1996. America and Russia were early adaptors of ATN and recently India had announced to implement ATN technology in their network³.

Now AI and Robotics have taken place therein passengers are on ease of travel, there is no hard copy required from booking till destination even at the places where passengers are not directly involved but getting smooth travel. Smart solutions are being placed which are AI and Robotics enabled.

IT Innovation in Airline Industry

IT innovation plays a very important role in the airline industry. IT played a major role in the last 40 years to enhance economic growth & productivity with IT solutions (Chen, DeLong, Weber & Zysman, 2001). It is an important catalyst for enhancing customer service and quality delivery in an increasingly globalized world. Customer service is the heart of an airline, without which no airline can think about their prospects. Before the 1950s, when the role of IT was limited in the airline industry, it was very tough to deliver quality service. Eventually, the concept of IT innovation had emerged and had catered to the need of every field of the airline industry such as Booking of Tickets, Check-in, Airline security system, In-flight Services, Navigation of an Airplane, Baggage services, Air traffic control, etc. IT innovation in web bookings, web check-in, kiosk check-in, baggage delivery, navigation, ATC, etc had led to greater customer satisfaction and quality delivery to the customers. Airline alliances are forced for enhanced networking of destinations. Code sharing⁴ among airlines are becoming common due to IT.

³ In Sep 2011—An international civil aviation conference conducted at Jaipur.

⁴ Code Sharing—Airlines have agreements that one airline would be operating carrier and another airline would be a marketing carrier who shares operating airline code.

Operational System

There was no globalized system available for booking of tickets and if anyone wanted to travel they had to take tickets manually from airline. If they take tickets from agents then the agent had to make a phone call to concerned airline to check availability and then the ticket could be issued. Likewise, the check-in system was also manual, which used to take more time and one boarding pass could be given for one sector only. It was very tedious and time-consuming. It was then American Airlines introduced CRS called SABRE. This system facilitates Reservation, ticketing, check-in, etc of passengers. Henceforth, scheduled airlines emerged in Europe to develop the new Global Distribution Systems (GDS), namely Galileo and Amadeus.

CUTE (Common User Terminal Equipment) also emerged to facilitate smooth check-in operation. Furthermore, DFMD (Door Frame Metal Detector) and HHMD (Hand Held Metal Detector) were used for the frisking of passengers which was earlier manually done by the airport security personnel.

This led to high chances of mistakes being made. Therefore, the need for a more secure system had arisen and the concept of Body scanner had emerged which scans the whole body which is monitored by the control room.

IT innovation had facilitated long flight passengers by in-flight entertainment, satellite phone, the internet, etc. Manual baggage check-in system was used earlier and whenever check-in baggage was misrouted or mishandled then it was very difficult to trace the baggage. Now, the CRS system can do through check-in until the last destination. Also, when any checked-in baggage gets mishandled or misrouted it can be easily traced by the system. Several airlines have started using GDS, therefore they have made alliances for their frequent travelers.

GDSs system is used to issue electronic tickets and exchange tickets with multiple carriers worldwide. This had reduced airline costs as well as increased sales and marketing network. The customer now gets transparent and clear pricing as well as they can make their self-booking online. Airlines provide the facility for online check-in and print their boarding pass online which facilitates the customer for the long queue at check-in counters and some airlines also provide the facility for SMS, kiosk Check-in, etc. Earlier although there were many check-in counters available, switching over from specific counters was not possible. After IT innovation CUTE had given the facility to use any of the counters by any of the airlines according to their

requirements. This had reduced the waiting time of customers in the queue and had led to speedy check-in. The recent development of IT in the security system gives nil tolerance for security lapse. Therefore, the security system facilitates the customer for a safe journey which is the most important aspect for any customer as well as an airline operator. IT innovation had given facilities for in-flight entertainment such as movies, games, satellite phones, the Internet, etc. GDS system facilitates in baggage check-in till the last destination with multiple carriers. There is no need to carry baggage for every sector and check-in again and again till the last sector. Likewise, when check-in baggage is misrouted or mishandled then it is very easy to trace the baggage. Airlines had made alliances and collaborations which facilitate passengers in terms of FFP, delay, or cancellations of flights. If a passenger is a frequent flyer then he or she gets facility for Lounge access at airports, frequent flyer miles on member airlines, priority tagging of baggage and reservation, flexible fares, extra baggage allowance, etc. Whenever a flight is delayed or canceled then passengers can be transferred from one airline to another (Annexure 1).

Air Traffic Operations

ATC used old and traditional methods for transmission of signals as well as communication. Continued growth in air travel resulted in an increased delay, loss of revenues, and overall hampering the growth in the airline industry. New generation technology systems are being put in place today. One of the recent developments is for “Using an emerging global network, ATN (Aeronautical Telecommunication Network)”. Previously manual takeoff and landing system was there for flights that were hampering flight operations in adverse weather conditions thereafter the concept of ILS (Instrumental Landing System) had evolved. Another important factor for any operation of an airplane is the weather. IT innovation had given automated instruments that take observations as well as give future predictions. PIC (Pilot in Command) takes the weather report for the intended destination and then takeoff. The IT innovation in ATC had increased the facility in terms of delay of the flight due to congestion. Using an emerging global network, ATN (Aeronautical Telecommunication Network) helps in:

- Better clarity of communications resulting in reduced transmission and/ or interpretation errors which reduces airplane accidents.
- The use of ATN-compliant data links would reduce congestion on the voice communication channels (studies conducted by one ICAO State have indicated a significant reduction in communication induced delays

for flight operations in high density en route and terminal airspace) which helps in “on-time performance.”

- Many operational benefits like reduced fuel consumption, flight time, advise shorter route for the flight through the use of the ATN could be obtained. This will help in reduced airfare because of less consumption of fuel.

In the takeoff and landing of airplane ILS plays a very important role. It facilitates automated landing and takeoff as well as minimize the accident while takeoff and landing. It also reduces flying time. When ILS was not there then it was very tough to land or takeoff where visibility is zero whereas ILS provides facility for landing and takeoff in ZERO visibility. However, it facilitates delay or diversion of the flight due to poor visibility at the airport. IT innovation had given automated instruments for meteorological observations which take observations as well as give future predictions. It is very helpful when flights are delayed or canceled due to adverse weather conditions.

Travel and tourism have completely transformed due to IT-enabled online travel on customer interaction (Customer-centric systems for the travel and tourism industry, 2002). Which has more on the traveler as well as technology-centric? Gone are the days, when customers used to give feedback in papers, while IT growing with the usages of the internet, customer feedback could also grow (Finch, 1999, p. 554).

Methodology

The key objective of this research is to evaluate whether IT smart solutions lead to customer satisfaction. The research was conducted with the assumption that the sample is random, groups are independent, the population variances are homogenous and the population distribution of the decision variables is normal in size.

The Sample Size for the research is 100 respondents (Annexure 2). The respondents are Airline Industry Personnel from Airline operator, ATC (Air Traffic control), AAI (Airport Authority of India), and travelers. For analyzing the data collected from the questionnaire it is transformed into a 7-point Likert scale (Annexure 3).

The following Hypothesis was tested to meet the objective of the research.

Ho: $\mu_1 = \mu_2 = \mu_3$ (IT smart solutions do not impact customer satisfaction).

Ha: $\mu_1 \neq \mu_2 \neq \mu_3$ (IT smart solutions do impact customer satisfaction).

The data analysis was done by running the data on statistical software SPSS to arrive at meaningful insights for the research.

Table 1: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.883 ^a	.781	.750	.230

a. Predictors: (Constant), Meteorological System, In-Flight Services, Security System, On-Time Performance, Check-In, Air Traffic Control, Booking/Ticketing, Delay/Cancellation, Baggage Services, Navigation, Cost Reduction, Take-Off/ Landing of Flight

A significant high value of R2 indicates that the IT solution parameters explain the dependent variable. Hence, they largely make an impact on service quality and lead to immense customer satisfaction.

Table 2: ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.391	12	1.366	25.786	.000 ^b
	Residual	4.609	87	.053		
	Total	21.000	99			

a. Dependent Variable: Customer Satisfaction

b. Predictors: (Constant), Meteorological System, In-Flight Services, Security System, On-Time Performance, Check-In, Air Traffic Control, Booking/Ticketing, Delay/Cancellation, Baggage Services, Navigation, Cost Reduction, Take-Off/ Landing of Flight

A large value of F negates our null hypothesis thereby accepts our alternate hypothesis that the means of groups are not equal i.e. the parameters are independent of each other. The study is conducted at a 5% level of significance ($\alpha = .05$).

Table 3: Coefficients^a

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.494	.542		-.911	.365
	On Time Performance	.126	.048	.200	2.629	.010
	Cost Reduction	.096	.028	.223	3.465	.001
	Security System	.141	.028	.292	5.108	.000
	Booking/Ticketing	.043	.027	.089	1.563	.122
	In-Flight Services	.099	.026	.220	3.817	.000
	Air Traffic Control	.121	.026	.261	4.652	.000
	Navigation	.050	.030	.102	1.678	.097
	Check-In	.091	.028	.185	3.272	.002
	Delay/Cancellation	.158	.023	.405	6.866	.000
	Take-Off/ Landing of Flight	.000	.029	.000	-.011	.991
	Baggage Services	.047	.030	.099	1.605	.112
	Meteorological System	.127	.020	.386	6.237	.000

a. Dependent Variable: Customer Satisfaction

Conclusion

This paper has investigated the impact of information technology smart solutions to get emerged Airline Business Intelligence (ABI) on customer satisfaction and quality delivery in the Airline industry. The paper sections focused on how the transformation has happened in the IT operations and Air Traffic operations in the Airline industry. The data analysis and findings indicate the growing importance of IT factors which are making an impact on quality service delivery and customer satisfaction. IT-enabled competitive advantages are crucial for both floor and air-traffic operations which leads to

a great impact on the tourism industry. Since people are on ease to travel and getting comfort, they will be thinking more about travel which will lead to making the tourism industry high. Finally, to make clear the aim of this work, attention had to be focused back on the paper's background and premises. As a consequence, it was crucial to highlight the connections among different IT factors which have significantly contributed to delivering service quality which is great efforts towards the tourism industry. The emergence of the Internet/IoT/AI allows travelers to exercise as much control over their travel plans, as they would like. In the true essence of the AI, the only constant changes.

References

- Ashford, N., Stanton, H. P. M., & Moore, C. A. (1997). *Airport operations*. New York: McGraw-Hill.
- Buhalis, D. (2004). Airlines: Strategic and tactical use of ICTs in the airline industry. *Information & Management*, 41(7), 805-825.
- Clemons, E. K., & Reddi, S. P. (1993). An analysis of the impact of information technology on the organization of economic activity. Decision Sciences Working Paper 93-01-01. Wharton University of Pennsylvania.
- Cohen, S. S., DeLong, J. B., Weber, S., & Zysman, J. (2001). *Tracking a transformation: E-commerce and the terms of competition in industries*. BRIE-IGCC Economy Project Task Force. Washington, DC: Brookings Press.
- Croft, J. (2001). Airlines' web portals prosper despite third-party sites. *Aviation Week & Space Technology*, 154(20), 86-89.
- Customer-centric systems for the travel and tourism industry. (2002, May). Accenture. Prepared for WTTC IT/eCommerce Task Force.
- Eason, K. (1988). *Information technology and organizational change*. London: Taylor and Francis.
- Evans, P., & Wurster, T. S. (1997). Strategy and the new economics of information. *Harvard Business Review*, 75(5), 71-82.

- Finch, B. J. (1999). Internet discussions as a source for consumer product involvement and quality information: An exploratory study. *Journal of Operations Management*, 17(5), 535-556.
- Goldsborough, R. (2001). Travel the real world. *Link-up*, 18(1), 23-24.
- Hair, J. F., Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. New York: Prentice-Hall.
- Jorgenson, D. W., Ho, M. S., & Stiroh, K. J. (2005). *Productivity volume 3: Information technology and the American growth resurgence*. Cambridge: MIT Press.
- Kettinger, W., & Lee, C. (1994). Perceived service quality and user satisfaction with the information services function. *Decision Sciences*, 25(5/6), 737-766.
- Maselli, J. (2002). *E-ticketing threatens travel agent*. Informationweek.com [Online]. Retrieved March 25, from http://www.informationweek.com/shared/printableArticle?doc_id=WK20020322S0014
- Au, N., Ngai, E. W. T., & Cheng, T. C. E. (2008). Extending the understanding of end user information systems satisfaction formation: An equitable needs fulfillment model approach. *MIS Quarterly*, 32(1), 43-66.
- Mullaney, T. J. (2002, June 27). Information technology: The internet: Orbitz Heavy Baggage. *Business Week*, 64.
- Pitt, L. P., Watson, R. T., & Kavan, C. B. (1995). Service quality: A measure of information systems effectiveness. *MIS Quarterly*, 19(2), 173-187.
- Hill, R. M., & Johnson, L. W. (2004). Advertiser expectations of agency creative product. *Services Marketing Quarterly*, 25(4), 53-69.
- Nucciarelli, A., & Gastaldi, M. (2008). Information technology and collaboration tools within the e-supply chain management of the

aviation industry. *Technology Analysis and Strategic Management*, 20(2), 169-184.

- The European e-Business W@tch. (2005). ICT and electronic business in the aeronautics industry. ICT adoption and e-business activity in 2005. Retrieved from <http://www.ebusinesswatch.org>

Webliography

- American Airlines www.aa.com
- Aeroflot www.aeroflot.org
- Air Canada www.aircanada.ca
- Air France www.airfrance.com
- Austrian Airlines www.aua.com
- British Airways www.british-airways.com
- Cathay Pacific www.cathaypacific.com
- Continental Airlines www.continental.com
- Delta Airlines www.delta.com
- Emirates www.ekgroup.com
- Finnair www.finnair.com
- Japan Airlines www.jal.com
- KLM www.klm.com
- Lufthansa www.lufthansa.com
- Malaysia Airlines www.malaysiaairline.com
- Qantas Airways www.qantas.com.au
- Air India www.airindia.in
- Singapore Airlines www.singaporeair.com
- South African Airlines www.saa.co.za
- Swissair www.swiss.com

- Turkish Airlines www.turkishairlines.com
- United Airlines www.united.com
- Virgin Atlantic Airways www.virginatlantic.com
- www.epubs.surrey.ac.uk/1120/1/fulltext.pdf
- www.papermasters.com/airline_industry.html
- www.flightglobal.com/insight
- www.oppapers.com
- www.bournemouth.academia.edu
- www.essaylib.com
- www.plaggrave-journals.com/thr/
- www.writing4students.blogspot.com

Airline IT Providers/GDSs and IT Providers

SABRE <http://www.sabre.com>

WORLDSPAN <http://www.worldspangroup.com>

AMADEUS <http://www.amadeus.com>

Galileo <http://www.travelport.com>

Airline Systems

IBM <http://www.ibm.com/solutions/travel/>

LIDO <http://www.lido.net/>

SITA <http://www.sita.net/>

ORACLE http://www.oracle.com/industries/travel_transportation/

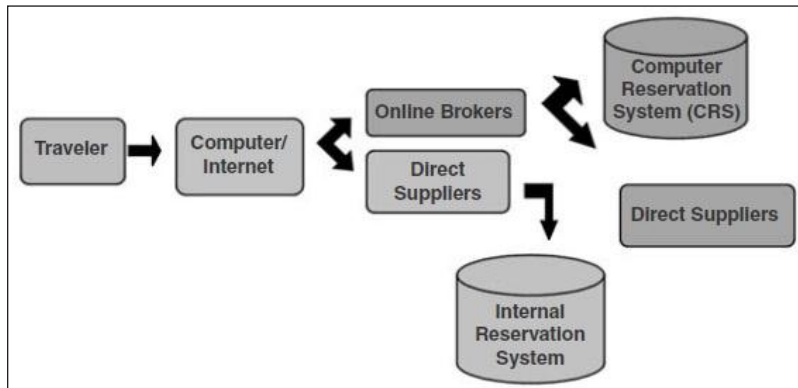
International Air Transportation Association (IATA) <http://www.iata.org/>

Inflight Catering Association <http://www.ifcanet.com>

Airport Technology <http://www.airport-technology.com/>

Airport Authorities of India(AAI) www.aai.aero

Annexure 1



Source: Services Marketing Quarterly, Vol. 25(4), 2004. <http://www.haworthpress.com/web/SMQ>, 2004 by The Haworth Press, Inc.

Fig. 1: Modeling the Airline Industry without Traditional Travel Agents

Annexure 2

Questionnaire

Q1. "On-Time Performance is a very important factor for an airline" context of this statement, IT innovation is boon in the airline industry, which is/are the factor/s true?

- (A) Air Traffic Control (ATC)
- (B) Instrumental Landing System (ILS)
- (C) Meteorological Observations
- (D) All of the above

Q2. How does IT innovation help in the airline industry?

- (A) To improve comfort in In-flight services
- (B) Reduces fuel consumption
- (C) None of the above
- (D) All of the above

Q3. In the context of passenger facilitation “IT has made a miracle” Do you agree on?

- (A) Booking/Ticketing (E-Ticketing, Web-Ticketing)
- (B) Check-in (Origin to the last destination)
- (C) Security System (screening, Frisking)
- (D) All of the above

Q4. On which part, do you think that IT innovation has reduced the cost of an airline?

- (A) Fuel
- (B) Manpower
- (C) Delays/Cancellation Expenses
- (D) All of the above

Q5. “Taking off and Landing of an airplane are affected in adverse weather conditions” IT has given immense improvement, are you agree?

- (A) An airplane can take off and land when visibility is ZERO
- (B) An airplane can’t take off
- (C) An airplane can’t land
- (D) No improvement

Q6. Which is not IT innovation in the airline industry?

- (A) Use the internet in In-flight
- (B) Manual booking and ticketing
- (C) Use satellite phone in In-flight
- (D) Above A and C both

Q7. “IT innovation has made improvements in Booking/Ticketing” which is the most appropriate?

- (A) Booking/Ticketing for any sector, any airline in one itinerary
- (B) Booking/Ticketing at airport counters

- (C) Booking/Ticketing from agents
- (D) Booking/Ticketing only from airline operator

Q8. Which is related to IT innovation in Ticketing?

- (A) Web ticketing
- (B) Mobile ticketing
- (C) IVR ticketing
- (D) All of the above

Q9. In the airline check-in system, which is the more appropriate related to IT innovation?

- (A) Through check-in from one airline to another airline till the final destination
- (B) Check-in only for the operating carrier
- (C) Check-in only for one sector
- (D) None of the above

Q10. “CUTE” (Common User Terminal Equipment) is the check-in system at airports, which is a very good example of IT innovation.

- (A) It is a common check-in system for all airlines
- (B) It is a very old system
- (C) It is not user friendly
- (D) None of the above

Q11. What is the most significant technological improvement in the airline security system?

- (A) HHMD (Hand Held Metal Detector)
- (B) DFMD (Door Frame Metal Detector)
- (C) Body Scanner
- (D) None of the above

Q12. “IT innovation has improved facilities for passengers” on which, do you agree with this statement?

- (A) In case of delay of flights
- (B) Comfort in flights
- (C) Entertainment
- (D) All of the above

Q13. Which country is not using “ATN”(Aeronautical Telecommunication Network)?

- (A) USA
- (B) Russia
- (C) Australia
- (D) None of the above

Q14. Which country has announced to implement ATN in forthcoming years?

- (A) Sri Lanka
- (B) UK
- (C) India
- (D) None

Q15. Which is not IT innovation in the airline industry?

- (A) ATN (Aeronautical Telecommunication Network)
- (B) ILS (Instrumental Landing System)
- (C) None of the above
- (D) All of the above

Q16. ATN will help in

- (A) Navigation of an airplane
- (B) Advise shorter path to airplane

(C) Decrease block time from origin to destination

(D) All of the above

Q17. In airline baggage services “IT innovation has played an important role to trace the baggage which is lost during the travel”, do you agree?

(A) Common baggage tracing is being used by most of the airlines

(B) Not possible to trace the baggage

(C) Baggage can be traced when airlines using an exclusive baggage tracing system.

(D) None of the above

Q18. Most of the airlines in the world are using JET engines driven airplane instead of TURBO propeller, It is good a good example of technological innovation which increases:

(A) Speed of Airplane

(B) Fuel efficiency

(C) All of the above

(D) None of the above

Annexure 3

Analysis of Questionnaire Data

Column 1	Column 2	Strongly Agree	Agree	Partially Agree	Average	Partially Disagree	Disagree	Strongly Disagree
Sr. No.	Parameters							
1	On-Time Performance	59	27	14	0	0	0	0
2	Cost Reduction	22	26	30	22	0	0	0
3	Security System	19	43	25	12	1	0	0
4	Booking/Ticketing	16	42	30	9	3	0	0
5	In-Flight Services	19	42	22	15	2	0	0
6	Air Traffic Control	30	33	29	6	2	0	0
7	Navigation	9	32	43	12	4	0	0
8	Check-In	11	37	38	11	3	0	0
9	Delay/Cancellation	20	35	30	9	4	1	1
10	Take-Off/Landing of Flight	16	47	22	12	2	1	0
11	Baggage Services	26	35	30	8	1	0	0
12	Meteorological system	3	53	27	4	5	3	5

