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Evaluation of the airport service quality

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Abstract

The article considers the problems of improvement of the quality of airport services provided to airlines taking into account the changes in consumer needs. The quality of airport services for airlines is investigated in this paper using SERVQUAL method. Literature analysis has resulted in the development of a system of criteria for assessment of the quality of the airport services provided to airlines. The expert survey has established the relative importance of airport service quality assessment criteria in respect of airlines and as result the authors propose a system of criteria designed for assessment of the quality of airport services provided to airlines.

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1. Methods of assessment of the quality of airport services and airport performance

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, Yu, & Fu, 2003). 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

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flight directions are determined by market changes. 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. Fodness & Murray (2007) performed an empirical survey of expectations of passenger in respect of services in this area and found that passenger's expectations towards airport services were multidimensional and identified three key dimensions: interaction, function and diversion. The created conceptual model of the quality of airport service was empirically tested by interviewing nearly one thousand passengers frequently using the services of airports, which enabled the authors to propose a set of recommendations for the measurement of airport service quality. Most of these recommendations focus on the measurement of the quality of passenger-oriented services. Lubbe, Douglas & Zambellis (2011) claim that the main measure of assessment of airport operations is the opinion of passengers, hence it is highly important to analyse passengers' expectations in respect of airport services. It is they who must define and evaluate services. Based on the model proposed by Fodness & Murray (2007), the authors conducted a study at the O.R. Tambo International Airport (South Africa), during which they investigated three areas of services provided by the airport – interaction, function and diversion. The interaction area was described by the speed of processing complaints, individual attention, and the speed of responding to queries. The functional area was made up of two groups of parameters: one of them described effectiveness (exterior signs, airport service signs, physical layout, the variety of means of transport ensuring accessibility, convenient location of baggage trolleys, availability of connecting flights), whereas the other group of criteria characterising efficiency covered luggage waiting time, registration speed, duration of unloading of passengers from the aircraft. The third area of assessment of airport operations, namely, diversion, consisted of three groups of criteria: maintenance (retail supply, supply of restaurants offering local cuisine, supply of stores reflecting traditional local culture), décor (the environment consistent with local culture, various artistic expressions, interior) and productivity (services of conference organisation, the presence of business centres, the presence of silence zones). The results of the research have shown that corporate and leisure travellers have different opinions about the importance of the services offered and the level of operational efficiency of the airport. The differences have also been identified by evaluating the expectations of frequent and occasional flyers in respect of airport services. In addition, the study has helped to establish that the passengers view the interaction dimension as the most important in assessing airport services as a whole.

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

In examining the quality of airport services provided to the passengers, Liou, Tang, Yeh & Tsai (2011) applied a new method instead of the traditional statistical analysis study – dominance-based rough set approach (DRSA). In the study conducted by the authors, passengers evaluated the level of airport services by ranking various sets of quality criteria. The proposed approach provides practical information, which is useful for the development of strategies of service quality improvement. The proposed model is presented in the form decision-making rules. This method also provides airport managers with information on how to improve individual decision-making (decision

rules). The proposed decision-making rules can help the decision-maker to develop the most appropriate strategies for different types of passengers and thus to improve the services provided. The DRSA method extends the classical rough set theory, which deals with quality criteria without ranking them by order of importance. The empirical study conducted on the example of Taiwan airports has shown the advantages of the DRSA method in helping airport management to identify critical areas, which should be the focus of efforts and specify the ways to improve the quality of services in different passenger segments.

In studying airport operational efficiency, some authors (Tseng, Ho & Liu, 2008; Perelman & Serebrisky, 2010); Zhang, Wang, Liu & Zhao, 2012; Jaržemskienė, 2012) 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. Research by Tenge (2012), Lopes & Rodrigues (2007) and Sutia, Sudarma & Rofiaty (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 that 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 & 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 assessment indicators allowing for assessment of the intellectual capital management in airport operations. Sutia, Sudarma & Rofiaty (2013) have analysed 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. In addition, unlike studies by other authors the study in question showed that the form of airport ownership and management strategy did not necessarily affect the growth of the airport's productivity, which is consistent with results of the study by Lin & Hong (2006). The aim of the survey carried out by Enoma & 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 safety is particularly affected by the choice of a risk management strategy. 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. It should be noted 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.

2. Operations of the airport

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 Analyses 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 (Fig. 1). 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.

According to data of the latest research conducted by the Airports Council International (ACI), 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. The Council conducts, on a quarterly basis, surveys of airport services with a view to determining the level of services provided by a specific airport and the place of the airport in a certain group of airports (benchmarking). An analysis of literature shows that assessments of the quality of airport services are 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 both on the attitude and behaviour of passengers that is why it is important to identify its causes and patterns.

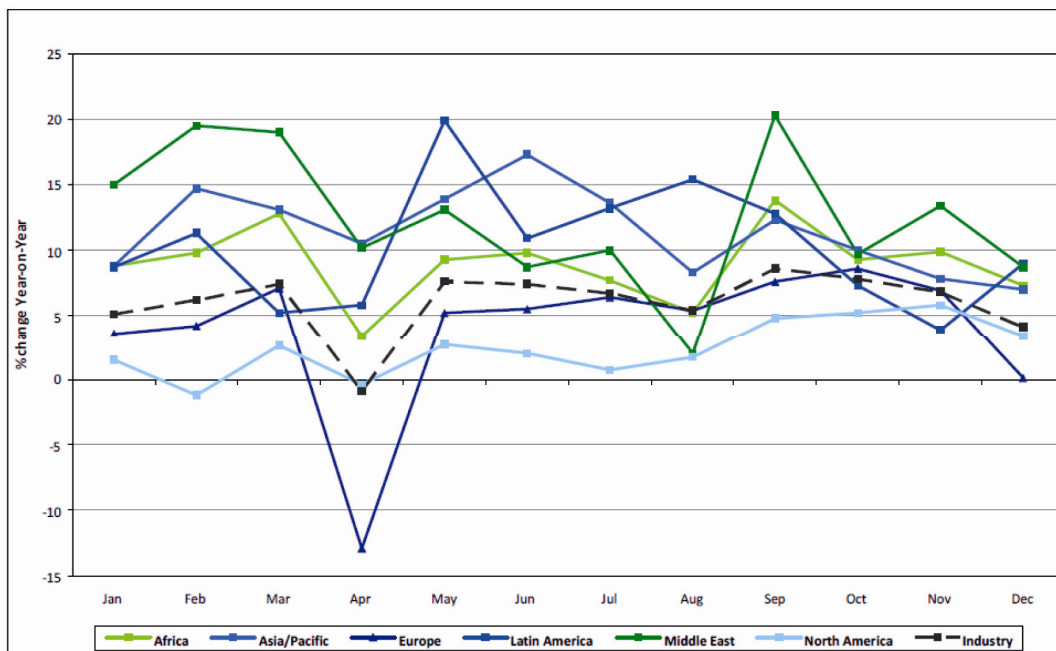


Fig. 1. Monthly Airport Passengers by Region (Annual Analyses of the EU Air Transport Market 2010, European Commission)

The services provided by airports can 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, luggage 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 can be claimed that there are three closely interrelated actors operating in the air transport services sector: the airport, airlines and passengers (Fig. 2). 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 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.

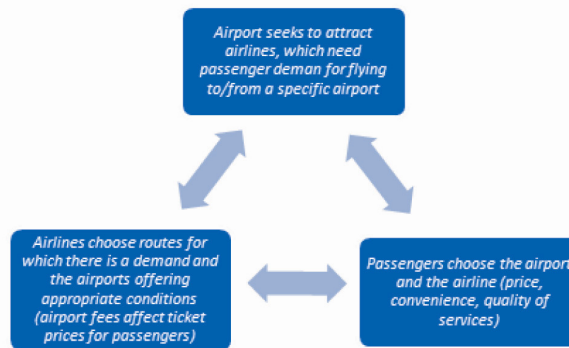


Fig. 2. Links between the airport, airlines and passengers (created by authors)

Airports are a particularly complicated business, where essentially different elements and activities are combined in order to serve both passengers and flights (airlines). The wide range of airport services is sometimes classified into airside operations and landside operations (Fig. 3). 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 directly related to servicing of passengers after / before the passengers exit the gate. This group includes commercial activities, 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 fully integrated into a single whole, and the functioning of one area is directly influenced by the activities of the other. For example, if the aircraft is unable to take off or land, it will neither be possible to provide landside operations. Therefore, in assessing the efficiency the two sides cannot be separated (Oum, Yu, & Fu, 2003).

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

- Aircraft landing-related services
- Aircraft parking-related services

- Aircraft-escort related services
- Use of airport equipment
- Provision of ground handling services
- Provision of non-aviation services
- Services of ensuring the safety of aircraft and passengers.

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; airports are located in different areas and are influenced by different environmental factors (Oum, Yu, & Fu, 2003). 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 frequently asked 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?

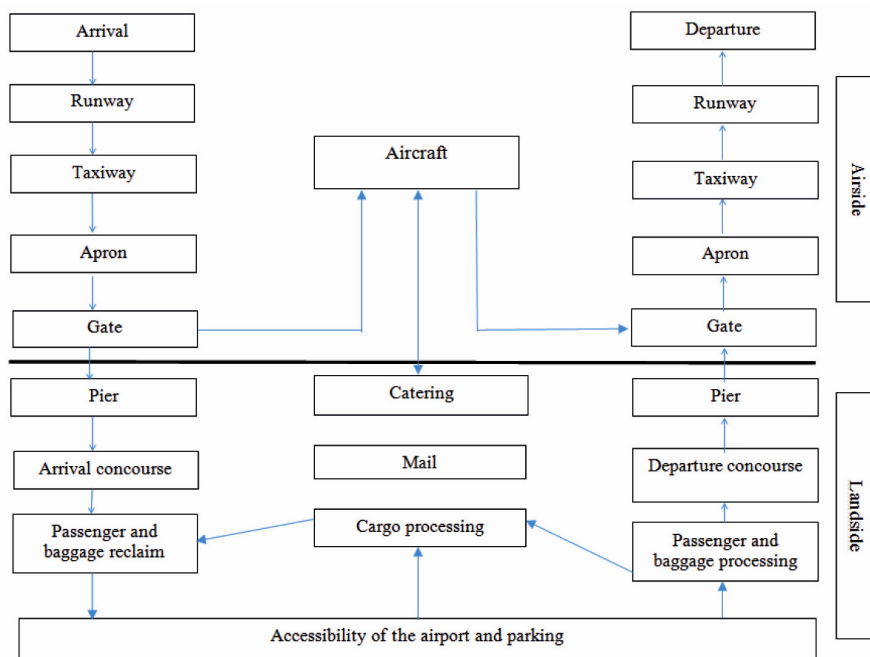


Fig. 3. Classification of airports' services (Ashford, Stanton & Moore, 1996. *Airport Operations*)

There are several purposes for which airport management carry 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 it should be noted that the main users of airport services are airlines, and it is the airlines which act as agents of airports, passengers and cargo carriers.

3. Research methodology

Service quality assessment is a challenging and complex problem, which has been the focus of extensive research, though there is still no consensus in scientific literature to what criteria should be employed to evaluate and measure quality. To help service providers identify their strengths and weaknesses, the most widely accepted method of measurement service quality is the SERVQUAL model. The authors of this service quality assessment method are Parasuraman, Zeithaml & Berry (1985–1988). Parasuraman, Zeithaml & Berry (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 been developed in order to evaluate the quality of services provided to customers of businesses. Later, a conclusion has been drawn that the dimensions of service quality assessment defined by the SERVQUAL methodology may be adapted to assessment of the quality of a wide range of services (from educational service to e-commerce and other e-services) by defining the principal areas of the quality and creating a system of assessment criteria reflecting the specific features of the services provided (Stodnick & Rogers, 2008; Zeithaml, Parasuraman & Malhotra, 2002; Yoo & Donthu, 2001; Loiacono, Watson & Goodhue, 2007; Parasuraman, Zeithaml & Malhotra, 2007). 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 pilot study comprises of 14 airline staff experts, who include high level (71 per cent) and middle level managers with 10–19 year experience (57 per cent). The gender of respondents was fairly distributed, with 57 per cent males and 43 per cent females. The experts' opinion carried out during the pilot study has allowed for evaluation of the importance of specific criteria within the airport service assessment system in 1–10 point scale.

4. System of criteria of airport service quality assessment

The task of assessing 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 has allowed selecting the assessment criteria, which can be used to determine the correspondence between the airport service quality expectations and the actual situation. 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, ground handling services, aircraft and passenger safety as well as non-aviation services. In addition to the mentioned services, the reliability dimension is involved in evaluating aircraft escort 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 assessment of the quality of airport services provided to airlines according to five SERVQUAL dimensions and airport service processes: the tangibles dimension is described by means of seven criteria, the reliability dimension – 13 criteria, the responsiveness – two criteria, the assurance dimension – nine criteria, and the individual attention dimension is reflected by five criteria (Table 1). Some of these quality assessment criteria have been taken directly from the literary sources, some have been formulated on the basis of the airport operational characteristics analysed by the authors. For example, Lopes & 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 were proposed during the survey of airline staff experts in Vilnius International Airport. As result of the experts' survey carried out during the pilot study the relative importance of airport services quality criteria (Table 1) was 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 – 10). The highest score given to these criteria 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 are two other criteria in this group that are not far behind in terms of importance – *Parking area space is appropriate for aircraft parking* (the service group – aircraft parking, assessment score average – 9.86) and *Equipment used is new and not worn* (the service group – airport equipment use; assessment score average – 9.86).

Table 1. Criteria of assessment of the quality of airport services

Dimension	Service	Assessment criterion	Source	
Tangibles (material basis: appearance of the staff, equipment, other tools and materials used for communication)	<i>Aircraft landing</i>	<ul style="list-style-type: none"> Airfield parameters (number, length and width of runways and taxiways) are appropriate for landing of available aircraft 	Tseng, Ho & Liu, 2008	
	<i>Aircraft parking</i>	<ul style="list-style-type: none"> Parking area space is appropriate for parking of available aircraft 	Tseng, Ho & Liu, 2008	
	<i>Airport equipment use</i>	<ul style="list-style-type: none"> Equipment used is new and not worn 	Feasibility study, 2010	
		<ul style="list-style-type: none"> Microclimate in space for passengers is appropriate (ventilation, heating, cleanliness) 	Wyman, 2012	
	<i>Ground handling services</i>	<ul style="list-style-type: none"> Range of offered ground handling services is large and sufficient 	was proposed by experts	
	<i>Aircraft and passenger safety</i>	<ul style="list-style-type: none"> Equipment used is new and not worn-out 	was proposed by experts	
	Reliability (stability of operation of the organisation and reliability, the ability to accomplish what was promised)	<i>Aircraft landing</i>	<ul style="list-style-type: none"> Microclimate of administrative premises is suitable for work(ventilation, heating, cleanliness) 	Wyman, 2012
			<ul style="list-style-type: none"> Airport has in place equipment for Category II low visibility landing 	Wyman, 2012
			<ul style="list-style-type: none"> Airfield is properly prepared for safe landing and manoeuvring of aircraft 	Tseng, Ho & Liu, 2008
			<ul style="list-style-type: none"> Airfield layout allows for rapid taxiing of aircraft to the terminal (use of fuel) 	Tseng, Ho & Liu, 2008 Wyman, 2012
<i>Aircraft parking</i>		<ul style="list-style-type: none"> Compliance with airfield safety requirements is secured by adequate regulation 	Tseng, Ho & Liu, 2008	
		<ul style="list-style-type: none"> Airfield throughput (number of take offs and landings per hour) is optimal 	Tseng, Ho & Liu, 2008	
		<ul style="list-style-type: none"> Terminal throughput (number of passengers per day) is optimal 	Tseng, Ho & Liu, 2008	
		<ul style="list-style-type: none"> Parking areas are properly prepared for aircraft parking 	Tseng, Ho & Liu, 2008	
		<ul style="list-style-type: none"> Number of parking areas is sufficient 	Tseng, Ho & Liu, 2008	
		<ul style="list-style-type: none"> Time of taxiing to the terminal with escort is appropriate 	Tseng, Ho & Liu, 2008	
<i>Aircraft escort</i>	<ul style="list-style-type: none"> Equipment is certified, calibrated and under proper maintenance 	Tseng, Ho & Liu, 2008		
	<ul style="list-style-type: none"> Check equipment is certified, calibrated and under properly maintenance 	Jaržemskienė, 2012 Feasibility study, 2010		
	<ul style="list-style-type: none"> Speed of passenger, crew, luggage check is appropriate and does not result in delay 	Feasibility study, 2010		
	<ul style="list-style-type: none"> Ground handling services are provided promptly and appropriately 	Wyman, 2012 Wyman, 2012		
<i>Ground handling services</i>				

Continued of Table 1

Dimension	Service	Assessment criterion	Source
Responsiveness (the willingness to help the client, to provide a service courteously and promptly)	<i>Airport equipment use</i>	<ul style="list-style-type: none"> Technical assistance in the event of equipment failure is provided promptly 	Feasibility study, 2010
	<i>Non-aviation services</i>	<ul style="list-style-type: none"> Technical maintenance and premise upkeep services are provided promptly and appropriately 	Feasibility study, 2010
Assurance (the knowledge and courtesy of the staff, the ability to inspire confidence of the client)	<i>Airport equipment use</i>	<ul style="list-style-type: none"> Competence of operational control personnel (knowledge of terminology, knowledge of English, experience) is sufficient Prevention of information system errors is appropriate 	was proposed by experts Lopes & Rodrigues, 2007
		<ul style="list-style-type: none"> Technological support staff is available round the clock 	Vreedenburg, 1999
		<ul style="list-style-type: none"> Competence of technological support staff (experience in the IT field, knowledge of terminology, knowledge of English) is sufficient 	was proposed by experts
	<i>Aircraft and passenger safety</i>	<ul style="list-style-type: none"> Competence of aviation safety personnel (experience, courtesy, knowledge of English) is sufficient 	was proposed by experts
	<i>Ground handling services</i>	<ul style="list-style-type: none"> Competence of the staff providing ground handling services (experience, courtesy, knowledge of English, terminology) is sufficient 	was proposed by experts
	<i>Non-aviation services</i>	<ul style="list-style-type: none"> Competence of the staff in contact with lessees (courtesy, speed, willingness to assist, experience) is sufficient 	was proposed by experts
Empathy (individual attention given to the client, taking care of the client and meeting of special needs)	<i>Aircraft landing</i>	<ul style="list-style-type: none"> Airport has appointed a person responsible for regular contact with airlines Airport provides timely statistical data and properly protects the data Airline data are properly protected 	Lopes & Rodrigues, 2007 Lopes & Rodrigues, 2007
	<i>Airport equipment use</i>	<ul style="list-style-type: none"> Equipment is adapted to individual requirements of the company 	Lopes & Rodrigues, 2007 Feasibility study, 2010
	<i>Non-aviation services</i>	<ul style="list-style-type: none"> Airport has appointed a person responsible for contact on rental issues (appropriate and prompt information provision) 	Lopes & Rodrigues, 2007

The following factors have scored the least points in the group of factors assessing the tangibles dimension:

- *The equipment used is new and not worn* (the service group – aviation safety, assessment score average – 2.71). It should be noted that the appearance and novelty of software is not very important, because these services are heavily regulated in international and national legislation (including the quality of equipment operation of – certification, calibration), and any infringement of such legislation would result in ban of the provision of services.
- *Microclimate of premises is suitable for work (ventilation, heating, cleanliness)* (the service group – non-aviation services, assessment score average – 4.14). It should be noted that this criterion becomes more important when airlines are already well-established in the airport, but at the time of choosing the airport other criteria are by far more important.

Reliability. Another assessment group of the service quality under analysis is stability of the organisation's operations and reliability, the ability to implement what was promised. The most important criterion in the group is *Compliance with airfield safety requirements is secured by adequate regulation* (the service group – aircraft landing, assessment score average – 10). Similar scores have been given to other two criteria – *Airfield is properly prepared to safe landing and manoeuvring of aircraft* (the service group – aircraft landing, assessment score average – 9.86),

Ground handling services are provided promptly, quickly, appropriately (the service group – ground handling services, assessment score average – 9.71).

From the point of view of experts, the least important criterion in the field is *time of taxiing to the terminal time with escort is appropriate* (the service group – aircraft escort, assessment score average – 6). It should be noted that the purpose of a follow-me car is to bring the aircraft to the terminal in low visibility conditions or in the situations when the aircraft crew is not familiar with the airport apron (first arrival). In both cases, it is most important for the crew that reaching of the terminal is ensured, and it is not so important how much time it takes (surely, within certain allowed time limit).

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 – 9.71). 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 7.14.

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 criterion *Competence of the personnel providing ground handling services (experience, courtesy, knowledge of English, terminology) is sufficient* (the service group – ground handling services, assessment score average – 9.43) could have the greatest impact on operational efficiency. Meanwhile, the respondents believe that the least important factor could be *Technological support staff is available round the clock* (the service group – airport equipment use, assessment score average – 6.57).

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 factors include the fact of *appointment, by the airport, of a person responsible for regular contact with airlines on aviation issues*, with this factor assigned to the group of aircraft landing services and the assessment score average being equal to 9.43, and the fact of *adequate protection of airline data*, with this criterion assigned to the airport equipment use group and the assessment score average being equal to 9.29. 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 *adaptability of the equipment to individual requirements of the company* (the service group of airport equipment use, the assessment score average – 6.86). Companies do not set any special requirements for airport equipment adaptability. Another low-impact factor is the fact of *appointment, by the airport, of a person responsible for contact on rental issues (adequate and prompt information provision)* (the service group of non-aviation services, the assessment score average – 6.86). This criterion is also becoming an important one for some airlines already well-established in the airport, but not at the airport's choice.

Importance assessments of different dimensions of the quality of services provided by the airport to airlines are presented in Table 2. Experts named reliability, responsiveness and assurance as key dimensions for airport services as a whole. Experts consider tangibles as the least important dimension. Such a view is probably determined by specific features of the services under analysis, since the significance of the physical environment in aviation is the least important in relation to safety, speed and competence.

Table 2. Importance assessment of airport service quality dimensions

Quality dimension	Average of experts' scores
Tangibles	6.94
Reliability	8.69
Responsiveness	8.43
Assurance	8.37
Empathy	8.17

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 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 have been mainly attributed to the groups of aircraft landing and ground handling services, while the least important – to the group of non-aviation services, which is ancillary services provided to airlines.

The pilot study has preserved in the system of service quality evaluation criteria only the criteria whose average of experts' scores amount to more than 6 points (31 criteria) and which are appropriate for assessment of the quality of airport services as provided to airlines. Experts have assessed the importance of quality dimensions in each group of services rather differently: the highest ratings (over 9 points) are in the quality dimensions of tangibles and reliability (Table 3).

Table 3. Importance of quality dimensions by service groups

Service group	Tangibles	Reliability	Responsiveness	Assurance	Empathy	Average
Aircraft landing	10	8.90		8.86	8.43	9.05
Airport parking	9.86	8.79				9.32
Airport equipment use	8.36	9.00	8.57	7.46	8.08	8.29
Landside services	5.14	9.71		9.43		8.09
Aircraft and passenger safety		8.64		8.86		8.75
Non-aviation services			7.14	7.71	6.86	7.24

The average assessments scores of the importance of individual service groups according to all quality dimensions (the last column in the Table 3) show, that of utmost importance for airlines is the quality of aircraft landing and parking service groups, while the quality of other service groups for airlines is far less important.

5. Conclusions

1. Literature analysis shows that in the course of the development of airports, the improvement of their 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.

2. Literature analysis has allowed identifying the assessment criteria that reveal, from different perspectives, the quality of airport services offered to airlines, performance levels, reliability and other factors that influence airline choice. This analysis has resulted in the development of a system of criteria for assessment of the quality of the airport services provided to airlines designed to assess the quality of airport services: the tangibles dimension is described by 7 criteria, the reliability dimension – by 13 criteria, the responsiveness dimension – by 2 criteria, the assurance dimension – by 7 criteria, while the empathy dimension is reflected by 5 criteria.

3. The experts' survey conducted within the framework of the pilot study has established the relative importance of airport service quality assessment criteria in respect of airlines. Based on the analysis of literature and expert assessment of the significance of criteria, the authors propose a system of criteria designed for assessment of 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.

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