

E-service quality: a case study of Varaždin County

Renata Mekovec

University of Zagreb, Faculty of Organization and Informatics, Croatia
renata.hudek@foi.hr

Krsto Kero

University of Zagreb, Faculty of Organization and Informatics, Croatia
krsto.kero@foi.hr

Abstract

E-service is a service delivered to a customer or a potential buyer through a web site. Owing to ICT evolution, a web site is becoming a communication, sales and marketing channel. There exist a growing number of web sites through which enterprises not only communicate with their customers but also offer and sell their goods and services. These developments in turn have created the need for measurement and evaluation of this kind of service. E-service quality can be interpreted as the evaluation of service provided to an individual by a web site. Therefore e-service quality is defined as difference between the service that a customer or a user of particular web site expects and the one actually provided by the web site. E-service quality evaluation results can be used as a basis for e-service quality improvement as well as the improvement of enterprise efficiency, competitiveness and attractiveness in the virtual market. The existing instruments for e-service quality evaluation are based on respondents' perception of their experience during their interaction with the seller by means of the Internet. While evaluating e-service quality, respondents complete a questionnaire consisting of a particular number of items where their degree of agreement/disagreement with a particular item is marked. In this paper the existing e-service quality evaluation instruments are presented, as well as their advantages and disadvantages. First, the structure of enterprises from Varaždin County offering online shopping service on their web sites was determined. Furthermore, the quality of e-service provided by enterprises from Varaždin County was defined using the E-S-QUAL instrument, one of the latest instruments for e-service quality evaluation. Along with this evaluation, the quality of e-service provided by enterprises from Varaždin County was determined using the upgraded E-S-QUAL instrument developed with a view to eliminate the influence of respondents' subjective perception on e-service quality evaluation results.

Keywords: e-service, e-service quality, quality evaluation, e-service evaluation instruments

1. Introduction

Simultaneously with the increase of the Internet users, increases the need for monitoring and measuring of the services provided through this medium. Besides the quality of goods and service offered to their customers and potential buyers, the enterprises need to keep in mind the quality of their promotion and commerce by the use of web-site. Besides the promotion, the web sites are used as the link between the seller and the buyer, where the buyer is able to find all the information about the enterprise, its assortment, and the way for online-buying. The service which the seller provides to the buyer through the web site is called electronic service, i.e. e-service. Although e-service excludes the physical contact between the seller and the buyer, it also requires measurement. Parasuraman (1998) defines the quality of service as the degree of difference between the buyer's expectation of the service and his/her perception of that service. The quality of e-service may be viewed as the difference between the service expected by the web site user, and the service provided to him/her in reality. The acquisition of the web site may be considered an opportunity for use of the new communication media for communicating and doing business with the buyers. What makes the difference between the successful enterprises and those less successful is their ability to integrate marketing, buyer service, use of information, and new technologies, to realize long-term, profitable market share (Willcocks and Plant, 2001). According to numerous authors, one of the main reasons for acceptance of new technologies and introduction of Internet into the business is the fact that the increase of the e-service quality may help the enterprise with its own web site to become more efficient and to achieve higher levels of satisfaction and retaining buyers on their web site (Grönross et al., 2000) Also, e-service quality may increase the attraction, number of visits of particular web site, buyers retaining, and maximize the competitive advantages of the e-commerce (Santos, 2003). The core of these new opportunities is the advantage of new technologies which enable the sellers to increase their competitiveness (Bodkin and Perry, 2004).

2. E-service quality evaluation

Although the discussion about the e-service and its quality began only with the onset of the information society in Europe, there are numerous systems dealing with the evaluation of the e-service quality. Yang et al. (2005) developed and assessed a system for quality measurement of the service perceived by the web portal user. They focused on the information presenting web portals (*IP Web portal*). Parasuraman et al. (2005) were dealing with the quality of the e-service which is provided by particular web site. The purpose of their work was to develop a scale, E-S-QUAL scale for measuring the quality of e-service of the web sites on which the users buy the goods, i.e. material products (*shop online*). If the web site user has a problem during shipping or recovery of the goods, E-S-QUAL scale is supplemented by the E-RecS-QUAL scale, which is related to the quality of recovery service. Ancarani (2005) in his research dealt with the assessment of the e-service quality in the local public sector. Albert et al. (2004) defined the framework for the new approach to the design and maintenance of the web sites, which also includes the metrics for e-service quality. The new approach is called GIST – *Gather-Infer-Segment-Track*. Wolfinbarger and Gilly (2003) were interested in the defining and measuring of the quality of online retail shopping, so they developed the eTailQ system. Francis and White (2001) developed the scale for measuring the perceived quality of the Internet retail shopping (*Perceived Internet Retailing Quality*); the scale is called PIRQUAL. There are two systems called SiteQual, and both are dealing with the same area of research. The authors of one such system are Webb and Webb, while the

authors of other are Yoo and Donthu. Harold W. Webb and Linda A. Webb (2004) in their work about the SiteQual system have found their main motivation in the fact that it is necessary to determine the minimal and the desirable level for various components of service and information quality, and also to show the way in which the expectation of the buyers may serve as the basic indicator, which can be used in creation and upgrading of the web sites, *business to consumer* (B2C) web sites. Yoo and Donthu (2001) have made the research related to the quality of the web services which offer the online service. The result of the research is the scale which the authors called SITEQUAL, whose role is the evaluation of the web site quality, and assessment of the influence of the web site quality to the behavior of the visitors of that web site. Loiacono, Watson and Goodhue developed in 2000 the system which they called WebQual, which is also used for the measurement of the web site quality. Barnes and Vidgen (2000) also developed a system they called WebQual, designed on the base of research and study of the voice of customer and quality function development. The system itself includes also the evaluation of the e-commerce, and the basic parameter of the evaluation is the web site service quality. That system is renamed eQual in 2005. González and Palacios (2004) in their research defined Web Assessment Index which is adequate for analysis of the commercial, educational or non-profit organizations. Zhang, Keeling and Pavur (2000) have designed the system for measurement of the quality of the web site home page. This system is focused on the measurement of the presentation, navigation and perception of the home page of the commercial web site. Most of the systems dealing with the quality of e-service and its evaluation have defined similar factors or groups of factors by which the e-service quality is assessed. The difference between the factors appears if they measure different types of service, so one type of factors are used in evaluation of the online shopping, and the other type of factors are used in service buying. The foundation of the most systems for evaluation of the e-service quality is the use of the interval scale, which measures the users' perception of services which they got from particular web site. In such way, the evaluation depends upon the subjective perception of the respondent, which grades his/her experience during the contact with the particular enterprise through the Internet. The contact of the buyer and the seller through the Internet consists of all activities which took place before, during and after the transaction – buying. Such method of measurement of the e-service quality provides good and worthy results, but the elimination of the subjectivity would yield much better results.

3. Research method

In the evaluation of the e-service quality provided by the enterprises from the Varaždin County, we used the E-S-QUAL instrument (Parasuraman et al., 2005) which is one of the newest systems for quality evaluation. E-S-QUAL instrument consists of 22 statements grouped into 4 dimensions: efficiency, system availability, fulfillment and privacy. With every statement, there is a 5-item scale on which the respondent grades the degree of his/her agreement/disagreement with the particular statement. Simultaneously, the quality of the e-service is evaluated by the application of the upgraded E-S-QUAL instrument (Mekovec, 2006) which, for every statement of the original E-S-QUAL instrument, defines a certain number of parameters whose existence the respondent needs to verify on the evaluated web site. In such way, the quality of e-service depends upon the existence/non-existence of the certain parameter, which decreases the influence of the respondent's subjective perception on the results of the evaluation of e-service quality. In the Business Registry of the Croatian Economic Chamber, there are data about all the enterprises in the Varaždin County. The research was focused on the Varaždin County enterprises, therefore only the Varaždin County

Chamber was monitored in the search. The search was made separately for every industry, so the enterprises could be grouped related to the industry (this term is related to the industry which the enterprise listed as its basic field of activity) reported by the enterprise in the Croatian Economic Chamber. The criterion for number of the employees was set to 1 or more of employees, so the enterprises without any employee can be excluded from the research (there are 384 such enterprises in the Varaždin County). For every industry according to the above mentioned criteria we got results – names of the enterprises which fulfill particular criterion. The basic set consisted of 1598 enterprises; most of those were dealing in commerce (G industry), after that, manufacturing industry (D industry), then real estate, renting and business services (K industry), construction (F industry), and transport and storage (I industry). The proportion of certain element in the set is the relative number which results from the proportion of the number of the elements in one part of the set and the number of the elements in the whole set (Kero and Bojanić-Glavica, 2003). The proportion is expressed in parts of one; if it is multiplied by 100, the result is the percentage expressed in parts of hundred.

For the enterprises for which the web sites were found, the assessment of technical and functional was conducted. After the technical and functional checking of the web sites, we found there are 219 of them which can be used in our research. The proportion of the enterprises with the working web sites was calculated by calculating the proportion of the number of enterprises with working web sites in the total number of enterprises in Varaždin County¹.

$$p_1 = \frac{n}{N} = 0,1371 \quad [1]$$

Of the observed enterprises, there were only 13.71% of them which had a working web site, i.e. web site which passed the test of technical correctness and checking of the functionality. Varaždin County, which is one of the most developed counties in Croatia, has less than 20% of enterprises which use the Internet. If we look at the structure of the enterprises with the working web site according to the industry, we can see that D industry (61 enterprises), G industry (64 enterprises) and M industry (37 enterprises) contain the largest percentage of enterprises with working web sites. The percentage of the enterprises with working web sites according to the groups of industries is shown in Figure 1.

¹ p_1 – the proportion of the enterprises with working web sites; n – number of the enterprises in the Varaždin County with working web sites; N – total number of enterprises in Varaždin County.

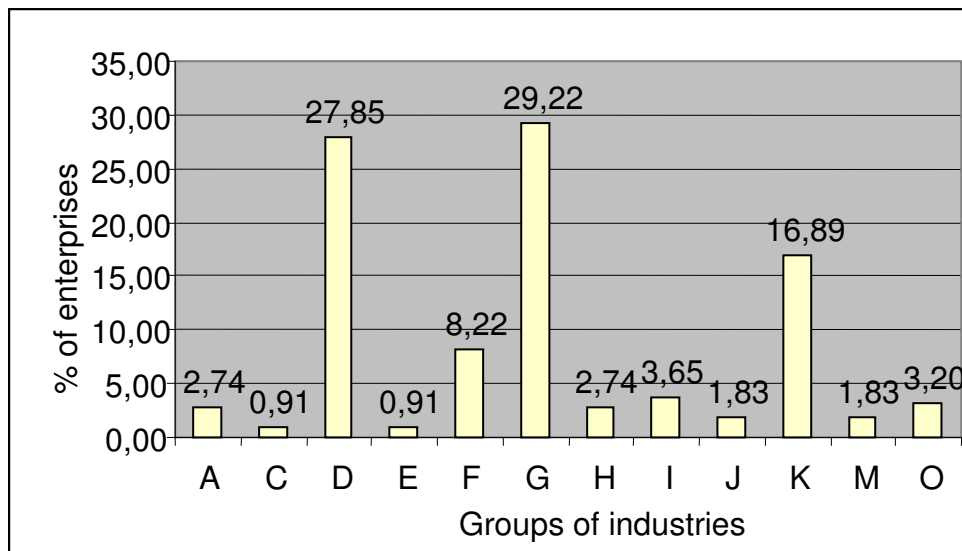


Figure 1. Percentage of the enterprises with working web sites in Varaždin County, according to the groups of industries

Out of the total of 219 enterprises from Varaždin County with working web site, only 52 of them offer some kind of e-service. This is only 23.74% of the total number of enterprises with the working web site. Of those enterprises, 30 have electronic form for the contact, 11 have electronic form for making an order, and 11 have the possibility for online buying and paying. The definition of the sample was not conducted, because of the small basic set which consists of only 9 elements – 6 web sites which offer the online shop service, and 3 web sites which offer the service of e-form for making an order. After the determination of the number of web sites through which the online shopping can be made, two respondents made an evaluation of e-service quality for every web site. For the evaluation of e-service quality, the respondents used the original and upgraded E-S-QUAL instrument.

Results

Table 1 shows the number of differences in grades (degrees) of the e-service quality in 9 enterprises from Varaždin County made by 2 respondents according to the groups of statements (efficiency, system availability, fulfillment and privacy). Column 2 shows the results of comparison of the grades of e-service quality by application of the original instrument E-S-QUAL. Of the total of 198 tests (22 statements x 9 enterprises), in 103 tests the results of the respondents differed, i.e. the grades of the two respondents were different in 52% of the tests. In the group “efficiency” there were 72 tests (8 statements x 9 enterprises), in which the answers of the respondents differed in 56.94% of the tests. The group “system availability” consisted of 36 tests (4 statements x 9 enterprises), in which the answers of the respondents differed in 47.22%. In the group “fulfillment” there were 63 tests (7 statements x 9 enterprises), and the difference was evident in 39.68% of them. In the group “privacy”, there were 27 tests (3 statements x 9 enterprises) and the difference was evident in 71.42% of them. In Table 1, the column 3 shows the results of the comparison of grades of the e-service quality by the use of upgraded E-S-QUAL instrument; there were 21 tests in which the results of the respondents differed. Out of the total of 198 tests (22 statements x 9 enterprises) which were conducted, the 21 differences represent 10.6% of all tests. If we view the differences in the grades of both respondents, the biggest difference was found in the group “efficiency”, 17 of them. In the group “fulfillment” there were 2 differences; in the groups “system availability” and “privacy” there was only 1 difference evident.

E-S-QUAL dimensions	Number of differences in the statement grades by two respondents	
	Original instrument	Upgraded instrument
1	2	3
Efficiency	41	17
System availability	17	1
Fulfillment	25	2
Privacy	20	1
Total	103	21

Table 1: The number of differences in the statement grades (N=22) by two respondents during the evaluation of the e-service quality of the Varaždin County enterprises

To calculate the medium degree of the quality for every particular group, we used the arithmetical mean of arithmetical means which is calculated as the simple arithmetical mean of arithmetical means (Šošić, 2004). The simple arithmetical mean of arithmetical means can be calculated only in the case when every arithmetical mean is calculated for the same number of elements; then it is calculated by summing the arithmetical means, and dividing them by the number of arithmetical means. To reach the total grade of the e-service quality for the group “efficiency” of the Varaždin County enterprises, we put into the proportion the sum of all arithmetical means and the total number of enterprises from the Varaždin County area.

The calculus is following:²:

$$x = \frac{\sum_{i=1}^n \bar{x}_i}{N} \quad [2]$$

The average grade of the e-service quality for the group “efficiency” of the Varaždin County enterprises calculated by the use of the original E-S-QUAL instrument is 3.69, while the same average grade calculated by the upgraded E-S-QUAL instrument is 3.43. Using the expression [2] for calculating the arithmetical mean of arithmetical means, the average grade of the quality for the group “system availability” for Varaždin County enterprises with the use of original E-S-QUAL instrument is 4.5, while the same average grade calculated by the upgraded E-S-QUAL instrument is 4.31. The average grade of the e-service quality for the group “fulfillment” of the Varaždin County enterprises calculated by the use of the original E-S-QUAL instrument is 2.4, while the same average grade calculated by the upgraded E-S-QUAL instrument is 2.76. The average grade of the e-service quality for the group “privacy” for Varaždin County enterprises with the use of original E-S-QUAL system is 2.3, while the same average grade calculated by the upgraded E-S-QUAL system is 2.18. The basic problem which emerges in the assessment and evaluation of the e-service quality in all four groups is the way in which the final grade within particular group is obtained, as well as the way in which the final grade of particular enterprise is obtained. In the research, we used arithmetical

² $\bar{x}_1, \bar{x}_2, \dots, \bar{x}_n$ - are the arithmetical means of every enterprise; \bar{x} - arithmetical mean of arithmetical means

mean of arithmetical means. This arithmetical mean of arithmetical means is good indicator only in the case when the values on whose base is arithmetical mean calculated are homogenous, i.e. when there are no large discrepancies. Otherwise, the arithmetical mean of arithmetical means is not representative.

4. Conclusions

Based on the results of application of the original and the upgraded E-S-QUAL instrument, and their comparison, it can be concluded that the upgraded system limits the respondents during the evaluation of the e-service quality, while the original system does not. This conclusion is confirmed by the number of responses in which the two respondents gave the same grade (same degree on the interval scale) to the assessed statement. Because of the defined parameters for every single statement, the upgraded E-S-QUAL limits the respondent's subjectivity during the evaluation of the e-service quality, because he/she has to assess the values of the defined parameters, while the original E-S-QUAL instrument enables the respondent to grade the e-service quality on the interval scale for every statement based only on his/her experience and perception. Although the results of the grades of e-service quality for 9 Varaždin County enterprises obtained through the original and the upgraded E-S-QUAL instrument differ very lightly, it is obvious that the grades of the e-service quality are lower when the respondents used the upgraded E-S-QUAL instrument than when they used the original one. Further researches should assess the upgraded E-S-QUAL instrument on larger number of enterprises, so it could be tested and evaluated. Furthermore, the significance of the particular parameters should be checked, and decision should be made whether we should retain them in particular system, or discard them.

References

- Albert, T. C., Goes, P. B., Gupta, A., (2004): GIST: A model for design and management of content and interactivity of customer-centric web sites, *MIS Quarterly*, Vol. 28, No. 2, pp. 161-182.
- Ancarani, A., (2005): Towards quality e-service in the public sector: The evolution of web sites in the local public service sector, *Managing Service Quality*, Vol. 15, No 1, pp. 6-23.
- Barnes, S., Vidgen, R., (2000): WebQual: an exploration of web site quality, *Proceedings of the 8th European Conference on Information Systems*, Vienna, July 3-5, Hansen, H. R., Bichler, M., Mahrer, H. (Editors), *Wirtschaftsunivsitat, Wien*
- Bodkin, C.D., Perry, M., (2004): Goods retailers and service providers: comparative analysis of web site marketing communications, *Journal of Retailing and Consumer Services*, Vol. 11, Issue 1, pp.19-29.
- Francis, J. E., White, L., (2001): What Internet shoppers expect, beyond the Web site, *Proceedings of the 2001 Australian and New Zealand Marketing Academy (ANZMAC) conference*, Massey University Albany Campus, Auckland New Zealand, December, 1-5, S. Chetty, S., Collins, B., (editors), *Auckland*
- Gonzales, M. F. J., Palacios, T.M.B., (2004): Quantitative evaluation of commercial web sites: an empirical study of Spanish firms, *International Journal of Information Management* 24, pp. 313-328.

- Grönroos, C., Helnomen, F., Isoniemi, K., Lindholm, M., (2000): The NetOffer model: a case example from the virtual marketspace, *Management Decisions*, Vol 38, No. 4, pp. 243-52.
- Kero, K., Bojanić-Glavica, B., (2003): *Statistika u primjerima*, FOI Varaždin, Varaždin
- Loiacono, E.T., Watson, R.T., Goodhue, D.L., (2000): WebQual: A Web Site Quality Instrument, available from <http://www.terry.uga.edu/cisl/includes/pdf/webqual.pdf>, (Accessed January 10, 2007)
- Mekovec, R (2006): Procjena kvalitete e-usluge primjenom sustava E-S-QUAL, magistarski rad, Sveučilište u Zagrebu, Fakultet organizacije i informatike, Varaždin
- Parasuraman, A., (1998): Customer service in business-to-business markets: an agenda for research, *Journal of Business & Industrial Marketing*, Vol. 13, No. 4/5, pp. 309-321.
- Parasuraman, A., Zeithaml, V., A., Malhotra, A., (2005): E-S-QUAL, A multiple-item scale for assessing electronic service quality, *Journal of Service Research*, Vol. 7, No. 3, pp. 213-233.
- Santos, J., (2003): E-service quality: a model of virtual service quality dimensions, *Managing Service Quality*, Vol. 13, No. 3, pp. 233-246.
- Šošić, I., (2004): *Primijenjena statistika*, Školska knjiga, Zagreb
- Webb, H., Webb, L., (2004): SiteQual: an integrated measure of Web site quality, *The Journal of Enterprise Information Management*, Vol. 7, No. 6, pp. 430-440.
- Willcoks, L. P., Plant, R., (2001): Pathways to e-business leadership: getting from bricks to clicks, *Strategies for e-business success*, Brynjolfsson, E., Urban, G.L., (Editors), MITSloan Management Review, Yossey-Bass, San Francisco
- Wolfenbarger, M., Gilly, M.C., (2003): eTailQ: dimensionalizing, measuring and predictingetail quality, *Journal of Retailing*, Vol. 79, pp. 183-198.
- Yang, Z., Cai, S., Zhou, Z., Zhou, N., (2005): Development and validation of an instrument to measure user perceived service quality of information presenting Web portals, *Information & Management*, Vol. 42, Issue 4, pp. 575-589.
- Yoo, B., Donthu, N., (2001): Developing a Scale to Measure Perceived Quality of an Internet Shopping Site (SITEQUAL), *Quarterly Journal of Electronic Commerce*, 2 (1), pp. 31-46.
- Zhang, X., Keeling, K., B., Pavur, R., J., (2000): Information quality of commercial web site home pages: An explorative analysis, *International Conference on Information Systems*, Proceedings of the twenty first international conference on Information systems, Brisbane, Queensland, Australia, 2001, December 10-13, Association for Information Systems, Atlanta, GA, USA