



ASSESSMENT OF THE AIRPORT SERVICE QUALITY

Arnoldina Pabedinskaitė¹, Viktorija Akstinaite²

^{1,2}*Vilnius Gediminas Technical University, Faculty of Business Management,
Saulėtekio al. 11, LT-10223 Vilnius, Lithuania
Email: arna@vgtu.lt; akstinaite.vik@gmail.com*

Abstract. The quality of airport services for airlines is been investigated in this paper using Servqual method. Literature analysis has resulted in the development of a system of criteria (37 criteria) for measuring the quality of the airport services provided to airlines. Based on the analysis of literature and expert assessment, the authors propose a system of criteria designed for measuring the quality of airport services provided to airlines according to five service quality dimensions as well as the service processes provided by airports. Using the criteria system quality the level of airport services provided to airlines has assessed. The following methods have been applied: the comparative analysis of the scientific literature and data analysis.

Keywords: service quality, airport services, Servqual method.

JEL classification: M10, M20, M30, L 80, L93, R40.

1. Introduction

The development of air transport activity worldwide has increased the demand for airport services and the need for more efficient processes of servicing aircraft, passengers or luggage. The level of competition in the European, North American or Asian markets has grown, and broader possibilities of choice have opened up for airlines in respect of the airports which can be used as a base and as connecting ones on their flight map. All air carriers seek to expand their operations at efficiently operating airports in order to reduce their costs and increase the quality of the services provided to the passengers (Oum *et al.* 2003). Thelle, H. *et al.* 2012 I. Humphreys *et al.* (2002), In carrying out their activities, airports aim at maximising the movement of aircraft, thus increasing the efficiency of operations in the competitive environment in which they function. In many countries, airports have turned from state monopolies into competing operators, and market changes determined flight directions. In addition, the emergence of low cost carriers in the market forces airports to increase the efficiency of the existing infrastructure in order to preserve competitiveness and to maintain their sales.

Studies of the operations and services provided by airports are currently being carried out from highly diverse perspectives. Some authors analyse passengers' expectations and experience, others study the airport's operational efficiency and productivity using a variety of methods of airport

performance assessment yet others examine and evaluate the quality of airport services.

In assessing the quality of airport services, some authors (Chou *et al.* 2011; Erdil, Yildiz 2011) developed criteria according to the classical dimensions of the Servqual methodology (tangibles, responsiveness, reliability, assurance and empathy). Erdil and Yildiz (2011) assessed quality according to 22 criteria, while Chou *et al.* (2011) supplemented the quality dimensions with the flight pattern group of criteria and used a set of 28 criteria.

In studying airport operational efficiency some authors use only various technical airport characteristics: number of runways, number of platforms, airport size, number of employees, number of flights, cargo volumes, number of passengers, etc. (Feasibility study 2012; Jaržemskienė 2012; Lin, Hong 2006; Perelman, Serebrisky 2010; Tseng *et al.* 2008; Vreedenburgh 1999; Wyman 2012; Zhang *et al.* 2012). Research some other authors (Lopes, Rodrigues 2007; Tenge 2012; Sutia *et al.* 2013) are based on the social capital and network approach to operations of organizations. According to Tenge (2012) the quality of airport services and the ability to constantly innovate are important variables that contribute to the overall attractiveness of an airport. In many cases, airport management underestimates the necessity of insight into the needs of clients. This is due to the fact, that it is airlines and tour operators, who are in direct contact with passengers. Contemporary information technologies (social networks), such as the social network of Facebook, provide for airports

an opportunity to broadly communicate with customers and obtain a better understanding of their needs. The author shows that airports are capable of increasing their operational efficiency by communicating with customers with the help of social networks. Based on various studies, Lopes and Rodrigues (2007) have identified the intellectual capital value chain, which plays a particularly important role in assessing the added value created by the intellectual capital and attributable specifically to the aviation sector. The authors have assigned to these elements of the value chain the indicators allowing for assessment of the intellectual capital management in airport operations. Sutia *et al.* (2013) have analyzed the relationship among human capital, leadership and strategic orientation with company performance, especially the influence of human capital investment on airport performance.

Vasigh (2006), when analyzing the financial and operational performance of 22 airports the total factor productivity (TFP) model has used. The results showed that the company managers who worked with more than one airport achieved higher TFP levels than those who worked with only one airport. Other results show an inverse relationship between the TFP and the two factors used in the study, namely, net assets and the landing area. The authors concluded that airport landing areas with a higher level of the TFP were used more intensively, and the net assets were used efficiently. Moreover, a positive relationship between the TFP and landing fees, traffic intensity and operating income means that these factors contribute to the enhancement of airport performance.

According to Kuo and Liang (2011) evaluation of service quality is very complex decision making problem with some uncertainty level of business environment. Authors proposed to use multicriteria methods for exploring and evaluating undefined qualitative factors.

Fernandes and Pacheco (2008) analyzed the quality of airport services using the methods of fuzzy multicriteria analysis and alpha-cut concept. The service quality analysis was carried out using a complex set of quality variables and their indicators, which allows to obtaining a comprehensive quality assessment. For the purpose of assessment of the quality of services, the authors used 36 criteria reflecting the physical dimension of the quality of the airport, the quality of services provided to the passengers as well as important commercial services of the airport. The method of fuzzy multicriteria analysis helps to identify the cause-and-effect relationship and to create a quality standard. The alpha-cut method enables to describe the various types of uncertainty in human system's variables and to determine, with a certain alpha probability, the upper and lower limits of the analysed parameters. The authors applied these methods to

the analysis of six airports in Brazil and actually proposed an analytical strategic framework for the management of airports.

The aim of the survey carried out by Enoma and Alle (2006) at Scottish airports has been to assess the influence of the compiled set of criteria on the management of airport services, with a focus on safety. The authors argue that the choice of a risk management strategy particularly affects the safety. Measurement of airport operational efficiency is a highly challenging task, especially in conjunction with the functions of service management. There is a need to identify the influencing factors, because the functions of service management are difficult to measure. The indicators identified by the authors assess the operation of an airport from the safety perspective: breaks of the safety personnel, implementation of evacuation processes during an emergency, control of potential panic control, processes in the event of airport equipment failure, actions in respect of the passenger posing a threat inside aircraft.

An analysis of literature shows a growing need for assessment of the operational efficiency of airports and the quality of the services provided by them in order to improve airport operation. Authors would like to note, that there is a wide variety of research methods and criteria used for assessment of the operational efficiency of airports and the quality of their services.

The aim of this paper is to establish the correspondence between the airport services quality expectations and the actual level of quality.

The following methods were applied in the paper: the comparative analysis of the scientific literature, Servqual method, survey and data analysis.

2. Analysis of aviation market

Since the period of the economic crisis, which began in 2008, the aviation services industry has evolved differently in different regions. In some regions, the growth of this industry somewhat slowed down, in others it remained stable, yet in others it began to grow. The European Commission's Annual Analysis Report of the EU Air Transport Market (2010) claims, that the main indicator of the growing market was the growth of GDP. Market growth in Europe and North America lagged behind in comparison with Asia, Latin America and the Middle East. The impressive growth in international traffic and development of a durable and stable market in developing countries were linked to economic growth to a greater degree than in mature economies. In 2010, airports recovered both in terms of traffic development and earned profit. Airlines recorded growth in traffic indicators during this period too. Today's air travellers have the opportunity to choose between several airports, hence there is the increasing need for

airports to compete and to distinguish themselves among its competitors by providing their performance advantages.

A survey published by the International Air Transport Association (IATA) shows that global aviation indicators continue to increase. The main indicator that defines the size of the market, that is, revenue passenger kilometres (RPK), has almost reached 480 billion. The aviation market's growth rate in Europe is moderate compared with the global market growth. According to IATA, the global passenger market's growth rate in September 2013 was 5.5 per cent, compared with September of the previous year. By the growth rate, Europe slightly lagged behind the world average (3.4 per cent) (IATA Economics. Air Passenger Market Analysis, September 2013).

Data of the International Air Transport Association show that in 2012, air transport operators carried 2.97 billion passengers, which is 41 per cent of the total world population, by scheduled flights. This indicator grew by 5 per cent compared with 2011. 30.5 million flights were carried out in 2012, and aircraft occupancy rate reached 79.5 per cent.

In 2012, economic growth led to passenger traffic rise and growth of the aviation market. Passenger flights that year grew significantly in efficiency, whereas freight transport by air was impaired by a shrinking market, falling consumption and reduced income. Development of appropriate passenger business volumes allowed airlines to increase its profits more than expected. One of the three largest markets which account for 83 per cent of the entire air traffic, namely, the airlines of the Asia-Pacific region, continued to make the highest profits, although this gain was lower than in 2011. The reason was the weakness of the freight market. North American airlines generated the second largest profits and improved the company's operations thanks to efficiency, which was the result of mergers. It was European airlines alone, that remained down due to the ongoing recession in the euro zone (IATA Annual Review 2013).

Air travel market's growth slowed down in 2012, but still did better than the weak global economy. Passenger traffic (expressed by the main indicator of the market size – revenue passenger kilometres (RPK)) grew by 5 per cent in 2012. Although growth rates are in line with industry trends, authors note, that development indicators were slowing down for the second consecutive year. Nevertheless, air travel stood unusually strong despite tough economic conditions. In 2012, 65 per cent of passenger growth in international markets was being recorded in emerging markets. Another 23 per cent of the growth was generated in Europe, which seems odd due to a severe recession in many economies of the euro zone. However, European growth statistics include

passengers from Russia, Central and Eastern Europe and Turkey, where the growth was more pronounced than in the rest of the euro zone. The developed U.S. market grew by 0.8 per cent. The fastest growth was observed in emerging internal markets, such as Chinese (9.5 per cent) and Brazilian (8.6 per cent) markets. The exception was decline by 2.1 per cent in the internal market of India due to airlines' decision to impose high prices.

Growth in the business travellers and higher quality segment remained strong. In 2012, the number of international higher class travellers increased by 4.8 per cent. As it has already mentioned, this was another year of recession for the freight market. Contrary to the passenger market, freight volumes were still weak due to global economic conditions. Global trade growth significantly slowed down. Freight transport by air, measured by cargo weight per kilometre, fell by 1.5 per cent due freight transport by other means. Freight transport by air was successful along with economic growth, because consignors required fast delivery, for which they were willing to pay an extra charge over long distances (IATA Annual Review 2013).

In addition to the market's trends described above, it should be noted, that the year 2012 was a record year as regards oil prices (Fig. 1).

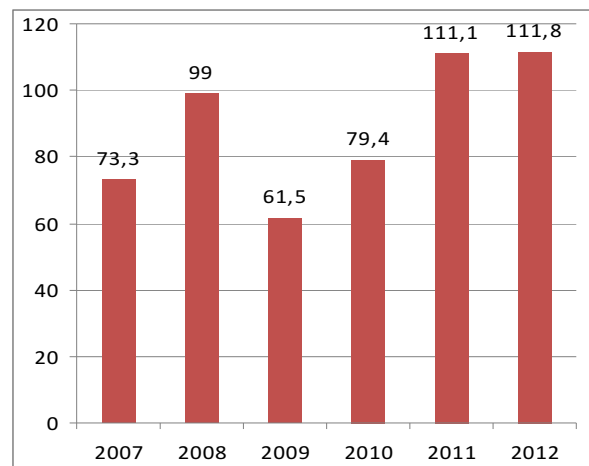


Fig. 1. Aviation fuel price changes (USA dollars per barrel) (source: IATA Economics. 2013. Profitability ...)

Aviation fuel price, if paid in cash, grew this year by several dollars and reached an average of USD 130 per barrel. Due to the rise in prices, fuel costs in the industry under analysis increased up to 209 billion dollars in 2012, which accounted for 33 per cent of current costs. In response to high aviation fuel prices, in 2012 the number of new and fuel cost-efficient aircraft rose to a record level. These new aircraft supplemented the seating capacity with 238 000 seats, adding 7-8 per cent to the global volume. High fuel prices prompted air-

lines to transfer older aircraft to the reserve, or to give up such aircraft altogether.

In 2012, airline profit declined, but stood better than expected in tough economic conditions (Fig. 2).

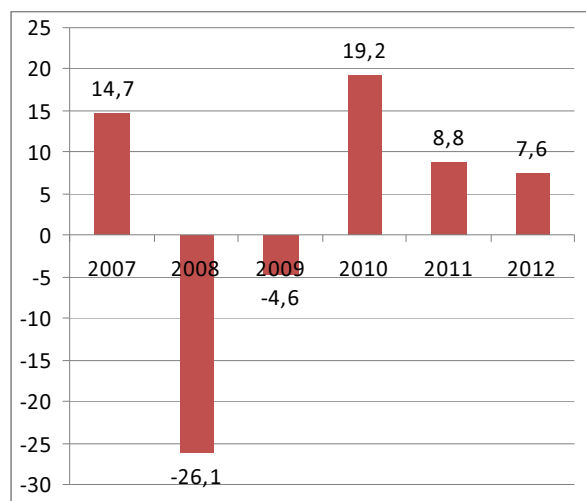


Fig. 2. Changes in net profit earned by airlines, in billions (source: IATA Economics. 2013. Profitability ...)

Over the past two decades, when global economic growth fell by 2 per cent, the airline industry went from profitable to unprofitable. In 2012, revenues declined, but a net income of 7.6 billion indicates adequate performance under tough economic conditions.

Air connectivity is a key factor in economic growth. Some states have introduced the policies, which support and promote the economic development of the aviation industry. Other countries are developing various obstacles with the help of irksome charges, burdensome regulation and other restrictions. Air connectivity creates utility both for economics and for individuals. An example could be the tourism industry, which is the main driving force in the development of economies. Almost 35 per cent of international tourists travel by air, and is been expected, that more than 120 million people to be directly employed in the tourism industry worldwide by 2021. Air connectivity opens up new markets and provides possibilities of expanding export activities.

Aviation is a highly regulated industry. However, this regulation should enable aviation to generate economic growth. A poorly designed regulatory mechanism impairs the possibilities of aviation to become a cause of economic growth. By cooperating with agents, who are positively affected by aviation, IATA promotes equitable regulation that would balance the need for market competition, rights of passengers and employees with opportunities for aviation to grow and serve communities both directly and indirectly. Unjustified and excessive charges imposed on international air transport also have a negative impact on the economy and

social development. IATA, assisted by a variety of industry allies, carries out a number of campaigns in order to persuade authorities to reduce or lift certain charges. Such charge initiatives, the specific features of which negatively influence the aviation industry also adversely affect economic growth. The last increase in air passenger charges in Great Britain, imposed in 2013, will cost the economy of Great Britain 459 million dollars per year, accompanied by the decline in GDP with the subsequent loss of 7,000 jobs.

Airport infrastructure charges must be at a level that would enable airlines to meet the demand for connectivity, to receive return on investment and to ensure adequate investment in the improvement of future performance and quality of services. Due the fact that infrastructure providers often have a monopoly status, various regulatory authorities play an important role in the supervision of the charges.

Travellers are increasingly willing to control their travels. Information technologies make it possible to improve passenger experience and to reduce costs having regard to the rising number of passengers and increasingly burdensome security requirements. They also help the industry to cope with the growing expectations of passengers, who are used to control the other areas of their lives, such as e-commerce and self-service banking. In November 2012, the Passenger Services Conference approved a new programme for simplifying business. This document describes a programme, based on the success of original initiatives. The programme provides for such amenities as kiosks, e-tickets and bar-code boarding passes in five programme areas: a new provision model, increased provision of passenger data, improves real-time access to information for passengers, smooth ground experience and seamless end-to-end journey for passengers. The Internet has fundamentally reshaped the way in which sellers and customers currently interact. Currently, 40 per cent of ticket sales are been done directly through airline websites. Airlines use their websites providing to customers their service packages and product innovations. Moreover, airlines are allowed to prepare their proposals in a manner to as to tailor them to specific needs of customers. However, the vast majority (60 per cent) of tickets are been sold indirectly via certain agents (ACI. 2013. The Airport IT Trends Survey 2012).

Air transport still creates a huge value for its customers, passengers, parcel consignors and other entities involved in the value chain, but still destroy value for airline investors. Here, the challenge is to increase return on investment while continuing the growth of the value created for the customer and economic development. Airlines need to improve properly their performance in order to attract 4-5 trillion dollars of new capital

required by them over the next two decades. Over the past 30 years, this industry has joined a growing number of cities by means of direct services. The number of unique pairs of cities increased 2.5 times from 6,000 in 1980 to over 15,000 in 2012 (IATA. 2013. Annual review 2013).

According to ACI Europe data (European Airport Traffic Trends 2013), in the group of airports' welcoming less than 5 million passengers per year Vilnius International Airport ranked third in January 2013 and fourth in February 2013 in terms of passenger growth. In its October report, ACI Europe mentioned Lithuania as one of the most rapidly developing EU countries in terms of the number of passengers. During the first nine months of 2013, Vilnius International Airport served 2,016,062 passengers and 24 306 aircraft. The number of passengers served, as compared with the corresponding period of 2012, increased by 22.1 per cent, flights – by 7.4 per cent (ACI Europe. 2013. Q3 EU airport passenger traffic).

Sustaining a considerable growth in the number of passengers, though slower than in 2012, Vilnius Airport is gradually closing the gap on the leader of the region's aviation services market – Riga Airport.

3. Operations of airport

An analysis of literature shows that quality measurement of airport services is being performed most frequently by conducting passenger surveys. However, insufficient attention is devoted to yet another important participant in this industry, namely, airlines, which are highly important customers for an airport - if airlines did not fly to a certain airport, it would lose some of its passengers and, at the same time, the market share. Through attracting new airlines, the airport increases its competitive advantage and the volume of activities, so air carriers contribute to the improvement of airport operations by evaluating the efficiency of the airport, expressing their opinion and satisfaction. Airline change in airports is considerable, as some airlines come in, others withdraw, thus increasing or reducing the number of routes. This change has an impact on both the attitude and behaviour of passengers that is why it is important to identify its causes and patterns.

The services provided by airports could be divided into two groups, namely, aviation and non-aviation services. Examples of aviation services could be the provision, maintenance and operation of the infrastructure required for the aircraft to take off, land, and stand, the provision and maintenance of the equipment and information technologies required for baggage handling and check-in of passenger, aviation safety services, etc. Aviation services also include ground handling services, such as preparation of the aircraft for flight, lug-

gage loading, passenger transport, etc. Meanwhile, non-aviation services include car parking, commercial activities at the airport (catering, commerce), business lounges, rent, advertising, and so on. Direct customers of aviation services are airlines, and those of non-aviation services – passengers.

Thus, it could be claimed that there are three closely interrelated actors operating in the air transport services sector: the airport, airlines and passengers (Fig. 3). The airport seeks to attract airlines in order to be able to offer a wider range of routes to passengers, while also making efforts to ensure the quality of services provided within the airport on purpose the passengers choose this airport for their travels. Deciding to open new routes, airlines primarily evaluate the existing airport infrastructure and its prices, the supply of ground-handling services and their costs. In addition, airlines have regard to the potential passenger demand trend, which is been affected by the airport providing its internal services. Equally important are airport taxes levied on airlines, which may affect the prices of tickets and, at the same time, the decision of passengers to use or not to use a certain airport and airlines.

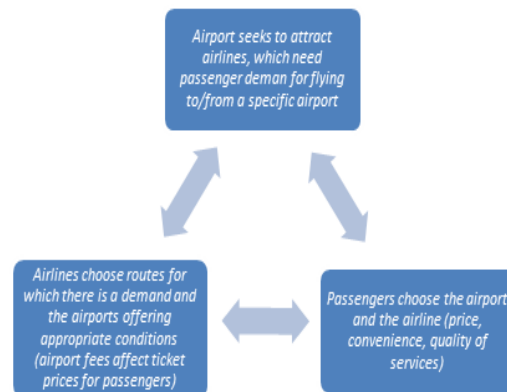


Fig. 3. Links between the airport, airlines and passengers (source: created by authors)

Airports are a particularly complicated business, where essentially different elements and activities are been combined in order to serve both passengers and flights (airlines). The wide range of airport services are been sometimes classified into airside operations and landside operations (Ashford *et al.* 1996; Ashford *et al.* 2011). Airside operations stand for the services provided until the passenger enters / exits a gate. They focus on the servicing of aircraft, including the services of maintenance of the runway and the apron (cleaning, lighting, ensuring safety), luggage loading / unloading / transportation to / from the terminal, aircraft pushback, aircraft cleaning, cargo loading / unloading, charging an aircraft battery, etc. Landside operations are been directly related to servicing of passengers after / before the passengers exit the gate. This group includes commercial activi-

ties, such as rent of parking lots, rent of premises, advertising and commerce, ensuring the accessibility of the airport, etc. These two different air- and land-based activities are been fully integrated into a single whole, and the functioning of one area is directly influenced by the activities of the other (Oum *et al.* 2003, Ashford *et al.* 1996, Ashford *et al.* 2011).

In respect of a complicated and complex activity of airports, we have distinguished the following areas of services provided to airlines:

- Aircraft landing-related services;
- Aircraft parking-related services;
- Use of airport equipment;
- Landside services;
- Non-aviation services;
- Services of ensuring the safety of aircraft and passengers;
- IT and information systems use.

The airport industry is very diverse, with a high degree of differentiation of services and their quality, different forms of ownership and management structures, different combinations of characteristics of services and operations. The assessment of operational efficiency of airports, and even more, their comparison becomes highly complicated due to such differences. For example, some airports still provide ground handling services to airlines and receive a large share of profit for such activity, whereas other airports leave the provision of such services to the airlines or independent external providers. For this reason, it is important to develop such operational efficiency metrics that would allow for a reasonable comparison of airports and identification of the best actors in the industry as well as the key factors which affect the efficiency of the airports. Studies of airport operations can also answer the following important for management questions: Are private airports more efficient than those controlled by the public sector? Does outsourcing enhance productivity? What is the impact of ancillary commercial activity on the efficiency of airports?

There are several purposes for which airport management carried out studies of airport operations and seek to measure the results: to measure the efficiency from the financial and operational perspectives; to evaluate investment opportunities; to monitor the activities of airports in the area of safety and the environmental impact. Passengers are also interested in efficient operation of airports, though and worth mentioned, that the main users of airport services are airlines, and there are the airlines, which operate as actors between of airports, passengers and cargo carriers.

4. Research design

Service quality assessment is a challenging and complex problem, which has been the focus of extensive research, though there is still no consensus to what method and criteria should be applied to measure quality. To help service providers identify their strengths and weaknesses, the most widely accepted method of measurement service quality is the SERVQUAL model. Parasuraman *et al.* (1988) have established that, regardless of the type of services, consumers in many cases assess the same features of services (five perception dimensions). The SERVQUAL methodology has developed in order to evaluate the quality of services provided to customers of businesses. Later, a conclusion has drawn that the dimensions of service quality assessment defined by the SERVQUAL methodology may be adapted to the quality of a wide range of services: from educational service to banking and e-services. It could be done by defining the principal areas of the quality and creating a system of assessment criteria reflecting the specific features of the services provided (Forapono *et al.* 2013; Loiacono *et al.* 2007; Parasuraman *et al.* 2007; Stodnick, Rogers 2008; Titko *et al.* 2013; Yoo *et al.* 2001; Zeithaml *et al.* 2002). SERVQUAL method of service quality assessment is based on the comparison of the expected quality of a specific service against the experienced quality, i.e., at the beginning, a client is asked to assess how much a specific service quality criterion is important to him, and later – how the same criterion is fulfilled by a specific service. The authors of the methodology have identified five key dimensions of service quality:

- tangibles (material basis - appearance of the staff, equipment and other tools used),
- reliability (stability of operation of the organisation and reliability, the ability to accomplish what was promised),
- responsiveness (the willingness to help the client, to provide a service in the best manner possible and within the shortest possible time),
- assurance (the knowledge and courtesy of the staff, the ability to inspire confidence of the client) and
- empathy (individual attention given to the client, taking care of the client and meeting of special needs).

The present study has been conducted on the example of Vilnius International Airport. The sample for the study comprises of staff experts taking into account the 75% of scheduled airlines, who include high level (53 per cent) and middle level managers (27 per cent) with 5-12 year experience (70 per cent of experts). The experts' opin-

ion carried out during the study has allowed to evaluate the importance (expected quality) and factual level (experienced quality) of specific criteria within the airport services assessment system in 1-10 point scale.

5. Criteria for measuring the airport service quality

The task of measuring the quality of specific services primarily involves the development of the criteria reflect the peculiarities of the services in each of the dimensions. An analysis of scientific literature on airport efficiency and service quality has allowed selecting the assessment criteria, which could be used to determine the correspondence between the airport service quality expectations and the actual level of service quality. The selected criteria have been grouped according to five SERVQUAL dimensions and airport service processes. Each process of service provided by the airport to airlines reflects all the service quality dimensions. For example, the tangibles dimension is reflected in the provision of aircraft landing, aircraft parking, airport equipment use and ground handling services, aircraft and passenger safety as well as non-aviation services. The responsiveness dimension is reflected in the analysis of airport equipment use and non-aviation services, while the assurance dimension is also manifested in aircraft landing, ground handling services and aircraft and passenger safety service groups. An analysis of literature has allowed for distinguishing the assessment criteria that can reveal to airlines, from different angles, the advantages of the airport, the level of operational efficiency, the level of services provided, reliability, and other factors, which influence the choice of the airline. This analysis has resulted in development of a system of criteria for measuring the quality of airport services provided to airlines according to five SERVQUAL dimensions and airport service processes. The tangibles dimension in this system is described by means of 5 criteria, the reliability dimension – 18 criteria, the responsiveness – two criteria, the assurance dimension – 7 criteria, and the individual attention dimension is reflected by 5 criteria (Akstinaitė 2014, Pabedinskaitė, Akstinaitė 2014). Some of these quality assessment criteria have been taken directly from the literary sources, some have been formulated based on the airport operational characteristics analysed by the authors. For example, Lopes and Rodrigues (2007) examine the elements of the airport intellectual capital that undoubtedly affects the process of the services provided, because human resources are of utmost importance for ensuring the quality of services. Some quality criteria have been proposed by staff of Vilnius International Airport during the survey. As a result of the experts'

survey carried out the relative importance of airport services quality criteria and factual level of quality have been evaluated.

Tangibles dimension. This group of assessment criteria describes the material basis of services: the appearance of the personnel, equipment, and other tools and materials used for communication. The survey results show that in this group, the most important criterion is *Airfield parameters (number, length, width of runways and taxiways) are appropriate for landing of available aircraft* (the service group – aircraft landing, assessment score average – 9,7). The highest score given to this criterion shows that the existing airport infrastructure can be one of the factors determining airlines' decision. It is important for airlines whether the airport is able to receive and provide services to the aircraft available in their fleet. There is the second criterion in this group that is not far behind in terms of importance – *Parking area space is appropriate for aircraft parking* (the service group – aircraft parking, assessment score average – 9). The following criterion has scored the least points in the group of factors assessing the tangibles dimension – *The range of offered landside services is large and sufficient* (the landside services group, assessment score average – 5,4). Average of evaluation of importance of tangible dimension is not very high and equal 7, 8.

Reliability. Another assessment dimension of the service quality under analysis is stability of the organisation's operations and reliability, the ability to implement what was been promised. The most important criterion in the group is *Equipment is been certified, calibrated and under proper maintenance* (the service group – airport equipment use, assessment score average – 9, 3). Experts have given similar scores to other three criteria:

Speed of passenger, crew, luggage check is appropriate and does not result in delay (the service group – aircraft and passenger safety, score average – 8,9);

Check equipment is been certified, calibrated and under proper maintenance (the service group – aircraft and passenger safety, score average – 8,8) and

Number of parking areas is sufficient (service group – aircraft parking, assessment score average – 8,7).

From the point of view of experts, two the least important criteria in the field are *Airfield throughput* (the service group – aircraft landing, assessment score average – 7) and *Passengers information system works appropriately* (the service group – information technology and information system use, assessment score average – 6,9). Average of importance evaluation of reliability dimension of quality is equal 8, 1.

Responsiveness. This group of factors reflects the service provider's willingness to assist the client and to provide a service in a courteous and fast manner. The group consists of two criteria. One of them is identified as quite important, namely, *Technical assistance in the event of equipment failure is provided promptly* (the service group – airport equipment use, assessment score average – 9.2). The second criterion *Technical maintenance and premise upkeep services are provided promptly and appropriately* belongs to the group of non-aviation services and has been awarded a lower average score of 8,8. Average of importance evaluation of responsiveness dimension of quality is equal 9.

Assessment of the assurance group criteria shows the impact of knowledge and courtesy of the staff, their ability to inspire consumer confidence on the overall quality of services. It has been established that the two criteria are very important: *Competence of the personnel providing landside services (experience, courtesy, knowledge of English, terminology) is sufficient* (the service group – landside services, assessment score average – 9.2) and *Competence of aviation safety personnel is sufficient* (the service group – aircraft and passengers safety, assessment score average – 9). These criteria could have the greatest impact on operational efficiency. Meanwhile, the respondents believe that the least important factor could be *Competence of the staff in contact lessees is sufficient* (the service group – non - aviation services, assessment score average – 5, 8). Average of importance evaluation of assurance dimension of quality is equal 8,1.

Empathy. Another group of criteria of the methodology under analysis is empathy to the consumer, taking care of him and meeting of special needs. In this group, the most important factor is *adequate protection of airline data* (the service group – airport equipment use, assessment score average – 8, 6). In addition, the study has found that the criteria of this group which are the least likely to affect the operational efficiency of the airport could be the fact of *airport has appointed a person responsible for contact on rental issues* (the service group of non - aviation services, the assessment score average – 4, 8). This criterion is also becoming an important one for some airlines already well - established in the airport, but not at the airport's choice. Average of importance evaluation of empathy dimension of quality is the least one and is equal 6, 8.

Assessment of importance and factual level of the quality for different dimensions of services quality are been presented in Table 1. Experts named responsiveness, reliability, and assurance as key dimensions for airport services as a whole. Experts consider empathy as the least important dimension of quality.

Table 1. Assessment of importance and factual level of quality for different dimensions (source: compiled by authors)

Quality dimension	Importance (average of scores)	Evaluation (average of scores)
Tangibles	7,8	6,8
Reliability	8,1	7,5
Responsiveness	9,0	6,2
Assurance	8,1	6,0
Empathy	6,8	3,8

The obtained research results show that the most important airport operational efficiency criteria are the factors that are closely associated with the direct and main services provided by the airport to airlines. Aircraft landing capacity, ensuring of aircraft safety, the quality and speed of maintenance services can be one of the most important factors in assessing airport operational efficiency from the perspective of their customers, that is, airlines. The criteria listed as the most important are mainly attributed to the groups of aircraft landing and landside services, while the least important – to the group of non-aviation services, which is ancillary services provided to airlines.

Experts have assessed the importance of quality dimensions in each group of services rather differently (Table 2).

Assessment of the importance and factual level of quality in each group of airport services for airlines is presented in Table 3.

Table 2. Importance of quality dimensions in each group of services (source: compiled by authors)

Service group	Tan-gibles	Relia-bility	Respon-siveness	Assu-rance	Em-pathy
Aircraft landing	9,7	7,88		9,2	7,25
Airport parking	9	8,1			
Airport equipment use	7,55	9,3	9,2	8,05	7,35
Landside services	5,4	7,4		8,7	
Aircraft and passenger safety		8,85		9	
Non-aviation services			8,8	5,8	4,8
IT and information system use		8		7,9	

Table 3. Importance and factual level of quality for different service groups (source: compiled by authors)

Service group	Importance	Evaluation
Aircraft landing	8,07	6,74
Aircraft parking	8,4	7,53
Airport equipment use	8,05	5,84
Landside services	7,17	6,57
Aircraft and passenger safety	8,9	6,93
Non-aviation services	6,47	4,6
IT and information system use	7,99	7,4

The average assessments scores of the importance of individual service groups according to all quality dimensions show, that of utmost importance for airlines is the quality of aircraft and passenger safety service, aircraft parking, aircraft landing and airport equipment use groups while the quality of other service groups for airlines is less important.

Cross analysis differences between expected and factual level of quality according to service groups and quality dimensions allows establishing weak points in service quality and start improvements. It should be noted quite big variation of such differences of scores in one group of services or one quality dimension. For example, in *airport equipment use* services group range of differences is from 0 to 3, 4, in *non – aviation services* group this range is from -1, 8 to 3, 7. It suggests that after service quality assessment could be useful to review and improve some criteria of quality evaluation system.

6. Conclusions

Literature analysis shows that the improvement of airport performance and service quality is a highly topical and challenging issue, which is widely considered from various angles and using different methods: analysis of passenger experiences, assessment of airport performance by means of technical performance indicators, and analysis of the quality of airport services using the SERVQUAL methodology.

Based on the analysis of literature and expert assessment of the significance of criteria, the authors propose a system of criteria designed for measuring the quality of airport services provided to airlines according to five SERVQUAL service quality dimensions as well as the service processes provided by airports to airlines. The tangibles dimension of airport service quality is described by 5 criteria, the reliability dimension – by 18 criteria, the responsiveness dimension – by 2 criteria, the

assurance dimension – by 7 criteria, while the empathy dimension is reflected by 5 criteria.

The survey conducted applying this system has allowed establishing the correspondence between the airport services quality expectations and the actual level of quality for different service groups and five dimensions of service quality.

References

- ACI. 2013. The Airport IT Trends Survey 2012. Executive summary, *Airline business*. 1–12.
- ACI Europe. 2013. Q3 EU airport passenger traffic. [online] [accessed 2 December 2013]. Available from Internet: <http://economicblog.myblog.lt/media/00/00/1252735320.pdf>
- Akstinaitė, V. 2014. *Information system model of airport services evaluation*. Master thesis. Supervisor A. Pabedinskaitė. Vilnius Gediminas Technical University. 102 p.
- Annual Analyses of the EU Air Transport Market* 2010. September 2011, European Commission.
- Ashford, N.; Saleh, M.; Wright, P. 2011. *Airport Engineering. Planning, design, and development of 21st century airports*. Fourth edition. Hoboken, New Jersey. 768 p.
- Ashford, N.; Stanton, H.; Moore, C. 1996. *Airport Operations* (2nd ed.). McGraw-Hill Education. 481p.
- Chou, C. C.; Liu, L. J.; Huang, S. F.; Yih, J. M.; Han, T. C. 2011. An evaluation of airline service quality using the fuzzy weighted SERVQUAL method, *Applied Soft Computing* 11: 2117–2128. <http://dx.doi.org/10.1016/j.asoc.2010.07.010>
- Enoma, A.; Alle, S. 2007. Developing key performance indicators for airport safety and security, *Facilities* 25: 296–315. <http://dx.doi.org/10.1108/02632770710753334>
- Erdil, S.; Yildiz, O. 2011. Measuring service quality and comparative analysis in the passenger carriage of airline industry, in *Procedia Social and Behavioral Science* 24: 1232–1242. <http://dx.doi.org/10.1016/j.sbspro.2011.09.117>
- European Airport Traffic Trends* 2013. [online] [accessed 2 December 2013]. Available from Internet: www.anna.aero/wp-content/uploads/european-airports-2012.xls
- Feasibility study Development of Šiauliai Airport* 2010. Vilnius. [online] [accessed 02.06.2013]. Available from Internet: http://aurimasnauseda.lt/wp-content/uploads/2012/11/Oro-uosto-galimybiu_studija.pdf
- Fernandes, E.; Pacheco, R. R. 2010. A quality approach to airport management, *Qual Quant* 44: 551–564. <http://dx.doi.org/10.1007/s11135-008-9212-9>
- Foropon, C.; Seiple, R.; Kerbache, L. 2013. Using Servqual to Examine Service Quality in the Classroom: Analyses of Undergraduate and Executive Education Operations Management Courses, *International Journal of Business and Management* 8: 1–12.
- Humphreys, I.; Francis, G. 2002. Performance measurement: a review of airports, *International Journal of Transport Management* 1: 79–85. [http://dx.doi.org/10.1016/S1471-4051\(02\)00003-4](http://dx.doi.org/10.1016/S1471-4051(02)00003-4)
- IATA. 2013. Annual review 2013. [online] [accessed 3 November 2013]. Available from Internet: <http://www.iata.org/about/Documents/iata-annual-review-2013-en.pdf>

- IATA Economics. 2013. Air passenger market analysis. September 2013. [online] [accessed 3 November 2013]. Available from Internet: <http://www.iata.org/whatwedo/Documents/economics/Passenger-Analysis-Sep-2013.pdf>
- IATA Economics. 2013. Profitability and the air transport value chain. [online] [accessed 2 December 2013]. Available from Internet: <http://www.iata.org/whatwedo/Documents/economics/profitability-and-the-air-transport-value%20chain.pdf>
- Jaržemskienė, I. 2012. *Estimation of Airport infrastructure exploitation efficiency by upgraded data envelopment analysis*. Summary of Doctoral Dissertation. Vilnius Gediminas Technical University. Vilnius: Technika., 24 p.
- Kuo, M.; Liang, G. 2011. Combining VIKOR with GRA techniques to evaluate service quality of airports under fuzzy environment, *Expert Systems with Applications* 38: 1304–1312. <http://dx.doi.org/10.1016/j.eswa.2010.07.003>
- Lin, L. C.; Hong, C. H. 2006. Operational performance evaluation of international major airports: An application of data envelopment analysis, *Journal of Air Transport Management*. 12: 342–351. <http://dx.doi.org/10.1016/j.jairtraman.2006.08.002>
- Loiacono, E. T.; Watson, R. T.; Goodhue, D. L. 2007. 'WebQual: An Instrument for Consumer Evaluation of WebSites, *International Journal of Electronic Commerce* 11(3): 51–87. <http://dx.doi.org/10.2753/JEC1086-4415110302>
- Lopes, I.; Rodrigues, A. M. G. 2007. Intangible Assets Identification and Valuation – a Theoretical Framework Approach to the Portuguese Airlines Companies, *The Electronic Journal of Knowledge Management* 5(2): 193–202.
- Oum, T. H.; Yu, C.; Fu, X. 2003. A comparative analysis of productivity performance of the world's major airports: summary report of the ATRS global airport benchmarking research report 2002, *Journal of Air Transport Management* (9): 285–297. [http://dx.doi.org/10.1016/S0969-6997\(03\)00037-1](http://dx.doi.org/10.1016/S0969-6997(03)00037-1)
- Pabedinskaitė, A.; Akstinaitė, V. 2014. Evaluation of the airport service quality, in *Procedia - Social and Behavioral Sciences*, pp. 398-409. DOI information: 10.1016/j.sbspro.2013.12.884
- Parasuraman, A.; Zeithaml, V. A.; Berry, L.L. 1988. SERVQUAL: A multiple – item scale for measuring consumer perception of service quality, *Journal of Retailing* (64): 12-40.
- Parasuraman, A.; Zeithaml, V. A.; Malhotra, A. 2007. E-S-QUAL: a Multiple-item Scale for Assessing Electronic Service Quality, *Journal of Service Research* 7(3): 13–33.
- Perelman, S.; Serebrisky, T. 2010. Measuring the Technical Efficiency of Airports in Latin America, *Policy Research Working Paper* 5339: 1–35.
- Stodnick, M.; Rogers, P. 2008. Using SERVQUAL to Measure the Quality of the Classroom Experience, *Decision Sciences Journal of Innovative Education* 6(1): 115–132. <http://dx.doi.org/10.1111/j.1540-4609.2007.00162.x>
- Sutia, S.; Sudarma, M.; Rofiaty D. 2013. The Influence of Human Capital Investment, Leadership and Strategic orientation on Airport Performance, *International Journal of Business and Management Invention* (2): 26–32.
- Thelle, H.; Pedersen, T. T.; Harhoff, F. Airport competition in Europe, *Copenhagen economics*, 1–124. [online] [accessed 6 May 2013]. Available from Internet: http://www.moodiereport.com/pdf/Copenhgen_Economics_Study_Airport_Competition_2012.pdf.
- Tenge, M. 2012. Social software platforms as motor of operational airport efficiency? - A conceptual framework. in *New Challenges of Economic and Business Development: Proceeding of Conference*. University of Latvia, Riga, Latvia, 1–10.
- Titko, J.; Lace, N.; Kozlovskis, K. 2013. Service quality in banking: Developing and testing measurement instrument with latvian sample data, *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis* 61(2): 507–515. <http://dx.doi.org/10.11118/actaun201361020507>
- Tseng, K. J.; Ho, J. F.; Liu, Y. J. 2008. A study on the performance evaluation of major international airports in the world, *Journal of Modelling in Management* 3: 71–81. <http://dx.doi.org/10.1108/17465660810860381>
- Vasigh, B.; Gorjidoz, J. 2006. Productivity analysis of public and private airports: a causal investigation, *Journal of Air Transportation* (11): 144–163.
- Vreedenburgh, M. 1999. Airport Operational Efficiency, Paper presented, at the *International Civil Aviation Organization Airport Privatization Seminar/Forum for the NAM/CAR/SAM Regions*, 13–16 December 1999. Guatemala.
- Wyman, O. 2012. *Guide to airport performance measures*. Airports Council International (pp. 1–61). Montreal: Oliver Wyman Inc. 61 p.
- Yoo, B.; Donthu, N. 2001. *Developing a Scale to Measure the Perceived Quality of an Internet Shopping Site (SITEQUAL)*. USA: Hofstra University. 6 p.
- Zeithaml, V. A.; Parasuraman, A.; Malhotra, A. 2002. Service Quality Delivery through Web Sites: A Critical Review of Extant Knowledge, *Journal of the Academy of Marketing Science* 30(4): 358–371. <http://dx.doi.org/10.1177/009207002236911>
- Zhang, B.; Wang, J.; Liu, C.; Zhao, Y. 2012. Evaluating the technical efficiency of Chinese airport airside activities, *Journal of Air Transport Management* 20: 23–27. <http://dx.doi.org/10.1016/j.jairtraman.2011.10.007>