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The Instrument for Evaluating the Academic Library E-Service Quality

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Abstract: New electronic services and their quality evaluation constitute an important field of research and challenge in the modern libraries. The aim of this article is to present an instrument for the evaluation of e-service quality in academic libraries. The instrument eUTLib Qual is based on the theoretical analyses of the existing models of (e-)service quality and their suitability in the context of academic libraries, and on the results of a qualitative and quantitative studies, conducted in the University of Tartu Library, Estonia.

Keywords: E-service quality; quality measurement; academic libraries; library e-services; library performance

Ein Ansatz zur Evaluation der Qualität der E-Services an wissenschaftlichen Bibliotheken

Zusammenfassung: Neue elektronische Dienste und ihre Qualitätsbewertung sind ein wichtiges Forschungsfeld und eine Herausforderung für die modernen Bibliotheken. Ziel dieses Artikels ist es, ein Modell für die Evaluation von digitalen Dienstleistungen wissenschaftlicher Bibliotheken vorzustellen. Das eUTLib Qual beruht auf der theoretischen Analyse bestehender Modelle der Qualität von E-Services und ihrer Anwendbarkeit für wissenschaftliche Bibliotheken sowie auf den Ergebnissen qualitativer und quantitativer Studien, die an der Bibliothek der Universität Tartu durchgeführt worden sind.

Schlüsselwörter: E-Service-Qualität; Qualitätsmessung; akademische Bibliotheken; bibliothekarischer E-Service; Bibliotheksleistungen

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1 Introduction

Economic and technological developments have changed library services and environments – today libraries are rapidly expanding into the virtual space. New electronic services and their quality evaluation constitute an important field of research and challenge in the modern academic libraries, bringing about high interest of practitioners as well as heated discussions among theorists. In recent years, interest in quality management, user satisfaction, service, and e-service quality evaluation¹ has considerably increased in the academic libraries. At the same time libraries are still in search of an optimal model of e-service quality and effective e-quality measurement tool. The aim of this article is to present the instrument for the evaluation of e-service quality in academic library. The instrument eUTLib Qual is based on the theoretical analyses of the existing models of (e-)service quality and their suitability in the context of academic libraries, and on the results of a qualitative and quantitative study, conducted in the University of Tartu Library, Estonia.

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¹ Cf. Hernon and Calvert (2005); Shachaf et al. (2008); Kyriallidou and Giersch (2004).

2 The complexity of defining and assessment (e-)service quality

Many researchers² argue that the process of service quality evaluation is complicated. The decomposition of service quality (SQ) is complicated by certain specific characteristics of services, due to which the user of the service is unable to evaluate the service prior to consuming it. Parasuraman et al. (1985)³ have developed the following classification of service specificities:

- *Intangibility* – the service is difficult to get hold of; it is a non-material phenomenon, which cannot be touched, owned, stored or displayed prior to its delivery, thus, it is difficult to find sufficiently objective grounds from which to define service quality;
- *Heterogeneity* – the service lacks uniform quality at its delivery, as it is composed of several interactions, and hence, service quality could be comprised of a number of “sub-qualities”, which could be individual for each service as well as for each service user;
- *Inseparability* – the service is a holistic process which cannot be delivered without the user, who influences the process of service delivery as well as service quality. The direct participation of the user in the service process compels us to think about service quality not only as meeting certain standards, but to consider how the user contributes to the service result.

These characteristics are also relevant to the e-services; furthermore, the virtual environment may even enhance their effect.

3 The models of service quality and their suitability to the library context

The most prominent conceptions of SQ are based on the disconfirmation model, according to which SQ is defined as the difference between the expected and received service quality.⁴ Disconfirmation happens because of the difference between expected and received service quality. The latter position is the basis of the two major theoretical

frameworks of service quality of American and Nordic schools.

The “Total Service Quality” approach by the Nordic school⁵ defines SQ in terms of functional quality and technical quality. Technical quality is defined as *what* the customer receives in the service outcome. According to this model, in the academic library context the technical quality may be associated with real objects – the building, furnishings, books, computers, etc. Functional quality is defined as *how* the user perceived the service.

According to Grönroos (1998), the functional aspect plays a decisive role in the evaluation of services. However, the library practice demonstrates that in the academic library context the perception of the SQ much depends on the academic competence of the user. University lecturers are objective experts in evaluating the quality of the information sources in their field, or the technical quality. For students, it could still be too difficult, therefore students rely on other criteria of quality associated with the service process and communication – the “how”.

Another aspect, which could influence the ratio of the technical and functional quality of academic library services, is the depth of user-librarian contact. The more intensive is the user’s contact with the librarian, the more important is the way how the service is carried out, meaning its functional quality. This seems to be an important aspect in studying the quality of e-services, because the more services are transformed into the virtual environment, the lower is the contact ratio between the user and the librarian and the importance of functional quality may change as well. For example, polite answers to e-inquiries do not draw a similar communicative response from library users as the librarian’s sincere smile or attentive look in face-to-face communication. As Radford noted, “interpersonal communication between librarian and library user is becoming more complicated in today’s rapidly evolving reference environment”.⁶

An advantage of the theoretical model of the American school, developed by the North American scholars Parasuraman et al. (1985, 1988), is that it focusses on identifying the features which the service user expects from a high-quality service, and on finding out where these expectations may clash with the reality. Based on this model, researchers of the American School developed the tool SERVQUAL for SQ assessment. According to Parasuraman et al.,⁷ service quality is affected by five factors: tangibility

² Cf. Grönroos (1998); Grönroos (2001); Edvardsson (1998); Parasuraman et al. (1985) and Parasuraman et al. (1988).

³ Parasuraman et al. (1985) 41.

⁴ Brady and Cronin (2001) 57.

⁵ Grönroos (1998); Grönroos (2001); Gummesson (1991); Ojasalo (2010).

⁶ Radford (2001) 29.

⁷ Parasuraman et al. (1988) 41–50.

(physical facilities, equipment), reliability (ability to perform the promised service dependably and accurately), responsiveness (willingness to help customer), assurance (knowledge and courtesy of employees), and empathy (caring individualised attention the firm provides to its customers).

American School perspective has found the widest use in librarianship and information sciences. The model and method SERVQUAL were adapted for the library SQ measuring instrument LibQUAL+™ by the ARL (Association of Research Libraries) New Measures Initiative. LibQUAL+™ is based on the library SQ model which consists of four dimensions: access to information, personal control, effect of service, and library as a place.⁸ According to Miller (2008), the users' perceptions about library staff competency and helpfulness compose the *service affect* dimension score.⁹ The *information control* dimension focusses on whether the library's collections are adequate to meet customer needs. The *library as a place* dimension addresses user perceptions regarding the facility's functionality and adequacy for academic activities.

Not all theoreticians agree that SQ and library SQ can be called the gap between expectations and performance. Various other models of service quality can be found in the relevant literature, for example Seth et al. (2005) observed and evaluated 19 different SQ models. The most promising for the library e-service context seems to be the Meyer and Matzmüller (1987) SQ model where service quality is defined by both the service organisation and the customer quality potential. In their view, the service provider can only release this potential through the active involvement of the customer. So, according to Meyer and Matzmüller (1987: 191), the service quality consists of four sub-qualities: potential quality of the service provider and of the customer (i.e., their capabilities, technical and personal skills and willingness), the process quality and the outcome quality. While the Meyer-Matzmüller model is not as widespread and implemented as the SERVQUAL and the Nordic School models, this approach seems especially relevant because the Meyer-Matzmüller model takes into account both the service provider's and the service user's roles.

The Nordic School and the American perspective of SQ see the user of service primarily as the evaluator of quality; with such an approach, the users' expectations and their actual experiences with the services are of primary importance. However, the academic library e-service is born in

the communication and cooperation between two contributing parties – the user and the library. So we can use, according to Gummesson (1991), the term “service quality” together with the term “relation quality”, examining quality primarily as a successful interaction with the service user. Goodwin (1990) has a similar approach, writing that the service and its result greatly depend on the user of the service and their knowledge, experience and motivation.

However, still another party besides the user and the library should be mentioned here. This is the university as the library's parent institution. Through its services, academic library serves the objectives of its university/academy. Unfortunately, none of the library SQ models of today consider the interests and effect of the parent organisation. The university has a role in the quality of e-services as well, since the direction of library development and the volume of its financing, which is needed to guarantee the meeting of the users' needs, depend on the university.

4 The academic library e-service research

Hernon and Calvert (2005) pioneered the library e-service research. They prepared a questionnaire for students asking them about the perceived quality of e-service in order to develop a tool for quality assessment. The problem is under serious scrutiny in American academic libraries (see, e.g., Kyrillidou et al. 2007, 2011), where DigiQual(R) was prepared for assessing digital libraries. Several authors¹⁰ focussed on the assessment of the quality of library web pages. Shachaf et al. (2008) studied the quality of library e-reference. The geography of such studies is quite wide including different countries, such as Malaysia, New Zealand, Portugal, Taiwan, etc. Notable research on the subject is summarised in Table 1.

Table 1 demonstrates that library e-SQ studies do not fully agree about quality dimensions yet, but they converge in one: library e-service quality is a multidimensional construct.

⁸ Kyrillidou (2006) 4.

⁹ Miller (2008) 55.

¹⁰ Wu et al. (2013); Kiran and Diljit (2012).

Table 1: Research on the quality of library e-service (by the author)

Research	Method	Quality determinants
Hernon and Calvert (2005). Library e-service quality research (university libraries, New Zealand)	Mixed: focus groups and web-questionnaire	Ease of use and access, site aesthetics, linkage, collections, reliability, support, security, flexibility, customisation/ personalisation
Kyrillidou et al. (2011). Library web-site quality assessment (academic libraries, USA)	Mixed methods: focus-groups, staff interviews and web-survey	Web attractiveness, design, features, accessibility, navigability, other technical aspects of the sites, interoperability of the sites
Griffiths (2008). Measuring the quality of academic library e-services and resources (Manchester University, UK)	Quantitative	Performance, conformance, features, reliability, durability, currency, serviceability, aesthetics, perceived quality, usability
Shachaf et al. (2008). Measuring the quality of online reference services (academic and public libraries in US)	Qualitative: content analysis of e-references	Timely response, reliability, courtesy
Vinagre et al. (2011). Digital library quality research (Portugal)	Mixed: focus-groups, web-questionnaire	Efficiency, competitive advantage, information adequacy
Kiran and Diljit (2012). Perception of web-based library SQ among students and staff (four universities in Malaysia)	Mixed method: focus groups and web-survey	Environment (access, collections, equipment), delivery (personalisation, relationship, support), outcome (reliability, service benefits)
Wu et al. (2013). Assessing the service quality of library website from university students' viewpoints (universities in Taiwan)	Quantitative: mail-questionnaire	Choices for searching according to users' preference, security, availability, promptness of taking care of problems and system response, simple procedure, relevant content, speed, accurateness, latest information is provided on the front page, variety of e-resources

5 The Zone of Tolerance concept for evaluating SQ

The Zone of Tolerance (ZoT) is recognised in both the service quality and customer satisfaction literature¹¹ as the area between the two degrees of customer expectation standards. According to Parasuraman et al. (1994), the service user's expectations are based on two different levels:

- *Desired service* – the level of service the customer hopes to receive, consisting of what the user believes should and could be provided by an excellent service organisation;
- *Adequate service* – the minimal level of service the customer will expect and accept.

A customer uses these levels as comparative standards in evaluating perceived service quality. Hence, we can talk about SQ only if the perceived service level lies higher than the minimal level of expectations. According to Gwynne et al. (2000), the level of SQ that falls into the ZoT is such that the customer will not evaluate it as good or bad, but instead what best satisfies the service user.

The practical value of the ZoT concept lays in the fact that general customer satisfaction with the service organisation is achieved as long as quality evaluations remain anywhere within the ZoT boundaries. Empirical research¹² has proved that if the perceived quality is located within the Zone of Tolerance, then the customer feels satisfied. Moreover, research by Liljander and Strandvik (1993) and Johnston (1995) demonstrated that fluctuations of quality estimations within the ZoT have only a marginal effect. The customer foremost perceives whether his expectations were met or not, and to a lesser extent, to what degree they

¹¹ Johnston (1995).

¹² Devlin et al. (2002); Teas and DeCarlo (2004); Einasto (2009).

were met. The service user should only sense when the perceived service drops out of the ZoT, both up and down.

6 eUTLib Qual instrument description and evaluation scales

The eUTLib Qual instrument does not use the gap score approach utilised in classic SERVQUAL and LibQUAL+™ tools. A review of relevant literature¹³ indicates that measuring the gap between expectations and performance can be extremely complicated. Several empirical studies¹⁴ indicated that the performance-based scale in most cases outperforms the disconfirmation-based SERVQUAL scale. Therefore, the eUTLib Qual implements Cronin and Taylor SERVPERF approach to measure library service performance directly, which makes the instrument much more simple and clear for survey participants.

The eUTLib Qual direct relative evaluation scale has verbal labels for its five points. The focus group participants found that this method was the only possible way for them to adequately evaluate whether the e-SQ level/*library performance* is acceptable, lower or higher. The level of service, sufficient for acceptance (the bottom of the ZoT), is taken as the middle of the scale (see Figure 1). The scale end points correspond to user total satisfaction (perfect level) and total dissatisfaction (unacceptable level).

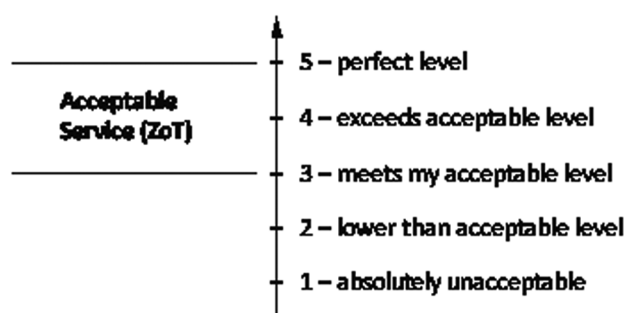


Fig. 1: Evaluation scale of service quality survey eUTLib Qual (by author)

Users also were asked to evaluate *the importance* of e-service quality criteria. Landrum and Prybutok (2003: 11) stressed that a good quality research should examine how importance scores might be used together with perfor-

mance scores for management purposes: “researches should examine the use of importance/performance maps and gauge how useful this information is for managers compared to expectations”. Their study indicated that importance and expectations are definitely not the same construct. In addition to performance measurement, eUTLib Qual explores the importance of chosen quality components for library users. Each e-quality criterion is examined directly on a five-level Likert type scale, with items named from 1 – ‘Not Important’ to 5 – ‘Very Important’.

7 The empirical research setting in the University of Tartu Library

The research setting is related to the e-services offered by the University of Tartu Library (UT Library, UTL)¹⁵ is the oldest and largest of Estonia’s academic libraries (the size of its collections is over 3.7 million items; it has about 55.000 users, and registers over 800.000 visits and over 750.000 loans a year). Being the most universal Estonian research library, UTL has unique collections of manuscripts and publications of scholarly value on all subjects; the oldest items date back to the 13th century. The library is digitising its historical special collections, and the rising number of virtual visits from all over the world each year confirms its successful role in global scholarly communication.

Currently, the library is actively developing e-services, providing the self-service module My ESTER of the e-catalogue; the services of electronic document delivery, e-Book on Demand and online reference are heavily used. The library website provides a convenient overview of the opening hours, events and exhibitions at the library, services, and options to use the conference centre. Through its home page the Library also mediates access to a representative collection of electronic scholarly information – more than 100 databases, ca 90.000 e-books, ca 84.000 e-journals, and the collection of Estonian e-textbooks. The Library also manages the University of Tartu Repository on DSpace, which has joined the e-theses portal DART-Europe.

UT Library has long-term traditions of library user surveys, for example, Loorits and Dubjeva (1995) reported about the users’ satisfaction with the quality of UTL reference services, and Miil (1998) described the UT Library study of performance quality. The library also participated

¹³ Buttle (1996); Morrison Coulthard (2004).

¹⁴ Babakus and Boller (1992); Boulding et al. (1997).

¹⁵ <https://utlib.ut.ee/en>.

in the study “Library performance measurement and evaluation in Estonian research libraries” in 1995–2000.¹⁶ UT Library started monitoring its service quality in 2005 developed the quality assessment tool UTLib Qual (2005) and eUTLib Qual (2009).¹⁷ Based on empirical research, a four-component conceptual model was designed for UTL service quality assessment, and a relative evaluation scale proposed. The UTLib Qual and e-UTLib Qual surveys provide a simple and clear agenda for improvement actions in the academic library: reallocating resources, resetting service priorities.¹⁸

8 Research Design

An overview of the research in the field of the e-SQ provided above (see Table 1) shows that studies in library e-SQ use a variety of methodologies, but in the main, libraries employ a mixed methodology as a combination of qualitative (focus groups, interviews, content analysis) study on the first stage of research and quantitative (e-mail questionnaire, web-survey) study on the next stage. In this mixed research, the main stress was laid on the qualitative method, followed by quantitative collecting of data, its analysis and drawing of final conclusions. Such methodology helps to specify the essence of the e-services and their quality, and to test the results with a larger sample.

Focus groups were used to identify the most significant criteria for the library e-service quality. According to Walden (2006), focus groups can be effectively used as assisting factors in hypothesis formulation, research design and questionnaire development. The task of this focus groups study was to discuss the most important issues of using library online. Recruiting the participants for focus groups was based on the principle that the productivity of members depends on the group's social and intellectual homogeneity.¹⁹ For the data analysis was used the coding according to research by Santos (2003) and Krueger (1994).

Discussing the good e-service criteria, the participants of focus groups identified 15 significant criteria: user-friendliness, access reliability, security, speed, credibility, and relevance of e-information, clarity of e-information, competence, feedback, dialogue, user participation, responsiveness, courtesy, empathy/support, and aesthetics. The list of these quality criteria, specified by the focus groups, was complemented with eight additional items

selected from relevant literature: navigation, accuracy, assurance, sufficiency, completeness, easy access, personalisation/customisation and entertainment. For operational definitions of the criteria see Supplement 1.

Focus group discussions were followed by a quantitative study – online survey. The quantitative study made use of the importance-performance approach²⁰ for investigating the users' perceptions of library e-SQ. The scale items were based on the 22 criteria of e-service quality, built on the basis of the focus group research and previous studies (see Table 1). Respondents were asked to rate the level of importance attributed to each e-quality criterion on the scale from 1 – ‘not important’ through to 5 – ‘very important’. In addition, respondents were asked to rate their perception of the UT library performance on a specially designed scale which included the Zone of Tolerance (see Figure 1). The online questionnaire was distributed among the library users by e-mail. Research was based on 416 fully answered questionnaires.

Statistical Package for Social Sciences (SPSS) was used for processing the data of quantitative study. Data processing included factor analysis and regression analysis. Factor analysis (principal component analysis, using Varimax rotation with Kaiser normalisation) was used as the method of structural classification in order to group and reduce the criteria of quality. The factor analysis was made for 3, 4 and 5 factors. During the factor analysis, one indicator with low communality (factor value 0.381) was removed from the analysis. After that, the factor analysis was run again. The sorted rotated values of factor loading with minimum value of 0.4 or more were considered. The regression analysis examined the associations of the four dimensions of perceived e-service quality with the respondents' gender, academic status and digital skills.

Factor analysis enabled to identify factors affecting e-SQ, as a result of the factor analysis; four dimensions with their associated 22 scale items were derived.

The first factor, *communication*, is concerned with aspects of the human-to-human (librarian-to-user) communication. The second factor, *content*, is related to the information provided or mediated by the library. The third factor, *access*, is concerned with aspects of the user-information system interaction. The fourth factor, *web design*, is focused on the aspects of e-environment and website design options.

¹⁶ Nuut et al. (2001); Lepik (2002).

¹⁷ See Einasto (2005); Einasto (2006); Einasto (2009).

¹⁸ Einasto (2009); Einasto (2016).

¹⁹ Vihalemm (2014);

²⁰ O'Neill et al. (2001).

Table 2: Factor analysis of individual dimensions of academic library e-sq, the given factor values > 0.4

Variable	Factor 1 Communication	Factor 2 Content	Factor 3 Access	Factor 4 Design
Support	.720			
Feedback	.716			
Courtesy	.673			
Dialogue	.695			
Competence	.694			
Responsiveness	.578			
Accuracy		.672		
Clarity		.661		
Relevance		.653		
Credibility		.649		
Sufficiency		.564		
Completeness		.537		
Speed			.768	
User-friendliness			.677	
Easy access			.667	
Reliability			.662	
Assurance			.640	
Navigation			.535	
Security			.533	
Entertainment				.759
Aesthetics				.753
Personalisation/ customisation				.501

9 Data analyses and practical applications

The collected answers were analysed by the following:

- location of e-SQ/library performance evaluations on the scale of The Zone of Tolerance,
- comparison of the answers from different groups based on the academic status, faculties, demographic profile of respondent,
- mapping the positive and negative evaluations by target groups and by faculties,
- identifying the importance of evaluated SQ criteria for different groups.
- E-services indicators which the library renders the best, and which are the most important/not important for users;
- E-services indicators which quality is unsatisfactory, and which are very important/not important to users.

The library should turn its attention first and foremost to those evaluations that fall below the Zone of Tolerance (below the acceptance level). It is useful to map out all such answers, analysing them by user groups. For optimal service development and efficient resource planning, the real needs of the library user should be identified through

which e-service criteria are essential for users and which are not. For these analyses is useful to construct importance-performance matrixes for every library's target group and each university faculty. The matrixes include the following indicators (see Table 3):

Survey results can be taken as a basis to development the library service strategy. It is considered vital to set priorities on those quality factors and criteria that are of high importance for users but where the quality estimation falls lower than ZoT. The elements of key importance in evolving library service development plans include analysing these factors, performing additional user enquiries as necessary, and starting special quality programs and projects. Additional human and financial resources should be directed into these areas.

Table 3: Importance-performance matrix for service quality indicators and service development (by the author)

		Performance of service	
		<i>Below the bottom of ZoT</i>	<i>Remains within the ZoT</i>
Importance for user	High	e-services indicators which quality is unsatisfactory, and which are very important to users	e-services indicators which the library renders the best, and which are the most important
	Low	e-services indicators which quality is unsatisfactory, and which are not important to users	e-services indicators which the library renders the best, and which are not important

Those service indicators that are estimated highly but are of low importance for users should also be of serious concern. A great economy of resources may be achieved here, as even lowering SQ to the bottom of the ZoT should not affect the overall satisfaction of users. Specific quality programs and projects were drawn for each strategic focus, concentrating on those services where importance was high, but evaluations did not stay within ZoT. The eUTLib Qual survey has set library benchmarks for developing services and making managerial decisions on which e-service areas should be addressed first. It helped to focus resources on satisfying the academic community's needs instead of wasting them on less important fields.

10 Conclusions and practical applications

This study demonstrates how academic libraries can use the instrument of e-service quality evaluating, based on the Zone of Tolerance concept and an importance-performance mapping method. The proposed approach to quality research allows gathering necessary information to focus strategic planning on services important for users and to efficiently allocate the library's resources. The research presents an alternative framework and measurement scale for monitoring academic library e-service quality.

Although published research on academic library e-service quality has increased, it mostly focuses on users' expectation. This study is one of a few that examine library e-service quality on the basis of users' perceptions as well as search for criteria that users identify as important for the quality evaluation. The principal difference of eUTLib Qual instrument from generally accepted SERVQUAL and LibQUAL+TM methods is that respondents do not have to evaluate their expectations (the width of Zone of Tolerance) on an absolute scale, instead concentrating on much simpler direct evaluation of their perception of service relative to

adequate expectations. This allows a combination of the practical values of ZoT concept, improving the questionnaire and increasing the validity of the data.

This study makes a contribution to an area of interest of librarians-practitioners. Academic libraries put much effort into the development of their services. They must be able to show whether their service quality satisfies their users and whether their services are developed in the right direction and in a cost-effective way. It is not very difficult today for library specialists to plan and carry out a users' survey. However, it is more difficult to apply survey results in library management processes. While such surveys give library managers information about user satisfaction, they provide too limited insights into developing services and focusing on real user needs. It is useful and interesting for library managers to know how users evaluate e-services, however, that alone does not provide enough value to move forward. This is a frequent question at professional meetings, how to incorporate the survey data in managerial decision-making practices, and how to use it to improve library e-services.

To conclude, the e-service quality of academic libraries is a multidimensional concept, whose total extent has not yet been fully grasped. It is essential to continue with research to enhance this concept. The instrument eUTLib Qual could provide inspiration for library practitioners looking for ways of evaluating e-SQ. As systematic (e-)SQ monitoring is still not standard practice for many academic libraries, the author hopes the methodology and the instrument offered will give academic library managers useful guidelines for measuring and maintaining appropriate (e-)SQ level, setting adequate tasks, providing necessary services, allocating resources optimally and eventually achieving more efficient operation.

References

- Babakus, E.; Boller, G. W. (1992): An empirical assessment of the SERVQUAL scale. In: *Journal of Business Research*, (24) 253–68.
- Boulding, W.; Kalra, A.; Staelin, R.; Zeithaml, V. (1997): A dynamic process model of service quality: from expectations to behavioral intentions. In: *Journal of Marketing Research*, 30(1) 7–27.
- Brady, M. K.; Cronin, J. J. (2001): Some new thoughts on conceptualizing perceived service quality: a hierarchical approach. In: *Journal of Marketing*, 65 (July) 34–49.
- Buttle, F. (1996): SERVQUAL: review, critique, research agenda. In: *Journal of Marketing*, 30 (1) 8–32.
- Devlin, J. F.; Gwynne, A.; Ennew, C. (2002): The antecedents of service expectations. In: *The Service Industries Journal*, 22 (4) 117–36.
- Einasto, O. (2005): Service Quality Monitoring in the Academic Library User's Tolerance Zone as a Start Point for Service Development. Ülikooliraamatukogu teenuse kvaliteedi monitooring kasutaja tolerantustsoonis kui teenuste arendamise lähtepunkt. Käsikiri. Master's Thesis. University of Tartu.
- Einasto, O. (2006): Mida lugeja tegelikult raamatukoguhoidjalt ootab? In: *Raamatukogu*, (6) 9–14.
- Einasto, O. (2009): A conceptual model for evaluating the service quality of research libraries. In: *Service Quality – Library Performance Indicator*. Transaction of the National Library of Estonia, 12B. Tallinn: RR, 101–17.
- Einasto, O. (2016): Academic library e-service quality and working user: conceptual model. PhD thesis. Tartu: University of Tartu Press. Available at http://dspace.ut.ee/bitstream/handle/10062/53446/einasto_olga.pdf?sequence=1&isAllowed=y.
- Griffiths, J. R. (2008): Measuring the quality of academic library electronic services and resources. Retrieved May 10, 2015. Available at https://www.researchgate.net/publication/251792554_Measuring_the_quality_of_academic_library_electronic_service_s_and_resources.
- Grönroos, Ch. (1998): Marketing services: the case of a missing product. In: *Journal of Business & Industrial Marketing*, 13 (4/5) 322–38.
- Grönroos, Ch. (2001): The perceived service quality concept – a mistake? In: *Managing Service Quality*, 11 (3) 150–52.
- Gummesson, E. (1991): Service quality. A holistic view. In: Brown, S.; Gummesson, E.; Edvardsson, B.; Gustavsson, B. O. (Eds.): *Service Quality. Multidisciplinary and Multinational Perspectives*. Lexington: Lexington Books.
- Gwynne, A.L.; Devlin, J.; Ennew, C. (2000): The Zone of Tolerance: insights and influences. In: *Journal of Marketing*, (16) 545–64.
- Hernon, P.; Calvert, P. (2005): E-service quality in libraries: Exploring its features and dimensions. In: *Library & Information Science Research*, 27 (3) 377–404.
- Johnston, R. (1995): The Zone of Tolerance: exploring the relationship between service transactions and satisfaction with the overall service. In: *International Journal of Service Industry Management*, 6 (2) 46–61.
- Kiran, K.; Diljit, S. (2012): Modeling Web-based library service quality. In: *Library & Information Science Research*, 34 (3) 184–96. Retrieved September 5, 2015. Available at <http://www.sciencedirect.com/science/article/pii/S0740>.
- Krueger, R. A. (1994): Focus Groups: A Practical Guide for Applied Research. Thousand Oaks, CA: Sage Publications.
- Kyrillidou, M. (2006): LibQUAL+™: A project from StatsQUAL™. In: *Association of Research Libraries*, 4–5.
- Kyrillidou, M.; Giersch, S. (2004): Qualitative Analysis of ARL E-Metrics Participant Feedback about the Evolution of Measures for Networked Electronic Resources. In: *Library Quarterly*, 74 (4) 423–40.
- Kyrillidou, M.; Thompson, B.; Cook, C. (2011): Regrounding LibQUAL+ for the digital library environment: an analysis of the DigiQUAL data. In: *9th Northumbria International Conference on Performance Measurement in Libraries and Information Services*. York, England, August 22. Proceedings. York: University of York, 205–11.
- Landrum, H.; Prybutok, V. R. (2003): A service quality and success model for the information service industry. In: *European Journal of Operational Research*, 12 (4) 359–77.
- Lepik, A. (2002): The multidimensional nature of performance measurement in research libraries: Estonian Approach. In: *Information Sciences*, (20) 42–48.
- Liljander, V.; Strandvik, T. (1993): Estimating Zones of Tolerance in perceived service quality and perceived service value. In: *International Journal of Service Industry Management*, 4 (2) 6–28.
- Loorits, E.; Dubjeva, L. (1995): Satisfaction with reference service of Tartu University Library. In: *Library Management Development Project*. 3rd Final Report. Stockholm: Stockholms Univeritetsbibliothek, 55–58.
- Meyer, A.; Mattmüller, R. (1987): Qualität von Dienstleistungen (Quality in Services). In: *Marketing ZFP*, 9 (3) 187–95.
- Mil, K. (1998): The Survey of the Resultfulness of library Performance at the Tartu University Library. In: *Research Libraries in Public Information System: Towards Performance Quality*, Tallinn: National Library of Estonia, 55–72.
- Miller, K. F. (2008): Service Quality in Academic Libraries. Doctoral dissertation. University of Central Florida, Orlando: Florida Retrieved from 15.03.2016. Retrieved May 10, 2015. Available at <http://old.libqual.org/documents/admin/Miller1.pdf>.
- Morrison Coulthard, L. (2004): Measuring service quality. In: *International Journal of Market Research*, 46 (4), 479–97.
- Nuut, A.; Lepik, A.; Liivamägi, T. (2001): Developing performance measurement and quality evaluation in Estonian research libraries: Survey of current situation. In: Stein, J.; Kyrillidou, M.; Davis, D. (Eds.): *Proceedings of Fourth Northumbria International Conference*, 159–69.
- Ojasalo, J. (2010): E-service quality: a conceptual model. In: *International Journal of Arts and Sciences*, 3 (7) 127–43.
- Parasuraman, A.; Zeithaml V. A.; Berry L. L. (1988): Servqual: A multiple-item scale for measuring consumer perceptions of service quality. In: *Journal of Retailing*, 64 (1) 12–50.
- Parasuraman, A.; Zeithaml, V. A.; Berry, L. (1985): A conceptual model of service Quality and its implications for future research. In: *Journal of Marketing*, (Fall) 41–50.
- Parasuraman, A.; Zeithaml, V.; Berry, L. (1994): Alternative scales for measuring service quality: a comparative assessment based on psychometric and diagnostic criteria. In: *Journal of Retailing*, 70 (3) 193–204.
- Radford, M. L. (2001): Encountering users, encountering images, communication theory and the library context. In: *Journal of Education for Library and Information Sciences*, 42 (1) 27–41.

- Santos, J. (2003): E-service quality: a model of virtual service quality dimensions. In: *Managing Service Quality*, 13 (3) 233–46.
- Seth, N.; Deshmukh, S. G.; Vrat, P. (2005): Service quality models: a review. In: *International Journal of Quality & Reliability Management*, 22 (9) 913–49.
- Shachaf, P.; Oltmann, M. S.; Horowitz, S. (2008): Service equality in virtual reference. In: *Journal of the American Society for Information Science and Technology*, 59 (4) 535–50.
- Teas, R. K.; DeCarlo, T. E. (2004): An examination and extension of the Zone-of-Tolerance model. In: *Journal of Service Research*, 6 (3) 272–86.
- Vihalemm, T. (2014): Andmekogumismetodid. Fookusgrupi intervjuu. Retrieved March 24, 2014, from <http://samm.ut.ee/fookusgrupi-intervjuu>.
- Vinagre, M. H.; Leonor, G. P.; Paula, O. (2011): Revisiting digital libraries quality: a multiple-item scale approach. In: *Performance Measurement and Metrics*, 12 (3) 214–36.
- Walden, G. R. (2006): Focus group interviewing in the library literature: a selective annotated bibliography 1996–2005. In: *Reference Services Review*, 34 (2) 222–41.
- Wu, C.-M.; Hsieh, C.-L.; Chang, K.-L. (2013): A Model for Assessing the Service Quality of University Library Websites. *Mathematical Problems in Engineering*. Retrieved May 10, 2015, from <http://dx.doi.org/10.1155/2013/363486>.

Supplement 1 eUTLib Qual questionnaire

CRITERIA OF E-SERVICE QUALITY	OPERATIONAL DEFINITIONS	HOW IMPORTANT TO YOU?	WHAT IS THE TU LIBRARY PERFORMANCE?
		5 – very important 4 – important 3 – quite important 2 – less important 1 – not important	5 – perfect level 4 – exceeds acceptable level 3 – meets my acceptable level 2 – lower than acceptable level 1 – absolutely unacceptable
CONTENT			
Accuracy	whether all the information related to the e-services is accurate	1-2-3-4-5	1-2-3-4-5
Clarity	concise and understandable content, terms and conditions	1-2-3-4-5	1-2-3-4-5
Relevance	library website provides useful and relevant information	1-2-3-4-5	1-2-3-4-5
Credibility	library website provides trustful information	1-2-3-4-5	1-2-3-4-5
Sufficiency	information received from the website is sufficient to meet the user needs	1-2-3-4-5	1-2-3-4-5
Completeness	exhaustive collections of e-materials to meet my immediate needs	1-2-3-4-5	1-2-3-4-5
ACCESS			
Speed	quick navigation, search, and downloading	1-2-3-4-5	1-2-3-4-5
User-friendliness	the library website is logically structured; easy for quick access and navigation	1-2-3-4-5	1-2-3-4-5
Easy access	website gives easy access to texts and search features on both the office and home computer	1-2-3-4-5	1-2-3-4-5
Reliability	correct technical functioning of the website; no broken links; databases are up and running	1-2-3-4-5	1-2-3-4-5
Assurance	feel confident in dealing with the site; providing personal attention	1-2-3-4-5	1-2-3-4-5
Navigation	easy to find what the user needs, easy orientation on the site, the user should not be lost on the library website	1-2-3-4-5	1-2-3-4-5
Security	user's personal information is protected; transactions are safe from intrusion	1-2-3-4-5	1-2-3-4-5

CRITERIA OF E-SERVICE QUALITY	OPERATIONAL DEFINITIONS	HOW IMPORTANT TO YOU?	WHAT IS THE TU LIBRARY PERFORMANCE?
		5 – very important 4 – important 3 – quite important 2 – less important 1 – not important	5 – perfect level 4 – exceeds acceptable level 3 – meets my acceptable level 2 – lower than acceptable level 1 – absolutely unacceptable
COMMUNICATION			
Support	empathy; supportive guidelines for research and library use; print-friendly format; helpfulness; FAQ availability	1-2-3-4-5	1-2-3-4-5
Feedback	personal confirmation from library about successful or failed transactions (requesting, etc.)	1-2-3-4-5	1-2-3-4-5
Courtesy	“netiquette”; respect of the partner; politeness; correctness	1-2-3-4-5	1-2-3-4-5
Dialogue	availability of library chat, virtual area for comments, questions and suggestions; choice of languages; easy finding of the contacts and people needed	1-2-3-4-5	1-2-3-4-5
Competence	possession of the required skills and knowledge to perform and provide the library e-service; expertise; problem solving	1-2-3-4-5	1-2-3-4-5
Responsiveness	quick response; effective handling of problems; helpfulness; making new information available	1-2-3-4-5	1-2-3-4-5
WEB-SITE DESIGN			
Personalisation	personalising the website to the users' needs	1-2-3-4-5	1-2-3-4-5
Aesthetics	nice, stylish and visually pleasing design, colourful, with images	1-2-3-4-5	1-2-3-4-5
Entertainment	animations, links to video clips, etc.; attractiveness	1-2-3-4-5	1-2-3-4-5



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