

A Proposed Scale for Measuring E-service Quality

Hongxiu Li, Reima Suomi

Information Systems Science Institute, Turku School of Economics, Finland

Turku Center for Computer Science, Finland

Hongxiu.li@tse.fi, Reima.suomi@tse.fi

Abstract

With rapid growth of the Internet and the globalization of market, companies accepted and adopted the new information and communication technology to offer e-services to their customers. This paper addresses e-service quality issue in the electronic marketplace. The purpose of this paper is to extend what are the main service quality dimensions in the realm of e-service. The paper explores e-service quality dimensions based on a review of the development of e-service quality scales and the SERVQUAL scale. It proposes an 8-dimension scale for measuring e-service quality with rewording and modifying of the SERVQUAL instrument: Website design, reliability, fulfillment, security, responsiveness, personalization, information and empathy. This paper concludes by discussing the findings of this study and highlighting areas for the future research in the realm of e-service quality.

1. Introduction

With rapid growth of the Internet and the globalization of market, companies accepted and adopted the new information and communication technology in the performance of their activities, not only to support traditional activities, but also to support those arising from new opportunities, mainly from the Internet. Electronic commerce and online business stand out among these opportunities. Most companies are establishing Websites, which are regarded as a new channel to conduct business transaction, and customers can make purchase through companies' Websites. It enables companies to access a global market with low operating cost, to offer information in depth, and to provide customers electronic service (e-service) with superior quality by means of the interactivity of the Internet, which increases the competition among companies.

Both concepts of e-service and e-service quality have become increasing important issues in research. E-service is different from traditional service, which is based on interactive information flow between customers and service providers. E-service quality has been regarded as having the potential not only to deliver strategic benefits, but also to enhance operational efficiency and profitability [12, 26]. E-service is becoming even more critical for companies to retain and attract customers. What brings online customers back to company's websites is a sense of loyalty that comes from good services offered by companies. Oliveria et al. (2002) suggest that companies can achieve competitive capabilities by offering good e-services to customers [24]. Service quality has strong impacts on customer satisfaction on the performance of companies. Improving e-service quality to satisfy and retain customers is becoming a challenging issue.

There are a range of studies on the dimensions, measures and attributes of e-service quality. The purpose of this paper is to uncover and interpret the current researches in the dimensions of e-service quality, and propose a theoretical scale to measure e-service quality, which provides fresh insight into the dimensions of e-service quality.

The remainder of this paper is organized as follows. Following the introduction, the next section provides a brief description of the SERVQUAL scale. Then the paper presents a review of the development of e-service quality dimensions, and an alternative e-service quality scale is proposed. Finally, the findings of the review and suggestions for future research are presented.

2. SERVQUAL scale for measuring service quality

To contextualize e-service quality, an examination of the SERVQUAL scale is required since most of the current e-service quality scales are developed based on the SERVQUAL instrument. The SERVQUAL scale was developed by Parasuraman et al. (1985, 1988), aiming at providing a generic instrument for measuring service quality across a broad range of service categories [2, 3]. The widely used SERVQUAL instrument is composed of five dimensions, which are based on the original ten dimensions developed by them [2, 3]. The five dimensions of SERVQUAL are:

- (1) Tangibles: The appearance of physical facilities, equipment, personnel and communication materials;
- (2) Reliability: The ability to perform the promised service dependably and accurately;
- (3) Responsiveness: The willingness to help customers and provide prompt services;
- (4) Assurance: The knowledge and courtesy of employees and their ability to convey trust and confidence;
- (5) Empathy: Care and individualized attention provided to customers.

SERVQUAL scale has been used to measure service quality in various service industries, and some studies have applied the SERVQUAL model to measure service quality in the context of e-service by rewording its items. However, the employing of the SERVQUAL scale by rewording its items seems to be inefficient in the context of e-service [1], and the generic dimensions of the SERVQUAL model need to be reformulated in order to be used meaningfully in the context of e-service since e-service is quite different from traditional service, with three aspects standing out [9]:

- (1) The absence of sales staff. In e-service, there is no service encounters between the customers and the sales staff as in the traditional service.
- (2) The absence of traditional tangible element. In e-service, service process is almost completed in the virtual environment with some intangible elements.
- (3) Self-service of customers. In e-service, customers conduct self-service in purchasing and realize control in business process.

Considering the differences between traditional service and e-service, obviously the SERVQUAL scale is not suitable for measuring e-service quality. New scales suitable for measuring e-service quality are needed in e-service studies.

3. Dimensions of e-service quality

With the increasing application of e-commerce in organizations, the importance of measuring and monitoring e-service quality in the virtual world has been recognized. Some studies have been conducted aiming at developing measurement scales adapted to e-service quality field (See Table 1).

Table 1. A review of the dimensions of e-service quality

Author(s)	Dimensions	Context
Dabholkar	Website designs, reliability, delivery, ease of use, enjoyment and	E-service

(1996)	control.	
Zeithaml et al. (2000)	Efficiency, reliability, fulfillment, privacy, responsiveness, compensation, and contact.	Online retailing
Yoo and Douthu (2001)	Ease of use, aesthetic design, processing speed, and security.	Online retailing
Cox and Dale (2001)	Website appearance, communication, accessibility, credibility, understanding and availability.	Online retailing
Jun and Cai (2001)	Website design, information, ease of use, access, courtesy, responsiveness, and reliability.	Online banking
Yang (2001)	Website design, security and information.	Online retailing
Author(s)	Dimensions	Context
Wolfenbarger and Gilly(2002, 2003)	Website design, reliability, security, and customer service.	Online shopping sites
Zeithaml et al. (2002)	Security, communication, reliability, responsiveness and delivery.	E-service
Madu and Madu (2002)	Performance, features, structure, aesthetics, reliability, serviceability, security and system integrity, trust, responsiveness, service differentiation and customization, Web store police, reputation, assurance and empathy.	E-service
Loiacono et al. (2002)	Information, interactivity, trust, response time, website design, intuitiveness, flow, innovativeness, integrated communication, business process and substitutability.	Online retailing
Yang and Jun (2002)	Website design, security, reliability, responsiveness, accessibility and customization.	Online retailing
Surjadaja et al. (2003)	Security, interaction, responsiveness, information, reliability, delivery, and customization.	E-service
Santos (2003)	Ease of use, appearance, linkage, structure, content, efficiency, reliability, communication, security, incentive and customer support.	E-service
Yang et al. (2003)	Responsiveness, credibility, ease of use, reliability, convenience, communication, access, competence, courtesy, personalization, collaboration, security and aesthetics.	Online retailing
Yang et al. (2004)	Reliability, responsiveness, competence, ease of use, security and product portfolio.	Online shopping sites
Field et al. (2004)	Website design, reliability, security, and customer service.	E-service
Kim and Stoel (2004)	Web appearance, entertainment, information, transaction capability, responsiveness and trust.	Online retailing
Yang and Fang (2004)	Responsiveness, reliability, credibility, competence, access, courtesy, communication, information, responsiveness and website design.	E-service

Gounaris et al. (2005)	Website design, information, trust, responsiveness and reputation.	Online retailing
Parasuraman et al. (2005)	Efficiency, availability, fulfillment, privacy, responsiveness, compensation and contact.	E-service
Lee and Lin (2005)	Website design, reliability, responsiveness, trust and personalization.	Online retailing
Kim et al. (2006)	Efficiency, fulfillment, system availability, privacy, responsiveness, compensation, contact, information and graphic style.	Online retailing
Fassnacht and Koese (2006)	Graphic quality, layout, attractiveness of selection, information, ease of use, technical quality, reliability, functional benefit and emotional benefit.	E-service
Cristobal et al. (2007)	Website design, customer service, assurance and order management.	E-service
Sohn and Tadisina (2008)	Trust, speed of delivery, reliability, ease of use, customized communication, website content and functionality	Online Financial service

With regards to the dimensions in the studies of e-service quality shown in Table 1, obviously, most researches develop adapted e-service quality scales based on the modification of the SERVQUAL instrument [9]. Zeithaml (2000) proposes a 7-dimension e-service quality scale with modification of the traditional SERVQUAL in order to make the developed scale to be adapted to e-service [26]. Later, Zeithaml et al. and Parasuraman et al. further conduct a study to explore the measures of e-service quality, which is based on their earlier research on traditional service quality, and develop an E-S-QUAL scale based on the 7-dimension scale proposed by Zeithaml [1, 26, 27, 28, 29]. A comparison between SERVQUAL and E-S-QUAL dimensions is investigated in their study as well. Zeithaml (2002) states that some dimensions of the SERVQUAL can be applied to e-service quality, but there are additional dimensions in e-service, many of which are specifically related to technology [27]. The original E-S-QUAL scale comprises 11 dimensions, and later is developed into a 7-dimension scale by Parasuraman et al., including the core dimensions and the recovery dimensions (2005). The four measures of the core dimensions are efficiency, system availability, fulfillment, and privacy, and the three measures of the recovery dimensions are responsiveness, compensation, and contact [1]. The 7-dimension scale offers the surface dimensions of e-service quality based on customers' experience and evaluation perspective, which are viewed also as the antecedents to the adoption of e-service [14].

Currently, studies on e-service quality have been conducted in different context, including e-service, online retailing, online shopping and online financial service. Most of the studies take a combination of traditional service quality dimensions and web interface quality dimensions as the point of departure. Dabholkar (1996) conducts a study on the measures of e-service quality focusing on web site design, and argues that there are 7 basic parameters in the judgment of e-service quality [23]. Yoo and Donthu (2001) develop a 4-dimension scale called SITEQUAL to measure online website quality [4]. Cox and Dale (2001) set up a 6-dimension scale to measure online retailing service quality [11]. Lociacano et al. (2002) develop a scale called WEBQUAL to measure online retailing service quality, which is composed of 12 dimensions [9]. Wolfenbarger and Gilly (2002) develop an e-service quality scale focusing on online shopping, which was initially titled COMQ and later was developed to eTailQ [18, 19].

Sohn and Tadisina (2008) put forward a 6-dimension model for e-service quality assessment, which is based on their empirical study on online financial institutions [6].

There is growing recognition of different variability in the outcome of e-service quality studies in terms of the measures of e-service quality [16, 22], and recently studies on e-service quality show more different dimensions in e-service quality [6, 7, 8, 10, 13, 15, 17, 21, 22, 25, 30, 33, 34]. Madu and Madu (2002) develop a 15 dimensions scale of e-service quality, which is built on better understanding of customers and providing services to meet the needs and expectations of customers [5]. Santos (2003) argues that both active dimensions and incubative dimensions are important in e-service quality and both of them should be taken into account in e-service quality evaluation, and puts forward a scale consisting of 11 sub-dimensions [15]. Field et al. (2004) develop a process model for assessing and improving service quality by identifying e-service system entities and transactions between those entities and mapping key quality dimensions onto them [13]. Gounaris et al. (2005) suggest that different dimensions of perceived e-service quality are influenced by different antecedents [25]. Yang and Jun (2002) identifies the differentiation among dimensions between online-purchaser and non-purchaser [32]. Yang and Fang (2004) further examine the differentiation of dimensions to online service satisfaction and dissatisfaction. They argue that there are four salient quality dimensions leading to both satisfaction and dissatisfaction, including responsiveness, reliability, ease of use and competence [30]. As mentioned earlier, Parasuraman et al. (2005) develop the dimensions for core service delivery and recovery services delivery in e-service quality [1]. Kim et al. (2006) extend the dimensions developed by Parasuraman et al. into a 9 dimensions scale in e-service quality to evaluate the service quality of websites in the apparel retailing sector [22].

4. A proposed scale for measuring e-service quality

Based on the previous review and taking advantages of the previously obtained results, a new scale is proposed in this study. The alternative scale recognizes the SERVQUAL dimensions whose nature is still maintained in e-service field, and create some new dimensions and attributes that recognize the e-service idiosyncrasy. The proposed scale is composed of 8 dimensions. Each dimension is illustrated in several attributes. It is built upon the rewording of the five dimensions of the SERVQUAL scale plus three additional dimensions.

Website design

The tangible elements on the SERVQUAL scale refer to the physical facilities, equipments and the appearance of the staff. In the virtual environment of e-service, the tangible elements should be focused on the website design since it constitutes the main access to organizations and to a successful purchase process. The deficiency of website design can result in a negative impression of the website quality to the customers, and customer may exit the purchase process. Website is the starting point for customers to gain confidence. Thus website design should meet the following attributes in order to attract customers to conduct purchasing online easily with good navigation and useful information on the website.

- Appealing and well organized website.
- Consistent and standardized navigation.
- Well-organized appearance of user interface.
- Quickly downloading.

- Easy use of the online transaction.

Reliability

According to some empirical studies, reliability is the most important dimension of e-service quality, which is also an important dimension in the SERVQUAL scale. In the virtual environment, it is vital to make customers to trust that the organization is going to perform what it promises to do. The following attributes in reliability dimension can make customers recognize the consistency and credibility of the company providing e-service.

- Accurate delivery service.
- Complete order service.
- Company being truthful about its offering.
- The online service always correct.
- Keeping service promise.
- Keeping promotion promise.
- Accurate online booking records.
- Website always available.

Responsiveness

Compared to responsiveness in SERVQUAL, responsiveness in e-service quality scale is a much narrow concept. In e-service, the company provides prompt service to customers through digital media when customers have questions or problems, which make customers more comfortable during purchasing and continue purchasing without interruption. The following are the attributes of responsiveness dimension.

- Adequate contact information and performance.
- Prompt responses to customers.
- Timely responses to customers.
- Adequate response time.
- Quickly solve problems

Security

Security refers to the freedom from danger, risks or doubts during the service process. This dimension holds an important position in e-service. Customers perceive significant risks in the virtual environment of e-service stemming from the possibility of improper use of their financial data and personal data, which is an important barrier to online customers to purchase online. The following are the attributes of security dimension of e-service quality.

- Protect the financial data of customers.
- Protect the personal data of customers.
- Terms on payment and delivery.
- Good reputation.

Fulfillment

In e-service, to inform customers of the right information about products or service availability is important when purchasing. Incorrect information can result in negative impact to customer's future repurchasing intention. In addition, flexibility in purchasing can increase customer's confidence to company. The following are the two attributes of fulfillment dimension.

- Information on products or services available when purchasing.
- System runs smoothly in the transaction process.
- Accurate promises about delivery service in purchasing process.
- Available to modify and/or defer the purchasing process at any time without commitment.

Personalization

In e-service, interactivity between customers and companies offers opportunities for companies to obtain information about customer, such as purchasing habits, needs, preferences and so on, which makes it possible to offer customer personalized service. Personalized service can improve customer's satisfaction, and customers will be reluctant to try other companies. Not only services and products, but also payment and delivery in the service process, can be personalized, which is aimed at meeting all the requirements and demands of customer. Personalization constitutes a vehicle to retain the customer in e-service. The following are the attributes of personalization dimension.

- Personalized products and services.
- Personalized payment terms.
- Personalized delivery terms.
- Personalized design.

Information

E-service can be regarded as information-driven service process. In e-service, information is vital for customer to make their decision since they can not physically examine what they want to purchase and how about the company. Customers need adequate information to make their purchase decision and conduct their self-service. The following are the attributes of information dimensions.

- Updated information.
- Information current and timely.
- Information accurate and relevant.
- Information easy to understand.

Empathy

Even though there is no direct human interaction in the virtual e-service process, some human contacts are involved in e-service, for example e-mail communication. Providing customer individual attention shows empathy to customers. Response to customers should always be cognizant of customer's needs and show understanding of customer's needs. In the virtual environment of e-service, empathy is important in customer's perception of the e-service quality without face-to-face encounters. The following are the attributes of empathy dimension.

- Good personal attention.
- Adequate contacts.
- Address complaints friendly.
- Consistently courteous.

5. Discussion and conclusion

An attempt is made in this paper to review various dimensions or measures of e-service quality. The different dimensions are summarized in Table 1. Based on the literature review of various dimensions of e-service quality, an alternative e-service quality scale has been proposed in this study. E-service takes place in a setting that is totally different from traditional service encounters, which make the scales accepted and applied in traditional service not suitable for e-service since e-service is characterized by the absence of sales staff, the absence of physical element and customer self-service. In this study, the proposed e-service quality scale presents the dimensions and attributes that are most important to online customer's satisfaction with rewording and modifying of the SERVQUAL scale. In the proposed scale, website design has take the place of tangibles in SERVQUAL instrument, and become quite important in e-service quality since it is the starting point of online purchase and the access to an organization. Reliability maintains to be a dimension in the proposed scale and becomes the most important dimension in e-service quality. Responsiveness in the proposed scale is a narrow concept compared to SERVQUAL instrument. Securities replace the dimension of assurance in SERVQUAL instrument, which focuses on the protection of customers' financial and personal data, and the protection of companies' image. Empathy in the proposed e-service scale stresses personal attention to customers compared to SERVQUAL instrument. In the proposed e-service scale, information, personalization and fulfillment are listed as important dimensions in e-service quality. Since e-service is interactive and information-drive in the virtual environment, it is evident that information is vital in e-service process. The interactivity in e-service results in the requirement of personalization in e-service and fulfillment is the requirement for e-service in the virtual environment.

High e-service quality provides long-term benefits to companies. The proposed e-service quality scale presented in the paper provides a framework of e-service quality and its determinants. It can be of assistance to companies that employ or plan to employ e-service in their business. It can make companies to better understand about e-service quality, customer's satisfaction and profitability.

Researchers and practitioners remain considering further work on the context of e-service quality. There is scope for further work on the measures of e-service quality in the context of pure service sectors the factors which have impact on customers' perception of e-service quality and satisfaction, and the relationship between e-service quality, customer satisfaction and retention to e-service adoption.

References

- [1] A. Parasuraman, V.A. Zeithaml, and A. Malhotra (2005), "E-S-QUAL: A multiple-item scale for assessing electronic service quality", *Journal of Service Research*, Vol. 7, No. 3, pp. 213-234.
- [2] A. Parasuraman, V.A. Zeithaml, and L.L. Berry (1985), "A conceptual model of service quality and its implications for future research", *Journal of Marketing*, Vol. 49, autumn, pp. 41-50.

- [3] A. Parasuraman, V.A. Zeithaml, and L.L. Berry (1988), "SERVQUAL: A multiple-item scale for measuring consumer perceptions of service quality", *Journal of Retailing*, Vol. 64, No. 1, pp. 12-40.
- [4] B. Yoo, and N. Donthu, (2001), "Developing a scale to measure perceived quality of an Internet shopping site (SITEQUAL)", *Quarterly Journal of Electronic Commerce*, Vol. 2 No. 1, pp. 31-46.
- [5] C.N. Madu, and A.A. Madu (2002), "Dimensions of e-quality", *International Journal of Quality & Reliability Management*, Vol. 19 No. 3, pp. 246-259.
- [6] C. Sohn, and S.K. Tadisina, (2008). "Development of e-service quality measure for the internet-based financial institutions", *Total Quality Management & Business Excellence*, Vol.19 No.9, pp. 903-918.
- [7] E. Cristoal, C. Flavian, and M. Guinaliu (2007), "Perceived e-service quality: Measurement validity and effects on consumer satisfaction and web site loyalty", *Managing Service Quality*, Vol. 17 No. 3, pp. 317-340.
- [8] E.T. Loiacono, R.T. Watson, and D.L. Hoodhue, (2002), "WEBQUAL: Measure of web site quality", 2002 Marketing Educators Conference: Marketing Theory and Applications, Vol. 13, pp. 432-437.
- [9] G-G Lee, and H-F. Lin (2005), "Customer perceptions of e-service quality in online shopping", *International Journal of Retail & Distribution Management*, Vol. 33 No. 2, pp. 161-176.
- [10] H. Surjadaja, S. Ghosh, and F. Antony, (2003), "Determinants and assessing the determinants of e-service operation", *Managing Service Quality*, Vol.13 No 1, pp.39-44.
- [11] J. Cox, and B.G. Dale, (2001), "Service quality and e-commerce: An exploratory analysis", *Managing Service Quality*, Vol. 11 No. 2, pp. 121-131.
- [12] J.J. Cronin (2003), "Looking back to see forward in services marketing: some ideas to consider", *Managing Service Quality*, Vol. 13 No. 5, pp. 332-337.
- [13] J.M. Field, G.R. Heim, and K.K. Sinha (2004), "Managing quality in the e-service system: Development and application of a process model", *Production and Operations Management*, Vol. 13 No. 4, pp. 291-306.
- [14] J. Rowley (2006), "An analysis of the e-service literature: Towards a research agenda", *Internet Research*, Vol. 16 No. 3, pp. 339-359.
- [15] J. Santos (2003), "E-service quality - a model of virtual service dimensions", *Managing Service Quality*, Vol. 13 No. 3, pp. 233-247.
- [16] K. Waite (2006), "Task scenario effects on bank web site expectations", *Internet Research*, Vol. 16 No. 1, pp. 7-22.
- [17] M. Fassnacht, and I. Koese (2006), "Quality of electronic services: Conceptualizing and testing a hierarchical model", *Journal of Service Research*, Vol. 9 No. 1, pp.19-31.
- [18] M.F. Wolfinbarger, and M.C. Gilly (2002), "COMQ: Dimensionalizing, measuring and predicting quality of the e-tailing experience", working paper, Marketing Science Institute, Cambridge MA, pp. 1-51.
- [19] M.F. Wolfinbarger, and M.C. Gilly (2003), "ETAILQ: Dimensionalizing, measuring and predicting e-tailing quality", *Journal of Retailing*, Vol.79 No.3, pp. 183-198.
- [20] M. Jun, and S. Cai, (2001), "The key determinants of Internet banking service quality: A content analysis", *International Journal of Bank Marketing*, Vol. 19 No. 7, pp. 276-291.
- [21] M. Kim, and L. Stoel, (2004), "Apparel retailers: Web site quality dimensions and satisfaction", *Journal of Retailing and Consumer Services*, Vol. 11, pp.109-117.
- [22] M. Kim, J-H. Kim, and S.J. Lennon (2006), "Online service attributes available on apparel retail web sites: An E-S-QUAL approach", *Managing Service Quality*, Vol. 16 No. 1, pp. 51-77.
- [23] P. Dabholkar (1996), "Consumer evaluations of new technology-based self-service options: An investigation of alternative modes of service quality", *International Journal of Research in Marketing*, Vol. 13 No. 1, pp. 29-51.
- [24] P. Oliveir, A.V. Roth, and W. Gilland (2002), "Achieving competitive capabilities in e-services", *Technological Forecasting & Social Change*, Vol. 69, pp. 721-739.
- [25] S. Gounaris, S. Dimitriadis, and V. Stathakopoulos (2005), "Antecedents of perceived quality in the context of Internet retail stores", *Journal of Marketing Management*, Vol. 21 No. 7, pp. 669-682.
- [26] V.A. Zeithaml, (2000), "Service quality, profitability and the economic worth of customers: What we know and what we need to learn", *Journal of the Academy of Marketing Science*, Vol. 28 No. 1, pp. 67-85.
- [27] V.A. Zeithaml (2002), "Service excellence in electronic channels", *Managing Service Quality*, Vol. 12 No. 3, pp. 135-138.
- [28] V.A. Zeithaml, A. Parasuraman, and A. Malhotra (2000), "A conceptual framework for understanding e-service quality: Implications for future research and managerial practice", *MSI Working Paper Series No. 00-115*, Cambridge, MA, pp. 1-49.
- [29] V.A. Zeithaml, A. Parasuraman, and A. Malhotra (2002), "Service quality delivery through web sites: A critical review of extant knowledge", *Journal of the Academy of Marketing Science*, Vol. 30 No. 4, pp. 362-375

- [30] Z. Yang, and X. Fang (2004), "Online service quality dimensions and their relationships with satisfaction: A content analysis of customer reviews of securities brokerage services", *International Journal of Service Industry Management*, Vol. 15 No. 3, pp. 302-326.
- [31] Z. Yang, (2001), "Consumer perceptions of service quality in Internet-based electronic commerce", *Proceedings of the EMAC Conference*, 8-11 May 2001, Bergen.
- [32] Z. Yang, and M. Jun, (2002) "Consumer perception of e-service quality: From Internet purchaser and non-purchaser perspectives", *Journal of Business Strategies*, Vol. 19 No. 1, pp. 19-41.
- [33] Z. Yang, M. Jun, and R.T. Peterson (2004), "Measuring customer perceived online service quality: scale development and managerial implications", *International Journal of Operations & Production Management*, Vol. 24 No. 11, pp. 1149-1174.
- [34] Z. Yang, R.T. Peterson, and S. Cai, (2003), "Services quality dimensions of Internet retailing: An exploratory analysis", *Journal of Services Marketing*, Vol. 17 No. 7, pp. 685-701.

Authors

Hongxiu Li is a Ph.D student of Information Systems Science at Turku School of Economics and Turku Center for Computer Science in Finland. She researches in the areas of e-service, e-commerce, and mobile service. She has together about 20 publications published in international conference proceedings and academic journals.

Reima Suomi is a professor of Information Systems Science at Turku School of Economics, Finland since 1994. He is a docent for the universities of Turku and University of Oulu in Finland. Years 1992-1993 he spent as a "Vollamtlicher Dozent" in the University of St. Gallen, Switzerland, where he led a research project on business process re-engineering. Currently he concentrates on topics around management of telecommunications, including issues such as management of networks, electronic and mobile commerce, virtual organizations, telework and competitive advantage through telecommunication-based information systems. Different governance structures applied to the management of IS and are enabled by IS belong too to his research agenda, as well as application of information systems in health care. Reima Suomi has together over 400 publications, and has published in journals such as *Information & Management*, *Information Services & Use*, *Technology Analysis & Strategic Management*, *The Journal of Strategic Information Systems*, *Behaviour & Information Technology*, *Journal of Management History* and *Information Resources Management*. For the academic year 2001-2002 he was a senior researcher "varttunut tutkija" for the Academy of Finland. With Paul Jackson he has published the book "Virtual Organization and workplace development" with Routledge, London.