

THE PUNCTUALITY OF THE AIRLINE IN AIR TRANSPORTATION SYSTEM: FACTORS OF FLIGHT DELAY IN-TIME

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ABSTRACT

The research purpose is to evaluate the relationship between on-time flight performances with the factor of the flight delay in-time. Departure and arrival punctuality is the key performance indicators of airlines and essentials for time valuing travelers. A crucial driver for good punctuality is good planning. Potential reasons of delays maybe weak in planning such as lack of communication, inefficiency of the ground operational factor, airport congestion problem, and other unexpected condition such as weather condition. Secondary data of the methodology will be useful for the research paper.

Keywords

Airlines; departure punctuality, performance indicator, punctuality problems, ground operation

1.0 INTRODUCTION

1.1 Background

Flight punctuality always is the core issue in the air transportation system. The air transport network, the 'Real World Wide Web', offers the practical, fast, reliable transport across globe for the people who need the air transport for the travel, businesses and visiting purpose. Formerly, academic literatures are familiar with the field in the on-time performance by airlines, but it is rarely focused on the factors why the flights delay in-time. Factors of flight in- time are waiting to be explored in the research.

Punctuality is also allows airlines to differentiate themselves from their competitors. Ever since air transportation is primarily a scheduled service, airlines considerably depend on punctuality of arrivals and do not appreciate a lot of variation in their operations, mainly to ensure the turnaround is accomplished on schedule to clear the aircraft for

subsequent departure. Additionally, from a commercial perspective airport management is interested in the timely freeing of space for subsequent arrivals with new passengers.

1.2 Objective

The main objective of the research is to identify the factors of flight delay in-time of the airlines influence the punctuality of flight schedules. Develop a theoretical framework that helps to improve punctuality of the flight schedules.

1.3 Significant of the study

On-time arrivals can make passengers connections, that aircraft can be prepared in time for the next flight, that crew have sufficient time to change aircraft in case they are operating multiple-sectors, and it avoids late minute gate changes with possible lost passengers. Airlines will still focus on the departure phase because an on-time departure is the best guarantee for an on-time arrival. Strong headwinds, very long taxi-times, unrealistic block times, and holdings etc can still cause arrival delays in case of an on-time departure. Therefore, measuring their operational performance is an essential aspect of every airline's daily business. Airlines may use their internal systems and procedures to collect data and monitor their (operational) performance.

2.0 LITERATURE REVIEW

In this chapter will briefly review the recent literatures of the punctuality of the airline and underline the factor of flight delay in time.

2.1 Punctuality of the flight schedules

A flight is considered delayed if it departed or arrived at the gate 15 minutes or more past its scheduled gate departure or arrival time that is shown in the airline's

reservation system. These delays are captured as gate arrival delays, gate departure delays, and block delays for example the delays occurring between gate departure and gate arrival (GAO, 2010).

A good understanding to explain the meaning of delay is “when the time lapse which occurs when the planned time period does not happen the planned event”(Eurocontrol, 2010). One of the cornerstones in order to achieve the best possible on-time performance is the creation of a realistic schedule. The aim to show that more can be done at the planning stage to manage on-time performance, and that there is a large amount of data that is available to assist planners. Airlines may come to a decision to include a buffer in the schedule in case of expected departure delays. This buffer will pick up the arrival punctuality and reduce the impact of reactionary delays on the on the whole level of punctuality.

2.2 Factors flights delay in time

Flight delay is a serious and extensive crisis in the United States. Increasing flight delays place a important strain on the US air travel system and cost airlines, passengers, and society at many billions of dollars every year (Michael et al., 2010). The report analyzes a diversity of cost components caused by flight delays, including cost to airlines, cost to passengers, cost of lost demand, as well as the indirect impact of delay on the US economy. Furthermore, the study offers a broader consideration of relevant costs than conventional cost-of-delay estimates, and employs several innovative methodologies for assessing the magnitudes of these costs. The results of this study advise that policies and mechanisms that discourage over scheduling should be considered in concert with capacity enhancements to insure effective use of new capacity in order to reduce flight delay and its associated costs.

2.2.1 Poor ground operation

The study from Cheng & Robert (2003), determined that flight schedule control and management influenced the punctuality performance of airline. A stochastic approach used in their investigation, and the aircraft turnaround model is help to define punctuality problem of turnaround aircraft. The results show that the departure punctuality of turnaround aircraft is influenced by the length of scheduled turnaround time, the arrival punctuality of inbound aircraft as well as the operational efficiency of aircraft ground services. It is proved with when the observation data shows that the operational efficiency of aircraft ground services varies among turnarounds

when compared it. Thus, it is recommended to achieve the improvement of departure punctuality of turnaround aircraft from two approaches: airline scheduling control and the management of operational efficiency of aircraft ground services.

According to propose by Branko (2011), airport punctuality to be improved by minimize the congestion and delay in airport analysis the performance benchmarking. A true performance quality influenced by actual flight schedules with a focus on usability for subsequent airport benchmarking and traffic modeling. It examines punctuality between the determinants of flight delays at airports, and thereby developing performance indicators such as slot capacity utilization and queuing time. The outcome is put into effect in traffic flow optimization by constantly minimizing server (i.e. runway, apron or terminal) occupancy times and maximizing punctuality (Eurocontrol, 2005).

2.2.2 Poor network planning and control

According to Hugo & Eugene (n.d.), departure planning can be optimized towards punctuality, towards acceptance of airlines’ planning preferences and towards efficient use of available runway capacity. It can be implement by using Collaborative Decision Making (CDM) where monitoring available planning data of different actors, a concept is presented here, that is based rather on a pro-active and synthesizing planning process. Moreover, it can be contribute in optimization towards punctuality is achieved by using flight preference functions. The tool is a planning-support tool based on balanced decision-making. The concept is that the human planning controller is superior in short-term, flexible and reactive decision making, assisting in a complex, strategic and iterative optimization process. Also, it can provide benefits to airline operations but that in all other respects works according to objective rules.

2.2.3 Bad Weather Condition

According Gloria (n.d.), weather play a significant role in a number of aviation accidents, incidents and flight delay in time. The factors contributed to accidents and flights delay in time are thunderstorms, in-flight icing, turbulence, ceiling, visibility, ground de-icing, and volcanic ash.

3.0 METHODOLOGY

Data of the research is using qualitative research with secondary data. The research paper is aim to gather an in-depth understanding of delay and the reasons

that causes such problems. In the research paper, data collected through 16 articles, analyze, and find the similar outcomes from those articles.

In the research of Khurram (2002), Pareto analysis, cause-effect diagrams, and statistical techniques such as data collection and graphing are used to measure quality of airport ground handling operations influence on time performance.

In the research of Kari & Francis (2000) evaluated improvement in airport operations by constructing quantitative approach. Mathematical models such as SIMMOD, TAAM, and CODAS wind data used to evaluate qualitatively the relative effects such as weather and its airport improvement.

4.0 FINDINGS

This research paper collected secondary data through 16 articles. From the articles analysis, the initial finding was evaluated.

4.1 Initial Finding

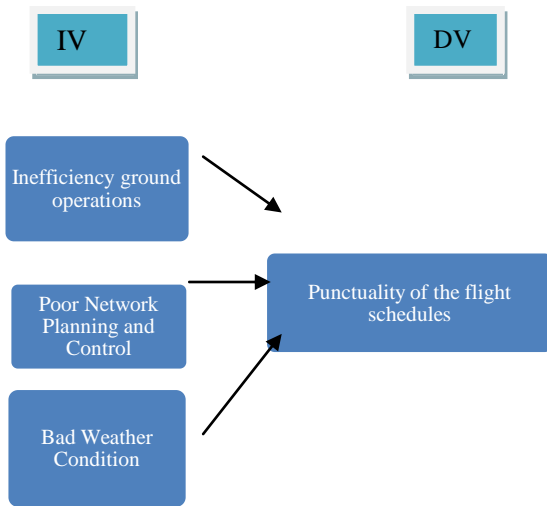


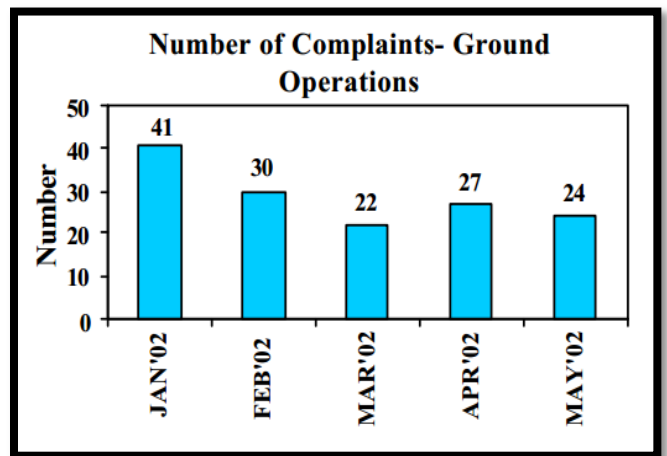
Figure 1: Theoretical Framework

In the study anticipated the three factors in Figure 1 can influence the on-time flight performance.

Table 1: Factors and condition attributes

Factors	Condition Attributes
Inefficiency ground operations	Process efficiency Timeliness information Equipment availability Management, staff grooming
Poor network planning and control	Fuel consumption planning New technology SOC checking Movement control system
Weather condition	Ceiling Visibility Precipitation

In the first factor of poor ground operations, Dubai International airport initiated a yearly customer satisfaction survey to develop baseline data for compared against quantified data in Figure 2. In survey, Khurram (2002) found that key operation areas with ground handling services influenced the customer satisfaction. Indirectly, it influenced flight on time performance.



Source : Khurram (2002)

Figure 2: Number of complaints –ground operations

The second factor, Sabre Airline (n.d) provides some efficient airlines capitalize on integrated solutions and processes. SOC staff member from the airline monitor and control the airline operation in order to obtain the solutions of flight delay in time. From the solutions, the research gained the expected outcome in Table 2

described on how the network planning and control can achieve on-time performance.

Table 2: The disruptions occur of poor networking planning and controlling.

Poor network planning and control	Disruptions
Fuel consumption planning	Poor flight time planning Poor flight speed planning
Technology	Poor navigational forecasting planning
System Operation Control (SOC) checking	Poor weight or load planning Poor contingency plan to alternate airport Poor route & attitude limitation planning.
Movement control system	Poor maintenance control of aircraft Poor real-time tracking controlling (flight following)

Source: Sabre Airline (n.d.)

For the last factor in Table 3, Kari & Francis (2000) conducted the CODAS winds data¹ to assess as the weather condition affected the airport operations for each 15-minute interval. The observational base of arrival and departure ground operation from a moderate size and non-hub airport which are: Dallas/Fort Worth International Airport (DFW), George Bush Intercontinental Airport in Houston, Texas (IAH), and Atlanta Hartsfield International Airport (ATL).

Table 3: Influence of weather

WEATHER FACTOR	DFW	ATL	IAH
% of ops affected by ceiling	5%	9%	6%
% of ops affected by visibility	3%	8%	6%
% of ops affected by precipitation	3%	4%	4%

Source: Kari & Francis (2000)

¹ The precipitation entries in the database belong to the set {0,1,T} where 0 indicates no activity, T indicates a thunderstorm and 1 indicates the presence of precipitation.

5.0 DISCUSSION & CONCLUSION

The flight schedule punctuality problem has generally been approached in the literature by conventional statistic analyses, which can only provide basic information about punctuality. In short, the factors of flight delay in time are: poor ground operation, poor network planning and control and bad weather condition.

The main purpose to identify the factor of flight delay in time is to improve the customer satisfaction. The study contributes the areas need to be focus that passengers are expecting better on-time performance to be serve. This study is only consisted of secondary data. Consistent measurement cannot be implemented because secondary data are gathered from different literatures; it has reduced reliability and validity of the study.

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