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## QUALITY ASSESSMENT OF PUBLIC SERVICES IN LATVIA

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**Abstract.** At present, the service sector receives growing attention taking into account its role in the socio-economic development of the society. Public services produced to meet the demands of the population occupy a special place in this sphere. Improving the quality of public services is one of the essential goals in improving the functioning of public administration in Latvia and globally. The research aimed to assess the customer service quality of administrative services provided by Latvia's public administration institutions, performing the factor and cluster analysis of the collected data. Research base: Public administration institutions (6) and their branches (17) in Latvia. The research participants are two hundred ninety-two occasionally selected customers of public administration institutions who filled in SERVQUAL questionnaires before and after their visit to an institution. The sample of customers is occasional and administratively territorial, observing the proportional representation of planning regions. The service quality assessment model – the SERVQUAL instrument (Parasuraman et al., 1988), was used for the data collection. The analysis of the research data factors and clusters was carried out. Service provision quality in all quality dimensions has been given a negative evaluation. The economic efficiency of the largest state institutions understudy is low, and so is the quality of provided services as evaluated by their customers.

**Keywords:** public administrative services; quality; service quality; efficiency; SERVQUAL model

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### 1. Introduction

One of the significant trends of the world economic development nowadays is the growing role of service sectors approved by the increase of the service production level compared to material production, the considerable growth of the range of services offered, and the number of employees in the service sectors.

This trend is undeniable in countries with a developed socio-economic system where the percentage of services in total GDP is about 70%. The share of services in GDP in Latvia as to the added value of sectors in 2019 reached 74.4% (LR Ekonomikas ministrija, 2020). At present, the service sector receives growing attention taking into account its role in the socio-economic development of the society. Public services produced to meet the demands of the population occupy a special place in this sphere. Several studies show that the quality of public service

significantly affects citizen satisfaction with these services, and citizen satisfaction with the quality of public services positively affects their trust in government (Wilantika, Wibisono, 2021). Improving the quality of public services is one of the crucial goals in improving the functioning of public administration in Latvia and globally.

The public sector includes state and local government bodies and their commercial companies, companies with state or local government capital shares of 50%, and more. The quality and efficiency of service provision are essential prerequisites for improving the process of public service provision. The evaluation of public services must become a necessary task for future actions that can positively impact the quality of services provided by public authorities (de Menezes, Pedrosa, 2022). For the gains of the quality improvement to become large enough, critical evaluation of the justification of demands and quality of services may yield a much more significant effect in alleviating the administrative load and improving state administration (VARAM, 2013). There is a need to implement administrative reforms and update public services.

Administrative reforms make a global trend in the present age. Both the developed and developing countries recognize administrative reforms as a driving force to facilitate economic growth, democracy, justice, and develop other aspects of social life (Dinh, 2014; Vasconcelos, 2021). Administrative reform in Latvia ought to make the organizational system more efficient and improve the quality of public services. In EU countries, including Latvia, the updating of the public sector is based on regularities and processes elaborated in the private sector. Application of the customer service standards accepted in the private sector in the state administration is one of the current issues of updating public administration in Latvia.

Assessing the quality of services in the Latvian public administration can reasonably contribute to improving the efficiency of public administration institutions and enhancing the quality of public life.

## **2. Theoretical background**

Public service is defined as a material or direct nonmaterial favor provided by the public administration to a private individual in general benefit service, governance (individual) service, or financial service (VARAM, 2012). Examples of public services are road maintenance, street lighting, registration, certified statements, permits, taxes, social care, education, health care, and residential house management.

The public sector comprises state and local government institutions and their commercial companies, commercial companies with state or local government capital share of 50%, and more.

Administrative services are public (i.e., state and local government) services provided by public administration institutions and local governments (Koliushko, 2009). Any public service is oriented toward meeting customers' needs, which can be classified in different ways (Maslow, 1943; Škapars, 2010).

We may define quality in various ways; there is no unified, universal definition of quality (Shariff, 2012). Different authors, for instance, Berry et al. (1985), define quality as correspondence with specifications, especially customers' specifications. An organization may evaluate the quality of provided services by studying customers' opinions. Acting in this way, an organization may enhance correspondence with customers' wishes and improve the advantages of their competitiveness (Shariff, 2012).

Quality is a totality of product features that determine its capability of meeting the previously set consumer's needs. Quality may be expressed by a simplified formula (ISO):

$$Q=P-E \tag{1.1}$$

Where: Q – quality level, P – the consumer's received result, E – desirable effect.

Service quality is a complex construct that has been given much attention in the literature on marketing (e.g., Gronroos, 1984, Parasuraman et al., 1985).

The early investigation of service quality was carried out by Gronroos (1984). Gronroos stated that, for the organization to gain success, it is vitally important that it understands customers' attitudes towards the provided services. This model evaluates service quality by comparing the expected and perceived quality. Gronroos (1984) suggested three dimensions for assessing service quality: technical quality, functional quality, and image. In the mid-1980s, Berry, Parasuraman, and Zeithaml (1985) started studying the determining factors of service quality and how customers evaluate service quality based on the conception of the perceived service quality (Gronroos, 1984). Ten determining factors were discovered that characterize customers' perception of the service. One of the dominant factors is competence; it is directly related to the technical quality of the result, whereas the other is reliability, which is related to the aspect of perceived quality. The rest of determining factors are more or less about dimensions of the process of perceived quality (Gronroos, 2005).

As a result of further research, ten factors determining the quality of service were reduced to five (Gronroos, 2005): material gains, security, responsiveness, competence, and empathy.

SERVQUAL method used in the study appeared as a tool for detecting how customers perceive service quality. This tool is based on the five factors mentioned earlier. It compares customers' hopes and expectations regarding how they perform the service and their experience of the service provision (rejecting hopes of fulfilling them).

To characterize five determining factors, 22 attributes are used, and respondents are asked to indicate (on a seven-point scale from "Fully disagree" to "fully agree") what they expected from the service and how they perceived the service. Based on the difference between hopes (expectations) and the received service, it is possible to calculate the total quality indicator.

The efficiency construct may be classified as the main in economics. Efficiency is one of the significant indicators of human activity, according to economic activity results. Efficiency secures economic activity's unified qualitative and quantitative characteristics as an economic category. Shampine and Reichelt (1992) note that economic efficiency is characterized by the ratio between the number of resource entities used in the production and the quantity of the product gained. Efficiency is the ratio between the achieved result and used resources (ISO 9000: 2015).

Efficiency in the public sector may be compared to efficiency in the private sector only if their aims are identical. Even in this case, they are not fully comparable because the state sector functions in the spheres that consider economic gains and social problems, for instance, social benefits (Stoian, Ene, 2003). The efficiency of state expenses means the ratio between investments' economic and social impact. Analyzing the efficiency of the public sector, the majority of researchers refer to the economic efficiency that is taken as a construct from the private sector. According to Mihaiu and Opreana (2010), efficiency in the public sector is a sum of economic efficiency and social impact.

Factors that affect efficiency in the public sector are as follows:

- Invested resources. In the public sector, resources are much harder to detect than in the private sector, as public services overlap and resources are used from several sources. But on the whole, resources invested in the public sector come from the collected taxes.
- Action results. They are more challenging to express in numbers than investments in the public sector, as they may have both an economic and social dimension. The results of the functioning of the private sector have the value of market share; they are easy to estimate, whereas, in the public sector, the results of functioning are difficult to estimate (Mihaiu, Opreana, 2010).

However, Hall and Lobina (2005) assert that private and state organizations do not show essential differences in efficiency. According to the authors, public sector efficiency may be interpreted as the ratio between the organization's functioning (number of provided services) and costs. Still, detecting the result and costs of functioning in the public sector isn't straightforward.

Organization or enterprise efficiency is a topical management science problem. At present, the significance of this problem is growing because there is increasing competitiveness among producers. At the same time, consumers and customers set higher demands for the quality and price of products or services.

The administrative reform to be carried out in Latvia should make the organizational system more efficient and improve the quality of public services. To date, no research has been conducted in Latvia on the quality and efficiency of shared administrative services. Monitoring the quality and efficiency of public administrative services in Latvia would make a reasonable contribution to improving the quality of life in society. The study examines the current situation with the quality of public administrative services to further develop a model for assessing the quality of administrative services.

### **3. Research objective and methodology**

The research aimed to assess the customer service quality of administrative services provided by Latvia's public administration institutions.

Reaching the set aim comprises the following objectives:

1. Analysis of the theoretical aspects of explaining the notions of services, quality, service quality, and efficiency.
2. Evaluation of the quality of public administrative services.
3. Analysis of data factors and public service quality assessment clusters.

Research object: customer service quality for administrative services in public administration institutions in Latvia from 2017 to 2019.

Research base: Public administration institutions (6) and their branches (17) in Latvia – State Social Insurance Agency of the Republic of Latvia departments of Riga, Daugavpils, Valmiera, Jelgava, Ventspils, State Revenue Service of the Republic of Latvia customer service centers in Riga, Jelgava, Ventspils, Valmiera, Daugavpils, State Land Service customer service center in Daugavpils, State Employment Agency departments of Daugavpils and Ventspils, Daugavpils Regional Environmental Board, Daugavpils Court, its departments of Krāslava and Preiļi.

The research is based on a sample of public service customers in Latvia's most significant cities and towns – Riga, Daugavpils, Jelgava, Ventspils, and Valmiera. The research participants are two hundred ninety-two occasionally selected customers of public administration institutions who filled in SERVQUAL questionnaires before and after their visit to an institution. The sample of customers is occasional and administratively territorial, observing the proportional representation of planning regions.

In the present research, the quantitative data collection method was used based on SERVQUAL model. The collected data were analyzed using factor analysis and cluster analysis methods. To test the method according to the sample of scientific literature sources, survey questionnaires were prepared, wherein changes were made during the research in the formulations of questions and the scale of service evaluation for customers. The questionnaire for SERVQUAL method consisted of two parts, each entailing 22 statements about the service quality that, in the division, formed a totality of 5-dimension criteria. Customers were asked to provide an evaluation for each statement according to a 5-point scale. Part A showed the customer's expectations concerning the service quality and the importance of various quality criteria for the customer. Part B conducted the customer's

evaluation of the received service. The object of evaluation in the questionnaires was service quality as a totality of five quality dimensions wherein:

- dimension 1 - the totality of material gains (appearance and physical elements);
- dimension 2 - security (confidence, accurate performance);
- dimension 3 - responsiveness (promptness and helpfulness);
- dimension 4 - competence (attention, reliability);
- dimension 5 - empathy (convenient receiving of the service, good communication, and understanding of the customer).

SERVQUAL method was formed as a tool for detecting how customers perceive the service quality. This tool is based on the five factors mentioned above and a comparison of customers' expectations of how the service must be provided with their experience of the service provision (rejecting or conforming to their expectations) (Parasuraman et al., 1988). The total service quality indicator is calculated based on the difference between the expectations and received service. The present research aims to evaluate the customer service quality of administrative services in Latvia's public administration institutions. The study tested the appropriateness of SERVQUAL method to the process of service quality evaluation, specified the options of its application, and experimented with formulations of SERVQUAL survey questions and the evaluation scale. A research model was elaborated, and the research survey questionnaire was translated into Latvian. Before circulating the questionnaire, the authors reviewed it to ensure whether it is user-friendly and has no ambiguous or sensitive questions. The survey was tested with twenty randomly selected customers of public services. The approbation allowed to correct errors before collecting the research data. After the test survey, the questions were modified, and the evaluation scale was reduced to a 5-point level. Though the authors studied the public services provided by the state institutions, the research is independent of the observed phenomenon (Lee, Wu, 2015).

#### 4. Results and discussion

The outcomes of research produced in 2017-2018 are analyzed. Their statistical analysis has revealed the following results (see Table 1). The mean value of the evaluation of customers' expected service is 4.47. The mean value of the customers' perceived service is 3.98. The results of the expected service evaluation are provided in Table 1. Comparing the data to similar research in Egypt and Malaysia concludes that in Latvia, customers have lower expectations for service. The perceived service in Latvia is evaluated higher than in Egypt but lower than in Malaysia (see Table 1).

**Table 1.** Characteristics of evaluation of customers' expected service

Quality dimensions	Number of questionnaires		Mean	Median	Moda	Mean expected service in Egypt	Mean expected service in Malaysia
	Reliable	Lost					
Material gains	292	0	4.1575	4.2500	5.00	6.029	4.69
Security	292	0	4.7301	5.0000	5.00	6.194	5.81
Responsiveness	292	0	4.6986	5.0000	5.00	6.181	4.67
Competence	292	0	4.5325	4.7500	5.00	6.217	4.81
Empathy	292	0	4.2363	4.4000	5.00	5.836	5.73
Total	292	0	4.4721	4.5909	5.00	6.091	5.142

*Source:* the table designed by the authors, processing the survey data statistically by SPSS 22.00, 2019; Rashid (2008); Ali, Yaseen (2012)

Customers evaluated as the essential quality dimensions in Latvia's public sector services security – mean 4.73 points, responsiveness – mean 4.69 points, and competence –mean 4.53 points. Customers' received service evaluation results are provided in Table 2.

**Table 2.** Characteristics of the evaluation of customers' perceived service

Quality dimensions	Number of questionnaires		Mean	Median	Moda	Mean perceived service in Egypt	Mean perceived service in Malaysia
	Reliable	Lost					
Material gains	292	0	3.9486	4.0000	5.00	3.172	4.23
Security	292	0	4.0616	4.2000	5.00	3.521	5.26
Responsiveness	292	0	4.0728	4.0000	5.00	3.700	4.23
Competence	292	0	4.0146	4.0000	5.00	3.576	4.40
Empathy	292	0	3.8479	3.8000	5.00	3.124	5.30
Total	292	0	3.9860	4.0000	5.00	3.418	4.68

Source: the table designed by the authors, processing the survey data statistically by SPSS 22.00, 2019, Rashid (2008); Ali, Yaseen (2012)

The lowest evaluation of the service performance in Latvia's public sector institutions is given to the 5th quality dimension – empathy (mean 3.84 points) but the highest – to 3rd quality dimension – responsiveness (mean 4.07 points). Comparison to similar research data in Egypt and Malaysia concludes that the customers' evaluation of the perceived service in Latvia is medium-high. Customers in Egypt have given a similar assessment. The lowest evaluation in Malaysia was given to material gains, whereas the highest was to empathy (see Table 2).

Calculating the difference between the evaluations of customer's perceived service and expected service, the mean quality of service provision is obtained that was evaluated negatively in all quality dimensions. Quality of the dimensions of security, responsiveness, and competence was evaluated respectively by -0,668 points, -0,626, and -0,518 points. The less negative evaluation was given to the quality of the dimensions of material gains (-0,209 points) and empathy (-0,388 points). Comparing the mean rate of service provision in Latvia and Egypt concludes that it is evaluated, on average, five times lower in Egypt. Service quality has received a less negative evaluation in Malaysia than in Latvia (see Table 3).

**Table 3.** Public service mean quality in Latvia in 2017-2018 (points)

Quality dimension	Mean evaluation of expected service (E)	Mean evaluation of perceived service (P)	Mean of the service quality (P-E)	Mean of the service quality in Egypt	Mean of the service quality in Malaysia
Material gains	4.1575	3.9486	-0.2089	-2.857	-0.09
Security	4.7301	4.0616	-0.6685	-2.673	-0.11
Responsiveness	4.6986	4.0728	-0.6259	-2.481	-0.09
Competence	4.5325	4.0146	-0.5179	-2.641	-0.08
Empathy	4.2363	3.8479	-0.3884	-2.712	-0.09
Total	4.4721	3.9859	-0.4861	-2.672	-0.09

Source: the table designed by the authors, processing the survey data statistically by SPSS 22.00, 2019, Rashid (2008); Ali, Yaseen (2012)

Analysis of the customer survey outcomes in the state institutions under study reveals that customers have provided the most favorable evaluation of services offered by Daugavpils Regional Environmental Board (from 0.147 to 0.424 points). The most negative evaluation was provided by customers of State Employment Agency (from -0.278 to -0.922 points), State Social Insurance Agency (from -0,215 to -0,882 points), and State Revenue Service (from -0.217 to -0,892 points). An almost threefold higher evaluation of the service quality was given to Daugavpils Court (from -0.092 to -0.323 points) and the Office of Citizenship and Migration Affairs (from +0.068 to -0.455 points) (see Table 4). Analysis of the public service quality evaluation results according to the place of residence of the surveyed customers, it may be concluded that residents of Latgale have provided a less negative evaluation of the service quality (from -0.159 to -0.409). In other regional towns understudy and Riga, the quality

of public services was evaluated as almost two times lower. In Riga, customers evaluated public service quality between -0.144 and -0.842 points; in Valmiera – between -0.275 and -0.878, in Ventspils – between -0.444 and -0.819 points.

**Table 4.** Public service quality evaluation in Latvia in 2017-2018, in the cross-section of state institutions understudy

Quality dimension	Mean evaluation of the service quality NVA	Mean evaluation of the service quality VAA	Mean evaluation of the service quality DRVP	Mean evaluation of the service quality DT, VZD	Mean evaluation of the service quality PMLP	Mean evaluation of the service quality VID
Material gains	-0.278	-0.215	0.162	-0.318	0.068	-0.215
Security	-0.729	-0.882	0.080	-0.332	-0.345	-0.786
Responsiveness	-0.922	-0.750	0.147	-0.323	-0.455	-0.662
Competence	-0.783	-0.680	0.221	-0.224	-0.062	-0.567
Empathy	-0.511	-0.600	0.424	-0.092	-0.055	-0.472
Mean of the service quality	-0.642	-0.636	0.211	-0.254	-0.174	-0.548

*Source:* the table designed by the author, performing the statistical processing of the survey data, 2019

Researcher Tetrevova (2008) mentions efficiency as the central problem in public sector performance. Efficiency means reaching the aims of a specific system functioning, i.e., obtaining the outcome evaluated by comparing the acquired status to the desirable one. Efficiency, in general, is a ratio of the obtained result concerning its costs. According to the author, economic efficiency may be treated as a ratio between the organization's functional outcome (the number of provided services) and costs. The author has produced calculations of the economic efficiency of the state institutions under study relating the number of services offered by the organization to their expenses (see Table 5) and compared the economic efficiency of the organizations' under investigation to evaluate the quality of services provided by them.

**Table 5.** Comparison of the mean of service quality and efficiency of state institutions under study according to the data for 2017-2018

State institutions	The ratio of the number of provided services to their costs*	Mean of the delivered service quality
State Revenue Service	0.260	-0.548
State Social Insurance Agency	0.129	-0.636
State Employment Agency	0.119	-0.642
Office of Citizenship and Migration Affairs	0.094	-0.174
State Environmental Service	0.025	-0.211
Ministry of Justice	0.012	-0.254

*Source:* the table designed by the authors, performing the statistical processing of the survey data, 2020.

\*The number and costs of the provided services (maintenance costs) according to VSIA, SRS, SEA, SES, MJ, 2018

The value of efficiency of organizations with high economic efficiency is more significant or equal to 1. As shown in Table 5, the economic efficiency of larger state institutions understudy is low, the same as the service quality evaluated by customers. According to the analysis of the obtained data, it must be concluded that a linear correlation of efficiency of public administration institutions to the quality of provided services is observed. Thus, by raising the quality of provided services, the efficiency of public administration institutions would grow. The quality and efficiency of provided services are essential prerequisites for improving the process of public service provision. Implementing a model of evaluating service quality would bring a systemic control of service quality, gradually improving the public service quality and raising the economic efficiency of public administration institutions. Improving the in-person provision of administrative services in public administration institutions contributes to more efficient state governance and customer satisfaction in various age groups. From all age

groups, the most negative evaluation of service quality was given by customers of the age of retirement (from -0.169 to -0.861 points). The higher assessment was provided by respondents aged between 20-40 (from -0.33 to 0.497 points).

The analysis of the obtained outcomes according to the surveyed customers' gender reveals that less negative evaluation of the service quality was given by males (from 0.029 to -0.672 points). Females have shown a lower service quality evaluation (from -0.296 to -0.704 points). The less negative evaluation was given to the dimension of material gains.

Analysis of the survey outcomes according to the respondents' level of education reveals that customers gave the most negative evaluation of service quality with secondary professional education (from -0.121 to -0.842). Respondents provided a higher evaluation with secondary education (from -0.269 to -0.538 points). Assessment of the survey outcomes according to the respondents' employment status concluded that retired customers gave the most negative service quality evaluation (from -0.35 to -1.2). Employed respondents gave a higher evaluation (from -0.261 to -0.740) (see Table 6).

**Table 6.** Public service quality evaluation according to respondents' employment status

Quality dimension	Mean of the service quality evaluation with employed respondents	Mean of the service quality evaluation with retired respondents	Mean of the service quality evaluation with unemployed respondents
Material gains	-0.610	-0.350	0.420
Security	-0.740	-1.10	-0.992
Responsiveness	-0.604	-1.20	-0.969
Competence	-0.502	-0.942	-0.813
Empathy	-0.460	-0.620	-0.450
Mean of the service quality	-0.521	-0.855	-0.644

*Source:* the table designed by the author, performing the statistical processing of the survey data, 2019

Comparison with similar research data in other European and Asian countries concludes that the performance of Latvia's public sector is medium-low (see Table 7).

**Table 7.** Comparison of the public service quality in Latvia and other countries

Quality dimension	Mean of the public service quality evaluation in Latvia for 2017-2018	Mean of the education service quality evaluation LLKC in Latvia for 2009-2010	Mean of the post-service quality evaluation in Italy for 2000	Mean of the public service quality evaluation in Egypt for 2012	Mean of the public service quality evaluation in Malaysia for 2008
Material gains	-0.208	-0.505	1.3	-2.857	-0.09
Security	-0.668	0.367	-0.9	-2.673	-0.11
Responsiveness	-0.625	0.937	-0.2	-2.481	-0.09
Competence	-0.517	-0.069	-0.1	-2.641	-0.08
Empathy	-0.388	-0.040	0.7	-2.712	-0.09
Mean of the service quality	-0.486	0.138	0.160	-2.672	-0.09

*Source:* the table designed by the authors, performing the statistical processing of the survey data, 2019, Franceschini et al. (1998); Rashid (2008); Grünberga-Zālīte (2011); Ali, Yaseen (2012)

The research analyses the outcomes obtained as customers of public services evaluated the expected and perceived usefulness and public service quality in Latvia. It was concluded during the research that it is

impossible to use the SERVQUAL method without adjusting it to the conditions of each state institution under study.

The evaluation of service quality revealed that the performance of public service organizations in Latvia does not meet their customers' expectations. Service provision quality in all quality dimensions has been given a negative evaluation. Hence, customer satisfaction with the public service provision is also negative. The economic efficiency of the largest state institutions under study is low, and so is the quality of provided services as evaluated by their customers. A close connection between the efficiency of public administration institutions with the quality of their provided services is observed. Thus, raising the efficiency of public administration institutions may increase the quality of their provided services. Service quality and efficiency are essential preconditions for improving the process of public service provision. Improving the organization of in-person provision of administrative services in public administration institutions would enhance the efficiency of state governance and customer satisfaction.

The outcomes of this analysis make it possible to conclude that the drawbacks of public services detected in the evaluation are to be reduced. An essential measure for improving service quality is regular surveying of customers to evaluate the quality of public services provided at the given time. Assessing the quality of services offered by state institutions and implementing a model for assessing service quality would improve the quality of the services provided and, along with that, also customers' satisfaction.

**Factor analysis of the research data**

Factor analysis is a mean of data reduction using correlations between data variables. If making factor analysis, it is assumed that some basic factors account for correlations or mutual relations between the observed variables (Chatfield, Collins, 1992). Factor analysis is widely used by researchers in economics, marketing, sociology, and education (Bollen, 1989; Doll et al., 1994; Li et al., 2002; Nimako et al., 2012). Statistical data analysis for the present research was produced by an approach similar to April and Pather (2008). Kaiser-Meyer-Olkin (KMO) test helps measure the suitability of data for analysis. Kaiser (1974) suggested using data with suitability values above 0.5. In the present research, the data suitability value is 0.835; which fits the range from medium to excellent suitability. Thus, we are confident that the collected data are suitable for factor analysis. After testing the usefulness of the data, the authors performed a factor analysis of the data to estimate the factors essential for the improvement of public service quality.

The outcomes of factor analysis for evaluating customers' expected service are provided in Table 8. Factor analysis was produced by means of principal component analysis (PCA). As seen in Table 8, the cumulative value of the expected service component analysis (%) is 60.676.

**Table 8.** Factor analysis of the evaluation of customers' expected service

compon ents	Initial specific (eigen) values			Extraction sums from square loads			Rotation sums from square loads		
	Total	Dispersions %	Cumulative %	Total	Dispersions %	Cumulative %	Total	Dispersion %	Cumulative %
1	9.058	41.174	41.174	9.058	41.174	41.174	6.231	28.323	28.323
2	1.805	8.202	49.376	1.805	8.202	49.376	3.728	16.945	45.268
3	1.359	6.176	55.552	1.359	6.176	55.552	1.911	8.687	53.955
4	1.127	5.124	60.676	1.127	5.124	60.676	1.479	6.721	60.676
5	0.898	4.080	64.756						
6	0.832	3.780	68.536						
7	0.775	3.523	72.059						

8	0.682	3.098	75.157						
9	0.606	2.753	77.910						
10	0.553	2.515	80.424						
11	0.528	2.402	82.826						
12	0.484	2.198	85.024						
13	0.459	2.087	87.111						
14	0.422	1.920	89.031						
15	0.405	1.839	90.870						
16	0.386	1.755	92.626						
17	0.336	1.528	94.153						
18	0.327	1.486	95.639						
19	0.283	1.287	96.927						
20	0.244	1.109	98.036						
21	0.226	1.027	99.063						
22	0.206	0.937	100.000						

Source: the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2019.

Conducting factor analysis with the method of PCA, four eigenvalues were obtained; the total square load acquisition sums exceeded one, with percental cumulative deviation constituting 60.676 in the case of evaluating customers' expected service. The first factor accounts for 41.174% of the total dispersion. It must be noted that the first factor accounts for a rather large volume of dispersion, whereas subsequent factors account for just a tiny volume of distribution.

As seen in Table 9, the data for evaluating customers' expected service were divided into four groups according to service quality factors. A load of each factor was evaluated. To evaluate the outcomes, it must be noted that the factor load greater than 0.30 is regarded as essential, 0.40 is regarded as important, and 0.50 or more is regarded as very significant. In the present research, the author assumed that only factors with a load above 0.50 are essential (Hair et al. 2010). The higher the factor coefficient, the more critical it concerns the customer's expectations concerning the service quality (Pallant, 2005). In fact, in the present research, minimum factor coefficient values start from 0.429 or more, and these coefficient values are regarded as significant for conducting factor analysis.

**Table 9.** Total dispersion of data of customers' expected service evaluation

	Components			
	1	2	3	4
RG_j_9	0.790			
RG_j_7	0.768			
RG_j_13	0.734			
RG_j_8	0.719			
RG_j_12	0.709			
RG_j_6	0.685			
RG_j_14	0.682	0.462		
RG_j_15	0.615	0.466		
RG_j_10	0.611			
RG_j_11	0.602			
RG_j_5	0.565			
RG_j_16	0.518	0.460		

RG_j_4	0.505			
RG_j_19		0.765		
RG_j_18		0.747		
RG_j_20		0.726		
RG_j_17	0.429	0.666		
RG_j_21		0.559		
RG_j_1			0.797	
RG_j_2			0.791	
RG_j_3			0.673	
RG_j_22				0.836

Source: the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2019.

**Group I**, with the most important factors customers consider in their evaluation of expected service quality, includes aspects related to such service quality dimensions as **security, responsiveness, and competence**. This group contains factors with a coefficient from 0.79 to 0.505. **Group II** includes factors related to such a service quality dimension as **empathy**. This group comprises elements with a coefficient from 0.765 to 0.559. According to importance, **group III** lists factors related to **material gains**. The coefficient of the facets of this group is between 0.797 and 0.673. **Group IV** lists factors associated with the dimension of empathy, like factor group II; therefore, in the author's opinion, these factor groups (II and IV) may be united. The outcomes of factor analysis for the customers' perceived service evaluation are provided in Table 10. Factor analysis was conducted using PCA. As seen in Table 10, the cumulative value of the perceived service component analysis (%) is 66.966.

**Table 10.** Factor analysis of the evaluation of customers' perceived service

Components	Initial specific (eigen) values			Extraction sums from square loads			Rotation sums from square loads		
	Total	Dispersions %	Cumulative %	Total	Dispersions %	Cumulative %	Total	Dispersions %	Cumulative %
1.	13.216	60.074	60.074	13.216	60.074	60.074	10.941	49.734	49.734
2.	1.516	6.892	66.966	1.516	6.892	66.966	3.910	17.232	66.966
3.	0.880	4.001	70.967						
4.	0.681	3.097	74.065						
5.	0.628	2.854	76.919						
6.	0.554	2.516	79.435						
7.	0.481	2.188	81.623						
8.	0.424	1.929	83.552						
9.	0.414	1.882	85.434						
1.	0.390	1.771	87.205						
11.	0.368	1.672	88.877						
12.	0.331	1.503	90.380						
13.	0.326	1.480	91.860						
14.	0.285	1.297	93.157						
15.	0.250	1.138	94.295						
16.	0.243	1.104	95.399						
17.	0.229	1.043	96.441						
18.	0.200	0.907	97.349						
19.	0.183	0.830	98.179						
20.	0.156	0.711	98.890						
21.	0.126	0.574	99.464						
22.	0.118	0.536	100.000						

Source: the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2019.

The first factor accounts for 60.074% of the total dispersion. It must be understood that the first factor accounts for the most significant volume of distribution, whereas the subsequent factors account for a small volume of dispersion. As seen in Table 11, the data for evaluating customers' perceived service were divided into two groups

according to importance. A load of each factor was evaluated. The author assumed for the present research that essential elements are those with a load above 0.50 (Pal, 1986; Pal, Bagi, 1987; Hair, Anderson, Tatham, Black, 2003). The higher coefficient of the factor, the more critical it concerns the customer's perceived service quality (Pallant, 2005). In fact, in the present research, minimum factor coefficient values were starting from 0.404 or more, and these coefficient values are regarded as significant for conducting factor analysis.

**Table 11.** Total dispersion of data of the evaluation of customers' perceived service

	Components	
	1	2
r_j_12	0.874	
r_j_14	0.856	
r_j_13	0.855	
r_j_7	0.832	
r_j_16	0.808	
r_j_15	0.787	
r_j_17	0.776	
r_j_9	0.769	
r_j_11	0.755	
r_j_10	0.746	
r_j_21	0.745	
r_j_8	0.731	
r_j_19	0.724	
r_j_20	0.718	
r_j_6	0.716	
r_j_18	0.703	0.404
r_j_5	0.647	0.415
r_j_4	0.645	0.533
r_j_22	0.417	
r_j_2		0.898
r_j_1		0.888
r_j_3	0.491	0.579

*Source:* the table designed by the authors, performing the statistical processing of the survey data by SPSS22.00, 2019.

**Group I** of factors considered most important by customers in evaluating the perceived service quality contains factors related to such service quality dimensions as **security, responsiveness, and empathy**. This group includes elements with a coefficient between 0.874 and 0.645. **Group II** lists factors related to **material gains**. This group contains factors with the coefficient from 0.898 to 0.579.

The comparison of the conducted factor analysis for data groups related to the evaluation of customers' expected and perceived services revealed that customers consider as most important service quality dimensions that need to be improved security, responsiveness, competence, and empathy. Less important are factors related to the dimension of material gains.

**Research data cluster analysis**

Cluster analysis is characterized in scientific literature as a tool of statistical classification whereby data or objects (events, people, things, etc.). They are classified into groups so that elements of one cluster are very similar to one another and are very different from elements of other clusters (Fraley, Raftery, 1998).

Service quality evaluation is traditionally related to regression models (Eboli, Mazzulla, 2008, 2010; Hensher et al., 2003; dell'Olio et al., 2011) or structural equation models (De Oña et al., 2013, Eboli, Mazzulla, 2007, 2012; Irfan et al., 2011). However, the majority of these models are limited to a certain extent due to prior defined assumptions and relations between dependent and independent variables; thus, disregarding these assumptions, erroneous evaluations of service quality are obtained.

Analysis of the data of Latvia's public sector administrative service quality was conducted by means of cluster analysis with Ward's method. Data were obtained from customers' surveys conducted in the period of 2017 and 2018. As a result of factor analysis, principal factors that affect service quality were identified. These determining factors were used to perform cluster analysis. Based on the outcomes of factor analysis, indicators were calculated for each factor RG score:

- Factor 1 - survey questions: 4,5,6,7,8,9,10,11,12,13,14,15,16
- Factor 2 - survey questions: 17,18, 19, 20, 21
- Factor 3 - survey questions: 1, 2, 3
- Factor 4 - survey question: 22.

The importance of factors for other survey questions used in the present research is distributed among various factors. Therefore it is impossible to provide severe characteristics of any aspect. As each element includes a different number of questions, the indicator of factor distinctiveness is the arithmetic mean of the numeric evaluation of the responses provided for each question included in the factor. Cluster analysis data normality test was also conducted. See Table 12. For the normality test, Kolmogorov-Smirnov and Shapiro-Wilk criteria were used.

**Table 12.** Cluster analysis data normality test

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Factor _1	,126	292	,000	,953	292	,000
Factor _2	,112	292	,000	,934	292	,000
Factor _3	,164	292	,000	,879	292	,000
Factor _4	,272	292	,000	,880	292	,000

*Source:* the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2020.

Cluster analysis was conducted by Ward's method of detecting distances by the method of Euclidean distance. To detect the number of clusters as a result of cluster analysis, the method of agglomeration coefficient analysis was used. In step 287 of cluster analysis, the agglomeration coefficient rapidly increased for almost 70 units. This allowed us to single out five customer groups that have standard features of cluster forming factors. Five sets were detected where customers were united in 5 groups, see Table 13.

**Table 13.** Cluster analysis with Ward’s method

		Frequency	%	Validity %	Cumulative%
Valid	1	101	34.6	34.6	34.6
	2	74	25.3	25.3	59.9
	3	52	17.8	17.8	77.7
	4	34	11.6	11.6	89.4
	5	31	10.6	10.6	100.0
	Total	292	100.0	100.0	

Source: the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2020.

**Cluster 1** contains customers who hold essential service quality dimensions such as security, responsiveness, and competence. This customer group is the largest, constituting 34.6% of the total number of respondents. **Cluster 2** lists customers who emphasize as important such quality dimensions as competence and empathy. The number of respondents in this group makes 25.3% of the total number of respondents. **Cluster 3** contains customers who regard the dimension of material gains as the most important one. This group of customers makes 17.8% of all respondents. **Clusters 4 and 5**, similar to cluster 2, accentuate the dimension of empathy. These customer groups constitute 22.2% of all respondents. Data normality test with Ward’s method was conducted, see Table 14.

**Table 14.** Normality test with Ward’s method

	Ward’s method	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
factor_1	1	,255	101	,000	,847	101	,000
	2	,085	74	,200*	,983	74	,439
	3	,144	52	,009	,954	52	,042
	4	,120	34	,200*	,967	34	,378
	5	,139	31	,135	,892	31	,005
factor_2	1	,272	101	,000	,817	101	,000
	2	,198	74	,000	,930	74	,001
	3	,236	52	,000	,924	52	,003
	4	,181	34	,006	,909	34	,008
	5	,142	31	,113	,926	31	,034
factor_3	1	,297	101	,000	,759	101	,000
	2	,126	74	,005	,944	74	,003
	3	,162	52	,002	,914	52	,001
	4	,195	34	,002	,876	34	,001
	5	,335	31	,000	,690	31	,000
factor_4	2	,348	74	,000	,781	74	,000
	3	,346	52	,000	,763	52	,000
	4	,353	34	,000	,636	34	,000
	5	,317	31	,000	,717	31	,000

Source: the table designed by the author, performing the statistical processing of the survey data by SPSS 22.00, 2020.

As the distribution of factor evaluation in the selected groups does not correspond with the normal distribution, for comparing these evaluations non-parametric Kruskal-Wallis test is used, see Table 15 and Table 16.

**Table 15.** Data Kruskal –Wallis test-1

	Ward's Method	Number	Mean
factor_1	1	101	206.71
	2	74	91.43
	3	52	67.21
	4	34	207.54
	5	31	147.85
	Total	292	
factor_2	1	101	215.64
	2	74	82.50
	3	52	62.57
	4	34	166.78
	5	31	192.56
	Total	292	
factor_3	1	101	191.72
	2	74	60.34
	3	52	129.61
	4	34	171.47
	5	31	205.79
	Total	292	
factor_4	1	101	168.00
	2	74	170.86
	3	52	51.15
	4	34	270.71
	5	31	42.00
	Total	292	

Source: the table designed by the author, performing the statistical processing of the survey data by SPSS 22.00, 2020.

**Table 16.** Data Kruskal –Wallis test-2

	factor_1	factor_2	factor_3	factor_4
Chi-Square	147,300	175,509	131,576	236,073
df	4	4	4	4
Asymp. Sig.	,000	,000	,000	,000

Source: the table designed by the author, performing the statistical processing of the survey data by SPSS 22.00, 2020.

There are statistically significant differences among all factors on 1% significance level among cluster group participants,  $p < 0.01$ .

**Table 17.** Gender distribution of customer clusters

		Gender		Total	
		female	male		
Ward's method	1	Number	67	34	101
		% with Ward's method	66.3%	33.7%	100.0%
	2	Number	49	25	74
		% with Ward's method	66.2%	33.8%	100.0%
	3	Number	45	7	52
		% with Ward's method	86.5%	13.5%	100.0%
	4	Number	29	5	34
		% with Ward's method	85.3%	14.7%	100.0%
	5	Number	24	7	31
		% with Ward's method	77.4%	22.6%	100.0%
Total	Number	214	78	292	
	% with Ward's method	73.3%	26.7%	100.0%	

Source: the table designed by the author, performing the statistical processing of the survey data by SPSS 22.00, 2020.

Analyzing the obtained customer clusters according to gender, it must be concluded that the majority in all groups are females (see Table 17 above).

**Table 18.** Age groups of obtained customer clusters

			Customer age			Total
			20-40	41-60	60<	
Ward's method	1	Number	44	46	11	101
		% with Ward's method	43.6%	45.5%	10.9%	100.0%
	2	Number	8	40	26	74
		% with Ward's method	10.8%	54.1%	35.1%	100.0%
	3	Number	14	23	15	52
		% with Ward's method	26.9%	44.2%	28.8%	100.0%
	4	Number	14	14	6	34
		% with Ward's method	41.2%	41.2%	17.6%	100.0%
	5	Number	21	9	1	31
		% with Ward's method	67.7%	29.0%	3.2%	100.0%
Total	Number	101	132	59	292	
	% with Ward's method	34.6%	45.2%	20.2%	100.0%	

*Source:* the table designed by the authors, performing the statistical processing of the survey data by SPSS 22.00, 2020.

Analysis of the obtained customer clusters according to customer age groups, showed that clusters 1 and 4 have a similar distribution of age groups (20-40 and 41-60 years of age; see Table 18 above). Clusters 2 and 3 are basically constituted of customers aged 41-60. Cluster 5 entails customers aged 20-40. The majority of customers in sets fall in the age group 41-60.

Analysis of the obtained customer clusters according to the principal factors for each cluster showed that all received customer clusters possess distinct characteristics related to such service quality dimensions as competence and empathy.

Analysis of the obtained customer clusters according to service quality dimensions revealed that two of the most distinct groups are incredibly similar in evaluating such service quality components as security and responsiveness. One of the customer clusters that may be called fastidious customers has given the most negative evaluation for all service quality dimensions.

Service quality research based on cluster analysis was produced to get detailed customer profiles with similar service evaluations. This approach detects customer groups' unique requirements and needs concerning the service quality and personalized service provision strategy. This segmentation methodology alleviates providing customized services that are adjusted to the individual needs or wishes of various customer groups. Service adjustment enhances customer satisfaction and loyalty (Cheung et al., 2003; Vesanen, 2007).

## Conclusions

In the quality of Latvian public sector administrative services, the essential quality dimensions for customers, the performance of which needs to be improved, are reliability, responsiveness, and competence. The clients rated reliability - on average 4.73 points, responsiveness - on average 4.69 points and competence - on average 4.53 points.

The quality of administrative services in all quality dimensions is assessed as unfavourable. The quality of security, responsiveness, and competence dimensions were assessed with -0.668 points, -0.626 points, and -0.518 points, respectively. A less negative evaluation of quality is observed only in the measurements of material benefits (-0.209 points) and empathy (-0.388 points). A similar study revealed that service quality dimensions such as responsiveness could positively affect customer satisfaction (Mosimanegape et al., 2020). Clients consider the essential quality of services provided by public administration institutions are the security of the service, competence, and responsiveness of the service providers. Factor group I lists factors considered by customers most important as to expected service quality and contains such service quality dimensions as security, responsiveness, and competence. Elements of this group have a coefficient from 0.790 to 0.505. Factor group II according to their importance, contains factors related to such a service quality dimension as empathy. Characteristics of this group have a coefficient from 0.765 to 0.559. Factor group III lists factors related to the material gains dimension. The coefficient of this group is from 0.797 to 0.673.

Comparing the produced factor analysis for data groups concerning the customers' expected service and perceived service evaluation revealed that customers consider security, responsiveness, competence, and empathy to be the most critical service quality dimensions. The performance whereof must be improved. Less essential are factors related to the measurement of material gains. The results of factor analysis confirm the outcomes of the public service evaluation survey conducted within the research. Clients of public administration institutions form four conditional groups according to the factors considered important as concerns the quality of the received services.

A service quality investigation based on cluster analysis was conducted to obtain detailed customer profiles with similar service evaluations. This approach detects customer groups' unique requirements and needs concerning service quality and personalized service provision strategy. This segmentation method makes the provision of customized services adjusted to various customer groups' unique needs or wishes.

Cluster 1 lists customers who hold as important service quality dimensions as security, responsiveness, and competence. Cluster 2 contains customers who single out as necessary competence and empathy. Cluster 3 entails customers who consider the dimension of material gains as the most important. The majority of customers of cluster 4, similar to cluster 2, emphasize the dimension of empathy.

The analysis of customer groups obtained as a result of cluster analysis according to service quality dimensions leads to the conclusion that two of the most distinct groups are remarkably similar in evaluating such service quality components as security and responsiveness. One of the groups is unique in its most negative evaluation of all service quality dimensions. This group may be called the fastidious customers.

The study evaluates the quality of administrative services provided by Latvian public sector institutions and compares it with the efficiency of these institutions. Within the research framework, factors have been identified that are considered necessary by the clients of Latvian public administration institutions regarding the quality of administrative services provided but which are less critical. Specific clusters or groups are formed by the clients of the Latvian public administration according to the factors that are important to them in the quality of the received services.

Due to the limitations to the volume of the research work, the research on customer service quality is concentrated mainly in the largest cities and towns in Latvia – Riga, Daugavpils, Jelgava, Ventspils, and Valmiera. The quality of administrative services was assessed only for face-to-face services, as 54% of the surveyed residents, describing the reasons for face-to-face communication, indicated the impossibility of solving the problem on the Internet (SKDS, 2019).

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